



Conservation status of Orthoptera (wētū, crickets and grasshoppers) in Aotearoa New Zealand, 2022

Steve Trewick, Danilo Hegg, Mary Morgan-Richards, Tara Murray, Corinne Watts,

Caption: Jacinda's wētā (*Hemiandrus jacinda*), At Risk - Naturally Uncommon. Photo: © Steve Trewick

New Zealand Threat Classification Series is a scientific monograph series presenting publications related to the New Zealand Threat Classification System (NZTCS). Most will be lists providing the NZTCS status of members of a group (e.g. algae, birds, spiders, fungi). There are currently 23 groups, each assessed once every 5 years. From time to time the manual that defines the categories, criteria, and process for the NZTCS will be reviewed. Publications in this series are considered part of the formal international scientific literature.

This publication is available for download from the Department of Conservation website. Refer www.doc.govt.nz under **Publications**.

The NZTCS database can be accessed at nzctcs.org.nz. For all enquiries, email threatstatus@doc.govt.nz.

© Copyright December 2022, New Zealand Department of Conservation

ISSN 2324-1713 (web PDF)

ISBN 978-1-99-118364-4 (web PDF)

This report was prepared for publication by Te Rōpū Ratonga Auaha, Te Papa Atawhai / Creative Services, Department of Conservation; editing by Amanda Todd and layout by Holly Slade. Publication was approved by Sharon Alderson, Director Monitoring and Evaluation, Department of Conservation, Wellington, New Zealand.

Published by Department of Conservation Te Papa Atawhai, PO Box 10420, Wellington 6143, New Zealand.

In the interest of forest conservation, we support paperless electronic publishing.



CONTENTS

Abstract	5
1. Background	6
2. Summary	8
2.1	

Conservation status of Orthoptera (w t , crickets and grasshoppers) in Aotearoa New Zealand, 2022

Steve Trewick^{1,*}, Danilo Hegg², Mary Morgan-Richards¹, Tara Murray³, Corinne Watts⁴, Peter Johns⁵ and Pascale Michel⁶

¹ Wildlife & Ecology Group, School of Natural Sciences, Massey University, Private Bag 11-222, Palmerston North 4442, New Zealand

² 135 Blacks Road, poho, Dunedin 9010, New Zealand

³ Department of Conservation, PO Box 5244, Dunedin 9054, New Zealand

⁴ Manaaki Whenua - Landcare Research, Private Bag 3127, Hamilton 3216, New Zealand

⁵ Canterbury Museum, Rolleston Avenue, Christchurch 8013, New Zealand

⁶ Department of Conservation, PO Box 10420, Wellington 6143, New Zealand

* Corresponding author; email: s.trewick@massey.ac.nz

Abstract

The conservation status of all 162 known taxa of Orthoptera (w t , crickets and grasshoppers) in Aotearoa New Zealand was reassessed using the New Zealand Threat Classification System (NZTCS). A list of these taxa is presented, along with a statistical summary and brief notes on the most important changes since the previous assessment. This list replaces all previous NZTCS lists for Orthoptera. In total, 18 taxa (11.1%) were assessed as being Threatened, 27 (16.7%) as At Risk, 95 (58.6%) as Not Threatened, and 5 (3.1%) as Introduced and Naturalised. A further 17 taxa (10.5%) were assessed as Data Deficient (i.e. insufficient information is available to assess their conservation status). Only 20 (12%) of the 162 documented Orthoptera taxa in Aotearoa New Zealand have not been formally described and named; however, we are aware of numerous additional entities. Also, several genera of Rhaphidophoridae, such as **Neonetus** and **Macropathus**, include species that are currently under investigation.

Keywords: Acrididae, Anostomatidae, Gryllacrididae, Gryllidae, Gryllotalpidae, Mogoplistidae, Rhaphidophoridae, Tettigoniidae, Trigonidiidae

1. Background

The New Zealand Threat Classification System (NZTCS) was developed in 2002 to complement the International Union for Conservation of Nature (IUCN) Red List system. Categories and criteria were defined to reflect Aotearoa New Zealand's unique environments and to account for the country's relatively small size and diversity of ecosystems, as well as the large number of taxa with naturally restricted ranges and/or small population sizes (Molloy et al. 2002). The conservation status of Orthoptera in Aotearoa New Zealand was first

A call for information was advertised through the New Zealand Entomological Society, DOC's 'Have your say' process (www.doc.govt.nz/conservation-status-weta-grasshoppers)



2. Summary

This report presents the conservation status of all 162 known taxa of Orthoptera (wētā, crickets and grasshoppers) in Aotearoa New Zealand. It is the latest update in a regular series of re-assessments (Hitchmough 2002; Hitchmough et al. 2007; Trewick et al. 2012, 2016).

In 2014, Trewick et al. (2016) assessed the conservation status of 175 Orthoptera taxa in Aotearoa New Zealand using the criteria specified in the NZTCS manual (Townsend et al. 2008). Here, we report a new assessment of 162 taxa, 24 of which have been assessed for the first time.

2.1 Additional taxa

Twenty-four taxa were assessed for the first time in 2022 (Table 1).

Eighteen of these are new species that were first described in recent papers (Taylor-Smith et al. 2016; Fitness et al. 2018; Hegg et al. 2019, 2022; Trewick et al. 2020; Trewick 2021). They include two species of Anostomatidae (genus **Hemiandrus**) and 16 species of Rhabdophoridae.

One native species of Gryllidae, **Gryllopsis maoria** (de Saussure, 1877), was accidentally omitted from previous assessments. This small, dark cricket has rarely been recorded and is listed as Data Deficient here.

Two exotic Orthoptera are recent arrivals in the country. The Australian katydid **Austrosalomona falcata** (Redtenbacher, 1891) was first detected in Aotearoa New Zealand in 2007 (MAF Biosecurity New Zealand 2007) and is now established in Northland (Green 2012). The cosmopolitan tropical house cricket **Grylloides sigillatus** (Walker, 1869) is occasionally intercepted at the border, and while an infestation detected in Tauranga in 2020 is thought to have been eradicated (Bleach 2020), more recent observations in Auckland suggest the species is still at large (see <https://inaturalist.nz/observations/109177874>).

The remaining three additions are taxonomically unresolved. The ground wētā **Hemiandrus** (CMNZ 2005.56.717) “*madisylvestris*” (Anostomatidae) is an undescribed endemic species (Johns 2001) that inhabits forest in South Westland and was recognised as valid by the panel. The scaly cricket **Ornebius** “*kermadecensis*” and a ground cricket **Pteronemobius** sp. (Gryllidae)

of *Bobilla bivittata* (Walker, 1869) in Aotearoa New Zealand was by Hudson (1973), who overlooked the descriptions of the native species *Bobilla nigrova* and *B. bigelowi* provided in Swan (1972).

The Acrididae *Siga*us “black”, *Siga*us “blue”, *Siga*us “green”, *Siga*us “red” and *Siga*us “yellow” have been replaced with *Siga*us *australis* (Hutton, 1898) “central arid”, as no details or voucher materials have been forthcoming to justify retention of the population tag names. It is recognised that colour-polymorphic *Siga*us *australis* exist throughout the arid zones of Central Otago and Canterbury, and while their density and level of gene flow are not known, this habitat is under extreme threat from climate change (Koot et al. 2022) and other types of anthropogenic modification (MfE & Stats NZ 2021).

Table 1. Orthoptera taxa assessed for the first time in this report.

ASSESSMENT NAME AND AUTHORITY	COMMON NAME	FAMILY
Taxonomically determinate		
<i>Austrosalomona falcata</i> (Redtenbacher, 1891)	olive-green coastal katydid	Tettigoniidae
<i>Grylloides sigillatus</i> (Walker, 1869)	tropical house cricket	Gryllidae
<i>Gryllopsis maoria</i> (de Saussure, 1877)	cricket	Gryllidae
<i>Hemiandrus luna</i> Taylor-Smith, Trewick & Morgan-Richards, 2016	ground w t	Anostomatidae
<i>Hemiandrus nox</i> Taylor-Smith, Trewick & Morgan-Richards, 2016	ground w t	Anostomatidae
<i>Miotopus richardsae</i> Fitness, Morgan-Richards, Hegg & Trewick, 2018	cave w t	Rhaphidophoridae
<i>Pharmacus cochleatus ordensis</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae
<i>Pharmacus cochleatus naucleus</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae
<i>Pharmacus cochleatus rawhiti</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae
<i>Pharmacus concinnus</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae
<i>Pharmacus cristatus</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae
<i>Pharmacus notabilis</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae
<i>Pharmacus per dus</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae
<i>Pharmacus senex</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae
<i>Pharmacus vallestris</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae
<i>Pleioelectron auratum</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
<i>Pleioelectron caudatum</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
<i>Pleioelectron crystallae</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
<i>Pleioelectron avicorne</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
<i>Pleioelectron rodmorrisi</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
<i>Pleioelectron triquetrum</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
Taxonomically unresolved		
<i>Hemiandrus</i> (CMNZ 2005.56.717) “madsylvestris”	ground w t	Anostomatidae
<i>Ornebius</i> (AMNZ86469) “kermadecensis”	scaly cricket	Mogoplistidae
<i>Pteronemobius</i> sp. [truncatus/tarrios]	cricket	Trigonidiidae

Table 2. Orthoptera taxa that were assessed by Trewick et al. (2016) but not included in the 2022 assessment.

ASSESSMENT NAME AND AUTHORITY	COMMON NAME	FAMILY	REASON FOR DELETION
Taxonomically determinate			
<i>Bobilla bivittata</i> (Walker, 1869)	ground cricket	Trigonidiidae	Dubious evidence of species ever existing in Aotearoa New Zealand
<i>Ornebius novarae</i> (Saussure, 1877)	scaly cricket	Mogoplistidae	Dubious evidence of species ever existing in Aotearoa New Zealand
<i>Pachyrhamma altum</i> (Walker, 1869)	cave w t	Rhaphidophoridae	Conspeci c with <i>Pachyrhamma edwardsii</i> (Scudder, 1869)
<i>Pharmacus chapmanae</i> Richards, 1972	cave w t	Rhaphidophoridae	Conspeci c with <i>Pharmacus cochleatus</i> (Karny, 1935)
<i>Pharmacus dumbletoni</i> Richards, 1972	cave w t	Rhaphidophoridae	Conspeci c with <i>Pharmacus montanus</i> Pictet & de Saussure, 1893
<i>Pleioelectron diversum</i> Hutton, 1897	cave w t	Rhaphidophoridae	Conspeci c with <i>Miotopus diversus</i> (Hutton, 1896)
Taxonomically unresolved			
<i>Brachaspis</i> "Hunter Hills"	Hunter Hills grasshopper	Acrididae	Conspeci c with <i>Brachaspis nivalis</i> (Hutton, 1897)
<i>Gryllidae incertae sedis</i> sp. A	cricket	Gryllidae	No known voucher material or justification
<i>Hemiandrus</i> "Cape Campbell"	ground w t	Anostomatidae	Conspeci c with <i>Hemiandrus bilobatus</i> Ander, 1938
<i>Hemiandrus</i> "Longwood Range"	ground w t	Anostomatidae	No known voucher material or justification
<i>Hemiandrus</i> "Mt George"	ground w t	Anostomatidae	No known voucher material or justification
<i>Hemiandrus</i> "Pureora 1"	ground w t	Anostomatidae	No known voucher material or justification
<i>Hemiandrus</i> "Pureora 2"	ground w t	Anostomatidae	No known voucher material or justification
<i>Hemiandrus</i> "Redhills"	ground w t	Anostomatidae	No known voucher material or justification
<i>Hemiandrus</i> "Richmond"	ground w t	Anostomatidae	No known voucher material or justification
<i>Hemiandrus</i> "small lake"	ground w t	Anostomatidae	No known voucher material or justification
<i>Hemiandrus</i> "Staveley"	ground w t	Anostomatidae	No known voucher material or justification
<i>Hemiandrus</i> "Tapuae-O-Uenuku"	ground w t	Anostomatidae	No known voucher material or justification
<i>Isoplectron</i> n. spp. (3)	cave w t	Rhaphidophoridae	No known voucher material or justification
<i>Macropathus</i> sp. A	cave w t	Rhaphidophoridae	No known voucher material or justification
<i>Macropathus</i> sp. B	cave w t	Rhaphidophoridae	No known voucher material or justification
<i>Neonetus</i> n. spp. (9)	cave w t	Rhaphidophoridae	No known voucher material or justification
<i>Pachyrhamma</i> n. spp. (>11)	cave w t	Rhaphidophoridae	No known voucher material or justification
<i>Petrotettix</i> sp. A	cave w t	Rhaphidophoridae	No known voucher material or justification
<i>Pharmacus?</i> n. spp. (3)	cave w t	Rhaphidophoridae	No known voucher material or justification
<i>Phaulacridium</i> n. spp. (3)	short-horned grasshopper	Acrididae	No known voucher material or justification

Table 3. Name changes affecting Orthoptera taxa in Aotearoa New Zealand between the publication of Trewick et al. (2016) and this report.

NAME AND AUTHORITY IN TREWICK ET AL. (2016)	NAME AND AUTHORITY IN THIS REPORT	FAMILY
Taxonomically determinate		
Hemiandrus "Otekauri"	Hemiandrus brucei Taylor-Smith, Morgan-Richards & Trewick, 2016	Anostomatidae
Hemiandrus "Horomaka"	Hemiandrus celaeno Trewick, Taylor-Smith & Morgan-Richards, 2020	Anostomatidae
Hemiandrus "elegans"	Hemiandrus jacinda Trewick, 2021	Anostomatidae
Hemiandrus "Kapiti"	Hemiandrus merope Trewick, Taylor-Smith & Morgan-Richards, 2020	Anostomatidae
Hemiandrus "vicinus"	Hemiandrus sterope Trewick, Taylor-Smith & Morgan-Richards, 2020	Anostomatidae
Hemiandrus "Onokis"	Hemiandrus taygete Trewick, Taylor-Smith, & Morgan-Richards, 2020	Anostomatidae
Lepidogryllus lepidus* (Walker, 1869)	Lepidogryllus parvulus (Walker, 1869)	Gryllidae

the South Island of Aotearoa New Zealand. In doing so, *Pharmacus brewsterensis* Richards, 1972 was revised to *Notoplectron brewsterense* (Richards, 1972) based on genetic and morphological evidence, while *Isoplectron cochleatum* Karny, 1935 was recognised as belonging to the genus *Pharmacus* and renamed *Pharmacus cochleatus* (Karny, 1935).

Suppressing the genus *Turbottoplectron* Salmon, 1948 has led to the recognition of *Pachyrhamma cavernae* (Hutton, 1900) and *Pachyrhamma unicolor* (Salmon, 1948).

2.4 Trends

The conservation status of 38 taxa has changed since the previous assessment in 2014 (Trewick et al. 2016), with 5 having improved, 19 having worsened and the remaining 14 having neutral changes (12 taxa moved into or out of Data Deficient and 2 taxa moved from Introduced and Naturalised to Not Threatened) (see Tables 4–6). Twelve (32%) of these changes were identified as actual changes in population levels or trends, with the remainder being driven by improved knowledge, occasionally from the re-interpretation of existing data or a change in the criteria used in the assessment (e.g. from number of individuals to area of occupancy) (Table 6).

Most notable are the population declines of *Deinacrida* giant wētā species, which reflect ongoing attrition by exotic pests. In all cases the species most affected exist in small habitat patches. Short-horn grasshoppers (Acrididae) that continue to decline are, at present, those in low-elevation habitats that are subject to rapid habitat modification from agricultural intensification, weed invasion and introduced mammalian pests including cats, stoats, hedgehogs and rats.

We note, however, that high-elevation Orthoptera that currently have relatively natural population ranges, and presumably abundances, are in very real danger of decline during the next 50 years due to uncontrolled anthropogenic climate change. The situation for alpine Acrididae has recently been modelled in detail with very concerning results (Koot et al. 2022).

Table 4. Comparison of the status of Orthoptera taxa in Aotearoa New Zealand assessed in 2002 (Hitchmough 2002), 2005 (Hitchmough et al. 2007), 2010 (Trewick et al. 2012), 2014 (Trewick et al. 2016) and 2022 (this report).

CONSERVATION STATUS	2002	2005	2010	2014	2022
Data Deficient	17	17	19	30	17
Threatened – Nationally Critical	3	3	1	2	3
Threatened – Nationally Endangered	5	6	2	2	5
Threatened – Nationally Vulnerable	0	0	3	4	8
Threatened – Nationally Increasing*	0	0	2	2	2
At Risk – Declining	3	3	1	1	5
At Risk – Relict	0	0	6	6	2
At Risk – Naturally Uncommon	34	38	31	32	20
Not Threatened	0	2	94	87	95
Introduced and Naturalised	0	0	8	9	5
Total	62	69	167	175	162

* The status At Risk – Recovering Added in Townsend et al. (2008) and used in 2010 and 2014 has been renamed Threatened – Nationally Increasing in this assessment following Michel (2021).

Table 5. Summary of status changes of Orthoptera taxa between 2014 (rows, Trewick et al. 2016) and 2022 (columns, this report). Numbers on the diagonal (shaded black) represent those taxa that have not changed status between 2014 and 2022,

Table 6. Summary of changes to the number of Orthoptera taxa assigned to each conservation status between 2014 (Trewick et al. 2016) and 2022 (this report).

TYPE OF CHANGE, REASON, CONSERVATION STATUS	NO. TAXONOMICALLY DETERMINATE TAXA
BETTER	5
More knowledge	5
Threatened – Nationally Endangered	1
Threatened – Nationally Vulnerable	1
Not Threatened	3
WORSE	19
Actual decline	7
Threatened – Nationally Critical	1
Threatened – Nationally Vulnerable	2
At Risk – Declining	4
More knowledge	3
At Risk – Relict	1
At Risk – Naturally Uncommon	2
Reinterpretation of data	9
Threatened – Nationally Critical	2
Threatened – Nationally Endangered	3
Threatened – Nationally Vulnerable	2
Threatened – Nationally Increasing*	1
At Risk – Declining	1
NEUTRAL	14
Greater uncertainty	8
Data De cient	8
More knowledge	4
Not Threatened	4
Reinterpretation of data	2
Not Threatened	2
NO CHANGE	100
Data De cient	5
Threatened – Nationally Endangered	1
Threatened – Nationally Vulnerable	3
Threatened – Nationally Increasing*	1
At Risk – Relict	1
At Risk – Naturally Uncommon	18
Not Threatened	68
Introduced and Naturalised	3
NEW LISTING	24
Data De cient	4
Not Threatened	18
Introduced and Naturalised	2
TOTAL	162

* Threatened – Nationally Increasing is a new name and category that replaces At Risk – Recovering A (Michel 2021).

2.4.1 Improved status

The Tekapo ground wētā (*Hemiandrus furoviarius*) and the Homer grasshopper (*Sigaus homerensis*) have moved out of the highest threat status, Threatened - Nationally Critical, into Threatened - Nationally Endangered and Threatened - Nationally Vulnerable, respectively, since the previous assessment due to increased knowledge about their populations. In addition, the cave wētā *Notoplectron brewsterense* and the ground wētā *Hemiandrus nitaweta*

2.4.3 Data Deficient

Seventeen taxa are currently considered Data Deficient (see section 3.1, Table 7). **Teleogryllus commodus** (Walker, 1869), the black field cricket, was added to this list in 2022 because existing scientific literature gives conflicting interpretations on whether it is native to Aotearoa New Zealand or has been introduced from Australia. Consequently, while the species is common and widespread in this country, we have to list it as Data Deficient because we do not have enough information to decide whether it should be assessed as Not Threatened or Introduced and Naturalised.

The katydid **Salomona solida** was previously assessed as Introduced and Naturalised but is now considered Data Deficient. This species is believed to be native to the Kermadec Islands and an observation of it was made from the Kermadec Islands in November 2021 (<https://inaturalist.nz/observations/100823368>; **Salomona solida**

Table 7. Conservation status of all known Orthoptera in Aotearoa New Zealand.

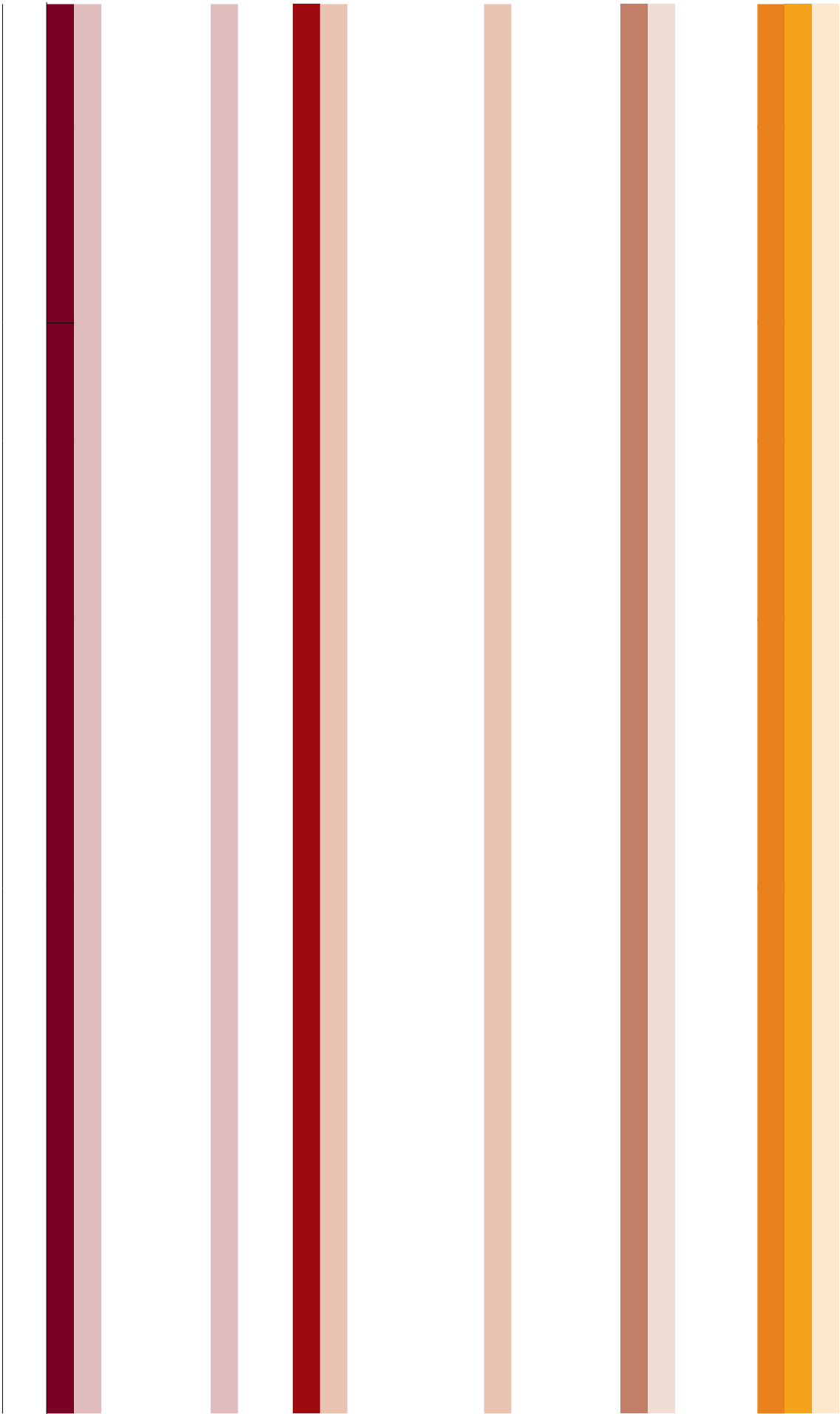
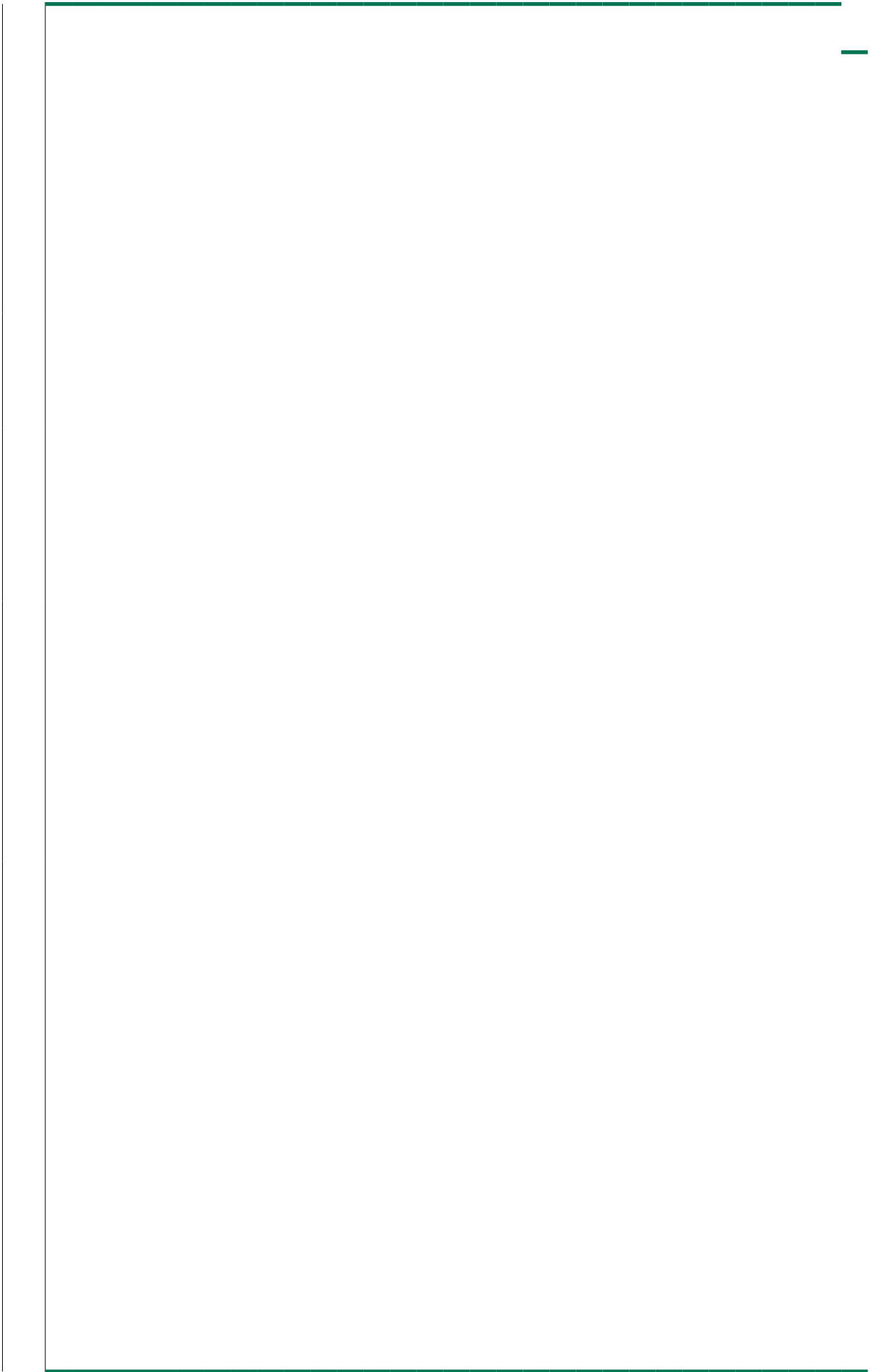


Table 7 continued

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
<i>Phaulacidium otagoense</i> Westerman & Ritchie, 1984	short-horned grasshopper	Acrididae	C(2)	Sp	Worse
<i>Sigaia campestris</i> (Hutton, 1898)	short-horned grasshopper	Acrididae	C(2)	Sp, DPS, DPT	Worse
Taxonomically unresolved (1)					
<i>Brachaspis nivalis</i> (Hutton, 1897) "lowland"	snow grasshopper	Acrididae	B(2)	Sp, DPR, RR	Worse
RELICT (2)					
Taxonomically determinate (2)					
<i>Hemiandrus superbus</i> Jewell, 2007	ground w t	Anostomatidae	B	Sp, DPS, DPT, OL	Worse
<i>Hemideina trewicki</i> Morgan-Richards, 1995	Hawke's Bay tree w t	Anostomatidae		Sp	No change
NATURALLY UNCOMMON (20)					
Taxonomically determinate (16)					
<i>Dinaecrida fallai</i> Salmon, 1950 (IUCN: Vulnerable D2, v2.3, 1996)	Poor Knights giant w t	Anostomatidae		CD, DPS, DPT, IE, RR	No change
<i>Dendroplectron aucklandense</i> Richards, 1964	Auckland Island cave w t	Rhaphidophoridae		IE, RR	No change
<i>Hemiandrus celaeno</i> Trewick, Taylor-Smith & Morgan-Richards, 2020	ground w t	Anostomatidae		RR	No change
<i>Hemiandrus jacinda</i> Trewick, 2021	Jacinda's w t	Anostomatidae		Sp, DPS, DPT, PF	No change
<i>Hemiandrus merope</i> Trewick, Taylor-Smith & Morgan-Richards, 2020	Kapiti ground w t	Anostomatidae		IE, OL	No change
<i>Hemiandrus subantarcticus</i> (Salmon, 1950)	ground w t	Anostomatidae		CD, IE, RR	No change
<i>Hemideina ricta</i> Hutton, 1896	Banks Peninsula tree w t	Anostomatidae		RR	No change
<i>Insulanoplectron spinosum</i> Richards, 1970	Snares Island w t	Rhaphidophoridae		CD, IE, RR	No change
<i>Ischyroplectron isolatum</i> (Hutton, 1895)	Bounty Island cave w t	Rhaphidophoridae		CD, IE, OL	No change
<i>Motuweta riparia</i> Gibbs, 2002	Rauk mara tusked w t	Anostomatidae		DPS, DPT, RR	No change
<i>Notoplectron campbellense</i> Richards, 1964	Campbell Island cave w t	Rhaphidophoridae		CD, IE, RR	No change
<i>Novoplectron serratum</i> Hutton, 1904	cave w t	Rhaphidophoridae		IE, RR	No change
<i>Pallidoplectron peniculosum</i> Richards, 1960	cave w t	Rhaphidophoridae		OL	Worse
<i>Pallidoplectron subterraneum</i> Richards, 1965	cave w t	Rhaphidophoridae		DPS, DPT, PF, RR	Worse
<i>Talitropsis crassicornis</i> Hutton, 1897	cave w t	Rhaphidophoridae		IE	No change
<i>Talitropsis megatibia</i> Trewick, 1999	cave w t	Rhaphidophoridae		IE, RR	No change
Taxonomically unresolved (4)					
<i>Hemiandrus</i> (CMNZ 2000.121.21093) "Hapuku"	ground w t	Anostomatidae		RR	No change
<i>Hemiandrus</i> (CMNZ 2000.121.21908) "Nokomai"	ground w t	Anostomatidae		RR	No change

Continued on next page

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
Hemiandrus "Porters Pass"	ground w t	Anostomatidae			No change
Hemideina thoracica (White, 1842) "2n=11,12"	Cuvier Island tree w t	Anostomatidae		RR	No change
NOT THREATENED (95)					
Taxonomically determinate (90)					
Alpinacris crassicauda Bigelow, 1967	short-horned grasshopper	Acrididae			No change
Alpinacris tumidicauda Bigelow, 1967	short-horned grasshopper	Acrididae			No change
Bobilla bigelowi (Swan, 1972)	small eid cricket	Trigonidiidae			No change
Bobilla nigrova (Swan, 1972)	eid cricket	Trigonidiidae			No change
Brachaspis collinus (Hutton, 1897)	short-horned grasshopper	Acrididae			No change
Brachaspis nivalis (Hutton, 1897)	snow grasshopper	Acrididae			No change
Caedicia simplex (Walker, 1869)	garden katydid	Tettigoniidae			No change
Conocephalus albescens (Walker, 1869)	eid katydid	Tettigoniidae			Neutral
Conocephalus bilineatus (Erichson, 1842)	eid katydid	Tettigoniidae			Neutral
Conocephalus semivittatus (Walker, 1869)	eid katydid	Tettigoniidae			No change
Deinacrida connectens (Ander, 1939)	scree w t	Anostomatidae		DPT	No change
Hemiandrus bilobatus Ander, 1938	two-lobed ground w t	Anostomatidae			No change
Hemiandrus brucei Taylor-Smith, Trewick & Morgan-Richards, 2016	Bruce's ground w t	Anostomatidae			Better
Hemiandrus electra					



NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
<i>Petrotettix cupolaensis</i> Richards, 1972	cave w t	Rhaphidophoridae			No change
<i>Petrotettix nigripes</i> Richards, 1972	cave w t	Rhaphidophoridae			No change
<i>Petrotettix serratus</i> Richards, 1972	cave w t	Rhaphidophoridae			No change
<i>Petrotettix spinosus</i> Richards, 1972	cave w t	Rhaphidophoridae			No change
<i>Pharmacus cochleatus cochleatus</i> (Karny, 1935)	alpine cave w t	Rhaphidophoridae			No change
<i>Pharmacus cochleatus ordensis</i> Hegg, Morgan-Richards & Trewick, 2022	black tumbling cave w t	Rhaphidophoridae			New listing
<i>Pharmacus cochleatus naucleus</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae		CI, RR	New listing
<i>Pharmacus cochleatus rawhiti</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae			New listing
<i>Pharmacus concinnus</i> Hegg, Morgan-Richards & Trewick, 2022	elegant sorcerer alpine cave w t	Rhaphidophoridae		RR	New listing
<i>Pharmacus cristatus</i> Hegg, Morgan-Richards & Trewick, 2022	tufted sorcerer alpine cave w t	Rhaphidophoridae	Richards, 1972		New listing

Table 7 continued

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
Talitropis poduroides (Walker, 1871)	cave w t	Rhaphidophoridae			No change
Talitropis sedilloti Bolivar, 1883	cave w t	Rhaphidophoridae			No change
Taxonomically unresolved (5)					
Hemiandrus (CMA 2005.56.712) "disparalis"	ground w t	Anostomatidae			No change
Hemiandrus (CMA 2005.56.804) "saxatilis"	ground w t	Anostomatidae			No change
Hemiandrus (CMA 2005.56.840) "Timaru"	ground w t	Anostomatidae			No change
Hemiandrus (CMNZ 2000.121.21086) "Waimakariri"	ground w t	Anostomatidae			No change
Hemiandrus (CMNZ 2005.56.717) "madisylvestris"	ground w t	Anostomatidae			New listing
INTRODUCED AND NATURALISED (5)					
Taxonomically determinate (4)					
Austrosalomona falcata (Redtenbacher, 1891)	olive-green coastal katydid	Tettigoniidae		SO	New listing
Gryllodes sigillatus (Walker, 1869)	tropical house cricket	Gryllidae		SO	New listing
Lepidogryllus parvulus (Walker, 1869)	fast-chirping eld cricket	Gryllidae		SO	No change
Ornebius aperta Otte & Alexander, 1983	scaly cricket	Mogoplistidae		SO	No change
Taxonomically unresolved (1)					
Pterapotrechus sp.	raspy cricket	Gryllacrididae		SO	No change

3.2 NZTCS categories, criteria and qualifiers

Full details of the criteria and qualifiers included in Table 7 can be found in Rolfe et al. (2021) or at https://nztc.org.nz/content/NZTCS_QUALIFIERS.

Summary definitions for the categories are presented below.

Data Deficient

Taxa that cannot be assessed due to a lack of current information about their distribution and abundance. It is hoped that listing such taxa will stimulate research to find out the true category (for a fuller definition, see Townsend et al. 2008).

Threatened

Taxa that meet the criteria specified by Townsend et al. (2008) for the categories Nationally Critical, Nationally Endangered and Nationally Vulnerable.

NATIONALLY CRITICAL

A – very small population (natural or unnatural)

A(1) <250 mature individuals

A(2) 2 sub-populations, 200 mature individuals in the larger sub-population

A(3) Total area of occupancy 1 ha (0.01 km²)

B – small population with a high ongoing or forecast decline of 50–70%

B(1) 250–1000 mature individuals

B(2) 5 sub-populations, 300 mature individuals in the largest sub-population

B(3) Total area of occupancy 10 ha (0.1 km²)

C – population (irrespective of size or number of sub-populations) with a very high ongoing or forecast decline of >70%

C Predicted decline >70%

NATIONALLY ENDANGERED

A – small population that has a low to high ongoing or forecast decline of 10–50%

A(1) 250–1000 mature individuals

A(2) 5 sub-populations, 300 mature individuals in the largest sub-population

A(3) Total area of occupancy 10 ha (0.1 km²)

RELICT

Taxa that have undergone a documented decline within the last 1000 years and now occupy <10% of their former range and meet one of the following criteria:

A 5000–20 000 mature individuals; population stable ($\pm 10\%$)

B >20 000 mature individuals; population stable or increasing at >10%

The range of a relictual taxon takes into account the area currently occupied as a ratio of its former extent. Relict can also include taxa that exist as reintroduced and self-sustaining populations within or outside their former known range (for more details, see Townsend et al. (2008)).

NATURALLY UNCOMMON

Taxa whose distributions are confined to a specific geographical area or which occur within naturally small and widely scattered populations, where these distributions are not the result of human disturbance.

Not Threatened

Resident native taxa that have large, stable populations.

Introduced and Naturalised

Taxa that have become naturalised in the wild after being deliberately or accidentally introduced into Aotearoa New Zealand by human agency.

4. Acknowledgements

We thank Nicola Pindur for reviewing an earlier version of this manuscript.

5. References

Bleach, C. 2020: Plant health surveillance and incursion investigation report: January to March 2020. *Surveillance* 47: 27-39.

Caudell, A.N. 1927: Report on the orthopteroid insects collected by the Fiji - New Zealand expedition from the University of Iowa. *Studies in Natural History by the University of Iowa* 12. 22 p.

Fitness, J.L.; Morgan-Richards, M.; Hegg, D.; Trewick S.A. 2018: Reinstatement of the New Zealand cave wētā genus *Miotopus* Hutton (Orthoptera: Rhaphidophoridae) and description of a new species. *European Journal of*
