Species lists for regional and unitary councils to inform biodiversity management

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Species lists for regional and unitary councils to inform biodiversity management

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Disclaimers

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Contents

Summary

Project and client

- The Resource Management Act 1991 (RMA) requires councils to maintain indigenous biodiversity. It also requires indigenous biodiversity to be considered in a wide range of resource management decision-making contexts and through a range of functions.
- Knowledge of whether a native species is found in a region can be essential information for maintenance of indigenous biodiversity. However, many councils do not currently have the capacity, resources, or expert knowledge to compile species lists for various taxonomic (species) groups in their region.
- Otago Regional Council (ORC), together with other supporting councils, secured an Envirolink Advice Grant to compile species lists by region for select taxonomic groups.

Objectives

The objectives of this project were to:

- Work with taxonomic experts to compile species lists by region for four taxonomic groups: amphibians, bats, birds, and reptiles. In addition, taxonomic experts were able to compile species list for indigenous vascular plants in Nelson-Tasman region and Southland region. For every taxon listed, the taxonomic experts assigned the unique identifier from the New Zealand Threat Classification System to ensure backward and forwards compatibility with the national tool to assess threat status. The output of these species lists is an Excel spreadsheet for each taxonomic group.
- A summary report to be produced as a Word document for each taxonomic group outlining the outputs, the data sources used, and next steps where appropriate. Some of this information is also provided in the Excel spreadsheets as a ReadMe file, i.e., a worksheet outlining details of the lists.

Results and Discussion

- Species lists were compiled for the various groups between August and December 2024. The Excel spreadsheets are provided as separate documents while the summary reports are provided as Appendices in this document.
- For the first time, comprehensive species lists have been developed for regions across Aotearoa New Zealand in a format that is readily accessible for all regional councils and unitary authorities at the appropriate regional scale.

- The species lists provide foundational knowledge to regional councils and unitary authorities. Such lists should be maintained and updated moving forward.
- Additional species lists should be developed for various taxonomic groups, starting with other groups listed in the New Zealand Threat Classification System as national threat assessments have been undertaken for them.
- Species lists should be provided to iwi and hāpu, partners and stakeholders, including Te Papa Atawhai – Department of Conservation and relevant ecological societies.

Introduction

In Aotearoa New Zealand our biodiversity is essential to our culture, our identity and our well-being. Our native plants, animals, mircoorganisms, and the ecosystems they create is unique to Aotearoa and irreplaceble. Due largely to our long isolation from other land masses and diverse geography and climate, Aotearoa makes an important contribution to global biodiversity, with an estimated 80,000 species of native animal, plants, and fungi. A high proportion of these native species are found nowhere else in the world.

However, our native species in Aotearoa are under significant pressure from introduced species, pollution, physical changes to our landscapes and coast, harvesting of wild species, human-induced climate change, and other factors. Across the country, almost 4,500 of our native species that have been assessed are classified as 'threatened' with or 'at risk' of extinction (4,456 as of December 1, 2024). This includes 94% (116 of 124) of our reptiles and 82% (178 of 217) of our birds. Further, many of our native species are categorised as 'data deficient' (5,333 as of December 1, 2024), which is when information is so lacking that an assessment is not possible. A high proportion of these threatened, at risk or data deficient species are found nowhere else in the world. Given the wealth and uniqueness of Aotearoa's species, the country has been described in the international context as 'one of the richest and most threatened reservoirs of plant and animal life on earth'.

In Aotearoa the Resource Management Act (1991) (RMA) regulates the effects of human activities on indigenous biodiversity, including native species. However, implementation of the RMA is failing to halt the decline of native species and their habitats. The RMA devolves responsibility for maintaining biodiversity to regional councils or unitary authorities, and territorial authorities. The resulting planning instruments have so far provided limited protection, with weak implementation, fostering ongoing loss. A contributor to this is that many regional councils or unitary authorities do not have comprehensive lists of the native species they have in their region, even for relatively well-known groups, and it's incredibly hard to regulate the effects of human activity on a species and its habitats when you don't know it's there.

To remedy the lack of knowledge of what species are in each region for select taxonomic groups, an Envirolink Advice grant was initiated by Otago Regional Council, with the support of other councils, to compile species lists by region council and unitary authority boundaries. Four taxonomic groups were selected to have species lists compiled by each region across Aotearoa and for another group for a reduced number of regions (due to funding availability). These taxonomic groups were amphibians, bats, birds, and reptiles by region across Aotearoa, and indigenous vascular plants for Nelson-Tasman (combined) and Southland regions only.

Results and Discussion

The compiled species lists for the various taxonomic groups will be available as Excel spreadsheets from the Envirolink website, with their accompanying summary reports provided as Appendices at the end of this document. The taxonomic groups that have been completed for all regions in Aotearoa so far are:

- Amphibians of Aotearoa New Zealand by region (Appendix 1)
- Bats of Aotearoa New Zealand by region (Appendix 2)
- Birds of Aotearoa New Zealand by region (Appendix 3)
- Reptiles of Aotearoa New Zealand by region (Appendix 4).

For two areas, species lists for indigenous vascular plants were also compiled:

- Indigenous vascular plants of Nelson-Tasman (Appendix 5)
- Indigenous vascular plants of Southland (Appendix 6).

The number of extant native taxa identified for each of the completed taxonomic groups varies by region (Table 1). This ranges from no extant native taxa in some regions for certain taxonomic groups to hundreds for others. For some of these species lists of the completed taxonomic groups, other information is provided for certain taxa, e.g., extinct taxa for the amphibians, taxonomically indeterminate taxa for reptiles, native taxa that were introduced into the region for conservation purposes, introduced and naturalised taxa.

For the indigenous vascular plants, 1421 were identified in Nelson-Tasman (combined), including 68 that are regionally endemic when these two regions are considered together, and 1180 were listed in the Southland Region. Note that in the summary report (Appendix 6) for the Southland indigenous vascular plants the compilers suggest additional resources that should be consulted in order to complete a more comprehensive list of all indigenous vascular plants in this region. Like all species lists, it is noted that all of those undertaken in this project should be treated as working drafts with continued work needed to maintain and update them moving forward.

Table 1. The total number of extant native taxa in Aotearoa New Zealand identified in each of the 16 geopolitical regions for four taxonomic groups using the current taxonomy in the New Zealand Threat Classification System (Rolfe et al. 2022), as of December 1, 2024. The four taxonomic groups are: amphibians, bats, birds, and reptiles. Note that this does not include extinct- or regionally extinct-taxa, nor native Aotearoa New Zealand taxa introduced to other regions, but does include taxa that are Data Deficient, have been lost since 2000, or been inferred from neighbouring regions.

Regional council or unitary authority (north to south)	**Region**	**Amphibians**	**Bats**	**Birds**	**Reptiles**
Northland	Northland Regional Council	1	2	217	35
Auckland	Auckland Council	1	2	231	27
Waikato	Waikato Regional Council	2	3	216	28
Bay of Plenty	Bay of Plenty Regional Council	1	2	191	23
Gisborne	Gisborne District Council	1	2	153	18
Hawke's Bay	Hawke's Bay Regional Council		2	185	18
Taranaki	Taranaki Regional Council		2	163	17
Manawatū-Whanganui	Horizons Regional Council		2	180	23
Wellington	Greater Wellington Regional Council		2	212	21
Tasman	Tasman District Council		1	179	20
Nelson	Nelson City Council		1	115	14
Marlborough	Marlborough District Council	1	2	182	28
West Coast	West Coast Regional Council		1	165	25
Canterbury	Environment Canterbury		1	233	37
Otago	Otago Regional Council		1	215	35
Southland	Southland Regional Council		3	230	31

In the summary reports, the authors who compiled the species lists have outlined the outputs, the data sources used, and next steps to improve the lists where appropriate. The information is often also provided in each Excel spreadsheet in a ReadMe file, i.e., a worksheet outlining the details of the document by each worksheet, but usually in a different format.

For this project, the compiled species lists are based on the taxonomic nomenclature of the New Zealand Threat Classification System (NZTCS; Rolfe et al. 2022). This means each of the species lists has at least the scientific name, vernacular (common) name, te reo Māori name, and unique identifier (column titled Species ID). Importantly, by having the unique identifier in a column it allows for backwards and forwards compatibility with the NZTCS, thus facilitating future updates of the national threat status of these documents by having a common column to merge (join) on in a process called taxonomic harmonization. Where national threat categories and statuses are provided in the species list as assessed using the NZTCS, the relevant reports for each group are: amphibians by Burns et al. 2018, bats by O'Donnell et al. 2023, birds by Robertson et al. 2021, indigenous vascular plants by de Lange et al. 2024, and reptiles by Hitchmough et al. 2021.

The authors of the compiled species' lists for the taxonomic groups also often provided additional information. For example, in each of the below species lists the following information is provided:

- Amphibian list – information for where the taxonomically unresolved management or evolutionarily significant units of Hochstetter's frogs are found by region was included as documented by Newman et al. 2013.
- Bat list – information on where each taxon can be found in a region where appropriate.
- Bird list – information on the International Union for Conservation of Nature (IUCN) Red List status, and presence status in the region, e.g., breeding.
- Reptile list – information on the type of presence in a region, e.g., endemic, or why it might be assigned to a region, e.g., found in neighbouring regions for marine taxa.
- Indigenous vascular plant list for Nelson-Tasman – information on whether taxa are regional endemics.
- Indigenous vascular plant list for Southland – information on the data repositories initially assessed if a taxon was in the region is provided to ensure greater reproducibility. A list of additional resources is also suggested in the summary report that should be consulted in order to more comprehensively assess all indigenous vascular plants in this region.

Given the requirement for councils to maintain indigenous biodiversity under the RMA, the compilation of these species' lists should assist with this. The use of such species lists should help inform councils' objectives, policies, methods, or monitoring.

An example of how species lists can be used is as precursors to regional threat assessments as part of the Regional Threat Classification System (RTCS; Crisp et al. in press). The RTCS is a tool to assess the conservation status of candidate taxa in Aotearoa New Zealand's sixteen geopolitical regions (Crisp et al. in press). It is complementary to the NZTCS, using the same categories, status rankings and criteria, adjusted to account for smaller regional scales. Such threat assessments have already been completed by three regional councils as of December 2024: Otago Regional Council has assessed six taxonomic groups (bats, Jarvie et al. 2023; amphibians, Jarvie 2024; selected species of mushroom fungi – non-lichenised agarics, boletes, and russuloid fungi, Jarvie and Cooper, 2024; reptiles, Jarvie et al. 2024a; birds, Jarvie et al. 2024b; indigenous vascular plants, Jarvie et al. 2024c), Greater Wellington Regional Council has assessed five taxonomic groups (birds, Crisp et al. 2024; indigenous freshwater fish, Crisp et al. 2022; indigenous vascular plants, Crisp 2020a; reptiles, Crisp et al. 2023b; bats, Crisp et al. 2023b) and Auckland Council has assessed five taxonomic groups (amphibians, Melzer et al. 2022a; reptiles, Melzer et al. 2022b; indigenous vascular plants, Simpkins et al. 2023; bats, Woolly et al. 2023; freshwater fish, Bloxham et al. 2023).

Additional species lists by region should be developed for other taxonomic groups in future. Our suggestion would be to start with other groups listed in the NZTCS as national threat assessments have been undertaken for them. Moreover, species that have been assessed as 'threatened' or 'at risk' nationally in the NZTCS may have additional requirements under various national and regional policies, plans, and strategies.

For the first time, comprehensive species lists have been developed for multiple regions across Aotearoa New Zealand for various taxonomic groups in a format that is readily accessible. We recommend these lists should be maintained and updated moving forward by councils. Our belief is that there should be a place for researchers and ecological societies, in addition to council staff, to assist with such updates if appropriately resourced.

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Appendix 1 – Amphibians in Aotearoa New Zealand by region

Authors: Hadley Muller and Tobia Dale

Reviewer: Dr Rod Hitchmough

Background

A project to collate a list of all amphibians in Aotearoa New Zealand by region received funding through Envirolink – a regional council driven funding scheme, with funds administered by the Ministry of Business, Innovation & Employment - Science and Innovation. This is part of a larger project to collate species lists for four groups: amphibians, bats, birds, and reptiles, plus indigenous vascular plants in Southland and Nelson-Tasman. The Envirolink scheme funds research organisations (Crown Research Institutes, universities and some not-for-profit research associations) to provide regional councils with advice and support for research on identified environmental topics and projects.

This project involved a collaboration of Dr Scott Jarvie (Otago Regional Council) and Dr Jo Monks (University of Otago – Ōtākou Whakaihu Waka) on behalf of the Biodiversity Working Group, Te Uru Kahika (Regional and Unitary Councils Aotearoa). The University of Otago – Ōtākou Whakaihu Waka contracted herpetologists Hadley Muller, Tobia Dale and Dr Rod Hitchmough to undertake the project.

Summary

This report provides an up-to-date record of amphibian species present within the 16 regional council terrestrial boundaries of Aotearoa New Zealand. Taxonomic and conservation literature, as well as online databases, were used to compile regional species lists. Regional lists include data on living, and extinct species.

Introduction

In Aotearoa New Zealand species are assessed for extinction risk following the rules-based New Zealand Threat Classification System (NZTCS) (Michel, Rolfe & Hitchmough 2022). Understanding the extinction risk of native fauna facilitates conservation management to prioritise threatened taxa. Beyond the nationwide threat assessments regional councils may conduct independent regional threat classifications. Despite the clear benefits this information provides to regional conservation planning, few councils have the capacity and expertise to undertake regional assessments.

In an effort to assist regional planning, we provide an up-to-date list of amphibian species present within Aotearoa New Zealand's 16 regional council terrestrial boundaries. Where

relevant, we have provided brief notes on the distribution and status of each taxonomic group with the regional council terrestrial boundaries.

Methods

Two regional species list were compiled:

- 'Current Assessment' includes all 11 taxa included in the current assessment under NZTCS (Burns *et al*. 2018).
- 'Hochstetter's frog, 2013' is an additional regional species list for the taxonomically unresolved management or evolutionarily significant units of Hochstetter's frogs included in the 2013 NZTCS assessment (Newman *et al*. 2013).

Amphibian species presence/absence data was allocated to one of the following categories: Absent, Data Deficient, Present – Regionally Extirpated, Present – Conservation Reintroduction, Present- Suspected Breeding and, Present – Breeding. Unless specified, presence data for Canterbury and Southland excludes Rēkohu Chatham Island and Rakiura Stewart Island respectively.

Further details on taxa's known distribution with region council terrestrial boundaries were provided in the notes section. Species-specific references are provided where necessary, especially regarding the uncertain historical distribution of *Leiopelma* frogs within New Zealand (Easton 2018). In 'Hochstetter's frog, 2013' the notes section lists discrete populations known to pertain genetically to each taxon.

We utilised a variety of sources to compile regional species lists, primarily: iNaturalist, NZFrogs' observation database, Herpetological Society of New Zealand online maps and, museum databases including Museum of New Zealand Te Papa Tongarewa and the Waitomo Caves Museum. Further literature on *Leiopelma* conservation, taxonomy and phylogenies clarified species distributions (Worthy 1987a; Stewart 2007; Fouquet *et al*. 2010; Gleeson *et al*. 2010; Bishop *et al*. 2013; Newman *et al*. 2013; Easton 2018; Seersholm *et al*. 2018).

We include Te Reo Māori names for all amphibian taxa, except *Ichthyosaura alpestris apauna* (the introduced Italian alpine newt). Te reo Māori names are (primarily) derived from an extensive unpublished literature review of te reo Māori names for frogs in New Zealand (Cisternas Tirapegui 2019). In addition, authors drew on knowledge from previous iwi relationships to make informed decisions for Archey's and Hamilton's frog te reo Māori names.

Pepeketua is currently the most widely used te reo Māori word used in reference native to *Leiopelma* frogs generally. However, this varies by iwi. Engaging with local iwi on which name is most appropriate is best practice.

Finally, is it noted for the Excel document, like all such species lists, should be treated as a working draft as knowledge of distributions and taxonomy can change over time.

Discussion

New Zealand's only native amphibians are all within the frog genus *Leiopelma (Bishop et al. 2013)*. *Leiopelma*, along with their closest relatives *Ascaphus*, are the most ancient group of living frogs (Easton 2018). Upon human settlement, six species of *Leiopelma* frog were distributed in native forests across New Zealand, except for the drier regions of Canterbury, Otago, and Marlborough (Worthy 1987a; Easton 2018).

We list three extinct *Leiopelma* frogs, *Leiopelma auroraensis (*Aurora frog), *Leiopelma waitomoensis* (Waitomo frog) and, *Leiopelma markhami* (Markham's frog). Subfossil radiocarbon dates suggest the presence of all three species during the Holocene, including since human settlement (Worthy 1987b; Easton 2018). Kiore (*Rattus exulans*) are believed to have driven the decline and extinction of these species (Worthy 1987b).

The three living *Leiopelma* species, *Leiopelma archeyi* (Archey's frog), *Leiopelma hamiltoni* (Hamilton's frog), and *Leiopelma hochstetteri* (Hochstetter's frog) are threatened by extinction, and require continued conservation management (Bishop *et al.* 2013). They are restricted to forested areas in the northern North Island, and on offshore islands in the Marlborough Sounds (Bishop *et al.* 2013). *Leiopelma* are extraordinarily cryptic, so it is still possible to discover previously unknown populations (Baber *et al.* 2006).

Four introduced amphibian species are listed under the NZTCS; all were deliberately introduced in Aotearoa New Zealand (Burns *et al.* 2018). A single species *Ichthyosaura alpestris apauna* is thought to be eradicated after concerted effort by the Ministry of Primary Industries. Distributions of New Zealand's three introduced frog species may continue to expand, in part due to domestic pet trade.

In additional to the species listed in this report, three species, the Mexican axolotl (*Ambystoma mexicanum*), the Japanese fire-bellied newt (*Cynops pyrrhogaster*) and the oriental fire-bellied newt (*Cynops orientalis*) are present in New Zealand's domestic pet trade. We highlight the potential for these species to establish wild breeding populations.

Acknowledgements

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Appendix 2 – Bats in Aotearoa New Zealand by region

Authors: Moira Pryde, Dr Colin O'Donnell, and other members of the Bat Recovery Group

Background

A project to collate a list of bats by region in Aotearoa received funding through Envirolink – a regional council driven funding scheme, with funds administered by the Ministry of Business, Innovation & Employment – Science and Innovation. This list of bats is part of a larger project to collate species lists for four groups: amphibians, bats, birds, and reptiles, plus indigenous vascular plants in the Nelson-Tasman Regions and Southland Region. The Envirolink scheme funds research organisations (Crown Research Institutes, universities and some not-for-profit research associations) to provide regional councils with advice and support for research on identified environmental topics and projects.

This project involved a collaboration of Dr Scott Jarvie (Otago Regional Council) and Dr Jo Monks (University of Otago – Ōtākou Whakaihu Waka) on behalf of the Biodiversity Working Group, Te Uru Kahika (Regional and Unitary Councils Aotearoa). The Department of Conservation – Te Papa Atawhai was approached to compile the list of bats for this project.

Method

A list of bats was compiled for each of the sixteen regions in Aotearoa New Zealand. Separate sheets are for each of taxa recorded: long-tailed bat, northern short-tailed bat, central short-tailed bat, southern short-tailed bat, greater short-tailed bat, and little red-flying fox. Each sheet provides the preferred common name from the national assessment, preferred Māori name from the national assessment, assessment name from the national assessment, current name and authority from the national assessment, current species name from the national assessment, threat category from the national assessment, threat status from the national assessment, New Zealand Threat Classification System Species ID, regional distribution, notes, and if the taxon has had a regional assessment

Outputs

An electronic Excel spreadsheet was produced titled **Bats of Aotearoa New Zealand by region. Envirolink Project spreadsheet**, with eight worksheets. The first worksheet labelled ReadMe, has brief notes explaining the subsequent worksheets. The next six worksheets are for each bat, respectively, and each includes information from the New Zealand Threat Classification (NZTCS) with the preferred common name, preferred Māori

name, assessment name, current name and authority, current species name, threat category, threat status, and Species ID. We also provide information on regional distribution, notes, and if the taxon has had a regional assessment. The final worksheet labelled national assessment has information from the latest NZTCS on bats.

The authors request if the information in the spreadsheet are to be used to inform regional conservation statuses, relevant staff from the Department of Conservation – Te Papa Atawhai staff who are recognised bat experts are invited to contribute. Moreover, if this data is to be included in Regional or Unitary Councils strategies, plans or policies, the authors note that Department of Conservation – Te Papa Atawhai staff who are recognised bat experts would be available for consultation. Finally, is it noted for the Excel document, like all such species lists, should be treated as a working draft as knowledge of distributions and taxonomy can change over time.

Appendix 3 – Birds of Aotearoa New Zealand by region

Author: Oscar Thomas

Background

A project to collate a list of all bird taxa (class: Aves) in Aotearoa New Zealand by region received funding through Envirolink – a regional council driven funding scheme, with funds administered by the Ministry of Business, Innovation & Employment – Science and Innovation. This is part of a larger project to collate species lists for four groups: amphibians, bats, birds, and reptiles, plus indigenous vascular plants in Southland and Nelson-Tasman. The Envirolink scheme funds research organisations (Crown Research Institutes, universities and some not-for-profit research associations) to provide regional councils with advice and support for research on identified environmental topics and projects.

This project involved a collaboration of Dr Scott Jarvie (Otago Regional Council) and Dr Jo Monks (University of Otago – Ōtākou Whakaihu Waka) on behalf of the Biodiversity Working Group, Te Uru Kahika (Regional and Unitary Councils Aotearoa). The University of Otago – Ōtākou Whakaihu Waka contracted ornithologist Oscar Thomas to undertake the project.

Method

Oscar Thomas collated an initial spreadsheet of taxa (species and subspecies) exported from the New Zealand Threat Classification System (NZTCS) online database, supplemented with additional information from the 2022 Birds New Zealand checklist.

A range of sources were used to help determine the status of each taxa in each region of Aotearoa New Zealand; including New Zealand Birds Online, eBird, the 2022 Birds New Zealand checklist, the Birds New Zealand Unusual Bird Report database, Notornis, the Birds New Zealand Beach Patrol database, and the Handbook of Australian, New Zealand & Antarctic Birds, supplemented with the personal knowledge of compilers and Birds New Zealand members.

Key contributions were made from Warwick Allen (Canterbury), Ian Armitage (Beach Patrol Database), Mike Bell (Chatham Islands), Russell Cannings (Nationwide), Pat Crowe (Marlborough), Geoff Foreman (Gisborne), Sean Jacques (Southland), Pete McClelland (Southland), David Melville (Nelson/Tasman), Malcolm Rutherford (Gisborne), and one anonymous person (Wellington).

Outputs

One electronic Excel spreadsheet was produced. **Birds of Aotearoa New Zealand by region. Envirolink spreadsheet** is a spreadsheet with four worksheets:

1. ReadMe — Background information on the project
2. Checklist — This is the main output, which includes columns for taxonomic order, NZTCS identification number, IUCN status, NZTCS status in 2021, NZTCS scientific name and NZTCS common name, in addition to 17 columns for each of the 16 regions of Aotearoa New Zealand as well as Rēkohu / Wharekauri / Chatham Islands, with accompanying notes columns for where justification and evidence is provided for the given status of the relevant taxon. Regions include 12 nautical miles of coastal marine area and inshore islands. The rows list 437 bird taxa, primarily from the Conservation status of birds in Aotearoa New Zealand, 2021 by Robertson et al. (2021) along with 9 taxa that were not assessed by this report. We followed the NZTCS taxonomy over other authorities as this is a statutory obligation for local governments.
3. Codes — the hierarchical categories used for assessing the status of each taxon in each region, which are as follows:

Status	**Code**	**Explanation**
Breeding	**B**	Recorded or expected to breed in the region
Suspected Breeding	**SB**	Suspected to breed in the region without clear evidence
Present	**P**	Recorded or expected in the region but does not breed/leave to breed
Migrant	**M**	More than 15 individuals recorded or expected to visit the region each year
Vagrant	**V**	Less than 15 individuals recorded or expected to visit the region each year
Lost	**L**	Recorded to breed in the region since 2000, but is no longer present
Data Deficient	**DD**	Recorded, expected or suspected in the region with insufficient data to classify higher

4. References — the list of sources used to collate and refine the list.

This project required assumptions to be made where evidence could not be found, particularly for taxa that are cryptic, mobile, or sparsely distributed. For example, given the complexity of observing seabirds; species ecology, beach-wrecks, and records from offshore or in adjacent regions were used to inform their status in a given region as best as possible. Small regions such as Nelson and regions with low observer coverage such as Gisborne and West Coast were harder to make inferences for and thus have lower certainty. This list relied on local knowledge to become the most useful and accurate resource it can be. Updates will be vital to maintain the integrity of this list when relevant new information on the status and distributions of birds across New Zealand is made available. Moreover, knowledge of distributions and taxonomy can change over time, so the list should be treated as a working draft.

Appendix 4 – Reptiles of Aotearoa New Zealand by region

Authors: Carey Knox and Dr Rod Hitchmough

Background

A project to collate a list of reptiles by region in Aotearoa received funding through Envirolink – a regional council driven funding scheme, with funds administered by the Ministry of Business, Innovation & Employment – Science and Innovation. This list of reptiles is part of a larger project to collate species lists for four groups: amphibians, bats, birds, and reptiles, plus indigenous vascular plants in the Nelson-Tasman Regions and Southland Region. The Envirolink scheme funds research organisations (Crown Research Institutes, universities and some not-for-profit research associations) to provide regional councils with advice and support for research on identified environmental topics and projects.

This project involved a collaboration of Dr Scott Jarvie (Otago Regional Council) and Dr Jo Monks (University of Otago – Ōtākou Whakaihu Waka) on behalf of the Biodiversity Working Group, Te Uru Kahika (Regional and Unitary Councils Aotearoa). The University of Otago – Ōtākou Whakaihu Waka approached Carey Knox and Rod Hitchmough to compile the list of reptiles for this project.

Method

A list of reptiles was compiled for each of the sixteen regions in Aotearoa New Zealand, plus the Chatham Islands. Separate sheets are for each region, with each sheet providing the scientific name, common name/s, New Zealand Threat Classification System Species ID, environment (Terrestrial or Marine), taxonomy, biostatus, threat category, threat status, threat criteria, qualifiers, regional endemic (yes/no), and the naming authority. We also include sheets with information on the councils and from the national assessment.

Outputs

An electronic Excel spreadsheet was produced titled **Reptiles of Aotearoa New Zealand by region. Envirolink Project spreadsheet**, with 20 worksheets. The first worksheet labelled ReadMe, has brief notes explaining the subsequent worksheets. The next 17 worksheets are for each region, and for each taxon from that region, includes information from the New Zealand Threat Classification System (NZTCS) with the preferred common name, preferred Māori name, assessment name, current name and authority, current species name, threat category, threat status, and Species ID. We also provide information on the type of presence in the region, and comments from the expert and reviewer. It is

noted for the Excel document for species by regions, like all such species lists, should be treated as a working draft as knowledge of distributions and taxonomy can change over time. The final two worksheets are labelled councils and national assessments, respectively.

Appendix 5 – Indigenous Vascular Plants of Nelson-Tasman

Author: Shannel Courtney

Background

A project to collate a preliminary list of indigenous vascular plants of the Nelson-Tasman received funding through Envirolink – a regional council driven funding scheme, with funds administered by the Ministry of Business, Innovation & Employment - Science and Innovation. This list of indigenous vascular plants for Nelson-Tasman is part of a larger project to collate species lists for four groups: amphibians, bats, birds, and reptiles, plus indigenous vascular plants in the Southland Region. The Envirolink scheme funds research organisations (Crown Research Institutes, universities and some not-for-profit research associations) to provide regional councils with advice and support for research on identified environmental topics and projects.

This project involved a collaboration of Dr Scott Jarvie (Otago Regional Council) and Dr Jo Monks (University of Otago – Ōtākou Whakaihu Waka) on behalf of the Biodiversity Working Group, Te Uru Kahika (Regional and Unitary Councils Aotearoa). The University of Otago – Ōtākou Whakaihu Waka contracted botanist Shannel Courtney to undertake the project.

Method

A list of indigenous vascular plants was compiled for the Nelson-Tasman Region. This list was based on personal knowledge supplemented by information from the Australasian Virtual Herbarium (AVH), New Zealand Plant Conservation Network (NZPCN), and iNaturalist NZ. The scientific and English common names are based on the taxonomic nomenclature in the New Zealand Threat Classification System (NZTCS) unless specified otherwise. Māori common names are taken from NZTCS and Te Aka Online Māori Dictionary. The later source is used where the two sources differ in spelling. Information from the NZTCS was provided for each taxon's Species ID, threat category and threat status. The regional endemic status was provided for each taxon in Nelson-Tasman.

Outputs

An electronic Excel spreadsheet was produced titled **Indigenous vascular plants of Nelson-Tasman. Envirolink Project spreadsheet**, with two worksheets. The first worksheet labelled **ReadMe**, has brief notes explaining the worksheet **Assessment**. The second Assessment worksheet lists 1423 taxa for the Nelson-Tasman, with 68 of them identified as regionally endemic. While efforts were made to make this provisional

Nelson-Tasman indigenous vascular plant list as comprehensive as possible, further work may identify additional taxa. As such, this species list, like all, should be treated as a working draft.

Appendix 6 – Indigenous Vascular Plants of Southland

Authors: Brian Rance, John Barkla and Dr Scott Jarvie

Background

A project to collate a preliminary list of vascular plants of the Southland Region received funding through Envirolink – a regional council driven funding scheme, with funds administered by the Ministry of Business, Innovation & Employment - Science and Innovation. This list of vascular plants for the Southland Region is part of a larger project to collate species lists for four groups: amphibians, bats, birds, and reptiles, plus vascular plants in the Nelson/Tasman Region. The Envirolink scheme funds research organisations (Crown Research Institutes, universities and some not-for-profit research associations) to provide regional councils with advice and support for research on identified environmental topics and projects.

This project involved a collaboration of Dr Scott Jarvie (Otago Regional Council) and Dr Jo Monks (University of Otago – Ōtākou Whakaihu Waka) on behalf of the Biodiversity Working Group, Te Uru Kahika (Regional and Unitary Councils Aotearoa). The University of Otago – Ōtākou Whakaihu Waka contracted botanists Brian Rance and John Barkla to undertake the project.

Method

Dr Scott Jarvie collated an initial spreadsheet of candidate species through amalgamation of four significant data sets. These data sets were Southland plant lists held by the New Zealand Plant Conservation Network (NZPCN), and vascular plant distributional data held by the National Vegetation Survey (NVS), Botanical Information and Ecology Network (BIEN), and the Australian Virtual Herbarium (AVH).

This amalgamated list was reviewed by Brian Rance and John Barkla. For each listed taxon, a decision was made and recorded to either accept or reject the entry. For rejected taxa an explanation was recorded in the 'Notes' column. Common reasons for rejection included:

- Taxon is exotic
- Taxon is non-vascular
- Southland Region is outside of the taxon's natural range
- Taxon name is a duplicate or a synonym of another entry

Following this exercise, we added c. 60 taxa known by us to occur in Southland Region which had not already been captured. These additions were based on our personal

knowledge and supplemented by iNaturalistNZ records and relevant field guides with distribution maps (e.g. 'Mountain Daisies – A guide to *Celmisia* in Aotearoa/New Zealand [Jane Gosden 2023] and 'Identification Guide to the ferns and lycophytes of Aotearoa New Zealand [Leon Perrie & Patrick Brownsey 2024]). We then checked and updated the taxa names to reflect those used in the New Zealand Threat Classification system (NZTCS) website and added taxa identification numbers from NZTCS. Finally, we added distribution and taxonomic notes where it was useful to do so.

Once a preliminary list with taxa identification numbers from NZTSC was obtained for the Southland Region, Dr Jarvie then joined this list with the NZTCS to derive the national conservation status of the taxa on the list.

Outputs

Two electronic Excel spreadsheets were produced. The first, **Indigenous vascular plants of Southland. Envirolink Project working spreadsheet** shows the source of all records and the decision to accept or reject them, along with reasons for rejection.

The second, **Indigenous vascular plants of Southland. Envirolink Project cleaned spreadsheet** has four worksheets. The worksheet labelled **preliminary**, is a simplified preliminary list of all vascular plant taxa accepted as being present in Southland Region, along with their NZTCS identification number, and accompanying notes. It lists 1180 taxa accepted for the Region. The worksheet labelled **preliminary_merged_nztcs-2017** is the preliminary Southland list merged with the NZTCS to derive the national conservation status of the taxa on the list, based on the recently superseded 2018 published list. The worksheet labelled **preliminary_merged_nztcs-2023** is the preliminary Southland list merged with the NZTCS to derive the national conservation status of the taxa on the list, based on the most recent 2024 published list. The worksheet labelled **ReadMe**, has brief notes explaining the previous three lists.

Below are listed ways to improve this provisional list of indigenous vascular plants as funding for this component of the project only allowed a coarse overview of the compiled data repositories and the sources listed above. There is further work that could be carried out on the list to improve its comprehensiveness. The first place for additional taxa to be discovered is likely through undertaking reviews of the following:

- Determine 'taxonomically indeterminate' species present in Region.
- Review orchid distributions from the New Zealand Native Orchids website
- Review key checklists and Southland flora reports esp. Southland/Otago Threatened plant list (B. Rance & J. Barkla), Stewart Island Plants (H. Wilson),

Inland Otago/Northern Southland (T. Druce), Big Bay flora (P. Johnson), Resolution Island flora (B. Rance), Upper Mararoa Valley flora (B. Rance), Waituna Ecological District list (B. Rance), Taringatura Ecological District (P. Enright) and Invercargill City Council flora (B. Rance)

- Review the Protected Natural Areas Programme (PNAP) ecological district survey reports that have been completed for Southland Plains (G. Walls), Taringatura (N. Simpson), Eyre (A. Mark), Nokomai (K. Dickinson) and Umbrella Ecological Districts (K. Dickinson).
- Cross reference the Southland list with the recently completed 'Regional conservation status of indigenous vascular plants in Otago' (Jarvie et al. 2024)
- Cross reference Southland list with the 'Conservation status of vascular plants in Aotearoa / New Zealand, 2023' (de Lange et al. 2024).