



# Conservation status of Orthoptera (w t , 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](http://www.doc.govt.nz) under *Publications*.

The NZTCS database can be accessed at [nzctcs.org.nz](http://nzctcs.org.nz). For all enquiries, email [threatstatus@doc.govt.nz](mailto: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
<hr/>	
1. Background	6
<hr/>	
2. Summary	8
<hr/>	
2.1 Additional taxa	8
2.2 Removed taxa	8
2.3 Changed taxon names	11
2.4 Trends	12
2.4.1 Improved status	15
2.4.2 Worsened status	15
2.4.3 Data Deficient	16
3. Conservation status of all known Orthoptera in Aotearoa New Zealand	16
<hr/>	
3.1 Assessments	16
3.2 NZTCS categories, criteria and qualifiers	24
4. Acknowledgements	27
<hr/>	
5. References	27
<hr/>	



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

Steve Trewick<sup>1\*</sup>, Danilo Hegg<sup>2</sup>, Mary Morgan-Richard<sup>3</sup>, Tara Murray<sup>3</sup>, Corinne Watts<sup>4</sup>, Peter John<sup>5</sup> and Pascale Michel<sup>6</sup>

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

<sup>2</sup> 135 Blacks Road, poho, Dunedin 9010, New Zealand

<sup>3</sup> Department of Conservation, PO Box 5244, Dunedin 9054, New Zealand

<sup>4</sup> Manaaki Whenua – Landcare Research, Private Bag 3127, Hamilton 3216, New Zealand

<sup>5</sup> Canterbury Museum, Rolleston Avenue, Christchurch 8013, New Zealand

<sup>6</sup> Department of Conservation, PO Box 10420, Wellington 6143, New Zealand

\* Corresponding author; email: [s.trewick@massey.ac.nz](mailto:s.trewick@massey.ac.nz)

## Abstract

The conservation status of all 162 known taxa of Orthoptera (wētā, 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 Rhabdophoridae, such as *Neonetus* and *Macropathus*, include species that are currently under investigation.

Keywords: Acrididae, Anostomatidae, Gryllacrididae, Gryllidae, Gryllotalpidae, Mogoplistidae, Rhabdophoridae, 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](http://www.doc.govt.nz/conservation-status-weta-grasshoppers))



## 2. Summary

This report presents the conservation status of all 162 known taxa of Orthoptera (with 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 *Grylodes 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	Anostostomatidae
<i>Hemiandrus nox</i> Taylor-Smith, Trewick & Morgan-Richards, 2016	ground w t	Anostostomatidae
<i>Miotopus richardsae</i> Fitness, Morgan-Richards, Hegg & Trewick, 2018	cave w t	Rhaphidophoridae
<i>Pharmacus cochleatus fiordensis</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae
<i>Pharmacus cochleatus nauclerus</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 perfidus</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 vallestis</i> Hegg, Morgan-Richards & Trewick, 2022	alpine cave w t	Rhaphidophoridae
<i>Pleiopectron auratum</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
<i>Pleiopectron caudatum</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
<i>Pleiopectron crystallae</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
<i>Pleiopectron flavicorne</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
<i>Pleiopectron rodmorrisi</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
<i>Pleiopectron triquetrum</i> Hegg, Morgan-Richards & Trewick, 2019	cave w t	Rhaphidophoridae
Taxonomically unresolved		
<i>Hemiandrus</i> (CMNZ 2005.56.717) “madsylvestris”	ground w t	Anostostomatidae
<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	Conspecific with <i>Pachyrhamma edwardsii</i> (Scudder, 1869)
<i>Pharmacus chapmanae</i> Richards, 1972	cave w t	Rhaphidophoridae	Conspecific with <i>Pharmacus cochleatus</i> (Karny, 1935)
<i>Pharmacus dumbletoni</i> Richards, 1972	cave w t	Rhaphidophoridae	Conspecific with <i>Pharmacus montanus</i> Pictet & de Saussure, 1893
<i>Pleioplectron diversum</i> Hutton, 1897	cave w t	Rhaphidophoridae	Conspecific with <i>Miotopus diversus</i> (Hutton, 1896)
Taxonomically unresolved			
<i>Brachaspis</i> "Hunter Hills"	Hunter Hills grasshopper	Acrididae	Conspecific with <i>Brachaspis nivalis</i> (Hutton, 1897)
Gryllidae <i>incertae sedis</i> sp. A	cricket	Gryllidae	No known voucher material or justification
<i>Hemiandrus</i> "Cape Campbell"	ground w t	Anostomatidae	Conspecific 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
Rhaphidophoridae <i>incertae sedis</i> sp. A	cave w t	Rhaphidophoridae	No known voucher material or justification
Rhaphidophoridae <i>incertae sedis</i> sp. B	cave w t	Rhaphidophoridae	No known voucher material or justification
Rhaphidophoridae <i>incertae sedis</i> sp. C	cave w t	Rhaphidophoridae	No known voucher material or justification
Rhaphidophoridae <i>incertae sedis</i> sp. D	cave w t	Rhaphidophoridae	No known voucher material or justification
<i>Sigaus</i> "black"	alpine grasshopper	Acrididae	Conspecific with <i>Sigaus australis</i> (Hutton, 1898) "central arid"
<i>Sigaus</i> "green"	alpine grasshopper	Acrididae	Conspecific with <i>Sigaus australis</i> (Hutton, 1898) "central arid"
<i>Sigaus</i> "red"	alpine grasshopper	Acrididae	Conspecific with <i>Sigaus australis</i> (Hutton, 1898) "central arid"
<i>Sigaus</i> "Remarkables"	alpine grasshopper	Acrididae	Conspecific with <i>Sigaus australis</i> (Hutton, 1898)
<i>Sigaus</i> "yellow"	alpine grasshopper	Acrididae	Conspecific with <i>Sigaus australis</i> (Hutton, 1898) "central arid"
<i>Talitropsis</i> n. sp.	cave w t	Rhaphidophoridae	
<i>Weta</i> sp. A	cave w t	Rhaphidophoridae	

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 <sup>T</sup>	FAMILY
Taxonomically determinate		
<i>Hemiandrus</i> "Otekauri"	<i>Hemiandrus brucei</i> Taylor-Smith, Morgan-Richards & Trewick, 2016	Anostomatidae
<i>Hemiandrus</i> "Horomaka"	<i>Hemiandrus celaeno</i> Trewick, Taylor-Smith & Morgan-Richards, 2020	Anostomatidae
<i>Hemiandrus</i> "elegans"	<i>Hemiandrus jacinda</i> Trewick, 2021	Anostomatidae
<i>Hemiandrus</i> "Kapiti"	<i>Hemiandrus merope</i> Trewick, Taylor-Smith & Morgan-Richards, 2020	Anostomatidae
<i>Hemiandrus</i> "vicinus"	<i>Hemiandrus sterope</i> Trewick, Taylor-Smith & Morgan-Richards, 2020	Anostomatidae
<i>Hemiandrus</i> "Onokis"	<i>Hemiandrus taygete</i> Trewick, Taylor-Smith, & Morgan-Richards, 2020	Anostomatidae
<i>Lepidogryllus lepidus</i> * (Walker, 1869)	<i>Lepidogryllus parvulus</i> (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 cochleatuscochleatus* (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 detailed 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
<b>Total</b>	<b>62</b>	<b>69</b>	<b>167</b>	<b>175</b>	<b>162</b>

\* The status At Risk – Recovering A defined 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,



#### 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 De cient

Seventeen taxa are currently considered Data De cient (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 De cient 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 De cient. 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.

Qualifiers are abbreviated as follow: CD = Conservation Dependent, CI = Climate Impact, De = Designated, DPR = Data Poor Recognition, DPS = Data Poor Size, DPT = Data Poor Trend, IE = Island Endemic, OL = One Location, PF = Population Fragmentation, RR = Range Restricted, S?O = Secure? Overseas, SO = Secure Overseas, Sp = Sparse. Further details about each of these can be found at <https://nzitcs.org.nz>.

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
<b>DATA DEFICIENT (17)</b>					
Taxonomically determinate (12)					
<i>Gryllopsis maoria</i> (de Saussure, 1877)	cricket	Gryllidae			New listing
<i>Hemianandrus lanceolatus</i> (Walker, 1869)	ground w t	Anostomatidae			No change
<i>Neonetus huttoni</i> Chopard, 1923	cave w t	Rhaphidophoridae			Neutral
<i>Pachyrhamma giganteum</i> Richards, 1962	Poor Knights cave w t	Rhaphidophoridae		CD, IE, RR	Neutral
<i>Pachyrhamma unicolor</i> (Salmon, 1948)	cave w t	Rhaphidophoridae		IE, RR	Neutral
<i>Paraneonetus multispinus</i> Salmon, 1948	cave w t	Rhaphidophoridae		IE, RR	Neutral
<i>Pharmacus vellestris</i>					

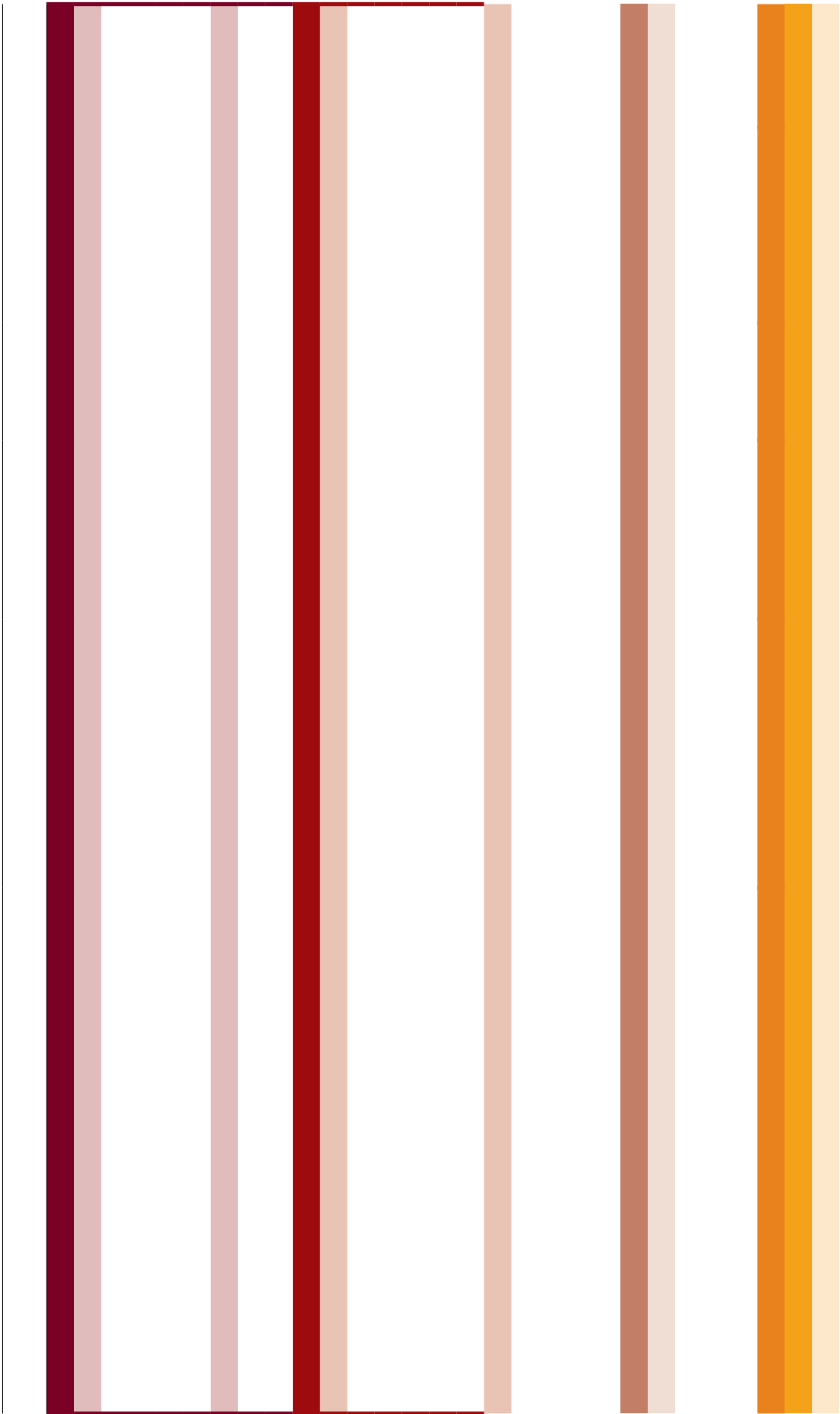


Table 7 continued

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
<i>Phaulacridium otageense</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>Deinacrida 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 celeeno</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 crassicuris</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) "Nokomal"	ground w t	Anostomatidae		RR	No change

Continued on next page

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
<i>Hemiandrus "Porters Pass"</i>					

Table 7 continued

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
<i>Hemideina femorata</i> Hutton, 1898	Canterbury tree w t	Anostomatidae			No change
<i>Hemideina maori</i> (Pictet & Saussure, 1891)	mountain stone w t	Anostomatidae			No change
<i>Hemideina thoracica</i> (White, 1842)	Auckland tree w t	Anostomatidae			No change
<i>Isoplectron aciculatum</i> Karny, 1937	cave w t	Rhaphidophoridae			No change
<i>Isoplectron armatum</i> Hutton, 1897	cave w t	Rhaphidophoridae			No change
<i>Isoplectron calcaratum</i> Hutton, 1897	cave w t	Rhaphidophoridae			No change
<i>Locusta migratoria</i> (Linnaeus, 1758)	migratory locust	Acrididae		SO	No change
<i>Macropathus filifer</i> Walker, 1869	cave w t	Rhaphidophoridae			No change
<i>Macropathus huttoni</i> Kirby, 1906	cave w t	Rhaphidophoridae			Neutral
<i>Maotoweta virescens</i> Johns & Cook, 2014	green moss w t	Rhaphidophoridae			Neutral
<i>Metioche maorica</i> (Walker, 1869) (IUCN: Least Concern, v3.1, 2018)	ground cricket	Trigonidiidae			No change
<i>Miotopus diversus</i> (Hutton, 1896)	cave w t	Rhaphidophoridae			Neutral
<i>Miotopus richardiae</i> Fitness, Morgan-Richards, Hegg & Trewick, 2018	Aola Richards' cave w t	Rhaphidophoridae			New listing
<i>Neonetus pilosus</i> (Hutton, 1904)	cave w t	Rhaphidophoridae			No change
<i>Neonetus variegatus</i> Brunner von Wattenwyl, 1888	cave w t	Rhaphidophoridae			No change
<i>Notoplectron brewsterense</i> (Richards, 1972)	cave w t	Rhaphidophoridae			Better
<i>Pachyrhamma acanthocerum</i> (Milligan, 1926)	Auckland cave w t	Rhaphidophoridae			No change
<i>Pachyrhamma cavernae</i> (Hutton, 1900)	cave w t	Rhaphidophoridae			No change
<i>Pachyrhamma edwardsii</i> (Scudder, 1869)	Edwards' cave w t	Rhaphidophoridae			No change
<i>Pachyrhamma fuscum</i> (Richards, 1959)	cave w t	Rhaphidophoridae			No change
<i>Pachyrhamma longicaudum</i> (Richards, 1959)	cave w t	Rhaphidophoridae		DPS, DPT	No change
<i>Pachyrhamma longipes</i> (Colenso, 1887)	cave w t	Rhaphidophoridae			No change
<i>Pachyrhamma ngongotahaense</i> Richards, 1961	cave w t	Rhaphidophoridae			No change
<i>Pachyrhamma spinosum</i> Richards, 1961	cave w t	Rhaphidophoridae			No change
<i>Pachyrhamma tuari</i> Richards, 1961	cave w t	Rhaphidophoridae			No change
<i>Pachyrhamma uncatum</i> (Richards, 1959)	gold mine cave w t	Rhaphidophoridae			No change
<i>Pachyrhamma waipuense</i> (Richards, 1960)	cave w t	Rhaphidophoridae			No change
<i>Pachyrhamma waitomoense</i> (Richards, 1958)	Waitomo cave w t	Rhaphidophoridae			No change
<i>Pallidoplectron turneri</i> Richards, 1958	cave w t	Rhaphidophoridae			No change
<i>Papirides dugdali</i> Bigelow, 1967	Dugdale's grasshopper	Acrididae			No change
<i>Papirides nitidus</i> Hutton, 1898	short-horned grasshopper	Acrididae			No change

Continued on next page



Table 7 continued

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
<i>Talitropsis poduroides</i> (Walker, 1871)	cave w t	Rhaphidophoridae			No change
<i>Talitropsis sedilloti</i> Bolívar, 1883	cave w t	Rhaphidophoridae			No change
<b>Taxonomically unresolved (5)</b>					
<i>Hemiandrus</i> (CMA 2005.56.712) "disparalis"	ground w t	Anostomatidae			No change
<i>Hemiandrus</i> (CMA 2005.56.804) "saxatilis"	ground w t	Anostomatidae			No change
<i>Hemiandrus</i> (CMA 2005.56.840) "Timaru"	ground w t	Anostomatidae			No change
<i>Hemiandrus</i> (CMNZ 2000.121.21086) "Waimakariri"	ground w t	Anostomatidae			No change
<i>Hemiandrus</i> (CMNZ 2005.56.717) "madsylvestris"	ground w t	Anostomatidae			New listing
<b>INTRODUCED AND NATURALISED (5)</b>					
<b>Taxonomically determinate (4)</b>					
<i>Austrosalomona faicata</i> (Redtenbacher, 1891)	olive-green coastal katydid	Tettigoniidae		SO	New listing
<i>Gryllodes sigillatus</i> (Walker, 1869)	tropical house cricket	Gryllidae		SO	New listing
<i>Lepidogryllus parvulus</i> (Walker, 1869)	fast-chirping field cricket	Gryllidae		SO	No change
<i>Ornebius aperta</i> Otte & Alexander, 1983	scaly cricket	Mogoplistidae		SO	No change
<b>Taxonomically unresolved (1)</b>					
<i>Pterapotrechus</i> 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://nztnz.org.nz/content/NZTCS\\_QUALIFIERS](https://nztnz.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 km<sup>2</sup>)

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 km<sup>2</sup>)

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 km<sup>2</sup>)

B – small population with a low to high ongoing or forecast decline of 10–50%

B(1) 250–1000 mature individuals in the largest sub-population

B(3) Total area of occupancy > 10 ha (0.1 km<sup>2</sup>)



- B – moderate population (unnatural), stable  $\pm$  10%
- B(1) 1000–5000 mature individuals
- B(2) ) 15 sub-populations, 500 mature individuals in the largest sub-population
- B(3) Total area of occupancy 100 ha (1 km<sup>2</sup>)
- C – moderate population and population trend that has a low to high ongoing or forecast decline of 10–50%
- C(1) 1000–5000 mature individuals
- C(2) ) 15 sub-populations, 500 mature individuals in the largest sub-population
- C(3) Total area of occupancy 100 ha (1 km<sup>2</sup>)
- D – moderate to large population and moderate to high ongoing or forecast decline of 30–70%
- D(1) 5000–20 000 mature individuals
- D(2) ) 15 sub-populations, 1000 mature individuals in the largest sub-population
- D(3) Total area of occupancy 1000 ha (10 km<sup>2</sup>)
- E – large population and high ongoing or forecast decline of 50–70%
- E(1) 20 000–100 000 mature individuals
- E(2) Total area of occupancy 10 000 ha (100 km<sup>2</sup>)

#### NATIONALLY INCREASING

*This is a new name and category for At Risk - Recovering A of Townsend et al. (2008).*

Taxa that have undergone a documented decline within the last 1000 years to a population size of 1000–5000 mature individuals or a total area of occupancy of 100 ha (1 km<sup>2</sup>)

## 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 w t genus *Miotopus* Hutton (Orthoptera: Rhaphidophoridae) and description of a new species. *European Journal of*

---

---

---

---

---