



# BUTTERFLY CONSERVATION SA Inc.

## NEWSLETTER

No. 9: November 2001

### ENDANGERED SPECIES PROTECTION ACT

Butterfly Conservation SA have recently nominated two species of butterflies to the Endangered Species Protection Act.

*Hesperilla flavescens flavia* common name Yellowish Sedge-skipper is one of 13 Australian species of skipper butterflies from the *Hesperilla* genus, family Hesperidae. *H. flavescens flavia* formerly occurred along the coastal edge of the Adelaide plain. Its larval host plant is the large saw-edge *Gahnia filum* (Cyperaceae) which occurs in brackish estuary and lagoonal habitats in coastal areas.

Recent surveys of remaining habitat in the Adelaide plains have failed to locate the butterfly and former populations in the lower Coorong under continuous pressure from pastoralists due to the clearing and overgrazing of its foodplant, the draining of suitable brackish swamp habitat means it is probably extinct in this location. It was last recorded from the Coorong in 1937.



Several small populations of the butterfly still exist in the west half of southern Yorke Peninsula and the west coast of southern Eyre Peninsula. The foodplant is very slow growing and large tussock clumps existing today are likely to be well over 100 years old. This species of butterfly is considered to be endangered.

*Jalmenus lithochroa* common name Lithochroa Hairstreak is one of 11 known species of the genus *Jalmenus* in the family Lycaenidae (Blues and Coppers). This species is the only butterfly endemic to South Australia and remaining colonies are only known to occur in the Flinders Ranges where they are totally dependent on *Acacia victoriae* as a larval foodplant and on the large meat ants *Iridomyrmex* spp. as a larval attendant ant.

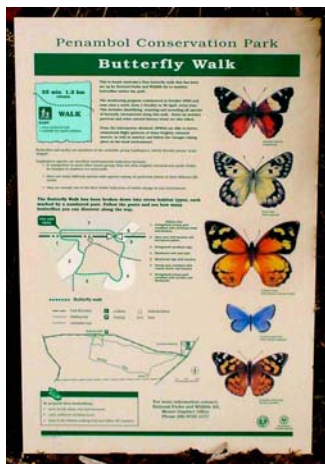
Both the ant and the foodplant are reasonable common in the plains area of the Flinders region which would make one believe that the butterfly should also be more widespread and stable. However, the low number of active colonies would suggest some other control is either keeping the butterflies at a low population level or is causing a slow decline.

Continued page 3. (Photos Roger Grund)

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- Composters of the forest
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CHRISTMAS MEETING  
10th December, 7.30 pm  
Urrbrae Wetlands Resource  
Centre. Bring a plate  
Mike Moore Guest Speaker



## SOUTH EAST BUTTERFLY WALK

Volunteers and staff from National Parks and Wildlife counted butterflies in the Penambol Conservation Park from November 2000 to April 2001.

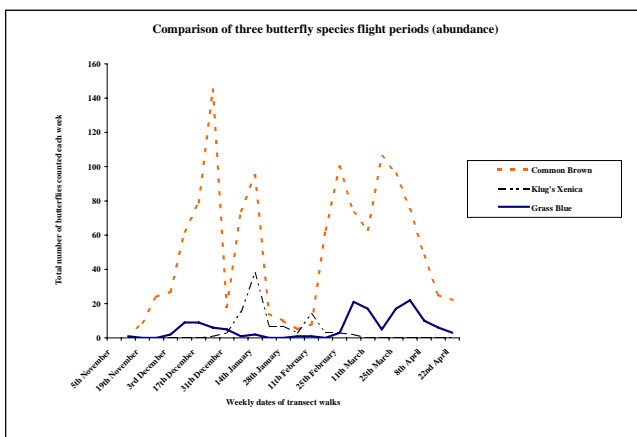
The Pollard Walk “the first of its kind in South Australia” was undertaken to help determine changes in the numbers and diversity of common and rare butterflies during a weekly transect walk.

The walk was divided into 7 sections reflecting changes in habitat and all butterfly species seen including their abundance were recorded. On average the walk took 30 minutes and was 1.2 km in length.

A total of 10 species were recorded during the survey, 4 of which are of conservation significance in the region (table).

Common Name	Scientific Name	Conservation Status in SE region
Australian Admiral	<i>Vanessa itea</i>	
Australian Painted Lady	<i>Vanessa kershawi</i>	
Barred Grass-skipper	<i>Dispar compacta</i>	U
Bright Shield-skipper	<i>Signeta flammeata</i>	R
Cabbage White	<i>Pieris rapae rapae</i>	
Common Brown	<i>Heteronympha merope merope</i>	
Common Grass Blue	<i>Zizina labradus labradus</i>	
Klug's Xenica	<i>Geitoneura klugii</i>	
Shouldered Brown	<i>Heteronympha penelope penelope</i>	U
White-banded Grass-dart	<i>Taractrocera papyria papyria</i>	R

The most commonly recorded species were the common brown, common grass blue and klug’s xenica. The abundance of each of the above species can be found in the graph below (graph).



This technique has merit in the management of threatened species on private and or public lands and is simple to set up and undertake. It also has use in determining a habitats health and condition. With the presence and/or absence of particular species being indicative of health. Considering we have many threatened butterfly species in our State, I urge you to try the Pollard Walk.

This years walk run by the local Bushcare contact has recruited in excess of 20 volunteers in the hope of raising the awareness and further educating local people about our beautiful South East butterflies.

For further information please contact Bryan Haywood, Bush Management Adviser, South East on 8735 1143. If Butterfly Conservation SA members wish to view the 2000/2001 report contact Jan Forrest at the SA Museum.

BUTTERFLY CONSERVATION SA Inc.  
 Membership \$10.00 pa  
 Applications and renewals to: David Keane  
 c/- P.O. INGLEWOOD, 5133 S.A.

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Unfortunately, one of the main habitat areas for the butterfly is the Willochra Plain extending south, which is also the brood area for the locust. The area is infrequently sprayed mainly by aerial means therefore based on the current knowledge of the biology and distribution of the butterfly, and upon the continual agricultural disturbances to its habitat, the butterfly is considered to be vulnerable.



Both the ant and the foodplant are reasonable common in the plains area of the Flinders region which would make one believe that the butterfly should also be more widespread and stable. However, the low number of active colonies would suggest some other control is either keeping the butterflies at a low population level or is causing a slow decline.

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### **ANNUAL GENERAL MEETING Chairman's Report September 2001**

I am pleased to report on another successful year for BCSA Inc. Our membership renewal rate has remained strong. With 76 financial members, we have a sound base, and it looks like we're here to stay!

Our newsletter remains the mainstay of information dissemination to members, fulfilling our general education objective. I encourage all members to contribute. The more representative it is of members views and activities the stronger and more useful it will be.

Our on ground projects continue to fulfill our research, education and information objectives. I now table the report from Ben Pavay, who has been working for us on the Yellow Sedge Skipper butterfly on Yorke Peninsula Project. This together with Roger Grund's earlier survey report, means that we can now acquit the grant funds and finalize the project for this stage. The most encouraging thing is that on ground work to protect habitat and raise awareness of the Yellow Sedge Skipper has been achieved, by locating and working with the people already in the area doing on ground works. The involvement of local property owners, the local Council, National Parks and Wildlife officers as well as conservation minded people is a great step forward. Incorporating butterfly needs in the work of other on ground projects is one of our major objectives. Thanks to Roger and Ben for all their work on this project.

The second grant funded project, the survey of Scott Creek Conservation Park in conjunction with the Friends Group, is another example of our aim to assist and educate groups who are enthusiastic about a habitat, to include butterflies in their management plans. The more we can work with these groups the wider the spread of the knowledge and expertise contained in BCSA.

Our thanks to those members, and particularly Lindsay Hunt and Mike Moore, who have provided talks to community groups throughout the year, these continue to be well received. In the coming year we will see some very tangible products of our work. Posters, identification charts and information sheets are close to production. These will be very useful for advertising, for education and for sale to raise funds. Although the work in preparing these is long and tedious the end products will be excellent.

We will continue to apply for grant funds, such as the coastal planting of the Bitter-bush, Adriana, as a food plant for the Bitter-bush Blue butterfly which is currently underway. The more successful projects we undertake the easier the path to obtaining grant funds becomes. We will soon have an impressive track record of successful projects.

I have enjoyed my time as Chairman, and look forward to continuing my involvement with BCSA as time permits in the coming year! Thank you to all the committee members for their support, enthusiasm and continuing work throughout the year. Thanks also to all the members who continue to network, breeding butterflies, share information and ideas, do project work and spread the butterfly word.

Keep up the good work everyone.

*Beth Keane*

## PLANTS, ANTS AND BLUE BUTTERFLIES

### Part 2: Chemical communication between butterfly caterpillars and ants

David Lohman

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According to a seldom-violated principle of ecology, no two species can coexist on exactly the same resources indefinitely. One of the species will be slightly better at utilizing those resources and cause the other to go extinct. It is perhaps no surprise, then, that some of the world's most diverse taxa are characterized by striking differences among closely related species in the resources that they utilize. Lycaenid butterflies are an excellent example of this phenomenon of 'adaptive radiation' because many lycaenids not only specialize on a few types of host plant, but also are further specialized in that many, perhaps half of all lycaenid species, associate with one or more species of ants. This host ant specialization superimposed upon host plant specialization carves up the array of potential resources rather finely, allowing a great number of lycaenids to coexist.

Most ant-associated lycaenid caterpillars are mutualists, and offer nutritious secretions to ants in return for protection from predators and parasitoids. However, a predilection for consuming the caterpillar secretions rather than the caterpillars themselves does not fully explain the lack of aggression towards caterpillars by some ants. Although any ant species might presumably benefit from associating with lycaenids, many ants that associate with one kind of lycaenid caterpillar might kill other lycaenid species. Observations like these suggest that chemical communication may play an important part in mediating the specificity of ant-caterpillar relationships.

The sensory world of ants is a chemical one; an ant worker may have as many as 10 different types of pheromone glands. One of the most important ant pheromones is not produced by glands at all, but by cells circulating in the hemolymph ('blood'). At every molt, these oenocyte cells secrete long strings of carbon atoms known as hydrocarbon molecules onto the surface of the new cuticle. In ants, as in all insects, these molecules are produced in various lengths and molecular configurations and congeal to form a wax that protects the insect from water loss. Ants and other social insects, however, have put these compounds to a new use: variation in the number and type of these 'cuticular hydrocarbon' molecules is used to communicate membership

in a particular ant species, colony, and/or caste. With only three or four kinds of hydrocarbon molecule, the pheromonal blend on the cuticle of ant larvae is rather simple, but with each successive life stage (pupa, pharate pupa, callow worker, mature worker), different hydrocarbons are added to this basic set. Mature workers can end up with dozens of different types of hydrocarbon molecule. When worker ants eclose from their pupae as callow workers, they learn the various hydrocarbon smells (*i.e.*, blends of cuticular hydrocarbons) of their colony within the first few weeks of adult life, and thereafter attack insects that lack one of the appropriate hydrocarbon blends.

A number of insects, including various beetles, fly maggots, and crickets have evolved the ability to produce or acquire the same blend of cuticular hydrocarbons as a particular ant species. This 'chemical mimicry' allows these parasites to infiltrate ant nests and feed upon ant larvae/pupae ('brood') or upon food regurgitations from the ants. Several suggestive studies and preliminary analyses point to the role of 'chemical mimicry' of ant brood by lycaenid butterfly caterpillars. Most of the ant-attended species so far studied produce the same cuticular hydrocarbon pheromones as the brood of their attending ants. This observation of ant **brood** mimicry is perhaps the key to understanding why some ants tend a caterpillar, while another ant species might attack it. The cuticular hydrocarbon brood pheromones of ants are so simple (often 3-4 compounds), that different ant species often have the same set of pheromones in similar proportions. It is therefore possible to swap ant brood between these species in the laboratory, because the recognition pheromones that mark them are shared by the two species. This underlying chemical basis of the ability to swap ant brood may also explain why some lycaenid caterpillars associate with many species of ants, while others are ant generalists. A caterpillar that mimics the brood of an ant with a complex or unique set of brood pheromones is likely to be an ant specialist and only tended by that one ant species. A caterpillar with a very common set of pheromones is likely to associate with several ant species.



Figure 1. *Iridomyrmex purpureus* ants attending larvae of *Jalmenus iclinus*.

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**PROFILE Beth Keane**

I grew up on a dairy property in Gippsland in Victoria. It had large areas of bushland, with dense undergrowth and koalas. 30 years on there is no bush left there, the property has been dissected

by a major powerline and only a few large gums remain in the pasture grasses.

This scenario is the essence of my interest in conservation and my underlying attachment to nature. I was 16 years old before I lived in a town and never felt really at ease with city life while at university in Melbourne. I moved to Adelaide in the late 70's and enjoyed the relaxed atmosphere of a smaller city. I do miss the big rivers and tall timber forest of Gippsland, but have also come to love the habitats of South Australia and the arid areas.

My career has always revolved around people systems and personnel management, training and organisational development. On meeting David, my husband, I discovered that the natural systems he worked with in mining rehabilitation and conservation operated on the same principles. I have now spent many years in our own business, doing environmental rehabilitation work and restoring our property in the hills at Inglewood to its original native vegetation.

Although I have little technical knowledge of butterflies they have always touched my heart. It is impossible to be unhappy in a garden with butterflies. They bring out the childlike wonder at the natural world in everyone and I believe they are a gateway for people to become involved with nature. I have enjoyed my time as Chairperson of BCSA and especially have been inspired by the knowledge and enthusiasm of the members.

Bringing together our knowledge of what butterflies need with the many people and projects who are already working in conservation is the most important thing we can do together with general education and awareness raising on butterflies. Real change can only happen at the community level, through individuals.

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It is likely that this chemical mimicry of ant brood by lycaenid caterpillars only explains why ants do or do not attack a given butterfly species. Lycaenid species also vary greatly in the frequency with which they are found with ants. Some are always found with ants, while others are often found alone. Variation in the persistence of ant-lycaenid interactions is most probably due to variation in the quantity or quality of the lycaenids' nutritive secretions, rather than some aspect of the lycaenids' hydrocarbons.

In the past 15 years, research on the complex pheromonal language used by ants to communicate amongst themselves has blossomed. Preliminary studies of lycaenid pheromonal communication offer a tantalizing glimpse of how these butterflies seem to have evolved a parallel chemical language, enabling a variety of fascinatingly complex alliances between butterflies and ants.

*I wish to gratefully acknowledge the advice of Lindsay Hunt and Roger Grund, and the hospitality and field guidance of Mike Moore and his family during a recent collecting trip in South Australia.*

David Lohman is a Ph.D. student of Prof. Naomi Pierce at Harvard University in the USA. His thesis examines chemical communication between butterflies and ants, with particular emphasis on the Australian genera *Jalmenus* and *Ogyris*.

**THANKS BETH**

*Sincere thanks go to Beth Keane for her contribution to BCSA as our first Chairperson, in particular her enthusiasm in helping to get the organisation off the ground and willingness to be project manager for grant funded projects.*

*On behalf of the committee and members I wish both Beth and David all the very best in their new career as parents (twins are expected shortly) and we hope to see Beth from time to time in the future.*

*Editor*

SUPPLIES OF *Adriana klotzchii* plants can be obtained from  
Coromandel Native Plant Nursery,  
Star and Arrow Road (east)  
COROMANDEL VALLEY  
Ph: 8388 2777

**NEW WEBSITE ADDRESS: 'Butterflies of South Australia'**  
(produced by Roger Grund) <http://www.chariot.net.au/rgrund/index.htm>

## COMPOSTERS OF THE FOREST

Excerpts from an article titled “**An Uncommon Man**” by Brad Collis in the Qantas magazine ‘The Australian Way’ January 2001. (Article sent to me by Helen Bourne of Kersbrook Landcare Group, May 2001)

**Ian Common** is one of Australian’s notable entomologists who, apart from spending a lifetime of collecting, was the curator of the Australian National Insect Collection (ANIC) in Canberra. The national insect collection within the CSIRO Division of Entomology houses more than eight million specimens. Ian is particularly attracted to moths.

### Did you know ?

The moth is one of only two insects (the other being the carpet beetle) that can digest hair. When other insects and micro-organisms have finished with a carcass, it is the moth that completes the decomposition by eating the hair and fur.

Ian Common discovered how moths turn dead gum leaves into soil nutrient in Australian bushland. It was always thought that moths only feed on green leaves. He discovered that many moths eat dead leaves and in fact came to the conclusion that they are the “Composters for eucalyptus forests”. If they eat leaf litter and return nutrients, then why do we burn the forest environment and kill off the insects which are essential to a healthy balanced habitat ?

If you would like a copy of the full article please contact David Keane on (08) 8389 2352.

### BUTTERFLY CONSERVATION SA Inc.

**Chairman:** Roger Grund

**Secretary and Newsletter Editor:** Jan Forrest OAM C/- South Australian Museum, North Terrace, ADELAIDE, 5000 ph (08) 82077503.

email < forrest.jan@saugov.sa.gov.au >

**Treasurer and Membership Secretary:** David Keane, C/- P.O., INGLEWOOD 5133 ph (08) 83892352 email < dkeane@iweb.net.au >

**Fundraising:** Lois Hasenohr

**Committee members:** Marcus Pickett, Beth Keane, Lindsay Hunt, Mike Moore, John Hunwick, Bo Bowwayne, Trevor Rowe, Tim Gudgeon and Bob Edge

**Honorary Member:** RH (Bob) Fisher OAM

### OUTREACH PROGRAM

AO size panels from the Exhibition “Where have all the Butterflies gone?” are available free of charge from Jan Forrest at the South Australian Museum for use by Landcare and other Conservation groups at seminars, conferences and workshops or just for display. Included are five introductory panels, and seventeen panels from seven habitat areas: Coastal, Grasses, Mallee, Urban, Migration/Vagrant, Eucalyptus Forrest/Woodland, Arid, Wetland and Lower South East.

The full exhibition is also now available. It includes full sized panels, model and butterfly specimens. Contact Senior Exhibition Officer, at the SAMuseum for further details.

### NOTES

Two second hand copies of the out of print book ‘Butterflies of South Australia’ by R.H.Fisher are available from the committee. Cost \$15

### DIARY DATES

#### MEETINGS

Committee meetings are held monthly (usually the second Monday of the month) at 6.00pm in the Urrbrae Wetlands Resource Centre, Cross Roads, Urrbrae. All members are welcome to attend. If you would like further information or receive an agenda please contact the Secretary Jan Forrest at the address above.

### WEB SITE (produced by Roger Grund)

‘South Australian Butterflies’ <http://www.chariot.net.au/~rgrund/index.htm>

### We welcome the following new members:

WILLIAMSTOWN  
GARDEN CLUB  
SIMON P. BROWN  
BON BOWWAYNE  
NATURE EDUCATION  
CENTRE  
RENAE TRENTELMAN  
NEVILLE J. WUTTKE  
AMANDA SULLEY  
JOHN WILSON

CHRISTMAS MEETING  
10th December, 7.30 pm  
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Mike Moore Guest Speaker

