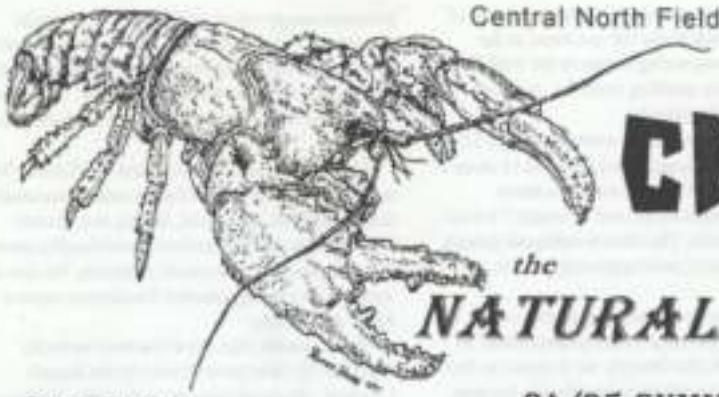
Central North Field Naturalists Inc



CNFN

the

NATURAL NEWS

Patron - Dennis Morris

04/05 SUMMER ISSUE

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Program and Events

January 9, Near Sheffield 9:30 am A survey of Rick and Jo Easton's property. Travel to Sheffield. Meet in the middle of town near the Post Office and service station. We'll travel together out to No Where Else. The Easton's phone is 6491 1439 if you need directions. There are many different environments to explore: creeks, rainforest, bushland etc. The owners want to covenant the land. Habitat for the Giant freshwater crayfish will be investigated, as well as plants, fungi, birds, etc.

February 6, Lake Mackenzie 9:30 am Meet just west of Mole Creek at the shingled shelter and picnic area. We'll travel together to the Lake, stopping on the way to view Devils Gullet, one of the spectacular views in Tassie. The lake area has rich alpine flora, with lots of cushion plants. We'll do some identification and exploration. Bring lunch and suitable gear for alpine conditions.

March 6, Penguin Tidepools 11:30 am Arrive at Penguin park for lunch. We'll follow the tide out at the shelf at the west end of the town. Low tide is 2:18. Bring suitable wading gear, sunscreen, hat, buckets and any copies of the tide pool bible: Graham Edgar's Australian Marine Life.

Victoria from the ground up

by Bob Mesibov

The past 12 months have seen my wife Trina and me finally get off our butts and visit Victoria as naturalists.

It's not that we're stop-at-homes. We've travelled together to Fiji, the Scottish Highlands, the Arizona deserts and the lush forests of the Carolina mountains. As a bug-collector on my own, I've done the Gondwana thing, too, looking for beasties in New Zealand, Chile and South Africa. But whenever we went t'other side, it was to eat, shop and enjoy the "kulcha" in downtown Melbourne.

The trigger for change was millipedes. For years now I've been slowly taxonomising my way through the rich Tasmanian fauna of flatback millipedes (Polydesmida), describing the new genera and new species which are endemic to our little island. In the fullness of time I reached the non-endemic genus *Australopelix*. A Victorian species had been described from Melbourne in 1902, and I'd seen at least one more species years ago in the Museum Victoria collection. To do up the genus properly, I'd not only have to describe the new Tasmanian species (20-odd) – I'd also have to look at what's living in Victoria.

Could I enlist the aid of Victorian collectors? Well, maybe, but... *Australopelix* aren't the sort of millipedes that go wandering around the garden on wet nights, or that can be sampled by putting out a few pitfall traps. They're forest creatures that like rotting logs and deep leaf litter. Finding them is a down-on-your-hands-and-knees job. No certificate needed, but experience highly desirable. And durable knees.

The first trip was part-holiday, part-expedition in

December 2003. We based ourselves at Marengo, west of Apollo Bay, and had a look at the tall wet forest in the Otways. One highlight was seeing koalas in the wild for the first time. Another was smelling fresh fox. And, of course, there were lots of millipedes.

When I got the millipedes home I sorted them into 12 species: one well-known species from heath and 11 more from tall wet forest. Of the 11, only one had a name. Another had an unpublished name, and I thought I'd seen 3 more in Museum Victoria. The other 6 millipede species, including an *Australopeltis*, were apparently new to science.

Er... could be a serious undersampling problem here. In Tasmania, if we'd done the same casual poking about in forest litter that we had in the Otways, we'd expect to find about half the total number of species resident in the area, i.e. the more common ones. Does this mean that there are 20-odd Otways millipedes, all but one of which are undescribed?

In March I spent two days in Melbourne looking carefully through millipede samples in Museum Victoria. Not all that much to see, alas, but I found more specimens of some of my Otways creatures and some interesting other wet-forest specialists. I came home and wrote up two new Polydesmida species and erected a new genus for them, *Victoriombrus* (from 'Victoria' plus the Greek word for rainshower). The paper is in this year's Memoirs of Museum Victoria and includes a list of all previously described Victorian Polydesmida, namely 17 species.

Next, I applied for assistance from the Ploenkey Foundation. The Foundation has long supported my millipede work and this time I was awarded a generous grant to help with travel expenses. I also distributed a millipede flyer to Victorian entomologists and field naturalist groups.

In September Trina and I returned to Victoria. We started near the western end of the Great Dividing Range. We sampled on Mt Cole west of Ballarat, in the wetter parts of the Wombat State Forest, and on Mt Macedon. After 2½ days we had more than 200 millipede specimens, including three *Australopeltis* species. One species was already in the Museum Victoria collection, the other two were new. The hunting bag included at least six other genera of Polydesmida. One of these other species had been named more than 100 years ago from a specimen collected in Melbourne. To the best of my knowledge, it hadn't been seen since. Where did we find it? On the concrete footpath in front of our motel room in Macedon.

When we weren't looking for millipedes in the west, we were despairing over the bush. The goldfields forests were heavily cut and burned in the mid-1800s. The regrowth had been repeatedly logged and fairly frequently burned ever since. We saw large areas of forest with 100% eucalypt canopy cover and (almost) only sparse bracken as an understorey. A local conservationist later told us that 'bush restoration' in the Wombat Forest requires a fair bit of imagination. There aren't many clues left to what was there in pre-European times.

Three weeks later we were back in Victoria. We sampled in the Strzelecki Ranges and its surrounds in South and West Gippsland, finding two already-collected but still undescribed Australopeltis species which appear to be Strzelecki endemics. We also saw some of the most spectacular Eucalyptus regnans forest imaginable.

Unfortunately, that forest has been seriously degraded for litter invertebrates by the Superb Lyrebird, whose rakings are everywhere. Millipedes were almost entirely restricted to rotting logs, and we were hard-pressed to find them. Lyrebirds also appear to be at least partly responsible for two other environmental problems. The first is erosion. On steeper slopes we saw extensive sheet-wash of the bared soil, half-buried logs downslope, and creeklines filled with sheets of mud. All this was under a dense forest canopy of *E. regnans* and understorey blackwood, musk, silver wattles and tall, spreading treeferns.

The second problem is weed infestation. The Gippsland forests were the weediest we'd ever seen. We walked down one memorable forest track which was carpeted by *Tradescantia*. There were billowing blackberries on either side, young holly trees in patches and a climber that may have been bridal creeper hanging from trees. In several spots we found a shrub we couldn't identify; we later realised it was *Daturo*, a garden escape.

So, how come you can walk in many parts of northwest Tasmania from a 100-year-old paddock into adjacent native forest and see almost no weeds, while similar Gippsland landscapes are appallingly weedy? I suspect lyrebirds might be part of the answer. They do a sensational job of preparing a seedbed for forest invaders.

The big millipede discovery on our third trip was on the north side of the Latrobe Valley, where we found *Isocladosoma maculatum* alive and well in the wild. The only previously known locality for this species was a museum in New York City, where the specimen label said "Australia"!

Our fourth and last excursion was a week-long, clockwise, 1500 km swing through the eastern Victorian highlands in late November. Once again we were amazed at the weediness of the landscapes we passed through, and the mountain forests blackened

by the January 2003 fires looked grim.

Millipedes were fairly hard to find. *Australopellis* turned out to be largely restricted to the wettest areas, and wasn't in evidence (as it is in Tasmania) in wet sclerophyll patches within dry sclerophyll forest. We added only (probably) one new species to the genus. On the other hand, we collected some dry-country Polydesmida which will take me more than a little time to sort out!

The trip's Marvellous Millipede Moment came after dark at 1300 m on the Bogong High Plains. We were camped in a copse of small snow gums (*E. pauciflora*), and by torchlight found two big (50 mm) flatbacks climbing tree trunks. Where this alpine millipede shelters in the daytime is something of a mystery. I was reminded of the Don Marquis poem "unjust", which begins

poets are always asking
where do the little roses go
underneath the snow
but no one ever thinks to say
where do the little insects stay
this is because
as a general rule
roses are more handsome
than insects
beauty gets the best of it
in this world

In late Spring, too, the high country was still blooming and fragrant with wildflowers. Descending to the dry (rain-shadowed) sheep country towards Omeo was sad!

Back in Gippsland we visited Buchan and made northward excursions into the high country past Dargo, Licola and Erica. In the East Gippsland lowlands we met a 1.2 m long lace monitor (*Varanus varius*) on daytime patrol in riparian blackwood forest. We were delighted and stopped for a chat, but it wasn't very friendly. It retreated to a handy tree limb and watched us waving away the mosquitoes.

During our four Victorian excursions we got up close to a wide range of non-millipede litter fauna which aren't native to Tasmania, such as mound-building termites, scutigeromorph centipedes ("Johnny Hairylegs") and some remarkably attractive cockroaches. We also found ourselves asking lots of naturalist's questions about vegetation, geology, landforms, streams and local weather. Even the limited bits of Victoria that we saw were wonderfully diverse. They would have been awe-inspiring before the miners, farmers and incendiarists got the upper hand.

Thismias – rare plants or not enough people looking?

by Sarah Lloyd

Even in far off Tasmania the thought of another four years of George W. Bush in the White House, coming so soon after the re-election of the right wing conservatives to the Australian parliament, is extremely depressing. Add to that the heart-wrenching sounds of chainsaws and bulldozers ripping into the nearby forest and the mood at Black Sugarloaf was particularly sombre on November 4th 2004.

So in an attempt to temporarily forget about the parlous state of the world, Ron and I went scrambling about in the legally protected forest of which we are currently custodians, to check out the activities of the local wombats. As rain had recently saturated the ground, I was also keeping an eye out for a 'spring flush' of fungi stimulated by the wet weather.

In the nearby gully tall eucalypts and blackwood trees tower above a closed canopy dominated by dogwoods (*Pomaderris apetala*), in an area reminiscent of cool temperate rainforests. The mid layer vegetation is comprised of daisy bush (*Olearia argophylla*), prickly currant-bush (*Coprosma quadrifida*) and tree ferns (*Dicksonia antarctica*) with virtually no ground cover plants. In places the thick blanket of leaf litter had been scratched aside by birds or native animals searching for insects and fungi in the soil. In one such area a speck of bright red caught my eye and, after close inspection, I exclaimed excitedly "I think it's a Thismia!" (Coincidentally, I had just been reading about Thismias in the latest edition of Nature Australia.)

Thismias, or fairy lanterns, are succulent herbs that belong to the Burmanniaceae family and are closely related to orchids. They grow almost entirely underground, are usually leafless, lack chlorophyll and are thus unable to photosynthesise. To obtain the nutrients they require, these saprotrophic plants rely on a symbiosis with fungi. However, as fungi are also unable to photosynthesize, a photosynthetic plant must also be involved in the association. It is possible that, like the underground flowering orchid of Western Australia, *Rhizanthella gardneri*, which is linked to a melaleuca species via its mycorrhizal fungus, Thismias may be associated with Pomaderris.

Little is known about the distribution and ecology of these rarely seen plants and their method of pollination remains a mystery. It is thought that pollen may be spread by termites, ants, flies or other small

invertebrates that inhabit the litter layer. The several I collected to send to the Tasmanian Herbarium were punctured through the side of the corolla tube, and in one flower I observed a small arthropod and several tiny faecal pellets. The curator of the herbarium, Alex Buchanan, has also noticed small faecal pellets around or within the flowers of other specimens sent to the herbarium, suggesting that a small arthropod may indeed be involved in transferring pollen. The strong fishy smell emanating from the flower may serve to attract litter layer detritivores to perform this function.

Thismias are mostly found throughout the tropics, with 32 species in tropical America, 25 in Southeast Asia, 19 in tropical Asia, and one each in Japan, the US state of Illinois and New Zealand. In some cases the story of their discovery is as intriguing as the plants themselves.

In 1912, *Thismia americana* was collected from a low sand prairie on the Chicago Lake Plain in Illinois by Norma Pfeiffer, then a botany student. She found more plants in the same area the following year, but that was the last reported sighting. This is hardly surprising given that the site is now covered in landfill and is highly industrialised. Extensive searches in the few remaining undisturbed habitats around Chicago have failed to find *T. americana*. However, there is a faint hope that a population may yet be found as suitable habitat remains in Indiana, Michigan, Wisconsin and possibly the Great Lakes region.

In 2000, researchers surveying the botanical riches of Jade Mountain in the Yushan National Park, which covers Taiwan's central mountain range, collected a white tentacled Thismia which they named *Thismia taiwanensis*. This newly described species appears to be endemic to the area, having never been found elsewhere in Taiwan or on the Chinese mainland.

In 2001, a third Thismia species for Australia was found by fungi enthusiast, Pat Jordon, at Bundanoon, in New South Wales. At first it was mistaken for a coral fungus (*Clavaria* sp.) because of its tentacle-like projections. It has since been named *Thismia clavarioides* because of this resemblance.

Meanwhile, as the forests around us continue to be destroyed, my recent find is a timely reminder of just how little we know about the natural world.

Thismia rodwayi photo: Sarah Lloyd

References

Curtis, W.M. & Morris, D.I. (1994) The student's flora of Tasmania, Part 4B ANGIOSPERMAE: Alismataceae to Burmanniaceae, St David's Park Publishing, Hobart.

Entwisle, T. (2004) Scratching the Surface in Nature Australia, Spring 2004

NatureServe Explorer viewed 4th November 2004 http://www.natureserve.org/explorer/servlet/NatureServe?sourceTemplate=species_Rpt

News in Science – *New-found flower species needs no sunlight* – 15/01/2003

Viewed 5th November 2004-11-05 http://www.abc.net.au/science/news/stories/s748315.htm

Taiwan Headlines *Tiny Tentacled plant a big discovery* viewed 5th November 2004-11-05 http://www.taiwanheadlines.gov.tw

White, M E (2003) *Earth Alive! From microbes to a Living Planet*, Rosenberg Publishing Pty Ltd, Sydney

Personal Communication: Cassia Read & Alex Buchanan

News From the Hebarium

Census Of The Tasmanian Vascular Plants

A new update to the Census has been compiled and can be downloaded from the website www.tmag.tas.gov.au/Herbarium/Herbarium2.htm.

Work is well advanced on a species database to provide background information on the vascular plants of Tasmania. As well as being a census of the Tasmanian flora, it will contain information on nomenclature, taxonomy, distribution and legal status of the species. Provision has been made for including images and dot maps.

Exploring Mt Stronach

by Alison Moore

On 30th October Angus and I decided to walk up Mt. Stronach, just outside Scottsdale. Mt. Stronach is described as a "'monadnock'- a prominent rounded mountain sized landform rising from the surrounding plain; a large mass of erosion resistant granite formed between 350 - 400 million years ago." It is an easy walk of 2-3 hours return but that can always be extended by several hours if you are a naturalist! Access is via a private property with cattle grazing and three gates to open and shut before the agricultural softness merges into a beautiful dry forest, full of bird song (Superb Fairy Wren, Tasmanian Thornbill?, Olive Whistler, Dusky Robin, Yellow Throated Honeyeater, Crescent Honeyeater, Striated Pardalote, Grey Fantail) commencing with a wettish section bordering a creek. You soon rise into *Kunzea ambigua* which will be glorious about now, we were a little early for most of the flowers were still in bud. This forest reserve was burnt in October 2003 and thus looks rather black-trunked and bare but in flower were pink finger and alpine caladenia, club moss particularly abundant just before the track emerges onto the granite plateau and coffee berry, prickly beauty, *Pultenaea daphnoides, Goodenia ovata* and *G. lanata, Pelargonium australe, Olearia lirata*, sundews by the hundreds (millions?), *Daviesia ulicifolia, Stackhousia gunnii. Diplarrena moraea. Pimelea linifolia* with *P.nivea* at the very top, *Pomaderris apetala, Comesperma volubile* and undoubtedly many more unseen. The most significant find of the day initially was observing an ant crossing the track, approximately 20mm in length (Angus always has his trusty Swiss Army knife at hand) in 4 distinct segments - the head followed by 2 slightly smaller sized segments, followed by a long rear end! red legs and brilliant iridescent blue colour. The ant seemed very keen to avoid us and then we saw another, equally shy and busy removing itself from our presence. Someone has suggested these ants are called 'bluebottles' but I didn't have a lot of success looking this name up on the Ant google search – lots of Portguese Man 'O War stuff. The Ant website required more knowledge than mine to choose a family etc. – I was looking for the glossy pictures!! I would be delighted to hear more about this gorgeous looking species from members who can tell me names, habits etc. and confirm whether it is called a "Bluebottle Ant"? Craig Read at QV thought the following picture was it? Mistaken for an ant but actually a female flower wasp.

The other discovery which came later in the week following sending a specimen to the Tasmanian Herbarium is the listed rare *Senecio velleioides* or Forest Groundsel which was right on the top of the mountain and which looks exceedingly weedy, exotic and European, but there you go, the natural world is set to confuse and delight us. *S. velleioides* occurs on the mainland in Victoria and NSW. In Tasmania it is widespread and found in moist places on hills, particularly after disturbance by fire (Curtis 1963) which fits nicely in with the mountain's recent fire history.

Fungi

by Sarah Lloyd

For many thousands of years, aboriginal Australians used fungi in every aspect of their lives. In the arid lands of central Australia a native truffle-like fungus and the Mulga Bolete were favourite foods, as was the beech orange, *Cyttaria gunnii*, in Tasmania. The bright orange shelf fungus *Pycnoporus sanguineus*, which is common on dead wood throughout the inland, was used medicinally, especially for mouth ailments. The spore masses of some species were used during ceremonies as a substitute for ochre. The fruits of the shelf fungus

known as 'punk.' *Piptoporus* sp. had two uses; the young fruits were eaten and the mature fruits were used as tinder, and often transported in bags to kindle fires. George Augustus Robinson, 'protector' of the Tasmanian Aborigines, noted that "*various are the fungus which the natives eat, and all are known to them by different qualities which they possess, and all are known by different names.*"

However, as in many traditional cultures around the world, some Aboriginal groups in Australia regarded the sudden and unpredictable appearance of fungi with suspicion, and associated them with evil spirits. Likewise, in European society, when the scientific study of mammals, birds, fish and flowering plants was burgeoning, the church discouraged the study of fungi until the 19th century because they were thought to be connected with the devil.

The ephemeral nature of fungi and their tendency to shrivel soon after collection, thus eliminating important identifying features, resulted in many early botanists overlooking this important group of organisms. Instead of building on the vast knowledge held by aboriginal people, much of it has been lost and the subsequent study and documentation of fungi in Australia has lagged far behind the study of plants and animals.

To a certain extent it is understandable that fungi have been mostly overlooked. They are usually invisible and only become obvious when their spore bearing bodies (akin to fruit) such as mushrooms, toadstools, jelly fungi, brackets and puffballs appear. However, fungi are so important ecologically, that becoming aware of their amazing variety of colours, forms and functions can change one's view of the world.

Undoubtedly it's the parasitic fungi that receive the most attention and give the whole group a bad name. This is because they obtain their nutrients from living plants and animals, sometimes painfully disfiguring or killing their hosts in the process. In many of the state's waterways platypus population are being affected by the Mucor fungus which causes deadly ulcerations. The chytrid fungus, believed to be responsible for world wide frog declines, has recently been confirmed in the state. It remains to be seen what impact this will have on Tasmania's unique frog fauna.

Nevertheless, in forest ecosystems, dead and dying organisms are crucially important to ecosystem function. In European forests, studies have shown that approximately one third of forest dwelling species including insects, plants, birds and mammals rely on dead and decaying wood for their survival. They and the forest ecosystems in which they live suffer when this important element is removed.

One of the most important functions of fungi is as decomposers, and without them we would be living in a putrid heap of accumulated organic material! Along with bacteria, and assisted by myriad invertebrates, saprotrophic fungi extract their nutrients from dead organic matter found in soil, litter, dung and wood. Hence they play a crucial role in hastening the decay of this material and in the process they transport, recycle and release nutrients to be used by other plants and animals.

In the Silurian period, approximately 450 million years ago, the successful colonisation of the terrestrial environment by plants has been largely attributed to a mutually beneficial relationship with fungi. Over 90% of plants have a symbiotic or mycorrhizal (literally 'fungus-root') association with fungi which form a sheath around or within the roots of their host plant and via microscopic thread-like growth structures called hyphae effectively extend the root zone. Fungal hyphae, known collectively as mycelium, are able to penetrate the tiny spaces between soil particles where they access nutrients and water. The fungus supplies the plant with water and soil nutrients, particularly phosphorus, and in return it obtains carbohydrates and sugars from the plant.

Mycorrhizal fungi are particularly important in poor soils, such as those found in Australia. In coastal heathlands, for example, where the soil is so deficient in nutrients as to be 'effectively lethal' to most plants (Kirkpatrick), fungi are vital in the effective uptake of nutrients. Even in better soils, fungal partners ensure better and faster plant growth and assist plants to resist pathogens and withstand drought. In turn, healthy, diverse vegetation is able to resist weed invasion and provide better habitat for birds and animals.

Fungi are so numerous within the soil, that soils have been described as a 'largely fungal phenomenon' (White 2003). In a handful of healthy forest soil, unravelled hyphae can measure 2 km long. They are important in maintaining soil structure, as nutrient recyclers, as antibiotics and as food for many native invertebrates and marsupials.

Australia has approximately 250,000 species of fungi, many of which are yet to be formally described and named. Little is known about their distribution, ecological requirements and plant associations. The Fungimap project was initiated in 1995 to address this lack of data. Similar to the Birds Atlas project run by Birds Australia, Fungimap is a scheme to map the distribution of 100 species of mushrooms, toadstools and other fungi using the information sent in by a

network of volunteer recorders throughout the country. It has also become a vital force in linking, enthusing and informing people with an interest in fungi.

In April /May 2005, the third national Fungimap conference, **Fungimap III - History, Ecology and Conservation** will be held at Gowrie Park, near Sheffield. It presents local people with a fantastic opportunity to learn more about the identification and ecological role of fungi from top local and international mycologists.

The historical aspect is particularly appropriate. In 1792 Jacques-Julien Houtou de Labillardiere was the first European to find and scientifically describe a fungus in Australia after finding the starfish fungus, *Aseroe rubra*, at Recherche Bay in

southern Tasmania. Subsequently, two Tasmanian naturalists, Ronald Gunn and William Archer made a significant contribution to the documentation of fungi in this state.

References:

BBC News/Science/Nature: Life giving deed wood 'at risk' viewed 3rd November 2004 http://news.bbc.co.uk/2/low/science/nature/3946273.stm

Kirkpatrick, J B, Harris, S (1999) *The disappearing heath revisited*. Tasmanian Environment Centre Inc, Hobart.

Kaloses, A.C. (1996) Aboriginal knowledge and use of fungi. *Fungi of Australia* 1B: 269-297. Australian Biological Resources Study, Canberra.

Vlasiu, M H & Lloyd, S J (2003) *Bugs, birds, bettongs and bush: maintaining habitats for fauna in Tasmania*, Kit 10 of the Tasmanian Bushcare Toolkit, Nature Conservation Report.

Watling, R. (2003) *Fungi*, The Natural History Museum, London.

White, M E (2003) *Earth Alive! From microbes to a Living Planet*, Rosenberg Publishing Pty Ltd, Sydney.

For more information on the Fungimap project & Fungimap Conference, contact Sarah (See page 1.)

FRASER ISLAND – August 2004

by Helen Jones

Last August I spent two weeks camping on Fraser Island, the largest sand island in the world. It is more than 120 kms long and about 40 kms wide. The dune systems on Fraser Island are still evolving – the highest reach up to 240 metres above sea level.

Most of the sand originated in the granites of the NSW tablelands. The rivers of eastern Australia have eroded and worn away the land on the wetter, steeper side of the Great Divide and swept the resulting sand into the Pacific Ocean. Waves created by the prevailing south easterly winds pushed it north thus creating the great sand masses of eastern Australia.

Compared with other continents, Australia has very few freshwater lakes, there being relatively few freshwater lake regions outside Tasmania, but Fraser Island has many freshwater lakes. Some lakes are surrounded by heath lands, some by open forest, others by rainforest while some have brilliant white beaches. Some have freezing cold, deep crystal clear water and in others the water is warm and tea coloured.

The sediments in one old Fraser Island lake have been aged to 300,000 years, making it the oldest lake sediment discovered in coastal Australia. Most of the Fraser Island lakes are not flushed out, therefore contaminants are retained and measurement of radioactive fallout from Australia's atomic testing programme (1950) showed that one of the perched lakes still retains almost all the *Caesium which fell there. *Caesium is a fallout product of a nuclear explosion*

There are three different types of lakes on Fraser Island – perched lakes, window lakes and barrage lakes.

The perched lakes (about forty – half the number of these lakes in the world) are formed when organic matter gradually builds up and hardens in a hollow, sealing the floor and then filling with rain water. The water in these lakes lacks a number of basic ions making it amongst the freshest water in the world.

Window lakes develop when a depression forms that reaches down to the water table. Here the water has a higher level of phosphates as the rain has been filtered through soil into the water table.

Barrage lakes are formed when sand moves in to block a water course.

None of these lakes are good habitat for fish etc because of the purity, acidity and low nutrient levels of the water. Four of the 26 frog species found on the

Ocean Lake, Fraser Island photo: Helen Jones

island have adapted to live in the acid lakes and swamps, and are confined to a very small part of the heath – called wallum - in undisturbed areas.

The so called "acid frogs" are *Litoria freycineti* (wallum rocket frog), *L. cooloolensis* (Cooloola tree frog), *L. olongburensis* (white striped tree frog) and *Crinia tinnula* (wallum froglet).

Fraser Island was given World Heritage Listing in December 1992, recognising it's combination of environments as having unique and precious natural environments that should be protected.

References:
Sinclair, J., 1997. Discovering Fraser Island and Cooloola.

Frog Research Group Finds Chytrid

by Jim Nelson

The CNFN's Tasmanian Chytrid Disease Research Group had hardly begun work before discovering the frog chytrid disease, *Batrachochytrium dendrobatidis* in tadpoles in both the North and South of the state. Tadpoles with abnormal mouthparts were collected from Hawley in the North and Knocklofty in the South, and sent away to the Geelong CSIRO lab for the Taqman real-time Polymerase Chain Reaction (PCR) test. This is a DNA test which amplifies the chytrid genome. Samples were also sent to Launceston Pathology Lab for histology. This involves slicing very thin sections through the mouthparts and mounting them on slides to see if the fungal sporangia and zoospores can be detected. Some excellent slides resulted clearly showing the fungus, with cross sections of sporangia either empty with discharge tubes visible or containing zoospores.

Since the original confirmation, several positives have come back from backyard frog ponds in the Hobart area, and a number of suspicious samples from elsewhere have been sent off. The recent CNFN excursion to the alpine area near Mother Cummings resulted in several samples being taken for PCR. These were from tadpoles of the endemic Tasmanian froglet, *Crinia tasmaniensis*. If these return positive, it would be quite disturbing to have frogs in such a pristine area with the disease. It certainly begs the question about how this deadly fungus can move around.

Chytrid has a motile zoospore which needs water to survive. Yet it has managed to spread around the world somehow. There is speculation that the spread was caused by sending African frogs around the world to use in pregnancy testing. Chytrid doesn't seem to occur in Africa, so perhaps the frogs there developed a resistance at some point.

Sometimes local frogs were also used for the pregnancy testing. So perhaps the possibly resistant African frogs could have had contact with chytrid and carried it to many places where it found its way into waterways - lots of speculation at present! Once in open water, there might be the possibility of carrying the zoospores from one water body to another by frogs moving about, perhaps by water birds flying from one pond to the next, and of course by human transfers such as using frogs for bait, or keeping tadpoles and releasing them in different places.

But how would chytrid get to remote areas like the Central Plateau Protected Area? Well, perhaps by platypus carrying zoospores from eating tadpoles and following small streams up the mountain. Perhaps by water birds that eat frogs or carry spores or fragments of frog skin on their feathers. We don't know, but one thing for sure is the fungus has a history of making its way to relatively pristine sites. In Queensland 7 rainforest species disappeared completely within 20

years due to chytrid.

A recent breakthrough in detecting chytrid in the environment came when it was realised that tadpoles could be identified as carrying the fungus in their mouthparts. The fungus attacks keratin, the outer dead layer of skin. The only keratin tadpoles have is in their mouthparts. The fungus attacks the keratinised teeth and oral sheaths of tadpoles, and is thus readily identified. The following photo shows a healthy tadpole's mouth, and one that has been attacked by chytrid.

Tadpoles are examined with a hand lens, and suspicious ones are humanely euthanased and sent off for testing. It is also usually necessary to send off a healthy tadpole as a control. We have had a surprise result in getting some positives for chytrid back on a few normal looking tadpoles of the brown tree frog. Thus, if we sample an area that appears to be clear of the fungus, we still need to send a specimen or two for a hopefully negative PCR result.

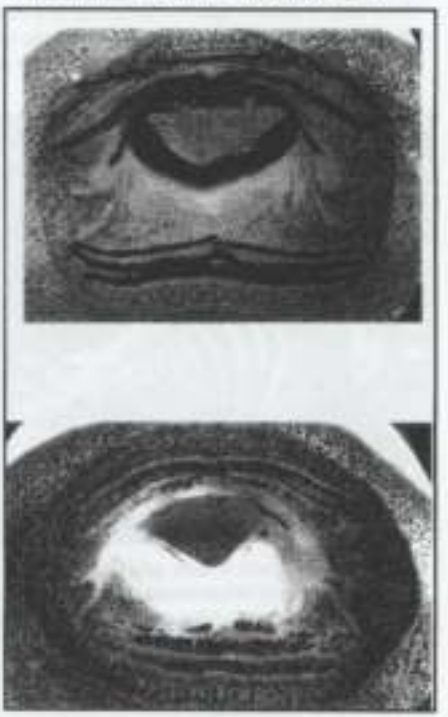

photo: Dr David Obendorf

The outer dark rows are the teeth rows, and the inner black "lips" are the oral sheath. Sheath abnormality is especially indicative of chytrid.

Our expectation based on preliminary results is that we are going to find quite a lot of chytrid disease in the Tasmanian frog population. Perhaps the most important thing will be to see if we can identify any "clean" areas or regions, and suggest what protocols might be put in place to attempt to keep them free of the disease. We also hope to get some basic assessment of the extent of the disease in the two threatened species, and in our endemic frogs. These are difficult objectives for a volunteer group to meet, and perhaps we can help generate some research and monitoring from the university and the Nature Conservation Branch

Tasmania's Wake-up Call

Unfortunately, it looks as though we lost the battle to keep chytrid out of Tasmania quite some time ago. I have been suspicious for years that there is a disease process in frogs in Tasmania. Until recently there has not been an opportunity to properly investigate. Meanwhile, Queensland banana frogs apparently have been flooding into Tassie, defying the quarantine measures we were told repeatedly were in place.

We don't really know what is happening to frogs or many other species because practically no recent monitoring has occurred. The G-Spot data for our Burrow's tree frog goes back to the early 90's with no recent entries and no repeat entries for known sites. This endemic frog occupies much of the SW World Heritage Area, and some of the monitoring taking place there needs to include it. Without surveys and monitoring we have no way to measure changes.

What is needed in Tasmania is a holistic approach. We have to have baseline studies in order to observe trends so that we know when we are losing species. There needs to be people on the ground looking for early detection of problems. Strong border control is imperative. If we can have management of entry, introduction and spread, then there will be some chance of control.

Once things are out of control such as the introduction and spread of animals like foxes, then huge costs follow trying to get on top of the problem. (Yet Burnie wharf is still not secure.) Weeds are another example which now cost farmers billions a year. Prevention may be difficult, but eradication is often close to impossible.

How can some of this happen? Forming partnerships with community groups such as the CCNF would be a start. The Wildcare program has some potential as well. But most of all there needs to be political will. Where will that come from?

Yookamurra Highlights

by Paul Hyde

A recent family trip to Adelaide included an overnight stay at the Yookammurra Sanctuary as part of an Earth Sanctuaries Foundation working party. Yookammurra was established in 1988 by Earth Sanctuaries Ltd to preserve one of the last blocks of pristine Mallee habitat and was subsequently developed as a 6000 ha feral-free ecotourism venue. The Sanctuary was acquired by AWC as part of the ESL restructure in 2002, and is currently operated as a reserve for conservation only, although the ecotourism facilities have been maintained for use by visiting scientist and working parties.

On arrival we were introduced to the prevalent Ward's weed and subsequently drove out to the 1.5 ha Malleefowl enclosure, which has a 5 metre high mesh roof, quite an engineering feat. We began by collecting rock (disturbed by earlier fence line roadway excavations) to form a fuel tank bund wall back at the main base, and identifying a recent poppy infestation for action the next day. The poppies had been heavily browsed, presumably by emus and were only detected because one had managed to flower in the protection of a brush pile. On our return, we set to the main task of the day, draining a pond at the accommodation block to reseal the liner, a somewhat messy exercise, bailing it out with buckets. After dark we dodged the local Woylies (Brush tailed bettongs) to get to a 4 ha Boodie (Burrowing bettong) enclosure to feed and count them, an interesting exercise with 30 or so marsupials demonstrating the finer points of chaos theory. This area is also home to temporary cages for Stick nest rats which had to be fed with salt bush and topped up with water while a very pale Boobook owl sat in a nearby tree waiting for the one that got away. Our last stop for the night was the adjacent 1 ha Bilby enclosure which is such a minefield that we had to walk on a cook wire strip for a sure foothold.

The following morning, Anne and I were taken out with a radio tracker guide to monitor one of the Numbat families , arriving at 7:10 am at three chairs positioned 4 metres south of an occupied burrow. The rules are simple. Don't move or make a sound, or you may blow your chance of seeing them. Piece of cake surely? The first motionless half hour was OK, but then birds started flying around – were those lorikeets purple crowned? – and by 8 am it was noticeable warmer and flies were doing unspeakable things on my face. I had risked a prolonged blink earlier, but fortunately I was looking when a clump of dried grass in front of the burrow entrance transformed into a ball of fur as the female came out, treated us to a broadside of those 7 wonderful white boop markings, did a 180 and shot off over a log. Three seconds of bliss, but wait there's more! Minutes pass and a small pointed snout comes straight towards us as a half size juvenile leaves the burrow to warm up in the sun. A second one emerges, but is more wary, standing on all fours nervously looking at us as if poised for flight. They are perfectly marked, simply gorgeous, but horribly exposed to a predator while they charge their batteries. After a few minutes, the first one turns to my left obscured by a bush and extends a livid orange-red tongue about 3 cm in length. Did the others see it? Then the second one points to the right, blinks several times and repeats the tongue stretch, a characteristic sequence apparently. It then rocks forward and extends its forelegs so the whole body is spread-eagled on the ground in a major stretch, then it is up and they are off like rockets, not to be seen again. Ten minutes of Mallee magic, with not a dry eye between us.

We walk 2 km back to base, taking a nesting Little Eagle and a party of White-browed Woodswallows in our stride in this post Numbat experience world before indulging in a cuppa on the veranda and watching a Scrub robin and White chinned honeyeater christen the refilled pond. The Numbats always produce 4 young, and have bred successfully in the main enclosure in the absence of foxes, cats etc. They leave the burrow when the temperature reaches 16 C, and return to this or an alternate burrow when it drops to 18 degrees as these temperatures match the activity of their termite food

supply. The enclosure obviously keeps feral predators out, but also keeps natural predators in and some females are reduced to 2 or fewer juveniles by this stage of the breeding season, presumably due to the local goannas. Similarly the snake population requires active management as they get so fat that they can't migrate through the fence, (the AWC doesn't use ESF working parties for this retrieval from the fence and relocation task!). The Sanctuary is a breeding base for all the marsupials mentioned above, the plan being to have a full suite of animals in the main enclosure and relocate the surplus to other feral free zones at AWC (Scotia) and potentially ESL and other sites. The benefit of isolating habitat from depredations by feral animals is not new; Darwin commented on it in his "The origin of Species", but the enclosures operated by ESL, AWC and others (Little Desert Lodge Malleefowl for instance) coupled with active ongoing management of all the species populations and habitat resources shows what can be achieved. Hopefully some of the State agencies responsible for Kangaroo Island and National Parks across the country will eventually follow the lead.

Gilbert's Potoroo *(Potorous gilbertii)*

Gilberts Potoroo is Australia's most endangered mammal. It is unlikely that many more than 30 animals exist. Only one population is known, and it is in dense, long-unburnt shrubland on the flanks of Mount Gardner, in Two Peoples Bay Nature Reserve, WA. For more information see Nature Australia Winter 2003.

Warrawong Sanctuary has sent several Long-nosed Potoroo females to WA to act as surrogate mothers for Gilbert's Potoroo young as part of a recovery plan. Anyone wishing to assist this innovative Gilbert's Potoroo project to help save the species can send donations to Earth Sanctuaries, PO Box 1135, Stirling SA 5152.

Starling's Parenting Observations

by Bee Bradshaw

Our ducks were ousted from their house for a few days. When Ralph went to feed them one morning a week ago, he found 5 baby starlings on the straw, having fallen out of their broken nest. The ducks were perhaps likely to sit on them as they were also broody and nesting (although they are barren), or somehow harm them in some other clumsy duck-like way. Anyway, we had to turf the ducks out as the nestlings were chirping like mad and the parents were outside with food in their mouths. We hoped that the parents would be able to find the nestlings on the floor instead of in their nest, which they did. A wonderful thing about wildlife is often their ability to adapt.

The nestlings continued to chirp and the parents continued to feed them tirelessly all day long. In and out they flew, and covering long distances they would return with some morsel in their beaks, welcomed by the nestlings. They grew pretty quickly and by the end of the week the feathers grew, and they also grew. After a week they had flown the coop (literally), and the ducks are now happier as they can have their house back. As for us, we have had a wonderful experience observing the starlings and their selfless parenting. By the way, Jim, we think the starling chicks are very cute and don't deserve to be called "Avian Rats".

(Reply by Jim Nelson)

I agree that starlings are beautiful and interesting birds in their own right. The derogatory term for them refers to the way they have become a pest species in Australia. I realise that it is a bit rich calling other species pests when our own species is without doubt the biggest blight on this continent, and in most places in the world. We may not individually be able to do a lot about our species' presence here, but even little things such as not allowing our misguided introductions to disadvantage the native species is something I believe in. Starlings compete with native birds such as our endemic Green Rosella for nesting hollows, and I do what I can to keep their numbers down without taking the least bit of pleasure in having to do so.

Even so, I too have had interesting experiences watching starlings, and anything that puts any of us more in touch with the natural world is to be embraced for the moment, and should not be sullied by anyone else's justifications for what probably amount to futile actions to control "pests". While I sympathise with a

Buddhist philosophy to do no harm, I personally feel a responsibility for the great harm we have already done by introducing very competitive species such as foxes, cats, rats, mice, starlings, sparrows etc. which cause the death and decline of local species.

Recently during our frog work, we discovered Claire Hardman's Honours thesis on the Chytrid fungus where she uncovered evidence of the large numbers of people who have released Queensland frogs into the Tasmanian environment. These frogs arrive hiding in bananas, and can sometimes be seen hopping down the supermarket aisles. Feeling sorry for the frogs and not wanting to harm them, people have released large numbers into the local environment. This is not only a disaster for the tropical frogs which cannot live in the Tasmanian environment, but it has probably very effectively released the deadly Chytrid frog fungus. This fungus has decimated frogs around the world and will probably kill untold thousands of frogs in Tasmania, and may even wipe out some species. Frog translocations probably also occurred to release another frog fungus, *Mucor amphibiorum*, which is killing our platypuses. Thus, while trying to do no harm, people can in ignorance do a great deal of harm indeed.

What then is the true path to being a good person in the treatment of other species on this planet? We each must answer this question in our own way. I would argue towards seeking to preserve our biodiversity in our actions. Introduced species have been demonstrated to often be major threats to local species, and gaining some understanding of possible consequences may help guide our actions. The real dilemma for those looking to do no harm is that even by choosing not to act we can cause great harm.

When I turn to the philosophy of Peter Singer's Animal Liberation, I can find no advice to solve the dilemma. He talks in chapter 6 about speciesism, and how we favour some species over others. But how are we to resolve the problem of not being prejudiced towards an introduced pest species whose existence threatens that of a rare endemic species? Weeds are a similar example, as "plants in the wrong place". So too can creatures be in the wrong place, and without action eventually we will mostly have a few common, robust species like rats, mice, foxes, cats, starlings and cane toads. (Speciesism by default!)

There was a quote in the Last Whole Earth Catalogue that went something like "We are as gods, and we need to start acting accordingly". This referred to looking after the planet in a caring and involved manner. Since most of the planet's problems are caused by us, I feel we need to rationally decide how to act.

Heron

a kinked neck,
slow flapping wings
dragging through air,
croaky complaint

coming to earth,
wings stretched in
parachute fashion,
stealthy touchdown

watching stillness,
a sudden plunge
captures a life,
quiet reflection

by Jim Nelson

The photo below was taken by Rod McQueen in the alpine area on Mother Cummings during our last excursion. I am amazed at how the various postures of field naturalists mimic those described in my poem above about herons. Maybe art reflects life in subtler ways than we know?

It was a terrific excursion, with many things in flower such as *Richea scoparia* and a number of orchids. The little Brassica plant we saw in flower along the track was revealed to be *Cardamine gunnii* (I think...). The ocellated skinks, *Niveoscincus ocellatus* (subalpine to alpine endemic) were active, as was a nice black tiger snake. Lots of orchids along the track, and many of the cushionplant species were in flower.

Request for information: Observations of bumblebees in native vegetation

Andrew Hingston

A feral population of the Eurasian bumblebee *Bombus terrestris* was discovered in Hobart in 1992 (Semmens et al. 1993). The effectiveness of this bee as a pollinator of greenhouse tomatoes has prompted repeated calls for its importation to the Australian mainland, where it does not yet occur. However, enormous harm has already resulted in Australia from deliberate introduction of animals that were believed to be harmless or beneficial, and this may also be the case if bumblebees are introduced to the Australian mainland (Low 1999).

The most important factor influencing the severity of an imported pollinator's ecological impact is its capacity to become established beyond the agricultural areas where the target crop is grown (Cunningham et al. 2002). A survey of the distribution of bumblebees in Tasmania up to autumn 2001 found evidence of them breeding in all of Tasmania's major types of native vegetation, including within six National Parks and the most remote parts of the World Heritage Area (Hingston et al. 2002). The conclusion drawn by Hingston et al. (2002) that bumblebees were breeding across a large part of southern and western Tasmania was subsequently questioned by Goulson et al. (2002) because Hingston et al. had accepted sightings of only two bees in one day as evidence of colony establishment. Goulson et al. (2002) argued that these may have been sightings of the same bee. However, more than 10 bumblebees were seen (by one person) in one day at 23 of the 51 locations where Hingston et al. found evidence of breeding in native vegetation, including within the most remote areas from human settlement (Hingston et al. 2002).

Because of the ongoing debate over the capacity for bumblebees to invade native vegetation, and the time that has passed since their distribution was last surveyed, I would like to survey the distribution of bumblebees in Tasmania during the coming spring, summer and autumn. I would appreciate it greatly if people could let me know of any places where they see more than 10 bumblebees in one day in native vegetation between spring 2004 and autumn 2005.

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References

Cunningham SA, FitzGibbon F, and Heard TA (2002) The future of pollinators for Australian agriculture. Australian Journal of Agricultural Research 53, 893-900.

Goulson D, Stout JC, and Kells AR (2002) Do exotic bumblebees and honeybees compete with native flower-visiting insects in Tasmania? Journal of Insect Conservation 6, 179-189.

Hingston AB, Marsden-Smedley J, Driscoll DA, et al. (2002) Extent of invasion of Tasmanian native vegetation by the exotic bumblebee Bombus terrestris (Apoidea: Apidae). Austral Ecology 27, 162-172.

Low T (1999) 'Feral Future: the untold story of Australia's exotic invaders.' (Viking Penguin Books Australia Ltd: Victoria.)

Semmens TD, Turner E, and Buttermore R (1993) Bombus terrestris (L.) (Hymenoptera: Apidae) now established in Tasmania. Journal of the Australian Entomological Society 32, 346.