



Blue Tier - our second permanent New Leaf reserve

Photo: Andy Townsend - Nature Photographers Tasmania

Old-growth myrtles tower over a moss-covered granite boulder in the Blue Tier

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Conservation on private land in Tasmania often means small areas of land with good conservation context. This is the case for the Tasmanian Land Conservancy's latest acquisition project, an eighty-five hectare patch of predominantly remnant rainforest that adjoins the Blue Tier Forest Reserve in the north-east highlands. Blue Tier is the second permanent reserve in the New Leaf project that, with the financial help of our supporters, we wish to protect forever.

In the previous issue of our newsletter we were very pleased to announce we have successfully raised the funds to permanently protect Skullbone Plains. This issue covers some of the exciting preliminary scientific work undertaken at Skullbone Plains in the Bush Blitz program, and focusses on why we want to also give permanent protection to the New Leaf Blue Tier property.

TLC Reserves Officer Tim Devereux and Reserves Manager Leigh Walters recently spent two days at the Blue Tier. This is an account of their experience.

"Leaving the Sun Flats Road carpark we surveyed the view of the surrounding landscape from the Moon Valley Rim walking track, an easy start to our two-

day adventure.

With a cloud hanging close to the top of Mount Michael to the east, the ridge-top of the TLC block looks dark and damp. In the foreground is the dusky green of an area of regenerating tea tree (*Leptospermum sp.*), cutting grass (*Gahnia grandis*) and yellow bottlebrush (*Callistemon pallidus*). These regenerating areas are common across the Blue Tier plateau, and are slowly masking the impacts of fire, tin mining and timber harvesting of by-gone times.

We set out for the block along the Three Notches track and then head east through the State Forest reserve with its rainforest vegetation composed of myrtle (*Nothofagus cunninghamii*), sassafras (*Atherosperma moschatum*), and an occasional celery top pine (*Phyllocladus aspleniifolius*). Lichens, mosses and ferns dominate the ground layer. The area shows signs of its past history, with the presence of occasional channels that were used to divert water for the sluicing of tin.

As the sun pierces the grey with a few shafts of sunlight, we cross the boundary onto the block. There is little change in the vegetation apart from areas where the

continued inside cover

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Photo: Andy Townsend

Dark sori on the underside of a mother shieldfern (*Polystichum proliferum*)

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understorey has a dense layer of hard waterfern (*Blechnum wattsii*). These are wet and unyielding, making walking more difficult. Heading for the south-western section of the block where our vegetation map shows a patch of teatree (*Leptospermum lanigerum*), we discover a real find - giant teatrees ten to 12 metres tall and 40 centimetres in diameter! This species is often just a slender shrub in other parts of Tasmania, and we wonder just how old they might be. Through the dense grove we see a different colour, a whitish-grey stand of almost pure sassafras. Whilst only small in area, it adds to the diversity we are finding.

The colour is what strikes you in this type of environment: greens of every shade which seem to catch the rays of the sun; occasionally a blast of orange from the strawberry bracket fungus (*Aurantiporus pulcherrimus*); and flashes of yellow, red, blue, brown and white. These colours come from all the organisms that make up such a huge part of the biodiversity of the block: the lichens, mosses, liverworts and fungi. Another notable feature is the diversity of ferns, including the fantastic translucent filmy ferns (*Hymenophyllum sp.*), plus *Grammitis* and *Asplenium spp.* clinging to the myrtle and sassafras, and kangaroo paw fern (*Phymatosorus pustulatus*) covering occasional granite boulders.

It is four in the afternoon and the light is fading. Light rain has set in but we are still looking for the best place to set up the only trail camera we have. During the day we had been on the lookout for animal runs and diggings. We find a

small clearing with plenty of burrowing crayfish (*Engaeus sp.*), their holes easily identified by the adjoining mounds of balled earth.

We also see small conical-shaped holes, further evidence of animal activity. We set up our night vision camera and hope for the best. We head for a small cabin to dry our clothes; the cabin had been kindly loaned to us by a TLC employee and long-time shack owner on the Blue Tier.

It is day two and the rain overnight has resulted in a general dampness. Light showers will prevail for most of the day and it is with much anticipation we set out for the block to pick up our camera. We view over 40 pictures of eastern quolls (*Dasyurus viverrinus*). This surprises us, as we were expecting to find spotted-tailed quolls (*Dasyurus maculatus*) that are usually more common in this rainforest environment.

We trudge across to the eastern and northern sections of the land where limited disturbance and an easterly aspect seem to have resulted in a slightly different facies of the vegetation community. There are larger myrtles and sassafras, a more open understorey, soft tree ferns in drainage lines, bare sand banks in creeks where the slope is less steep, and hundreds of crayfish burrows. From high up it is possible to catch a glimpse of the coast looking towards Eddystone Point. Unfortunately cloud and mist prevent a photograph.

In the silence we are aware that there are many invertebrates quietly working to recycle the forest litter. On one occasion the stillness is broken by the squawk of a black cockatoo (*Calyptorhynchus funereus*); on another, the flight and chirp of two green rosellas (*Platycercus caledonicus*).



Photo: Andy Townsend

Strawberry bracket fungus (*Aurantiporus pulcherrimus*)

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Flower of the common buzzy (*Acaena novae-zelandiae*)



Frond of a mother shieldfern (*Polystichum proliferum*)

The rainforest is a quiet place and contemplation leads us to consider the aboriginal custodians of the area. How did they live, use and influence the natural environment? We also ponder many other questions to be answered in these unique environments. For example: why are some of the myrtles showing signs of stress? When was the last fire? Will we find a Simson's stag beetle (*Hoplogonus simsoni*) or one of the other rare stag beetles that occur in this area, or *Anoglypta launcestoensis*, a snail restricted to the north-east? Do the black cockatoos nest in the hollows we see in the large old myrtles? We still know very little of the biodiversity.

Our first real visit to the TLC Blue Tier Reserve has raised many questions we will seek to answer in the future. What we can say is that this magnificent property is part of the headwater system of the Great Musselroe River, one of north-east Tasmania's least impacted river systems. The land also contributes to the catchment, storage and release of water to that system. The land contains habitat and secure breeding areas for the eastern quoll and possibly the black cockatoo.

The vegetation is a glimpse into the Gondwanan past with slow-growing species requiring little intervention, apart from the occasional old tree crashing to the forest floor and creating a gap to allow seedlings to capture light and grow to reach maturity. This may be compared to the quicker growing and fire-induced vegetation such as the adjacent swamp gum and stringybark forest (*Eucalyptus*

regnans and *E. obliqua*) found on the lower slopes. Many species on the block are as yet unknown to us, but with dedicated long-term management and research we will be able to catalogue the findings. It is gratifying to know that protection for this place will mean future generations will continue to benefit not only from the services the land provides, but also from the sheer joy of the beauty of colour, contrast and emotions experienced when visiting this amazing place.”

Leigh Walters
TLC Reserves Manager

Blue Tier Launch Reminder

We would love to have you join us for the official celebration of the protection of the Skullbone Plains reserve and the launch of our Blue Tier project in either Hobart or Launceston.

Please RSVP by Tuesday 12th June,
on (03) 6225 1399, or email us at info@tasland.org.au indicating which event you would like to attend and the number of people in your party.

Hobart

Saturday 23rd June,
11:30 am for a midday start, The Barn,
Rosny Hill Road, Rosny Park.

Launceston

Tuesday 26th June,
4:00 pm for 4:30 pm start, Blue Cafe Bar,
2 Invermay Road, Invermay.

ShareGift Australia

One way donations can be made to the TLC is through the Sharegift Australia Independent Charitable Fund.

ShareGift Australia is a not-for-profit organisation that provides a convenient and cost-effective way to sell and then donate parcels of shares that would normally be expensive to trade. It was set up by the National Australia Bank and JBWere, to help Australian registered charities.

ShareGift will convert shares into charitable donations without charging a brokerage fee. Shares receive full market value. ShareGift distributes 100 per cent of the market value of the shares donated and it is important to note that it is the ShareGift board's intention that this is to continue. To date, administrative costs have been covered by ShareGift corporate sponsors.

For more information, please contact us by phone, email us or visit our website:

(03) 6225 1399

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Sphagnum moss beds at Skullbone Plains



Extent of glacial refugia during the last glacial maximum



Shoreline and extent of periglacial activity during the last glacial maximum

Glacial refuge on Blue Tier

During the last glacial maximum, some 18,000-24,000 years ago, Tasmania was a huge southern peninsula of Australia extending into the cold, stormy Southern Ocean. We shared the thylacine and the Tasmanian devil with the southern part of the continent and Aboriginal bands moved freely across the Bassian Plain. Although temperatures were only five to six degrees colder than now, this meant that sea levels were well over 100 metres lower than today. This was a very different world in which to live.

Across much of the central plateau, glaciers were grinding away at the exposed rocks and glacial outwash was reworking flat and frigid places like Skullbone Plains. The heart of the Midlands was grassy and quite arid and extended north across the Bassian Plain to what is currently Gippsland.

It was in this setting that the now iconic temperate rainforests of Tasmania were at their nadir. Ice and cold forced the treeline lower, and generally droughtier conditions than at present restricted rainforests into deep sheltered valleys.

Only a few tiny rainforest refugia existed in the east. One such area was the Blue Tier. Here both moisture and temperature remained high enough to support the rainforest species' requirements.

These refugia were on south-eastern and south-facing slopes in deep gullies where soils were deep enough to retain adequate moisture for the rainforest

species. It is possible that such conditions were also produced where the easterly moisture-bearing winds ascended the mountains and formed regular banks of fog to produce cloud forests.

As the climate gradually warmed over the ensuing 6,000 years, rainforest trees including the myrtle beech (*Nothofagus cunninghamii*) and possibly the swamp gum (*Eucalyptus regnans*) - the tallest flowering plant in the world - threw their seeds out into the warming and moist soils and gradually crept up the slopes and valleys. This is how the cathedral-like forests festooned with mosses have managed to survive the last huge swing of climate change.

Blue Tier thus formed the nucleus for these species to recolonise the local landscape. The extensive rainforests of the north-east would not exist today if this critical refuge did not provide shelter for some rainforest species, as their ability to colonise new ground is severely limited by the throw of their seeds – mere hundreds of metres.

It is interesting now to fast-forward to the 21st century, where we are lurching into a hotter and potentially drier climate. Where are the current refuges and where could the climate refuges be in the future?

Current refuges are those areas that contain species that are pre-adapted to warmer and/or drier conditions than we currently experience and are championed by the temperate grasslands. It is from these areas that species will radiate into

the drier and hotter soils that we are starting to experience. These current refuges are typified by the lowland native grasslands that have less than 5 per cent of their pre-European extent, and exist only in small strongholds on a handful of properties in the Midlands.

Future refuges from climate change are those areas that will provide shelter for species that are not well adapted to increasing temperatures, to increased fire frequency and to reduced effective rainfall. Work conducted to date to identify these in Tasmania has found two factors are likely to dominate the definition and success of areas as refuges:

- deep topographic features are likely to play a critical role in providing shelter from increasing evapotranspiration; and
- connectivity of suitable habitat is likely to be critical in providing the ability for individual species to migrate along environmental gradients as these change and contract.

The Tasmanian Land Conservancy is collaborating with researchers and scientists in attempts to identify where these future refuges may be in an effort to save these areas for the future.

Daniel Sprod
TLC Landscape Ecologist



Pacific black duck (*Anas superciliosa*) at Skullbone Plains



Lake Ina in the World Heritage Area adjacent to Skullbone plains

Skullbone Plains Bush Blitz update

In February this year, our newly protected Skullbone Plains Reserve hosted a team of nearly 20 scientists from museums, herbariums, universities and botanical gardens throughout Australia as part of the Bush Blitz program.

Bush Blitz is a biodiversity discovery partnership between the Australian Government, BHP Billiton and Earthwatch Australia that aims to document the plants and animals across Australia's National Reserve System.

This was a tremendous opportunity, never before undertaken at Skullbone Plains to this degree, to perform high intensity, low impact ecological surveying to discover even more treasures. The scientists took 550 specimens for analysis and their detailed work will continue over the coming year, culminating in a substantial scientific report.

As part of the team, Nick Mooney (Parks and Wildlife Service, retired), Dr Sally Bryant and Matt Taylor (both from the TLC) took responsibility for the vertebrate fauna survey and their preliminary results are now being completed. Information for the vertebrate fauna survey was obtained from a number of sources including the Tasmanian Natural Values Atlas and sightings between 2010 and 2011 by TLC staff and other specialists, in addition to the species recorded during the Bush Blitz survey program. This initial report details the number of species identified during the survey period, including 14 mammal, 44 bird, eight reptile and three amphibian.

The distribution of Tasmania's fauna is

determined largely by its humid climate which transitions from wet and cold in the west, to warm and dry in the east. This climatic gradient is modified by geology which, in turn, regulates broad vegetation complexes and hence habitat and food availability. Due to local differences in altitude, rainfall, temperature, aspect, soil-type, etc, micro-habitats provide a range of niches favoured by certain types of fauna.

To accurately reflect the diverse vegetation types found on the 1647 ha Skullbone Plains Reserve, seven fauna survey sites were selected covering freshwater wetlands, sphagnum peatland to highland grassy sedge-land, *Eucalyptus gunnii* woodland, *E. delegatensis* dry forest, eastern alpine heath and *E. coccifera* forest.

The three basic survey techniques used in the 2012 survey for mammals, reptiles and amphibians were camera traps, hair tubes and incidental observations. Additionally, a two-hectare search methodology recommended by Birds Australia for the Atlas of Australian Birds project was employed for the avifauna survey. This involved recording all bird species by sight and call within a two hectare search zone over a 20 minute survey period.

Of the 14 mammals recorded during the survey period, two new species - the endemic long-tailed mouse (*Pseudomys higginsii*) and the swamp rat (*Rattus lutreolus*) were photographed. Some large species were very widespread, notably the short-beaked echidna (*Tachyglossus aculeatus*), Tasmanian devil (*Sarcophilus harissii*), eastern

quoll (*Dasyurus viverrinus*), common wombat (*Vombatis ursinus*) and common brushtail possum (*Trichosurus vulpecular*). Other species were more restricted in range but appeared locally abundant. One adult male Tasmanian devil caught on camera, appeared to have a small, raised, open lesion on its chin. This apparent record of the Devil Facial Tumour Disease (DFTD) is not new, the disease being long confirmed from the area by state government biologists. Although Tasmanian devils are thought to have decreased in the area by about 80 per cent since a decade ago due to DFTD, they are still widespread and appear to be covering the landscape.

Interestingly, only sparse evidence of rabbit, feral cat and fallow deer was recorded.

Tasmania's avifauna is well known and comprises over 220 resident and migratory bird species. Surveys undertaken at Skullbone Plains prior and during Bush Blitz recorded 44 bird species. This number is likely to increase as more surveys are undertaken during the spring period when many migrants have returned to the reserve to breed. Of the 44 species recorded, nine are endemic and three, the wedge-tailed eagle (*Aquila audax*), grey goshawk (*Accipiter novaehollandiae*) and masked owl (*Tyto novaehollandiae castanops*), are listed on state or commonwealth threatened species legislation.

Over the coming months we will continue to publish the updates and outcomes from this exciting project. Thank you to all involved.



Loga and Matt, Cradle Mountain World Heritage Area



The Vale of Belvoir, TLC permanent reserve

Photo: Denna Kingdom

Photo: Matthew Newton

WildFIRE Partnerships in International Research and Education

The TLC recently had the pleasure of hosting two student interns as part of the Australian contingent of the USA's WildFIRE Partnerships in International Research and Education (WildFIRE PIRE). Loga Fixico and Matt Weingart are undergraduate students studying environmental science at the tribal Salish Kootenai College in Montana, USA, and both share a common goal of becoming ecologists.

The WildFIRE PIRE is an international, scientific partnership focused on the causes and consequences of fire in temperate ecosystems of the past, present, and future. More than just a university research partnership, the WildFIRE program aims to bring together an array of fire scientists and managers from a wide range of disciplines to learn from each other and provide educational opportunities along the way.

Loga and Matt have spent nearly three months in Tasmania, working on a multitude of fire-related projects, including collecting sediment cores and undertaking vegetation-plot sampling at Cradle Mountain National Park. Their final month was spent with the TLC undertaking photogrammetric assessments of the forest/grassland boundaries at the Vale of Belvoir and Skullbone Plains.

By comparing historical aerial

photographs dating back to 1947, and recent satellite images, Matt and Loga have identified sites where significant changes in vegetation have occurred over the past 60 years. Structural changes in the vegetation were the most frequently observed, including transitions from grassland to woodland, and woodland to rainforest. These sites were subsequently accessed on foot to identify the processes that have driven the vegetation changes, including whether fire or stock grazing (or the absence of these) have altered the vegetation. The information gained from these assessments will provide the TLC with a better understanding of the long-term stability of these vegetation types which, in turn, will provide information on the best way to plan and manage fires and/or stock grazing at Skullbone Plains and the Vale of Belvoir into the future.

Despite working full-time with the TLC on their photogrammetric project, Loga and Matt also volunteered to work with TLC's reserve management staff and volunteers to build a stock-proof fence at Long Point over Easter. Both the interns loved this project, which provided physical labour and dramatic scenery, including watching the moon rise over The Hazards at dusk one evening.

Both Matt and Loga are native Americans, hailing from two different tribal groups in Montana. Loga, in

particular, has found that his traditional tribal upbringing has taught him to look for connections to, and between, his surrounding environments. Following a long day ground-truthing aerial photographs at the Vale of Belvoir, a quiet philosophical debate about diversity ensued after dinner. "Diversity is the key to success in any position" Loga said, relating this statement to a rainforest ecosystem and his own experience of undertaking a successful undergraduate degree.

This unique perspective of the environment and the advantage of seeing the sites for the first time, in partnership with their Geographic Information Systems skills, combined wonderfully for this project. We are sad to see Loga and Matt leave, but hope to see them back in Tasmania in the future.

Denna Kingdom
TLC Reserves Manager

If you would like to make an end of financial year donation to our Blue Tier reserve, please call us on (03) 6225 1399 or donate online at: www.tasland.org.au

Donations of \$2 or more are tax deductible.

We are grateful to the following organisations for their support in recent months



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