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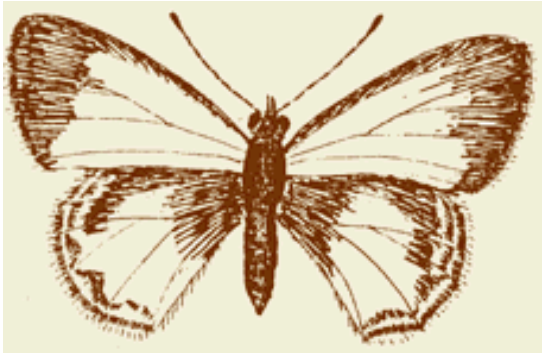
Victoria
The Place To Be

Small Ant-blue Butterfly

Acrodipsas myrmecophila



Small Ant-blue Butterfly *(Acrodipsas myrmecophila)*

Distribution in Victoria (DSE 2002)

Description and Distribution

The Small Ant-blue butterfly, *Acrodipsas myrmecophila* (Waterhouse and Lyell), belongs to the family Lycaenidae within the order Lepidoptera. It is very small, with a wingspan of about 20 mm, and has cryptic colouration. Its body and wings are generally dark bronze-brown, with subtle spots and markings (described in detail by Common &Waterhouse 1981). Females are distinguished by a broad blue area on the upper side of the forewing.

The Small Ant-blue is rare and localised throughout its range. The only recent Victorian record is from near Broadford (Britton & New 1992, 1993; Crosby 1988; Quick 1989). The species has been recorded previously from Ringwood, Heathmont, Glen Waverley, Lilydale, Wandin, Ocean Grove and another site near Broadford, but is believed to be extinct in these areas as a result of habitat disturbances (Britton & New 1993, Quick 1989). The Small Ant-blue has been recorded also from isolated localities in Queensland, New South Wales, South Australia, Western Australia and the Northern Territory (Common & Waterhouse 1981).

Conservation Status

Current Status

CNR (1995) Endangered

The Small 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 listed as a threatened community and the Large Ant-blue, Acrodipsas brisbanensis is also listed as a threatened taxon on Schedule 2 of the Flora and Fauna Guarantee Act 1988.

Reasons for Conservation Status

The Scientific Advisory Committee (1991) has determined that the Small Ant-blue is:

- in a demonstrable state of decline which is likely to result in extinction. It has disappeared from possibly seven of eight localities (Britton & New 1993, Quick 1989);
- significantly prone to future threats that are likely to result in its extinction, primarily because of its restricted occurrence, sensitivity to environmental conditions, and dependence on the Coconut Ant, *Papyrius 'nitidus'* (which is a complex of similar but potentially separate ant taxa).

Major Conservation Objective

The major conservation objectives are:

- to survey known and historic sites over a five-year period to determine present distribution;
- to continue detailed investigations into the ecological requirements of the Small Ant-blue; and
- to protect and maintain all known populations of the Small Ant-blue.

Management Issues

Ecological Issues Specific to the Taxon

The ecology of the Small Ant-blue is not well understood, and the difficulty of obtaining sound biological information is compounded by the species' rarity (New 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.
In Victoria, the main flight period (breeding season) of the Small Ant-blue is December to January, although sightings have been made in early autumn and late spring (Britton & New 1992, 1993; McCubbin 1971). During this time, males congregate on the summit of specific peaks, where they establish and defend territories around the tops of selected trees. Females flying to these prominent peaks are highly likely to find a suitable mate. This behaviour is known as 'hill-topping', and successive generations within each population will continue to utilise a specific high-point for locating mates. Hill-topping 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 Small Ant-blue is thought to spend little, if any, time hill-topping. It searches for suitable oviposition (egg-laying) sites soon after mating (Britton & New 1992, 1993; Quick 1989).
As with other lycanid butterfly species, the Small Ant-blue associates with ants, a characteristic known as myrmecophily. Typically these butterfly-ant relationships 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). A recent field study (Britton 1995) has revealed the attendant ant to be the Coconut Ant, Papyrius 'nitidus'. The female Small Ant-blue lays its eggs close to the ground on tree trunks or stumps, old fence posts and dead tree branches, particularly where these substrates are inhabited by the Coconut Ant. Both the eggs and immature larvae are attended by Coconut Ants and subsequently find their way into the ant nest, where the caterpillars and pupae develop (Britton 1995, Quick 1989).
As most butterfly-ant relationships are very species-specific, the survival of the Small Ant-blue probably depends on that of the Coconut Ant, and hence the ant's specific habitat requirements (New et al. 1996).
The Coconut Ant's biology is poorly known (New et al. 1996). It forms nests with 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 is related to wildfire frequency.
It is believed that the caterpillars of the Small Ant-blue feed by sucking fluids from ant larvae and pupae (Quick 1989). Adults are nectivorous and probably feed on a variety of flowering plants throughout their habitat (Britton & New 1992 & 1993).

Threatening Processes

Threatening processes frequently act in concert. Numerous human activities contribute to the demise of ecological communities, and these pressures can become acute and unmanageable with increasingly intense land use.
Urbanisation can directly affect butterfly habitat and has been responsible for the destruction of the previously known sites east of Melbourne (Crosby 1988, Quick 1989). Higher densities of human habitation are associated with accelerated rates of habitat disturbance, such as firewood collection, vegetation removal, weed invasion, and various recreational pursuits. 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 environs of the remaining known population are being transformed from broad-acre pastoral land to primarily residential land. Changes like these may have exacerbated the decline of the species at the Ocean Grove site (Crosby 1988, Quick 1989).
The only known population of the Small Ant-blue is supported by plant communities which have been widely cleared and fragmented for agriculture. The population is now restricted to a small isolated area of native vegetation within a larger area of 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 could 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 degrades butterfly habitat by removing plants used for hill-topping, food and shelter. Associated

developments such as 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. Intensive grazing pressure is thought to have played a role in the demise of the species on farmland three kilometres from the Broadford hill-topping site (Crosby 1988, Quick 1989). Of particular importance are threats which may deplete the food and shelter resources of the Coconut Ant, such as surface soil disturbance or the removal or destruction of fallen timber.
Less obvious threats to the Small 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 Small Ant-blue may prosper in the secondary successional stages which follow fire.

Wider Conservation Issues

An understanding of the biology of the Small Ant-blue will help in planning for the conservation of other related species including the Large Ant-blue. Sponsoring research will also help 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

The socio-economic effects of implementing a conservation program for the Small Ant-blue will be minor, provided the need for managing and protecting habitat is incorporated into planning by 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 Small Ant-blue, the lack of detailed ecological information, and its persistence at only one known site, there is little alternative to safeguarding the remaining hill-topping site and surrounding areas, on the basis that it is at least sustaining the species to some degree (New et al. 1994). While butterflies are likely to breed close to each hill-topping site, adults may concentrate from a radius of several kilometres (New et al. 1994). The Broadford hill-topping site is only 54 ha, so buffering it from development and land-use changes will be needed. Until there is a more detailed knowledge of the species' habitat preferences, maintaining existing land use is desirable.
The Broadford site includes the Mt Piper Education Reserve, which has only minor resource use conflicts. However, there is evidence of illegal firewood collection on the reserve and nearby roadsides. A more concerted effort by NRE and local government 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 uneconomical. 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 Small 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.
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.
Where native vegetation could be lost as a consequence of sub-division and residential development, strategic planning by the responsible planning authorities can minimise the impacts on hill-topping sites.
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 this 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 at the Broadford site includes erosion control and revegetation, restricting vehicle and horse access into the reserve, removing disused facilities and structures on and near the summit, and providing on-site interpretation material.

Liaison with the Geodetic Survey Section of the former Department of Survey and Mapping resulted in an agreement to minimise site clearance at the Broadford hill-topping site. Issues relating to hill-topping sites were also discussed with the former Department of Minerals and Energy and the communications industry.

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 71 (Large Ant-blue).

Research, Monitoring and Survey

- Through research into breeding biology and diet, identify and delineate habitat elements critical to the Small 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.
- 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

- Seek appropriate reservation status for the Mt Piper Education Reserve.
- 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 Small 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.
- Encourage the sharing and rationalisation of existing hill-top structures an their uses. For example, satellite survey technology has largely replaced the necessity of ground surveys employing 'trig points' with cleared sight lines.

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 via a variety 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 species.
- 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.

Other Desirable Management Actions

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

Legislative Powers Operating

Legislation

Catchment and Land Protection Act 1994 - (previously Soil Conservation and Land Utilisation Act 1958 which provided guidelines for land management within proclaimed water catchment areas; and the Vermin and Noxious Weeds Act 1958

which provided for the control of vermin and noxious weeds on public and private land).
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 the requirements for 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 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 Small 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 recovery plan research phase (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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Action Statement and Management
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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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