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 w t (*Hemiandrus jacinda*), At Risk – Naturally Uncommon. *Photo: © Steve Trewick*

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ISSN 2324-1713 (web PDF)
ISBN 978-1-99-118364-4 (web PDF)

This report was prepared for publication by Te R p 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.

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

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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 Classi cation 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 De cient (i.e. insu cient 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, Anostostomatidae, Gryllacrididae, Gryllidae, Gryllotalpidae, Mogoplistidae, Rhaphidophoridae, Tettigoniidae, Trigonidiidae

1. Background

The New Zealand Threat Classi cation System (NZTCS) was developed in 2002 to complement the International Union for Conservation of Nature (IUCN) Red List system. Categories and criteria were de ned to re ect 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 rst

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 (w t , 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 speci ed 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 rst time.

2.1 Additional taxa

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

Eighteen of these are new species that were rst described in recent papers (Taylor-Smith et al. 2016; Fitness et a2018; Hegg et al. 2019, 2022; Trewick et al. 2020; Trewick 2021). They include two species of Anostostomatidae (genus *Hemiandrus*) and 16 species of Rhaphidophoridae.

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 De cient here.

Two exotic Orthoptera are recent arrivals in the country. The Australian katydid *Austrosalomona falcata* (Redtenbacher, 1891) was rst 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 *Gryllodes 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 w t *Hemiandrus* (CMNZ 2005.56.717) “madisylvestris” (Anostostomatidae) 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 *Sigaus* "black", *Sigaus* "blue", *Sigaus* "green", *Sigaus* "red" and *Sigaus* "yellow" have been replaced with *Sigaus 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 *Sigaus 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		
Austrosalomona falcata (Redtenbacher, 1891)	olive-green coastal katydid	Tettigoniidae
Gryllodes sigillatus (Walker, 1869)	tropical house cricket	Gryllidae
Gryllopsis maoria (de Saussure, 1877)	cricket	Gryllidae
Hemiandrus luna Taylor-Smith, Trewick & Morgan-Richards, 2016	ground wētā	Anostostomatidae
Hemiandrus nox Taylor-Smith, Trewick & Morgan-Richards, 2016	ground wētā	Anostostomatidae
Miotopus richardsae Fitness, Morgan-Richards, Hegg & Trewick, 2018	cave wētā	Rhaphidophoridae
Pharmacus cochleatus fiordensis Hegg, Morgan-Richards & Trewick, 2022	alpine cave wētā	Rhaphidophoridae
Pharmacus cochleatus nauclerus Hegg, Morgan-Richards & Trewick, 2022	alpine cave wētā	Rhaphidophoridae
Pharmacus cochleatus rawhiti Hegg, Morgan-Richards & Trewick, 2022	alpine cave wētā	Rhaphidophoridae
Pharmacus concinnus Hegg, Morgan-Richards & Trewick, 2022	alpine cave wētā	Rhaphidophoridae
Pharmacus cristatus Hegg, Morgan-Richards & Trewick, 2022	alpine cave wētā	Rhaphidophoridae
Pharmacus notabilis Hegg, Morgan-Richards & Trewick, 2022	alpine cave wētā	Rhaphidophoridae
Pharmacus perfidus Hegg, Morgan-Richards & Trewick, 2022	alpine cave wētā	Rhaphidophoridae
Pharmacus senex Hegg, Morgan-Richards & Trewick, 2022	alpine cave wētā	Rhaphidophoridae
Pharmacus vallestris Hegg, Morgan-Richards & Trewick, 2022	alpine cave wētā	Rhaphidophoridae
Pleioplectron auratum Hegg, Morgan-Richards & Trewick, 2019	cave wētā	Rhaphidophoridae
Pleioplectron caudatum Hegg, Morgan-Richards & Trewick, 2019	cave wētā	Rhaphidophoridae
Pleioplectron crystallae Hegg, Morgan-Richards & Trewick, 2019	cave wētā	Rhaphidophoridae
Pleioplectron flavicorne Hegg, Morgan-Richards & Trewick, 2019	cave wētā	Rhaphidophoridae
Pleioplectron rodmorrisi Hegg, Morgan-Richards & Trewick, 2019	cave wētā	Rhaphidophoridae
Pleioplectron triquetrum Hegg, Morgan-Richards & Trewick, 2019	cave wētā	Rhaphidophoridae
Taxonomically unresolved		
Hemiandrus (CMNZ 2005.56.717) "madisylvestris"	ground wētā	Anostostomatidae
Ornebius (AMNZ86469) "kermadecensis"	scaly cricket	Mogoplistidae
Pteronemobius 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			
Bobilla bivittata (Walker, 1869)	ground cricket	Trigonidiidae	Dubious evidence of species ever existing in Aotearoa New Zealand
Ornebius novarae (Saussure, 1877)	scaly cricket	Mogoplistidae	Dubious evidence of species ever existing in Aotearoa New Zealand
Pachyrhamma altum (Walker, 1869)	cave wētā	Rhaphidophoridae	Conspecific with *Pachyrhamma edwardsii* (Scudder, 1869)
Pharmacus chapmanae Richards, 1972	cave wētā	Rhaphidophoridae	Conspecific with *Pharmacus cochleatus* (Karny, 1935)
Pharmacus dumbletoni Richards, 1972	cave wētā	Rhaphidophoridae	Conspecific with *Pharmacus montanus* Pictet & de Saussure, 1893
Pleioplectron diversum Hutton, 1897	cave wētā	Rhaphidophoridae	Conspecific with *Miotopus diversus* (Hutton, 1896)
Taxonomically unresolved			
Brachaspis “Hunter Hills”	Hunter Hills grasshopper	Acrididae	Conspecific with *Brachaspis nivalis* (Hutton, 1897)
Gryllidae *incertae sedis* sp. A	cricket	Gryllidae	No known voucher material or justification
Hemiandrus “Cape Campbell”	ground wētā	Anostostomatidae	Conspecific with *Hemiandrus bilobatus* Ander, 1938
Hemiandrus “Longwood Range”	ground wētā	Anostostomatidae	No known voucher material or justification
Hemiandrus “Mt George”	ground wētā	Anostostomatidae	No known voucher material or justification
Hemiandrus “Pureora 1”	ground wētā	Anostostomatidae	No known voucher material or justification
Hemiandrus “Pureora 2”	ground wētā	Anostostomatidae	No known voucher material or justification
Hemiandrus “Redhills”	ground wētā	Anostostomatidae	No known voucher material or justification
Hemiandrus “Richmond”	ground wētā	Anostostomatidae	No known voucher material or justification
Hemiandrus “small lake”	ground wētā	Anostostomatidae	No known voucher material or justification
Hemiandrus “Staveley”	ground wētā	Anostostomatidae	No known voucher material or justification
Hemiandrus “Tapuae-O-Uenuku”	ground wētā	Anostostomatidae	No known voucher material or justification
Isoplectron n. spp. (3)	cave wētā	Rhaphidophoridae	No known voucher material or justification
Macropathus sp. A	cave wētā	Rhaphidophoridae	No known voucher material or justification
Macropathus sp. B	cave wētā	Rhaphidophoridae	No known voucher material or justification
Neonetus n. spp. (9)	cave wētā	Rhaphidophoridae	No known voucher material or justification
Pachyrhamma n. spp. (>11)	cave wētā	Rhaphidophoridae	No known voucher material or justification
Petrotettix sp. A	cave wētā	Rhaphidophoridae	No known voucher material or justification
Pharmacus? n. spp. (3)	cave wētā	Rhaphidophoridae	No known voucher material or justification
Phaulacridium n. spp. (3)	short-horned grasshopper	Acrididae	No known voucher material or justification
Rhaphidophoridae *incertae sedis* sp. A	cave wētā	Rhaphidophoridae	No known voucher material or justification
Rhaphidophoridae *incertae sedis* sp. B	cave wētā	Rhaphidophoridae	No known voucher material or justification
Rhaphidophoridae *incertae sedis* sp. C	cave wētā	Rhaphidophoridae	No known voucher material or justification
Rhaphidophoridae *incertae sedis* sp. D	cave wētā	Rhaphidophoridae	No known voucher material or justification
Sigaus “black”	alpine grasshopper	Acrididae	Conspecific with *Sigaus australis* (Hutton, 1898) “central arid”
Sigaus “green”	alpine grasshopper	Acrididae	Conspecific with *Sigaus australis* (Hutton, 1898) “central arid”
*Sigaus “*red”	alpine grasshopper	Acrididae	Conspecific with *Sigaus australis* (Hutton, 1898) “central arid”
Sigaus “Remarkables”	alpine grasshopper	Acrididae	Conspecific with *Sigaus australis* (Hutton, 1898)
Sigaus “yellow”	alpine grasshopper	Acrididae	Conspecific with *Sigaus australis* (Hutton, 1898) “central arid”
Talitropsis n. sp.	cave wētā	Rhaphidophoridae	
Weta sp. A	cave wētā	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	FAMILY
Taxonomically determinate		
Hemiandrus "Otekauri"	*Hemiandrus brucei* Taylor-Smith, Morgan-Richards & Trewick, 2016	Anostostomatidae
Hemiandrus "Horomaka"	*Hemiandrus celaeno* Trewick, Taylor-Smith & Morgan-Richards, 2020	Anostostomatidae
Hemiandrus "elegans"	*Hemiandrus jacinda* Trewick, 2021	Anostostomatidae
Hemiandrus "Kapiti"	*Hemiandrus merope* Trewick, Taylor-Smith & Morgan-Richards, 2020	Anostostomatidae
Hemiandrus "vicinus"	*Hemiandrus sterope* Trewick, Taylor-Smith & Morgan-Richards, 2020	Anostostomatidae
Hemiandrus "Onokis"	*Hemiandrus taygete* Trewick, Taylor-Smith, & Morgan-Richards, 2020	Anostostomatidae
*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*:*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 De cient and 2 taxa moved from Introduced and Naturalised to Not Threatened) (see Tables 4–6). Twelve (32%) of these changes were identi ed 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 w t species, which re ect ongoing attrition by exotic pests. In all cases the species most a ected 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 modi cation from agricultural intensi cation, 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
Total	62	69	167	175	162

* 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 w t (*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 w t *Notopolectron brewsterense* and the ground w t *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 eld cricket, was added to this list in 2022 because existing scienti c literature gives con icting 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://nztcs.org.nz.

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
DATA DEFICIENT (17)					
Taxonomically determinate (12)					
Gryllopsis maoria (de Saussure, 1877)	cricket	Gryllidae			New listing
Hemiandrus lanceolatus (Walker, 1869)	ground wētā	Anostostomatidae			No change
Neonetus huttoni Chopard, 1923	cave wētā	Rhaphidophoridae			Neutral
Pachyrhamma giganteum Richards, 1962	Poor Knights cave wētā	Rhaphidophoridae		CD, IE, RR	Neutral
Pachyrhamma unicolor (Salmon, 1948)	cave wētā	Rhaphidophoridae		IE, RR	Neutral
Paraneonetus multispinus Salmon, 1948	cave wētā	Rhaphidophoridae		IE, RR	Neutral
Pharmacus vallestris					

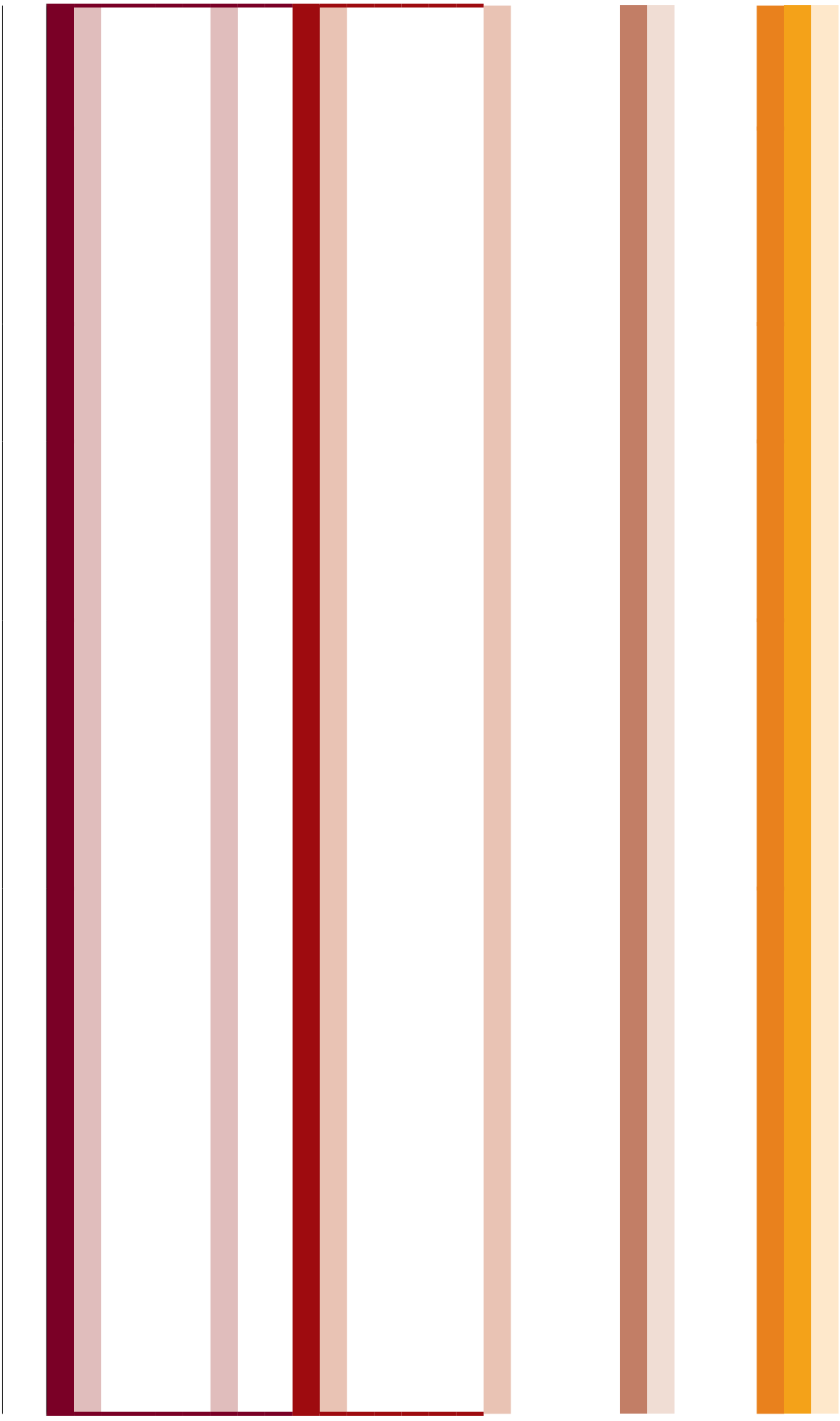

Table 7 continued

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
Phaulacridium otagoense Westerman & Ritchie, 1984	short-horned grasshopper	Acrididae	C(2)	Sp	Worse
Sigaus campestris (Hutton, 1898)	short-horned grasshopper	Acrididae	C(2)	Sp, DPS, DPT	Worse
Taxonomically unresolved (1)					
Brachaspis nivalis (Hutton, 1897) "lowland"	snow grasshopper	Acrididae	B(2)	Sp, DPR, RR	Worse
RELICT (2)					
Taxonomically determinate (2)					
Hemiandrus superbus Jewell, 2007	ground wētā	Anostostomatidae	B	Sp, DPS, DPT, OL	Worse
Hemideina trewicki Morgan-Richards, 1995	Hawke's Bay tree wētā	Anostostomatidae		Sp	No change
NATURALLY UNCOMMON (20)					
Taxonomically determinate (16)					
Deinacrida fallai Salmon, 1950 (IUCN: Vulnerable D2, v2.3, 1996)	Poor Knights giant wētā	Anostostomatidae		CD, DPS, DPT, IE, RR	No change
Dendroplectron aucklandense Richards, 1964	Auckland Island cave wētā	Rhaphidophoridae		IE, RR	No change
Hemiandrus celaeno Trewick, Taylor-Smith & Morgan-Richards, 2020	ground wētā	Anostostomatidae		RR	No change
Hemiandrus jacinda Trewick, 2021	Jacinda's wētā	Anostostomatidae		Sp, DPS, DPT, PF	No change
Hemiandrus merope Trewick, Taylor-Smith & Morgan-Richards, 2020	Kapiti ground wētā	Anostostomatidae		IE, OL	No change
Hemiandrus subantarcticus (Salmon, 1950)	ground wētā	Anostostomatidae		CD, IE, RR	No change
Hemideina ricta Hutton, 1896	Banks Peninsula tree wētā	Anostostomatidae		RR	No change
Insulanoplectron spinosum Richards, 1970	Snares Island wētā	Rhaphidophoridae		CD, IE, RR	No change
Ischyroplectron isolatum (Hutton, 1895)	Bounty Island cave wētā	Rhaphidophoridae		CD, IE, OL	No change
Motuweta riparia Gibbs, 2002	Raukūmara tusked wētā	Anostostomatidae		DPS, DPT, RR	No change
Notoplectron campbellense Richards, 1964	Campbell Island cave wētā	Rhaphidophoridae		CD, IE, RR	No change
Novoplectron serratum Hutton, 1904	cave wētā	Rhaphidophoridae		IE, RR	No change
Pallidoplectron peniculosum Richards, 1960	cave wētā	Rhaphidophoridae		OL	Worse
Pallidoplectron subterraneum Richards, 1965	cave wētā	Rhaphidophoridae		DPS, DPT, PF, RR	Worse
Talitropsis crassicruris Hutton, 1897	cave wētā	Rhaphidophoridae		IE	No change
Talitropsis megatibia Trewick, 1999	cave wētā	Rhaphidophoridae		IE, RR	No change
Taxonomically unresolved (4)					
Hemiandrus (CMNZ 2000.121.21093) "Hapuku"	ground wētā	Anostostomatidae		RR	No change
Hemiandrus (CMNZ 2000.121.21908) "Nokomai"	ground wētā	Anostostomatidae		RR	No change

Continued on next page

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
Hemiandrus “Porters Pass”					

Table 7 continued

NAME AND AUTHORITY	COMMON NAME	FAMILY	CRITERIA	QUALIFIERS	STATUS CHANGE
Hemideina femorata Hutton, 1898	Canterbury tree wētā	Anostostomatidae			No change
Hemideina maori (Pictet & Saussure, 1891)	mountain stone wētā	Anostostomatidae			No change
Hemideina thoracica (White, 1842)	Auckland tree wētā	Anostostomatidae			No change
Isoplectron aciculatum Karny, 1937	cave wētā	Rhaphidophoridae			No change
Isoplectron armatum Hutton, 1897	cave wētā	Rhaphidophoridae			No change
Isoplectron calcaratum Hutton, 1897	cave wētā	Rhaphidophoridae			No change
Locusta migratoria (Linnaeus, 1758)	migratory locust	Acrididae		SO	No change
Macropathus filifer Walker, 1869	cave wētā	Rhaphidophoridae			No change
Macropathus huttoni Kirby, 1906	cave wētā	Rhaphidophoridae			Neutral
Maotoweta virescens Johns & Cook, 2014	green moss wētā	Rhaphidophoridae			Neutral
Metioche maorica (Walker, 1869) (IUCN: Least Concern, v3.1, 2018)	ground cricket	Trigonidiidae			No change
Miotopus diversus (Hutton, 1896)	cave wētā	Rhaphidophoridae			Neutral
Miotopus richardsae Fitness, Morgan-Richards, Hegg & Trewick, 2018	Aola Richards' cave wētā	Rhaphidophoridae			New listing
Neonetus pilosus (Hutton, 1904)	cave wētā	Rhaphidophoridae			No change
Neonetus variegatus Brunner von Wattenwyl, 1888	cave wētā	Rhaphidophoridae			No change
Notoplectron brewsterense (Richards, 1972)	cave wētā	Rhaphidophoridae			Better
Pachyrhamma acanthocerum (Milligan, 1926)	Auckland cave wētā	Rhaphidophoridae			No change
Pachyrhamma cavernae (Hutton, 1900)	cave wētā	Rhaphidophoridae			No change
Pachyrhamma edwardsii (Scudder, 1869)	Edwards' cave wētā	Rhaphidophoridae			No change
Pachyrhamma fuscum (Richards, 1959)	cave wētā	Rhaphidophoridae			No change
Pachyrhamma longicaudum (Richards, 1959)	cave wētā	Rhaphidophoridae		DPS, DPT	No change
Pachyrhamma longipes (Colenso, 1887)	cave wētā	Rhaphidophoridae			No change
Pachyrhamma ngongotahaense Richards, 1961	cave wētā	Rhaphidophoridae			No change
Pachyrhamma spinosum Richards, 1961	cave wētā	Rhaphidophoridae			No change
Pachyrhamma tuarti Richards, 1961	cave wētā	Rhaphidophoridae			No change
Pachyrhamma uncatum (Richards, 1959)	gold mine cave wētā	Rhaphidophoridae			No change
Pachyrhamma waipuense (Richards, 1960)	cave wētā	Rhaphidophoridae			No change
Pachyrhamma waitomoense (Richards, 1958)	Waitomo cave wētā	Rhaphidophoridae			No change
Pallidoplectron turneri Richards, 1958	cave wētā	Rhaphidophoridae			No change
Paprides dugdali Bigelow, 1967	Dugdale's grasshopper	Acrididae			No change
Paprides nitidus 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
Talitropsis poduroides (Walker, 1871)	cave wētā	Rhaphidophoridae			No change
Talitropsis sedilloti Bolívar, 1883	cave wētā	Rhaphidophoridae			No change
Taxonomically unresolved (5)					
Hemiandrus (CMA 2005.56.712) “disparalis”	ground wētā	Anostostomatidae			No change
Hemiandrus (CMA 2005.56.804) “saxatilis”	ground wētā	Anostostomatidae			No change
Hemiandrus (CMA 2005.56.840) “Timaru”	ground wētā	Anostostomatidae			No change
Hemiandrus (CMNZ 2000.121.21086) “Waimakariri”	ground wētā	Anostostomatidae			No change
Hemiandrus (CMNZ 2005.56.717) “madisylvestris”	ground wētā	Anostostomatidae			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 field 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 quali ers

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

Summary de nitions for the categories are presented below.

Data De cient

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 nd out the true category (for a fuller de nition, see Townsend et al. 2008).

Threatened

Taxa that meet the criteria speci ed 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^2)

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^2)

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^2)

B – small population that has a low to high ongoing or forecast decline of 10–50%
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 .1 km

B – moderate population (unnatural), stable ± 10%
B(1) 1000–5000 mature individuals
B(2)) 15 sub-populations, 5
500 mature individuals in the largest sub-population
B(3) Total area of occupancy)
100 ha (1 km2
)

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, 5
500 mature individuals in the largest sub-population
C(3) Total area of occupancy)
100 ha (1 km2
)

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, 1
000 mature individuals in the largest sub-population
D(3) Total area of occupancy)
1000 ha (10 km2
)

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 km2
)

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 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 (± 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 con ned to a speci c 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

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