



FLORA &amp; FAUNA

GUARANTEE

## FLORA AND FAUNA GUARANTEE - SCIENTIFIC ADVISORY COMMITTEE

## FINAL RECOMMENDATION ON A NOMINATION FOR LISTING

*Keyacris scurra* Rehn 1952 - Matchstick Grasshopper

Date of receipt of nomination: 25 September 2017

File No.: FF/54/3784

Date of preliminary recommendation: 4 December 2017

Date of final recommendation: 12 February 2018

**Validity:** The nomination is for a valid item.**Prescribed Information:** The prescribed information was provided.**Name of the Nominator** is adequately provided.**Name of the item** is adequately provided.

The nominated taxon is accepted by the Scientific Advisory Committee (SAC) as a valid taxon because it has been formally described and it is accepted as a valid taxon by Museum Victoria.

*Keyacris* (formerly *Moraba*) *scurra* (Rehn 1952) is a morabine grasshopper. The morabines fall into a family of grasshoppers that is uniquely Australian. Grasshoppers in this group are flightless and have a characteristic matchstick-like appearance. The morabines consist of 250 species and 40 genera, and have been recorded from across Australia. The habitats they occur in include a range of heath, grassland, tree and shrub types. *Keyacris* was named after entomologist Ken Key, and studied by the eminent Australian geneticist and evolutionary biologist Michael White (1956). The group was used by White to develop a model of speciation where chromosomal differences among races drive the speciation process (see references).

The species is confined to habitats of a special type in which the tall perennial grass *Themeda australis* usually predominates. This, however, is not eaten by the insect, but may be important in other ways (e.g. by providing protection from predators)(White 1956). In captivity the species feeds on native daisies which are also present in the grasslands and probably constitute its main food plant. White (op. cit.) noted that "Suitable habitats occur in grassland, savannah woodland country and on the ecotones between this and both 'dry' and 'wet' sclerophyll forest."

Mulvaney (2012) noted that the species was once common in grasslands and grassy woodlands in south-eastern Australia, but is sensitive to habitat modification by sheep and cattle grazing and is now uncommon in the ACT region.

**Eligibility for listing as a taxon under the Flora and Fauna Guarantee**

The nominated item satisfies at least one criterion of the set of criteria prepared and maintained under Section 11 of the *Flora and Fauna Guarantee Act 1988*, and stated in Schedule 1 of the *Flora and Fauna Guarantee Regulations 2011*.

Based on the evidence that the Matchstick Grasshopper has declined in range and abundance to the point of extinction in Victoria, and that the processes thought to be responsible still exist and are likely to continue, the SAC believes the nomination meets the following Flora and Fauna Guarantee listing criteria:

**Evidence that criteria are satisfied:****Criterion 1.1** *The taxon is in a demonstrable state of decline which is likely to result in extinction**Evidence:*

*Keyacris scurra* occurs within one of the most modified regions of Australia where almost no original habitat remains. The species has very limited dispersal ability due to its flightless habit. The main threat currently is the way in which vegetation around cemeteries is now being managed (i.e. cemeteries are now managed by repeated mowing close to ground level which destroys the habitat of *K. scurra*).

**Sub-criterion 1.1.1** *The taxon is known to have occurred in Victoria after European settlement but has not been sighted in Victoria for 40 years**Evidence:*

The Matchstick Grasshopper originally occurred in northern Victoria in the wheat/grazing belt. It was also found in the wheat/grazing belt of NSW from the border to Goulburn. White (1956) noted that *Keyacris scurra* was already threatened in 1956 when he indicated that their occurrence was limited to "relatively minute 'islands'" in the general area of the species potential range. Many of these "ecological islands" are the cemeteries of small human

communities, i.e. areas of one to several acres which have been fenced for many years to exclude grazing animals, and hence retain much of the native vegetation that has largely disappeared from the heavily grazed land outside". The species may now be locally extinct in Victoria despite previously being very widespread. In a recent survey in NSW the species was only found in one site from 8 listed by White (1956) (additional expert advice). New (2011) noted that a number of Morabine grasshopper species have been lost in Australia following changes in native vegetation composition as a result of grazing by introduced herbivores.

**Sub-criterion 1.2.1** *The taxon is very rare in terms of abundance or distribution.*

*Evidence*

It is likely that most *Themeda* patches in cemeteries have now been destroyed or severely reduced. The species was already confined to a few cemetery sites in 1956 and is now extremely rare. Recent surveys for the species indicated that populations in cemeteries such as at Murrumbateman (NSW) and Wodonga (Vic), which were studied previously, no longer support populations (additional expert advice). New (2011) also noted that the species *K. scurra* is either extinct in Victoria or confined to one or two patches of suitable habitat at unknown locations in the state.

**Sub-criterion 1.2.3** *The reproduction or recruitment of the taxon has seriously declined or is not occurring.*

*Evidence*

Many morabine grasshoppers are known to have very low reproduction. New (2011) noted that a number of species produce only around 20 eggs over a lifetime. It is likely that *Keyacris scurra* also has low reproduction rates.

The data presented on distribution and abundance are the result of reasonable surveys and provide clear evidence that the taxon is rare in terms of abundance and distribution.

**Further information**

Mulvaney (2012) made the following comments on the species for populations in the ACT

- In Gungahlin it has been recorded at the National Transmission Authority land at Crace, Mulligans Flat Nature Reserve and Crace Nature Reserve.
- The species has also been observed at Hall Cemetery. Rowell and Crawford (1995) estimated populations of 470 at Mulligans Flat and 1330 at the Transmission site grassland. The latter is one of the largest populations recorded in the ACT. All of the known locations in Gungahlin are under conservation management.
- This species may also occur within the diverse *Themeda* understorey that occurs at the base of One Tree Hill, within Kinlyside, at Moncrieff and to the north of Bonner.

Blackith and Blackith (1966) found that *M. scurra* consumed at least 27 native and introduced plant taxa during feeding experiments in laboratory conditions.

The known distribution of *K. scurra* is largely confined to the temperate grassland of the south-eastern highlands. This is a nationally protected ecological community (Anon. 2016)

**Documentation**

The published information provided to the SAC has been assessed. Based on the available evidence, the SAC believes that the data presented are not the subject of scientific dispute and the inferences drawn are reasonable and well supported.

**Final Recommendation of the Scientific Advisory Committee**

The SAC concludes that on the evidence available the nominated item is eligible for listing in accordance with Section 11(1) of the Act because criteria 1.1 and subcriteria 1.1.1, 1.2.1 and 1.2.3 of the Flora and Fauna Guarantee Regulations 2011 have been satisfied.

The Scientific Advisory Committee therefore makes a final recommendation that the nominated item be supported for listing under the *Flora and Fauna Guarantee Act 1988*.

**References:**

Anon. (2016) *Natural Temperate Grassland of the South Eastern Highlands: a nationally protected ecological community*. Department of the Environment and Energy, Canberra.

<http://www.environment.gov.au/biodiversity/threatened/publications/natural-temperate-grassland-se-highlands-guide> (accessed February 2018)

Blackith, R.E. & Blackith, R.M. (1966) The food of Morabine grasshoppers. *Aust. J. Zoology* **14**: 877-894.

- Key, K.H.L. (1965) Generic assignment of the species hitherto known as *Moraba scurra* Rehn (Orthoptera : Acridoidea). *J. Entomol. Soc. Qld.* **4**: 39.
- Mulvaney, M. (2012) *The Extent and Significance of Gungahlin's Biodiversity Values*. Conservation Planning and Research, Policy Division. Environment and Sustainable Development Directorate, Canberra.
- New, T.R. (2011) 'In Considerable Variety': *Introducing the Diversity of Australia's Insects*. p. 158. Springer: London.
- Rehn, J.A.G. (1952) *The Grasshoppers and Locusts (Acridoidea) of Australia. Vol. 1. Tetrigidae to Eumastacidae*. Genus *Moraba* page 221, Plate 15. CSIRO Melbourne.
- Rowell, A. & Crawford, I. (1995) Survey of the Morabine Grasshopper *Keyacris scurra* (Rehn) in the ACT. Unpublished report to the Wildlife Research Unit, ACT Parks and Conservation Service, Canberra.
- White, M.J.D. (1956) Adaptive chromosomal polymorphism in an Australian grasshopper. *Evolution* **10**: 298-313.
- (1963) Cytogenetics of the grasshopper *Moraba scurra*. *Chromosoma* **14** (2): 140-145.
- White, M.J.D., Carson, H.L. & Cheney, J. (1964) Chromosomal races in the Australian grasshopper *Moraba viatica* in a zone of geographic overlap. *Evolution* **18** (3): 417-429.

#### Relevant website

Managing native vegetation in Victorian cemeteries

- <https://www2.health.vic.gov.au/public-health/cemeteries-and-crematoria/guidelines-policies-reports/cemetery-land-development/cemeteries-managing-native-vegetation>

Endorsement by the Convenor of the Scientific Advisory Committee

Date



19/2/2018

Prof Emeritus Barbara Evans,  
Convenor