

Flora & Fauna Guarantee Action Statement

#70

This Action Statement was first published in 1996 and remains current. This version has been prepared for web publication. It retains the original text of the action statement, although contact information, the distribution map and the illustration may have been updated.

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Large Ant-blue Butterfly *Acrodipsas brisbanensis*



Large Ant-blue Butterfly (*Acrodipsas brisbanensis*)
(Illustration by John Las Gourgues)



Distribution in Victoria (DSE 2002)

Description and Distribution

The Large Ant-blue *Acrodipsas brisbanensis* (Miskin), is a butterfly belonging to the family Lycaenidae within the order Lepidoptera. It is cryptically coloured and relatively small, with a wingspan of 22-26 mm. The undersides of its wings are typically brown with narrow bands and spots, but these markings are very variable. The body and uppersides of the wings are dark or bronze brown, and the female has bright blue colouring in the basal third. Two black patches on the outer part of the hind wing are bordered by a thin blue line. A detailed description of the adults is provided by Common & Waterhouse (1981). There are no descriptions of the larvae and pupae.

Within the taxon, two subspecies are recognised: *Acrodipsas brisbanensis brisbanensis* (Miskin) and *A. b. cyrilus* (Anderson & Spry). The latter is an endangered Victorian endemic. Surviving populations of this subspecies are confined

to remnants of open forest and woodland in central Victoria, including near Broadford, Mansfield (Britton & New 1992, 1993), Kangaroo Ground and Wedderburn (Douglas & Braby 1992). There are also unconfirmed records from Plenty Gorge and Kinglake National Park (Beardsell 1994). The subspecies is now believed to be extinct at several of its former locations, including Warrandyte North (Douglas & Braby 1992), the You Yangs (Field 1978, Atkins 1978), Moe, Springvale and Cranbourne. A record from near Genoa is likely to have been *A. b. brisbanensis* (Miskin) (Hunting 1980, 1986) and would therefore be the only record for this subspecies in Victoria. It also occurs in New South Wales, the Australian Capital Territory and Queensland (Common & Waterhouse 1981).

Conservation Status

Current Status

CNR (1995) Endangered

The Large Ant-blue is listed as a threatened taxon in Schedule 2 of the Flora and Fauna Guarantee Act 1988. Butterfly Community No. 1, which includes both the Large and Small Ant-blue butterflies, is also listed as a threatened community, and the Small Ant-blue, *Acrodipsas myrmecophila*, is listed as a threatened taxon.

Reasons for Conservation Status

The taxon is threatened by habitat disturbance and fragmentation. Habitat degradation has resulted in documented local extinctions. The Scientific Advisory Committee (1991) has determined that the Large Ant-blue is:

- in a demonstrable state of decline which is likely to result in extinction; it has disappeared from possibly five of its eight known sites (Douglas & Braby 1992, Britton & New 1993), and
- significantly prone to future threats that are likely to result in its extinction, primarily because of its restricted occurrence, sensitivity to environmental conditions and likely dependence on other invertebrate species.

Major Conservation Objectives

The major conservation objectives are:

- to determine the present distribution of the species in Victoria;
- to determine the ecological requirements of the species; and
- to protect and maintain all known populations of the species.

Management Issues

Ecological Issues Specific to the Taxon

The ecology of the Large Ant-blue is not well known, and the difficulty of obtaining sound biological information is compounded by the species' rarity (Britton & New 1994). Despite exhaustive study in the wild, aspects of the life history of the Large Ant-blue remain unknown (Jelinek et al. 1994). It is probable that subtle and complex relationships exist between the butterfly, its environment and other biota, so that it is unlikely that the links between land use change and population fluctuations will be entirely clear. Arresting the decline of wild populations poses significant challenges.

The main flight period (breeding season) of the Large Ant-blue in Victoria is December to February, although sightings have been made in March following earlier cold spells. During this period, male Large Ant-blue butterflies congregate on the summit of specific peaks, where they establish and defend territories around the tops of selected trees. Females can proceed to these prominent peaks and be assured of a high probability of finding a suitable mate. This behaviour is called 'hill-topping'. Successive

generations within each population continue to use a specific high-point for locating mates. 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 & New 1992, 1993; Crosby 1988; Quick 1989).

As with other lycanid butterfly species, the Large Ant-blue probably associates with ants, a characteristic known as myrmecophily. Typically, butterfly-ant associations are mutually beneficial and obligate, with the immature stages of the butterfly occurring within or close to the nests of ants. The ants obtain essential carbohydrates and amino acids from secretions produced by the caterpillars and, in turn, the ants protect the butterfly caterpillars from disease, starvation, parasites and predators (Britton & New 1992). It is suspected, although confirmation is needed, that the Coconut Ant, *Papyrius 'nitidus'* (Mayr), a complex of similar but possibly separate taxa, is the attendant ant taxon (New et al. 1996). Female Large Ant-blues have been observed laying eggs near the nests of the Coconut Ant (Douglas and Braby 1992), and it is thought that at least part of the butterfly's larval stage is spent inside the nest.

If this association between the Coconut Ant (or possibly another species) is confirmed, the survival of the Large Ant-blue probably depends 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 wildfire 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). Adults are nectivorous and probably feed on a variety of flowering plants (Britton & New 1992, 1993).

Threatening Processes

Urbanisation can directly affect butterfly habitat. Higher densities of human habitation are concomitant with accelerated rates of habitat disturbance, such as firewood collection, vegetation removal, weed invasion, and various recreational pursuits. An oviposition site for the Large Ant-blue was destroyed by housing development in 1988 (Beardsell 1994), and areas which previously supported the species in Cranbourne and Springvale have probably succumbed to habitat destruction caused by extensive urbanisation. 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. The immediate environs of two of the four known populations are being transformed from broad-acre pastoral land to primarily residential blocks. Changes like these may

have exacerbated the decline of the species at the You Yangs site.

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 random disturbances such as wildfire.

Small, sedentary populations of butterflies in accessible areas might be threatened by butterfly collection (Thomas 1984).

Mountain peaks and hill-tops are used for communication towers, fire lookouts and survey facilities. The construction of these facilities usually degrade butterfly habitat by removing plants used for hill-topping, food and shelter. Associated developments such as the construction of vehicle tracks may also affect butterfly and ant habitats. Other specific threats, such as mineral exploration, mining, grazing and fuel-reduction burning could precipitate direct and indirect habitat disturbance or modification unless they are appropriately managed. The potential impact of some recreational pursuits on the Large Ant-blue also needs to be evaluated; these include horse-riding, motorised recreation and (at the Mansfield site) hang-gliding. Of particular importance are threats which may deplete the food and shelter resources of attendant ants, such as surface soil disturbance or the removal or destruction of fallen timber. Less obvious threats to the Large Ant-blue and its attendant ants are natural changes to community structure and composition, such as those brought about by fire. Some ant species are particularly sensitive to environmental change (New et al. 1996). As with many plant species, optimum habitats for some invertebrates are transitory. It is conceivable that the Large Ant-blue may prosper in the secondary successional stages which follow fire.

Wider Conservation Issues

An understanding of the Large Ant-blue will help in planning the conservation of related species, including the Small Ant-blue. Sponsoring research helps develop expertise in invertebrate ecology.

Focusing on a species that has a complex interrelationship with the physical and biotic environment will involve management at the community level, which will benefit associated flora and fauna that also has been marginalised by broad-acre clearing. Maintaining natural processes and native plant communities around hill-topping sites - regardless of land tenure - will enhance their integrity and long-term viability.

Social and Economic Issues

Adverse socio-economic effects of implementing a conservation program for the Large Ant-blue will be minor, provided the need for managing and protecting habitat is incorporated into the planning of landholders, local government, other government agencies and industry. If

this does not occur, the potential for adverse impacts is likely to be greater.

Given the extreme rarity of the Large Ant-blue (particularly *A. b. cyrilus*), the lack of detailed ecological information about the species and its persistence at a limited number of sites, there is little alternative to safeguarding remaining hill-topping sites and surrounding areas, on the basis that they are at least sustaining the species to some degree (New et al. 1994). Until a more detailed knowledge of the species' habitat preferences is obtained, maintaining existing land use is desirable. This interim objective has no socio-economic implications for the Genoa Peak population, as the peak and its surrounds are within Croajingolong National Park. Buffering hill-topping sites in central Victoria from changes in land use and development will be more problematic: known hill-topping sites for *A. b. cyrilus* have only small core areas (including the summits) of public land, and while butterflies are likely to breed close to each hill-topping site, adults may congregate from a radius of several kilometres (New et al. 1994).

The summits of two of the known hill-topping sites - Broadford and Mansfield - are within small public land reserves where resource use conflicts are minor. However, there is evidence of illegal firewood collection on both reserves and nearby roadsides. A more concerted effort by NRE and local shires to modify firewood collection practices is needed. A recent report on firewood collection outlines the socio-economic dimensions of this issue and canvasses a range of measures (Read Sturgess 1995).

Some recreational activities may conflict with the conservation of the species. Where these activities need to be curtailed, NRE could negotiate with user groups and locate alternative sites if necessary. Although this might exclude or regulate some types of recreation, others might be enhanced.

Exploration and mining for gold and antimony occurred during the 1940s at the Broadford site, but at the time was considered to be uneconomic. Some geochemical and geophysical exploration is being carried out at one hill-topping and oviposition site as part of a regional survey of mineral resources. If a proposed mining operation threatens habitat, the net benefits to Victoria would need to be carefully weighed against the potential for the extinction of the Large Ant-blue in Victoria.

The appropriate management of remnant bushland on freehold land is crucial to the maintenance of microhabitats favoured by the Large Ant-blue and its attendant ants, and can be consistent with the goals of the landholders. In particular, the retention of native vegetation helps soil and water management and mitigates the effects of climatic extremes on stock. Many landholders, especially those who are not financially dependent on the land, are likely to respond positively to these programs. Remnant vegetation also provides aesthetic and environmental benefits (such as catchment stabilisation, biodiversity maintenance and nutrient cycling) to the wider community. In the context of community socio-economics, the benefits of retaining native vegetation far outweigh the costs. A small number of landholders may be adversely affected by limitations on their ability to clear native vegetation. Where native vegetation could be lost through sub-division and residential development, strategic planning by the responsible

planning authorities can minimise the impacts on hill-topping sites.

Retaining and managing native vegetation on freehold land will be pursued through education and extension services, community groups and financial incentives, such as Landcare groups, the Land for Wildlife program and Land Protection Incentive Scheme.

Some additional costs may be borne by industry and government in mitigating the impact of communication, survey and fire lookout facilities on hill-topping sites. The preparation of management guidelines for prospective users and the sharing of existing structures would help alleviate these costs.

Management Action

Previous Management Action

An Action Statement (No. 6) has been published for Butterfly Community No. 1 (Mt Piper) (Jelinek 1991), and a recovery plan for the community (Jelinek 1992) is being implemented. These documents are part of a conservation strategy that focuses on planning, management, research and monitoring of the butterfly community near Broadford. As part of this work, more detailed studies on selected species, including the Large Ant-blue, are also in progress (Beardsell 1994; Britton & New 1992, 1993; Jelinek 1991, 1992; Jelinek et al. 1994; New et al. 1994; Britton 1995; New et al. 1996).

The Broadford site is listed on the register of the National Estate on the basis of its significance for invertebrate conservation. In addition, a proposed amendment to the Broadford Shire Planning Scheme, known as Amendment L8 (Mt Piper Conservation Zone), reflects the environmental, cultural and scenic significance of the Mt Piper landscape. The policy guidelines for the amendment provide specific controls, preventing the unauthorised removal of native vegetation. The Broadford Shire (now part of the Shire of Mitchell) signposted roads surrounding Mt Piper to highlight their conservation significance and prohibit wood removal or unauthorised burning.

Continuing management activities at the Broadford site include erosion control and revegetation, restriction of vehicle and horse access into the reserve, the removal of disused facilities and structures on and near the summit, and the provision of on-site interpretation material.

Liaison with the Geodetic Survey Section of the former Department of Survey and Mapping concluded with an agreement to minimise site clearance at the Broadford hill-topping site. Discussions were also had with the former Department of Minerals and Energy and the communications industry on issues relating to hill-topping sites.

The actions already taken have been complemented by extension services to landholders, naturalist groups and interested individuals.

Intended Management Action

This Action Statement will be implemented together with Action Statements 6 (Butterfly Community No. 1) and 72 (Small Ant-blue).

Research, Monitoring and Survey

- Through research into breeding biology and diet, identify and delineate habitat elements critical to the Large Ant-blue. In particular, the identification and study of the attendant ant species is an urgent priority.
- Over five consecutive summer seasons, survey and monitor all known and potential hill-topping sites and areas where the Coconut Ant is known to occur. Conduct intensive searches for oviposition sites.
- Construct a series of monitoring stations within ant colonies, to facilitate behavioural studies.
- Investigate and report on land use adjacent to known hill-topping sites.
- Test the augmentation of Coconut Ant habitat using imported nest substrates at Mt Piper.

Management

- Review public land tenure at known hill-topping sites and seek appropriate reservation status where appropriate.
- Prepare and implement site-specific guidelines for the management of known hill-topping sites for the species.
- Liaise with public land user groups regarding possible recreational impacts.
- Liaise with individuals or management authorities responsible for communication, survey, fire lookout and other facilities at known and potential hill-topping sites of the Large Ant-blue.
- Continue to liaise with mining interests to alert them to the environmental constraints in and around known populations of the butterfly.
- Allow access only for walkers and management vehicles on all hill-topping sites on public land.
- Provide assistance, advice and, where possible, incentives to landholders and land managers for native vegetation management.
- Ensure that invertebrate conservation is considered by Catchment and Land Protection Boards in the preparation of Regional Catchment Strategies.

Community Education and Information

- Encourage and assist local Shires to promote and implement State Government policies relating to the retention of native vegetation.
- Communicate research results, habitat management guidelines and the importance of invertebrate conservation through a range of mediums and publications to reach as wide an audience as possible.
- Encourage the retention and management of native vegetation on freehold land through education and extension services, community groups and financial incentives, such as Landcare Groups, Land for Wildlife and the Land Protection Incentive Scheme.
- Ensure that land management organisations provide landholders with a consistent message about the

importance of native vegetation retention (including understorey and mistletoes) for invertebrate conservation.

Liaison

- Continue to liaise with planning agencies and landholders regarding the conservation of the Large Ant-blue butterfly.
- Encourage the sharing and rationalisation of existing hill-top structures and their uses. For example, satellite survey technology has largely replaced the necessity of ground surveys employing 'trig points' with cleared sight lines.
- Involve Landcare groups and Land for Wildlife members with habitat management.
- Encourage the participation of entomologists, students, landholders, butterfly collectors, interest groups and individuals in invertebrate surveys and to contribute records to NRE's Atlas of Victorian Wildlife.
- Wherever possible, seek to negotiate cooperative outcomes where it is necessary to maintain butterfly habitat on freehold land. Where additional habitat is to be extensively cleared for intensive land uses such as cropping, the powers available to NRE will be used as a last resort.

Other Desirable Management Action

- Investigate the biology and ecology of other myrmecophilous butterflies, particularly those associated with the Coconut Ant or related ant taxa.

Legislative Powers Operating

Legislation

Crown Land (Reserves) Act 1978 - provides for: the reservation of areas of Crown land; and determining a specific purpose and status for such land.

Fences Act 1968 - provides for the maintenance and repair of fences dividing landholders.

Flora and Fauna Guarantee Act 1988 - provides for the protection of flora and fauna in Victoria and the declaration of critical habitat if so designated.

Land Conservation Act 1970 - Provides for the determination of uses and reservation of Crown Land.

Planning and Environment Act 1987 - provides for the control of land use and development and for the establishment of agreements with landholders (S. 173).

National Parks Act 1975 - provides for the reservation of and protection of natural areas of Victoria and the flora and fauna they support.

Wildlife Act 1975 - regulates the taking and possessing of wildlife. Invertebrates listed under schedule 2 of the Flora and Fauna Guarantee Act 1988 become 'protected wildlife' under the Wildlife Act.

Victorian Conservation Trust Act 1972 - provides for the establishment of conservation covenants on land titles.

Licence/Permit Conditions

Capture of the Large Ant-blue butterfly requires a permit under the Wildlife Act 1975. Permits will only be issued if the research is in accordance with the research requirements outlined in this Action Statement, Action Statement No. 6 and the research phase of the recovery plan (New et al. 1994), or if it is related to the conservation and management of invertebrate communities.

Consultation and Community Participation

Liaison will continue or will be initiated with planning agencies, landholders, Landcare groups, Land for Wildlife members, entomologists, students, butterfly collectors, interest groups and individuals regarding the conservation of the butterfly, habitat management and surveys.

Implementation, Evaluation and Review

NRE Flora and Fauna Officers throughout Victoria and researchers from La Trobe University and the Museum of Victoria will be actively involved in the implementation of this Action Statement.

The North East Region of NRE will be responsible for coordinating the implementation of this Action Statement and monitoring the effectiveness of actions taken. Progress on the implementation of the Action Statement will be assessed annually.

Contacts

Research and Biological Information

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Further information

Further information can be obtained from Department of Sustainability and Environment Customer Service Centre on 136 186.

Flora and Fauna Guarantee Action Statements are available from the Department of Sustainability and Environment website: <http://www.dse.vic.gov.au>

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