Addendum to Protected Areas Network of New Zealand (PAN-NZ)

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1 Introduction

This is an addendum to the Manaaki Whenua – Landcare Research contract report LC4620, (Towards consistent land-use and management mapping: methodology and gap analysis for a pilot land-use map) of Law et al. (2025). In particular, it pertains to the parts of that report that address the Protected Areas Network of New Zealand (PAN-NZ). PAN-NZ is a national spatial data set that provides a comprehensive and up-to-date overview of protected areas across New Zealand.

The 2025 draft PAN-NZ layer can be obtained from: https://lris.scinfo.org.nz/layer/122065 and the 2026 layer at: https://lris.scinfo.org.nz/layer/124343.

Earlier versions of PAN-NZ, which differ substantially from these more recent layers in methodology, scope, completeness, data type and data schema, are available on a case-by-case basis via request to: pannz@landcareresearch.co.nz. Together, these earlier versions nominally represent protected areas in the period 2003–2014. However, because of absent or unclear metadata, we do not consider these suitable for re-use.

The 2026 PAN-NZ does not substantially differ from the 2025 PAN-NZ draft layer in terms of its production methodology. To avoid unnecessary duplication of text, this addendum must therefore be read in association with Law et al. (2025).

2 Recommendations for maintaining PAN-NZ

The following three recommendations for maintaining PAN-NZ, from report LC4620, were targeted for the 2026 revision.

1 Adding new data sources as they are made available, or change, particularly as the result of requests made to territorial local authorities (many of which are currently under way).

2 Removing data from the catalogue, as necessary.

3 Continuing to update PAN-NZ with revisions to the mappings between legal protections and International Union for the Conservation of Natural (IUCN) categories, which can then be used as input by the wider land-use map and any other third-party derivative data sets and applications.

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3 New input data for 2026 update

Appendix D of Law et al. (2025) listed the 18 data sources used for the 2025 draft PAN-NZ data set.

- Through a process of attempting to contact all outstanding local authorities, and a revision of available national data, we have doubled this collection to 36 sources (13 national, and 23 regional).
- In addition to these 36 sources, there are a further 6 data sets that it would have been possible for us to include but which we ignored for varying reasons, (e.g. the data already being adequately covered in an existing data set, insufficient legislative detail, or poor alignment with parcel boundaries).
- A further 18 potential data sets (consisting of data that councils typically maintain) have now been positively identified as absent.
- Finally, there are a total of 108 potential regional data sets which we have marked as 'pending'. The pending category covers organisations with which we could not establish contact, have not changed data licence terms, or there is insufficient information about the type of legal protection applied to land in the data.

3.1 New regional data

Regional data sets, including their licence terms and links to download, are listed on the PAN-NZ data catalogue (at https://manaakiwhenua.github.io/PAN-NZ-data-catalogue-and-guidelines/regional_datasets_catalogue/index.html). The new regional data sets for the 2026 revision are shown in Table 1.

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Table 1. New 2026 regional data sets (DC – district council, CC – city council, SNA – significant natural area)

Organisation	Data set	Licence type[a]	URL
Waikato DC	Parks and reserves	CC BY 4.0	https://data.waikatodistrict.govt.nz/layer/115910-reserve-operative-april-2013/
Waikato DC	SNAs	CC BY 4.0	https://data.waikatodistrict.govt.nz/layer/107133-significant-natural-area-legal-effect-notified/
South Waikato DC	SNAs	CC BY 4.0	https://southwaikatodc-open-data-portal-southwaikatodc.opendata.arcgis.com/datasets/583f8bbf5d3147449d49e5c044c30c17/explore?layer=1
Taupō DC	SNAs	CC BY 4.0	https://www.arcgis.com/home/item.html?id=3f727fabd18b4185a3fcd2f927144b0d
Bay of Plenty RC	Parks and reserves	CC BY 4.0	https://maps.boprc.govt.nz/datasets/BOPRC::boprc-regional-parks/explore
Hastings DC	Parks and reserves	CC BY 4.0	https://hastings-dc-open-data-hdcgis.hub.arcgis.com/datasets/22de4770a29043d1873b91fa9ae60d86_0/explore
Napier CC	Parks and reserves	Granted permission to use	https://spatial.napier.govt.nz/server/rest/services/NapierMaps/Assets/MapServer/26
Greater Wellington RC	Parks and reserves	CC BY 4.0	https://gwrc-open-data-11-1-gwrc.hub.arcgis.com/datasets/GWRC::greater-wellington-regional-parks-and-forests-boundaries/explore
Porirua CC	Parks and reserves	CC BY 4.0	https://data-pcc.opendata.arcgis.com/maps/dfdf2ccd9a4a415c815d8cda85006bb6/about
Porirua CC	SNAs	CC BY 4.0	https://data-pcc.opendata.arcgis.com/datasets/significant-natural-areas-variation-1/explore
Christchurch CC	Parks and reserves	CC BY 4.0	https://opendata-christchurchcity.hub.arcgis.com/datasets/8c5082665bbc4b1c84e5cb51efbe1d05_12

[a] For terms of the CC BY 4.0 licence see: https://creativecommons.org/licenses/by/4.0/deed.en

In addition, even more regional data sets are noted in the data catalogue, even if the licence terms are absent or insufficiently permissive for the data to be added to PAN-NZ in this 2026 revision. These may still be useful for users.

Waikato Regional Council, and the Waipa, Taupō, Kaikōura, Hurunui and Marlborough district councils, produced the six data sets that we deliberately ignored (see earlier in Section 3).

The following nine district, regional, or unitary councils confirmed their parks, reserves, and Significant Natural Areas (SNAs) data as absent: Far North, Ōtorohanga, Waitomo, Ōpōtiki, Taranaki, South Taranaki, Gore, Invercargill, and Chatham Islands.

One improvement in the 2026 revision was a wide expansion of the various forms of local purpose reserves identifiable from statutory actions. Many of these would have previously been captured as local purpose reserves, but with their purpose unspecified. Local purpose reserves are a type of protected area under the Reserves Act 1977. Peculiarly for reserve types defined under the act, they are not required to have a specific conservation purpose. Councils own many of them. The expanded typology of local purpose reserves includes local purpose reserves for the purposes of: parking, sewerage, sewage, access, amenity, protection of indigenous flora and fauna, aerodromes, community buildings, community centres, boating clubs, golf courses, heritage protection, maritime, drainage, esplanades, esplanade buffers, plant protection, war memorials, passive recreation, river protection, water conservation, wetland, utility, water supply, and others.

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We also identified various existing typographic errors in similar text search patterns by using Claude Code (Opus 4.8) with manual oversight (See Section 8 for more information) – and then corrected them.

We also made forms of text search more abstract so they could be more expansive while remaining within sensible constraints. Example: the former strict regular expression (or 'regex') for `'rec reserve'` became `'rec(?:reation)? res(?:erve)?'`. The latter can match both the text "rec reserve" and "recreation reserve". The former regex could only match the string "rec reserve". Reliance on matching text from statutory actions with regular expressions is not ideal but is nevertheless critical in the absence of local reserve data sets in various places.

3.2 New national data

National data sets, including their license terms and links to download, are listed on the PAN-NZ data catalogue (at: https://manaakiwhenua.github.io/PAN-NZ-data-catalogue-and-guidelines/national_datasets_catalogue/index.html). The new national data sets for the 2026 revision are:

- Te Urewera Establishment Land (Department of Conservation [DOC])
- South Island Pastoral Leases (Land Information New Zealand [LINZ])
- Hauraki Gulf / Tīkapa Moana Marine Protection Act 2025 (DOC)
- Sanctuaries to Protect Marine Mammals (DOC)
- Unformed Legal Road parcels (Outdoor Access Commission, Herenga ā Nuku Aotearoa).

Also of note is that the 2026 revision includes specific selections of the LINZ NZ Parcels layer to define the boundaries of Lakes Wānaka, Manapouri, and Te Anau, which are all protected under specific legislation, but the boundaries lack digital representation in any other existing data set.

Changes to the selection process for specific layers means that some existing data sets may contribute more or fewer protected areas than before, as a product of revision to the configuration, overlap with new or existing data, and the prioritisation process for handling de-duplication of overlapping protected areas.

3.3 Geographical expansion

The final extent of the output has been expanded in this revision to include New Zealand's outlying islands, including Campbell Island/Motu Ihupuku, Snares Island/Tini Heke, Solander Island/Hautere, plus the Antipodes, Auckland, Bounty, and Kermadec, Islands, all of which have legal reserves either on or around them. These were not included in the 2025 data set, which was previously limited to mainland New Zealand and the Chatham Islands.

3.4 Removed data

One major correction undertaken was a removal relative to the 2025 data set. This entailed the exclusion of parcels that are merely 'subject to the provision' of marginal strips. The 2025 draft map seemed to declare that any such parcels were legally marginal strips in their entirety, but this is not so.

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The removal of these parcels is a considerable improvement in terms of the overall areal extent of this type of reserve, as many affected parcels are quite large. However, it should be noted that affected parcels do still have marginal strips (e.g. along waterways); but these are simply not present in the cadastral boundaries and cannot readily be delineated in the map. On balance, as the marginal strips are the minor part of such parcels, it was deemed sensible to exclude them.

We extended the PAN-NZ software to accept an exclusion criterion which is applied when a text search on statutory actions would otherwise return a positive match. This is used to exclude specific types of reserves with specific text actions. For example, the 2025 version was often matching the form “Recreation Reserve”, even if the fuller form of the text string was “[Revoked] Recreation Reserve” to denote a parcel where a local purpose (recreation) reserve had been revoked.

4 Revised IUCN categorisation

Following Hughes’ (2025) recommendations for cross-referencing legal protections on land in New Zealand with the IUCN Protected Areas Framework, we significantly revised the mapping of legal protections to IUCN categories.

Where there is only one uncomplicated recommendation of IUCN category corresponding to a type of legal protection, we have adopted the recommended IUCN category. In practice this means that many reserves have changed IUCN categories between the 2025 and 2026 layers (Figures 1 & 2), even if nothing about them has actually changed.

However, in many cases there is a complicated recommendation. For example, areas protected under the National Parks Act 1980, S.4 (i.e. National Parks such as Fiordland National Park) are recommended to be categorised as either IUCN II, III or IV protected areas.[1] Although the primary recommendation is for IUCN II – and this is what we have adopted in all of these cases – we note that the IUCN III category may apply when a smaller geo-preservation site is a portion of the site; and the IUCN IV category may apply if a particular species of habitat is the emphasis of the protection.

In such cases, we have adopted the primary recommended IUCN category, and have left further exploration of this complexity as a recommendation for future work. The complexities often require consideration of the size of an area, its ecological integrity, the intended focus of the protection, and other considerations.

There is one exception to the rule to adopt the primary recommended IUCN category. Hughes (2025) noted that local purpose reserves are primarily categorised as IUCN II but may also be III or IV. However, this decision depends on information regarding the purpose of such reserves, many of which have an unstated purpose. For the 2026 data set, these have been assigned an IUCN null category of “Not Mapped”, indicating an unknown IUCN category, pending further work on systematically recording local purpose reserves’ purposes, where possible.

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[1]: A full set of best practice guidelines for IUCN categories, describing them and their protection is available from the IUCN. See Dudley, N. (Editor) (2008). Guidelines for Applying Protected Area Management Categories. Gland, Switzerland: IUCN. WITH Stolton, S., P. Shadie and N. Dudley (2013). IUCN WCPA Best Practice Guidance on Recognising Protected Areas and Assigning Management Categories and Governance Types, Best Practice Protected Area Guidelines Series No. 21, Gland, IUCN. https://portals.iucn.org/library/node/30018

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The other special category, “Not IUCN”, is retained. This means that the reserve is positively identified as not belonging to any IUCN Protected Areas Framework category.

In cases of marine reserves, Hughes (2025) notes that IUCN categories properly only apply to terrestrial portions. However, this has been ignored to avoid choosing one particular digital representation of land vs. marine space, and the entire reserve has been assigned the recommended IUCN category. This distinction may be left to end users to apply.

5 Improvements to PAN-NZ software

Although most changes related to new data sets and configuration changes, the in-house software used for producing the PAN-NZ output had minor revision.

The text search we applied to gazetted statutory actions previously only applied to the last line of statutory actions that were in fact composed of multiple lines of text. Now all lines are considered, leading to the expansion of various forms of reserve, particularly the Reserves Act 1977 (under which local purpose reserves are legislated). See Figure 3.

Some of the code for matching overlapping protected areas was indeterminate: capable of producing different results in different runs of the same software with the same configuration. The effect was typically a few minor differences, but we have corrected for it, such that the result is now stable.

We also implemented schema validation and applied it over the software’s configuration files. Schema validation checks that configuration files correctly match a specification and ensures their semantic correctness. The validation captured some pre-existing, subtle errors in the configuration that was used to produce the 2025 PAN-NZ map; in the worst case it discovered that one data set was not actually being used at all.

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6 Visual summary of change

Figures 1–3 provide visual summaries of the changes we made to PAN-NZ between the 2025 and 2026 versions.

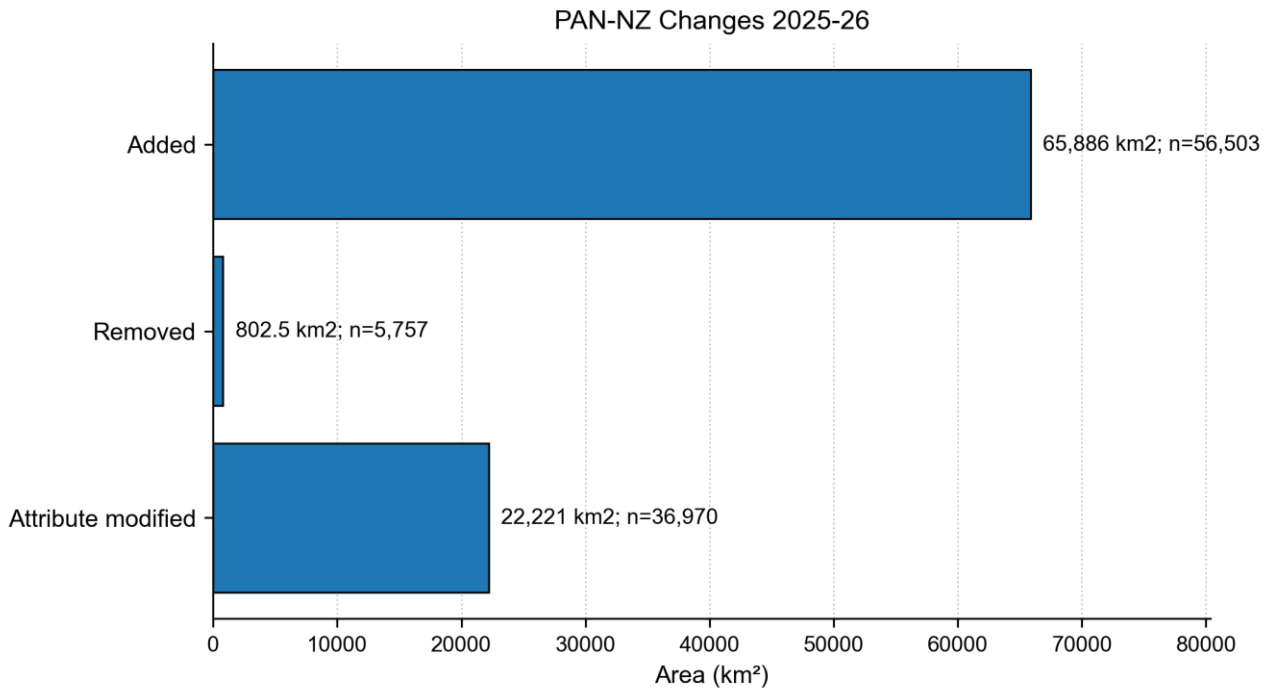

Figure 1. Summary of newly added, removed, and modified protected areas between the 2025 and 2026 versions of PAN-NZ. The x-axis shows the change in terms of area; bars are also labelled with a count. Most area change is due to the inclusion of marine protected areas, and Crown pastoral leases. Most attribute modifications are due to the adoption of the recommended IUCN categories in Hughes (2025).

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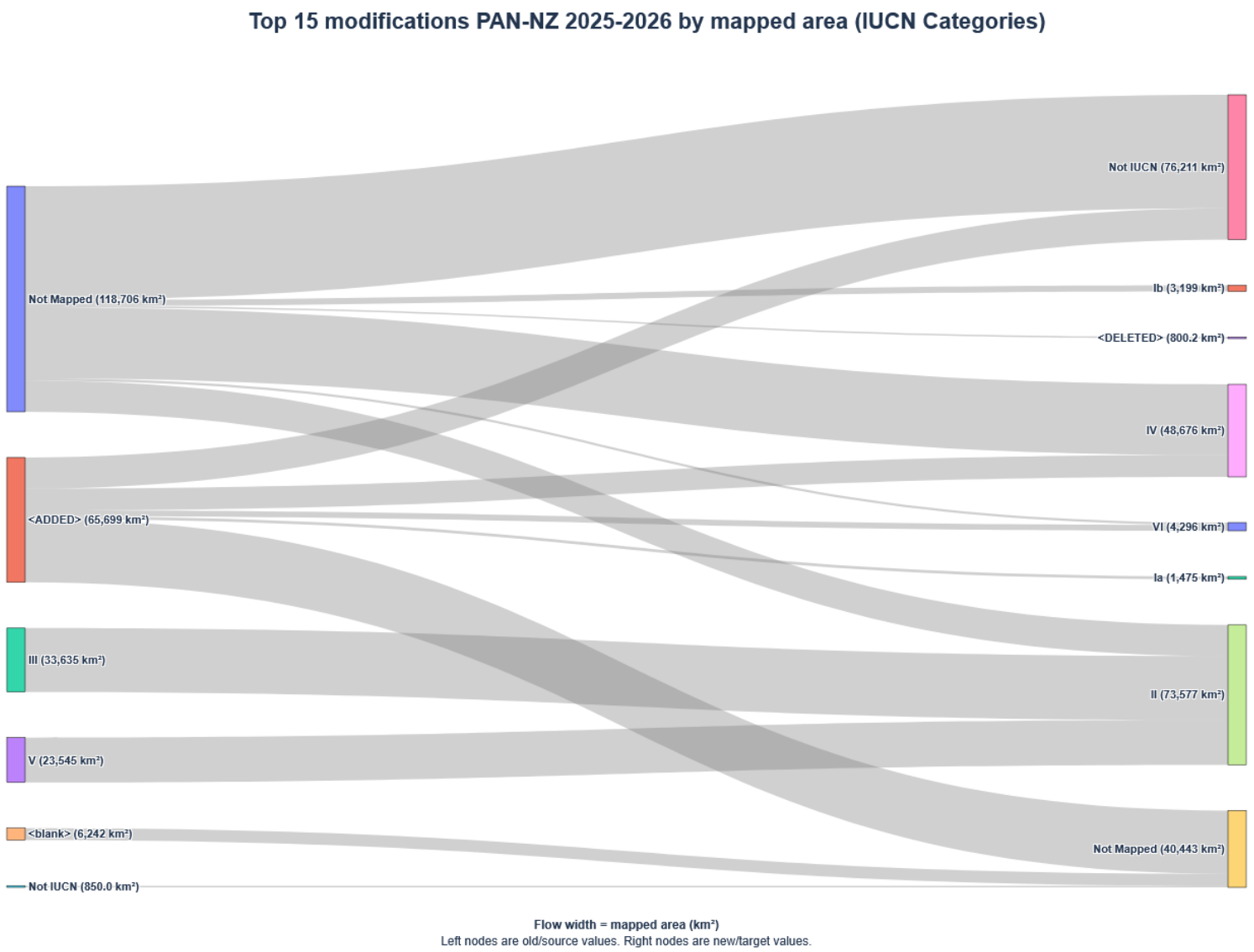

Figure 2. Summary of the major changes to the IUCN categorisation in PAN-NZ between the 2025 and 2026 versions. A major goal was to reduce the total area of Not Mapped protected areas (i.e. those without an identified IUCN category). Further note the considerable expansion of IUCN Category II, at the expense of Categories III and V, following Hughes (2025).

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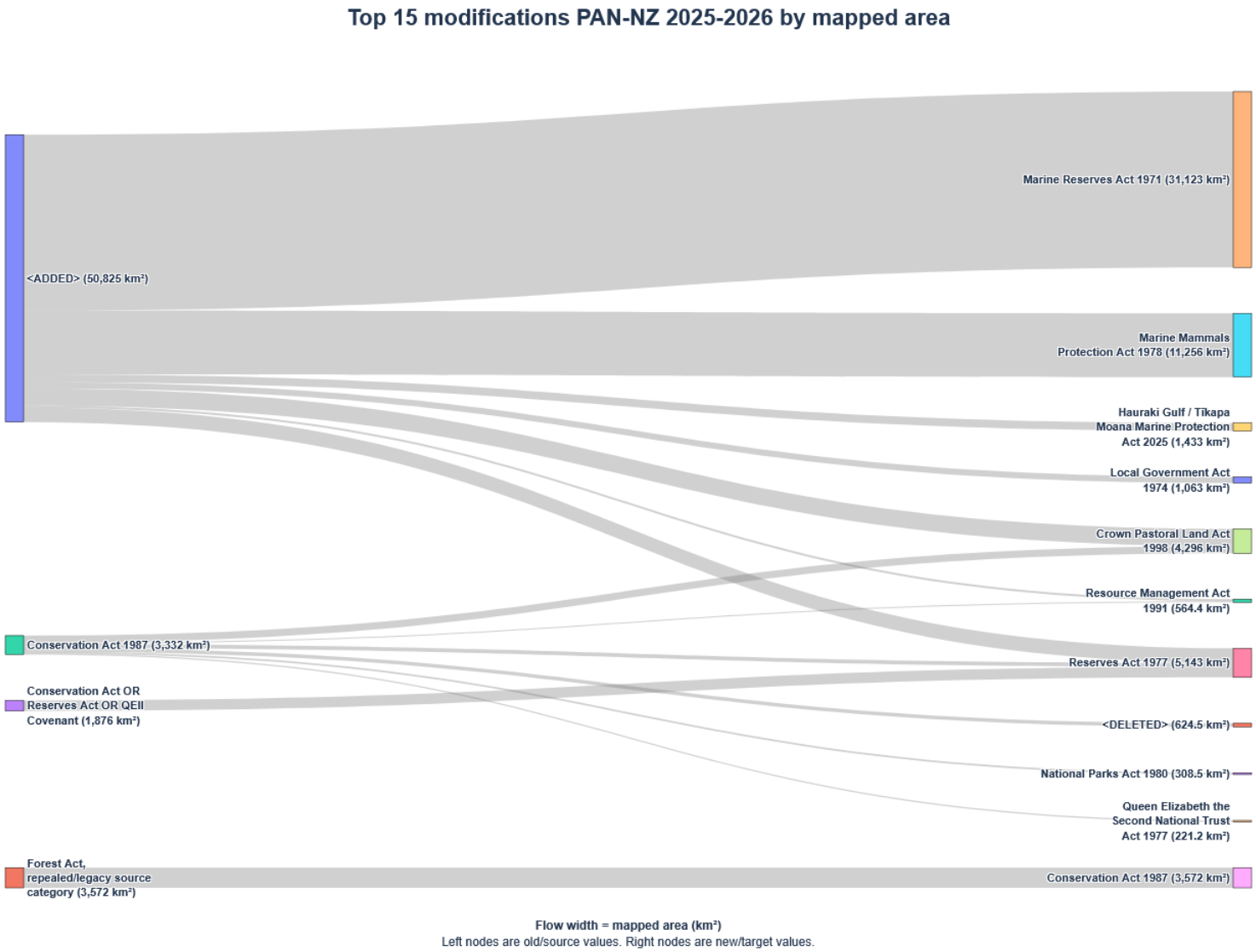

Figure 3. Summary of the major changes to the recorded protection legislation (not applying a further breakdown by section) between the 2025 and 2026 versions of PAN-NZ.

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7 Recommendations

1 Councils are still encouraged to submit new or relicensed data, suitable for inclusion. Current recommendations for data schema, content, and contact details can be found at the website: https://manaakiwhenua.github.io/PAN-NZ-data-catalogue-and-guidelines/

2 Council staff who have submitted static data sets (which have not been included in the 2025 or 2026 data set) should be encouraged to provide API access to their data. This is important from a technical perspective as it allows the data to be generated from code and configuration alone. This avoids the need for data to be bundled with code. Such data will also grow stale with time and require significant work to update.

3 Councils are encouraged to provide more legislative information, and to include descriptions of the purposes of local reserves, using standardised notation.

4 The MfE should further revise the assignment of IUCN categories, following the detailed recommendations in Hughes (2025). Although some reserves have clear one-to-one mapping of legislative protection to IUCN categories, in many cases this will involve the consideration of size, intactness, and ecological value of particular reserves. At present all reserves of the same legislative protection are assigned to the same IUCN category, yet this is not what Hughes (2025) recommended. The full complexity of the possible classification considerations was too great to implement in the available time. Some of the recommendations themselves may still leave room for interpretation and may require that reserves are noted with more than one possible IUCN category.

5 The supplementary guidelines of the IUCN classification pertaining to marine protected areas (MPAs) should be applied to various types of marine reserves as appropriate (Day et al., 2019).

6 The MfE should commit to further work to reduce and eliminate the remaining “Not Mapped” IUCN categories, especially for local purpose reserves. Many of the outstanding reserves were addressed in the 2026 map, but still not all. Completing this will require more information about reserve purpose, which is frequently absent even for local purpose reserve datasets that are currently included in PAN-NZ.

7 The MfE should be aware that the appropriateness of IUCN mapping should be kept up to date whenever relevant changes arise if new legislation is passed or existing legislation is amended.

8 Acknowledgements

Declaration of the use of generative AI/AI-assisted technologies

This research work included the use of Claude Code (Opus 4.8) for assistance editing and maintaining the configuration files for the PAN-NZ software. This assisted primarily in finding and avoiding typographic errors in regular expression strings. Gemini (3.1 Pro) was used to write code to generate the change summary diagrams included in this addendum.

After using these tools, the content was reviewed and edited as needed by the authors.

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9 References

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