Threatened Species Assessment

Acrodipsas brisbanensis
Large Ant Blue Butterfly

Taxonomy

Acrodipsas brisbanensis (Miskin, 1884)

Within the taxon, two subspecies were previously recognised: *Acrodipsas brisbanensis brisbanensis* (Miskin) and *A. b. cyrilus* (Anderson and Spry). The subspecies *A. b, cyrilus* is now considered within the variation of the nominate species and is therefore not recognised as a separate subspecies.

Current conservation status

Listed as threatened under the *Flora and Fauna Guarantee Act 1988* (SAC 1991).

Categorised as Endangered in the 2009 Advisory list of threatened invertebrate fauna in Victoria (DSE 2009).

Proposed conservation status

Endangered in Victoria.

Criterion B2ab(iii,v).

The bushfires of 2019/2020 have potentially impacted the taxon habitat. The degree of damage to the populations and the likelihood to lead to further decline in population is yet to be determined.

Species Information

Description and Life History

A. brisbanensis males are known to be rapid fliers and will congregate at the top of trees, on the summit of steep hills and on sand dunes. Perching for long periods of time, the male waits for the opportunity to mate with females that make brief visits to the summit. Hill-topping activity occurs from late morning to late afternoon, particularly during warm to hot weather when temperatures exceed 28°C and there is little wind. The female Large Ant-blue is thought to spend little time (if any) hill-topping. It searches for suitable oviposition (egg-laying) sites soon after mating (Britton and New 1992, 1993; Crosby 1988; Quick 1989).

The main flight period (breeding season) in Victoria is December to February, although sightings have been made in March following earlier cold spells. Successive generations within each population continue to use a specific high point for locating mates. The males are territorial, chasing rival males and other insects that approach their leaf perches.

A female has been observed laying a small cluster of eggs on a dead eucalypt stump containing Coconut Ants (*Papyrius* sp, *nitidius* group) and a few pupae have been recovered in ant tunnels in trees and under bark. The larval food is likely to be immature Coconut Ant remains located in ant nests, under bark or within hollow tree branches/stumps.

Generation Length

The generation length of *A. brisbanensis* is suspected to be 6 to 12 months. This is based on the best known congener (*A. myrmecophila*).

Distribution

The Ant-blue is the most widespread species from the genus in Victoria and Australia. The original specimens from Victoria were found south east of Melbourne at Cranbourne (1897) and Springvale (1906). It was more than 70 years before the next specimens were recorded in Victoria (Mt Piper, Broadford and the You Yang Ranges). Specimens have also been recorded at Genoa Peak, where it flies with the Copper Ant-blue.

Present surviving populations are confined to remnants of open forest and woodland in central Victoria, including near Broadford, Mansfield (Britton and New 1992, 1993), Kangaroo Ground and Wedderburn (Douglas and Braby 1992). There are also unconfirmed records from Plenty Gorge and Kinglake National Park (Beardsell 1994) although it is possible that the Ant-blue may be more common and widespread than records would suggest. The subspecies is now believed to be extinct at several of its former locations, including Warrandyte North (Douglas and Braby 1992), the You Yangs (Field 1978), Moe, Springvale and Cranbourne.

A previous record which cited a population of Ant-blue near Genoa is likely to have been the previously recognised *A.b. brisbanensis* (Miskin) (Hunting 1980, 1986).

Habitat

The Ant-blue is known from peri-urban areas of Melbourne, rural hilltops (e.g. Mt Piper), and forested areas in the Little Desert and Croajingolong National Parks.

If the association between the Coconut Ant is confirmed, the survival of the Large Ant-blue would depend on that of the ant, and hence on the ant's specific habitat requirements. The Coconut Ant's biology is poorly known (New et al. 1996). It forms nests which incorporate both underground galleries and chambers, as well as surface features such as stumps, ageing trees and decaying wood. The ants have a varied diet, but Acacia species are thought to be crucial for arboreal foraging (Beardsell 1994). The predominance of Acacia species in temperate sclerophyll forest communities is related to bushfire frequency. Ants also forage on young regenerating eucalypts when honeydew is present.

It is believed that the caterpillars of the Large Ant-blue might feed by sucking fluids from ant larvae and pupae (Quick 1989), while adults are nectivorous and probably feed on a variety of flowering plants (Britton and New 1992, 1993).

Approximately >95% of all records are from hilltops that have reasonably low vegetation, as the butterflies fly at the tops of the trees, and only hills with low vegetation are suitable for assessing.

Threats

The taxon is threatened by habitat disturbance and fragmentation. The alteration of ecological processes and patterns within and adjacent to remaining habitat for the Large Ant-blue is a threat to all remaining populations: in particular, changes to the land, such as vegetation clearance, modification of vegetation through weed invasion, or intensive land use and rural subdivision.

Most historic locations were found in last 40 years and extant populations are likely to occur at many if not all of these. The bushfires of 2019/2020 are believed to have impacted Mount Genoa, one of the few sites in Victoria

The remaining populations of the Large Ant-blue are supported by plant communities which have been widely cleared and fragmented for agricultural purposes. Populations are typically disjunct and restricted to small, isolated areas of native vegetation within larger areas of mostly modified habitat. The butterfly and its attendant ants are therefore vulnerable to climatic changes and disturbances such as bushfire.

IUCN Criteria

Criterion A. Population size reduction.
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4

	Critically Endangered	Endangered	Vulnerable
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.

A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(*a*) *cannot be used for A3*]

A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

based on any of the following:

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Evidence:

Ineligible under Criterion A

There is insufficient evidence to determine whether there has been or will be a reduction in population sufficient to meet any threshold for Criterion A.

Criterion B. Geographic range in the form of either B1 (extent of occurrence) and/or B2 (area of occupancy	Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1. Extent of occurrence (EOO)	< 100 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

Evidence:

Eligible under Criterion B2 as Endangered

The Area of Occupancy (AoO) across the taxon's range is estimated to be 60 km², based on 2 x 2 km grids derived from accepted, post-1970 records in the Victorian Biodiversity Atlas.

The taxon is estimated to be severely fragmented, considering the limited dispersal ability of the taxon, the barriers to dispersal, or lack of habitat separating them. It is estimated to have a continuing decline in (iii) and (v) above. Some habitats in urban areas may have been lost through land clearing and the future is uncertain as the butterfly and its attendant ants are vulnerable to climatic changes and random disturbances such as wildfire.

Criterion C. Small Population size and decline				
		Critically Endangered	Endangered	Vulnerable
Number of mature individuals		< 250	< 2,500	< 10,000
AND at least one of C1 or C2				
C1	An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2	An observed, estimated, projected or inferred continuing decline AND least 1 of the following 3 conditions:			
(a)	(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
	(ii) % of mature individuals in one subpopulation =	90 – 100%	95 – 100%	100%
(b) Extreme fluctuations in the number of mature individuals				

Evidence:

Ineligible under Criterion C

It is suspected that there are 50 to 1,000 mature individuals, but this qualifier is too weak and other thresholds under this criterion have not been met.

Criterion D. Very small or restricted population			
	Critically Endangered	Endangered	Vulnerable
Number of mature individuals (observed or estimated)	<·50	<·250	<·1,000
D2 Only applies to the VU category Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to critically endangered or Extinct in a very short time.	-	-	D2. Typically: AoO <·20 km2 or number of locations ≤·5

Evidence:

Ineligible under Criterion D

It is suspected that there are 50 to 1,000 mature individuals.

Criterion E (Quantitative Analysis) was not addressed as the taxon does not have a detailed Population Viability Analysis.

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