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Accounting for nature – biodiversity reporting and accountability in public sector

Nives Botica Redmayne, Fawad Ahmad and Dimu Ehalaiye
School of Accountancy, Economics and Finance, Massey University, Palmerston North, New Zealand

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Abstract

Purpose – This study investigates biodiversity reporting and accountability by public sector reporting entities using New Zealand regional councils as a case study. This study specifically examines the nature of biodiversity reporting, the benchmarks used to report on biodiversity and the factors/constraints affecting biodiversity accountability.

Design/methodology/approach – This study adopted a two-stage analysis model. This study first examined the regulatory framework for biodiversity accountability and then used content analysis to examine the annual reports of all 11 regional councils, from 2021 to 2024. Then, the authors conducted in-depth interviews with representatives from the New Zealand regional councils that are on the frontlines of biodiversity reporting and accountability. The analysis was evaluated through a public accountability theoretical perspective.

Findings – New Zealand regional councils are mandated to report on their biodiversity initiatives. However, the regulatory framework does not specifically stipulate the content requirements for these reports or the targets to be achieved, which weakens accountability. Theoretically, this study identifies limitations of supply driven accountability in biodiversity reporting, which leads to compliance-oriented reporting, non-comparable biodiversity disclosures and constraints on the effective public financial management of biodiversity resources. This study also found very limited engagement with broader stakeholders, such as rate payers and indigenous Maori/iwi groups, indicating that demand driven accountability is weak, potentially undermining public accountability for biodiversity.

Originality/value – The study contributes to accountability theory by demonstrating how accountability regimes can become dominated by supply-side pressures when demand-side scrutiny and applicable reporting framework are weak. In such contexts, organisations may produce increasingly extensive disclosures, yet the absence of clear accountability criteria and stakeholder engagement, limits the extent to which reporting supports meaningful evaluation of biodiversity related performance and resource commitments. The study findings contribute to the international debate on biodiversity accounting and accountability as it provides insights through the New Zealand context into factors that can lead to better accountability for biodiversity outcomes in other jurisdictions.

Keywords Accountability, Biodiversity reporting, Regional councils, New Zealand, Public sector

Paper type Research paper

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1. Introduction

A report titled "Assessment Report on Invasive Alien Species and Their Control" issued by The Intergovernmental Science-Policy Platform on Biodiversity & Ecosystem Services (IPBES) highlights a stark reality. The findings suggest that 60% of global species extinctions have been caused by an invasive non-native species leading to a significant loss of biodiversity which has an estimated $423bn of global economic annual costs (IPBES, 2023). Beyond the economic costs, biodiversity loss and extinction of species are considered as one of the greatest threats to earth (Roberts *et al.*, 2021). This significance emanates from the pivotal role that biodiversity plays in sustaining life on Earth - contributing to sustenance, medicinal resources, water and air purification, waste decomposition and facilitating pollination and disease control (Schneider *et al.*, 2014). The significance of biodiversity has been emphasised at The World Economic Forum 2020 that placed the loss of biodiversity amongst the five major threats to life on earth. Similarly, biodiversity is also part of the United Nations Sustainability Goals (SDGs) where there are calls for action regarding environmental, social and economic sustainability through SDG −14 Life below water and SDG-15 Life on land (UN, 2020; Roberts *et al.*, 2021).

From a public financial management perspective reporting non-financial information such as biodiversity information is central to accountability for the relevant stakeholders of public sector entities (Manes-Rossi, 2019; Jorge, 2021; Bisogno *et al.*, 2024). In early 2024, the new GRI standard on biodiversity, GRI 101: Biodiversity, became available to companies and other organisations. The GRI standard 101 is based on key global developments in the biodiversity field, such as the UN Kunming-Montreal Global Biodiversity Framework (GBF), the Science Based Target Network (SBTN) and the Taskforce on Nature-related Financial Disclosures (TNFD). This standard is envisaged as a standard to set global benchmark in accountability for biodiversity impacts and for comprehensive disclosures of organisations' impacts on biodiversity. The standard is also intended to be used by any organisation, regardless of size, type, sector, geographic location, or reporting experience. The standard took effect for reporting on 1 January 2026. In addition, in January 2026 IPSASB issued the IPSAS 51, *Tangible Natural Resources Held for Conservation* (IPSASB, 2026), a new standard with explicit public-sector guidance on accounting for natural resources with physical substance that governments hold to preserve or protect, which is a vital part of public financial management. This standard which becomes effective from January 2028 is envisaged to assist in how governments conceptualise and manage public wealth, by including natural resources. Natural resources and environmental assets are often strategic public assets that shape a country's long-term ecological, cultural and economic path and future. However, despite their economic and long-term importance, these assets have been historically excluded from government financial statements largely due to an absence of a clear reporting framework dependent on a variety of contextual factors.

This paper seeks to investigate and provide evidence on some of those key factors and challenges related to biodiversity reporting and accountability by public sector reporting entities using local governments in New Zealand as a case study. We examine whether reporting public sector entities (regional local councils) mandated in New Zealand to manage biodiversity are using or intending to use any standardised reporting frameworks such as GRI 101. We further examine whether the reporting entities consider that a specific public sector standard designed for biodiversity is needed, rather than using the generic GRI 101 standard. In addition, we examine biodiversity

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accountability practices by New Zealand regional councils, given the largely unregulated and non-standardised nature of biodiversity reporting practices. Theoretically, the study is motivated by public accountability theory from the perspectives of both supply and demand driven accountability frameworks, given that public sector entities are accountable for biodiversity management and responsible to report on biodiversity to stakeholders which include rate payers, community groups, non-government organisations as well as the broader society (Jones, 2003; Gaia and John Jones, 2017; Greiling and Spraul, 2010).

Thus, this study answers the following research questions (RQs):

RQ1. What is the nature of and the currently applied standards for biodiversity reporting by New Zealand regional councils?

RQ2. What are the factors and constraints influencing public sector biodiversity reporting and accountability as perceived by New Zealand regional councils?

To accomplish this investigation, we examined the regulatory framework for biodiversity accountability for New Zealand regional councils and conducted content analysis of the reports on biodiversity within the annual reports issued by the eleven New Zealand regional councils for the period 2021–2024, identifying emerging reporting trends across the reports. Secondly, we conducted interviews with the relevant staff and management working in the regional councils, to understand the current biodiversity reporting practices and accountability processes. New Zealand provides a relevant context for this study due to its exceptionally high levels of endemic biodiversity and biodiversity decline that mirrors, and in some cases exceeds, global trends, irrespective of the existence of a regulatory framework (Clarkson, 2022).

The findings of this study show that under the current biodiversity regulatory framework New Zealand regional councils are required to report on their biodiversity initiatives, however, the framework does not mention specific requirements in relation to the reporting and accountability requirements. Furthermore, the requirements in relation to wider stakeholders' engagements such as rate payers, indigenous and other related groups are blurred. Therefore, the reporting becomes a compliance exercise with a major focus on reporting to individual councils' internal stakeholders, rather than the wider stakeholders' groups. These regulatory and reporting limitations result in considerable variability in reporting, an increasing trend in verbal commitment and concern for biodiversity and a trajectory of declining funding for biodiversity and related initiatives, with more visible decrease in funding from the central government. Our findings also indicate that the reporting variability of biodiversity information creates a lost opportunity for a more meaningful assessment of the use of the available and spent resources for achievement of desired biodiversity outcomes on an aggregate national level and from the public entities' perspective. In that way and given that these resources are public resources obtained through levies and taxes, there is also a diminished understanding of the resource management and utilisation from the public entities' financial management point of view.

Our findings provide interesting and policy relevant lessons and contributions. First, the paper contributes to the literature examining the impact of regulatory framework on biodiversity disclosures and accountability. Findings from the related strand of literature suggest that the regulatory environment, especially central government involvement and coordination among multiple stakeholders, contributes to better environmental reporting outcomes (Ahmad *et al.*, 2026). In this context, the findings indicate that the absence of clear

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reporting expectations and measurable targets shifts responsibility for interpreting regulatory requirements onto reporting entities, resulting in inconsistent reporting practices and reduced accountability. These findings, thus mean that policymakers need to strike a better balance between flexibility and regulatory clarity by providing clearer guidance, standardised reporting expectations and measurable performance targets.

Second, our study contributes to biodiversity accounting for public sector financial management literature, as we provide evidence that standardised reporting for biodiversity, through GRI-101 or by consideration and adoption of IPSAS 51, can enhance consistent and transparent reporting as it is likely to provide local governments and central governments with a better, structured and more adaptable way to consider how biodiversity resources are identified, valued, managed and consequently reported on in public sector as well as how public financial resources used in biodiversity related activities are used. However, our findings also highlight that from the wider policy point of view to effectively operationalise biodiversity strategies there must be appropriate level of funding that is underscored by the appropriate accountability about funds utilisation and relevant stakeholder engagement. This is because in the absence of adequate central funding, accountability loses legitimacy due to a mismatch between delegated responsibilities and allocated resources.

Third, our findings contribute to public accountability theory and the international debate on biodiversity accounting by manifesting that, in the period under observation and in New Zealand context, there was an absence of strong demand driven accountability for biodiversity, standardised reporting expectations, and that the current accountability regime is largely a supply driven accountability (SDA) exercise without clear and widely consistent and comparable KPIs and accountability targets. While organisations may respond through increased disclosure to SDA, the lack of the overall clear performance benchmarks and stakeholder scrutiny limits the capacity of reporting to support meaningful accountability for biodiversity outcomes and associated investments. In that way, our findings provide valuable insights into factors that can lead to better accountability for biodiversity outcomes in other jurisdictions that are currently considering appropriate frameworks for biodiversity related policies and reporting, as well as provide useful insights for policy makers, standard setters and those who manage biodiversity related issues within the public financial management system.

The subsequent sections of this paper are structured as follows: Section 2 explores the New Zealand background as the study's setting. Section 3 presents a review of existing literature. Section 4 discusses the theoretical framework for the study, while Section 5 discusses the research methodology. Section 6 discusses the study's results and findings, and Section 7 concludes the paper and summarises the study's implications, contributions and limitations.

2. New Zealand regional councils' biodiversity reporting and accountability system

New Zealand operates a subnational system of local governments rather than states. These local governments currently comprise of 11 regional councils and 67 territorial authorities (6 unitary authorities, 13 city councils and 53 district councils). The current structure of local government in New Zealand is a result of nation-wide local government reforms that were carried out in the late 1980s. The present local government design replaced the old system of boroughs, towns and counties with regional councils and territorial authorities (Local Government Commission, 2025). Regional councils have the primary responsibility for environmental management in their regions and are subject to the Local Government Act 2002. This includes flood control, air and water quality and pest control as well as the

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regional water reserves and bulk water supply. Territorial authorities are responsible for community facilities such as parks and reserves as well as the resource management planning. Unitary authorities in New Zealand are territorial authorities that also have the powers of a regional council (Ehalaiye *et al.*, 2017; Ehalaiye *et al.*, 2021).

Current 11 regional councils in New Zealand have their boundaries determined to broadly coincide with their water catchment areas. Legislated by the Resource Management Act, 1991 (RMA), local governments through New Zealand regional councils are charged with managing the effects of the use of land, freshwater, coastal waters and air as well as the biosecurity control of animal and plant pests. To discharge their accountability for maintaining biological diversity, under the RMA and the National Policy Statement for Indigenous Biodiversity, 2023 (NPSIB), New Zealand regional councils are assigned integrated responsibilities for policy development, environmental monitoring, record-keeping and public reporting to support the sustainable management of natural and physical resources, with a particular emphasis on indigenous biodiversity. Section 30 of the RMA requires councils to develop and implement regional policies and plans that manage land, water, coastal environments and biodiversity, while balancing environmental protection with broader social, economic and cultural objectives. Biodiversity management must be consistent with Part 2 of the RMA, including the protection of indigenous biodiversity, Māori relationships with ancestral lands and resources and the principles of the Treaty of Waitangi [1] (Barrett *et al.*, 2020). Complementing this, section 35 of the RMA imposes a statutory duty on councils to gather environmental information, maintain records and undertake systematic monitoring of the state of the environment, the effectiveness of policy instruments and compliance with resource consents, with biodiversity monitoring encompassing ecosystem health, native species trends, habitat condition, wetland and freshwater systems, coastal biodiversity and changes in indigenous vegetation, with results required to be made publicly available.

To further strengthen these reporting obligations, in mid-2022 the final exposure draft of a new policy called the National Policy Statement for Indigenous Biodiversity (NPSIB) was released. The policy was gazetted in mid-2023, therefore, we will refer to it as NPSIB (2023). The NPSIB (2023) strengthens reporting and accountability obligations by directing councils to protect, maintain and restore indigenous biodiversity through consistent identification of significant natural areas, monitoring of biodiversity outcomes and evaluation of policy effectiveness, supported by collaboration with Māori *tangata whenua* and other stakeholders. It further requires councils to report on biodiversity status and trends, including through State of the Environment reporting and biodiversity strategies.

Therefore, New Zealand regional councils have a responsibility to oversee the state of the environment in their regions, the efficiency and effectiveness of policies and methods in policy statements and plans and to exercise the resource consents within the region. Regional Councils must also make the public informed about the role of the council and create an environment enabling public to participate effectively under the RMA (Environment Foundation, 2025).

3. Literature review

The literature on accounting, financing and reporting of biodiversity is still emerging in comparison to significant research conducted in the broader environmental and climate related accounting areas (Roberts et al, 2021; Dang *et al.*, 2025). Furthermore, most of the prior literature on biodiversity reporting has focused on corporate voluntary disclosures using content analysis and have developed disclosure indices (Addison *et al.*, 2019; Adler *et al.*, 2018; Bhattacharyya and Yang, 2019; Hassan *et al.*, 2020; Haque and Jones, 2020;

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Maroun and Ecim, 2024; Pujiningsih and Utami, 2024; Rimmel and Jonäll, 2013; van Liempd and Busch, 2013). Overall, these studies find that corporations provide limited disclosures regarding biodiversity. Furthermore, legitimacy and stakeholder pressures are main motivations for biodiversity disclosures, resulting in symbolic practices rather than real transparency (Sun and Lange, 2023; Blanco-Zaitegi *et al.*, 2024). In addition, biodiversity reporting requirements are largely voluntary, flexible and underdeveloped. Therefore, firms have wide discretion over the scope and tone of their biodiversity disclosures (Zharfpeykan and Chapple, 2026).

Within the public sector, biodiversity reporting and management is even less studied and understood, with only a few studies conducted in the UK, USA, Australia and New Zealand. We argue that this represents a significant gap in the literature, particularly given that government agencies and non-governmental organisations, rather than corporations, are typically entrusted with legal responsibility for biodiversity conservation and management (Barut *et al.*, 2016; Weir, 2019). Specifically, local governments play an extremely important role in relation to biodiversity conservation and mitigation of biodiversity loss (Barut *et al.*, 2016). Since local governments manage large biodiversity rich lands, they are often required to develop strategies for the conservation of biodiversity (Convention on Biological Diversity, 2010). Gaia and John Jones (2017) examined biodiversity reporting by UK local councils and report that the local councils adopted a pragmatic reporting approach by utilising the anthropocentric paradigm. Their findings suggest that the local councils' biodiversity disclosures are stakeholders oriented, i.e. focused on considering businesses, industry, ratepayers, farmers, landowners, workers and visitors as the users of the information, which can potentially contribute to the conservation of biodiversity. However, Gaia and John Jones (2017) questioned whether councils place genuine importance on biodiversity conservation. Gaia and Jones (2020) also reported that English local councils disclosed limited information on biodiversity, which was not sufficient for stakeholders to get a comprehensive picture of the current condition of local biodiversity. Gaia and Jones (2020) further showed that the level of biodiversity disclosure was significantly associated with the level of local councils' population, biodiversity management practices, local councils' visibility, the presence of councillors from environmentally oriented political parties and environmental non-governmental organisations operating in the local council area. Weir (2018, 2019) found through interviews of some UK local councils, that there were significant trade-offs and conflicts between satisfying the economic and ecological value of councils' biodiversity accounting. Similar findings are reported across other jurisdictions, for example, Stokes *et al.* (2010) examined the attitude of US municipalities towards biodiversity and report that biodiversity holds little weight in policy circles and the focus on biodiversity is more from the anthropocentric perspective. Similarly, Australian local governments are found to be reluctant in sharing strategic information pertaining biodiversity, particularly, regarding their goals and plans, indicating that biodiversity disclosures are not sufficient, making the monitoring and management of environmental assets and biodiversity difficult. Furthermore, there has been significant inconsistency in biodiversity reporting across different councils as reported in previous studies (Barut *et al.*, 2016).

In terms of protecting the environment and the biodiversity, New Zealand has been a world leader in establishing policies. New Zealand was one of the first countries to commit to the call for attenuating the global biodiversity loss and has formed a Biodiversity Strategy in 2000 (Schneider *et al.*, 2014). Today, New Zealand ranks highly in terms of its biodiversity related policies. However, in practice, New Zealand ranks poorly in terms of the rate of biodiversity loss and extinction of species, including the degradation of natural resources

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such as fresh water (Petrie, 2018; Schneider *et al.*, 2014). Willis (2017) evaluated the effectiveness of biodiversity management efforts since 2000, and highlighted the ongoing decline in biodiversity in New Zealand, advocating for systemic change in current attitudes about and management of natural resources, including biodiversity.

Among the limited studies conducted in New Zealand, Schneider *et al.* (2014) examined biodiversity information reported by the New Zealand local authorities. Their findings suggest that despite requiring accountability for natural resources and biodiversity, RMA does not have any other specific guidelines for reporting biodiversity related information, therefore, leading to reported information that is neither consistent nor comparable. Furthermore, the information that Schneider *et al.* (2014) found, was scattered across many documents and websites. Their study concluded that there is a need for more in-depth analysis of biodiversity reporting. Samkin *et al.* (2014) examined New Zealand conservation legislation and illustrated a framework for disclosure of biodiversity information. More recently, Petrie (2018) reports that lack of clear guidelines regarding biodiversity reporting makes the measurement of biodiversity difficult and subjective, leading to serious gaps in data on biodiversity and natural capital, thus, affecting the management, accountability and stewardship of biodiversity. Willis (2017) concluded that the key challenges concerning the biodiversity loss, and its reporting include incomplete information, poor monitoring, inconsistent prioritisation, legislative gaps and limited collaboration across different stakeholders. Willis (2017) further asserted that the lack of concise and standardised information is the major hindrance to cost-effective intervention and spatial prioritisation.

Overall, the scarce literature on biodiversity reporting and accountability, particularly in public sector setting, indicates the need for better understanding of both biodiversity reporting and accountability. This study attempts to fill this gap by providing evidence regarding key challenges in relation to biodiversity reporting and accountability in public sector. Thus, we contribute to the scant literature on biodiversity related reporting in public sector and add to the important scholarly and practice-oriented debate on biodiversity. Unlike previous studies, we use a two-stage analysis, i.e. document analysis to understand the nature of biodiversity reporting, followed by in-depth interviews to understand the accountability in reporting for biodiversity and the constraining factors affecting biodiversity disclosure practices.

4. Theoretical Framework - Public accountability

Biodiversity reporting by corporate entities has generally been studied from a legitimacy perspective, stemming from the argument that companies voluntarily disclose biodiversity information to gain legitimacy (Adler *et al.*, 2018; Bhattacharyya and Yang, 2019; Rimmel and Jonäll, 2013). We argue that legitimacy theory has limited applicability in the context of public sector entities, such as local councils, that are already mandated to manage and disclose biodiversity related information. Rather, we posit that such public sector organisations are accountable to stakeholders and society at large for the stewardship of environmental assets and natural resources (Jones, 2003). Thus, we draw on public accountability theory (Bovens, 2007; Bovens, 2009; Sinclair, 1995) to evaluate local councils' biodiversity reporting and accountability practices within a mandatory but non-standardised disclosure regime. Appendix 1 summarises the theoretical framing/expectations underpinning the study's analysis of biodiversity reporting and accountability.

Accountability is conceptualised as:

> […] a relationship between an actor and a forum in which the actor has the obligation to explain and justify his or her conduct, the forum can pose questions and pass judgment, and the actor may face consequences (Bovens, 2007: 450).

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Public accountability in this context can involve the actor being accountable to several parties inside and outside their organisations (Almqvist *et al.*, 2013; Gomes *et al.*, 2023; Sinclair, 1995). Thus, local councils have public accountability to its stakeholders, which include rate payers, community groups, non-government organisations as well as the broader society, when it comes to issues relating to the management of biodiversity and related disclosure of information (Deegan, 2002; Gaia and John Jones, 2017; Mulgan, 2000). The accountability relationship between local councils (as both a public sector organisation and through the elected representatives of their communities), presents a duty to maintain, enhance and report on the community's biodiversity and natural environment.

Disclosure of information for public accountability is driven from both the supply and demand sides of accountability (Greiling and Spraul, 2010; Kessy, 2020). Supply driven accountability (SDA), which is also referred to as state-cantered accountability includes formal state structures and processes such as standards, legal audits, fiscal reporting etc. directed towards compliance with laws and institutional regulations, with a view to achieving social accountability and governance objectives (Brinkerhoff and Wetterberg, 2016; Kessy, 2020). Hence, the discourse of SDA focuses on observing the formal rules of answerability, enforcement, and punishment (Kessy, 2020). However, SDA has limitations, as accountable parties may be systematically incentivised to structure and disclose information in ways that signal compliance to monitoring parties (Gent *et al.*, 2015; Pallas and Guidero, 2016), hence becoming a bureaucratic, "box-ticking" and impression management exercise that ignores beneficial outcomes for the public (Gomes *et al.*, 2023; Jones and Solomon, 2013; Kessy, 2020). From the SDA perspective, compliance with relevant standards and existing biodiversity management laws should enhance biodiversity reporting and accountability. However, there are risks that this will create a compliance regime, focused on accountability for output and impression management, rather than actual outcomes. Organisations have been found to focus more on the use of optimistic statements and neutralising techniques, therefore "green washing" (Dumay *et al.*, 2010; Zharfpeykan and Chapple, 2026), rather than meaningfully and consistently reporting on natural assets in their care, including biodiversity. Likewise, lack of clear and comparable information, due to unstandardised reporting, result in the information focusing on impression management and symbolic commitments rather than transparent and balanced disclosure on the use of public resources (Boiral, 2016; Gomes *et al.*, 2023).

Demand driven accountability (DDA) is a citizen-led action for demanding accountability from providers (Joshi and Houtzager, 2012). It involves a bottom-up approach through actions by the civil society, consumers and citizens to push officeholders to report or answer for their actions (Kessy, 2020). DDA has been described as the highest level of accountability, where central and local governments not only deliver goods and services as per their policy promises but are also responsive to citizens' demands (Kessy, 2020). DDA encompasses a wide range of actions and mechanisms apart from voting, which citizens can employ to hold the state to account (Hickey and King, 2016; Kessy, 2020). Examples of DDA tools and mechanisms include participatory budgeting, public expenditure tracking, public demonstrations, protests, citizen report cards, community scorecards, investigative journalism, social audits, citizen charters and the right to information acts (Agarwal, *et al.*, 2009; Yilmaz *et al.*, 2010). Thus, with DDA, if ratepayers and civil society organisations demand accountability and reporting on biodiversity, this should enhance more relevant biodiversity disclosures by local councils. However, DDA does have some limitations as there can be significant information asymmetry between the accountees (i.e. ratepayers, citizens and civil society groups) and the accountor (i.e. local councils) (Greiling and Spraul, 2010). The accountee is limited in how much it can observe all the actions of the accountor

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and has limited knowledge of what information could be available (Botica Redmayne *et al.*, 2023a; Greiling and Spraul, 2010; Schillemans, 2008). Therefore, the discretionary freedom of the accountor to either withhold relevant information (reluctance to disclose information) or to overload the accountee with too much or irrelevant information (information overload), whether intentionally or unintentionally is very high (Greiling and Spraul, 2010). Thus, from this perspective there are limitations for biodiversity reporting and accountability given the heavy reliance of time, resources and access to information necessary for ratepayers and citizens to collectively advocate for such accountability for positive biodiversity outcomes. This is because such collective advocacy is difficult to organise, scale and is often fragmented. This argument may be connected to present-day accounting and reporting practices that have failed to reflect biodiversity loss, management and related strategies within financial reporting (Dabbicco, 2021; Jones and Solomon, 2013).

Taken together, these theoretical insights provide a robust foundation for analysing local councils' biodiversity reporting practices and accountability within a mandatory but non-standardised disclosure regime. The public accountability framework informs our empirical examination of the standards, factors and constraints influencing public sector biodiversity reporting and accountability of New Zealand regional councils.

5. Data and methodology

We adopted a two-stage analysis model to examine biodiversity reporting and accountability by the New Zealand Regional Councils. In the first stage of the analysis, we conducted document analysis by examining the regulatory framework for biodiversity reporting and accountability by New Zealand regional councils. We also used content analysis (Botica-Redmayne *et al.*, 2023) to examine the text of annual reports of the 11 regional councils, covering the period from 2021 to 2024 (4 years). In the second stage we employ interviews with representatives from the New Zealand regional councils that are on the frontlines of biodiversity management, accountability and reporting.

The sample in this study begins with 2021 to avoid the potential impact of COVID-related disclosures on earlier years [2]. It has been reported that COVID-19 pandemic significantly affected entities' environmental disclosures (Bahadar and Zaman, 2022). This ensures a more accurate representation of standard reporting practices without the confounding effects of the pandemic. In total, the data set includes 44 entity-year observations, representing all 11 regional councils. Table 1 describes financial information as at year 2024, in relation to the investigated regional councils. The table indicates that Greater Wellington Regional Council is the largest regional council by assets and revenue in the sample, while Environment Southland is the smallest by these metrics.

5.1 Analysis process of documents and council annual reports

For the document analysis we focused on the specific regulatory documents, notably the Resource Management Act, 1991 (RMA) and the National Policy Statement for Indigenous Biodiversity, 2023 (NPSIB), which stipulates the accountability and reporting requirements for biodiversity by New Zealand regional councils. Also, given that these councils are entrusted with conservation and protection of biodiversity, the attention paid to biodiversity in the annual reports should indicate a level of commitment to biodiversity protection and management (He *et al.*, 2024).

In analysing the contents of the annual reports, we followed Giglio *et al.* (2023) and He *et al.* (2024) to create a biodiversity dictionary including the following terms: biodiversity, ecosystem(s), ecology/ecological, habitat(s), species, (rain)forest(s), deforestation, fauna, flora, marine, tropical, freshwater, wetland, wildlife, coral, aquatic, desertification, carbon

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Table 1. Details of the selected regional councils

Regional council	Total assets (NZD 000)	Total revenue (NZD 000)
Bay of Plenty Regional Council	920,801	191,184
Environment Canterbury	1,512,074	295,184
Environment Southland	114,231	57,848
Greater Wellington Regional Council	2,569,163	565,362
Hawkes Bay Regional Council	1,145,804	226,990
Horizon Regional Council	1,404,224	100,886
Northland Regional Council	273,376	91,105
Otago Regional Council	1,023,253	128,026
Taranaki Regional Council	153,388	46,135
Waikato Regional Council	1,170,786	208,619
West Coast Regional Council	235,784	35,212

sink(s), ecosphere and biosphere [3]. Following He *et al.* (2024), we then created a count of the total related words, *Bio_Verbo*, which is considered as a crude measure of the attention paid to biodiversity. As a refinement step, we divide the value of the *Bio_Verbo* by the total number of pages in annual report which indicate the use of related words per page, we call it *Bio_Concern*. To further analyse the related words used, we calculated the median value of the *Bio_Verbo*, which is 173 words, and assigned a value of 1 to those instances where the value of the *Bio_Verbo* is above the median (173) and zero otherwise and named it as *BioRisk_Score*.

To further authenticate the biodiversity and environmental commitments of the entities, we then examine the monetary spending on biodiversity related initiatives to investigate whether the verbal commitment had any financial significance. We first report total spending on biodiversity related initiatives and then divide this amount by total expenditure to contextualise the spending. We then disaggregate biodiversity spending by funding sources to examine trend in the sources of biodiversity-related financing.

We also searched for words including GRI 101, SDG 14 and SDG 15 to examine whether the selected regional councils show any conformance with or intension to adopt the GRI 101, and to examine their commitment to the related SDGs, during the sample period.

5.2 Interview data and analysis procedures

To authenticate and contextualise the document and content analysis conducted in the first stage of the analysis, and to answer our research questions, we conducted interviews with the representatives from the New Zealand regional councils in the second stage of the analysis. We interviewed council personnel directly involved in the reporting, management and accountability for biodiversity within their regions. The interviews were conducted using semi-structured interview questions as outlined in Appendix 2 and were developed around *RQ1* and *RQ2*, focusing on the factors and constraints influencing public sector biodiversity reporting and accountability from the perspective of New Zealand regional councils. The interviews also explored participants' perceptions of biodiversity reporting standards and the extent to which these standards are applicable within the public sector. The interviews for this study were conducted between February and October 2025. Table 2 reports details of the interviews.

Table 2 shows that ten interviews were conducted with 13 participants. The participants were project managers or principal advisors responsible for biodiversity, working across ten of the 11 regional councils [4]. The interviewees had a minimum of 10 years' experience in

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Table 2. Participants' interview details

Participant	Gender	Position	Interview duration (mins)
Interviewee A and B	A: Female B: Male	Panel of two including: A: Principal advisor B: Senior terrestrial ecologist	68:17
Interviewee C	Male	Environmental service manager	51:26
Interviewee D	Female	Team leader biodiversity	54:49
Interviewee E	Male	Principal biodiversity advisor/ Specialist team manager	79:43
Interviewee F and G	F: Male G: Female	F: Senior Scientist, Terrestrial Ecology G: Manager Environmental Implementation	66:41
Interviewee H	Female	Environmental Scientist, Terrestrial Ecology	50:08
Interviewee I	Male	Team Leader, Regional Biodiversity and Biosecurity Team	59:43
Interviewee J and K	J: Female K: Female	J: Scientist K: Biodiversity Team Leader	62:33
Interviewee L	L: Male	Biodiversity Policy Specialist	64:27
Interviewee M	M: Female	Terrestrial Ecologist	63:01

the biodiversity field and generally had backgrounds in ecology and environmental science. On average, each interview was around 1 h long in duration. The interviews focused on understanding the landscape, factors and constraints influencing biodiversity reporting and accountability practices in New Zealand as perceived by these experts within New Zealand regional councils. Generally, participants were allowed to freely discuss at length. To elicit more insights, we probed further into unanswered questions of issues not fully addressed, consistent with each interviewee's line of thought. We employ an interpretive analytical procedure (Baudot *et al.*, 2022; Moses *et al.*, 2024; Ehalaiye *et al.*, 2025) and approach our data analysis in this regard through an inductive technique that aligns with our research inquiry. This allowed us to synthesise emergent themes from the interview data (Moses *et al.*, 2024) around the nature of biodiversity reporting and the factors and constraints influencing biodiversity reporting and accountability practices in New Zealand.

6. Results and discussion

6.1 Findings from documents and annual reports analysis

A critical reading of sections 30 and 35 of the RMA, Part 2 of the RMA and the NPSIB, suggests that while the legislative framework establishes a comprehensive mandate for biodiversity management and reporting by New Zealand councils, several structural and operational gaps may limit its effectiveness. First, although section 35 requires councils to gather information and report on the state of the environment and policy effectiveness, the Act does not prescribe standardised indicators, methodologies, or reporting templates. This lack of national consistency leads to fragmented, non-comparable data sets across regions, reducing the regional councils' ability to undertake integrated national-scale biodiversity assessments or to reliably benchmark performance. In this way, a comprehensive public financial management of biodiversity related resources on a national level is not easily facilitated. Second, section 30 assigns broad and overlapping functions in relation to land, water and biodiversity management, but it provides limited operational guidance on prioritisation or trade-offs, resulting in uneven implementation depending on local capacity, resources and political will. From SDA perspective, this lack of guidance in relation to reporting and prioritisation results in more room for judgement in relation to biodiversity

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reporting and accountability at the council level and may result in the disclosure of information for impression management and symbolic commitments rather than transparent and balanced disclosure (Boiral, 2016; Gomes *et al.*, 2023) for public financial management.

Similarly, the principles in Part 2 of the RMA are broad and value-based, which supports flexibility but can create interpretive ambiguity in balancing competing objectives such as development pressures versus biodiversity protection. While the NPSIB strengthens direction by requiring councils to identify and manage significant natural areas and report on biodiversity outcomes, it still largely relies on council discretion in implementation detail and does not fully resolve inconsistencies in monitoring design, spatial mapping methods, or data integration systems. In addition, although the NPSIB emphasises collaboration with *tangata whenua*, it does not clearly prescribe mechanisms for co-governance, data ownership, or integration of mātauranga Māori with scientific data sets, which can constrain meaningful incorporation of indigenous knowledge systems. Thus, this limited collaboration with such important stakeholders hinders effective DDA in relation biodiversity accountability (Dabbicco, 2021; Jones and Solomon, 2013; Willis, 2017) as there can be significant information asymmetry between the Māori indigenous group stakeholders and the local councils (Greiling and Spraul, 2010). This limited collaboration also diminishes, under the DDA expected participation in budgeting and public expenditure tracking when it comes to biodiversity related resources.

Analysing these reporting and accountability requirements from the lens of public accountability theory, and more specifically from SDA, suggests that there are deficiencies in the accountability framework as it creates a form of discretionary accountability, i.e. the councils are required to report but at the same time they have substantial discretion in what they are reporting. In other words, the framework requires councils to interpret and operationalise reporting and accountability expectations at the council level. This leads to poor accountability outcomes (Gent *et al.*, 2015; Pallas and Guidero, 2016) and negatively affect the state of biodiversity and natural capital (Petrie, 2018; Willis, 2017). Thus, it is expected that this flexibility in the accountability requirements not only results in inconsistent reporting practices across different councils (Greiling and Spraul, 2010) but also contributes to reluctance in disclosing strategic biodiversity information (Barut *et al.*, 2016). However, there is also an expectation that the councils will, at a minimum, report on their biodiversity endeavours, with an expected increase in disclosures following the release of the NPSIB in mid-2022.

The content analysis of the councils' annual reports shows a visible shift in reporting for biodiversity information in the annual reports of the sampled councils since 2021. It was found that, during the sample period, most sampled councils included biodiversity information in their annual reports, largely in a dedicated section on biodiversity or as a sub-section of integrated catchment management, environmental services, etc. This finding contrasts with earlier findings of Schneider *et al.* (2014), who noted that biodiversity information reported by New Zealand councils is typically scattered across websites and other documents, with only a few councils reporting it in their annual reports. This indicates that some standardisation is emerging in terms of where information is placed, although this standardisation relates to the location of disclosures rather than their content or presentation. This shift appears to reflect SDA pressures arising from the NPSIB legislative requirements, whose first exposure draft was released in 2019. The NPSIB was gazetted in 2023, it provides more formal requirements for reporting consistency on biodiversity:

> Under the RMA, all councils must identify areas with significant native biodiversity. However, councils across Aotearoa have different criteria for identifying these areas and use different methods to maintain them. This has resulted in confusion and uncertainty for landowners who

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want to farm or develop their land. The NPSIB directs councils to set clear and consistent approaches in their policies, plans and strategies, which will provide more certainty and clarity (NPSIB, 2023:3).

Thus, from the SDA perspective, there are reporting requirements embedded in RMA and NPSIB, yet the requirements are not specific enough in relation to disclosure and methodology. Our findings suggest that these legislative requirements have at least stimulated the development and the disclosure of biodiversity related information in the councils' annual reports (Greiling and Spraul, 2010; Kessy, 2020).

To further understand whether there is any increase in the disclosure of the biodiversity and related information, we created a biodiversity dictionary. Figure 1 indicates the trajectory of *Bio_Verbo* score. It is evident from the trend, that the score in general has increased over time. In 2021, an average of approximately 166 words from our biodiversity dictionary were used in the annual reports, which were slightly reduced in 2022 but there is a sharp increase in the related words in the annual reports of 2023 and 2024, reaching close to around 190 words in 2024. The potential reason for this sharp increase is likely owing to the release of the final exposure draft of NPSIB in mid-2022 and its subsequent gazettal in mid-2023.

To refine our measure of biodiversity commitment, we divide the number of *Bio_Verbo* score by total number of pages in the annual report, which provides us a *Bio_Concern* score (see Figure 2). We further refine the measure of biodiversity commitment by creating a *Bio_Risk* index, which is created by assigning a value of 1 to those entity year observations where the value of *Bio_Verbo* Score is above 173 (median), 0 otherwise. A higher number of related words per page (*Bio_Concern*) is treated as an indicator of more commitment towards the biodiversity and biosecurity. Similarly, more entity year observations above the median of the *Bio_Verbo* score (having *Bio_Risk* score of above 1) is treated as better response to bio related risk. Figure 2 depicts the trajectory of the *Bio_Concern* and *Bio_Risk* scores. The figure for *Bio_Concern* indicates an increasing trend, where the number of words per page have been increased from 1.10 in 2021 to 1.23 in 2024 with a visible increase passing up from 2023, while the *Bio_Risk* scores are largely consistent showing a commitment to biodiversity.

In summary, Figures 1 and 2 indicate that the regional councils are attempting to demonstrate, through disclosures in their annual reports, that their concern, awareness and commitment to biodiversity are increasing over time. However, this increase, at least in terms

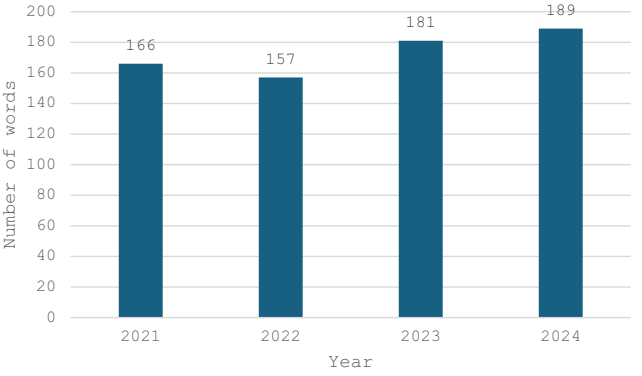


Figure 1. Trajectory of BioVerbo_Score

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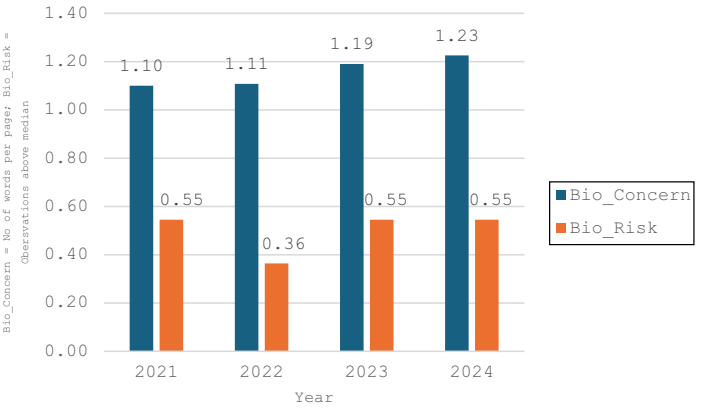


Figure 2. Trajectory of Bio_Concern and Bio_Risk

of disclosures, is more clearly visible since 2023, the year in which the NPSIB became gazetted. This indicates a supply driven accountability pressure (Greiling and Spraul, 2010) of biodiversity information disclosure, suggesting a positive trend. However, the verbal commitment through increasing disclosures is worthwhile only if it is accompanied by real commitment in the shape of allocating appropriate funds to biodiversity related activities. In the absence of monetary commitments, the increase in disclosures can be considered more of a "biodiversity washing" in annual reports (Dumay *et al.*, 2010; Zharfpeykan and Chapple, 2026). Figure 3 indicates the trajectory of amount spent on biodiversity related activities. The figure indicate that the spending trajectory is not at par with the verbal commitments. In 2021, each of the regional council, on average spent around 21 m NZD on biodiversity related operating initiatives. In 2022, there was a sharp decline in the biodiversity related

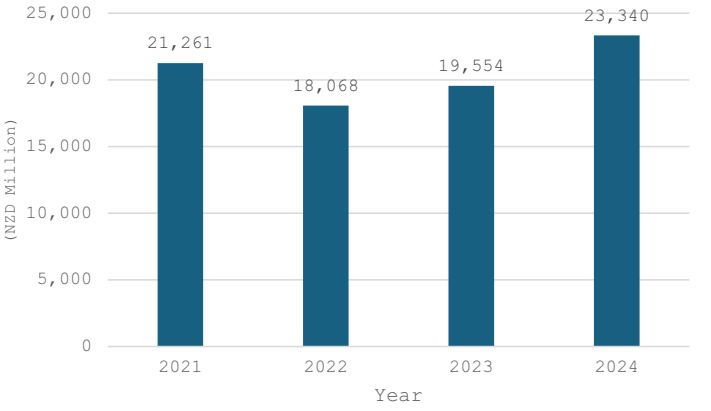


Figure 3. Trajectory of biodiversity spending ($000)

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expenses, with each regional council, on average, spending around 18 m NZD. Then in 2023, a steady growth in total spending is observed for the next two years, reaching around 23 m NZD in 2024. Even though the trajectory of total biodiversity related operating spending is not linear, the trend is not declining either. These findings are consistent with previous findings by Weir (2018, 2019) in UK.

To further contextualise the spending on biodiversity related initiatives, we divided biodiversity related spending by total expenses to examine the trend of biodiversity related allocations in the context of total spending during the year. Figure 4 depicts a clearer yet gloomy picture of the biodiversity related spending. Figure 4 indicates that in 2021, biodiversity related spending was around 23% of the total expenses, however, there is a persistent decline in the biodiversity related spending in proportion to total spending reaching less than 18% of the total spending in 2024. Taken together, Figures 2–4 indicate that irrespective of a visible increase in verbal commitments to biodiversity through increasing disclosures, the overall spending on biodiversity related initiatives is decreasing, at least in terms of proportion to total spending by the councils. This contradiction between verbal commitment and funding allocation points to an important limitation of the existing legal framework for biodiversity accountability, as the requirements in NPSIB are descriptive rather than outcome based. Furthermore, there is limited statutory requirement for long-term funding certainty or national data infrastructure, meaning monitoring programmes are vulnerable to budget constraints and funding gaps over time. Nevertheless, it is evident that the councils tend to provide more verbal information to answer the supply driven accountability pressure (Greiling and Spraul, 2010).

To understand the declining trend of biodiversity related spending, we segregate the sources of funding into three distinct categories: rates and annual charges, subsidies and grants and other funding. Figure 5 indicates the trajectory of biodiversity funding received from these three sources. The figure indicates that the allocation of internally generated funds (rates and annual charges) is steadily increasing, however, there is a substantial and continuous decline in the funding from external sources (i.e. from the central government) in a form of subsidies and other related funding.

These results suggest that the regulatory framework increases the supply driven accountability requirements, which are not accompanied by the availability of external funding. As a result, councils face strong accountability pressures to demonstrate transparency through reporting, while contending with weaker accountability mechanisms

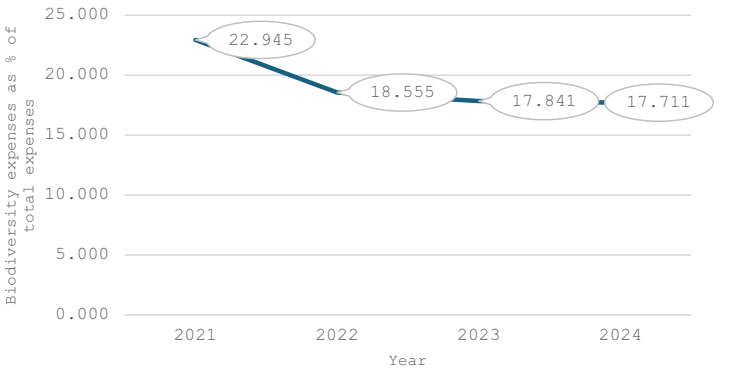


Figure 4. Biodiversity spending (% of total expenditures)

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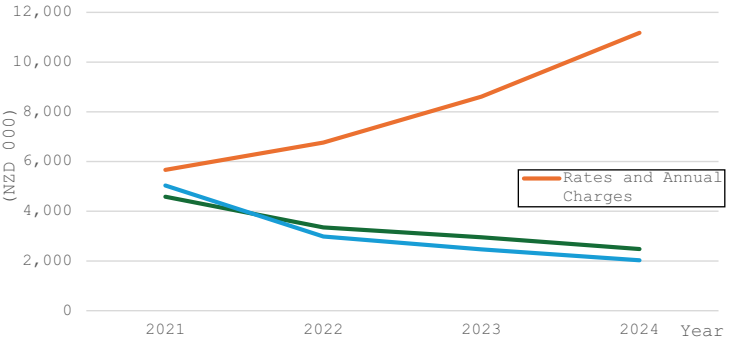


Figure 5. Trajectory of biodiversity funding (000)

regarding the provision of resources needed to address identified biodiversity challenges. Thus, the SDA pressure appears to overall increase the councils' biodiversity reporting and accountability commitment (Greiling and Spraul, 2010). However, in practical terms the increase in the commitment is manifested through narrative disclosures rather than through funding allocation. This confirms the influence of SDA in enhancing the volume of biodiversity reporting outputs, without necessarily enhancing beneficial biodiversity outcomes (Boiral, 2016; Gomes *et al.*, 2023). The analysis further indicate that the main funders of biodiversity initiatives are the rate payers. Likewise, the declining contribution from the central government funding raises serious concerns over the central government commitment to biodiversity outcomes, despite centrally developed and instituted policies and government stated commitments.

Lastly, we also examined whether the councils adopted or are inclined to adopt GRI 101. However, none of the regional councils explicitly mentioned GRI 101 in their annual reports. One of the regional councils mentioned in its 2023 annual report that it complied with GRI standards. However, in its 2024 annual report, the council mentioned that it no longer followed GRI standards and had instead decided to comply only with New Zealand External Reporting Board (XRB) Climate-Related Disclosure (CRD) standards. As the IPSAS 51 did not exist, even in the form of an exposure draft, during the observation period, none of the councils referred to standard in their annual reports. We also attempted to assess the level of commitment related to the SDGs (SDG 14 and 15), however, none of the councils referred to SDG 14 or SDG 15 throughout the sample period. This indicates that the regional councils neither use GRI 101 nor apply the SDG guidelines in their biodiversity reporting. These findings are consistent with previous findings in Australia (Barut *et al.*, 2016).

6.2 Analysis and discussion of interview findings

To further understand biodiversity accountability and reporting mechanisms at the council levels, we interviewed 13 biodiversity related officials or personnel from ten New Zealand Regional Councils. The findings from the interview analysis are presented in the two following sections- 6.2.1 and 6.2.2, each corresponding to one of the two research questions.

6.2.1 Nature of biodiversity reporting. The participants were of the view that there is an improvement in the state of biodiversity reporting over time as indicated in the following interview quote:

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> There have been changes in the last 4 or 5 years, we are getting better at reporting, through papers to councils and on the websites and social media (Interviewee F).

This response provides support for the findings from our analysis of the annual reports, which indicate an increase in the use of biodiversity-related words over the study period, and suggests a potential increase in reporting requirements since 2023. To further investigate the nature of biodiversity reporting, we asked the interviewees about the reporting requirements. They indicated that certain legislative requirements determined what they were required to report. However, they admitted that the requirements were not that clear:

> Now, take in point, of course, the Environmental Reporting Act, which requires us to give information to central government so they can do our nation's state of the environment reports. We do our own state of the environment reports. But there is no specific performance standard or target. (Interviewee J).

> The national policy statement for indigenous biodiversity, they're not quite as, prescriptive around things but there still is general directions and expectations on councils to do things. (Interviewee F).

When we asked them that if the reporting requirements or performance targets are not clear, how do they set targets, the respondents were of the view that they have very strong internal consultation processes in place:

> That's an interesting question. So, of course, at regional councils, we have governors who are our elected counsellors, and we have senior managers, and then we have, sort of, more operational type staff. And I think, our organization has a really great culture of listening to staff, and so essentially, if staff recommendations are, this is the way the world's going, this is best practice, we have a need for this, these are the kind of benefits they'll give us. (Interviewee J).

In summary, the respondents were of the view that there is an increasing trend in biodiversity disclosures, which is consistent with our earlier findings. However, as expected, there is no standardised reporting and accountability requirements under the existing framework. From an SDA perspective, the absence of clear externally defined, externally imposed targets and reporting requirements means that organisations internally construct the standards and benchmarks against which they are held accountable. These are developed primarily through consultation with elected members and staff and based on what is considered best practice. While this enables reporting to proceed in the presence of regulatory ambiguity, it shifts accountability inward, weakening external verifiability and consistency, and increases the risk that reporting becomes shaped by internal judgement and negotiation rather than transparent, comparable and externally grounded accountability criteria. This type of accountability systemically incentivizes a compliance, "box-ticking" and impression focused management process, rather than an outcomes-based system for biodiversity protection (Gent *et al.*, 2015; Gomes *et al.*, 2023; Jones and Solomon, 2013). Furthermore, the absence of clear guidelines makes measurement difficult and subjective, contributing to significant gaps in data, ultimately constraining effective management, accountability and stewardship of biodiversity and natural resources within a public financial management setting (Petrie, 2018).

To understand the preparers perspective on standardisation of biodiversity reporting and related disclosures, we asked whether interviewees were aware of the GRI 101 or biodiversity related SDGs. None of the interviewees were aware of the GRI 101 or related SDGs, especially SDG 14 and SDG 15. In addition, reporting on the management of biodiversity projects is generally limited in scope and primarily intended for internal

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purposes. Furthermore, the interviewees were of view that there is scope for improved reporting on biodiversity:

> I think GRI-101 would be aimed at the national level reporting. Regional councils don't engage on that level (Interviewee E).

One of the interviewees also considered that discussions regarding the adoption of GRI standards or SDGs related disclosures, should take place at the national level rather than at the local level, including within the regional authorities. It appears that, at least for now, regional councils do not engage at that level of discussion or decision-making required to influence the development or adoption of GRI standards or other biodiversity reporting standards. There is also some support for the overall oversight and audit or assurance of biodiversity reporting, citing the need for public confidence in biodiversity reported information:

> There should be a robust structure developed for biodiversity reporting - there is definitely a space for better reporting on the corporate level (Interviewee A).

These findings suggest that the GRI frameworks have not yet been integrated into the operational knowledge base of local authorities. This finding became more intelligible when participants described the primary function of their biodiversity reports - rather than serving as instruments of external accountability for natural and financial resources or alignment with sector-wide benchmarks, these reports are produced chiefly to inform councillors and support internal decision-making processes as evident in the following quote:

> Our reporting, a lot of it ends up in consultative reports and reports to council for councillors' agenda papers (Interviewee H).

Another interviewee raised similar concerns:

> Corporate reporting has been buried in committee reports (Interviewee J).

From a public accountability theory perspective these findings show limited demand driven accountability considering the non-engagement with the different stakeholders interested in biodiversity. Rather biodiversity accountability and reporting are largely SDA driven (Greiling and Spraul, 2010). This is a significant limitation in raising awareness and providing relevant information about biodiversity to different stakeholder groups in society and that impacts the biodiversity accountability (Gaia and John Jones, 2017; Mueller and Maes, 2015). In addition, this leads to a lost opportunity for a more meaningful assessment of the use of the available and spent resources for achievement of desired biodiversity outcomes on an aggregate national level and from the public entities' perspective.

Moreover, the limited engagement with formal standards does not appear to stem from resistance, but rather from the perceived purpose of reporting itself. When biodiversity information is primarily perceived as an internal briefing tool, the incentive to adopt, or even become familiar with broader reporting guidelines is substantially diminished. Furthermore, councils are specifically reluctant to share strategic biodiversity information such as goals and plans, making the disclosure insufficient for effective monitoring and management of biodiversity (Barut *et al.*, 2016). These findings highlight significant limitations in the current biodiversity reporting practices of New Zealand regional councils. Besides, despite an increasing trend in biodiversity-related disclosures, the usability of the information remains constrained, particularly in terms of understanding how effectively biodiversity-related spending and efforts translate into meaningful outcomes both on regional and national level. This situation, as explained by Gomes *et al.* (2023), suggests that when

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disclosures are shaped by institutional pressures, they can become routine exercise rather than a means of improving accountability and sustainability outcomes.

In response to this concern some of the interviewees accepted that they struggle with reporting relevant information:

> It is a struggle to align what we do with what and how to report. So, there is a difficulty to report on biodiversity success (Interviewee I).

> We don't have a formal strategy, but we do internally plan. Wetlands have been a focus for more than a decade, top-down priority has also been on wetlands. Consequently, there is trouble in prioritising biodiversity and what the values for the organisation are. And there is generally, a focus on efforts rather than outcomes (Interviewee L).

In summary, regional councils appear to be increasing the volume of biodiversity-related disclosures in response to central government driven legislative requirements (SDA). However, the practical value of the information remains limited owing to the lack of engagement with established reporting standards and the primarily internal orientation of current reporting practices. This finding is consistent with Barut *et al.* (2016) who reported inconsistency in biodiversity reporting across different Australian councils. Furthermore, biodiversity reports are largely designed to brief councillors rather than to align with wider frameworks or to support external accountability and broader stakeholder engagement (Schneider *et al.*, 2014). Therefore, the resulting disclosures often lack the structure, comparability and outcome-focused detail needed to inform broader government policy or evaluation of biodiversity related investment decisions.

These findings warrant further understanding, especially regarding the understanding of the factors and constraints influencing biodiversity reporting and accountability. The next section provides some insights on these issues.

6.2.2 Factors and constraints influencing biodiversity reporting and accountability. Analysis of participants' responses to the second research question, which examines the factors and constraints influencing biodiversity reporting and accountability as perceived by New Zealand regional councils, identified three main themes:

6.2.2.1 Absence of biodiversity reporting standard. Lack of mandatory biodiversity reporting standards and guidance has been identified by the participants as a key factor limiting the usability of disclosures, as identified by one participant:

> I have not seen a standardised approach to what to report to the council and the public […] […] It would be good to have national guidance and the standardisation, especially on the effectiveness of the programs (Interviewee I).

Similarly, another participant pointed at the same issue in the following words:

> Standardisation would be good. We have been trying to do that for long time; we are lacking in common methodology and standards (Interviewee H).

The interviewees mentioned that they often have to justify their role to the regional councillors and that improved reporting standards could provide a more effective means of demonstrating their achievements:

> There is a lot of reporting against the budget (Interviewee D).

Even though interviewees were largely of the view that mandatory biodiversity reporting standards are necessary, yet some of them noted that the standards should be flexible enough to accommodate regional differences. This flexibility would allow for the unique local

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contexts and challenges to be better reflected in the reports. For example, one interviewee suggested that:

> The system could be more useful to be easier to use and be automated (in the presence of standards). Currently the focus is on regional compliance. What we need is a common set of biodiversity indicators, that would be useful, but it would need to cater for regional differences, that is a standardised system that has a modular approach (Interviewee I).

Clearly, there is a perceived need for greater standardisation of reporting and for reporting to extend beyond internal stakeholders. However, all respondents acknowledged the complexity involved in designing standards that would accommodate the diversity of biodiversity and related issues.

Some of the interviewees proposed that being able to communicate on biodiversity in economic terms would be beneficial. That is, the ability to communicate the economic implications of biodiversity for society. The importance of closing the loop between biodiversity management and reporting, by moving beyond reporting solely on individual management projects, was also highlighted, as visible in the following interview quote:

> The challenge is in not knowing if we are making a difference. We count the species but there is a lot that we don't know (Interviewee D).

This finding is consistent with Weir (2018, 2019) who reported on the difficulties in capturing the economic and ecological value of councils' biodiversity.

We further asked whether the same biodiversity standard for-profit-entities and the public sector will be sufficient or should public sector entities have their own biodiversity standards. The interviewees were largely supportive of the development of a specific public sector reporting standard on biodiversity, if it does not become just another compliance exercise, and enhances public understanding of environmental issues. In the views of the interviewees, such a standard would facilitate more effective communication of the value of biodiversity:

> Such a standard would be essential, but it shouldn't be too rigid as biodiversity is very diverse (Interviewee E).

In summary, lack of standardised frameworks for biodiversity reporting, particularly a dedicated public sector biodiversity reporting standard has been identified by the participants as a major factor affecting effective disclosure of biodiversity related information. While the need for biodiversity standards is widely acknowledged, interviewees emphasised that the reporting framework should allow sufficient flexibility to account for regional variations. This would not only ensure that the reports remain relevant and reflective of local biodiversity challenges but would also improve the consistency and comparability of information across different regions. With these findings and the reflection on the recent issuance of IPSAS 51, it appears that the new standard might alleviate some of the identified obstacles in biodiversity reporting. However, it also remains to be seen whether the standard, once it comes into effect in 2028, will lead to improved overall accountability to stakeholders.

6.2.2.2 Inadequate funding and accountability for biodiversity projects. All the interviewees identified funding as a major constraint for public sector biodiversity reporting. Furthermore, all the interviewees reported that majority of their biodiversity funding comes from the local taxes or rates, which triangulates with the findings from our first stage analysis:

> The constraints are in resourcing, having capacity and capabilities to do the work effectively. Budgets are the constraint (Interviewee F).

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> The funding is mostly from ratepayers and not a lot of funding comes from central government (Interviewee I).

All the interviewees considered that biodiversity reporting had changed in the period between 2021 and 2024, largely in response to the worsening state of biodiversity, particularly the loss of habitats. All interviewees also believed that biodiversity accountability and reporting is highly dependent on the central government priorities, as visible in the following quotes:

> The biggest problem has been the loss of habitat in the past. It is going to be important to have some political wins (for the funding) in the future to work on that habitat loss (Interviewee E).

> I think a constraint is in building capabilities in New Zealand - there is no investment in this, no industry and no funding (Interviewee J).

> There is, however, absence of clear government direction. If you don't have a long-term vision in what you are trying to achieve, it is hard to plan and monitor biodiversity […]. Councils are also waiting for dust to settle before committing resources. So, we are still not super clear on restoration targets. These targets are not done consistently (Interviewee L).

In summary, inadequate funding has been identified by the interviewees as a major constraint influencing public sector biodiversity management, with most of the funding coming from rates rather than central government support. This finding particularly points at a major limitation of the RMA and NPSIB as these Acts put accountability pressures on councils from the reporting and disclosure fronts, yet the accountability mechanisms in terms of allocation of resources especially from the central government are extremely weak. This aligns with the findings from the first stage of the analysis and highlights the resourcing challenges faced by councils in addressing biodiversity related issues, especially the loss of habitat. While interviewees acknowledged improvements in biodiversity reporting between 2021 and 2024, in response to supply driven accountability pressures exerted by increase in the reporting requirements, these changes seem to be largely driven by the worsening state of biodiversity, particularly habitat loss. The interviewees emphasised that biodiversity reporting and accountability are highly dependent on central government priorities, with several noting the need for political support and investment to address ongoing constraints in capability building and funding. This is consistent with the findings reported by Gaia and Jones (2020), i.e. the level of biodiversity disclosure is significantly affected by the presence of councillors from environmentally oriented political parties. This further indicates the limited engagement with stakeholders regarding funding, particularly given that central government is a principal stakeholder. This is consistent with Barut *et al.* (2016) who postulated that governments play an extremely important role when it comes to biodiversity and further points to the disconnect between the central government biodiversity policies and the implementation of those policies on the regional and entity levels.

6.2.2.3 Limited engagement with stakeholders and unclear expectations regarding demand driven accountability. The NPSIB (2023) and Part 2 of the RMA require councils to engage local communities and Māori representatives/iwi for better environmental management and biodiversity conservation. This is an important requirement, as it is expected to strengthen community participation by providing an effective mechanism for communicating indigenous biodiversity concerns to regional councils, thereby facilitating demand driven accountability. Moreover, rate payers are important stakeholders, as they are the main funders for biodiversity initiatives, especially when the funding from the central government is on the decline. Also, environmental groups and the general public are other important stakeholders in this setting. Thus, there are various stakeholders involved in the

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biodiversity protection and restoration process. However, the findings from the interviews suggest that there are no clear expectations, nor engagement with these stakeholders for biodiversity demand driven accountability:

> It is time to have a bigger picture in thinking on biodiversity, which is currently not there (Interviewee A).

Furthermore, despite the decline in funding, the targets established by the councils and the corresponding budget allocations continue to be driven primarily by central government priorities rather than by engagement with wider community groups and stakeholders, as illustrated by the following quotation:

> We are accountable to the community. There are higher community expectations. We also need more directions from central government on indigenous biodiversity. There has been a shift in central government attitudes (Interviewee F).

Similarly, interviewees highlighted a broader issue of unclear expectations and fragmented approaches to biodiversity accountability and management, on the same lines as reported by Gaia and Jones (2020), indicating the need for more holistic, system-wide thinking. The interviewees further noted that despite significant investments, the outcomes are uncertain:

> There is a lot of investment – initially and now, between 2021-2024 but not quite sure what is coming out of it in the end (Interviewee D).

> CEO and mangers have corporate KPIs, and the outcomes (for biodiversity) are not always measured (Interviewee J).

From a DDA perspective, these findings suggest that stakeholders, particularly ratepayers and environmental groups who could demand greater accountability for biodiversity, are either not making their voices heard or lack robust mechanisms through which their concerns can be communicated. This is important because biodiversity reporting should balance the information needs of different stakeholders, ensuring that the information provided enables effective accountability by local councils (Deegan, 2002; Gaia and John Jones, 2017). Also, the misalignment between centrally imposed policies and the lack of standardisation of biodiversity reporting creates unclear expectations regarding accountability and the related expenditure among diverse stakeholders.

7. Conclusion, implications and limitations

This study provides evidence on the nature of biodiversity reporting and accountability by New Zealand regional councils, mandated by legislation to manage biodiversity in the country. Our findings suggest that the regional councils in New Zealand are required to report on their biodiversity initiatives, however, there is significant flexibility in terms of what to report and which targets to achieve. The framework delegates responsibility for interpreting and implementing reporting and accountability requirements to individual councils, resulting in inconsistent reporting practices and weakened accountability. Irrespective of this legislative loophole, councils are required to report on their initiatives, and the requirements became more stringent after the release of NPSIB, which as expected, increased the level of disclosure. Our results based on the content analysis of the 11 regional councils' annual reports from 2021 to 2024 suggest that the regional councils' verbal commitments and concerns for biodiversity have increased over the sample period, with more visible increase since 2023. However, when this verbal commitment is examined alongside actual monetary allocations and spending on biodiversity-related initiatives, the outcome is less positive and rather gloomy, showing a decrease in the proportion of funding

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directed towards biodiversity management efforts. The findings in this study also reveal that funding for biodiversity mainly comes from rates and fees, while subsidies and funding from the central government are on the decline. Therefore, the funding is seen as one of the major constraints in biodiversity management. Furthermore, reducing central government funding risks hollowing out accountability by increasing expectations without the resources needed to deliver meaningful environmental outcomes.

The results further indicate that there is considerable variability in reporting due to the lack of a standardised biodiversity reporting framework for the public sector. These findings are consistent with several previous studies, especially Barut *et al.* (2016). The results of our interviews show a consensus amongst the participants that there is a place for a specifically designed public sector standard for biodiversity reporting. Considering these findings, we argue that standardised information disclosure is an important step towards strengthening accountability for biodiversity and facilitating the development of cost-effective intervention mechanisms in the future that would enable appropriate financial management of biodiversity related resources.

These results in the light of public accountability theory indicate that biodiversity reporting is largely due to the reporting being oriented towards the compliance with the legislation (RMA) and reporting to individual councils' internal stakeholders rather than the wider stakeholder groups. More specifically, the results are driven by supply side accountability pressure with minimal consultation with wider stakeholder groups. From an SDA perspective, the absence of clearly defined external targets and reporting requirements leads organisations to internally construct the standards and benchmarks against which they are held accountable. These are typically developed through consultation with elected members and staff and guided by interpretations of best practice. While this enables reporting to continue under conditions of regulatory ambiguity, it shifts accountability processes inward, reducing external verifiability and consistency. As a result, reporting risks become shaped by internal judgement and negotiation rather than transparent, comparable and externally defined accountability criteria which reduces the opportunity for financial accountability for biodiversity on both an aggregate, national level and the public entities.

Furthermore, from the DDA perspective engaging the heterogeneous stakeholders such as rate payers, community groups, non-government organisations as well as the broader society that are interested in biodiversity and related initiatives (Deegan, 2002; Gaia and John Jones, 2017) would assist in standardisation of expectations. This wider engagement is expected to result in better accountability with a focus on the outcomes of biodiversity related efforts and investments.

This study provides contributions to the scarce literature on biodiversity reporting and accountability and is intended to inform the international debate on standardisation and guidance on biodiversity accountability practices as well as reporting, especially in reference to public sector. From the policy point of view, the findings indicate that the absence of clear reporting expectations and measurable targets shifts interpretive responsibility onto reporting entities, leading to inconsistent reporting and weakened accountability, especially for financial management of biodiversity related resources in public sector entities, underscoring the need for policymakers to balance flexibility with clearer, standardised and more measurable regulatory guidance. Furthermore, a fragmented reporting approach without involving multiple stakeholders appears to result in ineffective reporting and accountability (Ahmad *et al.*, 2026). Finally, implementing biodiversity initiatives and evaluating accountability loses effectiveness when central government delegates responsibility to local councils without providing the resources to deliver on it. Thus, these findings suggest that for more meaningful outcomes and accountability in relation to biodiversity, the policies must

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provide measurable targets, cohesive policy directions that are accompanied by appropriate funding allocations.

Theoretically we contribute to public accountability theory by showing that while supply driven accountability pressures may increase biodiversity disclosure volume, the absence of clear performance measures and broader stakeholder engagement risks reducing the meaningfulness of these disclosures. Also, the very limited engagement with stakeholders, particularly rate payers, who provide most of the resources for biodiversity protection and conservation, shows that demand driven accountability is very low in this setting and confirms the challenges of harnessing needed citizens engagement to demand such accountability for biodiversity. Our findings from the New Zealand setting contributes valuable insights for implementation of biodiversity related policies in other jurisdictions that are currently considering the appropriate approach to biodiversity related resources, management and reporting.

Similar to other studies, this study has some limitations. Since the results are based on data collection in one country, it is quite plausible that the findings of this study are idiosyncratic to the New Zealand environment and maybe limited in generalisability to wider settings. However, comparative research across countries with similar biodiversity management and reporting challenges could in the future, provide further insights into broader and more generalisable patterns. Methodologically, we note that the content analysis approach adopted by following Giglio *et al.* (2023) and He *et al.* (2024) that measures biodiversity disclosures through word count while capturing the extent of biodiversity reporting, may not necessarily reflect the quality or underlying accountability practices. To mitigate this limitation, we supplement the content analysis with further examination of the spending trajectory, the sources of fundings and conducted semi-structured interviews to gain deeper insights into the reporting processes and accountability mechanisms. Future studies could employ qualitative disclosure analysis or disclosure quality indices to examine whether biodiversity reporting is outcome-oriented, symbolic, strategic, or performance-based.

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Notes

[1.] The Treaty of Waitangi (Te Tiriti o Waitangi) is New Zealand's founding document, signed in 1840 between the British Crown and the indigenous Māori chiefs establishing British sovereignty and a partnership (partnership), that ensures Māori involvement in decisions (participation), and requires active protection of Māori interests (protection).

[2.] In 2020 during the on-set of COVID-19, New Zealand had a full lock-down in place for most of the year that significantly restricted human movement from place to place and this impacted normal operations of public sector entities including activities around biodiversity management and accountability.

[3.] Giglio *et al.* (2023) selected these words based on their close similarity to "biodiversity", derived from pre-trained 300-dimensional word vectors using the Google News dataset, which has been widely used (He *et al.*, 2024; Zhou *et al.*, 2025).

[4.] We were unable to conduct an interview with relevant personnel from the eleventh regional council. This was despite repeated attempts to contact the council and request an opportunity to participate in the study. Nevertheless, we are confident that the perspectives captured from the other ten councils provide sufficiently broad representation of current perceptions regarding biodiversity reporting and accountability among New Zealand regional councils.

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Table A1. Theoretical framework on biodiversity reporting and accountability

Theoretical lens	Fundamental assumptions	Key mechanisms/ limitations	Expected influences on biodiversity reporting and accountability	Selected references
Public accountability theory	Accountability is a social relationship in which an actor feels an obligation to explain and to justify his or her conduct to some significant other Accountability is not limited to a principal–agent relationship, and vice versa, actors can be accountable to several parties inside and outside their organizations Accountability can be supply or demand driven	Supply driven accountability (SDA) involves formal checks and balances, standards, legal audits and fiscal reporting for compliance with laws and institutional regulations SDA can become bureaucratic, box-ticking' and impression management exercises which discount beneficial outcomes for the public Demand driven accountability (DDA) involves a bottom-up approach where citizens, consumers, or civil society organizations demand accountability from those in power DDA can be fragmented, difficult to scale, and heavily reliant on citizens having the time, tools and access to information necessary to demand such accountability	The adoption of relevant standards and compliance with existing biodiversity related laws will enhance biodiversity reporting and accountability, but there is risk of a compliance regime of accountability for outputs and impression management, rather than beneficial biodiversity outcomes Ratepayers, citizens and civil society organizations demand for accountability and reporting on biodiversity will likely enhance relevant and responsive biodiversity disclosures. However, there are limitations on the organization of citizens and required resources to demand such accountability for positive biodiversity outcomes	Almqvist *et al.* (2013); Bovens (2007); Bovens (2009); Gomes *et al.* (2023); Greiling and Spraul (2010); Kessy (2020); Mulgan (2000); Sinclair (1995)

Appendix 2

Table A2. Interview questions (questionnaire)

Question no.	Question detail
Question 1	Could you please tell us a bit about yourself and your organisation?
Question 2	What is your organisation doing about biodiversity reporting? (Do you have specialists working in this area (experts, special departments)?
Question 3	What is the nature of biodiversity reporting by your council/ NZ regional councils? • How does the RMA Act inform your biodiversity reporting practices? • How do you decide which biodiversity issues or indicators are most important for your council to monitor and report? • Are there particular biodiversity matters that your council considers especially significant for your region? • How is the information currently passed to the finance or reporting teams? Is there a formal process?
Question 4	Has your biodiversity reporting changed in the period between 2021 and 2024?
Question 5	What standards do you/regional councils use to report on biodiversity and why? How do you choose the reporting standard? • Is your reporting mapped to GRI standards, such as GRI-101 (effective from January 2026) and/or any of the SDGs? • Are you planning to use the GRI standard GRI-101? If yes, why? If not, why not? • What kind of tools, templates, or guidance would help you prepare biodiversity data so it can be consistently used across many councils? • Would having a common set of biodiversity indicators or definitions across all councils be helpful? If so, which ones? • How could standard setters make it easier for biodiversity specialists and finance teams including accountants to work together on consistent, comparable biodiversity disclosures?
Question 6	What are the factors and constraints influencing public sector biodiversity reporting as perceived by you/NZ regional councils?
Question 7	Are there particular community expectations, legal obligations, or funding arrangements that influence what you disclose about biodiversity?
Question 8	What are the biggest challenges you face in collecting reliable biodiversity data (e.g., resource constraints, seasonal variations, measurement methods)?
Question 9	If you could change one thing about how biodiversity information is reported at the council level, what would it be?
Question 10	Is there a place for a specifically designed public sector standard for biodiversity reporting and why?
Question 11	What does your organisation do about biodiversity management? • Do you set any targets? Who set those targets i.e., who is involved in that process? • Do you plan and set any future targets and actions? Who is involved in setting those targets? • How do you measure performance against the set targets? • What happens if there are any deviations from the set targets? • Do you think that the measure for the effectiveness of biodiversity programs could be standardized?

(*continued*)

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Table A2. Continued

Question no.	Question detail
Question 12	Who monitors the progress in terms of biodiversity management - is this just the regional council or does central government through relevant ministries also get involved
Question 13	Is there a meaningful link between the reporting on biodiversity and the biodiversity management that you do or is reporting mostly a compliance exercise?
Question 14	Since biodiversity related actions are not costless, what is the funding mechanism for the projects and initiatives that your regional council does? (How much, if any of the funding comes from central government is funding?
Question 15	Is there a place of perhaps more oversight, audits or reviews on biodiversity management and reporting? Would that lead to any better management? What is the best way, in your opinion, to ensure accountability around biodiversity management and reporting?

Corresponding author
Nives Botica Redmayne can be contacted at: n.redmayne@massey.ac.nz

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