



Manaaki Whenua
Landcare Research

Protected Areas Network New Zealand methodology review and report

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Summary

Project and client

The Ministry for the Environment (MfE) commissioned Manaaki Whenua – Landcare Research (MWLR) to review the Protected Areas Network of New Zealand (PAN-NZ).

Background

PAN-NZ, which was developed by MWLR, is part of a series of mapping layers designed to provide key insights into New Zealand's ecology, biodiversity, and environmental traits. This database uses data from many other sources and, like most of them, is not systematically maintained. This situation, plus recent published biodiversity reports and strategies calling for nationally coordinated response efforts and more stringent recording of information, has convinced MfE to commission this review.

Objectives

In relation to data sources, the objectives of this project were to:

- identify the various types of protected areas, and subsequently ensure the availability of an appropriate data source that accurately represents each class of protected area.
- record data gaps
- assess the data sharing maturity of each source.
- assess Significant Natural Areas (SNAs) data sources and their suitability for inclusion within PAN-NZ
- develop a draft survey to actively engage with custodians of protected area data to gather information about the protected area data they possess and their current state.

In relation to the classifications of protected areas, the objectives were to:

- describe different levels of legal protection.
- assess the suitability of approaches to categorise protected areas and their suitability within a New Zealand context while fostering collaboration with the international community.

In relation to methodologies, the objectives were to:

- summarise the existing methodology for PAN-NZ compilation, curation, and dissemination.
- explore potential options for enhancing the PAN-NZ data collation, storage, and data sharing ecosystem.

Methodology

This project:

- collated current and potential PAN-NZ data sources, including details of licensing, privacy requirements or other constraints.
- documented key technical features of data sources, such as resolution, formats available, frequency of updates and changes, and availability of web-services.
- identified data gaps and approaches to fill those gaps.
- identified and listed key stakeholders, data providers, and end-users.
- drafted structured interviews and survey questions.
- reviewed the classifications currently used and their suitability and created a dictionary of labels to inform a future standard vocabulary.
- outlined the mapping methods used for PAN-NZ versions and discussed options for future versions of PAN-NZ.

Results

- The various Protected Areas of New Zealand have been searched, sourced, and described.
- Data gaps have been identified.
- A draft survey and interview questions have been prepared to gather additional information on these data, their usage, and their accessibility requirements.
- The current classifications have been reviewed, discussed, and evaluated.

Conclusions and next steps

There is a strong need for a comprehensive, national, publicly available protected areas network data set.

Recommendations

- A budget should be developed for PAN-NZ database modernisation, ongoing system maintenance, ongoing data improvement and the dissemination of PAN-NZ data. To ensure both the quality of the data and the removal of obstacles related to data access, data loading, and data dissemination, funding should include supporting and collaborating with protected area data providers.
- PAN-NZ should receive sustained funding for database modernisation, ongoing system maintenance, ongoing data improvement and dissemination of data. Funding should be via those who require current and defensible protected area data for national and international reporting of environmental policy outcomes. It is recommended MfE, the Department of Conservation (DOC) and Statistics New Zealand (Stats NZ) have an annual contract with MWLR for delivery of PAN-NZ services.
- A cross-agency group should be formed to oversee PAN-NZ data and data sharing improvements as well as represent PAN-NZ stakeholders' needs. This group should include, but not be limited to, MfE, Stats NZ, DOC and MWLR.
- The means of sharing protected area data by the data creators must be improved. The group formed to oversee PAN-NZ data and data sharing improvements should work with already-established groups that are working to improve data sharing across local government, central government, and other organisations. If this is not feasible, then

a dedicated working group will be needed to bring together key stakeholders and develop data sharing best practices.

- Addressing these common data sharing challenges should take heed of recommendations published in:
 - Focusing Aotearoa New Zealand’s Environmental Reporting System (Parliamentary Commissioner for the Environment 2019)
 - Data Investment Plan (Stats NZ 2022).
- Mapped significant natural areas (SNAs) should be included in PAN-NZ.
- New Zealand’s Internationally protected national sites should be included in PAN-NZ.
- Marine protected areas should be included in PAN-NZ.
- Areas as protected by Te Urewera Act 2014 and Te Awa Tupua (Whanganui River Claims Settlement) Act 2017 should also be included.
- Further work should be commissioned by MfE to classify and categorise those additional protected areas recommended by this report for inclusion in PAN-NZ
- To gain the greatest benefit from PAN-NZ, the data it holds should be released publicly under open licensing. Prior to release a privacy assessment should be undertaken, and the principles outlined in the *Māori Data Governance* model should be considered (Kukutai et al. 2023).

1 Background

1.1 Protected Areas data drivers

The *Environment Aotearoa 2019* (Ministry for the Environment & Stats NZ 2019) report reinforced the significance of the well-known trends in New Zealand's degradation and loss of biodiversity. These include land, freshwater, and marine habitation loss, which can make some native species particularly vulnerable to extinction.

To protect New Zealand's biodiversity, it is important to have a unified and complete nationwide view and the extent to which areas are being protected. Recent policy has highlighted the importance of protected areas by making them a central component of biodiversity protection strategies. This includes *Te Mana o Te Taiao – Aotearoa New Zealand Biodiversity Strategy 2020* (Te Mana o Te Taiao), which states that 'legal protection, such as public conservation land and marine reserves, is an important tool for managing some of the pressures on biodiversity' (Department of Conservation 2020, p. 23).

The *Draft National Policy Statement for Indigenous Biodiversity* (NPS-IB) (Ministry for the Environment & Stats NZ 2022) is in its final stages following public consultation. The NPS-IB proposes a mandate for local territorial authorities to map natural ecosystems and habitats that possess significant indigenous biodiversity, and to protect them. Such protected areas under the NPS-IP are referred to as Significant Natural Areas (SNAs). Implementation of the NPS-IB would lead to greater recognition and protection of New Zealand's unique biodiversity.

Although protected areas are recognised as pivotal to New Zealand's biodiversity conservation successes, data on protected areas are fragmented, incomplete, and poorly funded. This is part of a greater problem that led to the OECD environmental performance review of New Zealand in 2017 to concluded that 'The shortage of reliable and nationally uniform data is particularly acute in such key environmental policy areas as waste management and biodiversity protection' (OECD 2017, p. 110).

A data set representing the full extent of protected areas throughout New Zealand would be a valuable tool for biodiversity conservation efforts.

- It would support the objectives outlined in *Te Mana o Te Taiao*, including Objective 10.4.1, which focuses on significant progress in identifying, mapping, and protecting coastal and marine ecosystems with high biodiversity value.
- It would identify gaps in the coverage of protected areas, which is related to the recommendation in *Te Mana o Te Taiao*: 'Ecosystems and species are protected, restored, resilient and connected from mountain tops to ocean depths' (Department of Conservation 2020 p.43). Without a national data set of protected areas this will be impossible to measure, monitor or report on.
- It would allow national-level analyses, such as
 - determining the representation of ecosystems within protected areas and thereby priorities for making additions to protected areas

- understanding the overlap between endangered native species and the Protected Area Network
 - updating the Threatened Environment Classification, which underpins assessment criteria for the significance of indigenous biodiversity in many regions and districts and is incorporated in many RMA plans and policy statements.
- It would generate information for state of the environment (SOE) reporting at the local, regional, national, and international levels. For example, the measurement of New Zealand's progress towards achieving the Kunming Montreal Global Biodiversity target of '30 by 30'. Target three of 30 by 30 is to ensure that at least 30% of terrestrial and inland water areas, and of marine and coastal areas are effectively conserved and managed through systems of protected areas and other effective area-based conservation measures, by 2030 (United Nations 2022). New Zealand is obliged to deliver its first report on the progress toward this goal in 2024 and a complete up to date PAN-NZ would be indispensable in enabling accurate reporting.
 - It would demonstrate the protection of New Zealand's natural environment, which is crucial for showcasing the country as a place of unspoiled nature. Many overseas markets now require proof of environmental protection as a condition for supporting our products (Ministry for the Environment 2019).

An ongoing process is needed for collecting, assembling, analysing, curating, and updating a national database on protected areas and making the information contained in that database available to as wide a range of users as possible to help achieve better conservation outcomes.

1.2 PAN-NZ

MWLR maintains and periodically updates the PAN-NZ database to support a range of research and conservation management applications. PAN-NZ has evolved as the result of ad-hoc project work (Ministry for the Environment et al. 2004; Rutledge et al. 2004; Walker et al. 2005, 2006, 2008; Cieraad et al. 2015; Carrick et al. 2021; Waka Kotahi NZ Transport Authority 2023) that has seen PAN-NZ data updated as per each project's requirements.

The PAN-NZ database is a compilation of information on legally protected areas, encompassing various legislative provisions such as the National Parks Act 1980, Conservation Act 1987, and Reserves Act 1977. It integrates data from multiple sources, including the Department of Conservation (DOC), Land Information New Zealand (LINZ), Queen Elizabeth II National Trust (QE II), and regional councils. To keep the database up to date, several iterations have been produced to incorporate new information, primarily from LINZ, regional councils, and QE II.

Several barriers hinder the efficient creation of a comprehensive national protected areas data set. These barriers were identified during the data discovery process for this report and the compilation of previous PAN-NZ versions. They are:

- missing or restrictive licensing – A licence provided alongside data communicates the data's terms of use. Data licensing issues, either due to commercial interests or a lack

of understanding of licensing requirements, can significantly impede the inclusion of data into systems such as PAN-NZ.

- limited utilisation of web services and application programming interfaces (APIs) – the lack of widespread adoption of web services and APIs for data sharing hinders the efficient creation of a comprehensive national protected areas data set.
- limited resources and competing priorities – small entities, such as smaller councils, which curate protected areas data, often face resource constraints and competing priorities when it comes to collecting, creating, managing, and sharing data.
- a local focus and a perception of limited value – a previous survey (Rutledge et al. 2008) revealed that owners of regional-level protected areas data, particularly those working in local government, may not see the value of national-level data sets (Rutledge et al. 2008); and that their primary focus is on local issues, which may diminish their motivation to contribute to a centralised data set unless required by central government.
- reliance on goodwill for data sharing – the successful creation of PAN-NZ relies on the willingness of data providers to share their data in a manner that facilitates its utilisation by others.
- insufficient sustainable funding – PAN-NZ currently lacks a sustainable funding model to ensure its completeness and frequent updates, which poses challenges to its long-term viability.
- insufficient records are collated for land under private landowner covenant (by territorial land authority local councils) or held in iwi/whānau/hapū-based trusts outside of Ngā Whenua Rāhui.
- the lack of a clear statutory mandate for a New Zealand agency to systematically develop and maintain a whole-of-scope protected areas data set, which has been highlighted in other key landscape management domains, such as land use (Rutledge et al. 2009) and the lack of nationally consistent, scale-appropriate ecosystem mapping.

The primary challenge to developing and disseminating a comprehensive PAN-NZ database is inadequate and inconsistent funding. This has made it difficult to obtain information from local government due to these agencies having limited resources, and the large number of councils, including 11 regional councils and 67 territorial authorities. As a result, the current PAN-NZ database does not include all information held by territorial authority landholdings, and covenant data and must therefore underestimate the total number and coverage of protected areas. The challenge is to find out how much of an issue this may be, and whether the level of protection on the areas missed is so low (per the schedule of Appendix 6) that missing them is of little consequence.

Furthermore, the quality and availability of data vary greatly among councils. While some councils possess highly accurate spatial data layers for covenant information, others only maintain hardcopy lists of covenants associated with individual properties. Our understanding of these disparities is derived from other projects, anecdotal evidence, and informal discussions with council staff. For a list of data sources used in previous versions, please refer to Appendix 1.

1.3 Data gaps

In the context of PAN-NZ, a data gap refers to incomplete or missing data that are required in order to obtain a full picture, at a national level, of where protections have been applied across New Zealand's terrestrial and marine environments. A data gap can also include gaps in the capability to use data or limitations with the infrastructure to access data. Such data gaps include data not having licensing that explicitly communicates reuse, and the lack of machine-to-machine interfaces that allow data to be fetched by automation.

A 2008 survey assessed the state of data on protected lands across New Zealand, with a focus on estimating protected areas held by territorial authorities (Rutledge et al. 2008). This estimated that at least 85,000 ha of legally protected areas were not captured by the PAN-NZ data set. Furthermore, this figure was considered an underestimate, given that only a portion of councils responded to the survey.

Other extremely important categories, especially marine protected areas, areas protected by international law such as UNESCO World Heritage sites, and internationally significant wetlands designated as Ramsar sites are not currently included in PAN-NZ.

2 Methodology

The report 'Standardised terrestrial biodiversity indicators for use by regional councils' by Bellingham et al. (2016) was leveraged to identify the data gaps. In this study, legally protected areas for terrestrial biodiversity purposes in New Zealand were identified and classified based on the level of protection they provide to biodiversity (see Appendix 2). We used this list of protected areas to find data sets that describe their spatial extents and attributes.

Where a data set could not be found, a data gap was noted. While Bellingham et al. provide a good starting point, there are limitations to this approach, including:

- the scope being limited to terrestrial environments.
- focusing only on New Zealand legal protections
- changes in policy since 2016.

For this reason, the discovery exercise (captured by Appendix 8) starts with Bellingham et al.'s classifications and then builds on them to include other identified protected areas.

3 Results

The process of identifying types of protected areas, and the associated data and data gaps, is captured in Appendix 8. During the analysis we found that publicly protected lands data sets provided by the DOC Public Conservation Land and LINZ Protected Areas data sets encompassed many types of legally protected areas. There was considerable overlap between these data sets, as well as notable differences arising from their distinct

purposes. For example, the DOC Public Conservation Land data set covers an area of approximately 87,071 km², and the LINZ Protected Areas data set approximately 163,629 km². The difference is mainly due to the LINZ data set including marine protected areas, some of which are very large.

We also found instances, in both these data sets, of terrestrial legally protected areas missing. The owners of these data sets have acknowledged these issues and include disclaimers in the metadata to highlight this limitation. For example, the LINZ protected areas metadata declares, 'The Department cannot guarantee the accuracy of the information but rather it represents best endeavour to maintain an accurate record of conservation land' (LINZ 2023a).

Most information on terrestrial legally protected areas comes from central government sources, focuses on a national-level resolution, and is mature in data sharing capabilities. Mature data sharing includes transparent licensing terms that facilitate data reuse, along with web services that enable automated retrieval of the data.

In contrast, legally protected data from other sources is often less mature in terms of data sharing infrastructure. Such data are typically maintained by regional councils, territorial authorities, and public trusts such as the QEII National Trust, which act as custodians of the information. Immature data sharing capabilities mean that many of these organisations do not provide licensing to explicitly allow reuse, or web services that allow automated access to the data. Some data providers only make their data available via direct contact and requests.

To put this into perspective, of the eight central government data sources identified:

- all provide licensing for reuse.
- all provide self-service download facilities.
- three provide web services (see Appendix 5).

Of the 15 local government data sources identified for potential SNA data:

- four provide licensing for reuse.
- six provide self-service download facilities.
- three provide web services (see Appendix 8).

It is therefore clear that territorial authority data sources have a lower occurrence of clear licensing, self-service data download facilities, and web services. This is of major concern if compiling a version of PAN-NZ for public dissemination. While many of the source data sets are public facing, they cannot be included in PAN-NZ without licensing that explicitly allows reuse. An intriguing aspect to consider is whether the absence of a licence indicates a deliberate decision to restrict reuse or if it is simply a result of other factors that prevented the appropriate field from being populated.

New Zealand's Protected Areas Network will undergo significant expansion if the NPS-IB is enacted. This policy will mandate territorial authorities to map and safeguard Significant Natural Areas (SNAs), which would significantly increase their role as creators of protected area data sets and how these data are created, stored, and shared. As a result, territorial

authorities would play a vital role in expanding and maintaining the data set for protected areas in New Zealand.

In addition to these proposed SNA responsibilities, local governments hold the authority to designate land for protection under Section 77 of the Reserves Act 1977. However, these protected areas often face the challenges of limited visibility and significant ambiguity. Unfortunately, our search for publicly available spatial data sets pertaining to these areas did not provide further access or insight, as no useful data sets were discovered.

While some local government data sets with names such as 'parks' or 'reserves' were identified (e.g., in *Canterbury Maps*, Environment Canterbury 2017), they encompassed a diverse range of parks without any clear indications of their status under the Reserves Act or any other forms of protection. To tackle this issue a potential survey has been drafted. The survey could help actively engage with local government entities to facilitate the discovery of these data sources, as well as the existing and future state of data and provision.

Compiling a national-level data set from local government data sources is expected to present a significant challenge. To overcome this, it will be crucial to establish strong relationships with the holders of the data and provide extensive support.

The following subsections contain groupings of identified protected areas, along with comments on data gaps and their potential solutions. Recommendations are also provided for incorporating the data sets into future versions of PAN-NZ.

3.1 Terrestrial legally protected areas

Terrestrial protection has been the focus of previous iterations of PAN-NZ. These are also those areas identified by Bellingham et al. (2016), which include DOC public conservation land, LINZ protected areas, DOC conservation covenants area, QEII National Trust covenants, regional parks (from region councils), and the Ngā Whenua Rāhui kawenata reserves data sets (see Appendix 5 for details).

The PAN-NZ database has included the DOC public conservation land and the LINZ protected areas data sets in various iterations (see Appendix 1 for previous data sets used). However, due to significant overlap, these data sets have not been used in the same versions. Although both record protected Crown land under the Conservation Act 1987, National Parks Act 1980, Reserves Act 1977, and Wildlife Act 1953, the LINZ data set has a broader scope, including areas protected under the Marine Mammals Protection Act 1978, Marine Reserves Act 1971, and Te Urewera Act 2014. It also includes soil conservation reserves and reserves designated for gravel extraction. These often have little value for biodiversity protection. In contrast, the DOC public conservation land data set prioritises areas with higher biodiversity protection.

However, because these data sets only record protected areas on Crown land, they don't encompass all land under the Reserves Act, including privately owned reserves vested in local authorities or controlled and managed by other organisations. Furthermore, preliminary investigation of these data has identified errors of omission for example:

- the DOC public conservation land data set misses Lake Okataina Scenic Reserve
- the LINZ protected area data set misses Ruataniwha Conservation Park.

We recommend that all types of terrestrial legally protected areas be included in future versions of PAN-NZ. Efforts should be made to resolve all data gaps identified in Table 1. Engagement with data custodians via the proposed survey is the first step towards identifying the data required to close the documented data gaps.

Table 1. Terrestrial legally protected areas data gaps, identified as a result of compiling Appendix 8

Identified Data Gaps	
Data gap	Solution
<p>Water Conservation Order No spatial data sets representing Water Conservation Orders were discovered.</p>	Contact either MfE or the Environmental Protection Authority (EPA) as a first step.
<p>Protected private land No Protected Private Lands data has been identified.</p>	<p>One solution may be to extract protected private land data from LINZ NZ Parcel data (LINZ 2023b), although an evaluation of completeness would be needed.</p> <p>The data set includes a field 'statutory_actions' with actions such as '[Create] Protected Private Land for Scenic Purposes [The John Fensham Sanctuary for Native Birds and Trees] <i>New Zealand Gazette</i>, 2001, p. 175.'</p> <p>The proposed survey may also identify data sources for Protected Private Lands.</p> <p>Regional groups could also be convened to identify any omissions. This would include those with local land knowledge such as regional councils and QEII</p>
<p>Regional parks – Auckland Although we have had access in the past, the link (URL) is no longer valid. The only public-facing data set we discovered contains only one park.</p>	Contact Auckland Council.
<p>Consent notice No spatial data sets representing consent notices were discovered.</p>	Contact Land Information New Zealand
<p>Covenants held by local authorities, and reserves vested in local authorities We are aware that some local authorities have this information digitised while others maintain hard copies. This data gap would require substantial investment to resolve.</p>	<p>The proposed survey component of this work aims to help discover data currently collated and stored by territorial authorities.</p> <p>LINZ primary parcels include records with statutory actions referring to section 77 of the Reserves Act. The extraction of these may provide some data to fill this gap.</p>
<p>Incomplete data sets Both the LINZ protected area and DOC public conservation land data sets have errors of omission</p>	PAN-NZ curators should work with the data owner to resolve issues at source.

3.2 Marine protected areas

PAN-NZ does not hold information on marine protected areas.

The objective of *Te Mana o Te Taiao – Aotearoa New Zealand Biodiversity Strategy 2020* is to ensure 'ecosystems and species are protected, restored, resilient and connected from mountain tops to ocean depths' (Department of Conservation 2020, p. 43). We recommend including terrestrial and marine protected areas in future PAN-NZ data sets to support those reporting across both environments. Fortunately, the LINZ protected areas data set already incorporates marine reserves, marine mammal sanctuaries, and marine areas, as well as meeting the highest requirements of data access and licensing.

There have been no data gaps identified in marine protected areas.

3.3 Internationally protected areas

PAN-NZ does not hold information on internationally protected areas.

New Zealand's UNESCO World Heritage Sites, recognised for their outstanding natural and cultural values, are protected under international law to ensure their preservation for future generations. New Zealand is also a signatory to the Ramsar Convention and therefore has obligations to protect and conserve those wetlands designated as Ramsar sites.

We recommend that international sites be included in PAN-NZ and all data gaps as identified in Table 2 are resolved. DOC provides an Internationally Recognised Areas data set, which includes New Zealand's UNESCO World Heritage Sites and Ramsar sites. Reviewing this data set revealed missing records; for example, it lists only six Ramsar sites, omitting the most recent addition, Wairarapa Moana Wetland, added on 20 July 2020, yet the data set was last updated on 15 November 2021. This is an example of incomplete data.

Table 2. International legally protected areas data gaps where missing data have been identified.

Identified Data Gaps	
Data gap	Solution
<p>DOC Ramsar data are not complete</p> <p>The Wairarapa Moana Wetland is missing from the DOC Internationally Protected Areas dataset</p>	Contact DOC

3.4 Significant Natural Areas

The NPS-IB proposes mandating territorial authorities to map and protect SNAs. These areas would greatly increase the extent of New Zealand's protected biodiversity. For example, Figure 1 highlights the extent of SNAs as mapped by the Porirua City Council. Provided the last steps are taken to enact the proposed SNA legislation, we recommend including SNA data in future versions of PAN-NZ. However, because not all these data have been collected and territorial authorities would have until 2025 to complete this task, we recommend onboarding SNAs to PAN-NZ after all the other data sets have been completed.

Barriers to onboarding SNAs are the same as for other data sets but compounded due to the large number of data sources. This is because SNA data are to be collected and stored across 67 territorial authorities.

Table 3. Significant Natural Area data gaps where missing data have been identified.

Identified Data Gaps	
Data gap	Solution
<p>A discovery exercise searching the internet for public-facing SNA data sets was undertaken (see Appendix 8). This revealed no SNA data sources for many territorial authorities. This is expected as authorities will have until 2025 to map their SNAs under the proposed policy.</p>	<p>Identify and leverage central, regional, and local government efforts to improve data and data sharing. This may include monitoring and engaging with the outcomes of the <i>Focusing Aotearoa New Zealand's Environmental Reporting System</i> report.</p>

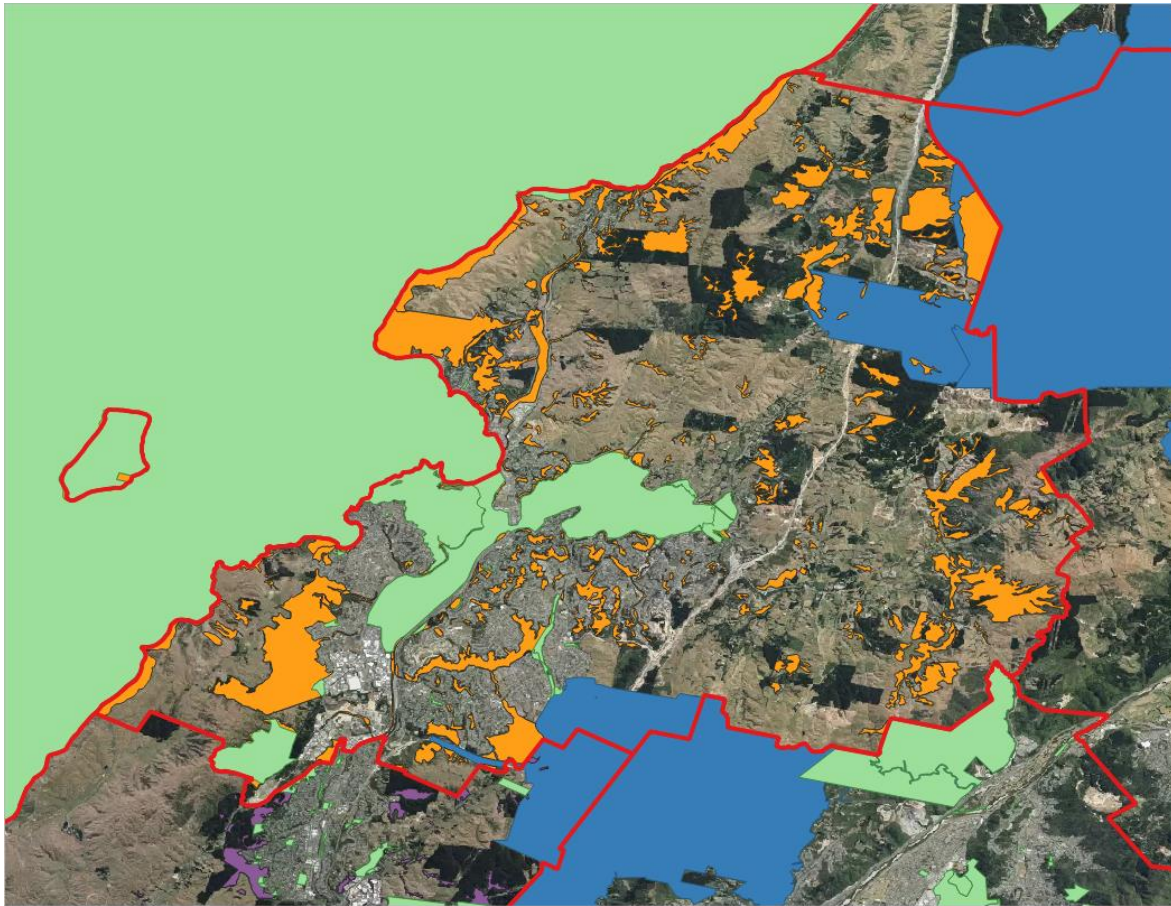


Figure 1. This view, centred on the Porirua City Council area (council extents in red) shows regional parks (blue), LINZ protected areas (green), and Porirua City Council SNAs (orange). This illustrates the large spatial extent of protection afforded by SNAs in the Porirua area.

3.5 Te Urewera and Te Awa Tupua

Te Urewera National Park and the Whanganui River are protected under Te Urewera Act 2014 and Te Awa Tupua (Whanganui River Claims Settlement) Act 2017, respectively. Te Urewera is well represented by the DOC Te Urewera data set, but no data set was identified for Te Awa Tupua and this has been recorded as a data gap (see Table 4). These areas are afforded a high degree of protection and should be included in future versions of PAN-NZ.

Table 4. Te Urewera and Te Awa Tupua data gaps where missing data have been identified.

Identified Data Gaps	
Data gap	Solution
<p>Te Awa Tupua</p> <p>A data set representing the spatial extent of the protection has not been identified. It is not clear if such an extent exists.</p>	<p>Efforts should be made to speak with the custodians of the Whanganui River.</p>

3.6 Other

Previous versions of PAN-NZ include areas with long-term stable protection. Another class of protection is transient protection status, such as seasonal or cultural bans on activities that affect biodiversity. A mature protected areas and land-use information system should include such information. At this stage, however, their inclusion is not recommended, although a systems approach that considers data of this nature is warranted.

Other protected areas for conservation we identified include:

- kauri management areas: these areas are protected, not in perpetuity, but for short-term specific date ranges.
- rāhui collection zones, including areas where harvesting of fish and seafood is restricted (again, these are not protected in perpetuity, but are in place for a limited time to allow for natural resource recovery).

4 Discussion

4.1 Current PAN-NZ methodologies

The first compilation of the national protected areas data was a simple aggregation of data sets provided by DOC, territorial authorities, Ngā Whenua Rāhui, and the QEII Trust using ArcGIS 9+ and 10+. To meet the licensing requirements of the QEII and Ngā Whenua Rāhui data, any ownership or identifying information was anonymised so that only the spatial extent and broad type of protection were included in the data set. Much of the work in creating these data sets was in locating and negotiating with data owners for access and licensing suitable for a research data set of protected areas.

For the 2014 PAN-NZ data set, LINZ provided a parcel data set with associated statutory actions as a field. This field contained a plain-language description of the statutes applied to each parcel. We developed a semi-automated trained language-parsing model in Visual Basic for Applications (VBA) within an access database to attempt to extract any current statutes that implied or explicitly indicated some form of protection. The final allocation of protection was then used as a lookup table to select the data from the spatial layer.

The language model attempted to parse all statutes that were currently applied to each parcel, and then each statute was investigated to determine what, if any, form of biodiversity protection it provided to the parcel. Actions identified indicated either the start or end of the relevance of a statute to a cadastral parcel, along with a year this occurred. Multiple action statements may occur over a time period or be relevant at any one time. Below is an example of a record from the 2015 LINZ data:

[Create] Recreation Reserve [Omakau Recreation Reserve] New Zealand Gazette 1952 p 1087 [Create] Recreation Reserve [Omakau Recreation Reserve] New Zealand Gazette 1983 p 3386 [Referenced] Classified as a recreation reserve. New Zealand Gazette 2007 p 854 By DOC (Otago Conservancy).[Referenced] New Zealand Gazette 2007 p 2829[Referenced] Part now Local Purpose (water supply) Reserve New Zealand Gazette 2009 p 3766

*Change of Classification of Section 1 SO 423705 (1500m2)[Referenced]
Declared national park. [Rakiura National Park.] New Zealand Gazette 2002 p
263 Named Rakiura National Park. Rakiura National Park Order 2002 (SR
2002/6).*

The language model was manually trained on a subset of +2,600 records extracted from the full data set of just under 200,000 rows. While the error rate was very low, there were records that even the model trainers found ambiguous or difficult to classify. Some data errors were present in the data set provided by LINZ, with both omissions and commissions resulting from incorrectly attributed parcels, as well as parsing errors (as determined by local knowledge, which in itself may be incorrect).

The results from the process were then aggregated as before, with additional protected areas data sets such as those held by territorial authorities and the QEII trusts. Checking was done manually by staff with expert knowledge of specific regions.

After this analysis was completed, LINZ undertook to curate the information in the statutory data set and now releases a protected areas data set derived from essentially the same information that was extracted in the 2014 PAN-NZ. This data set includes DOC areas protected by the Conservation, Reserves, National Parks, Marine Mammal, and Marine Reserves Acts.

The most recent compilation of data on protected areas was undertaken for Waka Kotahi as part of their non-monetised benefits manual. This project built a metadata and spatial geodatabase for use by Waka Kotahi. The licensing of the data collected on protected areas was specific to this project and so could not be released in any form as an updated PAN-NZ database. The database included an overarching protected areas data layer, along with the individual protected areas data layers, as required by Waka Kotahi.

In all versions of the protected areas data sets there have been overlapping areas and sometimes conflicting protected status. No attempt has been made to correct or identify conflicting spatial boundaries provided by the data suppliers, and digitising errors have been transferred verbatim into the final data set.

4.2 Future PAN-NZ methodology options

4.2.1 The ideal

Working within a mature data sharing ecosystem, owners of the protected areas data sources would all share their data, employing the New Zealand Government Open Access and Licensing (NZGOAL) principles (NZGOAL, n.d.) and do so via widely adopted standard

webservices, such as The Open Geospatial Consortium's (OGC)¹ Web Feature Services (WFS)² or OGC APIs.

PAN-NZ software would automatically, and frequently, load data direct from the source/custodian providers, having explicitly been given permission via clear licensing. Data provided via web services would also be in the same schema format as other related data providers, allowing data to be easily integrated with all the input data sets to be collated. Data owners would not need to store the data in a standardised format, but instead would serve the data in a mutually agreed-upon format.

Custom PAN-NZ software would load the data, raise any issues with incoming data (flagging for manual assessment or notifying the custodian or collator) and store it for dissemination. As part of the loading of the data, sensitive information would be obscured, ensuring all data incorporated into a PAN-NZ data set are suitable for sharing publicly. The PAN-NZ data would then be shared publicly via a web interface and/or data portal for viewing, with web services provided for streaming to other applications. All PAN-NZ data would be licensed for reuse. The backend software would be developed utilising configuration files to seamlessly incorporate data sets, enabling easy management of both new and existing data sources without the need to modify the system's source code.

An ideal PAN-NZ research database for protected areas would allow access through time-stamps, enabling the capture of data as they exist at a particular point in time and as they evolve over time. This functionality would enable researchers to conduct repeatable analyses using a specific referenceable version of the data, and to examine the data during a specific period, even if they were subsequently modified.

4.2.2 Transitioning to the ideal PAN-NZ model

Our data source review found that data are not being served in a way that enables the 'ideal' PAN-NZ system described above. Based on these findings, the next version of the PAN-NZ system will need to be built, albeit with limitations resulting from the current PAN-NZ data sharing environment. However, any future development should include supporting data providers to improve their data sharing capabilities.

While technology often takes the spotlight as a solution for advancing data sharing ecosystems, emphasising collaboration as the centrepiece of PAN-NZ holds greater potential for making a substantial impact. This includes encouraging the adoption of the New Zealand Government's NZGOAL recommendations for data sharing and licensing. By doing so, barriers to the public release of extensive PAN-NZ data could be addressed, facilitating greater transparency and accessibility.

1 The Open Geospatial Consortium (OGC) is an international organisation that focuses on developing open standards and interoperability for geospatial data and technologies. The OGC plays a crucial role in facilitating the exchange and utilisation of geospatial data.

2 Web Feature Service (WFS) provides a standardised and interoperable approach to accessing and sharing geospatial information over the internet. This is one of the protocols developed by OGC.

Acknowledging the limitations of the current data sharing environment and prioritising the development of a modern PAN-NZ system built on collaboration, the following milestones are considered important steps in achieving an improved PAN-NZ product and data sharing environment.

PAN-NZ collaboration milestones

- A cross agency group consisting of, but not limited to, MfE, DOC, Stats NZ and MWLR should be formed to oversee the improvement of protected area data and data sharing. This group should be adequately resourced to support efforts in improving data sharing. Required resourcing may include financially supporting workshops and providing expertise to data creators.
- The data creators/custodians of PAN-NZ are also responsible for many other data sets that government departments aggregate, so other initiatives already working with the same data providers to solve the common goals of improving data-sharing maturity should be sought. By leveraging and collaborating with such initiatives, greater progress can be made in achieving the shared goals of data improvement.

PAN-NZ technology milestones

- A budget should be developed for PAN-NZ database modernisation, ongoing maintenance, and ongoing data improvement. To ensure both the quality of the data and the removal of obstacles related to data access, data loading, and data dissemination, funding should include supporting and collaborating with protected area data providers.
- With the emergence of new technologies and concepts that benefit data aggregation, a comprehensive architectural review and design should be undertaken. Concepts that may be of interest include data mesh, data pipelines and grid index systems (e.g., discrete global grid systems).
- All data recommended for inclusion in PAN-NZ by this report should be incorporated into PAN-NZ. This includes data via WFS and manually acquired input data. This process should be staged and the cross-agency group overseeing PAN-NZ improvements should represent PAN-NZ stakeholder requirements. Some considerations for staging data loading into PAN-NZ include giving a higher priority to protected areas with higher protected area classification ranks (see the below section on protected area classification) and delaying SNA inclusion in PAN-NZ until the legislation has passed its final stages and until the date at which all territorial authorities are required to have mapped SNAs by.
- PAN-NZ software should be extended to load web service data and update the database in an automated manner. Updating via web services should be scheduled to run at set intervals and/or be prompted when input data are updated.
- PAN-NZ data that are licensed for reuse should be shared publicly following the principles of NZGOAL. By sharing the data publicly, the investment in PAN-NZ will be best utilised. This is because government agencies at all levels, and other key stakeholders and organisations, will have access to the national protected areas data set without the need to duplicate investment and effort. As part of any public release, a privacy assessment should be conducted, and the principles of the *Māori Data Governance Model* report considered (Kukutai et al. 2023).

- Data that are already publicly facing but not explicitly licensed for reuse should not be shared publicly, but rather filtered out and treated as sensitive for public dissemination. PAN-NZ should, however, make a protected area data catalogue available to highlight the sources obscured for public dissemination. This will inform users that data gaps exist, the reasons for obscuring these data, and where they can download the public data that are available but not licensed for inclusion in PAN-NZ.
- Time-stamped versions of the PAN-NZ data should be published to support conservation research and environmental reporting.

4.2.3 Protected area classification

To classify protected areas, we recommend using the ranking system developed by Bellingham et al. (2016) (see Appendix. 3). The working group that created this New Zealand-focused system included regional councils, indicating the potential for a high level of buy-in from those protecting areas of biodiversity. This group also found that the International Union for Conservation of Nature (IUCN) rating was not suitable for New Zealand's biodiversity conservation context (Bellingham et al. 2016). This ranking should be used in parallel with the IUCN classification, and Bellingham et al. provided advice for links between their recommended classifications and the IUCN classification to enable parallel use (see Appendix. 4).

Bellingham et al.'s ranking and mapping to the IUCN classifications of protected areas do not extend to those additional protected area types recommended by this report for inclusion in PAN-NZ. These are marine protected areas, SNAs, those areas as protected by Te Urewera Act 2014 and Te Awa Tupua 2017 and New Zealand's Internationally protected areas. It is recommended that further research is commissioned to define the classification of these protected areas.

The ranking should be included in the aggregated PAN-NZ data. This will allow users of the data to filter protected areas based on the degree of biodiversity protection each area provides. This would allow users to, for example, easily omit reserves with low biodiversity protection, such as those for the purpose of resource extraction, while allowing those that are interested in such reserves to include them in their work.

5 Stakeholder engagement

Two main purposes of stakeholder engagement for the development of PAN-NZ were identified, which require separate approaches:

- a status update from data providers of currently available data that can feed into PAN-NZ and its qualities.
- further understanding of user needs to inform the development of PAN-NZ

For the status update, clearly pre-definable information is needed from data providers, so an online survey is an appropriate tool. A draft survey has been developed with input about the data requirements articulated by spatial data scientists involved in this project

and drawing on the survey conducted to inform the previous version of PAN-NZ in 2008 (Rutledge et al. 2008).

To gain a better understanding of user needs and their various contexts (iwi, policy makers, land managers), a more qualitative approach is appropriate. This will enable researchers to develop a deeper understanding and allow for follow-up questions that can give further context of specific (potential) user needs and considerations. Initial recommendations relating to this process are outlined at the end of this section.

The priority for this report was to gain updates from (potential and known) data providers, so the focus of this section is on collecting this information.

5.1 Survey to assess the quality and availability of data to update PAN-NZ

Based on input from data scientists, we identified the information needed from potential and known data providers. Depending on the nature of the information sought, either open or multiple-choice questions were devised. The final questions in the survey were designed to help inform the second stage of the engagement, which focuses on end users, and to contribute to the recruitment for that.

A preliminary survey has been drafted and is presented for discussion in Appendix 7. Before administering the survey, ethics approval should be obtained. This ensures appropriate considerations are taken in relation to the ethical side of engaging human participants in research.

5.2 Survey data collection and management recommendations

Getting a survey to the right people and then getting them to fill it out can be a key challenge when collecting data using a survey, as shown by the 2008 PAN-NZ survey. To increase participation, the team could distribute the survey to relevant contacts in their networks. Where there are no existing relationships, publicly available contact information could be used. Articulating the potential benefit for participants (and their organisation) in the invitation email will also help recruitment. Time to follow up with phone calls, and potentially in-person meetings, should be budgeted for.

Once responses have been collected, data will need to be imported, checked, and collated. Ultimately, data can be put alongside information collected through desktop research to identify additional data sources and their properties.

5.3 Key considerations for better understanding users

We have identified a number of parties who may have distinct needs and purposes for PAN-NZ data in their respective contexts. Diverse potential user groups include researchers, policy makers, and the public. As a result, there are likely to be diverse needs and considerations relating to, for example, formats and features of PAN-NZ data, accessibility, different classifications, and tikanga or protocols in relation to the data and publication.

These complexities, nuances, and values-based considerations may not be easily or appropriately captured using an online survey. To understand user requirements and considerations for PAN-NZ, more in-depth, qualitative social research methods, such as focus groups or semi-structured interviews, are recommended. It will be key to conduct a stakeholder analysis to make sure perspectives of all (potential) user groups are captured.

6 Conclusions and recommendations

With recent central government policy releases such as Te Mana o Te Taiao – Aotearoa New Zealand Biodiversity Strategy 2020 and the National Policy Statement for Indigenous Biodiversity placing a strong emphasis on protected areas to achieve their objectives, there is no doubt there is a strong need for a complete national protected areas data set. The Te Mana o Te Taiao objective of ‘ecosystems and species are protected, restored, resilient and connected from mountain tops to ocean depths’ calls attention to a connectedness that can only be understood when all disparate data sets identified in this report are unified in one location.

To ensure New Zealand has the required protected area data to support biodiversity conservation outcomes we make the recommendations below:

- A budget should be developed for PAN-NZ database modernisation, ongoing maintenance, and ongoing data improvement. To ensure both the quality of the data and the removal of obstacles related to data access, data loading, and data dissemination, funding should include supporting and collaborating with protected area data providers.
- PAN-NZ should receive sustained funding – This is to ensure PAN-NZ is no longer updated in an ad-hoc fashion but is fit for purpose to support environmental reporting, research and data driven decision making, when required. Funding should include database software modernisation, ongoing database software maintenance, data gap resolution and ongoing updating of PAN-NZ data. As national and international monitoring and reporting of environmental outcomes has a dependency on current and defensible data from PAN-NZ, we recommend those responsible for such reporting, primarily, MfE, Stats NZ and DOC have an annual contract with MWLR to maintain, update and deliver timely information from PAN-NZ.

MWLR has a proven track record in collecting, collating, and compiling PAN-NZ data for New Zealand and at regional-scales. MWLR possesses the expertise to conduct comprehensive analyses, and to facilitate rapid, automated, and flexible updates, analysis, and reporting. Moreover, MWLR has extensive experience in maintaining and widely disseminating critical spatial datasets, such as S-map, LENZ, and the Land Cover Database, and existing nationally significant datasets and associated infrastructure, such as the Land Resource Inventory, the Land Use Capability classification system, the National Vegetation Survey databank, and the National Soil Data Repository.

Without sustained funding, MWLR lacks the resources to update PAN-NZ and to supply up to date protected area data to users. Without updates, the information will become increasingly unfit for purpose.

- A cross agency group consisting of, but not limited to, MfE, DOC, Stats NZ and MWLR should be formed to oversee the improvement of protected area source data and data sharing. This group should also represent the users and stakeholders of PAN-NZ, to ensure their needs are met. This group's objective is not to directly improve PAN-NZ source data maturity but look for opportunities to work with other groups and initiatives working to improve data and data sharing maturity across local government, central government, and other organisations.
- Data creators must be supported in enhancing the maturity of their protected area data and data sharing capabilities - PAN-NZ collates protected area data from many sources. This report has found that many of these data sources do not provide data in a manner that enables seamless integration into a national database. However, these difficulties in data discovery, barriers to collation, and the data gaps faced by PAN-NZ, are not unique. Many important national data sets across New Zealand's government can only exist by collecting and collating data from central and local government entities. Based on the findings of evaluating data sharing maturity in this study, it appears likely that numerous other national data sets that aggregate data from similar agencies encounter similar challenges. The problem is, therefore, far greater than the PAN-NZ data set. To address the common challenges in collating national data sets, we recommend tackling them at a higher level than the PAN-NZ data sets, but rather at a whole data-sharing ecosystem level.

To achieve effective data sharing, we recommend that the group overseeing PAN-NZ data improvements identifies existing groups and government initiatives aimed at addressing common challenges and collaborates with them directly. The recommendations of *Focusing Aotearoa New Zealand's Environmental Reporting System* (Parliamentary Commissioner for the Environment 2019) and the *Data Investment Plan* (Stats NZ 2022) are promising places to start. The *Focusing Aotearoa New Zealand's Environmental Reporting System* report makes recommendations for how to improve New Zealand's environmental reporting, with a focus on data access and sharing. Since the report's release, steps have been taken to update the Environmental Reporting Act 2015, which will strengthen the mechanisms for collecting data, including new data collection provisions. Although *Focusing Aotearoa New Zealand's Environmental Reporting System* does not specifically mention protected areas, given how integral protected areas are to the objectives of recent biodiversity policy, opportunities should be sought by the group overseeing PAN-NZ data improvements to leverage the outcomes of this report, either directly or indirectly to benefit protected area data sharing.

The *Data Investment Plan* serves as a guiding framework for government investment in data. While it prioritises investments under three themes (society, environment, and the economy), it does not specifically prioritise investments in protected areas data. However, the plan places a significant emphasis on environmental protection and acknowledges that it does not restrict or impede investments in data that fall outside its current scope. This recognition allows for the possibility of investment in other data areas beyond the plan's explicit focus. Given the plan's goal of improving data aggregation, including from local to national scale, it is advisable to actively engage with the initiative to explore opportunities for improving PAN-NZ. Future work could also form the basis of a case study for implementing better practice, or testing recommendations of the *Data Investment Plan's* outcomes.

Established groups working across local government such as the Local Government Geospatial Alliance (LGGGA) and the Regional Councils' Biodiversity and Biosecurity working group may also be able to provide guidance on working with local government data creators.

If there is no opportunity for the group formed to oversee PAN-NZ data improvements to engage with government initiatives such as the Data Investment Plan or the outcomes of *Focusing Aotearoa New Zealand's Environmental Reporting System* to improve protected areas data sharing, it is anticipated PAN-NZ will still derive significant benefits from these endeavours. Both *Focusing Aotearoa New Zealand's Environmental Reporting System* and the *Data Investment Plan* strongly emphasise the need for enhanced data sharing across various levels of government and stakeholders, and this is expected to foster a more advanced data sharing environment overall. Consequently, PAN-NZ stands to gain greatly from this improved landscape of data sharing. We recommend that, if the group overseeing PAN-NZ data improvements cannot find opportunity to work with the above-mentioned already established groups and initiatives, it should then form its own working group to bring together key stakeholders and develop data sharing best practices.

- Datasets not currently included in PAN-NZ, but identified by this report for inclusion should be added to ensure PAN-NZ encompasses the full extent of New Zealand's protected environments. These are:
 - New Zealand's Internationally protected areas – These include the UNESCO World Heritage Sites and Ramsar Wetlands New Zealand has committed to protecting.
 - Marine protected areas – It is recommended that as well as terrestrial legally protected areas, marine protected areas are included in PAN-NZ. This will provide insights in to the connectiveness of terrestrial and marine protected areas and enable PAN-NZ to support those required to report on protected areas across both land and marine environments.
 - SNAs - Requirements for the mapping and protection of SNAs, as proposed under the draft National Policy Statement for Indigenous Biodiversity, would significantly expand New Zealand's network of protected areas. We recommend including SNA spatial extents in PAN-NZ. However, the creation of a comprehensive national data set incorporating SNAs poses a significant challenge. Given that territorial authorities are responsible for generating SNA data, the compilation at a national level of a protected areas data set will be complex due to the involvement of the large number of data creators. This highlights the need to work with data creators to ensure mature data sharing practices.
 - Areas as protected by Te Urewera Act 2014 and Te Awa Tupua (Whanganui River Claims Settlement) Act 2017.
- A piece of work should be commissioned by MfE to extend the protected area classifications of Bellingham et al. (2016). This is to classify the additional protected areas recommended by this report for inclusion in PAN-NZ. The classification of these areas will ensure PAN-NZ has a consistent classification of the protection provided by each protected area across the entire data set. This work should also map any newly classified protected areas to IUCN classifications to support work with international bodies and reporting.

- PAN-NZ data should be released publicly under open licensing – ensuring PAN-NZ data is open for all to access, ensures the investment in PAN-NZ is best utilised. All New Zealanders and organisations will thus have access to a nationwide protected areas data set when required, without having to duplicate investment and effort. As part of any public data release, a privacy assessment should be conducted, and the principles of the *Māori Data Governance Model* (Kukutai et al. 2023) considered.

By undertaking these steps, the development of the PAN-NZ database would be advanced, and its value for conservation planning purposes increased. This would play a crucial role in addressing the loss of native biodiversity within New Zealand.

7 Acknowledgements

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8 References

- Bellingham PJ, Overton JMcC, Thomson FJ, MacLeod CJ, Holdaway RJ, Wiser SK, Brown M, Gormley AM, Collins D, Latham DM, Bishop C, Rutledge DT, Innes JG, Warburton B 2016 Standardised terrestrial biodiversity indicators for use by regional councils. Landcare Research Contract Report LC2109 prepared for Regional Councils' Biodiversity Monitoring Working Group, Auckland Council, Auckland, New Zealand.
- Carrick S, Drewry J, Barnes M, Barringer J, Price R, Ausseil, AG, Jones H, Borman, D. 2020. Land fragmentation environmental reporting indicator – technical methods for analysis from 2002 to 2019. Manaaki Whenua-Landcare Research contract report LC3846.
- Cieraad E, Walker S, Price R, Barringer J 2015. An updated assessment of indigenous cover remaining and legal protection in New Zealand's land environments. *New Zealand Journal of Ecology* 39(2): 309–315. [See particularly Appendix 2: <https://newzealandecology.org/system/files/articles/CIERAAD%20SC%20SUPP.pdf>]
- Environment Canterbury 2017. Canterbury maps. <https://hub.arcgis.com/datasets/ecan::parks>
- Kukutai T, Campbell-Kamariera K, Mead A, Mikaere K, Moses C, Whitehead J, Cormack D 2023. Māori data governance model. Te Kāhui Raraunga.
- LINZ 2023a. NZ parcels. <https://data.linz.govt.nz/layer/51571-nz-parcels/>
- LINZ 2023b. Protected areas. <https://data.linz.govt.nz/layer/53564-protected-areas/metadata/>
- Department of Conservation 2020. Te Mana o Te Taiao – Aotearoa New Zealand Biodiversity Strategy 2020. Wellington, Ministry for the Environment.
- Ministry for the Environment, Department of Conservation, Local Government New Zealand 2004. A snapshot of council effort to address indigenous biodiversity on private land: a report back to councils. Ministry for the Environment & Stats NZ

2019. New Zealand's Environmental Reporting Series: Environment Aotearoa 2019. Wellington, Ministry for the Environment.
- Ministry for the Environment & Stats NZ 2022. Draft National Policy Statement for Indigenous Biodiversity. Wellington, Ministry for the Environment.
- NZ Government (n.d.). NZGOAL (New Zealand Government Open Access and Licensing) framework. <https://www.data.govt.nz/toolkit/policies/nzgoal/>
- OECD 2017. OECD environmental performance reviews: New Zealand 2017. OECD.
- Parliamentary Commissioner for the Environment 2019. Focusing Aotearoa New Zealand's environmental reporting system. Wellington, Parliamentary Commissioner for the Environment.
- Rutledge D, Hoffmann N, Briggs C, Price R 2008. Protected Area Network New Zealand (PAN-NZ): metadata database survey and needs assessment. Landcare Research Contract Report: LC0708/182, prepared for the Ministry for the Environment.
- Rutledge D, Price R, Briggs C, Cowell S 2009. Geospatial land-use classification for New Zealand: review and recommendations. Official Statistics Research Series, Vol 5.
- Rutledge D, Price R, Heke H, Ausseil A-G 2004. National analysis of biodiversity protection status: methods and summary results. Landcare Research Contract Report: 0405/042, prepared for the Ministry for the Environment.
- Stats NZ 2022. Government Data Investment Plan 2022
- United Nations 2022. COP15: Nations adopt four goals, 23 targets for 2030 in landmark UN biodiversity agreement. Press release. <https://www.cbd.int/article/cop15-cbd-press-release-final-19dec2022>
- Walker S, Price R, Rutledge D 2005. New Zealand's remaining indigenous cover: recent changes and biodiversity protection needs. Landcare Research Contract Report LCR0405/163, prepared for Land Information New Zealand.
- Walker S, Price R, Rutledge D 2008. New Zealand's remaining indigenous cover: recent changes and biodiversity protection needs. Science for Conservation 284. Wellington, Department of Conservation.
- Walker S, Price R, Rutledge D, Stephens RTT, Lee WG 2006. Recent loss of indigenous cover in New Zealand. New Zealand Journal of Ecology 30(2): 169–177.
- Waka Kotahi NZ Transport Authority 2023. Land transport benefits framework measures manual. <https://nzta.govt.nz/resources/land-transport-benefits-framework-measures-manual/>

Appendix 1 – Previously used data sources

This appendix lists data sources used in previous versions of PAN-NZ. Each version of PAN-NZ may have different purposes in relation to funding. Some versions have been created to support other specific MWLR work, where the PAN-NZ version may not be the deliverable but instead constitutes secondary data input to support other products and research.

PAN-NZ Version	Data Sources
PAN-NZ Version 2008 & 2011	DOC public conservation area Ngā Whenua Rāhui kawenata National Heritage Fund areas QEII covenants Auckland Regional Council – regional parks Environment Bay of Plenty – regional parks Horizons Regional Council – regional parks Wellington Regional Council – regional parks
PAN-NZ Version 2012	Environment Bay of Plenty – regional parks Horizons Regional Council – regional parks Nelson City Council conservation land Wellington Regional Council – regional parks Ngā Whenua Rāhui kawenata QEII covenants
PAN-NZ Version 2014	Auckland City Council – parks Environment Bay of Plenty – biodiversity sites Environment Bay of Plenty – high value ecological sites Environment Bay of Plenty – regional parks Environment Bay of Plenty – wetland extents DOC public conservation area Environment Canterbury – regional parks Greater Wellington Regional Council – open space LINZ marginal strips LINZ parcels with statutory actions National Parks LINZ appellation Nelson City Council conservation land Ngā Whenua Rāhui kawenata QEII covenants Tasman District Council reserves Waipa reserves

PAN-NZ Version	Data Sources
PAN-NZ Version 2020	Protected areas 2014 LINZ protected areas LINZ primary parcels QEII covenants Auckland Regional Council – regional parks Environment Bay of Plenty – regional parks Wellington Regional Council – regional parks Nelson City SNA Rotorua District protected natural areas Western Bay of Plenty reserves Gisborne protected management areas Hastings District recommended area for protection

Appendix 2 – Legally protected areas for biodiversity purposes, by rank

This appendix summarises Table 15-7 'Classification of areas legally protected for biodiversity purposes' as published by Bellingham et al. (2016) by rank. A six-level (0–5) ranked classification scheme was developed to report on the legal protection of areas for biodiversity purposes. This classification was developed in consultation with regional council representatives. The highest rank (5) represents areas where biodiversity protection is the main purpose of the legal protection. The definitions of rankings are expanded on in Appendix 3.

This was used as the starting point to identify data gaps by matching the below-identified legal protections with data sources. Where a data source could not be identified to represent the type of legal protection, a data gap was noted.

A reproduction of Table 15-7 can be found in appendix 6.

Rank	Type of legal protection			
HIGH Protection is the main purpose or ranked equally with a limited number of other compatible purposes				
5	National Park Nature Reserve	Sanctuary Area Scientific Reserve	Water Conservation Order Wilderness Area	Wildlife Management Area Wildlife Sanctuary
MODERATELY HIGH Protection is a main purpose but shared with less compatible purposes (e.g., recreation)				
4	Amenity Areas Conservation Covenant Conservation Park	Māori Reservation (Wetland or Scenic Reserve)	QEII Open Space Covenant Protected Private Land	Scenic Reserve Watercourse area Wildlife Refuge
MODERATE Protection is a desired purpose but subject to compatibility with a different main purpose or may be less comprehensive (i.e., only some aspects of biodiversity protection are targeted)				
3	Ecological Area Government Purpose Reserve (Ecological or Wildlife)	Māori Reservation (Conservation or Conservation of Native Bush) Ngā Whenua Rāhui Kawenata	Local Purpose Reserve (Ecological) Stewardship Area	Wildlife Management Reserve
MODERATELY LOW Some biodiversity protection is achieved but it is of secondary importance				
2	Esplanade Reserve or Strip Historic Reserve Local Purpose Reserve (Other – various)	Māori Reservation (Various purposes related to Recreation, Camping, Water Supply, Meeting Places, Historic Significance, etc.)	Marginal Strip Consent Notice	Recreation Reserve Regional Parks
LOW Protection results indirectly and fortuitously as a result of other activities				
1	Māori Reservation (Various purposes related to Marae, Pā Sites, Papakāinga, Urupā, Wāhi Tapu, etc.)	River ed	Road Reserve	

Appendix 3 – Classification of areas legally protected for biodiversity.

This appendix gives the classification of specific types of legal biodiversity protection as proposed by Bellingham et al. (2016).

Rank	Description	Example
5	High degree of biodiversity protection; protection is the main purpose or is ranked equally with a limited number of other compatible purposes	Wildlife Sanctuary
4	Moderately high degree of biodiversity protection; protection is a main purpose but is shared with other, less compatible purposes (i.e., recreation)	Conservation Park
3	Moderate degree of biodiversity protection; protection is a desired purpose but subject to compatibility with a different main purpose or may be less comprehensive (i.e., only some aspects of biodiversity protection are targeted)	Ecological Area
2	Moderately low degree of biodiversity protection; some biodiversity protection is achieved but it is of secondary importance	Recreation Reserve
1	Low degree of biodiversity protection; protection results indirectly and fortuitously as a result of other activities	Road Reserve
0	No legal protection for biodiversity	c. 65% of New Zealand

Appendix 4 – IUCN protected area categories related to Bellingham et al. 2016 rankings

This appendix shows how Bellingham et al. (2016) mapped their ranking of biodiversity protection to the International UN IUCN protections.

Code	Name	Description	New Zealand Protected Areas	
Ia	Strict Nature Preserve	Category Ia protected areas are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values. Such protected areas can serve as indispensable reference areas for scientific research and monitoring	National Parks Act of 1980	Specially protected areas
			Conservation Act 1987	Ecological areas Sanctuary areas
			Reserves Act 1977	Nature reserves Scientific reserves
			Wildlife Act 1953	Wildlife sanctuaries
			Marine Reserves Act 1971	Marine reserves
			Marine Mammal Protection Act 1978	Marine mammal sanctuaries
			Fisheries Act 1983 & Harbours Act 1950	Marine parks
Sugar Loaf Islands Marine Protected Area Act 1991	Marine protected areas			
Ib	Wilderness Area	Category Ib protected areas are usually large, unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.	National Parks Act of 1980	Wilderness areas
			Conservation Act 1987	Wilderness areas
II	National Park	Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities.	National Parks Act of 1980	National parks (balance)
			Conservation Act 1987	Conservation parks
			Reserves Act 1977	National reserves
III	National Monument or Feature	Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.	Reserves Act 1977	Historic reserves Scenic reserves Wildlife purpose reserves

Code	Name	Description	New Zealand Protected Areas	
IV	Habitat/Species Management Areas	Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.	Conservation Act 1987	Stewardship areas Private land reserved under conservation covenants or private agreements
			Wildlife Act 1953	Wildlife refuges and management areas
			Reserves Act 1977	Private land reserved under conservation covenants or private agreements
V	Protected Landscape/Seascape	Category V protected areas are where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.	Reserves Act 1977	Recreation and other reserves
VI	Protected area with sustainable use of natural resources	Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level, non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.		

Appendix 5 – Review of data sources

The table below summarises attributes of the major data sources identified via Appendix 8, with a focus on data currency and data sharing maturity. Attributes for each data set are summarised by traffic-light colour coding: green indicates the highest standards are met, orange indicates some improvement is required, and red indicates that barriers to the data set being incorporated into PAN-NZ must be overcome.

While no privacy issues have been raised by the data owners, as with any data release under government policy (NZGOAL), before releasing any protected areas data set a privacy assessment would need to be undertaken.

Data sets	Purpose	Attributes
Data sources for terrestrial legally protected areas ranked by Bellingham et al. (2016)		
DOC public conservation land	Legally protected conservation on land administered by DOC.	Last updated: ● Weekly Accessibility: ● RESTful API and download Resolution: N/A National Licensing: ● CC BY 4.0 licence Limitations: ● Disclaimer: care should be taken in deriving conclusions from any data or information supplied. Privately owned reserves are excluded from the dataset as they are not Crown land.
LINZ protected areas	Legally protected land and marine areas are mostly administered by DOC. The data set includes areas not for the protection of biodiversity, such as reserves for soil conservation and gravel extraction	Last updated: ● 2 May 2022 Accessibility: ● OGC WFS and download Resolution: N/A National Licensing: ● CC BY 4.0 licence Limitations: ● Disclaimer: the Department cannot guarantee the accuracy of the information but rather it represents best endeavours to maintain an accurate record of conservation land. Privately owned reserves are excluded from the data set as they are not Crown land. The data set has not been updated for 12 months (at time of reporting). Informal commentary from LINZ attributes this to publishing issues rather than the data set not being maintained
DOC conservation covenant areas	Data set indicating voluntary legal agreement made between a landowner and an authorised agency giving formal protection to the natural, cultural, historical and/or	Last updated: ● 3 May 2023 (continual) Accessibility: ● Download only Resolution: N/A National Licensing: ● CC BY 3.0 licence Limitations: ● It is not clear how complete this data set is. 'An authorized agency' is a broad category, and if this is intended to cover landed vested to local government, an assessment of completeness would need to be undertaken.

	significant values of a site.			This is because it is believed that such protected areas are poorly captured in New Zealand.
QEII National Trust registered and formalised covenants	QEII National Trust covenants protect and preserve natural and cultural heritage values of private land under the Queen Elizabeth II National Trust Act 1977	Last updated:	●	It is understood data are kept up to date internally.
		Accessibility:	●	Data must be requested via webform. It can take days to weeks to get the data.
		Resolution	N/A	National
		Licensing:	●	Unknown
		Limitations:	●	
Regional parks	Regional parks owned by regional councils. These are in the Auckland, Bay of Plenty, Canterbury, and Wellington regions	Last updated:		Varying. See Appendix 8.
		Accessibility:		Varying. See Appendix 8.
		Resolution	N/A	National
		Licensing:		Varying. See Appendix 8.
		Limitations:		Varying. See Appendix 8.
Ngā Whenua Rāhui kawenata	Land protected under s.77A – Ngā Whenua Rāhui kawenata of the Reserves Act 1977	Last updated:	●	27 March 2023
		Accessibility:	●	Download only
		Resolution	N/A	National
		Licensing:	●	Unknown
		Limitations:	●	None known or stated
LINZ primary parcels	May be required to fill in data gaps using statutory actions.	Last updated:	●	Weekly
		Accessibility:	●	Download & web services
		Resolution	N/A	National
		Licensing:	●	CC BY 4.0 licence
		Limitations:	●	The information pertaining to protected areas would need to be identified and extracted from this layer.
The Māori Land Spatial Dataset	The Māori Land Spatial Dataset is a combination of the spatial data available in the Map Search section of our Māori Land Online website and static data about management structures from our Māori Land Information System.	Last updated:	●	31 May 2017 (same as release date)
		Accessibility:	●	Download only
		Resolution	N/A	National
		Licensing:	●	CC BY 4.0 licence
		Limitations:	●	This data set has possibly been added to represent the protected areas under Te Ture Whenua Māori Act 1993. This data set references Māori reservation but not the sub-types (e.g., wet land and conservation of native bush). This data set's purpose should be further discussed with the data owner to better understand its intent.
Various territorial authority sources	It has been identified that territorial authorities hold information on	Last updated:	●	
		Accessibility:	●	
		Resolution	N/A	District and city council
		Licensing:	●	

	land vested to them for protection.	Limitations:	●	These data are held across the many territorial authorities but have poor visibility.
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Data sources for protected areas not ranked by Bellingham et al. (2016)

DOC marine reserves	Areas protected under the Marine Reserves Act 1971	Last updated:	●	Weekly
		Accessibility:	●	Download only
		Resolution	N/A	National
		Licensing:	●	CC BY 4.0 licence
		Limitations:	●	The data set includes 44 marine reserves, as expected
DOC Te Urewera	Vesting of Te Urewera establishment land.	Last updated:	●	15 November 2021 (as needed)
		Accessibility:	●	Download only
		Resolution	N/A	National
		Licensing:	●	CC BY 3.0 licence
		Limitations:	●	There is only one record. Should Ruakituri Wilderness Area as vested under the act be included?
DOC internationally recognised areas	Internationally recognised areas are protected areas that have been internationally recognised by the International Union for Conservation of Nature (IUCN).	Last updated:	●	15 November 2021 (as needed)
		Accessibility:	●	Download only
		Resolution	N/A	National
		Licensing:	●	CC BY 3.0 licence
		Limitations:	●	One Ramsar site (Wairarapa Moana Wetland as designated 19/08/2020) is missing from this data set.
Significant Natural Areas (SNAs)	SNAs as proposed in the draft National Policy Statement for Indigenous Biodiversity	Last updated:		Varying. See Appendix 8.
		Accessibility:		Varying. See Appendix 8.
		Resolution	N/A	Territorial authority.
		Licensing:		Varying. See Appendix 8.
		Limitations:		Varying. See Appendix 8.

Appendix 6 – Classification of areas legally protected for biodiversity purposes

This appendix reproduces Table 15-7 'Classification of areas legally protected for biodiversity purposes' as published by Bellingham et al. (2016). The purpose of this is to provide a description of all relevant legislation.

Rank	Designation	Legal Mechanism
5	National Park Purpose: s 4 Preserving areas in perpetuity as national parks, for their intrinsic worth and for the benefit, use, and enjoyment of the public, areas that contain scenery of such distinctive quality, ecological systems, ornate natural features so beautiful, unique, or scientifically important that their preservation is in the national interest; including that they shall be preserved as far as possible in their natural state and native plants and animals shall as far as possible be preserved and the introduced plants and animals shall as far as possible be exterminated	National Parks Act 1980
5	Nature Reserve Purpose: s 20 (1) Protect and preserve in perpetuity indigenous flora or fauna or natural features that are of such rarity, scientific interest or importance, or so unique that their protection and preservation are in the public interest.	Reserves Act 1977
5	Sanctuary Area Purpose: s 22 Preserve areas in their natural state indigenous plants and animals in it, and for scientific and other similar purposes shall be preserved as far as possible in its natural state	Conservation Act 1987
5	Scientific Reserve Purpose: s 21 (1) Protect and preserve in perpetuity for scientific study, research, education, and the benefit of the country, ecological associations, plant or animal communities, types of soil, geomorphological phenomena, and like matters of special interest; (2) (a) indigenous flora and fauna shall as far as possible be preserved and the exotic flora and fauna shall as far as possible be exterminated; (c) where scenic, historic, archaeological, biological, or natural features are present those features shall be managed and protected to the extent compatible with the principal or primary purpose of the reserve; (d) to the extent possible compatible with the principal or primary purpose, maintain value as a soil, water, and forest conservation area; (e) with consent, manipulate for experimental purposes or to gain further scientific knowledge.	Reserves Act 1977
5	Water Conservation Order Purpose: s 199 (1) The purpose of a water conservation order is to recognise and sustain – (a) outstanding amenity or intrinsic values which are afforded by waters in their natural state: (b) where waters are no longer in their natural state, the amenity or intrinsic values of those waters which in themselves warrant protection because they are considered outstanding. (2) A water conservation order may provide for any of the following: (a) the preservation as far as possible in its natural state of any water body that is considered to be outstanding: (b) the protection of characteristics which any water body has or contributes to, and which are considered to be outstanding, – (i) as a habitat for terrestrial or aquatic organisms: (ii) as a fishery: (iii) for its wild, scenic, or other natural characteristics: (iv) for scientific and ecological values: (v) for recreational, historical, spiritual, or cultural purposes.	Resource Management Act 1991
5	Wilderness Area Purpose: s 20 Preserve areas for their indigenous natural resources and exclude machinery, buildings, livestock, vehicles, motorised vessels, roads, tracks and trails.	Conservation Act 1987
5	Wildlife Management Area Purpose: s 23B Protect areas for their wildlife and wildlife habitat values (including the capacity for the movement of wildlife, genetic material of indigenous plants, and genetic material of wildlife)	Conservation Act 1987
5	Wildlife Sanctuary	Wildlife Act 1953

Rank	Designation	Legal Mechanism
	Purpose: (s 10) Preserve areas where all wildlife shall be absolutely protected; s 9 (2) prohibit or restrict (a) right of entry, (b) hunting or killing, capturing, disturbing, harrying, molesting, or worrying, taking eggs or spawn of any creature, taking for any purpose of or interference with vegetation of any description, or introduction or liberation of any living creature or the eggs or spawn of any living creature, or introduction or planting of any vegetation of any description or the spores or seeds of any vegetation of any description, (c) burning or clearing by any means whatsoever of any trees, shrubs, grasses, or other plant life, (d) camping or any other specified form of sport or relaxation, (e) lighting of fires or the doing of anything likely to cause a fire, (f) use of boats and vehicles, (g) wilful disturbance of wildlife in the sanctuary by flying aircraft over the sanctuary or by noise in the vicinity, (h) use of firearms or explosives, (i) taking or keeping of domestic animals or domestic birds into or in the sanctuary, (j) depositing of rubbish and the leaving of litter, (m) cutting, construction, or maintenance of private roads, tracks, tramways, or other means of access or communication, (n) pollution of any by means of rubbish, sewage, industrial waste, mining debris, saw mill refuse, or any other means, (o) other matters as may be considered necessary for the control of the sanctuary or for the protection and wellbeing of any wildlife or vegetation therein.	
4	Amenity Areas	Conservation Act 1987
	Purpose: s 23A Protect areas for their indigenous natural and historic resources, facilitate people's appreciation of them, and foster recreational activities.	
4	Conservation Covenant	Reserves Act 1977
	Purpose: s 77 Any private land or any Crown land held under Crown lease that should be managed so as to preserve the natural environment, or landscape amenity, or wildlife or freshwater-life or marine-life habitat, or historical value, and that the particular purpose or purposes can be achieved without acquiring the ownership of the land, or, as the case may be, of the lessee's interest in the land, for a reserve, may treat and agree with the owner or lessee for a covenant to provide for the management of that land in a manner that will achieve the particular purpose or purposes of conservation.	
4	Conservation Park	Conservation Act 1987
	Purpose: s 19 Protect natural resources while facilitating public recreation and enjoyment.	
4	Māori Reservation (Wetland or Scenic Reserve)	Tu Ture Whenua Māori Act 1993
	The chief executive may, by notice in the Gazette issued on the recommendation of the court, set apart as Māori reservation any Māori freehold land or any General land—(a) for the purposes of a village site, marae, meeting place, recreation ground, sports ground, bathing place, church site, building site, burial ground, landing place, fishing ground, spring, well, timber reserve, catchment area or other source of water supply, or place of cultural, historical, or scenic interest, or for any other specified purpose; or (b) that is a wāhi tapu, being a place of special significance according to tikanga Māori.	
4	QEII Open Space Covenant	Queen Elizabeth II National Trust Act 1977
	Purpose: s. 2 Preserve any area of land or body of water that serves to preserve or to facilitate the preservation of any landscape of aesthetic, cultural, recreational, scenic, scientific, or social interest or value. (These are usually in perpetuity.)	
4	Protected Private Land	Reserves Act 1977
	Purpose: s 76 Land possessing such qualities of natural, scientific, scenic, historic, cultural, archaeological, geological, or other interest that its protection is desirable in the public interest, or that rare species of indigenous flora or fauna are on the land, and the preservation of such flora and fauna is in the public interest, and that the land is sufficiently fenced or is otherwise protected from damage by stock.	

Rank	Designation	Legal Mechanism
4	Scenic Reserve	Reserves Act 1977
	Purpose: s 19 (1) (a) protecting and preserving in perpetuity for their intrinsic worth and for the benefit, enjoyment, and use of the public, suitable areas possessing such qualities of scenic interest, beauty, or natural features or landscape that their protection and preservation are desirable in the public interest; (b) providing, in appropriate circumstances, suitable areas which by development and the introduction of flora, whether indigenous or exotic, will become of such scenic interest or beauty that their development, protection, and preservation are desirable in the public interest; (2) (a) the indigenous flora and fauna, ecological associations, and natural environment and beauty shall as far as possible be preserved, and for this purpose, except where determined otherwise, exotic flora and fauna shall as far as possible be exterminated; (b) the public shall have freedom of entry and access to the reserve; (c) to the extent compatible open portions of the reserve may be developed for amenities and facilities where these are necessary to enable the public to obtain benefit and enjoyment.	
4	Watercourse Area	Conservation Act 1987 § 23
	Purpose: s 23 Protect the wild, scenic, and other natural or recreational characteristics present when considered with the associated river, lake, or stream concerned.	
4	Wildlife Refuge	Wildlife Act 1953
	Purpose: s 14 (3) Areas where it is unlawful for any person to hunt or kill for any purpose, or molest, capture, disturb, harry, or worry any wildlife in the wildlife refuge, or to take, destroy, or disturb the nests, eggs, or spawn of any such wildlife, or for any person to bring onto the wildlife refuge or have in his possession or discharge in the wildlife refuge any firearm or explosive, or have in his possession or control in the wildlife refuge any dog or cat, or to do anything likely to cause any wildlife to leave the wildlife refuge; (1)(f) prohibit or restrict the pollution by means of rubbish, sewage, industrial waste, mining debris, saw mill refuse, or any other means, (1A) prohibit or restrict the use of boats; (2) authorised persons may keep or bring domestic animals; keep or bring firearms or explosives; discharge firearms or explosives; destroy any animals specified, perform any other acts necessary for the carrying on of the normal use of the land, subject to any specified conditions.	
3	Ecological Area	Conservation Act 1987
	Purpose: s 21 Managed to protect the values for which it is held	
3	Government Purpose Reserve (Ecological or Wildlife)	Reserves Act 1977
	Purpose: s 22 (1) providing and retaining areas for such Government purpose or purposes as are specified in any classification of the reserve; (2) may be classified for wildlife management or for other specified wildlife purposes; (4) (a) where scenic, historic, archaeological, biological, cultural, scientific, or natural features or wildlife are present on the reserve, those features or wildlife shall be managed and protected to the extent compatible with the principal or primary purpose of the reserve; (b) to the extent compatible with the principal or primary purpose, value as a soil, water and forest conservation area shall be maintained; (5) may prohibit access to the whole or part of the reserve, or, as the case may be, the whole or any specified part of that part of the reserve, and no person shall be entitled to enter the reserve or, as the case may be, the part specified in the notice, except under the authority of a permit	
3	Māori Reservation (Conservation or Conservation of Native Bush)	Tu Ture Whenua Māori Act 1993
	The chief executive may, by notice in the Gazette issued on the recommendation of the court, set apart as Māori reservation any Māori freehold land or any General land—(a) for the purposes of a village site, marae, meeting place, recreation ground, sports ground, bathing place, church site, building site, burial ground, landing place, fishing ground, spring, well, timber reserve, catchment area or other source of water supply, or place of cultural, historical, or scenic interest, or for any other specified purpose; or (b) that is a wāhi tapu, being a place of special significance according to tikanga Māori.	
3	Ngā Whenua Rāhui Kawenata	Reserves Act 1977

Rank	Designation	Legal Mechanism
	Purpose: s 77A (1) (a) Māori land or Crown land held under a Crown lease by Māori managed to preserve and protect – (i) the natural environment, landscape amenity, wildlife or freshwater-life or marine-life habitat, or historical value of the land; or (ii) the spiritual and cultural values which Māori associate with the land, (b) a Ngā Whenua Rāhui kawenata under this section may be in perpetuity or for any specific term or may be in perpetuity subject to a condition that at agreed intervals of not less than 25 years, and usually for a term renewable after a 25 year period	
3	Local Purpose Reserve (Ecological)	Reserves Act 1977
	Purpose: s 23 (1) providing and retaining areas for such local purpose or purposes as are specified in any classification of the reserve; (2) (a) where scenic, historic, archaeological, biological, cultural, scientific, or natural features or wildlife are present on the reserve, those features or wildlife shall be managed and protected to the extent compatible with the principal or primary purpose of the reserve; (b) to the extent compatible with the principal or primary purpose, value as a soil, water and forest conservation area shall be maintained; (3) where vested in a local authority or where the administering body is a local authority, may prohibit access to the whole or any specified part of the reserve, and in that case no person shall enter the reserve or, as the case may be, that part, except under the authority of a permit issued by the local authority; (4) may prohibit access to the whole or any specified part of the reserve, and in that case no person shall enter the reserve or, as the case may be, that part, except under authority of a permit	
3	Stewardship Area	Conservation Act 1987
	Purpose: s 25 Managed so that natural and historic resources are protected.	
3	Wildlife Management Reserve	Wildlife Act 1953
	Purpose: s 14 (3) Impose conditions in relation to all or any of the matters specified in s 9(2) (see Wildlife Sanctuary above)	
2	Esplanade Reserve or Strip	Resource Management Act 1991
	Purpose: s 229 An esplanade reserve or an esplanade strip has 1 or more of the following purposes: (a) to contribute to the protection of conservation values by, in particular – (i) maintaining or enhancing the natural functioning of the adjacent sea, river, or lake; or (ii) maintaining or enhancing water quality; or (iii) maintaining or enhancing aquatic habitats; or (iv) protecting the natural values associated with the esplanade reserve or an esplanade strip or (v) mitigating natural hazards; or (b) to enable public access to or along any sea, river, or lake; or (c) to enable public recreational use of the esplanade reserve or esplanade strip and adjacent sea, river, or lake, where the use is compatible with conservation values. s 230 An esplanade reserve 20 metres in width shall be set aside... along the mark of mean high water springs of the sea, and along the bank of any river or along the margin of any lake.	
2	Historic Reserve	Reserves Act 1977
	Purpose: s 18 (1) protecting and preserving in perpetuity such places, objects, and natural features, and such things there on or therein contained as are of historic, archaeological, cultural, educational, and other special interest; (2) (c) where scenic, archaeological, geological, biological, or other scientific features, or indigenous flora or fauna, or wildlife are present on the reserve, those features or that flora or fauna or wildlife shall be managed and protected to the extent compatible with the principal or primary purpose; (d) to the extent compatible with the principal or primary purpose of the reserve, its value as a soil, water, and forest conservation area shall be maintained; (e) except where otherwise determined, the indigenous flora and fauna and natural environment shall as far as possible be preserved	
Rank	Designation	Legal Mechanism
2	Local Purpose Reserve (Other – various)	Reserves Act 1977

Rank	Designation	Legal Mechanism
	Purpose: s 23 (1) for the purpose of providing and retaining areas for such local purpose or purposes as are specified in any classification of the reserve. (2) Every local purpose reserve shall be so administered and maintained under the appropriate provisions of this Act that – (a) where scenic, historic, archaeological, biological, or natural features are present on the reserve, those features shall be managed and protected to the extent compatible with the principal or primary purpose of the reserve.	
2	Māori Reservation (Various purposes related to Recreation, Camping, Water Supply, Meeting Places, Historic Significance, etc.)	Tu Ture Whenua Māori Act 1993
	The chief executive may, by notice in the Gazette issued on the recommendation of the court, set apart as Māori reservation any Māori freehold land or any General land—(a) for the purposes of a village site, marae, meeting place, recreation ground, sports ground, bathing place, church site, building site, burial ground, landing place, fishing ground, spring, well, timber reserve, catchment area or other source of water supply, or place of cultural, historical, or scenic interest, or for any other specified purpose; or (b) that is a wāhi tapu, being a place of special significance according to tikanga Māori.	
2	Marginal Strip	Conservation Act 1987
	Purpose: Part 4A s 24 (1) Any strip of land 20 metres wide extending along and abutting the landward margin of (a) any foreshore; or (b) the normal level of the bed of any lake not subject to control by artificial means; or (c) the bed of any river or any stream (not being a canal under the control of a State enterprise within the meaning of section 2 of the State-Owned Enterprises Act 1986 and used by the State enterprise for, or as part of any scheme for, the generation of electricity), being a bed that has an average width of 3 metres or more; (2) any land extending along and abutting the landward margin of any lake controlled by artificial means a strip of land that – (a) is 20 metres wide; or (b) has a width extending from the maximum operating water level to the maximum flood level of the lake – whichever is greater	
2	Consent Notice	Resource Management Act 1991
	Purpose: s 221 (1) Where a subdivision consent is granted subject to a condition to be complied with on a continuing basis by the subdividing owner and subsequent owners... the territorial authority shall... issue a consent notice specifying any such condition. (4) Every consent notice shall be deemed – (b) to be a covenant running with the land when registered under the Land Transfer Act 1952, and shall... bind all subsequent owners of the land	
2	Recreation Reserve	Reserves Act 1977
	Purpose: s 17 (1) providing areas for the recreation and sporting activities and the physical welfare and enjoyment of the public, and for the protection of the natural environment and beauty of the countryside, with emphasis on the retention of open spaces and on outdoor recreational activities, including recreational tracks in the countryside; (2) (b) where scenic, historic, archaeological, biological, geological, or other scientific features or indigenous flora or fauna or wildlife are present, those features or that flora or fauna or wildlife shall be managed and protected to the extent compatible with the principal or primary purpose of the reserve; (c) those qualities of the reserve which contribute to the pleasantness, harmony, and cohesion of the natural environment and to the better use and enjoyment of the reserve shall be conserved; (d) to the extent compatible with the principal or primary purpose, its value as a soil, water, and forest conservation area shall be maintained	
2	Regional Parks	Local Government Act 2002

Rank	Designation	Legal Mechanism
		<p>Purpose: s 139 (1) (a) means land – (i) owned by regional councils; and (ii) acquired or used principally for community, recreational, environmental, cultural, or spiritual purposes; and (b) includes land within the meaning of paragraph (a) that is – (i) reserve within meaning 2(1) of the Reserves Act 1977; or (ii) otherwise held or administered under the Reserves Act 1977 or any earlier corresponding enactment</p>
1	Māori Reservation (Various purposes related to Marae, Pā Sites, Papakāinga, Urupā, Wāhi Tapu, etc.)	Tu Ture Whenua Māori Act 1993
	<p>The chief executive may, by notice in the Gazette issued on the recommendation of the court, set apart as Māori reservation any Māori freehold land or any General land—(a) for the purposes of a village site, marae, meeting place, recreation ground, sports ground, bathing place, church site, building site, burial ground, landing place, fishing ground, spring, well, timber reserve, catchment area or other source of water supply, or place of cultural, historical, or scenic interest, or for any other specified purpose; or (b) that is a wāhi tapu, being a place of special significance according to tikanga Māori.</p>	
1	River Bed	River Boards Act 1908
	<p>Purpose: 73 (1) All rivers, streams, and watercourses within any river district constituted under this Act, whether or not the same are navigable or are altered by the ebb and flow of the tide, shall be to all intents and purposes within and subject to the jurisdiction of the Board, so far as may be requisite for the construction or maintenance of any works necessary to prevent or lessen any damage which may be occasioned by the overflow or the breaking of the banks of the same.</p>	
1	Road Reserve	Reserves Act 1977
	<p>Purpose: s 111 (1) Where any land is vested in the Crown or in any local authority for the purposes of a road reserve and the land is required for the purposes of a road, the land may be dedicated as a road by notice under the hand of the Minister or, as the case may be, by resolution of the local authority, and lodged with the District Land Registrar.</p> <p>(2) For the purposes of this section the term road includes any road, street, access way, or service lane; and the expression road reserve has a corresponding meaning.</p>	
0	No legal protection	

Appendix 7 – PAN-NZ Survey

This appendix presents the proposed PAN-NZ draft survey, aimed at engaging with PAN-NZ data holders.

PAN-NZ data sources

Introduction

You are asked to participate in this survey because you or your organisation have been identified as potentially having knowledge of key data sources that may feed into an update of a national protected area network dataset (PAN-NZ).

Manaaki Whenua - Landcare Research, has been contracted by the Ministry for the Environment (MFE) to assess whether, and how, PAN-NZ could be updated. Key to this is an assessment of the available data.

PAN-NZ can inform decision makers, researchers, environmental organisations, and other parties interested in protected areas in their work by providing the ability to understand the status of protected areas on a national scale. PAN-NZ can, for example, provide context for local authorities, inform prioritisation of conservation efforts, and assist with State of the Environment (SOE) reporting. By participating in this survey, you provide key information for the development of PAN-NZ.

This survey takes approximately [XX] minutes. The contact information you provide will not be shared to third parties. By continuing this survey, you agree that the data you provide [INSERT ETHICS PROCESSES].

If you have any further questions, please contact [INSERT CONTACT DETAILS LEAD RESEARCHER].

PAN-NZ data sources

Your details

1. Your name

2. Organisation

3. Role

4. Your email address

Please complete if you are happy to be contacted after the survey

5. Your phone number

PAN-NZ data sources

Availability of protected areas data and meta data

6. Have you (your organisation) contributed data to PAN-NZ in the past?

- Yes
- No
- I don't know

7. Do you know of spatial or other digital data related to protected areas (click all applicable options)?

- Within your agency
- From other organisations
- Neither

8. Do you coordinate with other organisations or individuals to collect and manage PA data?

- Yes
- No

If yes, who?

9. Do you provide this protected area data to other agencies?

- Yes
- No

PAN-NZ data sources

Technical features

10. What is the name of this data set

11. Is metadata available for the data set?

Yes

No

12. Why not? Will it be in the future?

13. Is metadata available for exploration?

Yes

No

14. What data standards is the metadata compliant with?

ISO 19115

ISO 19139

Other

15. If metadata is available please upload here

Choose File

Choose File

No file chosen

The following questions apply only if not covered in metadata

16. When was the data last updated?

17. How often does the data get updated

- Weekly
- Monthly
- Other (please specify)

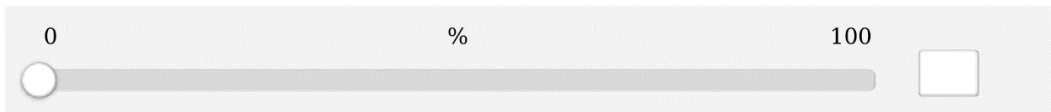
18. How often do changes occur in the circumstances that data in this data set represents?
(e.g. how often are there changes in protection status or mechanisms for protection)

19. What is the resolution of this data?

20. What area does this dataset cover (spatial extent, e.g. Waikato Region)?

21. How complete is this data set?

0 % 100



22. What typology or classification is used to distinguish protected areas?

23. How are types defined?

- Legal protection status
- Other (please specify)

24. What is the legal protection status of Protected Areas included?

- Reserve
- Non-reserve
- Tenants
- Covenants
- Other (please specify)

25. What format is the current data you hold in?

- Shapefile
- MapInfo TAB
- MapInfo MIF
- CSV
- GeoPackage/SQLite
- Geodatabase
- KML
- DWG
- PDF
- Excel
- Other (please specify)

26. Does the data set include time stamped versions (to see change over time), or only the latest data?

- Time stamped versions
- Latest versions only

PAN-NZ data sources

Details about accessibility of data

27. What type of licencing is the data under?

- Creative commons
- Open
- Requires licence

If it requires a licence: what?

28. Are there any further privacy requirements?

- Yes
- No

If yes, please specify

29. Are webservices (e.g WFS, ArcGIS REST API) available for this data set?

- Yes
- No

30. If yes, please provide the link

31. If no, how is your data currently provided to external agencies?

- On request
- We don't share it
- Other (please specify)

32. Is any further data related to protected areas likely to become available in the next year?

Yes

No

If yes, please provide the nature of the data and projected timeframes

33. With an increased focus on the sharing of spatial and environmental data, is your organisation working independently or with others to improve data sharing capabilities?

Yes

No

If yes, who is this work with? What are the goals?

PAN-NZ data sources

Details about accessibility of data

34. Would you use a national PAN-NZ data set?

Yes

No

If yes, how?

35. Would you be interested in giving your input into the development of PAN-NZ from your needs as an end-user, and can we contact you for that?

Yes

No

36. Any other comments?

PAN-NZ data sources

Thank you

Many thanks for taking the time to complete this survey.

Appendix 8 – Protected area data discovery and data gap identification

The process of identifying possible data sources to represent New Zealand's protected areas started with listing those protected areas identified by Bellingham et al. (2016) (see Appendices 1 & 2). This gives some insight into the nature of the make-up of large data sets such as LINZ protected areas and DOC conservation land, which represent different classes of protected areas. The second half of the table in this appendix identifies types of protected area and their data sources that are not identified by Bellingham et al. (2016) but are components of the full extent of New Zealand's Protected Area Network.

Category	Rank	Legislation	Legislation section	Data custodian	Data sources	Licence	Published date	Last updated	Accessibility	Comment on data
Terrestrial legally protected as identified by Bellingham et al. (2016)										
National parks	5	National Parks Act 1980	s.12 - Specially Protected Area s.14 Wilderness Area s.15 - Amenities Area s.4 - National Park	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	s.12 only Comes with the disclaimer 'Care should be taken in deriving conclusions from any data or information supplied.'
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	The Department cannot guarantee the accuracy of the information. Rather it represents best endeavours to maintain an accurate record of conservation land. This data set has had c. 5000 downloads.
Nature reserve	5	Reserves Act 1977	s.20 - Nature Reserve	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Sanctuary area	5	Conservation Act 1987	s.22 - Sanctuary Area	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Scientific reserve	5	Reserves Act 1977	s.21 - Scientific Reserve	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Water Conservation Order	5	Conservation Act 1987								DATA GAP 15 listed here: https://www.epa.govt.nz/assets/Uploads/Documents/RMA-Proposals/Guidance/8f2f439a69/MFE-Infosheet-Water-Conservation-Orders.pdf
Wilderness area	5	Conservation Act 1987	s.20 - Wilderness Area	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Wildlife management area	5	Conservation Act 1987	s.23B - Wildlife Management Area	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Wildlife sanctuary	5	Wildlife Act 1953	s.9 - Wildlife Sanctuary	LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Amenity areas	4	Conservation Act 1987	s.23A - Amenity Area	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Conservation	4	Reserves Act 1977	s.77 Conservation Covenants	DOC	Conservation Covenant Areas (4)	CC BY 4.0 licence	7 May 2021	3 May 2023	Download only	

Category	Rank	Legislation	Legislation section	Data custodian	Data sources	Licence	Published date	Last updated	Accessibility	Comment on data
covenant				Local government						DATA GAP Local government sources were sought for this data type. However, none were found that provided clarity. For example, Canterbury Maps listed reserves and sports fields but provided no legislative reference to identify those reserves vested under the Act
Conservation park	4	Conservation Act 1987	s.19 - Conservation Park	DOC LINZ	DOC Public Conservation Land (1) LINZ Protected Areas (2)	CC BY 4.0 licence CC BY 4.0 licence	8 March 2018 2 Feb 2017	Weekly 2 May 2022	Download only Download, OGC WFS	
Māori reservation (wetland or scenic reserve)	4			Māori Land Court DOC	Māori Land Court (3) Conservation Covenant Areas (4)	CC BY 4.0 licence CC BY 4.0 licence	31 May 2017 2 Feb 2017	31 May 2017 2 May 2022	Download only Download only	Includes a Māori reservation for natural, historic, or cultural conservation purposes under Sections 338 to 341 of the Te Ture Whenua Māori Act 1993 (Māori Land Act 1993).
QEII open space covenant	4	Queen Elizabeth II National Trust Act 1977	S2. Purpose	QEII	QEII Trust (5)	Not clear	Not clear	Not clear	No self-service download. Must contact QEII directly.	
Protected private land	4	Reserves Act 1977	s.76 Declaration of protected private land							DATA GAP
Scenic reserve	4	Reserves Act 1977	s.19(1)(a) - Scenic Reserve s.19(1)(b) - Scenic Reserve	DOC LINZ	DOC Public Conservation Land (1) LINZ Protected Areas (2)	CC BY 4.0 licence CC BY 4.0 licence	8 March 2018 2 Feb 2017	Weekly 2 May 2022	Download Only Download, OGC WFS	
Water course area	4	Conservation Act 1987	s.23 Water course areas							According to https://www.doc.govt.nz/globalassets/documents/getting-involved/nz-conservation-authority-and-boards/nz-conservation-authority/protecting-new-zealands-rivers.pdf 'There are no watercourse areas in New Zealand.'
Wildlife refuge	4	Wildlife Act 1953	s.14 - Wildlife Refuge	LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Ecological area	3	Conservation Act 1987	s.21 - Ecological Area	DOC LINZ	DOC Public Conservation Land (1) LINZ Protected Areas (2)	CC BY 4.0 licence CC BY 4.0 licence	8 March 2018 2 Feb 2017	Weekly 2 May 2022	Download only Download, OGC WFS	
Government purpose reserve (ecological or wildlife)	3	Reserves Act 1977	s.22 - Government Purpose Reserve	DOC LINZ	DOC Public Conservation Land (1) LINZ Protected Areas (2)	CC BY 4.0 licence CC BY 4.0 licence	8 March 2018 2 Feb 2017	Weekly 2 May 2022	Download only Download, OGC WFS	
Māori reservation (conservation or conservation of native bush)	3	Tu Ture Whenua Māori Act 1993		Māori Land Court DOC	Māori Land Court (3) Conservation Covenant Areas (4)	CC BY 4.0 licence CC BY 4.0 licence	31 May 2017 2 Feb 2017	31 May 2017 2 May 2022	Download only Download only	Includes a Māori reservation for natural, historic, or cultural conservation purposes under Sections 338 to 341 of the Te Ture Whenua Māori Act 1993 (Māori Land Act 1993).

Category	Rank	Legislation	Legislation section	Data custodian	Data sources	Licence	Published date	Last updated	Accessibility	Comment on data
Ngā Whenua Rāhui Kawenata	3	Reserves Act 1977	s.77A - Ngā Whenua Rāhui Kawenata	Ngā Whenua Rāhui	Ngā Whenua Rāhui Open Data (6)	Not included	29 Jun 2022	27 Mar 2023	Download only	
Local purpose reserve (ecological)	3	Reserves Act 1977	s.23 - Local Purpose Reserve	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Stewardship area	3	Conservation Act 1987	s.25 - Stewardship Area	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Wildlife management reserve	3	Wildlife Act 1953	s.14A - Wildlife Management Reserve	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Esplanade reserve or strip	2	Resource Management Act 1991	S.229 -Purposes of esplanade reserves and esplanade strips	LINZ	LINZ Primary Parcels (7)	CC BY 4.0 licence	22 May 2011	weekly	Download, OGC WFS	LINZ primary parcels include entries in the statutory_actions field such as '[Create] Subject to the provision of Esplanade Strips Sec 232 Resource Management Act 1991.' This can be parsed and extracted.
Historic reserve	2	Reserves Act 1977	s.18 - Historic Reserve	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Local purpose reserve (other – various)	2	Reserves Act 1977	s.23 - Local purpose reserves	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Māori reservation (various purposes related to recreation, camping, water supply, meeting places, historic significance, etc.	2	Tu Ture Whenua Māori Act 1993		Māori Land Court	Māori Land Court (3)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	This appears to be land relating to Te Ture Whenua Māori Act 1993
				DOC	Conservation Covenant Areas (4)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download only	Includes a Māori reservation for natural, historic, or cultural conservation purposes under Sections 338 to 341 of the Te Ture Whenua Māori Act 1993 (Māori Land Act 1993).
Marginal strip	2	Conservation Act 1987	s.24(2) - Fixed Marginal Strip S.24_1_2	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Consent notice		Resource Management Act	s.221 Territorial authority to issue a consent notice							DATA GAP
Recreation reserve	2	Reserves Act 1977	s.17 - Recreation Reserve	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Regional parks	2			Auckland region						DATA GAP
				Bay of Plenty Region	BOPRC GIS Data Regional parks (8)	No licence provided	2 Nov 2016	8 Sep 2020	Download only	
				Canterbury Region	ECAN GIS Data Parks (9)	CC BY 3.0 licence	16 Aug 2016	27 Mar 2017	Download only	As well as regional parks, includes others (such as reserves) – filtering required

Category	Rank	Legislation	Legislation section	Data custodian	Data sources	Licence	Published date	Last updated	Accessibility	Comment on data
Regional parks (continued)	2			Gisborne Region	N/A					No regional parks identified
				Hawke's Bay Region	N/A					No regional parks identified
				Manawatū-Whanganui Region	N/A					No regional parks identified
				Marlborough Region	N/A					No regional parks identified
				Nelson Region	N/A					No regional parks identified
				Northland Region	N/A					No regional parks identified
				Otago Region	N/A					No regional parks identified
				Southland Region	N/A					No regional parks identified
				Taranaki Region	N/A					No regional parks identified
				Tasman Region	N/A					No regional parks identified
				Waikato Region	N/A					No regional parks identified
				Wellington City Council	GWRC GIS Data Regional Parks (9)	No licence Provided	11 Oct 2021	11 Oct 2021		The 10 parks are stored across 10 individual layers
				West Coast Region	N/A					No regional parks identified
Areas not identified by Bellingham et al. (2016) but identified as relevant to New Zealand's Protected Areas Network										
Conservation purposes		Conservation Act 1987	s.7 - Conservation Purposes	DOC	DOC Marine Reserves (10)	CC BY 4.0 licence	20 March 2018	3 May 2023	Download only	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Marine area (other)		Includes: Kaikōura (Te Tai o Marokura) Marine Management Act 2014 Marine and Coastal Area (Takutai Moana) Act 2011	Includes: s.11 – Te Rohe o Te Whānau Puha Whale Sanctuary s.12 – Ōhau New Zealand Fur Seal Sanctuary Schedule 1 – Te Whata Kai o Rākihōuia i Te Tai o Marokura – Kaikōura Marine Area Schedule 4 - Mātaitai reserves and taiāpure-local fisheries s.11 - Common Marine and Coastal Area	LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Marine reserves	N/A	Marine Reserves Act 1971	s.3 - Marine Reserve	DOC	DOC Marine Reserves (1)	CC BY 4.0 licence	20 March 2018	3 May 2023	Download only. (includes .shp, file geodatabase, GeoJson and more)	
				LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	
Marine mammal sanctuaries		Marine Mammals Protection Act 1978	s.22 - Marine Mammal Sanctuaries	LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	

Category	Rank	Legislation	Legislation section	Data custodian	Data sources	Licence	Published date	Last updated	Accessibility	Comment on data
Te Urewera Act 2014		Te Urewera Act 2014	Includes: s.126 - Ruakituri Wilderness Area s.127(2) - Conservation Area protected as if it were a national park s.128(1)(b) - Conservation Area protected as if it were a national park	LINZ	LINZ Protected Areas (2)	CC BY 4.0 licence	2 Feb 2017	2 May 2022	Download, OGC WFS	This data set includes Ruakituri Wilderness Area but not Te Urewera itself.
Te Urewera		Te Urewera Act 2014		DOC	DOC Te Urewera (11)	CC BY 3.0 licence	7 May 7 2021	15 Nov 2021	Download only	
Te Awa Tupua (Whanganui River Claims Settlement) Act 2017										DATA GAP
Conservation area (Waitangi endowment area)		Waitangi Endowment Area	s.2 Waitangi Endowment Forest.	DOC	DOC Public Conservation Land (1)	CC BY 4.0 licence	8 March 2018	Weekly	Download only	
Internationally protected	N/A			DOC	DOC Internationally Recognised Areas (12)	CC BY 3.0 licence		As needed data updated: 15 Nov 2021		6 Ramsar wetlands (1 is thus missing as Ramsar recognise 7 in NZ); 3 World Heritage Sites
Kauri management areas		<i>Biosecurity (National PA Pest Management Plan) Order 2022</i>		Auckland City Council	Kauri Management Areas (13)	Unknown	Unknown	Unknown	No download provided	
Significant Natural Areas		RMA 1991	<i>s.54</i>	Ashburton District						DATA GAP
				Auckland						DATA GAP
				Buller District						DATA GAP
				Carterton District	CD SNAs (14)	Unknown	Unknown	Unknown	No download provided	
				Central Hawke's Bay District						DATA GAP
				Central Otago District						DATA GAP
				Chatham Islands Territory						DATA GAP
				Christchurch City						DATA GAP
				Clutha District						DATA GAP
				Dunedin City						DATA GAP
				Far North District						DATA GAP
				Gisborne District	GDC SNAs (15)	Unknown	Unknown	Unknown	No download provided	
				Gore District						DATA GAP
				Grey District						DATA GAP
				Hastings District						DATA GAP
Significant		RMA 1991	<i>s.54</i>	Hauraki District						DATA GAP

Category	Rank	Legislation	Legislation section	Data custodian	Data sources	Licence	Published date	Last updated	Accessibility	Comment on data				
Natural Areas (continued)	(continued)	(continued)		Horowhenua District						DATA GAP				
				Hurunui District							DATA GAP			
				Invercargill City								DATA GAP		
				Kaikōura District									DATA GAP	
				Kaipara District									DATA GAP	
				Kapiti Coast District									DATA GAP	
				Kawerau District									DATA GAP	
				Lower Hutt City									DATA GAP	
				Mackenzie District									DATA GAP	
				Manawatu District									DATA GAP	
				Marlborough District									DATA GAP	
				Masterton District									DATA GAP	
				Matamata–Piako District				MPDC Significant Natural Areas (16)	Unknown	Unknown	Unknown	Unknown	No download provided	
				Tararua District										DATA GAP
				Nelson City				NCC Significant Natural Areas (17)	Unknown	Unknown	Unknown	Unknown	No download provided	
				New Plymouth District				NPDC Significant Natural Areas (18)	Unknown	Unknown	Unknown	Unknown	No download provided	
				Ōpōtiki District										DATA GAP
				Ōtorohanga District										DATA GAP
				Palmerston North City										DATA GAP
				Porirua City				http://PCC Significant Natural Areas (19)	Unknown	9 Augt 2022	9 Sep 2022	Download		
				Queenstown–Lakes District										DATA GAP
				Rangitikei District										DATA GAP
				Rotorua District				RDC Significant Natural Areas (20)	CC BY 4.0 licence	26 Feb 2021	26 Feb 2021	Download		
				Ruapehu District										DATA GAP
				Selwyn District										DATA GAP
				South Taranaki District										DATA GAP
				South Waikato District				SWDC Significant Natural Areas (21)	CC BY 4.0 licence	22 July 2020	22 July 2020	Download		
				South Wairarapa District										DATA GAP
				Southland District										DATA GAP
				Stratford District										DATA GAP
				Tararua District										DATA GAP
				Tasman District										DATA GAP
				Taupo District				TDC Significant Natural Areas (22)	Unknown	Unknown	Unknown	Unknown	No download provided	
Tauranga City										DATA GAP				
Thames–Coromandel District										DATA GAP				
Timaru District				TDC Significant Natural Areas (23)	Unknown	Unknown	Unknown	Unknown	No download provided					

Significant RMA 1991

s.54

Category	Rank	Legislation	Legislation section	Data custodian	Data sources	Licence	Published date	Last updated	Accessibility	Comment on data	
Natural Areas (continued)	(continued)	(continued)	Upper Hutt City		UHCC Significant Natural Areas (24)	Unknown	Unknown	Unknown	No download provided		
			Waikato District		WDC Significant Natural Areas (25)	CC BY 4.0 licence	17 Feb 2022	21 Feb 2022	Download and web services (WFS)		
			Waimakariri District								DATA GAP
			Waimate District								DATA GAP
			Waipa District		WDC Significant Natural Areas (26)	CC BY 4.0 licence	30 Sep 2020	30 Sep 2020	Download, web services (WFS)		
			Wairoa District								DATA GAP
			Waitaki District								DATA GAP
			Wellington City		WCC Significant Natural Areas (27)	Unknown	30 Sep 2020	30 Sep 2020	Download, web services (WFS)		
			Western Bay of Plenty District								DATA GAP
			Westland District								DATA GAP
			Whakatane District		WDC Significant Natural Areas (28)	Unknown	Unknown	Unknown	No download provided		
			Whanganui District								
			Whangarei District		WDC Significant Natural Areas (29)	Unknown	Unknown	Unknown	No download provided		

- <https://doc-deptconservation.opendata.arcgis.com/datasets/72354ba9bf7a4706af3fdfe60f86eea1>
- <https://data.linz.govt.nz/layer/53564-protected-areas/>
- <https://www.Maorilandcourt.govt.nz/your-Maori-land/Maori-land-data-service/#spatial-data>
- https://doc-deptconservation.opendata.arcgis.com/datasets/e35ba07f91aa47df9651f423f4ff11d0_0
- <https://qeianationaltrust.org.nz/publications-and-resources/gis-data/>
- https://nwr-open-data-nwr.hub.arcgis.com/datasets/3e788355a98a4e949f7baf8027a183cf_0
- <https://data.linz.govt.nz/layer/50772-nz-primary-parcels/>
- <https://data-boprc.opendata.arcgis.com/datasets/BOPRC::boprc-regional-parks>
- <https://opendata.canterburymaps.govt.nz/datasets/ecan::parks>
- https://doc-deptconservation.opendata.arcgis.com/datasets/0e74f9682502447c9a14d51340512361_0
- https://doc-deptconservation.opendata.arcgis.com/datasets/de40c244856c4fd7936cb0b55ac5d67e_0
- https://doc-deptconservation.opendata.arcgis.com/datasets/f0cbb7544b1f4dae910fba8d8728d72a_0
- <https://aucklandcouncil.maps.arcgis.com/apps/webappviewer/index.html?id=01eb57408000447fa2d5dd2776ee472d>
- <https://gis.mstn.govt.nz/WairarapaViewer/?map=25092c1c467841908f7854a3ecc1fa41>
- https://maps.gdc.govt.nz/H5V2_12/
- <https://webmap.mpd.govt.nz/PublicPortalFull/>
- <https://hub.arcgis.com/datasets/NelsonCity::significant-natural-areas/explore>
- <https://geohub.npdc.govt.nz/datasets/834f1d444b1a4cdbc076a93b72aeca22/explore>
- <https://data-pcc.opendata.arcgis.com/datasets/significant-natural-areas-variation-1/explore>
- https://data-waikatolass.opendata.arcgis.com/datasets/f6d7eac945974ec18b42ad0e3c310726_0/explore
- <https://southwaikatodc-open-data-portal-southwaikatodc.opendata.arcgis.com/datasets/583f8bbf5d3147449d49e5c044c30c17/explore?layer=1>
- <https://taupo.isoplan.co.nz/eplan/property/16249/0/100>
- https://www.arcgis.com/home/webmap/viewer.html?url=https%3A%2F%2Fgis.timaru.govt.nz%2Farcgis%2Frest%2Fservice%2FPublic%2FDraft_District_Plan%2FMapServer&source=sd
- <https://uhcc.maps.arcgis.com/apps/webappviewer/index.html?id=f9c096b90a5a49e58f658ad460fa503d>

- <https://data.waikatodistrict.govt.nz/layer/107126-significant-natural-area-v10/>
- <https://data.waikatodistrict.govt.nz/layer/107126-significant-natural-area-v10/>
- <https://data-wcc.opendata.arcgis.com/datasets/420153583b1d4889b4be4dc76b7fe6ac>
- <https://gis.whakatane.govt.nz/HTML5Viewer/?viewer=OnlineMaps>
- <https://wdc.maps.arcgis.com/apps/View/index.html?appid=b3d7300c56ea4d0e8276fa40f7c6b0ae>