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## CONSERVATION ADVISORY SCIENCE NOTES

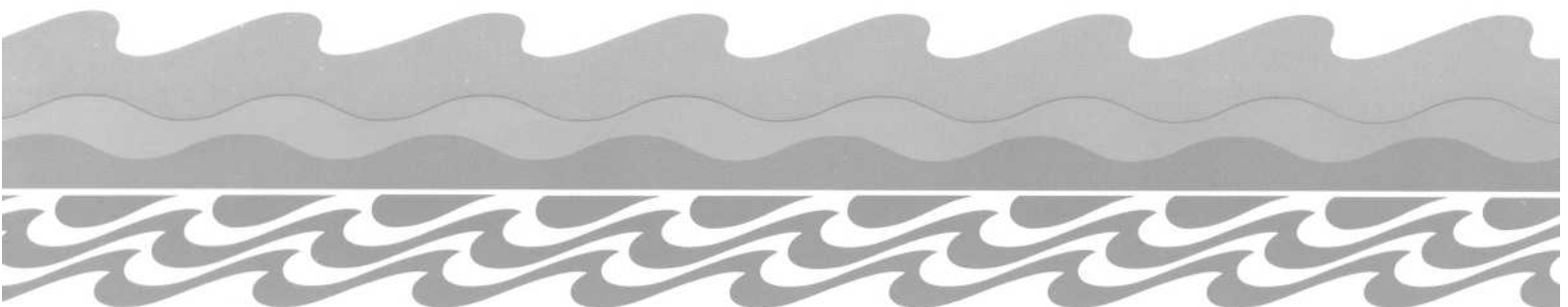
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### *MECODEMA CHILTONI* BROUN : AN ASSESSMENT OF THE PRIORITY FOR CONSERVATION

(Short Answers in Conservation Science)

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***MECODEMA CHILTONI* BROUN**

**AN ASSESSMENT OF THE PRIORITY  
FOR CONSERVATION**



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Front cover: *Mecodema chiltoni* Broun, 33mm long. Collected by Brian Patrick from the Nokomai Range, 14 November 1981 in tussock grassland at 1100m.

(Photo: Barbara Barratt)

## EXECUTIVE SUMMARY AND RECOMMENDATIONS

The taxonomic position of *Mecodema chiltoni* Broun and closely related species is described. There are about 63 currently recognised species of *Mecodema* in New Zealand. *M. chiltoni* was first described in 1917 from Mt. Dick near Kingston, on the south western side of Lake Wakatipu. Since then it has been found on the Carrick Range, on the Nevis side of the Hector Mountains, in the southern and central Eyre Mountains, and at Bold peak near Kinloch. The altitude range in which specimens have been discovered is 606-1524m, although most have been found below 1100m. Generally populations have been found in tussock grassland, although beech forest has also been shown to support a healthy population of *M. chiltoni*. Considerable agricultural development has, and continues to take place in mid-altitude native grassland, which clearly has the potential to place the viability of the species at some degree of risk. *M. chiltoni* being a large, flightless predator is inherently threatened by habitat change. Specimens have been located from areas which may have some degree of protection from further development. It is considered important to ascertain where viable populations remain and assess the vulnerability of these in relation to land tenure.

The available information about current distribution, abundance and therefore conservation status of *M. chiltoni* is limited, and an analysis of these factors has precipitated the following recommendations:

- (1) establish the current distribution of *M. chiltoni* with an estimate of population abundance and sustainability,
- (2) determine the habitat requirements of larvae and adults (or at least characterise habitats where it still occurs),
- (3) establish the land tenure and the current and future land management and development proposals for areas where *M. chiltoni* occurs,
- (4) evaluate the need for and level of protection required to enhance, if not ensure the survival of the species.
- (5) depending upon the outcome of (1) to (4), it may then become necessary to draw up a conservation management plan for the species and instigate a basic research programme to provide further information on the ecology of the species. This should be directed towards assisting with environmental management decisions and ideally should include a periodic monitoring programme to detect changes in population abundance and distribution.

## INTRODUCTION

This report was commissioned by the Department of Conservation, Dunedin. Concern had been expressed that the status of *Mecodema chiltoni* Broun should be 'rare and endangered' and it was decided that an analysis of available information on the distribution, biology, ecology and priority for conservation should be prepared. Recommendations on the requirement for further field survey, and methodology which should be employed were requested so that the Department would then be in a position to develop a strategy for the conservation of *M. chiltoni*.

The objectives of this report are to:

- (1) summarise the taxonomic position of *M. chiltoni*,
- (2) assemble available records of distribution and abundance,
- (3) collate information on biology and ecology,
- (4) synthesise (2) and (3) to determine the apparent conservation needs of *M. chiltoni*,
- (5) recommend action required to evaluate and implement a conservation strategy.

## TAXONOMIC STATUS

Order: Coleoptera  
Family: Carabidae  
Tribe: Broscini  
Genus: *Mecodema* Blanchard 1853  
Species: *chiltoni* Broun 1917

The New Zealand endemic genus *Mecodema* Blanchard was described in 1853 (Blanchard 1853), selecting *Mecodema sculpturatum* as the genotype (Appendix I). Although Broun had not seen Blanchard's diagnosis, he gave his own description derived from *Mecodema lucidum* (Broun 1880) (Appendix II). Later, Broun repeated this generic description (Broun 1909) still not having seen Blanchard's description, but added that 'the above details will define the genus with sufficient accuracy'.

In his revision of the Broscini, Britton (1949) reduced the number of species of *Mecodema* from 82 to 58 mostly as a result of rationalising Broun's synonymy. Britton recognised eight species groups, *M. chiltoni* being placed in the *costellum* group, which is characterised by the large size of the species within it (20-39mm long), elytral intervals 3,5 and 7 distinguishable from 2,4 and 6 which have a smoother texture and are more convex. All 11 species in the group occur in the South Island, including Stephen's Island.

Townsend (1965) in his discussion of the genus added five new species and recognised two new subspecies from the Nelson area.

*Mecodema chiltoni* Broun was first described in 1917 (Broun 1917) from a single specimen found by Mr T. Hall on 11 March 1914. This specimen, a female (which became the holotype), was found on Mt. Dick, Lake Wakatipu (Appendix III). Mt. Dick is about 7.5km north of Kingston rising close to the south-western shore of the lake to 1808m. According to Thomas Broun, he and Mr T. Hall 'shared in the pleasure of naming the species in the honour of Professor Charles Chilton', who was the Professor of Biology, Canterbury College, University of New Zealand.

Broun compared *M. chiltoni* with *Mecodema costellum* Broun from Stephen Island, but distinguished it from the former by its less elevated elytral costae (ridges) and the puncturation of the interstices between the costae. *Mecodema costipenne* Broun, which was described from Routeburn, Lake Wakatipu, was distinguished as being smaller (although that too was described from a single, and in this case damaged, specimen), and with puncturation of the elytra which is more similar to *M. costellum*. The sides of the pronotum of *M. costipenne* were also described as being more narrowly curved towards the base such that the basal angles were almost obsolete (Appendix III).

Britton (1949) examined the holotype during his revision, along with a further specimen and the elytra of four others collected from 'Nevis, 2900ft, 19 Dec 1938' by M. R. Renn Foord. Although not illustrated, Britton describes the male genitalia 'with both parameres setiferous' (Appendix IV), so presumably the Nevis specimen, or fragments included a male. Having discovered a 'colony' of *M. chiltoni* in the southern Eyre Mts., Townsend

(1965) illustrated the male genitalia, further confirming the close affinity of this species with *M. costipenne* which is shown for comparison (Appendix V).

*M. chiltoni* is one of the larger species of the genus, at 36-38mm long and 10.5mm wide, and indeed, would be amongst the largest of the Carabidae native to New Zealand.

## **DISTRIBUTION**

Information on the distribution of *M. chiltoni* has been derived mainly from label data from specimens in collections throughout New Zealand as shown in chronological order for collection date, in Table 1. In addition to label data, the locality code (Crosby *et al.*, 1976) and the Ecological Region and Districts (McEwen 1987) are given when details on the labels were sufficiently explicit. The label data have been used to plot the known distribution of *M. chiltoni* (Map 1) as far as possible where reasonably precise records are available, although altitudes were often not given on the labels for some of the earlier specimens including the Mt Dick and Bold Peak sites. Unfortunately, some of these older records gave such data as 'Lake Wakatipu' or 'O.M. Bannockburn'. While the former is very imprecise, the latter may be speculatively interpreted as 'Old Man Range, Bannockburn', which in turn could be what we now know as the Carrick Range.

The distribution information we have (Table 1 and Map 1), suggests that *M. chiltoni* is fairly restricted in its distribution to the western shores of Lake Wakatipu, and areas to the east of the Lake as far as the Carrick Range, and to the south on both sides of the Maitai River as far as the southern Eyre Mts. The currently known distribution of *M. chiltoni* falls into six main localities. From north to south these are:

- (1) Bold Peak, Humboldt Mts to the west of Kinloch: a single incomplete specimen collected in 1918, precise location and altitude unknown.
- (2) The Carrick Range to the south west of Bannockburn: live specimens collected between 1965 and 1979 from the summit at just under 1300m (the Watt 1979 altitude record of 1380m may be an error) down to about 880m.
- (3) Mt. Dick just north of Kingston: this is the type locality, precise location and altitude unknown, single specimen collected 1914, four specimens collected 1955. Remains of a specimen also collected from 1524m on Cainard Stn. although exact locality not known.
- (4) Hector Mts. on the Nevis Valley side: live specimens collected between 1938 and 1988



**Table 1.** Label details for *M. chiltoni* specimens held in collections. The exact wording of the labels has been reproduced as far as possible for locality. Also included are specimen location, Locality Codes, Ecological Regions and Districts (see text).

Specimen Location	Label Details				Code	Ecological Region	Ecological District
	Locality	Date	Altitude/Habitat No specimens	Collector			
AMNZ	O.M. Bannockburn	1912?		C.E. Clarke	CO	Central Otago	Old Man
British Museum	Mt. Dick, Lake Wakatipu	11 Mar 1914	1 ♀ (holotype)	T. Hall	OL	Mavora	Eyre
Museum of NZ Wellington	Bold Peak	11 Feb 1918	1 spec. incomplete Det. E.B. Britton	Lewis Colln.	OL	Aspiring	Dart
AMNZ	L. Wakatipu	1923		G. Howes			
NZAC	Nevis	19 Dec 1938	2900' (879m) 1 spec. plus remains of 4 others	M.R. Renn Foord	CO	Lakes	Remarkables
NZAC	Mt Dick, Otago	11 Jan 1955	2 specs.	E. Fairburn	OL	Mavora	Eyre
Museum of NZ Wellington	Mt. Dick, Kingston, Lake Wakatipu	12 Apr 1955	2 specs.	Fairburn Colln.	OL	Mavora	Eyre
NZAC	Mt. B. Eyre Mtn. [as below]	3 Feb 1963	2000' (606m) 15 specs.	J.I. Townsend	OL	Mavora	Eyre
J.I. Townsend Colln.	Irthing Stream, Five Rivers	3 Feb 1963	2000' (606m) 6 specs.	R.M. Bull	OL	Mavora	Eyre

Specimen Location	Label Details				Code	Ecological Region	Ecological District
	Locality	Date	Altitude/Habitat No specimens	Collector			
Canterbury Uni.	Nevis Road, Carrick Ra.	23 Jan 1965	2900' (879m) 1 ♂, 1 ♀	R.S. Bigelow	CO	Central Otago	Old Man
Canterbury Uni.	Nevis Saddle, Carrick Ra.	24 Oct 1969	1 ♂ under schist rocks in tussock and <i>Aciphylla</i>	P.M. Johns	CO	Central Otago	Old Man
NZAC		Acquired 1970	2 elytra, 1 spec. in pieces	E.S. Gourlay			
NZAC		Acquired 1970	2 specs.	E.S. Gourlay			
NZAC	Quartzville, Carrick Ra.	30 Jan 1971	3000' (909m) 1 spec.	J. McLaren	CO	Central Otago	Old Man
NZAC	Cainard Station, Eyre Mts.	17 Nov 1971	1524m 1 spec. elytra and head only	J.C. Watt	OL	Mavora	Eyre
NZAC	Carrick Ra.	7-31 Oct 1979	975m 1 spec. pit traps near water race	J.C. Watt	CO	Central Otago	Old Man
NZAC	Carrick Ra., Watts Rock	31 Oct 1979	1380m 2 specs., under stone	J.C. Watt	CO	Central Otago	Old Man
Lincoln Uni. Canterbury	Watts Rock, Carrick Ra.	31 Oct 1979	1297m remains of 2 specs.	R.M. Emberson	CO	Central Otago	Old Man

Specimen Location	Label Details				Code	Ecological Region	Ecological District
	Locality	Date	Altitude/Habitat No specimens	Collector			
BIP Barratt Colln. DN	Hector Mts.	14 Nov 1981	4500' (1364m), 1 ♀	B.I.P. Barratt	CO	Lakes	Remarkables
BIP Barratt Colln. DN	Hector Ra.	14 Nov 1981	1100m, 1 ♀	B.H. Patrick	CO	Lakes	Remarkables
Otago Museum, Dunedin	Upper Nevis Valley, Whitten's Creek	2 Feb 1984	captured on ground near large weta hole	A.C. Harris	CO	Lakes	Remarkables
Lincoln Uni.	Hector Mts.	1 Jan 1986		S. Wylie	CO	Lakes	Remarkables
BH Patrick Colln. DN	Nokomai Ra.	18 Oct 1988	1000m	B.H. Patrick	CO	Waikaia	Nokomai
BIP Barratt Colln. DN	Nokomai Ra.	18 Oct 1988	900m, 2 ♀	B.H. Patrick	CO	Waikaia	Nokomai
Otago Museum, Dunedin	Upper Nevis Valley, Whitten's Creek	12 Feb 1992	found on ground near large weta hole, elytra only	A.C. Harris	CO	Lakes	Remarkables

AMNZ = Auckland Museum, New Zealand

NZAC = New Zealand Arthropod Collection (Landcare NZ Ltd.)



**Map 1.** Lake Wakatipu area showing localities where *M. chiltoni* has been collected (red spots), and a less precise record from Cainard Station in the central Eyre Mountains (red circle). The map is reproduced from NZMS 242 Sheet 4 'Ecological Regions and Districts of New Zealand'.