Regionally Endemic Species in Otago

Scott Jarvie

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Scott Jarvie
Otago Regional Council, Ōtepoti Dunedin

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Salt pan cress, *Lepidium kirkii* Petrie. A regionally endemic vascular plant only known to occur on patches of saline/sodic soils (sometimes referred to as salt pans) in the semi-arid region of Central Otago. Photograph by John Barkla on the covers.

Burgan skink, *Oligosoma burganae* Chapple et al. 2011. A regionally endemic skink species restricted to the Rock and Pillar and Lammermoore Ranges in Otago. Photograph by Carey Knox on the frontispiece.

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Executive Summary

This report provides an overview of regionally endemic species in the Otago Region, meaning they are not found elsewhere on Earth. A total of 358 species were identified as regionally endemic to Otago, with the species group mainly focused on being birds, bryophytes, reptiles, select invertebrate terrestrial groups, vascular plants, although freshwater fish and some freshwater invertebrates are included. Of the species assessed, 193 had been assessed nationally for their threat status, with 168 (85 percent) having elevated extinction risk (Threatened, At Risk, or Data Deficient). Other species groups should have their regional endemics identified. The report will support the Otago Regional Council, our iwi partners, territorial authorities in the region, stakeholders, landowners, and community groups to provide an evidence base to inform biodiversity management across the region. This includes highlighting the biota (flora, fauna, and fungi) in Otago that are regionally endemic, including those that are at risk or threatened with extinction, which the Council has statutory obligations to protect.

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Introduction

This report provides an overview of species that are regionally endemic to Otago, meaning they are found nowhere else on Earth. A summary is provided of the number of regionally endemic species for select taxonomic groups, including birds, bryophytes (mosses, hornworts and liverworts), select invertebrates groups, reptiles, and vascular plants. The report will support the Otago Regional Council, our iwi partners, territorial authorities in the region, stakeholders, landowners, and community groups to provide an evidence base to inform biodiversity management across the region. This includes highlighting the flora, fauna, and fungi in Otago that are regionally endemic and at risk or threatened with extinction, which the Council has statutory obligations to protect.

Background

An endemic species is a species (or taxon) whose geographic range or distribution is confined to a single given area. Although the species may inhabit a small area, such as a single lake, or its range may extend across an entire region, it is considered endemic if it not found natively anywhere else in the world. Endemic species are often found in isolated areas, such as on island or on a mountain within a mountain range, and they often have specialised adaptations that allow them to survive only in unique habitats. Such specialisations often make them susceptible to the effects of environmental disturbances.

Our indigenous biodiversity in Aotearoa New Zealand makes a significant contribution to overall global diversity, with an estimated 80,000 species of native animals, plants and fungi. Our high level of endemism among these native species and large proportion of threatened species make Aotearoa New Zealand an internationally recognised world ‘hotspot’ for biodiversity (Myers et al. 2000). The high endemism is largely the result of our long isolation from other land masses and diverse geography and climate, allowing unique flora, fauna and fungi to develop. For example, Aotearoa New Zealand’s endemic species include all our native frogs and reptiles, more than 90% of our insects, approximately 80% of vascular plants and a quarter of bird species. At regional scales in Aotearoa New Zealand, an area that has long been recognised to have extraordinary regional endemism is Otago.

In Aotearoa New Zealand the Department of Conservation – Te Papa Atawhai manages indigenous species nationally under the Wildlife Act (1953), but regional and district councils having statutory obligations to maintain indigenous biodiversity under the Resource Management Act 1991 (RMA), including to manage the habitats of threatened species. This report provides a preliminary list of regionally endemic, largely terrestrial species found in Otago, meaning they are found nowhere else globally.

Methods

Data sources

1. Compilation of information from regional conservations sources

To compile information on regionally endemic species in Otago, initially sources were: 1) recently completed regional conservation status reports for six taxonomic groups (bats, 2023b; indigenous vascular plants, 2024a; birds, 2024b; reptiles, Jarvie et al. 2024c; mushroom fungi, i.e., selected species of non-lichenised agarics, boletes and russuloid fungi, Jarvie and Cooper 2024; amphibians, Jarvie 2024; https://www.orc.govt.nz/environment/biodiversity/regional-threat-assessments/), 2) recent compilations of species lists for two groups (lichen and non-lichenised fungi; fungi from 2005 report by Hitchmough et al., excluding those taxa included in the de Lange et al. 2018 report), and 3) recently completed spreadsheets for five groups (hornworts and liverworts, Pritchard 2025a; mosses, Pritchard 2025b; freshwater fish, Campbell 2025; marine mammals, Jarvie 2024b; parasitic mites and ticks, Jarvie 2024c; Onychophora, Jarvie 2024d; https://www.orc.govt.nz/environment/biodiversity/otago-species/).

2. Collation of information from the Global Biodiversity Information Facility

The Global Biodiversity Information Facility (GBIF, https://www.gbif.org/) was used as a secondary source, because it captures data from many institutions with standardised terminology. GBIF has become the 'go-to' aggregator for such information and has directly enabled a steady increase in scientific publications[1] and a 1:12 societal benefit[2]. To get data not available on GBIF, contact was made with the curators of Tūhura Otago Museum (OMNZ), Canterbury Museum (CMNZ), the Te Papa – Museum of New Zealand (MONZ) and Lincoln University (LUNZ), as these collections either don't publish, or have limited records, on GBIF. Responses were received from every institution. A geographical filter was then applied using the GIS layer for the Otago Regional Council's administrative boundary (https://datafinder.stats.govt.nz/layer/120946-regional-council-2025/).

To validate the preliminary list the following was also completed: 1) each species was checked to see if specimens were from outside Otago. 2) Conducted online searches for any indication that the species was not only from Otago. The taxonomic name was used in the search, and any information returned was typically a text-based description (e.g., 'species x is often in the Waikato and Auckland regions …'). Online sources included: Wikipedia, Wikispecies, iNaturalist, specialist taxonomic portals (World Spider

[1] More than 10,000 scientific papers enabled by GBIF-mediated data
[2] Report reveals return on investments in GBIF

Catalogue (https://wsc.nmbe.ch/), Scalenet (García Morales et al. 2016), Thysanoptera Aotearoa (Thrips of New Zealand) [Mound et al. 2017]), and published literature.

3. Additional sources of information

To ensure backwards and forward compatibility with changes in taxonomic nomenclatures to future proof the compilation, the following occurred. First, the New Zealand Organisms Register (NZOR, https://www.nzor.org.nz/) 'matching' function was used to match the names of type species and return an NZOR identification number. NZOR is an actively maintained compilation of all organism names relevant to Aotearoa New Zealand: indigenous, endemic or exotic species or species not present in Aotearoa New Zealand but of national interest to our conservation and biosecurity agencies. NZOR is digitally and automatically assembled on a regular basis from several taxonomic data providers. It provides a consensus opinion on the preferred name for an organism, any alternative scientific names (synonyms), common and Māori names, relevant literature, and the data provider's view on the documented presence/absence in New Zealand.

Second, the database of the New Zealand Threat Classification System (NZTCS, https://nztcs.org.nz/) was used to match the names of type species with their conservation status (if it had been assessed) by 'marrying' with the Species ID. For each taxonomic group, the latest threat assessment information is provided: i.e., indigenous vascular plants (de Lange et al. 2024), rhytididae (carnivorous snails; Walker et al. 2024), bats (O'Donnell et al. 2023), mushroom fungi (selected species of Agaricales, Boletales, Russulales; Cooper et al. 2022), Orthoptera (wēta, crickets and grasshoppers; Trewick et al. 2022), parasitic mites and ticks (Acari; Heath et al. 2022), birds (Robertson et al. 2021), reptiles (Hitchmough et al. 2021), spiders (Sirvid et al. 2021), leaf-veined slugs and amber snails (Barker et al. 2021), pūpūharakeke/flax snails (Walker et al. 2021), hornworts and liverworts (de Lange et al. 2020), marine macroalgae (Nelson et al. 2019), marine mammals (Baker et al. 2019), amphibians (Burns et al. 2018), chimaeras, sharks and rays (Duffy et al. 2018), freshwater fishes (Dunn et al 2018), lichens (de Lange et al. 2018), Onychophora (Trewick et al. 2018), hymenoptera (Ward et al. 2017), lepidoptera (Hoare et al. 2017), mosses (Rolfe et al. 2016), stick insects (Buckley et al. 2016), earthworms (Buckley et al. 2015), fleas (Heath et al. 2015), aphids (Stringer et al. 2012), coleoptera (Leschen et al. 2012), diptera (Andrew et al. 2012), hemiptera (Stringer et al. 2012), small or less well-known terrestrial invertebrates (Buckley et al. 2012), nematodes (Yeates et al. 2012), micro-snails (Mahlfeld et al. 2012), and fungi excluding selected species of Agaricales, Boletales and Russulales (Hitchmough et al. 2007; other taxa were re-assessed by Cooper et al. 2022).

Results

A total of 358 species are recorded as endemic to or occurring only in Otago (Table 1). The most speciose group was invertebrates with 301 taxa, followed by indigenous vascular plants with 40 taxa, freshwater fish with eight taxa, reptiles with six taxa, bryophytes (mosses and liverworts) with two taxa, and birds with one taxon.

Table 1. The number of species that are endemic to Otago from different functional groups with different orders (ordered initially by functional groups then the order with the most species)

Functional group	Order name	Common name	Number of species	Percentage of species
Invertebrates (n = 301)				
	Araneae	Spiders	73	20.4%
	Diptera	Flies	64	17.9%
	Coleoptera	Beetles	45	12.6%
	Lepidoptera	Moths	32	8.9%
	Sarcoptiformes	Mites (feather, skin mites, next-dwelling dust)	20	5.6%
	Hymenoptera	Wasps, bees, ants	17	4.7%
	Hemiptera	True bugs	15	4.2%
	Plecoptera	Stoneflies	8	2.2%
	Trichoptera	Caddisflies	6	1.7%
	Orthoptera	Weta, grasshoppers	5	1.4%
	Opilliones	Harvestmen	5	1.4%
	Trombidiformes	Chiggers (mites)	5	1.4%
	Entomobryomorpha	Springtails	1	0.3%
	Diplostracha	Water fleas	1	0.3%
	Dorylaimida	Roundworms (dorylaims)	1	0.3%
	Isopoda	Crustaceans (pill bugs, woodlice, slaters, or sowbugs)	1	0.3%
	Pseudoscorpiones	False scorpions	1	0.3%
	Stylommatophora	Land snail, slugs	1	0.3%
Vascular plants (n = 40)				
	Asterales	Daisies, sunflowers	11	3.1%
	Boraginales	Borages, for-me-nots	7	2.0%
	Poales	Grasses	7	2.0%
	Capparales	Brassicales – mustard, capers	3	0.8%
	Aralialeas	Ivy family	2	0.6%
	Rosales	Roses	2	0.6%
	Thymelaeales	Daphne	2	0.6%
	Apiales	Umbellifers (celery, carrot or parsley)	1	0.3%
	Caryophyllales	Inks, carnations	1	0.3%
	Fabales	Legumes, peas, beans	1	0.3%
	Oxalidales	Wood sorrel	1	0.3%
	Ranunculales	Buttercups	1	0.3%
	Violales	Violets	1	0.3%
Freshwater fishes (n = 8)				
	Galaxiiformes	Galaxiids	8	2.2%
Reptiles (n = 6)				
	Squamata	Lizards and snakes*	6	1.7%
Bryophytes (n = 2)				
	Bartramiales	Mosses	1	0.3%
	Jungermanniales	Liverworts	1	0.3%
Birds (n = 1)				
	Suliformes	Gannets, cormorants, and allies	1	0.3%

*Note that terrestrial snakes are not resident indigenous species in Aotearoa New Zealand

Of the regional endemics, 193 taxa had their conservation status assessed nationally in the NZTCS (Table 2). This means only ~54 percent of regionally endemic taxa in the Region had been assessed nationally. Conservation statuses for these species from the NZTCS means in the Threatened category there are 46 taxa (Nationally Critical = 24; Nationally Endangered = 15; Nationally Vulnerable = 6; Nationally Increasing = 1), At Risk category 55 taxa (Declining = 2; Naturally Uncommon = 51; Relict = 2) and Not Threatened category 25 taxa. Sixty-seven taxa were in Data Deficient category, meaning there was insufficient data to assign a conservation status, while 165 taxa had not been assessed yet.

Table 2. Number of regionally endemic species in Otago assessed in the New Zealand Threat Classification System (NZTCS), with their threat category and status.

NZTCS threat category	NZTCS threat status	Taxon count
Threatened (n = 46)		
	Nationally Critical	24
	Nationally Endangered	15
	Nationally Vulnerable	6
	Nationally Increasing	1
At Risk (n = 55)		
	Declining	2
	Naturally Uncommon	51
	Relict	2
Not Threatened (n = 25)	Not Threatened	25
Data Deficient (n = 67)	Data Deficient	67
Total		193

In the Otago region the invertebrate species had the most regional endemics (Table 3). Of these, the orders with more than ten taxa regional endemics are Araneae, Diptera, Coleoptera, Lepidoptera, Sarcoptiformes, Hymenoptera and Hemiptera. Whereas the following taxonomic groups have less than eight taxa or less in their orders: Plecoptera, Orthoptera, Trombidiformes, Trichoptera, Opiliones, Dorylaimida, Entomobryomorpha, Isopoda, Pseudoscorpiones and Stylommatophora.

For many regionally endemic invertebrates, they have not had their conservation status assessed nationally (Table 3; 159 out of 301 or ~53 percent). Of the taxa that have a national conservation status, 18 were Threatened (Nationally Critical = 11; Nationally Endangered = 5; Nationally Vulnerable = 3), 37 were At Risk (Naturally Uncommon = 35; Relict = 2), 23 were Not Threatened, and 64 were Data Deficient.

Table 3. Regionally endemic invertebrate species in Otago. The New Zealand Threat Classification System (NZTCS) categories and statuses are provided. The NZTCS reports are Andrew et al. 2012, Grainger et al. 2018, Hoare et al. 2017, Leschen et al. 2012, Marlfeld et al. 2012, Sirvid et al. 2021, Stringer et al. 2012, Trewick et al. 2022, Ward et al. 2016, Yeates et al. 2012.

Name	Order	Family	NZTCS Category	NZTCS Status	Report Name
Alistra centralis	Araneae	Hahniidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Akatorea otagoensis	Araneae	Desidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Amaurobioides maritima	Araneae	Anyphaenidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Anoteropsis flavescens	Araneae	Lycosidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Anoteropsis urquharti	Araneae	Lycosidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Aorangia poppelwelli	Araneae	Stiphidiidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Ascuta leith	Araneae	Orsolobidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Cambridgea arboricola	Araneae	Desidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Cambridgea secunda	Araneae	Desidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Cantuaria aperta	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cantuaria apica	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cantuaria assimilis	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cantuaria catlinensis	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cantuaria depressa	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cantuaria dunedinensis	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cantuaria kakanuiensis	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cantuaria lomasi	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cantuaria maxima	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cantuaria napua	Araneae	Idiopidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Cantuaria pilama	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cantuaria toddae	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cantuaria vellosa	Araneae	Idiopidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Cycloctenus fugax	Araneae	Cycloctenidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Dunedinia pullata	Araneae	Linyphiidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Dunstanoides kochi	Araneae	Desidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Duripelta otara	Araneae	Orsolobidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Gasparia montana	Araneae	Desidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Gasparia nava	Araneae	Desidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Gohia parisolata	Araneae	Desidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Goyenia multidentata	Araneae	Desidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)

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Endemic invertebrates

Name	Order	Family	NZTCS Category	NZTCS Status	Report Name
Haplinis dunstani	Araneae	Linyphiidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Haplinis marplesi	Araneae	Linyphiidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Hapona otagoa	Araneae	Desidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Hexathele waipa	Araneae	Hexathelidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Huttonia palpimanoides	Araneae	Huttoniidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Laestrygones otagoensis	Araneae	Desidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Lamina minor	Araneae	Toxopidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Makora mimica	Araneae	Desidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Mamoea rufa	Araneae	Desidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Mangareia maculata	Araneae	Desidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Maniho centralis	Araneae	Desidae	Threatened	Nationally Endangered	Spiders 2020 (Sirvid et al. 2021)
Meringa leith	Araneae	Physoglenidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Meringa otago	Araneae	Physoglenidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Migas linburnensis	Araneae	Migidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Migas lomasi	Araneae	Migidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Migas taierii	Araneae	Migidae	Threatened	Nationally Endangered	Spiders 2020 (Sirvid et al. 2021)
Migas toddae	Araneae	Migidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Neoramia alta	Araneae	Stiphidiidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Neoramia matua	Araneae	Stiphidiidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Neoramia nana	Araneae	Stiphidiidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Neoramia otagoa	Araneae	Stiphidiidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Otagoa wiltoni	Araneae	Desidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Oramia littoralis	Araneae	Agelenidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Pakeha protecta	Araneae	Cyclocteniidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Pakeha subtecta	Araneae	Cyclocteniidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Panoa tapanuiensis	Araneae	Desidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Parafroneta monticola	Araneae	Linyphiidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Paravoca otagoensis	Araneae	Cyclocteniidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Protoerigone otagoa	Araneae	Linyphiidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Rayforstia antipoda	Araneae	Anapidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Rinawa otagoensis	Araneae	Hahniidae	Not Threatened	Not Threatened	Spiders 2020 (Sirvid et al. 2021)
Subantarctia centralis	Araneae	Orsolobidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Subantarctia trina	Araneae	Orsolobidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)

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Endemic invertebrates

Name	Order	Family	NZTCS Category	NZTCS Status	Report Name
Tangata otago	Araneae	Orsolobidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Tangata tautuku	Araneae	Orsolobidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Tautukua isolata	Araneae	Orsolobidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Viridictyna kikkawai	Araneae	Dictynidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Waiporia hawea	Araneae	Orsolobidae	At Risk	Relict	Spiders 2020 (Sirvid et al. 2021)
Waiporia wiltoni	Araneae	Orsolobidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Wiltonia graminicola	Araneae	Orsolobidae	At Risk	Naturally Uncommon	Spiders 2020 (Sirvid et al. 2021)
Wiltonia porina	Araneae	Orsolobidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Zealoctenus cardronaensis	Araneae	Miturgidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Zealanapis otago	Araneae	Anapidae	Data Deficient	Data Deficient	Spiders 2020 (Sirvid et al. 2021)
Asilis annulicornis	Coleoptera	Cantharidae			
Catoptes robustus	Coleoptera	Curculionidae			
Chalcolampra apicula	Coleoptera	Chrysomelidae			
Chalepistes curvus	Coleoptera	Curculionidae			
Chalepistes dugdalei	Coleoptera	Curculionidae			
Chalepistes patricki	Coleoptera	Curculionidae			
Duvaliomimus taieriensis	Coleoptera	Carabidae	At Risk	Naturally Uncommon	Coleoptera 2010 (Leschen et al. 2012)
Eugnomus alternans	Coleoptera	Curculionidae			
Inophloeus inuus	Coleoptera	Curculionidae			
Inophloeus praelatus	Coleoptera	Curculionidae			
Irenimus minimus	Coleoptera	Curculionidae			
Lithocia stictica	Coleoptera	Curculionidae			
Lyperobius cupiendus	Coleoptera	Curculionidae			
Maoritrechus nunni	Coleoptera	Carabidae	At Risk	Naturally Uncommon	Coleoptera 2010 (Leschen et al. 2012)
Mecodema laeviceps	Coleoptera	Carabidae	Threatened	Nationally Critical	Coleoptera 2010 (Leschen et al. 2012)
Mecyclothorax otagoensis	Coleoptera	Carabidae			
Megadromus fultoni	Coleoptera	Carabidae	At Risk	Naturally Uncommon	Coleoptera 2010 (Leschen et al. 2012)
Megadromus sp. 8 "Omeo Hut"	Coleoptera	Carabidae	Threatened	Nationally Critical	Coleoptera 2010 (Leschen et al. 2012)
Metacorneolabium zanotium	Coleoptera	Staphylinidae			
Mimopeus lewisianus	Coleoptera	Tenebrionidae			
Mimopeus rugosus	Coleoptera	Tenebrionidae	At Risk	Naturally Uncommon	Coleoptera 2010 (Leschen et al. 2012)
Nicaeana fraudator	Coleoptera	Curculionidae			
Oopterus monticola	Coleoptera	Carabidae			
Orchymontia otagensis	Coleoptera	Hydraenidae	Data Deficient	Data Deficient	Freshwater invertebrates 2018 (Grainger et al. 2018)
Pedalopia novaezelandiae	Coleoptera	Carabidae			
Pentarthrum fultoni	Coleoptera	Curculionidae			
Pentarthrum subsericatum	Coleoptera	Curculionidae			
Prodontria capito	Coleoptera	Scarabaeidae			
Prodontria jenniferae	Coleoptera	Scarabaeidae	At Risk	Naturally Uncommon	Coleoptera 2010 (Leschen et al. 2012)
Prodontria lewisii	Coleoptera	Scarabaeidae	Threatened	Nationally Endangered	Coleoptera 2010 (Leschen et al. 2012)

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Endemic invertebrates

Name	Order	Family	NZTCS Category	NZTCS Status	Report Name
Prodontria modesta	Coleoptera	Scarabaeidae	At Risk	Naturally Uncommon	Coleoptera 2010 (Leschen et al. 2012)
Prodontria montis	Coleoptera	Scarabaeidae			
Prodontria patricki	Coleoptera	Scarabaeidae	Data Deficient	Data Deficient	Coleoptera 2010 (Leschen et al. 2012)
Prodontria pinguis	Coleoptera	Scarabaeidae	At Risk	Naturally Uncommon	Coleoptera 2010 (Leschen et al. 2012)
Prodontria regalis	Coleoptera	Scarabaeidae	At Risk	Naturally Uncommon	Coleoptera 2010 (Leschen et al. 2012)
Rygmodus opimus	Coleoptera	Hydrophilidae			
Sciacharis tautukuensis	Coleoptera	Staphylinidae			
Scopodes basalis	Coleoptera	Carabidae			
Syrphetodes cirrhopogon	Coleoptera	Ulodidae			
Taenarthrus capito	Coleoptera	Carabidae			
Trichopsida popei	Coleoptera	Carabidae			
Trichopsida propinqua	Coleoptera	Carabidae			
Waitatia bellicosa	Coleoptera	Staphylinidae			
Zeadelium senile	Coleoptera	Tenebrionidae	At Risk	Naturally Uncommon	Coleoptera 2010 (Leschen et al. 2012)
Zeolymma brachypterum	Coleoptera	Staphylinidae			
Eulimnadia marplesi	Diplostracha	Limnadiidae	Threatened	Nationally Critical	Freshwater invertebrates 2018 (Grainger et al. 2018)
Amphineurus operculatus	Diptera	Limoniidae			
Amphineurus perarmatus	Diptera	Limoniidae			
Amphineurus senex	Diptera	Limoniidae			
Anabarhynchus castaneus	Diptera	Therevidae			
Anabarhynchus fuscofemoratus	Diptera	Therevidae	Data Deficient	Data Deficient	Diptera 2010 (Andrew et al. 2012)
Anabarhynchus indistinctus	Diptera	Therevidae	Data Deficient	Data Deficient	Diptera 2010 (Andrew et al. 2012)
Anabarhynchus spiniger	Diptera	Therevidae			
Anabarhynchus triangularis	Diptera	Therevidae	At Risk	Naturally Uncommon	Diptera 2010 (Andrew et al. 2012)
Anabarhynchus tricoloratus	Diptera	Therevidae			
Anabarhynchus wisei	Diptera	Therevidae	Data Deficient	Data Deficient	Diptera 2010 (Andrew et al. 2012)
Ceratomerus earlyi	Diptera	Therevidae			
Culiseta novaezealandiae	Diptera	Culicidae			
Dicranomyia acanthophallus	Diptera	Limoniidae			
Dicranomyia allani	Diptera	Limoniidae			
Dicranomyia circularis	Diptera	Limoniidae			
Dicranomyia huttoni	Diptera	Limoniidae			
Dicranomyia megastigmosa	Diptera	Limoniidae			
Dicranomyia otagensis	Diptera	Limoniidae			
Dicranomyia primaeva	Diptera	Limoniidae			
Discobola haetara	Diptera	Limoniidae	Data Deficient	Data Deficient	Diptera 2010 (Andrew et al. 2012)
Dolichopeza howesi	Diptera	Tipulidae			
Gonomyia oliveri	Diptera	Limoniidae			
Gynoplistia aculeata	Diptera	Limoniidae			
Gynoplistia aurantiopyga	Diptera	Limoniidae			

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Endemic invertebrates

Name	Order	Family	NZTCS Category	NZTCS Status	Report Name
Gynoplistia hirsuticauda	Diptera	Limoniidae			
Gynoplistia laticosta	Diptera	Limoniidae			
Heteria flavibasis	Diptera	Tachinidae			
Hilara anisonychia	Diptera	Empididae			
Hilara philpotti	Diptera	Empididae			
Hilara vector	Diptera	Empididae			
Hilarempis kaiteriensis	Diptera	Empididae			
Libnotes falcata	Diptera	Limoniidae			
Limnophila oliveri	Diptera	Limoniidae			
Liriomyza vicina	Diptera	Agromyzidae	Data Deficient	Data Deficient	Diptera 2010 (Andrew et al. 2012)
Metalimnophila penicillata	Diptera	Limoniidae			
Metalimnophila simplicis	Diptera	Limoniidae			
Molophilus analis	Diptera	Limoniidae			
Molophilus pictipleura	Diptera	Limoniidae			
Neolimnia ura	Diptera	Sciomyzidae	At Risk	Naturally Uncommon	Diptera 2010 (Andrew et al. 2012)
Neolimnia vittata	Diptera	Sciomyzidae			
Nothodixa otagensis	Diptera	Dixidae			
Oropezella nigra	Diptera	Hybotidae	Data Deficient	Data Deficient	Diptera 2010 (Andrew et al. 2012)
Pales exitiosa	Diptera	Tachinidae			
Paracladura lyrifera	Diptera	Trichoceridae			
Parahyadina angusta	Diptera	Ephydridae			
Parentia defecta	Diptera	Dolichopodidae	Data Deficient	Data Deficient	Diptera 2010 (Andrew et al. 2012)
Pericoma barbata	Diptera	Psychodidae			
Pollenia hispida	Diptera	Polleniidae			
Pollenia immanis	Diptera	Polleniidae			
Pollenia uniseta	Diptera	Polleniidae			
Pseudolycoriella hauta	Diptera	Sciaridae			
Pseudolycoriella plicitegmenta	Diptera	Sciaridae			
Pseudolycoriella porehu	Diptera	Sciaridae			
Psychoda pulchrima	Diptera	Psychodidae			
Psychoda tridens	Diptera	Psychodidae			
Rhabdomastix neozelandiae	Diptera	Limoniidae			
Scatella subvittata	Diptera	Ephydridae			
Spilogona argentifrons	Diptera	Muscidae			
Spilogona dolosa	Diptera	Muscidae			
Tasiocera bituberculata	Diptera	Limoniidae			
Tephritis marginata	Diptera	Tephritidae			
Thinempis otakouensis	Diptera	Empididae			
Tricimba dugdalei	Diptera	Chloropidae	At Risk	Naturally Uncommon	Diptera 2010 (Andrew et al. 2012)
Zelandomyia otagensis	Diptera	Limoniidae			
Longidorus waikouaitii	Dorylaimida	Longidoridae	Threatened	Nationally Critical	Nematodes 2010 (Yeates et al. 2012)
Entomobrya promontorium	Entomobryomorpha	Entomobryidae			
Aneurus brevipennis	Hemiptera	Aradidae			
Anzygina barrattae	Hemiptera	Cicadellidae	Data Deficient	Data Deficient	Hemiptera 2010 (Stringer et al. 2012)
Chinamiris zygotus	Hemiptera	Miridae	At Risk	Naturally Uncommon	Hemiptera 2010 (Stringer et al. 2012)
Eriococcus argentifagi	Hemiptera	Eriococcidae			
Eriococcus crenilobatus	Hemiptera	Eriococcidae			
Eriococcus latilobatus	Hemiptera	Eriococcidae			

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Endemic invertebrates

Name	Order	Family	NZTCS Category	NZTCS Status	Report Name
Forsterocoris salmoni	Hemiptera	Rhyparochromidae	Data Deficient	Data Deficient	Hemiptera 2010 (Stringer et al. 2012)
Hypsithocus hudsonae	Hemiptera	Pentatomidae	At Risk	Naturally Uncommon	Hemiptera 2010 (Stringer et al. 2012)
Kiwisaldula laelaps	Hemiptera	Saldidae	Threatened	Nationally Endangered	Freshwater invertebrates 2018 (Grainger et al. 2018)
Kiwisaldula yangae	Hemiptera	Saldidae			
Montanococcus thriaticus	Hemiptera	Eriococcidae			
Paradorydium sertum	Hemiptera	Cicadellidae			
Romna oculata	Hemiptera	Miridae	Not Threatened	Not Threatened	Hemiptera 2010 (Stringer et al. 2012)
Trioza gourlayi	Hemiptera	Triozidae			
Ventrispina dugdalei	Hemiptera	Pseudococcidae			
Adelencyrtoides tridens	Hymenoptera	Encyrtidae	Data Deficient	Data Deficient	Hymenoptera 2014 (Ward et al. 2017)
Amblyaspis breviscutellaris	Hymenoptera	Platygastridae	Data Deficient	Data Deficient	Hymenoptera 2014 (Ward et al. 2017)
Ceratanaphes monticola	Hymenoptera	Mymaridae			
Chorebus paranigricapitis	Hymenoptera	Braconidae	Data Deficient	Data Deficient	Hymenoptera 2014 (Ward et al. 2017)
Leptacis arcuata	Hymenoptera	Platygastridae	Data Deficient	Data Deficient	Hymenoptera 2014 (Ward et al. 2017)
Leptacis fuscalata	Hymenoptera	Platygastridae	Data Deficient	Data Deficient	Hymenoptera 2014 (Ward et al. 2017)
Platygaster novaezealandiae	Hymenoptera	Platygastridae	Data Deficient	Data Deficient	Hymenoptera 2014 (Ward et al. 2017)
Prosynopeas notaulicum	Hymenoptera	Platygastridae			
Shireplitis frodoi	Hymenoptera	Braconidae	Data Deficient	Data Deficient	Hymenoptera 2014 (Ward et al. 2017)
Shireplitis tolkieni	Hymenoptera	Braconidae	Data Deficient	Data Deficient	Hymenoptera 2014 (Ward et al. 2017)
Woldstedtius gauldius	Hymenoptera	Ichneumonidae	Not Threatened	Not Threatened	Hymenoptera 2014 (Ward et al. 2017)
Zelandonota rufiscutum	Hymenoptera	Platygastridae	Data Deficient	Data Deficient	Hymenoptera 2014 (Ward et al. 2017)
Zelostemma longipedicellatum	Hymenoptera	Platygastridae			
Zelostemma medionitens	Hymenoptera	Platygastridae			
Zelostemma brevistriatum	Hymenoptera	Platygastridae			
Zelostemma laevicornu	Hymenoptera	Platygastridae			
Zelostemma popovicii	Hymenoptera	Platygastridae			
Austridotea benhami	Isopoda	Idoteidae	At Risk	Naturally Uncommon	Freshwater invertebrates 2018 (Grainger et al. 2018)
Aoraia oreobolae	Lepidoptera	Hepialidae	At Risk	Naturally Uncommon	Freshwater invertebrates 2018 (Grainger et al. 2018)
Aoraia orientalis	Lepidoptera	Hepialidae			
Arctesthes siris	Lepidoptera	Geometridae			
Arctesthes titanica	Lepidoptera	Geometridae	Threatened	Nationally Vulnerable	Lepidoptera 2015 (Hoare et al. 2017)
Atomotricha lewisi	Lepidoptera	Oecophoridae			
Dichromodes gypsotis	Lepidoptera	Geometridae			
Dichromodes ida	Lepidoptera	Geometridae			
Dichromodes simulans	Lepidoptera	Geometridae			
Epichorista tenebrosa	Lepidoptera	Tortricidae			
Gelophaula palliata	Lepidoptera	Tortricidae			
Hierodoris gerontion	Lepidoptera	Oecophoridae			
Hydriomena clarkei	Lepidoptera	Geometridae			

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Endemic invertebrates

Name	Order	Family	NZTCS Category	NZTCS Status	Report Name
Lycaena sp. *"Chrystalls Beach"*	Lepidoptera	Lycaenidae	Threatened	Nationally Critical	Lepidoptera 2015 (Hoare et al. 2017)
Loxostege sp. "salt pan"	Lepidoptera	Crambidae	At Risk	Relict	Lepidoptera 2015 (Hoare et al. 2017)
Mallobathra cataclysma	Lepidoptera	Psychidae			
Mallobathra memotuina	Lepidoptera	Psychidae			
Mallobathra perisseuta	Lepidoptera	Psychidae			
Notoreas "South Shag River"	Lepidoptera	Geometridae			
Orocrambus cultus	Lepidoptera	Crambidae			
Orocrambus geminus	Lepidoptera	Crambidae			
Orocrambus lindsayi	Lepidoptera	Crambidae			
Orocrambus punctellus	Lepidoptera	Crambidae	Data Deficient	Data Deficient	Lepidoptera 2015 (Hoare et al. 2017)
Phylacodes cauta	Lepidoptera	Plutellidae			
Pyrgotis humilis	Lepidoptera	Tortricidae			
Scoparia caliginosa	Lepidoptera	Crambidae			
Scoparia pascoella	Lepidoptera	Crambidae			
Scoparia tuicana	Lepidoptera	Crambidae			
Scoriodyta suttonensis	Lepidoptera	Psychidae			
Tinea furcillata	Lepidoptera	Tineidae			
Tingena terrena	Lepidoptera	Oecophoridae			
Archyala culta	Lepidoptera	Tineidae	Data Deficient	Data Deficient	Lepidoptera 2015 (Hoare et al. 2017)
Hierodoris polita	Lepidoptera	Xyloryctidae	At Risk	Naturally Uncommon	Lepidoptera 2015 (Hoare et al. 2017)
Americovibone remota	Opiliones	Neopilionidae			
Cenefia sorenseni	Opiliones	Triaenonychidae			
Nuncia (Corinuncia) *sublaevis* (Pocock, 1903)	Opiliones	Triaenonychidae			
Rakaia macra	Opiliones	Pettalidae			
Prasma sorenseni regalia	Opiliones	Triaenonychidae			
Pharmacus notabilis	Orthoptera	Rhaphidophoridae	Not Threatened	Not Threatened	Orthoptera 2022 (Trewick et al. 2022)
Pharmacus senex	Orthoptera	Rhaphidophoridae	Not Threatened	Not Threatened	Orthoptera 2022 (Trewick et al. 2022)
Pharmacus vallestris	Orthoptera	Rhaphidophoridae	Data Deficient	Data Deficient	Orthoptera 2022 (Trewick et al. 2022)
Setascutum pallidum	Orthoptera	Rhaphidophoridae	Not Threatened	Not Threatened	Orthoptera 2022 (Trewick et al. 2022)
Sigaus childi	Orthoptera	Acrididae	Threatened	Nationally Vulnerable	Orthoptera 2022 (Trewick et al. 2022)
Nesoperla patricki	Plecoptera	Gripopterygidae	Threatened	Nationally Critical	Freshwater invertebrates 2018 (Grainger et al. 2018)
Zelandobius auratus	Plecoptera	Gripopterygidae	Data Deficient	Data Deficient	Freshwater invertebrates 2018 (Grainger et al. 2018)
Zelandobius crawfordi	Plecoptera	Gripopterygidae	Threatened	Nationally Critical	Freshwater invertebrates 2018 (Grainger et al. 2018)
Zelandobius edwardsi	Plecoptera	Gripopterygidae	Threatened	Nationally Critical	Freshwater invertebrates 2018 (Grainger et al. 2018)
Zelandobius inversus	Plecoptera	Gripopterygidae	Data Deficient	Data Deficient	Freshwater invertebrates 2018 (Grainger et al. 2018)
Zelandobius mariae	Plecoptera	Gripopterygidae	Threatened	Nationally Critical	Freshwater invertebrates 2018 (Grainger et al. 2018)

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Endemic invertebrates

Name	Order	Family	NZTCS Category	NZTCS Status	Report Name
Zelandobius montanus	Plecoptera	Gripopterygidae	Data Deficient	Data Deficient	Freshwater invertebrates 2018 (Grainger et al. 2018)
Zelandoperla maungatuaensis	Plecoptera	Gripopterygidae			
Synsphyronus lineatus	Pseudoscorpiones	Garypidae			
Austrachipteria novazealandica	Sarcoptiformes	Achipteriidae			
Cultroribula otagoensis	Sarcoptiformes	Astegistidae			
Dicrotegaeus incurvus	Sarcoptiformes	Cerocepheidae			
Dicrotegaeus mariehammerae	Sarcoptiformes	Cerocepheidae			
Lanceoppia trapezoides	Sarcoptiformes	Oppiidae			
Macrogena abbreviata	Sarcoptiformes	Ceratozetidae			
Macrogena brevisensilla	Sarcoptiformes	Ceratozetidae			
Macrogena hexasetosa	Sarcoptiformes	Ceratozetidae			
Magellozetes crassisetosus	Sarcoptiformes	Ceratozetidae			
Microlamellarea minuta	Sarcoptiformes	Lamellareidae			
Pedunculozetes ovatum	Sarcoptiformes	Chamobatidae			
Porallozetes badamdorji	Sarcoptiformes	Punctoribatidae			
Pterochthonius roynortoni	Sarcoptiformes	Atopochthoniidae			
Safrobates gerdi	Sarcoptiformes	Oribatellidae			
Safrobates insignis	Sarcoptiformes	Oribatellidae			
Scapheremaeus gibbus	Sarcoptiformes	Cymbaeremaeidae			
Scapheremaeus luxtoni	Sarcoptiformes	Cymbaeremaeidae			
Tripiloppia alpina	Sarcoptiformes	Oppiidae			
Tripiloppia frigida	Sarcoptiformes	Oppiidae			
Zealandozetes southensis	Sarcoptiformes	Maudheimiidae			
Alsolemia cresswelli	Stylommatophora	Charopidae	Threatened	Nationally Critical	Land Snails 2010: (Mahlfeld et al. 2012)
Costachorema hebdomon	Trichoptera	Hydrobiosidae	At Risk	Naturally Uncommon	Freshwater invertebrates 2018 (Grainger et al. 2018)
Oeconesus angustus	Trichoptera	Oeconesidae	Threatened	Nationally Critical	Freshwater invertebrates 2018 (Grainger et al. 2018)
Olinga christinae	Trichoptera	Conoesucidae	Data Deficient	Data Deficient	Freshwater invertebrates 2018 (Grainger et al. 2018)
Philorheithrus harunae	Trichoptera	Philorheithridae	At Risk	Naturally Uncommon	Freshwater invertebrates 2018 (Grainger et al. 2018)
Pseudoeconesus paludis	Trichoptera	Oeconesidae	Threatened	Nationally Endangered	Freshwater invertebrates 2018 (Grainger et al. 2018)
Tiphobiosis quadrifurca	Trichoptera	Hydrobiosidae	Data Deficient	Data Deficient	Freshwater invertebrates 2018 (Grainger et al. 2018)
Aceria microphyllae	Trombidiformes	Eriophyidae			
Diversipes laticaudatus	Trombidiformes	Scutacaridae			
Pedaculops propinquae	Trombidiformes	Eriophyidae			
Scutacarus cornutus	Trombidiformes	Scutacaridae			
Scutacarus incisus	Trombidiformes	Scutacaridae			

Forty vascular plant species are endemic to Otago (Table 4). Of these forty, the most speciose order was Asterales with 11 taxa, Boraginales and Poales with seven taxa, Capparales with three taxa, Araliales, Rosales, Thymelaeales with two taxa, and six orders had one taxon (Apiales, Caryophyllales, Fabales, Oxalidales, Ranunculales and Violales).

For 34 taxa of regionally vascular plants, they had their conservation status assessed nationally (Table 4; de Lange et al. 2024), while all 40 taxa had their conservation status assessed regionally (Table 4; Jarvie et al. 2025). In the recent regional threatened classification 20 species were assessed as Regionally Threatened (Regionally Critical = 13; Regionally Endangered = 4; Regionally Vulnerable = 3), 16 species were Regionally At Risk (Regionally Declining = 3; Regionally Naturally Uncommon = 13) and four taxa were Regionally Data Deficient.

In Otago six lizard species are regional endemics (Table 5). Of these six, three are skinks and three are geckos. Two of the largest, most colourful species of skinks in Aotearoa New Zealand are the regionally endemic Otago skink (*O. otagense*) and grand skink (*O. grande*). Shiny black with bold blotches of gold, the Otago skink can reach 30 cm in length on a heavy-set body and is a true giant among the country's endemic skinks. The grand skink is a little smaller and more svelte than the Otago, and its skin is peppered with tiny golden flecks on a black background. A small alpine skink is the third regionally endemic skink and is restricted to two populations in inland Otago; it is known as the Burgan skink (*O. burganae*). The three gecko species that are endemic to Otago belong to the *Woodworthia* species complex: Raggedy Range gecko (*W.* "Raggedy"), schist gecko (*W.* "Central Otago"), and the Kawarau gecko (*W.* "Cromwell). These three gecko species are medium-sized, with diurno-noctural activity patterns, and typically occur in rocky habitats. All six regionally endemic lizards are at risk or threatened with extinction as assessed in the national and regional threat classifications (Hitchmough et al. 2021; Jarvie et al. 2024).

Table 4. Regionally endemic vascular plants species in Otago. The New Zealand Threat Classification System (NZTCS) and Regionally Threat Classification System (RTCS) categories and statuses are provided. The NZTCS report is de Lange et al. 2024 and RTCS report is Jarvie et al. 2025.

Name and authority	Common name	Order	Family	NZTCS category	NZTCS status	RTCS category	RTCS status
Abrotanella patearoa Heads		Asterales	Asteraceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Naturally Uncommon
Acaena aff. *rorida* (OTA 59561; Pool Burn)	bidibidi	Rosales	Rosaceae	Threatened	Nationally Critical	Regionally Threatened	Regionally Critical
Acaena tesca B.H.Macmill.	bidibidi	Rosales	Rosaceae	Not Threatened	Not Threatened	Regionally At Risk	Regionally Naturally Uncommon
Anisotome (b) (CHR 511716); "Otago bog")		Araliales	Apiaceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Naturally Uncommon
Anthosachne aprica (Á.Löve & Connor) C.Yen & J.L.Yang	blue wheat grass	Poales	Poaceae	At Risk	Naturally Uncommon	Regionally Threatened	Regionally Vulnerable
Apium "inland saline"		Apiales	Apiaceae			Regionally Threatened	Regionally Critical
Brachyscome humilis G.Simpson & J.S.Thomson	daisy	Asterales	Asteraceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Naturally Uncommon
Brachyscome "Taiari"		Asterales	Asteraceae			Regionally Threatened	Regionally Critical
Cardamine sciaphila Heenan	cress	Capparales	Brassicaceae	Threatened	Nationally Critical	Regionally Threatened	Regionally Critical
Carex applanata Thorsen & de Lange		Poales	Cyperaceae	At Risk	Naturally Uncommon	Regionally Threatened	Regionally Endangered
Carex aff. *aucklandica* "Dunstan"		Poales	Cyperaceae			Regionally Data Deficient	Regionally Data Deficient
Carex aff. *wakatipu* (e) (CHR 472041; Bendigo)		Poales	Cyperaceae			Regionally Data Deficient	Regionally Data Deficient
Carmichaelia compacta Petrie	Cromwell broom	Fabales	Fabaceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Declining
Celmisia haastii var. *tomentosa* G.Simpson & J.S.Thomson	daisy	Asterales	Asteraceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Naturally Uncommon
Celmisia lindsayi Hook.f.	Lindsay's Daisy	Asterales	Asteraceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Naturally Uncommon
Craspedia argentea Breitw. & K.A.Ford, sp. nov.		Asterales	Asteraceae	Threatened	Nationally Critical	Regionally Threatened	Regionally Critical
Craspedia (ll) (CHR 629757; Otago)		Asterales	Asteraceae	Not Threatened	Not Threatened	Regionally Data Deficient	Regionally Data Deficient
Craspedia (y) (CHR 516260; Cape Saunders)		Asterales	Asteraceae	Threatened	Nationally Critical	Regionally Threatened	Regionally Critical
Festuca matthewsii subsp. *pisamontis* Connor		Poales	Poaceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Naturally Uncommon
Gingidia grisea Heenan		Araliales	Apiaceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Declining
Helichrysum simpsonii subsp. *tumidum (Cheeseman)* de Lange & Blanchon		Asterales	Asteraceae	Threatened	Nationally Vulnerable	Regionally Threatened	Regionally Vulnerable
Kelleria villosa var. *barbata* Heads		Thymelaeales	Thymelaeaceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Naturally Uncommon
Leptinella aff. *pectinata* (a) (CHR 580894; Nevis)		Asterales	Asteraceae	Threatened	Nationally Vulnerable	Regionally Threatened	Regionally Vulnerable
Lepidium crassum Heenan & de Lange	thick-leaved scurvy grass	Capparales	Brassicaceae	Threatened	Nationally Endangered	Regionally Threatened	Regionally Endangered
Lepidium kirkii Petrie	salt-pan cress	Capparales	Brassicaceae	Threatened	Nationally Critical	Regionally Threatened	Regionally Critical
Luzula traversii var. *tenuis* Edgar	wood-rush	Poales	Juncaceae	At Risk	Naturally Uncommon	Regionally Threatened	Regionally Endangered
Melicytus aff. *crassifolius* (b) (CHR 616706; Cape Saunders)		Violales	Violaceae	Threatened	Nationally Critical	Regionally Threatened	Regionally Critical
Montia aff. *fontana* (CHR 681612; "Otago alpine flush")		Caryophyllales	Montiaceae			Regionally At Risk	Regionally Naturally Uncommon
Myosotis albosericea Hook.f.		Boraginales	Boraginaceae	Threatened	Nationally Critical	Regionally Threatened	Regionally Critical
Myosotis bryonoma Meudt, Prebble & Thorsen	forget-me-not	Boraginales	Boraginaceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Naturally Uncommon

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Endemic vascular plants

Name and authority	Common name	Order	Family	NZTCS category	NZTCS status	RTCS category	RTCS status
Myosotis glabrescens L.B.Moore	forget-me-not	Boraginales	Boraginaceae	Threatened	Nationally Critical	Regionally Threatened	Regionally Critical
Myosotis goyenii Petrie subsp. *goyenii*		Boraginales	Boraginaceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Declining
Myosotis hikuwai Meudt et al. 2022.		Boraginales	Boraginaceae	Threatened	Nationally Endangered	Regionally Threatened	Regionally Endangered
Myosotis oreophila Petrie		Boraginales	Boraginaceae	Threatened	Nationally Critical	Regionally Threatened	Regionally Critical
Myosotis umbrosa Meudt, Prebble & Thorsen		Boraginales	Boraginaceae	Threatened	Nationally Critical	Regionally Threatened	Regionally Critical
Oxalis aff. *magellanica* (CHR 472028: "Otago alpine flush")		Oxalidales	Oxalidaceae			Regionally At Risk	Regionally Naturally Uncommon
Pimelea sericeovillosa subsp. *alta* C.J.Burrows		Thymelaeales	Thymelaeaceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Naturally Uncommon
Poa pygmaea Buchanan		Poales	Poaceae	At Risk	Naturally Uncommon	Regionally At Risk	Regionally Naturally Uncommon
Solenogyne christensenii (Petrie) de Lange, Jian Wang ter & Barkla, comb. nov.		Asterales	Asteraceae	Threatened	Nationally Critical	Regionally Threatened	Regionally Critical
Ranunculus (c) (CHR 472008; Garvie Range)		Ranunculales	Ranunculaceae	Data Deficient	Data Deficient	Regionally At Risk	Regionally Naturally Uncommon

Table 5. Regionally endemic reptile species in Otago. The New Zealand Threat Classification System (NZTCS) and Regionally Threat Classification System (RTCS) categories and statuses are provided. The NZTCS report is Hitchmough et al. 2021 and RTCS report is Jarvie et al. 2024.

Name and authority	Common name	NZTCS Category	NZTCS Status	RTCS Category	RTCS Status
Oligosoma burganae Chapple et al., 2011	Burgan skink	Threatened	Nationally Endangered	Regionally Threatened	Regionally Vulnerable
Oligosoma grande (Gray, 1845)	grand skink	Threatened	Nationally Endangered	Regionally Threatened	Regionally Endangered
Oligosoma otagense (McCann, 1955)	Otago skink	Threatened	Nationally Endangered	Regionally Threatened	Regionally Endangered
Woodworthia "Central Otago"	schist gecko	At Risk	Declining	Regionally At Risk	Regionally Declining
Woodworthia "Cromwell"	Kawarau gecko	At Risk	Declining	Regionally At Risk	Regionally Declining
Woodworthia "Raggedy"	Raggedy Range gecko	Threatened	Nationally Vulnerable	Regionally Threatened	Regionally Vulnerable

In Otago two bryophytes are regionally endemic (Table 6). One of these species is a liverwort (*Neolepidozia patentissima* var. *ampliata*, with a national threat assessment of Data Deficient), while the other is a moss (*Conostomum pusillum* var. *otagoensis*, whose threat status has not yet been nationally assessed).

Table 6. Regionally endemic bryophyte species in Otago. The New Zealand Threat Classification System (NZTCS) category and status for the liverwort is from de Lange et al. 2020.

Name and authority	Order	NZTCS category	NZTCS status	Functional group
***Neolepidozia patentissima* var. *ampliata* (J.J.Engel & G.L.Sm.) E.D.Cooper**	Jungermanniales	Data Deficient	Data Deficient	liverwort
***Conostomum pusillum* var. *otagoensis* Fife**	Bartramiales			moss

The only regionally endemic bird species is the Otago shag/matapo, i.e., known to currently exclusively breed in the region (Table 7). Although Holocene fossil and archaeological midden assemblages indicate a former wider distribution across the eastern Te Waipournamu/South Island, following human arrival the species became restricted to rocky cliffs and islands off Otago. The Otago shag has recently extended their range northwards and southwards, and now occur from the southern Catlins north towards the Waitaki River. Using updated information released since national assessment, research suggests the species is not having a population increase > 10% but would have a stable count of ±10 % between 2007 and 2021 (Parker & Rexer-Huber 2022); this is why there is a difference between the national status vs. the regional status.

Table 7. Regionally endemic bird species in Otago. The New Zealand Threat Classification System (NZTCS) category and status is from Robertson et al. 2021 and the Regional Threat Classification (RTCS) category and status is from Jarvie et al. 2025.

Name and authority	Common Name	Māori Name	NZTCS category	NZTCS status	RTCS category	NZTCS status
Leucocarbo chalconotus G.R. Gray, 1845	Otago shag	matapo	Threatened	Nationally Increasing	Regionally Threatened	Regionally Vulnerable

Eight freshwater fishes are endemic to the Otago region, all of which are Galaxiid species (Table 8). There are two slim and slender species from the pencil galaxias group – lowland longjaw galaxias (*Galaxias cobitinis*) and alpine galaxias (Manuherikia River) (*G.* aff. *paucispondylus* "Manuherikia"), and six belong to the cigar-shaped *Galaxias vulgaris* species complex: Central Otago roundhead galaxias (*G. anomalus*), Taieri flathead galaxias *(G. depressiceps*), Eldon's galaxias (*G. eldoni*), dusky galaxias (*G. pullus*), Teviot flathead galaxias (*G.* "Teviot") and Nevis galaxias (*G.* "Nevis"). All of Otago's endemic freshwater fishes are threatened with extinction (Dunn et al. 2018).

Table 8. Regionally endemic freshwater fishes in Otago. The New Zealand Threat Classification System (NZTCS) categories and statuses are provided. The NZTCS report is Dunn et al. 2018.

Name and authority	Common name	NZTCS Category	NZTCS Status
Galaxias anomalus Stokell, 1959	central Otago roundhead galaxias	Threatened	Nationally Endangered
Galaxias cobitinis McDowall & Waters, 2002	lowland longjaw galaxias (Kakanui River)	Threatened	Nationally Critical
Galaxias depressiceps McDowall & Wallis, 1996	Taieri flathead galaxias	Threatened	Nationally Vulnerable
Galaxias eldoni McDowall, 1997	Eldon's galaxias	Threatened	Nationally Endangered
Galaxias pullus McDowall, 1997	dusky galaxias	Threatened	Nationally Endangered
Galaxias "Teviot"	Teviot flathead galaxias (Teviot River)	Threatened	Nationally Critical
Galaxias aff. *paucispondylus* "Manuherikia"	alpine galaxias (Manuherikia River)	Threatened	Nationally Endangered
Galaxias "Nevis"	Nevis galaxias (Nevis River)	Threatened	Nationally Endangered

Summary and conclusions

The Otago Region has a diverse biota (fauna, flora and fungi) reflecting the region's contemporary landscapes, geological past and climatic history. Alpine areas, river valleys, dryland ecosystems and coastal landscapes are among the many ecosystems that contribute to this biodiversity.

For most taxonomic groups, the process of obtaining data and verifying regional endemics within the Otago region worked well, particularly with the data-driven approach trialled. However, it would be highly valuable to have all institutions in Aotearoa New Zealand provide data to GBIF as a central aggregator of biodiversity information. This would enhance access to data and provide better taxonomic and geographical coverage.

Endemic species

A total of 358 species were identified as regionally endemic to Otago. Although it is often difficult to create lists of endemic species for a region, with the traditional approach being to create a list by sifting through published literature, examining specimens in collections, and/or conducting new sampling. However, these are time consuming tasks, typically done by a researcher with a restricted taxonomic focus. The combination of the data-driven- and traditional -approaches has made regionally endemic lists of species feasible.

Because of the increasing number of digital records now makes such a task much easier and taxonomically more comprehensive, the data-driven approach used in this report to generate a preliminary regional list of endemic species worked well. For example, it returned several well-known endemic species, such as the Cromwell chafer beetle (*Prodontria lewisi*), the speargrass weevil (*Lyperobius cupiendus*), and the Maungatua stonefly (*Zelandoperla maungatuaensis*), salt pan cress (*Lepidium kirkii*), Cromwell broom (*Carmichaelia compacta*), Otago skink (*Oligsoma otagense*), grand skink (*O. grande*), among many others.

Despite this, the endemic list should be considered preliminary. The biggest issue is that the list has been created with incomplete digital information about almost all the species. Consequently, the extent of the geographical distribution is also likely to be incomplete (although there are some exceptions; for example, the Cromwell chafer beetle, the Maungatua stonefly, salt pan cress and the grand skink).

Greater confidence could be obtained by: 1) digitising all specimens that already exist in taxonomic collections, and 2) undertaking new field surveys to better delimit a species

distribution (e.g., it is likely that some of the regionally endemic species listed in this report will also be present in the Southland and Canterbury regions).

Due to the nature of working with incomplete data on such projects, it is encouraged that if regionally endemic taxa in the Otago Region do not appear that they should be reported for inclusion in subsequent reports. This will include a focus on regional endemic lists for species from lesser-known taxonomic groups, e.g., fungi, freshwater invertebrates, spiders.

Recommendations

- Complete compilation of regional endemic lists for species from lesser-known taxonomic groups.
- Support initiatives to digitise all specimens and samples of endemic species in the Otago Region. This will give important information on their geographical distributions.
- Encourage institutions to become data providers to GBIF as a central aggregator of biodiversity information. This will enhance access to data and provide better taxonomic and geographical coverage.
- Encourage and support national initiatives on the digitisation of specimens and the georeferencing of locality information.

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References

Andrew, I.G., Macfarlane, R.P., Johns, P.M., Hitchmough, R.A., Stringer, I.A.N. (2012). The conservation status of New Zealand Diptera. New Zealand Entomologist 35: 99–102.

Baker, C.S., Boren, L., Childerhouse, S., Constantine, R., van Helden, A., Lundquist, D., Rayment, W., Rolfe, J.R. (2019). Conservation status of New Zealand marine mammals, 2019. New Zealand Threat Classification Series 29. Department of Conservation, Wellington. 18 p.

Barker, G.M., Brook, F.J., Mahlfeld, K., Walker, K., Roscoe, D.J., Hitchmough, R.A., Edwards, E., Rolfe, J.R., Michel, P. (2021). Conservation status of New Zealand indigenous terrestrial Gastropoda (slugs and snails), 2020. Part 1. Athoracophoridae (leaf-veined slugs) and Succineidae (amber snails). New Zealand Threat Classification Series 32. Department of Conservation, Wellington. 15 p.

Buckley, T.R., Boyer, S., Bartlam, S., Hitchmough, R., Rolfe, J., Stringer, I. (2015). Conservation status of New Zealand earthworms, 2014. New Zealand Threat Classification Series 10. Department of Conservation, Wellington. 10 p.

Buckley, T.R., Hitchmough, R., Rolfe, J., Stringer, I. (2016). Conservation status of New Zealand stick insects, 2014. New Zealand Threat Classification Series 15. Department of Conservation, Wellington. 3 p.

Buckley, T.R., Palma, R.L., Johns, P.M., Gleeson, D.M., Heath, A.C.G., Hitchmough, R.A., Stringer, I.A.N. (2012). The conservation status of small or less well-known groups of New Zealand terrestrial invertebrates. New Zealand Entomologist 35: 137–143,

Burns, R.J., Bell, B.D., Haigh, A., Bishop, P., Easton, L., Wren, S., Germano, J., Hitchmough, R.A., Rolfe, J.R., Makan, T. (2018). Conservation status of New Zealand amphibians, 2017. New Zealand Threat Classification Series 25. 7 p.

Cooper J.A., Buchanan, P.K., Leonard, P., Allison-Cooper, L., Johnston, P., Padamsee, M., McKenzie, M., Michel, P. (2022). Conservation status of selected species of non-lichenised agarics, boletes and russuloid fungi in Aotearoa New Zealand. New Zealand Threat Classification Series 38. Department of Conservation, Wellington. 49 p.

Department of Conservation (DOC). (2020a). Biodiversity in Aotearoa – overview of state, trends and pressures. https://www.doc.govt.nz/globalassets/documents/conservation/biodiversity/anzbs-2020-biodiversity-report.pdf

Department of Conservation (DOC). (2020b). Te Mana o Te Taiao - Aotearoa New Zealand Biodiversity Strategy 2020. https://www.doc.govt.nz/globalassets/documents/conservation/biodiversity/anzbs-2020.pdf

de Lange, P., Blanchon, D., Knight, A., Elix, J., Lücking, R., Frogley, K., Harris, A., Cooper, J., Rolfe, J. (2018). Conservation status of New Zealand indigenous lichens and lichenicolous fungi, 2018. New Zealand Threat Classification Series 27. Department of Conservation, Wellington. 64 p.

de Lange, P.J., Glenny, D., Frogley, K., Renner, M.A.M., von Konrat, M., Engel, J.J., Reeb, C., Rolfe, J.R. (2020). Conservation status of New Zealand hornworts and liverworts. New Zealand Threat Classification Series 31. Department of Conservation, Wellington. 30 p.

de Lange, P.J., Gosden, J., Courtney, S.P., Fergus, A.J., Barkla, J.W., Beadel, S.M., Champion, P.D., Hindmarsh-Walls, R., Makan, T., Michel, P. (2024). Conservation status of vascular plants in Aotearoa New Zealand, 2023. New Zealand Threat Classification Series 43. Department of Conservation, Wellington. 105 p.

Dunn, N.R., Allibone, R.M., Closs, G.P., Crow, S.K., David, B.O., Goodman, J.M., Griffiths, M., Jack, D.C., Ling, N., Waters, J.M., Rolfe, J.R. (2018). Conservation status of New Zealand freshwater fishes, 2017. New Zealand Threat Classification Series 24. Department of Conservation, Wellington. 11 p.

Duffy, C., Francis, M., Dunn; M., Finucci, B., Ford, R., Hitchmough, R., Rolfe, J. (2018). Conservation status of New Zealand chondrichthyans (chimaeras, sharks and rays), 2016. New Zealand Threat Classification Series 23. Department of Conservation, Wellington. 13 p.

Funnel, G., Gordon, D., Leduc, D., Makan, T., Marshall, B.A., Mills, S., Michel, P., Read, G., Schnabel, K., Tracey, D., Wing, S. (2023). Conservation status of indigenous marine invertebrates in Aotearoa New Zealand, 2021. New Zealand Threat Classification Series 40. Department of Conservation, Wellington. 42 p.

Grainger, N., Harding, J., Drinan, T., Collier, K., Smith, B., Death, R., Makan, T., Rolfe, J. (2018). Conservation status of New Zealand freshwater invertebrates, 2018. New Zealand Threat Classification Series 28. Department of Conservation, Wellington. 25 p.

Heath, A., Rolfe, J., Michel, P. (2022). Conservation status of parasitic mites and ticks (Acari) in New Zealand, 2021. New Zealand Threat Classification Series 37. Department of Conservation, Wellington. 23 p

Heath, A.C.G., Stringer, I., Hitchmough, R., Rolfe, J. (2015). Conservation status of New Zealand fleas, 2014. New Zealand Threat Classification Series 12. Department of Conservation, Wellington. 5 p

Hitchmough, R.A., Barr, B., Knox, C., Lettink, M., Monks, J.M., Patterson, G.B., Reardon, J.T., van Winkel, D., Rolfe, J, Michel, P. (2021). Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series 35. Department of Conservation, Wellington. 15 p.

Hoare, R.J.B., Dugdale, J.S., Edwards, E.D., Gibbs, G.W., Patrick, B.H., Hitchmough, R.A., Rolfe, J.R. 2017: Conservation status of New Zealand butterflies and moths (Lepidoptera), 2015. New Zealand Threat Classification Series 20. Department of Conservation, Wellington. 13 p.

Jarvie, S. (2024). Regional conservation status of Otago's amphibians. Otago Regional Council, Otago Classification Series, 2024/4. 24 p.

Jarvie, S., Barkla, J., Rance, B., Rogers, G., Ewans, R., Thorsen, M (2024b). Regional conservation status of indigenous vascular plants in Otago. Otago Regional Council, Otago Classification Series, 2024/3. 134 p.

Jarvie, S., Cooper, J. (2024). Regional conservation status of selected species of non-lichenised agarics, boletes and russuloid fungi in Otago. Otago Regional Council, Otago Threat Classification Series, 2024/7. 40 p.

Jarvie, S., Davidson-Watts, I., Dennis, G., Gower, C., Pryde, M. (2023). Regional conservation status of bat species in Otago. Otago Regional Council, Otago Threat Classification Series, 2023/2. 19 p.

Jarvie, S., Knox, C., Monks, J.M., Purdie, S., Reardon, J., Campbell, C. (2024a). Regional conservation status of reptile species in Otago. Otago Regional Council, Otago Threat Classification Series, 2024/5. 43 p.

Leschen, R.A.B., Marris, J.W.M., Emberson, R.M., Nunn. J., Hitchmough, R.A., Stringer, I.A.N. (2012). The conservation status of New Zealand Coleoptera. New Zealand Entomologist 35: 91–98.

Michel, P. (2021). Amendment to the New Zealand Threat Classification System 2008: revised categories 2021. Department of Conservation, Wellington. 5 p.

Nelson, W.A., Neill, K., D'Archino, R., Rolfe, J.R. (2019). Conservation status of New Zealand macroalgae, 2019. New Zealand Threat Classification Series 30. Department of Conservation, Wellington. 33 p.

O'Donnell, C., Borkin, K., Christie, J., Davidson-Watts, I., Dennis, G., Pryde, M., Michel, P. (2023). Conservation status of bats in Aotearoa New Zealand, 2022. New Zealand Threat Classification Series 41. Department of Conservation, Wellington. 18 p.

Robertson, H.A., Baird, K.A., Elliot, G.P., Hitchmough, R.A., McArthur, N.J., Makan, T, Miskelly, C.M., O'Donnell, C.J., Sagar, P.M., Scofield, R.P., Taylor, G.A., Michel, P. (2021). Conservation status of birds in Aotearoa New Zealand, 2021. New Zealand Threat Classification Series 36. Department of Conservation, Wellington. 43 p.

Rolfe, J., Hitchmough, R., Michel, P., Makan, T., Cooper, J.A., de Lange, P.J., Townsend, C.A.J., Miskelly, C.M., Molloy, J. (2022). New Zealand Threat Classification System manual 2022. Part 1: Assessments. Department of Conservation, Wellington. 45 p.

Rolfe, J., Makan, T. Tait, A. (2021). Supplement to the New Zealand Threat Classification System manual 2008: new qualifiers and amendments to qualifier definitions, 2021. Department of Conservation, Wellington. 7 p.

Sirvid, P.J., Vink, C.J., Fitzgerald, B.M., Wakelin, M.D., Rolfe, J., Michel, P. 2020: Conservation status of New Zealand Araneae (spiders), 2020. New Zealand Threat Classification Series 34. Department of Conservation, Wellington. 33 p.

Stringer, I.A.N., Hitchmough, R.A., Larivière, M.-C., Eyles, A.C., Teulon, D.A.J., Dale, P.J., Henderson, R.C. (2012). The conservation status of New Zealand Hemiptera. New Zealand Entomologist 35: 110–115.

Townsend, A.J., de Lange, P.J., Duffy, C.A.J., Miskelly, C.M., Molloy, J., Norton, D.A. (2008). New Zealand Threat Classification System manual. Department of Conservation, Wellington. 35 p.

Trewick, S., Hegg, D., Morgan-Richards, M., Murray, T., Watts, C., Johns, P., Michel, P. (2022). Conservation status of Orthoptera (wētā, crickets and grasshoppers) in Aotearoa New Zealand, 2022. New Zealand Threat Classification Series 39. Department of Conservation, Wellington. 28 p.

Trewick, S., Hitchmough, R., Rolfe, J., Stringer, I. (2018). Conservation status of New Zealand Onychophora ('peripatus' or velvet worm), 2018. New Zealand Threat Classification Series 26. Department of Conservation, Wellington. 3 p

Rolfe, J.R., Fife, A.J., Beever, J.E., Patrick J. Brownsey, P.J., Hitchmough, R.A. (2016). Conservation status of New Zealand mosses, 2014. New Zealand Threat Classification Series 13. Department of Conservation, Wellington. 12 p.

Walker, K., Brook, F.J., Barker, G.M., Roscoe, D.J., Edwards, E., Hitchmough, R.A., Rolfe, J.R.; Michel, P. (2021). Conservation status of New Zealand indigenous terrestrial Gastropoda (slugs and snails), 2020. Part 2. Achatinellidae, Bothriembryontidae (pūpūharakeke), Euconulidae, Helicarionidae, Pupinidae and Vertiginidae. New Zealand Threat Classification Series 33. Department of Conservation, Wellington. 9 p.

Walker, K., Walton, K., Edwards, E., Hitchmough, R., Payton, I., Barker, G., Michel, P. (2024). Conservation status of New Zealand indigenous terrestrial Gastropoda (slugs and snails). Part 3. Rhytididae (carnivorous snails), 2022. New Zealand Threat Classification Series 42. Department of Conservation, Wellington. 32 p.

Ward, D., Early, J., Schnitzler, F-R., Hitchmough, R., Rolfe, J., Stringer, I. (2017). Conservation status of New Zealand Hymenoptera, 2014. New Zealand Threat Classification Series 18. Department of Conservation, Wellington. 14 p.

Yeates, G.W., Zhao, Z.Q., Hitchmough, R.A., Stringer, I.A.N. (2012). The conservation status of New Zealand Nematoda. New Zealand Entomologist 35: 128–130

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