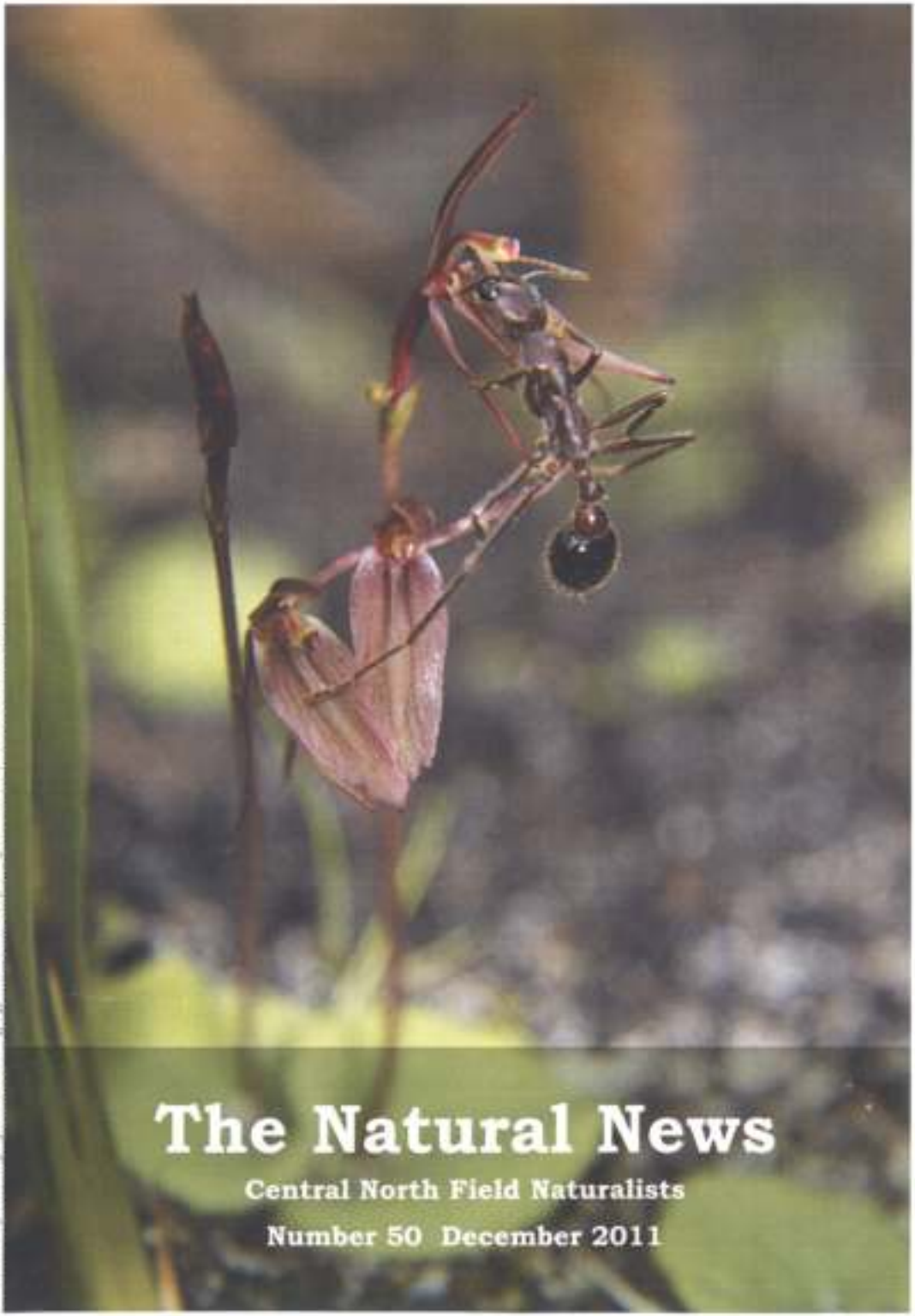

The Natural News

Central North Field Naturalists

Number 50 December 2011

Bullant (*Cyrtomyrmex torficatus*) on large green-orchid (*Cyrtostylis reniformis*) Photos: Phil Collier

[CNFN has had a long involvement with platypuses. In the early 1990s the group raised funds to support research into the fungal disease *Mucor amphibiorum*. We are delighted that we are able to contribute to the research that James outlines in this article.

On Nov 16th we learnt that our funds for this research have been boosted by an Australian Government's 'Caring for Our Country' grant of $19,700.00.]

Platypuses are not an uncommon sight in rivers and dams in Tasmania and the species is listed in the category of "Least concern" in the International Union for Conservation of Nature red list.[1] However, we should not be complacent about the conservation status of this species. A wide variety of threats to platypus populations have been described and population declines and local extinctions have been observed.[2,3,4] Suggested threats to platypus populations include factors that affect their food source or their ability to find suitable burrowing sites, such as bank erosion, loss of riparian vegetation and river sedimentation, as well as river flow regulation, introduced species and disease.[2,3,4]

Of particular concern in Tasmania is the fungal disease mucormycosis, which has been observed in this state, but not to date on mainland Australia. Mucormycosis in platypuses was first reported in 1983[5], and the causal organism was identified to be *Mucor amphibiorum* in 1993.[6] This organism has been found in amphibians and soil (but not in platypuses) on mainland Australian, but so far in Tasmania it has only been found in platypuses.[7] Mucormycosis causes skin ulcers, sometimes lesions in other organs, and death in a significant number of cases.[2,8] Since 1983, the disease has been confirmed in several river catchments that drain into the Tamar Basin.[2,8,9,10] There have also been reports of possible cases in other river catchments.[2,3,8,9] While recent research suggests the age structure of mucormycosis affected populations has been impacted by the disease,[10] and observational studies in other populations have suggested that habitat degradation has affected population density in certain river catchments (Grant & Temple-Smith 2003),[4] to date it has not been possible to assess thoroughly the impacts of the various threats to platypus populations. This is largely a result of the difficulties associated with studying this cryptic species. Low recapture rates in field studies mean that it is rarely possible to observe the health/survival of individuals over time. Measures of population density such as capture rates and observational studies are unreliable in species that are non-uniformly distributed, cryptic, net-shy and have a low density.[11] In addition, measures of population density do not necessarily equate to measures of population health as they do not assess whether population size is being maintained by local recruitment or whether individuals are migrating from elsewhere.

A captured platypus - holding by the tail is the safest way for both platypus and handler

As a result, my supervisors from the Conservation Medicine Program at Murdoch University School of Veterinary and Biomedical Sciences and I are undertaking a project which aims to develop a framework for the assessment of the health of wild platypus populations. We hope that this framework will become an important tool for assessing the magnitude of the impacts of the various threats faced by platypus populations, and that it will be important to the development of new conservation management plans. This project follows on from an investigation we performed in 2007-8 into the prevalence of mucormycosis in platypuses in three river catchments in northwest Tasmania. During this previous study we didn't confirm any cases of mucormycosis but we did observe for the first time two other infections that were similar in appearance to mucormycosis.[12] We have recently started a two year field study to measure/assess a wide range of health parameters in individual platypuses in the Inglis River catchment in northwest Tasmania. Health and demographic data from individuals will include: sex, age, body size, weight, body condition, reproductive status, serological evidence of leptospirosis and toxoplasmosis, clinical signs/laboratory evidence of mucormycosis and other fungal/bacterial diseases, haematology/biochemistry parameters, and levels of internal and external parasites. Platypuses will be captured with fyke nets or gill nets. Captured platypuses will be anaesthetised for examination, which will be performed in their natural environment, and they will be released at the site of their capture within four hours of capture. We will develop two important new research techniques: 1) we will use ultrasonography to assess reproductive status and to provide a subjective measurement of body condition, and 2) we will use in-stream remote microchip readers to monitor platypus movements/survivorship without the need to recapture individuals. The use of ultrasonography will provide important new health information, including whether platypuses breed in certain locations. The use of remote microchip readers will be an important new technique for monitoring long-term platypus movements and assessing survivorship. We will also gather new and existing data relating to habitat and land use in the Inglis catchment, and we will perform a public survey of platypus sightings. We will combine information from

Taking body measurements in the field

all parts of the study to address many critical gaps in the current knowledge of platypus population health, including:

(1) obtaining extensive new health data from a wide range of individual health/disease parameters; (2) determining rates of morbidity/mortality associated with various infections; (3) obtaining new data on longevity, breeding, migration, recruitment and habitat use; (4) determining relationships between disease indicators and environmental variables/land use practices; and (5) comprehensive analysis of immunogenetic diversity for a single platypus population – vital for understanding the risk posed by disease outbreaks to population viability.

This project is being performed with the generous financial assistance of the Central North Field Naturalists, as well as funding from The Holsworth Foundation, Cradle Coast Natural Resource Management, Tasmanian Alkaloids and the Forest Practices Authority. Equipment for the project has been provided by the Forest Practices Authority and the Department of Primary Industries, Parks, Water and the Environment. My supervisors are Dr KristinWarren, Prof Ian Robertson, Dr Carly Holyoake and Dr Trish Fleming at the School of Veterinary and Biomedical Sciences, Murdoch University, Western Australia, Dr Sarah Munks at School of Zoology, University of Tasmania/Forest Practices Authority, Hobart, and Joanne Connolly, School of Animal and Veterinary Sciences, Charles Sturt University, NSW. We also have formal collaborations with Assoc Prof Kathy Belov, Australian Wildlife Genomics Group, University of Sydney, and Dr Rebecca Lonsdale, Diagnostic Veterinary Imaging, Western Australia.

Setting a fyke net

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Volunteers needed for important platypus research

If anyone is interested in volunteering for the fieldwork, please contact me:

email: jamesm@southcom.com.au

Phone: 0487 979213.

The fieldwork is generally performed between 4pm and 11pm to midnight. It involves work in rivers (wearing waders) and surrounding terrain. It can be quite cold, involves a degree of physical activity, and on around half the nights we do not capture any platypuses. But for people who enjoy being out and about, and who are interested in wildlife and conservation, it can be very rewarding.

Below: setting a gill net

Insect discoveries at Ragged Jack and Lobster Falls - Alison Moore

Having long admired Ragged Jack's profile when walking on Ben Lomond over many years, Angus and I decided on the last Saturday in April that it was time for a decent bushwalk. Friends had assured us to "just follow the 1st right hand road from Ben Lomond Road and you can't miss it!" Well, we've all been there. Having reached a point on the road which was now taking us away from the mountain we retraced our journey to a small dirt track, one of many off to the left, but this one had a fairly indistinct sign with RJ – 7 written enigmatically upon it. After about one kilometre up that track we came to a T-junction, no signs and not having a 4WD we left our trusty Peugeot at that point and took the right hand track towards the mountain. For 4WDrivers you can go for another 2kms where there is a reasonable parking area just before a creek crossing.

As we now know, this is a Fire Trail which you follow up and up and up having crossed the River o' Plains Creek where we stopped for a bite to eat and drink – a beautiful section of the creek with waterfalls, marvellous mosses and typical alpine riparian vegetation. Continuing on we consulted our Giblin map of 1:25 000 and when almost about to turn around, having reached an altitude where scree forms the bulk of the landscape and the eucalypts become thin and stunted, we saw some stone cairns leading off to the right towards Ragged Jack. But unable to see further markings we continued on for another ten minutes where brightly painted red and white tin lids announced a path up through the scree to the next level of vegetation before commencing the climb to the mountain top. At this point we decided that it was too late in the day to commence what appeared to be at least another hour of walking/rock hopping and so turned around to commence the trip back.

It was then our eyes alighted on an impressive insect and we spent the next 10 minutes photographing and admiring this beautiful creature although were saddened to see it had lost its right rear leg – and judging by the length of the left rear leg this was a significant loss to the insect. It resembled a grasshopper with extremely long antennae, a flattened shield-like section behind the head and long striped legs. It had the most beautiful almost transparent wings of bat-grey/brown with delicate venation and a startling abdomen showing bright blue dots which circled the body. While watching its stumbling progress we wondered why it didn't use its impressive wings to fly away.

[If grasped by a predator grasshoppers can sacrifice a limb by contracting a special muscle at the base of the limb. A small diaphragm immediately closes the wound and prevents infection and blood loss. Ed]

Upon returning home we searched (unsuccessfully) in Elizabeth Daley's *Wings an introduction to Tasmania's winged insects*. We then commenced the internet search. On the Australian Museum's website we found a suggestion to 'email an entomologist' and began a relationship with Kathy Ebert, Entomology Manager at the University of Queensland, St. Lucia. (kmebert@uqconnect.net)

Kathy identified the insect as a male Mountain Katydid (*Acripeza reticulata*). The females are rather squat with small (3cm) shell-like forewings (compared to the males' 6cm forewings). Both sexes show off the blue dot circles and a bright

Mountain Katydid (*Acripeza reticulata*)

red abdomen if threatened. The Mountain Katydid (or Mountain Grasshopper) is listed as an Australian Insect Icon due to its remarkable colours.

I recommend checking these sites for further information -

www.brisbaneinsects.com/brisbanegrasshoppers/MountainKatydid.htm

http://museumvictoria.com.au/about/mv-blog/apr-2011/mountain-katydids/

We again called upon Kathy to help us identify our next 'unknown'. Angus and I visited Lobster Falls in April and were intrigued on our return to the car to see this fascinating 'cocoon' on the track. Not being able to find any information (due primarily to us not knowing what to search for) we forwarded the pictures to Kathy who identified the casing and wrote,

"These are very clever little caterpillars that weave a "bag" or case around themselves to hide in. Many species in this family glue sticks or bits of leaves around the bag for camouflage. Interestingly, the caterpillar stays in the case the whole time, will pupate in the bag, and if it is a female, will stay in the bag as an adult! This particular species looks like a ribbed case moth *Hyalarcta nigrescens*. Kathy suggests that the last photo we took shows the shed pupal case of the male.

Take a look at the following websites and you can read more about them;

http://australianmuseum.net.au/image/Ribbed-case-moth/

http://lepidoptera.butterflyhouse.com.au/psyc/nigresc.html

http://www.brisbaneinsects.com/brisbane_moths/RibbedCaseMoth.htm

ribbed case moth *Hyalarcta nigrescens*.

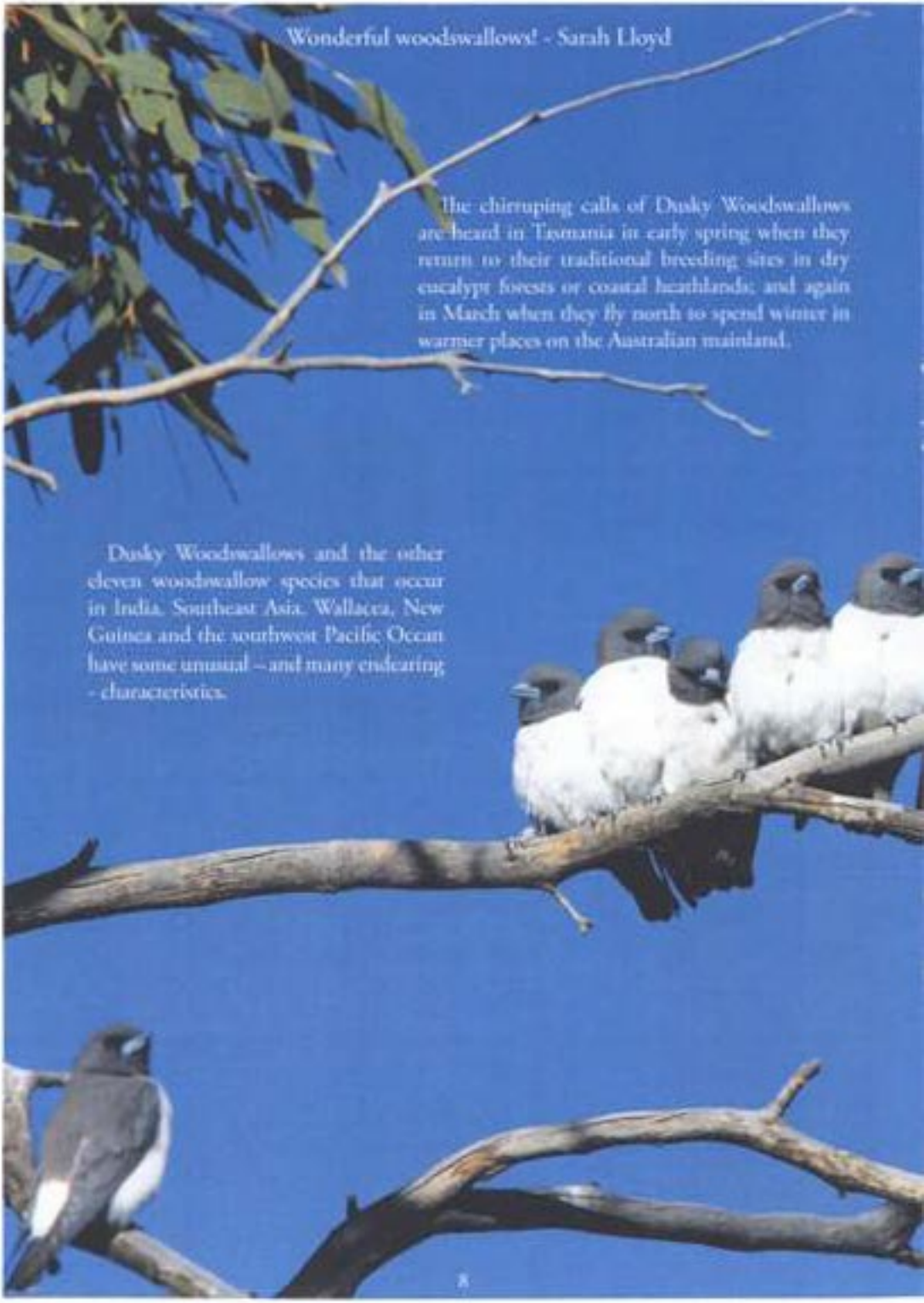
Bullant on large gnat-orchid - by Phil Collier and Robin Garnett

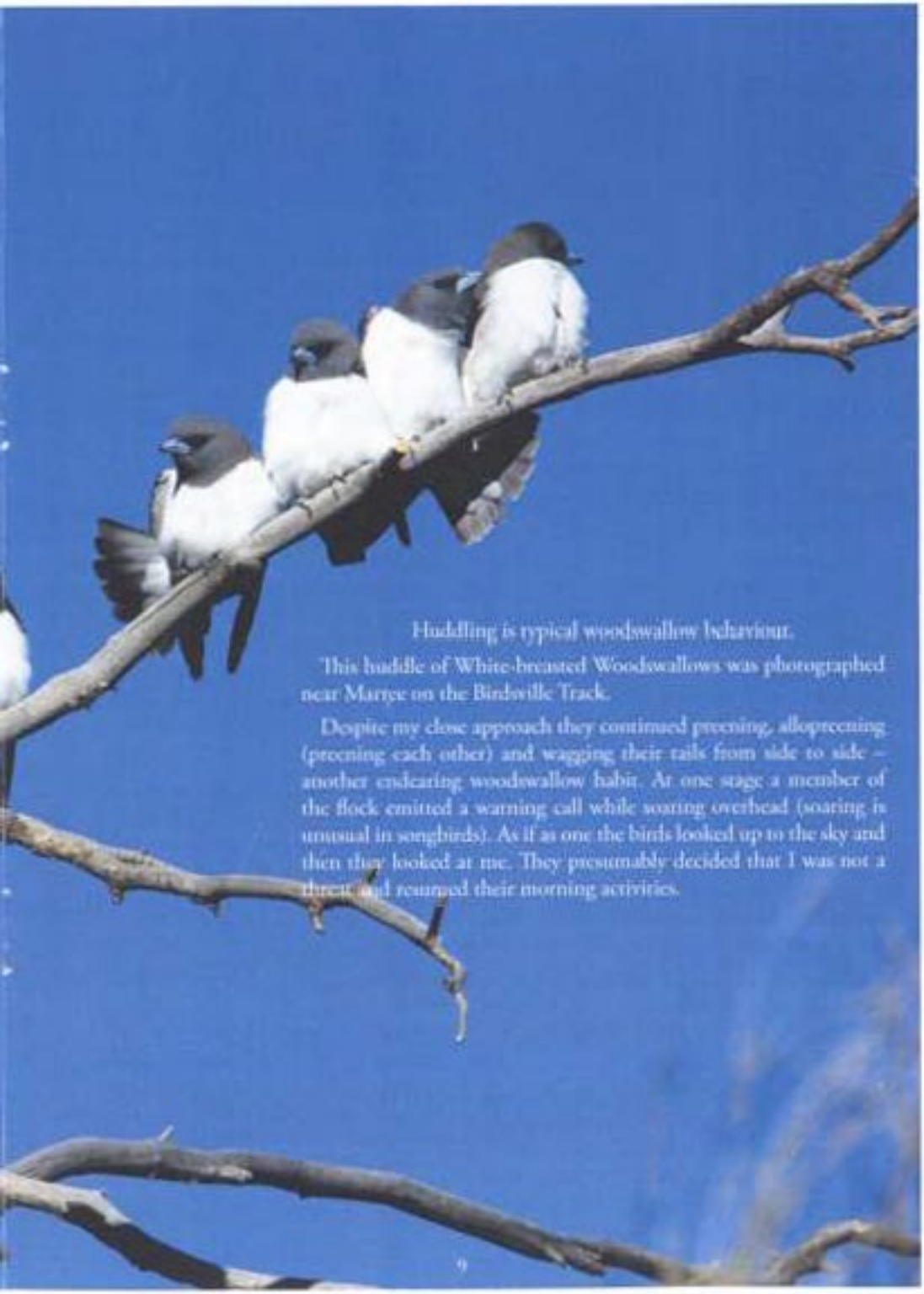
We were trying to identify this orchid in August 2011 in burnt heathland east of Low Head. As the common names imply *Cyrtostylis robusta*, large gnat-orchid, differs from *Cyrtostylis reniformis*, small gnat-orchid, by its larger yellow-green leaf, larger flower with a broader labellum and small saw teeth towards the tip. We were used to seeing the large gnat-orchid on coastal dolerite hilltops, not in sandy heathland. This is a new location for this threatened species in Tasmania. While we were scratching our heads, a bullant (*Myrmecia forficata*) walked into the scene and systematically visited each flower. For a change we had a camera at the ready! Whether the ant was taking nectar and/or pollen is unclear. There was no evidence that the orchid's pollina were removed on the ant's body. It would be interesting to collate other sightings of ants visiting winter-flowering orchids if anyone has seen it previously.

Wonderful woodswallows! - Sarah Lloyd

The chirruping calls of Dusky Woodswallows are heard in Tasmania in early spring when they return to their traditional breeding sites in dry eucalypt forests or coastal heathlands; and again in March when they fly north to spend winter in warmer places on the Australian mainland.

Dusky Woodswallows and the other eleven woodswallow species that occur in India, Southeast Asia, Wallacea, New Guinea and the southwest Pacific Ocean have some unusual – and many endearing - characteristics.





Huddling is typical woodswallow behaviour.

This huddle of White-breasted Woodswallows was photographed near Maryce on the Birdsville Track.

Despite my close approach they continued preening, allopreening (preening each other) and wagging their tails from side to side – another endearing woodswallow habit. At one stage a member of the flock emitted a warning call while soaring overhead (soaring is unusual in songbirds). As if as one the birds looked up to the sky and then they looked at me. They presumably decided that I was not a threat and resumed their morning activities.

Dusky Woodswallow

Woodswallows belong to an ancient Gondwanan family, the Artamidae, whose members include magpies, currawongs and butcherbirds.

The grey, brown, or black and white plumage of woodswallows has a distinctive bloom caused by powder downs. Powder downs are down feathers that grow continually rather than being lost through the normal moulting process. The tips of the feathers break off to produce a fine, talcum powder-like substance with which the birds preen and waterproof their feathers. They are unusual in passerines (songbirds) but are common in non-passerines such as parrots, cockatoos, pigeons and herons.

Woodswallows usually feed by catching insects on the wing but they will also forage on or near the ground. They occasionally use their brush-like tongues to feed on nectar.

Woodswallows have complex breeding behaviour. Some breed as simple pairs, and some breed cooperatively; both breeding strategies can be found in the same species.

Cooperative breeding involves non-breeding birds ('helpers at the nest') from a previous season's brood or from a brood reared earlier in the same season assisting related (and sometimes unrelated) breeding pairs to rear their offspring by bringing food to the nestlings. This breeding strategy is common in Australian birds and may have evolved to overcome a paucity of suitable breeding sites, lack of breeding partners and lack of parental experience. It seems to be altruistic behaviour that improves the chances of survival of the species rather than individual birds.

Cooperative breeding is mostly found in sedentary rather than migratory species such as woodswallows. But not only are Dusky Woodswallows co-operative breeders but they breed colonially and crèche their newly fledged young. Crèching is not that unusual in the bird world but Dusky Woodswallows, unlike other birds that crèche (e.g. swans, galahs and penguins), will not only feed their own young, but all other birds in the crèche.

Huddling (see page 9) and clustering are typical woodswallow habits. Clustering refers to their propensity to spend the night in tightly packed groups. It is particularly well documented in Black-faced, Little and Dusky Woodswallows. Groups of between five and twenty individuals spend the night in traditional roosting sites such as the side of a tree trunk, inside a burnt out stump, or the underside of a raven's nest or clump of mistletoe.

Dusky Woodswallows, like many other birds, seem to be declining. For the past six years I have been monitoring bird species on an extensive property that encompasses agricultural land and 'production forest' south of Cressy. Since 2006 Dusky Woodswallows have been recorded either intermittently or regularly at seven of the nine survey sites. This year they were seen at only one site.

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The dense canopy foliage of the trees in Tasmania's cool temperate rainforests and wet eucalypt forests create dark damp conditions that are ideal for the proliferation of cryptogams, plants such as algae, ferns, bryophytes (mosses, liverworts and hornworts), fungi and lichens that reproduce by spores rather than seeds.

Algae were the first cryptogams to appear on Earth. They are simple green plants that do not have stems, leaves and roots. They have no sterile layer of cells surrounding and protecting their reproductive organs so they are mostly restricted to aquatic habitats.

Bryophytes is a term used for three unrelated groups of plants: the mosses, liverworts and hornworts. They are thought to have evolved from a group of green algae about 400 million years ago and although they represent separate evolutionary lines, they are lumped together because they developed similar adaptations to increase their reproductive success and to overcome the problems of desiccation.

Firstly, they produce their sperms and eggs in separate sacs called antheridia (male) and archegonia (female); secondly, they retain the fertilized eggs inside the archegonia where the embryos grow into spore-bearing structures called sporophytes. Thirdly, and most importantly, they enclose their spores in a rot resistant, waterproof, UV shielding carotenoid polymer called sporopollenin. It was this last adaptation that enabled them to colonise the land.

Sporopollenin is a waxy polymer that is deposited in the outer walls of the spores of bryophytes. It provides an extremely effective shield against UV radiation, especially the short wavelength radiation that is particularly damaging to cells. Bryophytes are able to respond to fluctuating levels of UV radiation by adjusting the amount of sporopollenin they deposit in the walls of their spores.

Unlike flowering plants, most bryophytes do not have a transport system for conducting water. In addition, the leaves of most bryophytes lack a thick waxy covering that in flowering plants reduces water loss. Their extremely thin leaves (usually only one cell thick) are able to absorb water directly from rain or moisture-laden air. They lack true roots but attach to the substrate (e.g. logs, trees, rocks or soil) by hair-like rhizoids through which they can take in water and minerals.

Bryophytes usually reach peak abundance in wet habitats and in the Tasmania's rainforests logs, exposed roots, trunks, rocks and soil are blanketed in a rich variety of liverworts and mosses that in some habitats can number over two hundred species.

Bryophytes also occur in arid environments and even in predominantly wet areas they become desiccated during prolonged dry periods. Their remarkable ability to absorb water through their leaves means they can rehydrate as soon as moisture becomes available; they can transform quickly from a crisp to a photosynthesizing green plant. This ability, along with the relatively large amount of water they can hold on their leaves by surface tension, makes them crucial in maintaining a stable humid atmosphere in rainforests and wet forests. Soil colonising species help to reduce evaporation and prevent erosion.

Bryophytes do not contain lignin, the substance that gives structural strength to the cells in ferns and flowering plants. Consequently, most bryophytes are small.

moss *Hypopterygium didictyon*

Fossil evidence from the Devonian Period reveals that the first plants to colonise the land resemble today's liverworts. There are two groups, thalloid (or thallose) liverworts and leafy liverworts.

Thallose liverworts are thought to have evolved in Laurasia and they now dominate the northern hemisphere flora. There are relatively few in Tasmania. One of the most familiar is *Marchantia berteroana*, a species that often grows with potted plants. It has thick leathery leaves that lie flat on the surface (usually soil) from where it can access water and nutrients. Their female reproductive organs (archegoniophore) resemble small green umbrellas that sit above the leaves.

In some species of thallose liverworts small cups develop on the upper surface of the leaves. These cups (below) contain small disc-shaped gemmae, a type of vegetative propagule. Raindrops falling on the cups dislodge and expel the 'seeds' giving the plants a means to reproduce vegetatively.

gemmae cups on thallose liverwort

Marchantia berteroana

Liverworts synthesize bibenzyls, compounds that are absent from the other bryophytes and are found elsewhere in nature in only a few flowering plants. One bibenzyl, lunularic acid, inhibits the germination of the plant's gemmae and the growth of the thallus. During cool seasons the production of lunularic acid slows down and the thallus grows quickly; in the warmer months production of lunularic acid rises and the thallus becomes dormant, thus avoiding desiccation.

thallose liverwort *Hymenophyton flabellatum* (right) and several moss species cover a 'mossy' log

Leafy liverworts have small thin leaves and superficially resemble mosses. They evolved in Gondwana and dominate the southern hemisphere liverwort flora.

New Zealand, with 600 described species, is the centre of southern hemisphere liverwort diversity with Tasmania a close second. The liverworts that occur in Tasmania and New Zealand include primitive endemic families that inhabited Gondwana before it fragmented, as well as genera that evolved after the fragmentation. The primitive families are believed to hold the key to the understanding of the evolution of liverworts - the first plants on Earth.

leafy liverwort *Lepidozia* sp.

Despite their superficial resemblance to mosses, (some 'mossy' logs are in fact completely covered in liverworts) liverworts differ in several ways. Some of these differences are visible to the naked eye while other differences, such as the oil bodies in their leaves or the elaters in their capsules, require a powerful microscope.

T. Thekaekara

Left: Elaters are spiral-form structures that act like springs and help to eject spores from the capsules. They change shape with changing humidity: as the air dries out inside the capsule increasing tension is placed on the elator. When the tension is released the capsule bursts open and the spores are ejected.

T. Thekaekara

Right: Many liverworts have small structures called lobules on the underside of their leaves. These lobules are also known as water sacs as it was once thought their function was to provide a reservoir of water during dry spells. However not only do the lobules have small openings, they are too small to be a back up water supply. They are now thought to house nitrogen-fixing cyanobacteria and tiny protozoa which are likely to provide nutrients to their hosts.

Compounds common in leafy liverworts include monoterpenoids. Some are aromatic with fragrances reminiscent of lemons, peppermint, camphor and parsnips. Others have bitter, sweet, peppery or nauseating flavours that probably evolved to defend the plants against animals such as grazing snails and insects. Sesquiterpenoids are also common. They are poisonous and are known to cause dermatitis, especially in forest workers in daily contact with trees covered in liverworts.

moss *Dicranoloma* sp.

Moss

There are three main groups of mosses. The 'true' mosses are the most widespread and species rich with about 9000 species; the granite mosses, about 100 of them, are restricted to granite and the third group, the sphagnum mosses, have a cosmopolitan distribution and are usually associated with bogs.

liverwort sporophytes

moss sporophytes

hornwort sporophytes

The most obvious (visible) difference between mosses and leafy liverworts is their fertile structures called sporophytes. However, these features are not always present, so a familiarity with some basic structural differences will assist in telling them apart.

(For more about this and other fascinating aspects of bryophytes visit the excellent website: http://www.bluetier.org/nature/mosses.htm compiled by Tom Thekathyil)

Liverwort sporophytes - the dark spherical capsules containing the spores of liverworts mature close to the plant and before the translucent stalks begin to lengthen. When the stalks lengthen they lift the capsule above the plant. The capsule splits into a star-shaped structure and the spores are ejected. The stalk is unable to make its own food and it therefore lasts for hours or several days at the most.

Moss sporophytes have a stalk (seta) that is usually brown and solid with long lasting capsules. As the stalks slowly lengthen they raise the capsules above the plant. The capsules mature only once the stalk has stopped growing.

Hornwort sporophytes are needle-shaped structures that open by one or two vertical slits. They continue to grow if conditions are favourable and shed mature spores from the tip and produce new spores at the base.

References:

Malcolm, B & N. (2006) *Mosses and other bryophytes an illustrated glossary.* Micro Optics Press, Nelson, NZ.

Meagher, D. & Fuhrer, B. (2003) *A field guide to the mosses and allied plants of Southern Australia.* ABRS & FNCV, Canberra.

Volunteers needed for Little Penguin Count - Patricia Ellison

The Friends of Lillico Penguins (FoLP) and Parks and Wildlife Service, Tasmania (PWS) are organizing a count of Little Penguins at Lillico Beach Conservation Area to take place on the evening of Saturday 14th January, 2012.

Lillico Beach is on the Bass Highway about five minutes drive west of Devonport. Our last count was in January 2008.

If you would enjoy an evening in the company of penguins, sitting on the beach and counting them as they return to their nests, we would love to hear from you. Your participation would provide valuable information about the condition of the Little Penguin colony at Lillico Beach which will be used by FoLP and PWS in continuing to protect and understand these fascinating birds. You are sure to enjoy a memorable evening!

To take part, you will need reasonable night vision (don't forget to bring binoculars) and be able to sit fairly still in silence for up to two hours. You will also need to be able to walk across uneven shingle to your counting position; the distance will range from a few metres to as much as 1km each way.

The evening will begin with a briefing session at 8.00 pm and it could be as late as midnight before we finish.

A limited number of billets will be available for people who live too far away to drive home afterwards.

If you are interested in joining us and think you may be available on the night, please send us your contact details so that we can keep you informed about our planning for the count. Closer to the time, we will ask you to register a formal expression of interest. contact details:

Patricia Ellison, President, FoLP – 0459 084 742, pellison@iinet.net.au
John Coombes, Secretary, FoLP – 6424 6795, jcjb@iprimus.com.au
Steve Mansfield, Volunteer Facilitator, PWS Phone: 6429 8727, mob: 0428 576 229, stephen.mansfield@parks.tas.gov.au

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Have you got wings? - Ron Nagorcka

'Have you got wings?'

This is an oft heard question on our walks. It refers to the marvellous book *'Wings'* by Elizabeth Daley about Tasmania's insects. Highly recommended.

What about Malcolm?

This refers to a book with the much less imaginative title *Mosses and other bryophytes, an illustrated glossary* by Bill and Nancy Malcolm, New Zealanders with a lifelong passion for their subject. I don't care if you are not the least bit interested in bryophytes, any self-respecting naturalist and /or book lover should get this book – it is seriously good. Delightful and informative diagrams, fantastic colour photos, thoroughly cross-referenced with clear explanations about how things work, and beautifully laid out. It leads you around all sorts of wonderful worlds – and it's a hell of a lot more pleasant than searching the web. I love it. Five and a half stars!

And Sarah's latest?

Don't miss *Munginabitta's country: flora and fauna at Penatana and Marshalls Hill* on the Rubicon estuary. Published by The Six Rivers Aboriginal Corporation. Available from Fullers, Tiagara or Sarah. It's a gripping yarn!

About those snakes:

(See last newsletter for the story so far.)

What were all those snakes doing together in the hothouse? I am endebted to John Bowden for the information that four of them would have been male, and one a receptive female. The males were waiting around in hope.

In this issue:

See insert or website for walks program

White-breasted Woodswallows Binalsville Track, Maree - Photo: S.Lloyd

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