



Top End

Native Plant Society

President:

Dave Liddle

Vice President:

Russell Dempster 8983 2131

Secretary:

Peter Ebsworth

Treasurer:

Peter Ebsworth

Publicity:

Louise Finch

Publications:

Sarah Hirst

Public Officer:

Helen Spiers

Librarian:

Ingrid Najarian

General Committee Members:

Alex Bakunowicz

Barry Smith

Webmaster:

Dave Liddle

PO Box 135

Palmerston NT 0831



March 2014 Newsletter

General Meeting Times

The next TENPS meeting will be held on *Thursday March 20th 2014*. Meetings are held at 7:30 pm on the third Thursday of each month at Marrara Christian College, on the corner of Amy Johnson Avenue and McMillans Road. The meeting is followed by a chance to meet with other members and access the TENPS reference Library over a cuppa. Bring your plants along to swap, sell or have identified. The guest speaker presentation commences around 8pm. All are welcome.

Field trips are usually on the weekend following the Meeting, details provided in the newsletter or at the meeting.

What's in Flower?



Ipomoea nil photographed at Territory Wildlife Park by Sarah Hirst. A South American species widely naturalised.



Natives mean more!

www.topendnativeplants.org.au

Upcoming TENPS Speakers

March 20th: Jenni Low Choy - Groote Island research report.

Jenni will talk about interesting differences and plants of Groote Eylandt Archipelago. She will also share fond memories and knowledge from floristic and biodiversity surveys on Groote Eylandt in 2005 with a future goal of producing a vegetation map and guide to plants of the area. (Jenni was awarded the 2013 TENPS scholarship.)

April 17th: TBA

May 22nd: TBC Tom North - National Seed Bank.

June 19th: Michael Braby - topic TBA

TENPS Field Trip

March 23rd: Old Growth forest at Cyrus Road Barry Springs. Our hosts Jessie and Nicholas will share their wonderful property on the day. This private property features 20 acres of 'Old Growth' *Eucalyptus tetrodonta* forest that has remained unburnt for more than 10 years.

Meet on corner of Cox Peninsula Road and Cyrus Road Berry Springs at 9.00am on Sunday. There is limited parking at the property so most vehicles will be parked on Cyrus Road. For more information contact Sarah Hirst on 0437886824.

April 26th: Darwin River Conservation Agreement Blocks - hosted by the Ebsworth's, Spiers' and Phil Hickey. NB A Joint Field trip with NT Field Naturalists.

May 26th: Howard Sand Sheet with Dave Liddle.

June: Katherine TBC

July: Lyons streetscapes TBC

TENPS Committee Meeting

Committee meetings are held every second month and members are most welcome to attend. The next committee meeting will be on Wednesday 2nd April 2014 at 7.30 pm, venue TBA.

NT Field Naturalist Club Events

Monthly Meetings are held at Charles Darwin University, in Blue Building 1, Room 1.54 Business Faculty, usually on the second Wednesday of every month (except January), starting at 7:45 pm.

Field Trips are a great way to explore the best of Darwin area's nature spots in the company of like-minded people. These are usually held on the Sunday following the monthly meeting and often related to the topic of this meeting. Additional outings are held from time to time, and everyone is welcome.



Don Sands (centre) talking to Atlas Moth Forum participants at East Point Landcare site. Photo by Russell Dempster.

Atlas Moth Forum Report (Part 1) - 'Management Plans for Threatened Lepidoptera in Australia' by Dr Don Sands.

Dr Don Sands has been involved in Conservation of Lepidoptera species in Australia including helping establish a recovery network for the Richmond Birdwing Butterfly (*Ornithoptera richmondia*), and more recently the Australian Fritillary Butterfly (*Argyreus hyperbius inconstans*) and the Pink Underwing Moth (*Phyllodes imperialis smithersi*). Don's presentations during the Atlas Moth Forum (February 20-23rd 2014) focused on the establishment of the Richmond Birdwing Butterfly Conservation Network as a model for Atlas Moth conservation in the Top End. This report summarises other Lepidoptera conservation projects and next month Part 2 will

summarise local knowledge of the Atlas Moth shared during the forum activities.

The Australian Fritillary

The Australian Fritillary is the single Australian representative of what is a northern hemisphere group. The host plant is a species of violet (*Viola betonicifolia*), the Arrow Leaf Violet. The violet grows in wet areas and produces many seeds in spring (*below*) which are spread by floodwaters and as the violets colonise new areas this results in a boom in butterfly numbers.



Male Australian Fritillary. Photo by Stephan Shuichi Haupt courtesy of <http://lepidoptera.butterflyhouse.com.au/>



Viola betonicifolia with seeds. Image courtesy of Mt Gravatt Environment Group blog November 2012.

The last of these population booms was recorded in 1984 and Fritillary numbers have been declining ever since due to the lack of spring floods and the behaviour of the violet plant.

The Pink Underwing Moth

The Pink Underwing Moth host plant *Carronia multiseppalea* is very rare and is found only in old growth rainforest which as we know is being fragmented and lost. The moth larvae are spectacular (see below) and the species has become the basis of a recovery plan through the Dorrigo Plant Society. The larvae also feed on a *Pycnanarrhena* vine (closely related to the local *Tinospora* species).



Pink underwing Moth larvae. Photo by Lui Weber/ Rex Features courtesy of <http://scinerds.tumblr.com/>

The Richmond Birdwing Butterfly

The Richmond Birdwing is a large iconic species found near Brisbane since the 1800s and was therefore an ideal flagship species for Lepidoptera conservation.



Male Richmond Birdwing. Photo by Carolyn Rifello courtesy of the Wildlife Preservation Society of Queensland website.

The recovery team/network was established as an incorporated community group to enable them to apply for grants.

The target was both the butterfly and the food plant *Pararistolochia pravenosa* (below) and affiliated plant community as without the habitat and food there could be no recovery.



Photo by Jenny Thynne, courtesy of the Wildlife Preservation Society of Queensland website.

Don also reminded us that an ecosystem is the interaction between the community and a species not just the habitat.

The first step was to develop a dossier which included knowledge of the target species

- taxonomy,
- its distribution and biology,
- host plant(s)
- ecology
- habitat for food plant and the interactions
- threats to both habitat in the insect and abatement strategies
- plus references and literature search

Don undertook much of the initial dossier development work for the Richmond Birdwing through his role as an entomologist at CSIRO. Whilst he started it, he quickly stepped back into a support role. He strongly advocates a bottom up approach to such conservation projects. Operation of a conservation network requires access to funding so it must become a not-for-profit organisation to enable the organisation to tap into grant funds. In the Birdwing case bottom up meant collaboration between various community organisations including Landcare groups and school students coordinated through the CSIRO Double Helix Club.

One of the threats for the Richmond Birdwing is false host toxicity from the introduced Dutchman's Pipe Vine *Aristolochia elegans* (photo by Dr Don Sands). Other threats to the Birdwing include loss of habitat and breeding sites due to weed invasions which displace plants and plant communities and in particular exotic grasses which increase fire intensity. Drought stress and deliberately lit fires, particularly during periods of drought are significant threats to Birdwing habitat. Changes in climate contribute as plant pollinations systems of the food plants can change as has been observed in *Pararistolochia pravenosa* vine. Fragmentation of habitat and habitat corridors leads to inbreeding.



There is also a reduction in the security of protected habitat with National Parks which should protect indefinitely our natural heritage - the flora and fauna of the nation - for all. There is an increasing trend to permit other uses within National Parks which may threaten flora and fauna. Don advocates reminding politicians that the National in National Park means such sites should be protected for the nation.

So was the Richmond Birdwing Butterfly the right species to start a recovery network for? The species was recognised taxonomically and there was a published decline. It is an iconic species ideal as a flagship species for Lepidoptera conservation. There was enough information available to start a dossier and the species has a simple lifecycle that could be promoted widely (see poster below).

Climate change pressure was pushing the Birdwing out of areas. The local Council and Land for Wildlife were able to propagate host plants and provide to schools and the community to promote conservation of the habitat and to retain the butterflies in areas under climate pressure.



Lifecycle poster courtesy of the Richmond Birdwing Conservation Network website.

Don was able to develop research guidelines for additional work. This included studies on leaf toughness which is a very important factor for the first instar caterpillars. Females are unable to test this before laying eggs so there is significant natural mortality of caterpillars in tough leaves. It is known that the butterfly larvae pupate off the host plant. As the larvae are cannibalistic this makes good sense otherwise they may be eaten by other larvae.

The natural habitat is old growth forest with *Pararistolochia pravenosa* vine curtains hanging up to 60 feet for the canopy. Pollination of the *Pararistolochia pravenosa* flowers is by a male fly which is attracted by a chioromone (plant pheromone) which is the same as the pheromone produced by a female fly. *Pararistolochia* species differ from the *Aristolochia* vines in that the fruit is not dehiscent (does not split). The seeds fall to the forest floor intact and are immediately buried by Brush turkeys scratching. The turkeys do eat the flesh but their primary role is to bury the seed. This means that there is a number of critical species involved; and without the fly, the brush turkey and the vine there can be no butterflies. The fly appears to be a Phorid fly species but is actually an undescribed species and it is poorly understood. It is also almost

impossible to find fruit on wild *Pararistolochia pravenosa* vines in the forests.

A second host plant is known, *Pararistolochia laheyana* which is found only at high altitude Mt Warning and has a different pollinator. The problem with this host is at this altitude it is too cold for the Birdwing to survive in most seasons. That is the plant is ok but the climate is wrong. An exceptionally warm winter in 1994 resulted in butterflies surviving winter on the mountain. Therefore this host plant may become important as the planet warms due to climate change in the future.

Community participation was critical for the success of the program. 23 separate Landcare groups were involved in the Birdwing Recovery Program. The CSIRO Double Helix Club was ideal to connect with schools and 400 schools got involved with 300 schools maintaining ongoing participation. 2 school programs were run, one for older students and one for the youngsters. Some of the research projects the students contributed to included:

- food plant propagation and cultivation
- leaf toughness trials where students could measure toughness using a penetrometer and manipulate the toughness of food plants offered through starvation trials
- phenotypic plasticity studies where physical differences are demonstrated to be due to environmental variation not genetic variation.

A dossier is also required for the host plant(s) along with the development of simple diagrams and newsletters communicate with the community. 17 community workshops were run and all documents were published with ISBN numbers and placed in libraries to create a readily accessible and permanent resource.

A third host species was also identified, *Aristolochia meridionalis* that is a ground hugging species. As a host plant this is less threatened than *P. pravenosa* and there are odd populations in drier areas so may be valuable in connecting

fragmented habitat. How many plants are needed to sustain a butterfly population?

In Indigenous ranger co-op initially took on the propagation of food plants for sale to the community. This nursery project was highly successful and made \$50 000 through the sale of 50 000 new vines to the public. Vines are usually 3 years old before they are sold and it takes 5-7 years for a new vine to produce fruit. All propagation and butterfly research was conducted under permits to ensure it was properly targeted and data recorded. *P. pravenosa* is a pH critical species and for growth in gardens dolomite is required to increase the pH. Eight nurseries are currently producing food plants commercially and they are planted with a companion plant for the vine to grow up; a look-alike vine is often used for support. Connectivity of habitat patches had increased due to the planting of more food plants. Simple identification keys were also produced for the community to help people figure out which is the host plant.

To overcome inbreeding problems in the Richmond Birdwing, outcrossing research has also been carried out. Butterflies from separate colonies around 30 km apart were bred and the progeny of this outbreeding were released. In the third generation there was been a butterfly population explosion so the outbreeding was therefore a success and increased the viability of the population.

Recovery actions continue and are driven by the community. This includes the inbreeding research, improving corridor connections and as the community wants to keep going captive breeding will continue. Additional aims are to restore the population to a state where the status can be downgraded and address climate change.

Don presented a strong argument for changing the way threatened species are listed. He believes species should be listed nationally rather than state by state as often species listed by states are not listed federally and surely conservation of species is a national issue?

What is the value of a species? This can only be determined through the development of the dossier and subsequent targeted research. In the case of the Richmond Birdwing Butterfly the primary reason to conserve it is that it is iconic as a flagship species for broader conservation. It has the potential to attract community interest and create a moral obligation to preserve it as the Atlas Moth does here in the Top End.

Thanks to Dr Don Sands for his excellent talks and generously sharing information with TENPS and others throughout the forum.

Article by Sarah Hirst

Next month: learn more about Atlas Moth conservation progress and where to from here....

Lepidoptera Conservation Dossier formats:

Insect Dossier

- Identification - *classification, name, alternate names and location of Type specimen.*
- Status
- Distribution
- Habitat and host plant(s) - *if the insect does not naturally lay eggs on the plant in the wild it is not a host plant! Some host species may also produce sterile adults.*
- Conservation significance
- Threats
- Biology and behaviour

Host Plant Dossier

- Identification - *classification, name, alternate names and location of Type specimen. Other species in the genus*
- Status
- Distribution
- Habitat, associated plants and communities
- Soil type
- Aspect (slope)
- Water table
- Herbivore interactions and leaf toughness
- Pollination
- Conservation significance
- Threats
- Map current locations/sites
- Density plants/ha² or plants/m²
- Extent of patch(es)
- Recruitment
- Habitat protection and land tenure

SUBSCRIPTION FORM - ANNUAL MEMBERSHIPS DUE JULY 1

Please accept my subscription/renewal for membership of the Top End Native Plant Society

New membership

Renewal

My details are as follows:

Name/s (Please print all family member names).....

Postal Address.....Post Code.....

Telephone (work)..... (home)

Email address

Please Note: Newsletters will be available on the member's page of the website and members will be notified by email when each one is uploaded (Acrobat Reader is required to read files).

If you would like to receive your newsletter by post please tick the box (black & white copies only).

Payment Enclosed \$..... (\$20.00 per member/family, \$15.00 unwaged)

Signature Date:/...../.....

TO:

Sender:



PO Box 135
Palmerston NT 0831