Sub-canopy (2 – 5m)
Canopy (5m+)

Using ordination analysis (PC-Ord), no large-scale differences in vegetation composition or structure were identified between territories. However, hihi territories within Bush 2 had decreased species diversity than other territories, with a decreased cover within the subcanopy and shrub layers. Hangehange (*Geniostoma ligustrifolium*), an important source of nectar and fruit for hihi, was reduced in availability in these territories. Likewise, the experimental addition of supplementary food into hihi territories had little effect on any breeding success and maternal investment parameters measured.

Importantly, however, hihi were observed to predominantly feed on insects during the breeding season, indicating that nectar and fruit may not be as important as assumed during this period. Therefore the fieldwork conducted with support from the Lucy Cranwell field grant, and the Auckland Botanical Society, has lead to further research concerning the relationship between hihi and their floristic environment. Research into the differences in pollen loads, and location of pollen loads between the three honeyeater species (tui, *Prosthamedera novaeseelandiae*, and bellbird, *Anthornis melanura*) on Tiritiri and Little Barrier Island is currently being conducted and analysed. Comparisons of vegetation composition will also be made with that collected on Kapiti Island (the second managed hihi population), and Little Barrier Island. In addition, the vegetation composition data collected during this study is contributing towards other thesis research being conducted on Tiritiri by University of Auckland students.

Neither New Zealand's flora, nor fauna exist in isolation (although it is becoming increasingly so). Therefore, to increase our understanding of either we must attempt to determine the dynamics between them. The fieldwork supported by the Lucy Cranwell Field grant has contributed to the further understanding of the relationships between hihi and their environment, and has allowed me to develop and understanding and appreciation of the importance of both hihi for the forest, and forest for hihi.

Field Trip: Lichens recorded at the Court property, Waitoki. 19/04/03

Carol Lockett

Lichens collected during the visit to Sandra and Robin Court's bush at Waitoki (Haines & Lockett 2004) on 19 April 2003 have been further studied. This is the updated list, the numbers referring to voucher specimens held in the herbarium at UNITEC. Identifications were carried out under the supervision of Dr Dan Blanchon, with nomenclature based on Galloway (1985) and Malcolm & Galloway (1997).

Cladonia chlorophaea (Florke ex Sommerf.) Spreng. - #001183
Heterodermia leucomelos ssp. *boryi* (Fee) Swinscow & Krog - #001146
Hypogymnia lugubris (Pers.) Krog - #001151
Menegazzia sp. - #001157
Parmotrema chinense (Osbeck) Hale & Ahti - #001145
Megalospora sp. - #001147
Pseudocyphellaria carpoloma (Delise) Vain. - #001153
Pseudocyphellaria multifida (Nyl.) D.J. Galloway & P. James - #001160
Punctelia sp. - #001144
Ramalina celastri (Spreng.) Krog & Swinscow - #001142
Rimelia cetrata (Ach.) Vale & A. Fletcher - #001158
Rimelia reticulata (Taylor) Hale & A. Fletcher - #001150
Sticta sp. - #001154
Teloschistes xanthorioides J.S. Murray - #001143
Usnea rubicunda Stirt. - #001156
Usnea sp. - #001148
As yet unidentified crustose type - # 001163

References

Galloway, D. J. 1985. *Flora of New Zealand Lichens*. Government Printer, Wellington
Haines, L.; Lockett, C. 2004. Field trip: Waitoki, property of Sandra and Robin Court, Horseshoe Bush Rd. 19/04/03. *Auckland Botanical Society Journal* 59(1): 10-11.
Malcolm, W. M.; Galloway, D. J. 1997. *New Zealand lichens.Checklist, key, and glossary.* Museum of New Zealand, Wellington..

Field Trip: Lake Ohau Central Otago, 3-10/01/04

Kerry Bodmin (editor)

Authors: Chris Ashton, Paul Asquith, Enid Asquith, Ewen Cameron, Gael Donaghy, Leslie Haines, Cathy Jones, Steve McCraith, Julie McLintock, Margaret Peart, Juliet Richmond, Betty Seddan, Sally Warren, Alison Wesley and Maureen Young.

Other members of the group: Noel Ashton, Pam Carmont, Lisa Clapperton, Pam Dale, Graeme Jane, Sandra Jones, Doug Rogan, Paul Schoefield, Bill Sykes, Anthony Wright

Even while still on our first trip 'overseas' to Molesworth in 2002, the 20 strong group from the Auckland Botanical Society were keen to repeat this fabulous alpine adventure. Our chief organiser, Sandra Jones, once again took up the biannual mantle to arrange accommodation, keen botanists, food, wine and transport to the comparative luxury of Lake Ohau. Old friends greeted each other and new friends were made as we gathered on the windy shores of Lake Ohau for a 'wondrous' week of alpine botanising.

Saturday 3rd Jan 2004 – Shores of Lake Ohau

Most people had arrived at the Ohau Lodge by early afternoon, except for Chris and Noel Ashton, Graeme Jane and Gael Doughy. When the motel units were finished being cleaned, the vehicles were unloaded, cupboards and fridges stocked, beds selected, and a few tents erected by the lake edge. We set up the living rooms of the three motel units for different purposes: scientific (botany books & references, microscope & plant presses), lounge (reading & relaxing), and the third for cooking and eating. At 3pm those present set out southwards along the adjacent lakefront on the western side of the lake. Sandra kindly volunteered to stay behind to organise the dinner. The scrubby slope down to the lake was dominated by mānuka (*Leptospermum scoparium*), matagouri (*Discaria toumatou*), and some *Coprosma propinqua* forming a canopy about 2.0m tall. Kanuka (*Kunzea ericoides*) appeared to be absent, and *Rubus schmidelioides* was the abundant vine present with green fruit.

The stony lake margin itself was dominated by native herbs. The common violet-purple flowers of *Utricularia novae-zelandiae* were much admired. Sterile *Gunnera dentata* was locally present here, but was not seen elsewhere in the general area. Other dicotyledon herbs included: *Acaena inermis, Epilobium angustum, E. chionanthum, E. komarovianum, E. nerteroides, Euchiton traversii, Galium perpusillum, Gonocarpus micrantha, Hydrocotyle sulcata* (common with bronze-shiny leaves), *Leptinella* ? *mediana, Oxalis exilis, Plantago* sp., *Pratia angulata, Ranunculus foliosus, R. glabrifolius, Viola cunninghamii*; and exotics: hawkbit (*Leontodon taraxacoides*), monkey musk (*Mimulus guttatus*), *Myosotis laxa* and *Sagina procumbens*.

The leafless sedge *Eleocharis acuta* was common and extended into the lake itself, though the rim at the top of the culm sheath was not thick in the field, it became more pronounced when pressed (a good diagnostic character). Other monocots included: *Eleocharis gracilis* and *Schoenis pauciflorus.* But it was the *Carex* species where the most species diversity occurred: *C. berggrenii* (brown leaves <5cm long, with blunt tips), *C. coriacea, C. echinata, C. kaloides* (2 reddish tussocks pointed out by Cathy), *C. flaviformis* (<10cm tall, bright green), *C. gaudichaudiana* (<10cm tall, fruiting heads banded appearance by black glumes & green utricles), *C. tenuiculmis* (originally described as a var. of *C. secta*, elevated to species level by the 'two Peters' in 1997; Peter de Lange later confirmed the det, adding that it was an unusual habitat for it), *C. goyenii* (erect yellowish clumps in the open), and locally the exotic *C. ovalis*.

Submerged by the lake margin was *Myriophyllum triphyllum* (common and bright green), *Lilaeopsis* (no it wasn't an aquatic fern!), and Doug's find of *Elatine gratioloides*.

Some 1.3km south of the Lodge we headed inland up to the road to meet the arranged transport at 6pm. Different species on the lakeside bank included a few pale green mats of *Raoulia australis* with yellow fertile centres, kowhai (*Sophora microphylla*) with divaricating juveniles, mountain beech (*Nothofagus solandri* var. *cliffortioides*) with abundant red-flowering mistletoes (*Peraxilla tetrapetala*) slightly past their best. Some of these mistletoes were so large and so showy that they were visible on beech trees nearly 1km away above the road. Riflemen were common in the beech forest and the adjacent scrub. One of the highlights of the walk was *Korthasella clavata* parasitising *Coprosma propinqua* (this earned Sally a chocolate fish for spotting it first). Also on the open grassy banks were the native grasses *Elymus solandri* (quite glaucous) and *Poa cita*; and a fern that New Zealand shares with the northern hemisphere, *Asplenium trichomanes*. What a great 3-hour introduction for us North Islanders.

Back at base the Ashton's had now arrived. After dinner (roast chicken) Anthony returned to the beech stand for Sandra to admire the *Korthasella clavata* at 10pm (long twilights are useful). Graeme and Gael arrived at 10.30pm after leaving the Wellington Bot Soc field trip at 4.30pm at Greymouth, we were now at our maximum with 26 people. The scientific room participants were the last to bed (as usual) about midnight.

Sunday 4th Jan – Ohau Skifield

We had the usual efficient start to the first day with breakfast eaten and lunch made by 8.50am. Access to Ohau ski field took us first to Ohau Lodge and views up the Dobson River to Aoraki, Mt Cook. The first hiccup of the day came halfway up to the skifield with a puncture on the new (!!) hire vehicle. We eventually started botanising by 9.50am. The herbfields and fellfields of the Ohau skifield provided more than enough botanical interest for all present. In the first hour we didn't make more than about 20m from the vehicles. There were woody plants and ferns, herbs and bogplants. We saw the most amazing *Nertera*

balfouriana, where we couldn't see the leaves for the abundance of orange pear-shaped fruit.

It was such a good time to visit with most of the plants in flower. Herbaceous plants in the seepage areas of the lower slopes of the skifield, many of which were in fruit or flower, were *Ourisia caespitosa, Bulbinella angustifolia, Epilobium, Neopaxia linariifolia, Cardamine debilis* agg., *Ranunculus gracilipes* agg., *Acaena saccaticupula* with robust flowering spikes, tiny *Myosotis pygmaea* var. *drucei*, and large flowered *Psychrophila obtuse* and *Oreobilis pectinatus* (beautiful comb-sedge).

Standouts were *Psychrophila obtuse* with flowers, fruit and curious double leaves, *Oreobilis pectinatus, Oreomyrrhis* "bog" new species, *Ourisia caespitosa*, and *Neopaxia linariifolia* initially mistaken for *Selliera*. *Bulbinella angustifolia* was still in flower and bud compared to the spent flowers at lake level. Short woody plants also occurring on the seepage were: *Gaultheria parvula* and *Coprosma atropurpurea* (large red berries and 'no' leaves).

Special plants found on rocky outcrops high on the scree slopes were *Anisotome pilifera, Ourisia sessilifolia* subsp. *splendida, Aciphylla dobsonii*, *Ranunculus haastii*, *Gentiana* (with red margins, *Hebe pinguifolia* agg. (also with red margins on leaf), *Raoulia grandiflora,* and *R. youngii.*

By lunchtime we had separated into high altitude and low altitude groups.

The mountaineer group left the other party on the skifield at 1800m and climbed to 1925m and along the tops. The view of the Main Divide from the top, and the overview of the power system from Ohau to Benmore was spectacular, though Aoraki (Mount Cook) remained elusively beneath cloud. The descent was steep, and we screed down – a bit more effort than some expected, the motel didn't seem any closer even halfway down. Coming down the mountain we came across the green-flowered *Clematis marata* (growing in *Chionochloa*) and more *Discaria toumatou* than we would have liked.

Despite the last of the group not arriving until 8pm, they were still in time for dinner due to the delay of the skifield exploration group. They had to deal with a flat tyre on Anthony's wagon, the second puncture for the day.

Monday 5th January – Trip to Round Stream

This was a day of several ventures, including tyre puncture repairs, the lower stream botanising group, the 'upper basin challenge' and independent adventurers.

The first 200m took 2 hours and entailed crossing and re-crossing the stream. Much debate covered detailed taxonomic features of *Coprosma propinqua* and other divaricating shrubs (*Aristotelia fruticosa* and *Melicytus alpina*). A clump of green *Raoulia* with yellow flowers had a perfume of 'dirty' honey. *Hoheria lyalli* was particularly appreciated such the majority of the group were northerners. *Arthropodium candidum* was seen in flower and had delicate feathery anthers. *Asplenium flabellifolium* was another special feature with the growing tips rooting.

Peraxilla tetrapetala was flowering profusely in very large clusters from many mountain beech. The tuis had been hard at work causing the blossoms to open. Two adult bellbirds and fledglings were spotted in the vicinity of these trees.

The group reached the waterfall ½ hour ahead of the time wagered by the puncture duo. At the waterfall large fronds of *Pyrrosia* were spotted across the stream on the rock cliffs.

After lunch the majority of the group struggled up an extremely steep and dusty slope with a shortage of hand holds. The promised basin along the waterfall did not materialise. The core of the independent adventurers found two basins, but the rest found only a plateau and were consoled by watching an agitated falcon wheeling and calling distractedly. Those in tents at the camp site struggled to keep them grounded from the wind gusts and spray from the lake.

The day ended with a third helping of coleslaw and plum stone spitting.

Tuesday 6th Jan - Hooker Valley Walk, Mt Cook National Park

Although the day was heavily overcast and interspersed with heavy rain showers the base of the Hooker Valley provided an awesome sight. The lower slopes of Mt Sefton and the Footstool supported a thick layer of snow and ice, which could regularly be heard cracking and moving occasionally sending an ice cliff thundering down the mountainside. The first species' to catch the eye were the large spaniards *Aciphylla aurea* and *A. scott-thompsonii* – the former being the more common of the two.

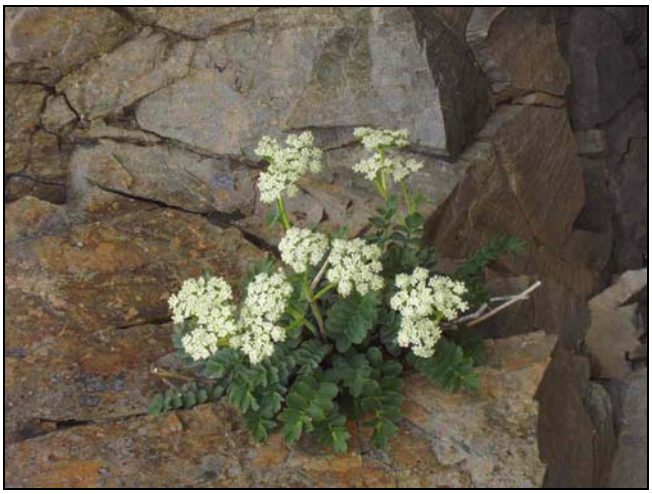
Numerous fine specimens peered out from behind mountain totara (apparently the hybrid of *Podocarpus hallii* x *P. nivalis*), itself very common. *Coriaria angustissima*, the feathery tutu, was an interesting sight for those from the north only familiar to its larger cousin *C. arborea*. At the first bridge numerous fine examples of *Celmisia semichordata* gave bright colour to the banks of the grey Hooker River and the appropriately named muttonbird scrub, *Brachyglottis rotundifolia*, was seen nearby in flower. In the open area next to the main track bright mauve flowers gave away the identity of the whip broom *Carmichaelia australis*.

Carex kaloides **on the western margin of Lake Ohau, 3 January 2004.**

Aciphylla dobsonii **- stiff as a hedgehog, high on scree slopes above Ohau ski field, 4 January.**

Peraxilla tetrapetela **on** ***Nothofagus solandri*** **var.** ***cliffortioides*** **(mountain beech), near Lake Ohau, 3 January**

Hooker Valley - Ewen and some fearsome friends.



Anisotome pilifera **high on scree slopes at the Ohau ski fields, 4 January 2004.**

The group packed and ready to leave minus Noel Ashton the photographer plus Doug Rogan, Paul Schoefield, Sally Warren?

A forced lunch stop during a heavy downpour proved to be a wise decision. The bank that the bedraggled botanists hunkered next to was home to *Geum cockaynei*, *Epilobium malanocaulon* (with its distinctive black stems), *Parahebe lyallii* and *Gingidia montana* all within a single square metre of rock face. Further on with bellies full and across the second bridge the areas famous 'lily' (buttercup) *Ranunculus lyallii* became very common. Unfortunately only a single flower was still present. It was also impressive to see three species of *Dracophyllum* (*D. kirkii, D. longifolium* & *D. uniflorum*) growing side by side.

Further up the valley the Hooker Glacier came into view. The Glacier was named after Sir William Jackson Hooker, Director of Kew Gardens, by Dr Julius von Haast in 1861. The terminal lake of the Hooker Glacier is a recent addition and has arisen with the retreat of the glacier itself - as evidenced by the fact that the Hooker Hut (perched up on the lateral moraine), is now more difficult to reach. On the return trip edelweiss (*Leucogenes leontopodium*) was spied adjacent to the track by a sharp pair of eyes. *Celmisia coriacea*, with its large, stiff, grey- green leaves and showy white flowers, and *C. verbascifolia*, with purple-stalked leaves, were conspicuous.

Yellow-flowered *Myosotis macrantha*, Hooker Valley, Mt Cook National Park. Also seen on North Temple Walk (7 January 2004, Photo: E. Cameron).

Bird activity in the park was possibly due to the low cloud. A lone kea was sighted near the glacier lake. Other species seen or heard were rifleman, dunnock, chaffinch, yellow hammer, Australasian harrier, house sparrow, pipits, grey warbler and black backed gulls. A possible sighting of kereru was made in the carpark although this was during the downing of the traditional (and well deserved) G&T's.

Wednesday 7th Jan – North Temple Walk

With a fine day after early morning cloud, nine of the more intrepid of the group headed up the Temple River bed, with the aim of making the North Temple cirque.

After admiring the extent and flowering of *Peraxilla tetrapetala* in the carpark, the group found many plants of interest – epilobiums, raoulias, parahebes, acaenas, and a *Colobanthus*, all of which were expected river bed plants. A surprise was a large *Myosotis macrantha* found on the open river bed.

The stream crossing was achieved by some with dry boots. On entering the bush, the North Islanders examined the unfamiliar *Pittosporum divaricatum*, and further on some of the group were entertained by a nosy kea which started to vandalise a tree.

The first view of the cirque had all the camera freaks clicking, and even those familiar with the place were amazed with the effects of a large avalanche. A large area of trees on the opposite side of the valley was flattened by the blast. On the lower slopes *Brachyglottis cassinioides* was seen with its papery bark helping to distinguish it from *Ozothamnus vauvilliersii*. The attractive grass *Poa subvestita* was in full flower, with its silky spikelets drooping over the stream.

The walls of the cirque yielded some lovely plants. The snow marguerites (*Dolichoglottis lyallii* and *D. scorzoneroides*) were both in flower, as were their lovely butter yellow hybrids. The little greenhood orchid, *Pterostylis humilis*, was in late flower under some tussock perched in a wetter area.

Higher on the slopes there were *Cheesemania fastigiata* and *Dracophyllum menziesii*, a large leaved *Dracophyllum* that reaches only about 1m in height. A real find was a completely yellow flowered *Myosotis macrantha*. There were big swards of *Celmisia verbascifolia*, right at peak flowering, and many *Ranunculus lyallii* still in flower.

Temple View Loop Walk

Those less intrepid botanists headed around the very scenic Temple View Loop Track. This was mostly in beech forest with some open areas, including the ridge. From a photographer's point of view, the highlights were the many orchids in flower: *Aporostylis bifolia*, *Chiloglottis cornuta*, *Gastrodia cunninghamii*, *Prasophyllum colensoi* and *Pterostylis australis*. *Brachyglottis haastii* was also very photogenic. Other finds were fine specimens of *Celmisia densiflora* (very sticky), *Schizeilema trifoliatum*, *S. haastii* and five

species of *Acaena*, including *A. jurenca* and very large plants of *A. dumicola*.

Keen eyes spotted a rifleman feeding fledglings in their nest and several others playfully flying about. We were also fortunate to see and admire a jewelled gecko (*Naultinus gemmeus*) on *Polystichum vestitum*.

Thursday 8th January - Kettleholes

To add to the variation of the week, on Thursday other points in the neighbourhood were explored. The kettleholes south of Lake Ohau on private land, possibly formed as ice blocks from retreating glaciers melted, yielded many treats such as the white star shaped creeping lily, *Herpolirion novae-zelandiae* here tall for it's species and on raised areas the purple flowered *Hebe pimeleoides*. Serious bottoms up inspection identified *Pratia angulata*, *P. perpusilla, Euchiton lateralis*, *E. traversii* and *Hypericum japonicum* amongst other small turf plants. Johnson (2003) notes that 20.6% of the named native New Zealand angiosperms occur in ephemeral wetlands.

Swan lagoon, on the left past the kettleholes but still on the Ohau Road, gave a variety of water birds including banded dotterel and New Zealand shovelers. The cream of the collection was two black stilts. Bill attracted a following when he gave an informal tutorial on the different pines – *Pinus nigra* cones were found by Kerry and Steve to make excellent cricket balls when whacked by stray fence posts. Two plants of interest in the turf around the lake, more in that they were unseen at the kettleholes, were *Selliera radicans* and *Triglochin striata*.

Lunch was by the Ohuriri River near the Clay Cliffs 10km west of Omarama. A 100m uplift of the stukk-active Ostler Fault has exposed gravels and silts that have weathered to striking pinnacles. The tilted layers are softly multicoloured and when walking in the ravines cameras were busy.

The heat of the day was relieved at the Omarama Pub while a delightful grey bearded member of the party quietly removed interesting 'weeds' from the roadside, collecting a large plastic bag full of specimens in a remarkably short time. The most interesting of these was *Potentilla argentea* with its dissected leaves and yellow flowers.

A brief stop on the way home at another kettlehole gave two species disguised with silver hairs and caused much discussion. These cryptic plants were later discovered to be *Parahebe canescens* (blue flowers) and *Leptinella maniototo* (sterile).

Juliet who celebrated her birthday by acquiring a most fetching possum down hat was given a birthday cake complete with candles, a miniature boat candle and the usual off – key rendition of "Happy Birthday".

Friday 9th January – Hopkins Valley

Heavy rain through the night and early morning, which raised the lake level, delayed the start of the day's trip up the Hopkins Valley. A party of well-wrapped passengers finally set off in 3 vehicles at 10.45 am to botanise the gravel flats at the head of the lake. Introduced plants dominated the grazed area, but some cushion plants also grew there, including *Raoulia australis, R. tenuicaulis, R. haastii, Scleranthus uniflorus, Muehlenbeckia axillaris* and *Leptinella serrulata.*

A short drive to the first bridge showed the power of the swollen streams, and also a fruiting plant of "dead sticks", *Helichrysum depressum.* It was decided at this point that lunch could be more comfortably eaten back at camp than out in the wind and rain.

Some time later another attempt was made on the Hopkins. Stops were made at several places up the river, mostly in swampy areas or gravel fans. Carex's seen were *Carex gaudichaudiana, C. sinclairii, C. echinata,* and *C. coriacea. Clematis marata* with numerous seed heads was draped over the divaricating shrubs. A second *Scleranthus* was seen, this time *S. brockiei*, with a less compact form and 2 minute flowers on each stalk.

The last stop, in a temperature of 8°C, was in a gravel scrape, where shelter was found behind matagouri and sweet briar bushes for the now traditional G&T, to be drunk in strange places. A final excitement was the discovery of red currant, *Ribes rubrum,* growing in the scrub, and this signalled time to return to the warmth and comfort of our base.

Freehold Stream, Ohau Range

Three less intrepid members set off for a short walk up the south end of Freehold Stream hoping to avoid the rain. One interested in insects, one livids and all hoping for different plants. There were a few bell birds, grey warblers, 1 tom-tit and possibly unknown creepers. Amazing livid song was celebrated until it was noticed that a piece of polystyrene on a bottle is very deceptive. There had obviously been a lot of rain in the night with deep furrows on the track and a thick carpet of mistletoe 'petals'. The only new plant was *Brachyglottis haastii* on the bare ground near the look out. One disappointing aspect was the lack of understorey which seems to be the case in the local patches of bush.

Birding

A different birding terrain for many with the opportunity to complete 6 Atlas squares for the revision of the New Zealand Bird Atlas. Highlights of the trip for most were – black stilt, riffleman with nest, brown creeper, tomtit, kea, New Zealand falcon, crested grebe, banded dotterel and black fronted tern.

A total of 50 different birds were seen and / or heard. Thanks to all the sharp eyed people who contributed to the Atlas Squares lists!

Mountains of thanks to our 'wondrous' chief organiser, Sandra Jones, and to her able South Island liaison, Anthony Wright, who hunted out superb field trip sites for us to explore. Special thanks must go to Graeme Jane for his amazing species lists and to Gael Doughy, Graeme and Cathy Jones for their inexhaustible knowledge of South Island alpine plants. Thank you to the whole party for the good vibes and great times, it was 'wondrous'!

Ewen thanks the Department of Conservation of the Canterbury Conservancy, for a permit to collect herbarium specimens, which allowed critical determinations to be made later, and added valuable additions to the Auckland Museum herbarium (AK).

Acknowledgements
I would like to extend my gratitude to Ewen Cameron for his proof reading, comments and persistence.

Reference
Johnson, P. (2003). Canterbury kettles and other ephemeral wetlands: Collection centres for native plant diversity. *Canterbury Botanical Society Journal* 37; pp 42-47.

Field Trip: On the sand – Karekare to Pararaha and back. 21/02/04

Ewen K Cameron

On an overcast and windy morning on 21 February 2004 twenty-five of us set out from the Karekare car park for a beach and dune walk down to the Pararaha Stream and back. The forecast for the day was for the wind and rain to increase.

The group consisted of Bot Soccers: Enid Asquith, Paul Asquith, Dean Baigent-Mercer, Steve Benham, Daphne Blackshaw (present but did not join the walk), Quentin Blackshaw, Ewen Cameron (leader), Lisa Clapperton, Sharen Graham, Peter Hutton, Jo Mackay, Elaine Marshall, Malcolm Simpson, Shirley Tomlinson, Alison Wesley, Barbara White, Bob White, Peter White, Mike Wilcox, Tony Williams, Maureen Young; and the following locals: Caroline Grove, Matthew Grove, Alan Moore, Julia Moore and Ryan Moore.

The dunes south of the Pararaha Stream have radically changed since the late 1980s, and are now flooded, permanently wet and form an extensive oioi sward (*Apodasmia similis*) – creating the largest freshwater wetland on the Auckland mainland (deep and difficult to walk through). But the dunes north of the Pararaha are totally different, being taller, undulating, and containing permanent wetlands only by the cliffs (up to Tunnel Point) and ephemeral ponds in the dune hollows. Our trip was restricted to north of the Pararaha Stream. The whole dune area is very dynamic and is constantly changing. For background information see under 'Karekare' and 'Whatipu Wilderness' in *A Field Guide to Auckland* (Cameron et al. 1997).

Karekare Point had to be negotiated slowly because the tide was quite high and a large swell was running. We followed the old Piha Tramway route (1907-21) still marked by sleeper spikes in the rocky headland. During recent years the build up of sand in this area has meant that the short cliff track no longer has to be used because the once deep gut impassable around high tide has now filled with sand. A few plants were viewed on the mainly bare rocky cliffs that are absent from the dunes: *Celmisia major* and *Asplenium obtusatum* subsp. *northlandicum*.

From here on we focused on the dune plants in the recently created 820ha Whatipu Scientific Reserve managed by the Auckland Regional Council (ARC), gazetted on 26 September 2002. There was a large (>100m across) shallow pool off Cowan Point, formed by the recent stormy weather (Fig. 1), which we rounded and headed inland to the back of the vegetated dunes and away from the freshening NW wind. The fore-dune was dominated by the long-creeping spinifex (*Spinifex sericeus*) and occasional much smaller clumps of the orange-leaved pingao (*Desmoschoenus spiralis*) – towards Whatipu this species locally dominates the fore-dunes. Small shrubs (<1m tall) of tauhinu (*Ozothamnus leptophyllus*) were present 50m in from the front of the fore-dune and as we ventured further landwards the bare sand decreased and the species diversity increased. Hawkbit (*Leontodon taraxacoides*) and shore bindweed (*Calystegia soldanella*) became common, and then knobby sedge (*Ficinia nodosa*) and gravel groundsel (*Senecio skirrhodon*). This later exotic species has greatly increased on the dunes over the last decade. Finally when there was no bare sand, knobby sedge was equally as dominant as the spinifex, which was now reduced to crowded clumps (not long-running over open sand). Other species were now commonly present: harestail (*Lagurus ovatus*), fleabane (*Conyza albida*), *Oxalis rubens* (Fig. 2), coxsfoot (*Dactylis glomerata*), pampas (*Cortaderia selloana*), toetoe (*Cortaderia splendens*) and tarweed (*Parentucellia viscosa*). Pampas was more common on the adjacent cliffs than on the sand – which was probably a reflection of it being more aggressively managed in the