THE NATURAL NEWS

Central North Field Naturalists Inc.
(CNFN)

No. 33 Winter 2006

Patron: Dr Peter McQuillan

CNFN Contacts:
President: Ron Nagorcka
999 Denmans Road, Birralee, 7303
Ph (03) 6396 1380
email: ronag@vision.net.au
Secretary: Jan Nelson
68 Dynans Bridge Rd. Weegena 7304
Ph (03) 6368 1313
email: nlester@ tassie.net.au
Treasurer and Editor: Sarah Lloyd
999 Denmans Rd, Birralee, 7303
Ph (03) 6396 1380
email: sarahlloyd@primus.com.au

Walks Program (see insert for more details)

Sunday August 6th: Quamby Bluff cryptogamic adventure. Meet at 10.00 at the car park on the Lake highway.

Sunday September 3rd: Alistair Ross and Julia Butler-Ross are kindly allowing us to visit their property at 232 Bellamy Rd, Forthside. BBQ facilities are available. Meet at 10.00 (see enclosed map)

October 1st: We will visit John and Farley Plapp's Land for Wildlife property at 2782 Frankford Highway.

October 13,14,15th
Federation Meeting: King Island. Contact Sarah for more details.

November 5th: CNFN AGM at Weegena.
N.B. The venue has changed!!
This year we'll meet at Lyn and John Hayward's cabin, Hawley's Rd., Weegena. Walk starts at 1.00 pm, meeting at 4.00pm Bring food to share. BBQ available

Numbats, Conservation and Related Corporate Acronyms

By Paul Hydes

The Numbat (*Myrmecobius fasciatus*) was widely distributed across Australia in the 18th century and with an exclusive diet of termites it is our only strictly diurnal mammal. Introduction of foxes in 1871 resulted in a rapid decline in populations of this and other small marsupials which, when coupled with habitat destruction, meant that by 1910 Numbats were confined to a few pockets in the south west of Western Australia. By 1982 it was estimated that only 200 individual animals remained and the Numbat was named as the world's most endangered species. In 1985, Western Australia's Department of Conservation and Land Management (CALM) introduced fox control programmes which assisted a gradual increase in Numbat numbers over the next 5 years.

It was realised that survival of the species would be assisted if recolonisation of other parts of the Numbat's original range could be achieved, resulting in 1993 in the first inter-state relocation programme. The site chosen was the fox free sanctuary at Yookamurra in the South Australia mallee region, established by Earth Sanctuaries Ltd (ESL) with partial funding assistance for the transfer of 15 Numbats provided by the Earth Sanctuaries Foundation (ESF), a charitable group with close but not exclusive links to ESL. The Yookamurra project was so successful that in 1999, 19 of the South Australian animals were

transferred to ESL's Scotia sanctuary in New South Wales where they bred successfully so that in the following year, an estimated 2000 Numbats were living across three states.

Meanwhile, ESL had listed on the stock exchange, run into financial difficulties and been restructured, divesting all but two of the sanctuaries (Adelaide, Melbourne) in 2001 to Australian Wildlife Conservancy (AWC) an independent, Perth based non-profit conservation group with several sanctuaries of their own in critical habitat areas around the country. AWC therefore took over the running of Yookamurra but whereas ESL had a focus on eco- tourism, AWC concentrated on conservation research and access to the reserves was primarily for scientists, educational groups and working volunteers.

AWC has acquired other sanctuaries in recent years, notably Mornington in the Kimberley and Brooklyn in far north Queensland, and has recently successfully negotiated with Birds Australia to take over management of the Newhaven Reserve northwest of Alice Springs. AWC has also changed its approach to sanctuary access with eco tourism income from some sanctuaries making a significant contribution to their annual revenue. Anyone wishing to visit one of the 13 sanctuaries under their control can obtain details from www.australianwildlife.org, noting that a range of accommodation options is available at some sanctuaries and access is by prior arrangement with the local manager (Phil Scully at Yookamurra).

In the last few years, ESL acquired the Waratah sanctuary outside Sydney but again ran into financial strife and subsequently merged with a Melbourne based company, ES Link which among other things offers consultancy advice on small scale wind/solar power systems and has assets at Lake St Clair and on Bruny Island where it is behind the Simpsons Point eco-residential development, part of the Tasmanian Private Forest Reserves Programme. Their sanctuaries at Waratah Park (Sydney, 02 9986 1788), Little River (You Yangs, Melbourne, 03 5283 1602) and Warrawong (Adelaide Hills, 08 8370 9197) are open to visitors.

In 2005, the board of ESF decided to make a clear distinction between its own interests and those of ESL and renamed the charitable operation as the Foundation for Australia's Most Endangered Species (FAME). The latter has funded an environmental education project with Birds Australia and supported university groups working on the Broad shelled tortoise, native orchids and Mountain Pygmy Possums, in addition to funding a protected breeding area for the Gilberts Potoroo in Western Australia. Their most recent venture was assistance for the relocation of 20 Numbats from Scotia to the Arid Recovery protected area north west of Adelaide in September 2005. Anyone interested in FAME can contact them at PO Box 1135, Stirling SA 5152

Numbat or Banded Ant-eater

[Illustration by Neville W. Cayley from Troughton, E. (1957) Furred Animals of Australia. Angus and Robertson, Sydney]

Footprints in the Pollen (Part 2)

By Phil Watson

Following Part 1 of this article detailing the fascinating roles that bees play in the plant's mating game, Part 2 will expose the equally enthralling interrelationships played out with other groups of insects as well as with birds and mammals.

Pollination by birds

Recent studies have revealed the partnership that exists between over 100 species of birds frequenting around 1000 native plants. The large, robust flowers are often characterised by brilliant colours and voluminous flows of sugary nectar.

Anna's Hummingbird on hibiscus
[Audubon, J.J.(1981) The Art of Audubon. Macdonald, London]

Although there is no direct bird to plant (1:1) relationship in Australia, (common amongst hummingbirds of America or sunbirds and sugarbirds of South Africa), our brush-tongued honeyeaters and parrots are strongly attracted to scentless, brilliant red or orange flowers. With insects blind to red colours this gives birds a distinct advantage. Many birds thrive on the brush type flowers of gums, banksias, hakeas and bottlebrushes, whilst others feed on the tubular flowers of *Grevillea* spp., *Richea* spp., *Epacris* spp. and *Correa* spp. The colourful floral features of bird-pollinated flowers make them vibrant additions in any garden. They attract a diversity of nectar feeders such as Eastern Spinebills, Wattlebirds, Noisy Miners, Swift Parrot, Eastern Rosellas and Crescent and New Holland Honeyeaters.

[A cautionary note: Too many nectar producing plants attract aggressive honeyeaters such as wattlebirds and New Holland Honeyeaters. These birds will defend a rich nectar source and chase away small birds such as fairy-wrens and thornbills. Noisy Miners are strongly associated with dieback in eucalypts. Ed]

Kangaroo Paws are architecturally designed to have only one receptive flower each day which are staged along its flowering stem. The new flower pivots boldly into position while the spent flowers hinge away after pollination. The curvature of the flower leading to their nectar target matches closely the shape of the bird's head and beak. Consequently the pollen is dusted on the bird's head, before being inadvertently carried from flower to flower.

Junk food for Mammals

Current estimates indicate over 25 species of mammals actively visit native flowers. These furry fellows include 7 species of possums, arboreal mammals such as Sugar gliders as well as bats and rodents. All are recognised as pollinators of Myrtaceae and Proteaceae in dry woodland communities. For example the Grey-headed flying Fox, like other flying foxes,

Pygmy possum on banksia
Photo: J. Simmons

flies up to 40 kilometres across cleared and urban landscapes to forage in flowering gums such as the Spotted Gum *Corymbia maculata*. These animals can comfortably survive without nectar, but the flowers provide a type of junk food option in exchange for their services of transferring pollen.

Flies, gnats, midges and mosquitos

As quiet achievers in the pollination game flies frequent flowers ranging from complex orchid blooms to simple radial flowers. Remarkable in the extreme are the specialised **long-proboscis** South African flies whose needle-like mouth part is up to 70mm or 4 times their body length. Without the ability to retract its prodigious appendage, it must fly with it extended forward or tucked loosely below its body. They have co-evolved with purple, red or bluish flowers of *Pelargonium* spp. which exhibit intensely coloured nectar guides and long–floral tubes containing deep nectar pools. While this intricate symbiotic relationship excludes nectar raiders, the impacts of climate change or habitat loss could easily result in extinction. Other typical examples are iris-like plants including *Babiana*, *Sparaxis*, and *Ixia* spp. Some of these species are flower garden favourites in south eastern Australia, but with no specialised flies here they lack the ability to be open-pollinated.

Commonly known for their biting and uncouth behaviour are the **short-tongued flies** such as blow flies, carrion flies and march flies. These species have lapping mouth parts and are attracted to decaying putrid scents and livid-coloured flowers such as the Milkweeds *Asclepiaceae*. An excellent example in Western Australia is the brown and yellow Stinking Roger flower *Hakea denticulata* which smells of rotting wallaby. Pollination is carried out when blowflies, attracted by the smell, seek egg laying sites.

Using a similar style of smelly attractant, the Helmet Orchid *Corybas recurvus* entices flies and gnats to their dull, ground hugging fungus–like flowers. Once pollinated the fungus-scented flower shrivels and then rises on an elongated stalk blocking further pollination.

The cryptic orchid-like, ground-dwelling Fairy lanterns *Thismia* sp., which also emit a fleshy odour, are considered to be pollinated by gnats, midges, as well as beetles and other invertebrates.

Thismia rodwayi

Greenhoods, *Pterostylis* spp., emit alluring pheromones of the female **fungus gnats** or, less commonly, of a mosquito species. This is intended to entice the male onto the cocked elastic labellum. Once triggered the labellum flips inwards encapsulating the insect inside the flower. In its frantic attempts to escape, the gnat initially brushes its pollen load onto the stigma before being directed by columnar wings to be pollen dusted and finally set free. As a testament to their very short memories and the power of the pollination process, they soon forget the experience and suffer a repeat episode. Those people who have been attacked near wetlands by swarms of blood thirsty female midges, flies and mosquitos, can be consoled in the knowledge their blood is fuelling these pollinators to skim around the flowers on the water's surface.

Wasps, sawflies and ants

One can only be amazed by recent reports indicating that over 500 species of male thynnid wasps have evolved close relationships, some 1:1,

with indigenous terrestrial orchids eg Duck orchids *Caleana sp.* Hammer orchids *Arthrochilus sp.* Spider Orchids *Caladenia sp.* and Mosquito Orchids *Acianthus sp.*. In contrast, ants are poor pollinators, due to their lack of body hair and tendency to damage the pollen during its transport.

In recognition of the importance of thynnids to pollination, some species of Hammer or Elbow Orchids have been renamed *Thynninorchis sp.* to highlight their

Hammer Orchids mimic female thynnid wasp

symbiotic relationship. Two species of *Thynninorchis*, namely *T. huntianus* and *T. nothofagicola*, are able to mimic the shape and scent of the flightless female wasp after she emerges from her underground cell and climbs up on a grass stalk or low shrub. Here, posing with erect antennae, she releases a pheromone unique to her species. Mistaking the orchid for a female, with which he expects to fly off and mate on the wing, the male wasp seizes the elasticised labellum only to be thrown into the pollen presenter. Records indicate that many of these thynnid wasp pollinated orchids are at their peak of flowering just before the females emerge. After mating the male relocates the female to her original site where she parasitises corby or curl grubs, using her long proboscis to inject her eggs.

A similar scenario occurs between the male *Scoliid* Wasp and the Bearded Orchid *Calochilus herbaceous*. The strikingly big hairy labellum with its pair of eye-like glands at its base combines with the pheromone scent to lure the male wasp.

Sawflies, a variety of wasp, are also active pollinators of plants such as the large Flying Duck Orchid *Caleana major*. Their upside down flowers, with broad columnar wings, presented on a wiry scape mimic the female wasp sufficiently to entice the male to attempt copulation.

Beetles

Although beetles may have pollinated some of the very earliest of flowers, their contribution is mostly limited to the diverse Myrtaceae and Asteraceae families. Some, such as gum beetles and cockchafers, are more prone to eat and damage the flower rather than pollinate them and their larvae also damage the plant's root system. Typically, Myrtaceae benefit mostly from beetles especially the jewel beetles whose footprints are common in the pollen of the gums, ti-trees, baeckeas, and paperbarks.

Importantly the gregarious behaviour of some brightly coloured hairy beetles has been used to advantage by open flowered daisies including Billy Buttons *Craspedia glauca* and *C. alpina*, Dolly Bushes *Cassinia* spp. and Daisy Bushes *Ozothamnus* spp. where they feed on the pollen or gather to mate. During their frolicking the beetles become dusted with pollen. Beetle-pollinated plants have shallow, broadly concave or convex brightly coloured flowers held erect with short sturdy exposed organs. These make attractive landing platforms. Some flowers even have ornamental beetle–like markings to lure passing mates with the promise of company, and hence participate in the pollination process.

Butterflies and Moths

Since most of the 22,000 Australian moths are active after dark, plants adapted to moth pollination have white or pale colours, with little scent during the day. These help to camouflage them from day active insects. Some moth-pollinated plants remain fully

closed during the day further minimising impacts from raiders. In the evenings majestic transformations occur, including alluring perfumes and luminescing colour patterns. By first light they begin reverting to their neutral day time forms. Typical native examples include *Boronia* spp, White Candles *Stackhousia* spp. and Hounds tongue, *Cynoglossum* sp., while the strongly scented cottage garden favourite *Cestrum nocturnum* exemplifies the moth pollination features found in some of the exotic weeds.

Both larva and adult moths or butterflies depend totally on living plants or their associated decaying organic matter. Consequently they have a major effect on plants by either aiding with pollination and organic matter breakdown for nutrient supply or by destructively feeding on the plant parts.

Bursaria spinosa is a butterfly favourite and attracts the Tasmanian butterflies Bright Copper and Shouldered Brown to its prolific nectar- bearing flowers.

Indigenous plants such as Rice flowers *Pimelea* spp., have adapted their form and structure by positioning their nectaries at the base of long thin corollas. Whilst the moth is probing deeply for nectar, the prominently exserted anthers and stigmas transfer the pollen to and from their hairy bellies. One of the earliest emerging spring butterflies, the Hobart Brown is strongly attracted to Rice flowers, *P. humilis & P. linifolia* whilst the Tasmanian species of Macleay's Swallowtail, whose larva feed on the foliage of Sassafras *Atherosperma moschatum*, seeks out *Pimelea* spp. on forest margins and road sides.

Alpine Pollinators

In the alpine zone the meandering low flying Leprea Brown butterfly is strongly reliant on the prostrate alpine heath *Pentachronda pumila* (right). The Mountain Blue is the most alpine-adapted butterfly in Australia and is an important pollinator of alpine daises such as Alpine buttons *Cotula alpina* Mountain Daisy, *Erigeron* sp. and Silver Snow Daisy, *Celmisia saxifraga*. To protect itself from predation the undersides of its wings blend well with the grey lichens and dead twigs common in alpine areas.

The Dominula Skipper, White Grass Dart and the Yellow Banded Dart also feed and help pollinate the herbaceous daisies in montane woodlands. They have low whirring flight patterns ideal for seeking out the ground hugging Snow Everlasting *Helichrysum milliganii*, Paper Daisy *Leucochrysum albicans* and Everlasting Daisies *Craspedia alpina*. Whilst feeding they adopt a distinctive profile at rest with their forewings held erect over their bodies and hind-wings held horizontally.

Conclusion

The wondrous but cryptic world of pollination ecology is exciting and vibrant, but, like many ecological systems is subject to global climatic changes and rapid habitat degradation. No matter how insignificant or inconsequential a species may appear, it has a critical role in maintaining the checks and balances of a healthy ecological community.

Recommended Reading:

S.L.Buchmann and G.P.Nabhan (1996) *The Forgotten Pollinators*, Island press, USA

K.Faegri and Van der Pijl (1973) *The Principles of Pollination Ecology*, Collins London)

Harvey, M.S. and Yen A.L. (1997) *Worms to Wasps: An illustrated Guide to Australia's Terrestrial Invertebrates* Oxford University Press, Melbourne

J.B. Kirkpatrick and S. Harris (1999) *The Disappearing Heath Revisited* Tasmania Environment Centre Inc.

Simon Nevill (2001) *Guide to wildflowers of South Western Australia* Simon Nevill Publications

Back to Birch's by Jim Nelson

Birch's Inlet lies at the southwest end of Macquarie Harbour, near the entrance to the Gordon River in western Tasmania. Following the Inlet south, you enter the Birch's River which drains a large section of the South West Conservation Area.

The Birch's River area became of interest to an intrepid group of field naturalists and frog enthusiasts during the early 1990s because of reports of good populations of Burrow's tree frogs (*Litoria burrowsae*). In 1993, several field nats assisted by Tasmania's Parks & Wildlife service (P&W) made 3 trips to Birch's to increase the knowledge of the natural history of Tasmania's only endemic tree frog. We published the results in the Deloraine Field Naturalists Bulletin, which I can make available to anyone who wants it.

Burrow's tree frog (*Litoria burrowsae*) Photo: J. Simmons

Following the CNFN's Commonwealth funded investigation last year into the chytrid fungus in Tasmania, we became worried that *L. burrowsae* might be under threat. Known distributions of the frog, such as the Cradle Mountain area (where the frog was first discovered), seemed to be absent of the wonderful, distinct "quanking" call of the species. We decided to return to Birch's to see what was happening there, and hopefully once again soothe our senses with the unique sound of the frog's call, and to drink in the wonderful solitude of the moorlands.

We arrived at Strahan on a blustery, grey morning to catch our charter across the harbour. An hour before, the skipper had decided it was too rough to go. Then, just as we pulled in there was a lull, and we made a run for it. It all seemed pretty crazy to even think of going with that kind of weather about, but Paul Swiatkowski, Steve Cronin and I were all keen to get there and find out what the frogs do during some real West Coast autumn weather.

We arrived at the dock at Birch's River just ahead of some more bad weather in the harbour, and I imagine the skipper, Mario, must have had a nasty trip back. The Birch's river was running full and fast, and the ferrying of our gear, along with the table, chairs, mattresses, gas, stove and lantern supplied by P&W for the Orange Bellied Parrot hut made the trip pretty interesting.

[The Orange-Bellied Parrot, one of Australia's rarest birds, breeds only in the southwest of Tasmania. After breeding it heads north to spend winter in coastal areas of southern Victoria and South Australia. The hut at Birch's Inlet provides researchers with accommodation during summer when monitoring programs are undertaken. Ed]

You have to be a bit crazy to do this stuff, and I have been in some similar situations with Steve in the past, such as being stranded on Three Hummock Island during bad weather. We made the best of it and had a great time catching fish to eat and gathering New Zealand spinach for salads, then travelling to the Emerald Swamp on mountain bikes in bucketing rain with the track under water. Similarly, I had been stuck at Birch's in the past with Paul due to bad weather, and we managed to catch eels to augment our dwindling food stocks. Thus, I felt the three of us would make the best of it whatever the circumstances, so we didn't even hesitate. Anyone going to the southwest needs to be prepared to cop it from the weather, so the only question was whether it

would be worth it or whether the frogs head for cover at such times.

They certainly don't head for cover! Instead, they went into breeding mode with the rain, and about 3 males were competitively calling in between wind gusts from the pond behind the hut, with another calling from a close by pond. The first day we found only 3 older *L. burrowsae* tadpoles with back legs, but hundreds of recently hatched smaller ones and also spawn and hatching tadpoles. *L. burrowsae* tadpoles hatch out much larger than the *Litoria ewingi* (brown tree frog) also present, and as such are immediately recognisable wriggling in eggs. *L. ewingi* were also gearing up for serious breeding. There were lots of small freshly hatched taddies of *L. ewingi*, but like *L. burrowsae* only a few larger tadpoles. The second night it blew a gale.

Saturday dawned windy with frequent squalls, so in full wet weather gear we set out and surveyed 15 areas of water, mostly containing tadpoles. We took water measurements for ph, salinity, turbidity and temperature. At first it looked as though the *L. burrowsae* were rejecting the water of slightly higher salinity, but in the end it seemed perhaps to just be a matter of opportunity. I have all the records in a very wet notebook which I will soon transcribe into electronic form for anyone's information.

Very few tadpoles were large enough to assess their mouths for the chytrid fungus. The ones that were large enough all looked pristine. However, one of the larger *L. burrowsae* had distorted bottom teeth rows, but the actual teeth looked fine. I did swab it for chytrid, which was the only tadpole swab I did.

Saturday night we spent about 3 freezing hours trying to catch some frogs, and eventually caught two males. We inspected, measured and photographed them, and I swabbed both of them with separate swabs. They looked fine, and at 65mm from snout to vent, one was the largest male we have ever recorded. (The previous record is 62mm, the only female caught measured 71mm.)

Sunday dawned a surprisingly better day, and the sun even appeared. The frogs went into full competitive calling during the day, and there were about 7 *L. burrowsae* calling close to the hut. We needed to get our gear back to the dock for a 3 pm pickup, so we spent the morning rewarding ourselves by doing a trip into the rainforest. There has always been a question of whether the frogs go into the forest as there is usually a forest association with *L. burrowsae* (according to Paul), with at least patches of bush in sight of breeding areas. Do they use forest? We don't know, because we have never found a frog that wasn't down at the water. The forest was flooded in areas, but no signs of frogs of any sort.

Back in 1993 we caught 63 frogs on one trip to Birch's, all of them male. They were all found in or around the water. We couldn't find them anywhere else, and we couldn't find any females. Dr. Peter Brown finally caught a female later that year at Birch's after we had begun to wonder if they existed! It is the only one I know of that has been seen there. This is a very cryptic frog to study.

One purpose of the current trip was to get to the area at a time of year we hadn't experienced to see what was happening, and to get there with Paul (arguably the world expert on the species) to take advantage of his knowledge of the frog and his experience at Birch's. Steve was a complete novice in terms of looking at *L. burrowsae*, and my experience was pretty limited.

Paul certainly got us up to speed on the tadpoles. He demonstrated how you can tell *L. burrowsae* from *L. ewingi* while they are still in the water by using a discreet but evident nasal stripe on *L. ewingi* tadpoles. It works on all but the smallest of taddies. I was able to confirm the diagnosis in combination with my *L. ewingi* 'copper belly diagnosis' (which can be pretty discreet in high tannin areas

when the taddies go very dark) and with the presence of the numerous iridipores (sparkling dots on the skin). The *L. ewingi* nasal stripe works a treat for quick differentiation. It is short and quite far forward on the nasal area, but the beauty of it is that it is visible in the water if you get the right angle.

We also were able to compare the size differences in hatching tadpoles, and the differences in eggs. I think Steve and I are now happy to get amongst some previously recorded *L. burrowsae* breeding sites in Spring to do some meaningful work.

All indications from our trip suggest that about October there will be lots of *L. burrowsae* tadpoles reaching metamorphosis at Birch's and those over-wintering taddies would be the ideal to test for chytrid. Given that the Orange Bellied Parrot releases and monitoring starts there at about the same time, it would probably be a short, sharp trip to check out the frogs because the hut would likely be occupied. A solid day down there would do it, I think. We would like nothing better than to give the frogs there a clean bill of health, and then hope they can stay that way in the face of the terrible chytrid fungal disease that has been killing frogs around the world. Given that the stronghold for *Litoria burrowsae* is in the World Heritage Area, we might hold out some small hope that the disease will not reach them.

The CNFN assisted with the expenses of this trip to Birch's Inlet as part of a commitment to establish the potential threats to Tasmania's only endemic tree frog.

References:

Swiatkowski, P.A., Dudley, J., Worth, B., Nelson, J., Hingston, A., & Petraitis, J., Tasmanian (Burrows) Tree Frog *Litoria burrowsae*, Deloraine Field Naturalists Newsletter No 5, Autumn 1993

Cogger, H.G. (1992) *Reptiles and amphibians of Australia*.

Martin, A.A. & Littlejohn, M.J., 1982. *Tasmanian amphibians*. Fauna of Tasmania Handbook No 6, University of Tasmania.

Brown Tree Frog (*Litoria ewingi*) Photo: S. Lloyd

Lichens & mosses festoon trunks and branches of the rainforest trees in western Tasmania and the area has a wonderful fungal diversity; the unanswered question: do *L. burrowsae* use forest? [Photo: S. Lloyd]

Mycologists in Paradise by Sarah Lloyd

It's late autumn and most of the summer migrants: the Striated Pardalotes, Dusky Woodswallows, Black-faced Cuckoo-shrikes and Swift Parrots, have either left the state or are restlessly flocking, preparing to return to the Australian mainland where they can be assured of a more reliable winter food supply than here in Tasmania. Migratory shorebirds, some already donning their spectacular brick red breeding plumage, are also heading north, traversing the globe to return to their breeding grounds in Siberia, Mongolia, Alaska or northern China.

This mass departure of birds sees a corresponding exodus of bird watchers. Many of my ornithological colleagues are studying maps, checking forecasts and booking flights to far north Queensland or more distant countries, places much richer in feathered delights than in bird poor, chilly Tasmania.

But for naturalists with an interest in cryptogams there's reason enough to stay. The autumn rains begin to saturate logs, branches and the forest floor and their green covering of mosses and liverworts glisten as they rehydrate after the desiccating warmth of summer. Crisped wafers of foliose lichens soften, filmy ferns but one cell thick revive and an amazing profusion of fungal fruits starts appearing on just about every surface.

For me this year was especially exciting as I went with a group of mycologists to the rainforests of northwest Tasmania to record, collect and photograph the stunning diversity of fungal species in the ancient myrtle beech forests of the Tarkine.

The group was small, ten people in all. It included Greg Mueller and Betty Strack, mycologists from the Chicago Field Museum who have studied fungi in the Nothofagus forests in South America and more recently in the eastern highlands of Papua New Guinea; Tom May and Teresa Lebel from the Royal Botanic Gardens (RBG), Melbourne; botanical/fungal artist, Katrina Syme, from Western Australia; Pam Catcheside a botanist/mycologist from South Australia and husband, David, and Graham Patterson, who works assiduously as a Fungimap volunteer. I joined the team because I'm on the committee of Fungimap Inc. and as local residents, Ron, my partner and I acted as guides and interpreters of the endemic flora. Jason Edwards, a freelance nature photographer with Australian Geographic, was also with us for most of the week.

Considerable pre-planning is needed for an expedition that includes international and interstate participants and the unpredictable and ephemeral nature of the appearance of fungi makes it particularly difficult to anticipate the best time for such a trip. However, as there had been a proliferation of fungi in the Tarkine in late April last year, we decided to begin this year's excursion at approximately the same time. On April 18th we headed for the Bischoff Hotel at Waratah, our headquarters for the week.

The first day was devoted to a Fungimap meeting, a necessary though time-consuming exercise when committee members were observed gazing longingly out the window at the mist-covered slopes of the nearby forested gully. We were all keen to get into the field and at 9.00 the next morning were clothed in wet weather gear and descending the steep slope into the Magnet valley, not far west of Waratah.

Because all the collected specimens would need to be described, photographed, documented (as per permit from local authorities), in some cases painted and later dried before being lodged in various herbaria, collecting protocols and a strict numbering system were clearly enunciated. We were also mindful of the need to restrict the collections as the preparation of fresh specimens would more than occupy each evening back at the pub. We broke into small groups of three or four people, each group included a scribe, photographer and someone proficient in fungal identification. Tom, Graham, Ron and

I negotiated the shallow but swiftly flowing waters of a pristine section of Magnet creek while the rest of the group headed downstream. Here past mining activity had denuded the vegetation which is yet to fully recover even though the mine has been closed for over half a century.

The following day we returned to the track to Philosopher Falls, the area that had caused so much excitement the previous year. Here the callidendrous ("beautiful trees") rainforest has an open park-like appearance. With no eucalypts in sight, giant myrtle beech and sassafras form a light-excluding canopy and, apart from the tall treeferns (*Dicksonia antarctica*) which grow in profusion, the ground is almost devoid of other vascular plants. Instead the floral diversity is evident in the stunning array of mosses, liverworts and lichens that clothe the logs, exposed roots, trunks, branches and soil.

The sweet, slightly musty odour of decaying vegetation was all pervasive, but the distinctive smells of some of the fungal fruits had us all sniffing, trying to recall. Those with a keen nose detected the watermelon fragrance of the bright red brackets *Tyromyces pulcherrimus* on the myrtle beech, the fresh cucumber smell of the slimy yellowish *myxomas*, the apricot aroma of the *Cantharellus* and a deliciously garlic scent emanating from minute *marasmius*. Those with a lesser sense simply shrugged their shoulders and said "mushroom", no doubt somewhat pleased they were unable to detect the stench of wet nappies, ammonia and even public toilets that made the rest of us wish we'd not inhaled so deeply.

With all attention focussed on the ground and freezing rain and icy cold fingers making for less than perfect collecting conditions it was easy to momentarily forget that we were in one of the most beautiful forests imaginable. Before long the quiet concentration was interrupted by the sharp "tick" of a Pink Robin and the fluty songs of Green Rosellas and gave us cause to look around and wonder at our surroundings. Bryophytes festooned the canopy branches, hailstones hung like jewels suspended in filigree cobwebs and, now and again when blue sky appeared, shafts of sunlight would penetrate the forest and light the clustered fruits of ruby coloured mushrooms; too tempting for any photographer or artist to ignore.

As we moved further into the forest we found leathery shelf fungi, delicate corals, brain-like jellies, brackets, truffles, discs and cups and a profusion of mushrooms in every conceivable colour. In a single afternoon we listed more than 140 different species and collected many specimens that await further examination and are undoubtedly new to science.

A nondescript putty-coloured truffle lying on the soil surface turned out to be one of the most exciting finds and back at the pub we took turns to peer down the microscope at its pink angular spores. This feature immediately identified it as a *Richoniella* sp. a member of that charismatic family, Entoloma. This species of *Richoniella* and a multicoloured wax cap *Hygrocybe aroubastata* were both recorded for the first time in Tasmania.

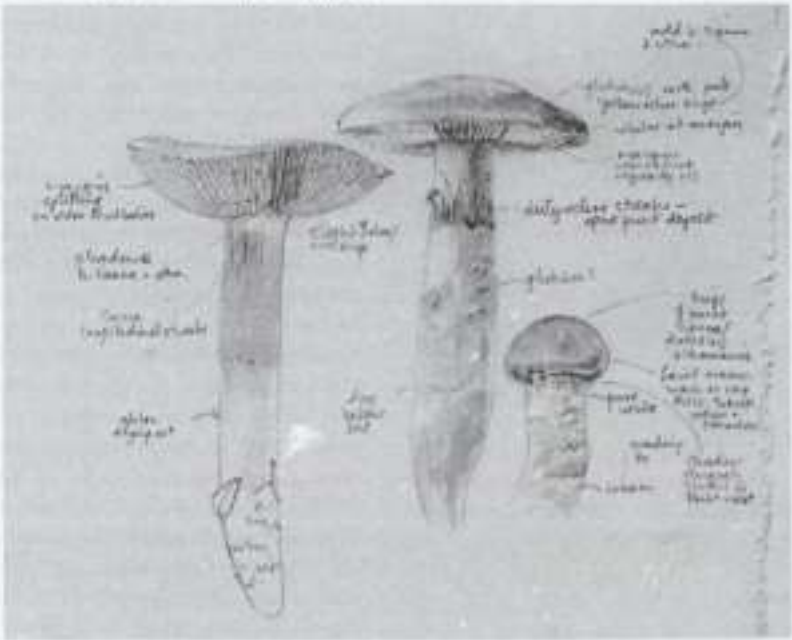
On Saturday we drove to Hellyer Gorge for a fungi foray where we met local contributors to the fungi mapping scheme and members of regional field naturalists and resource management groups. They had driven from the sunny north into the persistent wetness typical of the west coast and had a taste of the conditions we had been and would continue to experience during our time in the Tarkine; conditions that make the area so wonderfully rich in fungi. While driving back from Hellyer Gorge we discussed the possibility of foregoing another cold, wet foray and returning to the pub for a coffee and the warmth of a blazing fire. However, being ever mindful of the unique opportunity to spend only a few more days in the field together, we resisted the temptation

and instead started searching for a patch of forest different from those thus far explored.

The vista from a highpoint on the highway west of Waratah gives a sense of the topography and the vegetation mosaic that characterises the Tarkine. Extensive buttongrass moorlands are interspersed with patches of forest. On hills and exposed slopes these forests are predominantly of eucalypt species, while Myrtle Beech and other rainforest trees flourish in the sheltered gullies and wetter areas. When not shrouded in clouds or swirling mists distant mountains frame the spectacular scenery.

The bitumen highway is crisscrossed by powerlines, and heavy duty transmission towers march across the landscape to the mines that scar this richly mineralised part of the state. From this semi-industrialised place we took a short walk into yet another magical forest and soon forgot the rain, cold and discomfort and began to explore. Tall straight tea tree (*Leptospermum* sp.) dripping with bryophytes with spindly emergent eucalypts poking through their canopy again created conditions devoid of ground layer vegetation. We scratched around and unearthed several truffle species and added more names to the growing species list. The interstate mycologists were so intent on their tasks that they failed to see the cryptically coloured Bassian Thrush, which hopped, then flew from our midst. We returned to the car in time to avoid the next bout of freezing rain and headed for the hotel and another meal of hearty pub food.

Financial support from the Central North and Launceston Field Naturalists, the Royal Botanic Gardens, Melbourne and Australian Geographic made this excursion possible without individuals having to incur out of pocket expenses. All time in the field was willingly donated to the cause of improving our knowledge of the incredible fungal diversity in this remarkable part of the world.



Katie Syme's sketch of a *Cortinarius* sp. Her field notes: *"scattered under Nothofagus off side of road to Philosopher Falls - a beautiful sight. Hailing and too dark for a photo - digital camera damp and doing odd things anyway. 21.04.06"*

[Reproduced with permission.]