# Waikato Botanical Society Inc.

**Newsletter No. 25, April 2007**

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## In this issue:

## UPCOMING BOTANICAL SOCIETY EVENTS 2007

### May 12th & 13th
### Waikawau wetland plant survey

Visit the isolated north eastern corner of the Coromandel to explore the as yet unsurveyed Waikawau wetland. The wetland encompasses an extensive estuarine area and stretches up a largely forested valley system. The Moehau Environment Group (www.meg.co.nz) has adopted the wetland as a long term ecological restoration project. The work to date has focused primarily on developing a comprehensive pest management strategy to protect native birds (e.g. fernbirds and brown teal). MEG would like to know more about the plants found in the saline and freshwater zones of the wetland in order to map habitats etc.

*Travel to Waikawau on Friday after work or meet at the DoC house on the Saturday at 10:30 am. Participant numbers limited!*

**Getting there**: It takes approximately 2.5 hours to reach Waikawau from Hamilton. The recommended route is via Colville (gravel road). Accommodation will be in the DoC house at Waikawau Bay, a short distance on your RHS after you see the Kayak hire and horse riding signs. The house is 1 story brick and has a large sloping paddock in front of it.

**What to bring**: Be prepared to get wet feet! Gumboots or just old sneakers, raincoat, warm clothing, insect repellent etc. Bring all food (breakfast, lunch, snacks and something for shared dinners) as there are very limited supplies after Colville.

**Contact:** Monica Peters for carpooling and further information.
Email: monica.peters@landcare.org.nz Ph: 07 858 3725 (office), 07 856 1906 home

### Saturday 26th May
### **(note change of date)
### Kakepuku Mountain Historical Reserve

Since 1995 a community voluntary group, Kakepuku Mountain Conservation Society, has maintained annual pest management. Goats have been eradicated and possum numbers remain below 2%. Low rat numbers allowed the introduction of Toutouwai (North Island Robin) in 1999. We will be following a pest management line to view flowering *Dysoxylum spectabile* (kohekohe). There is an impressive group of these trees approx. half way to summit. From here we will climb to summit of 450metres. Lunch, then descend via another valley which has *Urtica ferox*, the native tree nettle.

**Meet:** Carpool from Landcare Research, Gate 10 Silverdale Rd, Hillcrest at 9.30am or 10.15am at the Kakepuku mountain carpark on Kakepuku Road (formerly Mountain Rd). Proceed from Te Awamutu via Bank Road, which merges into Puniu Road, left towards Te Mawhai. Kakepuku Road branches from here on the south side of the mountain. Proceed further down Kakepuku Road to farm property. Access Historical Reserve via paddock, we will be climbing over boundary fence to enter and leave Reserve.

**Contact:** Jan Hoverd ph 07 871 8071, email jlhoverd@xtra.co.nz

## Saturday 21st July
## Pirongia Te Aroaro O Kahu Restoration Society
## ***New Trip***

The restoration group are setting up permanent vegetation monitoring plots within their intensive pest control area and a non-treated adjacent area on Mt Pirongia with the aim to see if seedling establishment is affected by rodent control. Eight plots have been established already using the FORMAK method and the group would like to establish several more this winter. On this trip the botanical society will assist with the measurement and setting up of some new plots with members of the restoration group, we will also collate a species list for the area. There may be a chance to venture further up the mountain following the plotting.
**Meet:** 9.30am end of Waite Rd.
**Contact:** Selwyn June ph (07) 843 3066 selwynjune@xtra.co.nz

## Sunday 26th August
## Botanical Society Threatened Plant Collection Working Bee #6

A working bee in the threatened plant garden. Please bring gloves, old clothes and boots for weeding, planting and propagating activities.
**Meet:** 9.45 am at Waikato University Gate 9, Hillcrest Rd
**Contact:** Liz Grove eg3@waikato.ac.nz ph 07 846 0965 (hm).

## Sunday 2nd September
## Dickies Flat, Karangahake

As we have now completed two walks up the Waitawheta River from Karangahake, the higher level 7 track and the Dubbo as well as the river level track, we will continue up the river heading more into the northern Kaimais. It will be a chance to compare previous notes and plant lists, to see if there is a shift from Coromandel to Kaimai in the vegetation type.
**Meet:** At the L&P bottle by the Ohinemuri River at Paeroa by 9.30am**.**
**Contact:** Doug Ashby dj.ashby@xtra.co.nz ph 07 862 4706 to carpool from Hamilton Liz Grove eg3@waikato.ac.nz ph 07 846 0965 (hm).

## Saturday 13th October
## Tawarau Forest, Northern King Country

A trip into Tawarau forest along the Gorge Track. Leaving from Were Road - the track crosses farmland then follows the Tawarau River through a spectacular limestone gorge. The track is mostly level and takes 3 hours return (without any botanising).
**Meet:** Waitomo Cave Museum at 9am.
**Contact:** Kerry Jones 07 855 9700 (home) 086 500 595 (pager)

## Saturday 10th November
## Opuatia wetland

Concentrating on the northern segment of the wetland, which is owned by the regional council, we will botanise the fen vegetation and mineralised edges that border the wetland. Several threatened species are know to occur at the south end of the wetland but the northern end has received less attention so this trip will aim to fill some gaps in our knowledge.
**Meet:** Rangiriri Tavern car park at 9 am. To carpool from Hamilton contact Andrea.
**Contact:** Andrea Brandon abrandon@doc.govt.nz ph 07 858 1018 (wk)

## Sunday 25th November
## Botanical Society Threatened Plant Collection Working Bee #7

A working bee in the threatened plant garden. Please bring gloves, old clothes and boots for weeding, planting and propagating activities.
**Meet:** 9.45 am at Waikato University Gate 9, Hillcrest Rd
**Contact:** Liz Grove eg3@waikato.ac.nz ph 07 846 0965 (hm).

## Sunday 2nd December
## Kakahu Stream Kauris, Kaimai-Mamaku Forest Park

(combined trip with Rotorua Botanical Society)

This field trip will cross private farmland to access the rarely visited southern most naturally occurring kauri trees growing in forest on the margins of the Kakahu Stream on the south-western edge of the Kaimai-Mamaku Forest Park. If time permits we may also explore other forest remnants in the vicinity including kahikatea stands and some tawa dominated forest areas with emergent rimu present.
**Contact:** Paul Cashmore 07 348 4421 (hm), 349 7432 (wk)
**Meet:** 8am Landcare Research carpark Gate 10 Silverdale Rd, Hillcrest to carpool or 8:45 am at Okoroire Hall on cnr SH 28 and Okoroire Rd
**Grade:** Medium

## BAD WEATHER

Please contact the trip leader on the morning of field trips if you are unsure if they will go ahead and don't want a wasted trip to the meeting point. It is always helpful to notify the trip leader of your intention to attend a trip in case you are late to the meeting point or for any last minute change of plan. Please be prepared on all trips with your own lunch, drink, sturdy footwear, and clothes for all seasons. We encourage carpooling for longer distances and suggest a contribution is made toward petrol costs for the driver.

# NEWS

## Leonard Cockayne Memorial Lecture
## 20th June 7.30 pm

The Cockayne Memorial Lecturer for 2007 is Dr Bill Lee from Landcare Research, Dunedin. The Cockayne Memorial Fund was established by public subscription to commemorate the life and work of Leonard Cockayne by the encouragement of botanical research in New Zealand. Under the rules amended by Council in 1957, the interest from the fund shall be used for grants in aid of addresses to be delivered or publications related to botanical research by New Zealand workers. Council in 1964 resolved to institute a triennial Cockayne Memorial Lecture, to be supported by the trust fund. **Waikato location:** Room AG30 in A Block of the School of Maori and Pacific Development, Waikato University. Entry to A Block is through Gate 8, off Hillcrest Road. A campus map is available at http://www.waikato.ac.nz/contacts/map.pdf

## The Biology Olympiad 2007

Waikato Botanical Society was pleased to award three botanically-minded high school students with copies of the Botany of the Waikato book in early April. The students were taking part in the 'Biology Olympiad' in which Waikato University hosted the final step of the selection process to find New Zealand's representatives for the International Biology Olympiad. The Waikato section involved a day of botany with students having to learn plant taxonomic groups, learn lab techniques such as plant sectioning and carry out plant physiology experiments. The winners of the books were Ruth Bollen (Auckland), Synove Scott, & Bob Li (Auckland) for their top scores in the plant test.

Described as the academic equivalent of the Olympic Games, with 55 countries taking part, the Olympiad will be held in Saskatoon, Canada, in July.

## Field Guides for Sale

Graeme Jane has some useful guides for sale:
**Field Guide to Rushes, Sedges and Allied plants**
All species are included except those not seen for a long while or only present on offshore islands. Each species is illustrated with grey tone (digital photo) silhouettes and a brief text description emphasising any distinguishing field features on the opposing page. Quick keys to species are also included. Intended for field use with A5 format and wire ring binding. Cost is $15.
I also have a **field guide to ferns and fern allies** in a similar format for $10.
Please send reply only to Graeme Jane at GTJane@clear.net.nz

## Our own Webpage

**Don't forget we have a webpage** up and running where you can see photos from previous field trips and events. The site is hosted by the University of Waikato Centre for Biodiversity and Ecology Research and can be found at:

**http://cber.bio.waikato.ac.nz/Waibotsoc/WaikatoBotSoc.html**

## Botanical Resources

Don't forget the society has an extensive collection of journals and newsletters from all botanical societies around the country and the NZ botanical society. These are kept in the Waikato University Herbarium and make a valuable reference collection for research or general interest, please contact a committee member if you want to look through any of these. The society would like to thank member Vivienne Cassie-Cooper for kindly donating us her full collection of NZ Botanical Society newsletters, we will now be able to fill any gaps in our collection dating back to 1996.

**TRIP REPORTS AND EVENTS FROM THE PREVIOUS SIX MONTHS**

## North Taranaki Weekend

## Coastal forest – Mt Messenger / Whitecliffs Saturday, 20 January 2007

Five enthusiastic members from the Waikato made the journey south to meet with their Taranaki member. A grey cloudy day greeting us with the threat of rain, our trip started with a traverse over the Mt Messenger road tunnel on SH3. An uphill climb led us through hardwood scrub with young regenerating *Podocarpus hallii, Phyllocladus trichomanoides* and *Weinmannia racemosa.*

It was great to be back in familiar territory with Taranaki's cool and regular rainfall resulting in luxuriant rainforest vegetation, with a thick understorey of *Blechnum novae-zelandiae, B. discolor, Dianella nigra, Rhopalostylis sapida* etc. As usual, we moved fairly slowly for the first few hours taking note of a wide range of species, though we were all conscious of the big day ahead. The trip involved a +/- 10km tramp to the coast and a brisk! 2km walk south along the beach to Pukearuhe. We gained the **summit of Mt Messenger** (310m asl) in time for morning tea, climbing through *Dracophyllum strictum, Astelia solandri* and *Carmichaelia australis.* The summit track traversed a steep sided ridge through an open forest canopy of *Quintinia serrata, Weinmannia racemosa*, and young *Prumnopitys ferruginea*. Views to the north overlooked farmland and SH3 winding northwards in the distance. The SW side of the ridge was moist, supporting a thick canopy of *Beilschmiedia tawa* and occasional *Laurelia novae-zealandiae*, a few tall remnant *Metrosideros robusta* were seen on the north side.

A *Gaultheria oppositifolia* in full flower was found **on the ridge** along with *Solanum aviculare*, *Olearia thomsonii, Freycinettia banksii*, and we suspect a *Pittosporum colensoi* (but we had left the rope and harness behind!). We entered a patch of young maire, *Mida salicifolia* saplings - a threatened species. The foliage of the young plants is very similar to *Nestegis* sp., *Mida* sp. having shorter petioles, leaves alternate or in sub-opposite pairs, with shiny upper leaf surface. A small patch of hard beech, *Nothofagus truncata* signified a change in vegetation associated with soil type. Beech forest is not well represented in Taranaki, hard beech occurring northwards of Mt Messenger – and *N. menziesii, N. solandri* var. *solandri* the only other species in

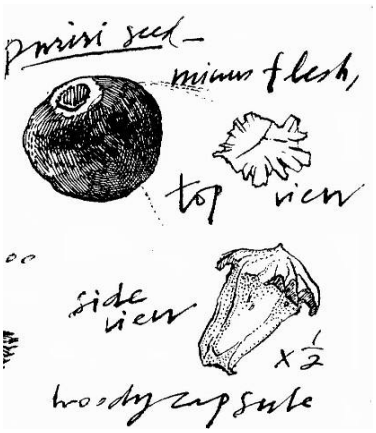
Taranaki occurring in the eastern hill country. The rain arrived with a steady drizzle, though lovely and warm. We trudged on making good time arriving at the turnoff to Waipingau Stream and the grand "mown-highway" associated with the natural gas pipeline. We then entered **coastal forest**, with swathes of *Vitex lucens*, *Cyathea medullaris*, *Corynocarpus laevigatus*, *Cordyline australis* and *Rhopalostylis sapida* clothing the steep valley sides. Breaking out onto the sand we were met by one of the last remaining natural colonies of pingao, *Desmoschoenus spiralis* in Taranaki. But there was one more plant to find. Jane Hart, our trip leader, led the group across the stream in a successful search of a colony of *Myosotis petiolata* var. *pansa*. A great 7 hours of botanising, we really managed to cover some distance on this one, another excellent trip to Taranaki. Janica Amoore

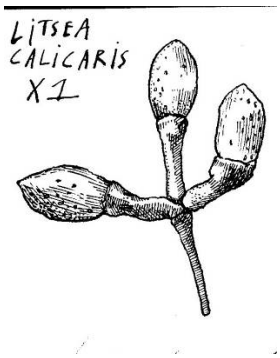
**Mt Messenger species list 20/01/07, compiled by Janica Amoore**

*Alseuosmia macrophylla*
*Anaphaloides trinerva*
*Asplenium bulbiferum*
*Asplenium flaccidum*
*Asplenium polyodon*
*Astelia solandri*
*Blechnum discolor*
*Blechnum filiforme*
*Blechnum fluviatile*
*Bechnum novae-zelandiae*
*Carmichaelia australis*
*Carpodetus serratus*
*Clematis paniculata*
*Collospermum hastatum* - fl
*Coprosma grandifolia*
*Coprosma lucida*
*Coprosma robusta*
*Cordyline banksii*
*Cyathea dealbata*
*Cyathea smithii*
*Dacrydium cupressinum*
*Dianella nigra* - flr & fr
*Dicksonia squarrosa*
*Dracophyllum strictum*
*Earina mucronata* - fl
*Elaeocarpus dentatus*
*Freycinettia baueriana*
*Gahnia* sp.
*Gautheria antipoda*
*Gautheria oppositifolia* - fl
*Gautheria paniculata*
*Geniostoma rupestre* - fr
*Griselinia lucida* - fr
*Hedycarya arborea*
*Huperzia varia*
*Knightea excelsa*
*Lastreopsis hispida*
*Laurelia novae-zelandiae*
*Leptopteria hymenophylloides*
*Leucopogon fasiculatus*
*Libertia micrantha*
*Lindsaea trichomanoides*
*Litsea calicaris*
*Lycopodium volubile*
*Macherina sinclairii*
*Melicytus ramiflorus*
*Metrosideros perforata*
*Metrosideros robusta*
*Mida salicifolia*
*Myrsine australis* - fr
*Lophomyrtus bullata*
*Nestegis montana*
*Nestegis sp.*
*Nothofagus truncate*
*Olearia rani*
*Olearia thomsonii*
*Parsonsia sp.*
*Passiflora tetrandra*
*Phormium cookianum*
*Phyllocladus trichomanoides*
*Pittosporum colensoi*
*Pneumatopteris pennigera*
*Podocarpus hallii*
*Pratia angulata*
*Prumnopitys ferruginea*
*Prumnopitys taxifolia*
*Pseudopanax arborea*
*Pseudopanax crassifolius*
*Pseudowintera axillaris*
*Pteris macilenta*
*Quintinnia serrata*
*Rhopalostylis sapida* - fr
*Ripogonum scandens* - fl & fr
*Rumohra adiantiformis*
*Solanum aviculare* - fl
*Sticherus cunninghamii*
*Trichomanes reniforme*
*Uncinia uncinata*
*Weinmannia racemosa*
*Winika cunninghamii* - fl

## Tauwhare Scenic Reserve, Mokau, Sunday 21 January 2007

A small group of us (Barry Hartley, Jane Hart, Jan and Laurie Hoverd, Jan Butcher and myself, Monica Peters) went on a leisurely wander through the informal track in the Tauwhare Scenic Reserve. While there's no signage to indicate that a significant cultural history is buried here, Geoff Park writes eloquently about why this finger of land that causes such a dramatic kink in the Mokau River has remained under protection. Botanically, January is a rich time for a visit as many of the trees are seeding profusely. We enjoyed a c. 1km circuit along the forested top before dropping into damp Nikau (*Rhopalostylus sapida*) grove and stepping out on to the grassy verge for a celebratory glass of afternoon wine in acknowledgement of Barry's recently awarded QSM. Inside the forest, Hinau (*Eleocarpus dentatus*) berries carpeted the ground, as did White Maire (*Nestegis lanceolata*) drupes that ranged in all shades of green to pale apricot.




Pukatea (*Laurelia novae-zelandiae*) capsules were still green, their tufted seeds still ripening and Puriri (*Vitex lucens*) were simultaneously fruiting and flowering. A Kowhai (*Sophora microphylla*) pointed out by Barry drew gasps of admiration – for most of us this specimen had the largest and straightest trunk we'd ever chanced upon. The soft ground was studded with the small hard yellow seeds, which sparked a minor collecting frenzy. Other trees on the reserve include Mangeao (*Litsea calicaris*), Titoki (*Alectryon excelsus*), Kohekohe (*Dysoxylum spectabile*), Miro (*Prumnopitys ferruginea*), and Karaka (*Corynocarpus laevigatus*). Positively identifying *Mida salicifolia* vs *Nestegis lanceolata* still remains a challenge and was vigorously debated over the weekend. In all it's a fascinating spot – I recommend teaming up a trip to the reserve with a gentle cruise up the river. Monica Peters, Line drawings by Monica Peters.

**Reference**: Geoff Park 1995. *Nga Uruora: Ecology and History in a New Zealand Landscape*. Victoria University Press pp 113-162

## Waikato and Rotorua Botanical Society Field Trip to Pureora Saturday 17th-Sunday 18th February 2007

With **perfect February weather** on the way, bot-socers from Taranaki, Rotorua and Thames along with the Hamilton contingent began assembling at the cabins in Pureora village from Friday afternoon onwards. The combination of icecream and red wine got the early bird Taranaki/Thames troupe off to a fine start that the rest of us weren't able to catch up on, that night at least.

Saturday morning saw fifteen of us head off to the **Waipa Mire** to botanise this more unusual and less visited component of Pureora Forest Park. The Waipa Mire is at the headwaters of the Waipa River, surrounded on three sides by relatively intact podocarp forest (including the Waipapa Ecological Area) while the fourth side is flanked by plantation pine forest. DOC have been carrying out weed control (mostly willows) in the mire to protect a range of species and habitats in a relatively (compared to the lower Waikato wetlands) pristine environment. We entered the mire cautiously through a weedy hedge of blackberry, and while attempting to stick to the higher, less swampy ground, traversed the mire. Along the way we saw *Gahnia rigida* and *Clematis quadribracteolata* and the odd grey willow which were pulled when possible.

In a slow flowing streamlet we came across the first **threatened plant** for the day – stout water milfoil (*Myriophyllum robustum*) classified in Gradual Decline in the latest threatened plant lists. A relatively large patch of healthy looking plants could be seen both up and down stream from where we crossed the streamlet. A little further on and some discussion went on about what grass we were looking at (later confirmed as *Deyeuxia quadriseta* thanks to John Hobbs). We reached the far side of the mire where a monoao (*Dracophyllum subulatum*) dominated ecotone exists on higher ground before grading into tall forest in behind. A single plant of *Pimelea tomentosa* (Serious Decline) was spotted growing under a tall *Coprosma propinqua*. After skirting around the mire, we then stumbled across a lot more *Pimelea tomentosa* plants scattered through the shrubby ecotone bordering the mire. All age classes were present indicative of recruitment. Back into the mire and heading for home we saw drifts of flowering **swamp leek orchids**, *Prasophyllum hectorii* (Nationally Vulnerable). Back at the cabins a shared dinner and a few bottles of wine finished the day off quite nicely.

Swamp leek orchid - *Prasophyllum hectorii*

*Dactylanthus taylorii (Photo: Avi Holzapfel)*

**Sunday morning** was spent poking around the village where we saw *Dactylanthus taylorii* (Serious Decline) and *Ileostylis micranthus* (not threatened). We then headed to a privately owned property nearby where we surveyed the stream margin for ***Melicytus flexuosus*** (Gradual Decline). We found 164 plants in a range of age classes from seedlings and young plants right through to fruiting adults. In the

process a couple of parsley fern, *Botrichium australe* (Sparse), plants were spotted. After a late lunch we made it to the privately owned **Bog Pine Reserve** for a quick look. Both *Pittosporum turneri* (Nationally Endangered) and *Dactylanthus* have been recorded in this reserve but with time running out we focussed on finding the *Pittosporum*. Four trees of *Pittosporum turneri* could be identified from a distance and we trekked in to one tree not too far from the fenceline to get a closer look. Dactylanthus was not spotted on the day so that will be saved for another trip. It was a pretty tired bunch of bot socers that then headed home late that Sunday afternoon.

## *Dactylanthus* evening talk and sowing with Avi Holzapfel 21st February 2007

On Wednesday 21st February Dr Avi Holzapfel from the Department of Conservation gave a very interesting talk about the biology and conservation of the rare and unusual root parasite ***Dactylanthus taylorii***, better known for the formation of the 'woodrose'. *Dactylanthus taylorii* is ranked in the Serious Decline national threat category due to the absence of young plants recruiting into populations which has been linked to browsing by introduced animals. Possums, rats and pigs can cause damage to the very small flowers and fruit which emerge from the forest floor thus reducing the amount of seed available to maintain populations. Avi discussed the recent success of seed-sowing trials of *Dactylanthus* in the wild as a conservation management tool. The study took 4 years for the first signs of plant establishment but many plants emerged in the following 3 years. It was found that a disproportionate number of the new plants were females, whereas in known wild populations males are dominant, which raises plenty of questions for further research on this species.

Following Avi's talk we then moved down to the society's threatened plant collection site to **sow some *Dactylanthus* seeds** which had been collected on the Pureora fieldtrip, with Department of Conservation permission. The hundreds of tiny seeds from several inflorescences were mixed with sand to separate them out and make sowing easier. We then prepared four clearly marked plots by clearing the leaf litter and a little soil to expose the fine roots of the host trees, *Pittosporum tenuifolium* and *Myrsine australis* in this case. The seed was sprinkled on the ground surface and covered again with leaf litter. The sowing of seed in cultivation was an historic occasion and we will now have to eagerly wait for at least four years before we know whether the parasite has successfully established on the roots of the host trees at the site! The occasion was celebrated with a barbeque and some seeds were also experimentally sown into two large pots with *Melicytus ramiflorus* and *Pittosporum colensoi* host trees, which may be a useful mobile resource if successful.

## THREATENED PLANT PROFILE: DACTYLANTHUS TAYLORII

*Dactylanthus taylorii* Hook.f.
Wood rose, pua o te reinga, flower of Hades (see the photo on p. 9 of the newsletter)
**Status**: Serious Decline (Qualifiers: conservation dependent, recruitment failure)
**Family**: Balanophoraceae
**Distribution**: Endemic to North Island, distributed from Northland down to the Wairarapa. Historically recorded in the Kahurangi National Park area of northern South Island.

**Description**: This plant grows as a root parasite on a host tree or shrub and consists mainly of a round warty tuber up to 50cm in diameter at or just below the soil surface. The plant has no green leaves or shoots of its own but produces fleshy flowering shoots up to 20cm long which are covered with small, brown scale-like leaves. Plants are either male or female and produce flowers followed by fruit from January to May. Inflorescences contain hundreds of tiny flowers with fragrant nectar and are adapted to attract the short-tailed bat which pollinates this plant. Today pollination is also by mice and sometimes by rats.
**Similar Species**: None but sometimes confused with galls and root galls found on beech trees, Rhizobium and Frankia nodules and other growths on exposed roots and basal trunks have been collected as wood rose. *Dactylanthus* can be distinguished from these by the presence of small circular scars left by former buds and flowering shoots.
**Habitat**: Second-growth forest, *Dactylanthus* grows parasitically on the roots of about 30 species of native hardwood tree and shrubs such as *Griselinia littoralis* and *Pseudopanax arboreus* and *Pittosporum tenuifolium*. The plant prefers damp but well drained places and is often found at the head of small streams. It has been found at altitudes from near sea level to 1200m.
**Threats**: Habitat destruction, collectors of wood roses and browsing animal such as possums. Cattle destroy plants through trampling. Decline in numbers of short-tailed bats may have also caused a decline in this species. Rats and pigs are also major browsing threats alongside possums.
**Source**: www.nzpcn.org.nz and Brandon A., de Lange P. J. & Townsend A. (2004) Threatened plants of Waikato Conservancy. Department of Conservation, Wellington.

## THREATENED PLANT GARDEN UPDATE

We installed a drip irrigation system in December with funding from the DOC Community Conservation Fund. This has kept the plants watered over the dry spells this summer, unfortunately including the weeds, but some bark mulching helped to reduce weeds early in summer. *Teucridium parvifolium, Rorrippa divaricata, Picris burbidgei* and *Calystegia marginata* are all thriving in the garden and have produced seed this summer. The two *Lepidium oleraceum* are surviving but are more sensitive to drought and frost events, and the *Hebe speciosa* are growing on well.

We had successfully germinated some *Pimelea tomentosa* from Pureora but unfortunately lost the two young seedlings to a possible fungal infection. We were pleased with the successful germination of *P. tomentosa* (2 from 8 seeds) after no success last year, this year we removed the flesh and scarified the seeds, which we did not do with last years seed.

*Sicyos australis* was removed from the garden earlier in the year as a new publication indicates that it may indeed be a coloniser and not a threatened native plant. We may plant *Sicyos aff. australis* from Cuvier Island (Coromandel) in the future but will first ascertain whether seed remains in the garden from the removed plant. This situation illustrates the difficulties in management of rare plants and the need for ongoing research into the status of many threatened species.

Presently *Pimelea arenaria, Melicytus flexuosus* and *Calystegia marginata* are awaiting germination in the greenhouse and in February four small plots were seeded with *Dactylanthus taylorii* in the garden.

# Bringing our past alive: the role of history in ecosystem reconstruction at Waiwhakareke (Horseshoe Lake), Hamilton

What was the Waikato basin like 1000, or even 500 years ago? What has changed and what has been lost? For the first time in New Zealand, city folk are tackling a remarkable large-scale ecological project designed to create ecosystems from scratch. And it's happening in Hamilton. The goal, of protecting our native biodiversity by returning depleted flora and fauna to the city, is shared by community volunteers, scientists and city planners. With limited opportunity to restore the original vegetation, these groups are investing their energy at Waiwhakareke, a 60 ha site set aside for recreation within the city boundaries.

**Hamilton Ecological District is one of the most modified areas of New Zealand, with only about 1.6% of the original vegetation and less than 20 hectares in total of high quality indigenous habitat remaining in Hamilton city. More than 20% of the indigenous flora is threatened or extinct, and more than half of the indigenous bird species have gone. The size of indigenous remnants is also a concern. The largest indigenous remnant in the city is Claudeland's Bush at 5.2 ha, while Hammond Bush, the richest of all the city remnants with 145 native plant species, visiting kereru, and recently discovered native bats, is only 1 ha in extent. All of this makes Hamilton one of the most ecologically depauperate cities in New Zealand.**

Growing numbers of enthusiastic Hamiltonians are working hard to turn around the lack of indigenous ecosystems in their city. Ecological restoration has focused on the city gully system (covering about 750 ha). But there will be no return to the city, of native birds such as the tui and kereru, without a more extensive restoration plan. In 2004, with encouragement from local groups, city planners approved a concept plan for the development of Waiwhakareke Natural Heritage Park. The goal is to reconstruct five characteristic Waikato ecosystems to the site, which currently comprises rolling farmland and a degraded peat lake.

**History – why does it matter?**

Both restoration and the reconstruction of ecosystems seek to increase and retain biodiversity - the variety of life forms that exist in a particular place - within functioning ecosystems. Understanding the past history of the area provides knowledge that will help us to make informed decisions about what is unique to the Waikato; what kind of environmental conditions previously existed; and ultimately which of our native flora and fauna should be restored. By understanding the past history of the Hamilton Basin, both plant and human, we can begin the task of reconstructing authentic functioning ecosystems at sites such as Waiwhakareke.

**Thousands of years ago. . .**

Identifying pollen grains and spores trapped in the peat beds of bogs and lakelets has allowed scientists to trace changes in the vegetation, over long time periods, associated with climate. Starting twenty thousand years ago, they document a bleak climate in the Waikato with common plants being grasses, herbs, very hardy shrubs such as bog pine and pink pine, and trees that are now confined to mountain forests such as silver beech and kaikawaka. As the climate became milder 14000 to 10000

years ago, lowland forests spread, dominated by matai. A wet, warm period followed in which rimu and broadleaved forests spread for several thousand years. Large raised peat bogs, still characteristic of the Waikato region, grew rapidly. Fertile swamps with kahikatea also grew locally. From about 5000 years ago, the climate was probably drier and frostier, so trees such as tanekaha and kauri became important, with tree ferns and other species decreasing in abundance. One thousand years ago tall forest probably covered most of the region, except in a few mostly boggy places.

**People and the environment**

In the last 700 years, human occupation has caused further landscape change in the Waikato. One way of dating these changes is by the analysis of tephra deposits from volcanoes. In the Hamilton basin, the critical "settlement layer" for dating prehistory in the North Island is the Kaharoa Tephra, formed when Mt Tarawera erupted in the Okataina volcanic area between about A D 1300-1390. Using this evidence, significant human settlement in the North Island with accompanying deforestation in the Hamilton Basin began at about 1280 AD. This is consistent with Māori tradition which records the occupation of the traditional inhabitants Ngā Iwi, and the later movements of the Tainui peoples Ngāti Ngamuri, Ngāti Koura and Ngāti Wairere from the 1600s.

Deforestation has been an accelerating trend over the centuries since initial Polynesian and later European arrival, although Māori tradition indicates that the land around Waiwhakareke itself remained forested until relatively recently. It is thought that prior to European settlement the whole of this area was heavily forested with mixed stands of kahikatea, titoki, rewarewa tawa, matai and rimu, and stands of kauri and tōtara overlooking the lake. Mangemange and pirita (supplejack) vines were also present, tree ferns such as mamaku and kingfern (para) in the undergrowth. Oral tradition also recalls flocks of bellbirds, kaka, weka, kereru (woodpigeons) and kiwi in this area.

**Geology and the flora**

The underlying geology and soils determine the principal ecosystems present in any area, and hence the composition of the flora. Four general landform units form the Hamilton Basin which corresponds approximately to the boundaries of the Hamilton Ecological District: hills, gullies, alluvial plains and peatlands. Within each landform unit, there are further divisions. As an example, hilly land, found at the margins of the Hamilton Ecological District, is usually moderately well drained with a soil profile of late Quaternary composite rhyolitic and andesitic tephras on weathered Hamilton ash. This type of soil typically supported rimu/tawa forest, similar to that remaining on the foothills of Mt Pirongia. Tawa dominated the canopy with emergent rimu, miro, kahikatea, totara and northern rata. Other broadleaved species included titoki, hinau, rewarewa and pukatea, with an understorey of small trees and shrubs such as mahoe, pigeonwood, raurekau and silver fern. Analysis of the soils and geology at Waiwhakareke therefore indicates which species are suitable for planting at this site, and which functioning ecosystems are likely to thrive.

**Rebuilding Waiwhakareke: the big five ecosystems**

From a combination of scientific research, examination of historical records and oral tradition, a likely flora for the areas under ecological reconstruction has been established. Analyses of the soils, topography and water table of the area have also helped determine which species will thrive at this site. Ecological reconstruction will include three forest ecosystem types. Kauri forest will be developed on the ridge crest

to echo the hardwood forests that existed 1000 years ago. An example of this type can still be seen at Pukemokemoke Reserve near Gordonton. Māori tradition also identifies this forest type in the Hamilton Basin. Canopy species included kauri, hard beech and tanekaha with rimu, tawa and rewarewa, with tree ferns and shrubs such as mingimingi in the understorey. A second type, mixed rimu/tawa forest, will be developed on the hillslope. A third forest type with pukatea, kahikatea and swamp maire was once found on colluvial footslopes. Although there are no intact remains in Hamilton Ecological District, this forest had a diverse range of native plants that all perform important ecosystem functions. For example, the fleshy fruits of native conifers like rimu feed the birds and in turn are spread by them. This ecosystem will be represented in the semi-swamp area at Waiwhakareke.

Swamp environments are highly valued by Māori for their rich food and weaving resources, and Waiwhakareke was once well known for its tuna (eels), harakeke, raupo and bird species. This environment will be represented by harakeke and other wetland species around the lake margin. Finally, a peat lake aquatic habitat will be restored as the fifth ecosystem.

**Plus one more threatened ecosystem**

Recent soil analysis indicated that another ecosystem was overlooked in the original restoration plan- a restiad bog ecosystem, which is indicated by peat type and peat depth near the lake. Scientists will now translocate and monitor *Sporandanthus ferrugineus* (the cane rush) and *Empodisma minus* over the next year to recreate this threatened, sixth, ecosystem.

**How long do we have to wait?**

Because many species have specific microhabitat requirements, planting at Waiwhakareke will occur in stages with late successional species benefiting from the shade and shelter of the first stage, or pioneer plants. Initial planting is now underway, with tī, *Coprosma tenuicaulis*, harakeke, and other wetland plants already on site. It is anticipated that Within 20 years, this carefully staged and monitored ecosystem reconstruction will add immeasurably to the abundance of native flora and fauna within Hamilton city, and provide a vision for other cities to follow. Although it is likely that these reconstructed ecosystems will differ from the forests of 1000 years ago in some respects, nevertheless they will give our unique native biota a fighting chance for future life in the city. And development of a visitor centre and walkways will allow us all to learn about and enjoy this heritage area.

Cilla Wehi and Gillian Dufty

**Further reading:**

Clarkson B D, Clarkson B R and Downs T M 2007 (revised ed.) Indigenous vegetation types of Hamilton Ecological District. *CBER Contract Report No. 58*. Centre for Biodiversity and Ecology Research, Department of Biological Sciences, School of Science and Engineering, The University of Waikato, Hamilton. Online: http://cber.bio.waikato.ac.nz/publications

Nicholls J 2002. History of the Vegetation. In: Botany of the Waikato, pp. 23-28. Waikato Botanical Society, Hamilton.

Lowe D J, Newnham R M, McFadgen B G and T F G Higham 2000. Tephras and Archeology. *Journal of Archaeological Science* 27, 859–870.

# President's Report

I would like to start by thanking everybody who has helped with organising trips and events during the past year. I have noted a variety of people attending different fieldtrips and events through the year which provides good reason for the committee to keep up the range of events on offer. Winter has tended to be a hard time to run trips with unpredictable weather contributing to low attendance and cancellations. For this reason the coming year's programme focuses on summer events. I again encourage all members to put forward any suggestions for events they would like to see the society involved with in the future.

We have again enjoyed some joint trips with the Rotorua Botanical Society during the year and continue to actively share information with other botanical societies throughout the country. Our membership has continued to increase to 72 paid up members in 2006.

The committee has worked hard to continue to lift the public profile of the society this year with displays in the public library, at Bioblitz and the University open day. We have regular newspaper write-ups as well as the circulation of information to councils and other organisations. The society website is regularly updated with information and we thank Brendan Hicks of the Biology Department for uploading the files for us.

The society has continued membership to the NZ Plant Conservation Network, NZ Association for Environmental Education and Hamilton Environment Centre. These organisations all provide forums for promoting society events and keeping the society up to date with other relevant happenings both locally and nationally. The societies University graduate and undergraduate prizes were both awarded again this year for the top students in plant related courses.

The threatened plant collection garden has started well this year with seven species planted out and several more currently awaiting germination, including the *Dactylanthus* sown a month ago. The application of mulch supplied by the university grounds staff before Christmas was very important in reducing weed growth and keeping soil moist and we will have to continue this practice. We received some funding from DoC to establish some self-timed irrigation at the site which has also been important over the dry months, although the weeds have appreciated the watering and we need to plan for more working bees during summertime. Many thanks to Lynne Baxter for her help with the garden and seed germination.

Committee changes; Wade Tozer left the committee during last year having taken up a research position in Sydney, and Shirley Nichols is resigning from her position on the committee as Vice President. Shirley has spent the last five years producing and editing the newsletter and has relinquished the role to Cilla during the year. Paula Blackett is also resigning from the committee and I would like to acknowledge Wade, Shirley and Paula's contribution to the committee over many years and wish them all the best with their respective careers. Janica is stepping down as Treasurer this year but will remain on the committee, a big thank you to her for taking up that role for the last two years and dealing with the continuing book sales. Andrea Brandon and Jane Hart have continued to do fantastic jobs as secretary and publicity officer respectively and Cilla has capably taken up the newsletter editor role.

Again there is a great programme of events to look forward to this year and we will be working hard to progress development of the threatened plant garden.

## SUBSCRIPTIONS

The 2006-07 membership year began in March so any unpaid subs are now due. Please complete and return the form to continue your subscription if you have not already done so. Please note we had a technical amendment to our subscription categories at the recent AGM which means that the $5 subscription now applies to all unwaged persons e.g. retired, not only students.

**Subscriptions are due <u>now</u> for the year to Feb 2008**

-Please note the NEW address for membership subscriptions below (new treasurer)

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WAIKATO BOTANICAL SOCIETY
Membership form

Please return with your subscription to: Membership
Waikato Botanical Society
c/o Box 187
Tuakau 2342

Please print clearly
Name(s): .....

Address: .....

.....

E-mail:.....

Phone: .....(day) .....(evening)

| | | |
|---|---|---|
| Subscription enclosed: | Individual/Couple/ Family | $15.00 (per year) |
| | Student /Unwaged | $5.00 (per year) |

Please make cheques payable to "Waikato Botanical Society Inc."

## Waikato Botancial Society Records Feb 28th 2006 - Feb 28th 2007

| **Bank Balances as @ 28th Feb 2006** | | | |
|---|---|---|---|
| Cheque | | 7826.23 | |
| Savings | | 0 | |
| Term Deposit | | $6,000.00 | |
| Total funds 28th Feb 2006 | | | $13,826.23 |

| **Income** | | | |
|---|---|---|---|
| Subs | 828.00 | | |
| Interest (chq a/c) | 32.82 | | |
| Interest (Term deposit) | 540.49 | | |
| Book sales (64) | 993.00 | | |
| Postage & handling | 0.00 | | |
| Donations | 35.00 | | |
| Other | 0.00 | | |
| Total | | $2,429.31 | |

| **Expenses** | | | |
|---|---|---|---|
| Advertising | 31.40 | | |
| General | 258.00 | | |
| Staionary/stamps | 40.19 | | |
| Catering | 0.00 | | |
| Donations/prizes/membership | 591.25 | | |
| Threatened plant garden | 42.36 | | |
| Bad debt | 30.70 | | |
| Total | | $993.90 | |
| | | | |
| Profit | | | $1,435.41 |

**End of year reconcillation**

**Expenses owing**

| | | |
|---|---|---|
| 100061 | $50.00 | |
| 100063 | $13.99 | |
| 100066 | $89.81 | |
| | | $153.80 |

**Expected income (invoices)**

| | |
|---|---|
| | $0.00 |
| difference | -153.80 |

| | | |
|---|---|---|
| Bank Balance | | $15,261.64 |
| Adjust Balance as @ 28 Feb 2007 | | $15,107.84 |

**Assets**

| | | Value (based on cost) |
|---|---|---|
| Books in Stock 28/2/06 | 1005 | $16,019.70 |
| Books in Stock 28/2/07 | 941 | $14,999.54 |

| | |
|---|---|
| Total funds available 28th Feb 2007 | $15,261.64 |

| | | |
|---|---|---|
| **Bank Balances as @ 28th Feb 2007** | | |
| Cheque | 5,261.64 | |
| Savings | 0.00 | |
| Term Deposit | 10,000.00 | |
| Total funds 28th Feb 2006 | | $15,261.64 |

| | |
|---|---|
| Waikato Botanical Society net worth 28 Feb 2007 | $30,107.38 |