Great Barrier Island,
Anniversary Weekend 25-28 January 2002

Ewen Cameron, Helen Preston-Jones, Graeme Jane, Mike Wilcox

Thirty-five Bot Soccers travelled out on the "Jet Raider" on Friday evening in pleasant, calm conditions, and on arrival at Tryphena located our gear (except for 1 bag) in the dark and bussed to the Crossroads Backpackers at Claris. Ewen Cameron was leader, Mei Nee Lee took the bookings, Maureen Young was Camp Mother (food), and Paul Asquith was the Cellarmaster.

The Party

Enid Asquith	Quentin Blackshaw	Fran Hinz	Garry McSweeney	Doug Shaw
Paul Asquith	Jan Butcher	Graeme Jane	Jenny McSweeney	Ann Sullivan
Mitchell Beazley	Ewen Cameron	Sandra Jones	Colleen Pilcher	Bob White
Olivia Beazley	Lisa Clapperton	Mei Nee Lee	Helen Preston-Jones	Mike Wilcox
Ross Beever	Georgie Gardner	Alistair MacArthur	Carol Ralph	Nancy Wilcox
Steve Benham	Peter Goodwin	Jo Mackay	CJ Ralph	Pam Wilcox
Daphne Blackshaw	Gael Doughy	Carol McSweeney	Juliet Richmond	Maureen Young

Introduction (by Ewen Cameron)

Great Barrier Island is about 40 km long x 15 km across at the widest point, covering c.285 square km, making it New Zealand's fifth largest island by area. Yet it supports a native vascular flora >570 species (see Table 1 and Appendix 1), which is 45% greater than that of the Chatham Islands (NZ's 4th largest island), and only 4% less than the native flora of Stewart Island (NZ's 3rd largest island) (Cameron 2001). Cook aptly named the island, as its length truly acts as a barrier for the Hauraki Gulf. Sandy beaches on the exposed east coast are in marked contrast to the deep drowned river-valleys (harbours) of the west side that support tall mangroves (*Avicennia marina*) along their sheltered margins. Numerous small islands and islets nestle close to Great Barrier, the largest being Kaikoura Island (564 ha) forming Fitzroy Harbour, and Rakitu (Arid) Island (350 ha) being the only sizeable island on the eastern side.

In the past Great Barrier's vegetation suffered many large-scale clearances, including: those by pre-uropean Maori, European mining for precious metals, logging and gum digging, followed by fire and farming. The nutrient deficient soils resulted in much of the cleared land 'reverting' to manuka (*Leptospermum scoparium*). Today, most of the Barrier forests are still regenerating from past clearances, resulting in kanuka

Plant group	Totals
Ferns & fern allies	121
Conifers	13
Dicot trees & shrubs	132
Mistletoes	3
Dicot herbs	112
Dicot climbers	20
Monocot climbers	2
Grasses	32
Orchids	49
Other monocots	92
Totals	**576**

Table 1: Native vascular flora of Great Barrier Island & associated islands; hybrids excluded.

(*Kunzea ericoides*) being the most abundant woody species on the island. But on some of the poor soils low manuka may still dominate. Even the tall northern forests of Te Paparahi in the north are regenerating, as indicated by the scattered appearance of tall kanuka.

Great Barrier Island lacks possums, but feral goats (since Cook?) and pigs have been present for a long time. The goats particularly have highly modified areas of forest, especially in Te Paparahi where they have recently been eradicated. Because it's an island with only some1000 residents many environmental weeds common elsewhere in NZ are either absent or very local on Great Barrier (most weeds begin as garden ornamentals). The island supports some 75 nationally or regionally threatened and uncommon vascular plant species, and two endemic shrubs. It is also the stronghold for several threatened bird and lizard species, and Hochstetter's frog. Great Barrier is recognised by the Department of Conservation (DoC) as a key conservation area, and it administers nearly 66%, Auckland City Council administers another 10 %, and several private landowners now actively controlling plant and animal pests on their own land. Cameron (1985) summarised its natural values when documenting a case for better protection for the natural areas.

The object of the Bot Soc trip was to visit as many different habitats as possible: forest, shrubland, hot pools, freshwater wetlands, estuarine habitats, and sand dunes. The traverse of Hirakimata (Mt Hobson) has to be the most diverse and spectacular botanical walk in the Auckland region; Te Ahumata plateau (Whitecliffs) has stunted vegetation on mineral-rich soil; hot pools are bordered by lush vegetation; Kaitoke wetland – is the largest and probably the most unmodified wetland in the Auckland region; and Whangapoua – has wonderful zonation of estuarine vegetation and is probably the best unmodified estuary in northern NZ. The accommodation limited the trip to 35 people.

Day 1: 26 Jan: Traverse of Hirakimata (Mt Hobson) (by Helen Preston-Jones)

This started early; it was to be a long day (Ewen estimated it would be an 8 hr tramp). Breakfast over; sandwiched up, our party of 34 (1 member left behind still recovering from a strenuous South Island tramp), led by Ewen, expert on things Barrier, boarded two local buses to take us to the start of the trip, which was to be the traverse of Hirakimata. We started from the NE side and climbed up through Windy Canyon, to lunch on the island's summit, Hirakimata, before descending steeply past two kauri dams, to reach the road end near Port Fitzroy. Here waiting buses brought us back to the Crossroads Backpackers and we freshened up, before wandering round to the neighbouring Claris Club, to EAT OUT. A first for a Bot Soc trip! Definitely saved on the cooking and the duties. While most of the party retired early, a few carried on well into the small hours keeping the locals on their toes.

Tall, semi-wild pines (*Pinus* spp.) surround the Backpackers at Claris, a mixture of regenerating tea tree and paddocks. A very sandy soil, as we were not far from the beach. On the winding bus trip to the start of the track (320m asl), the native bush closed in around the road as we gained height. All height gained was welcome as Hirakimata summit is 627 m asl.

The local DoC ranger, David Agnew, and his three-year-old son, Phoenix, met us. David had previously been stationed on Little Barrier and specialises in threatened species. (Phoenix's upbringing in hilly country was evident as he lasted the trip a lot better than some of the party – although he was carried for a considerable distance!). We began walking at 9am. Windy Canyon lived up to its name, the wind being funnelled between towering cliffs. The area is part of an eroded rhyolite dome, and the steep cliffs were densely covered with rata vines, including *Metrosideros perforata* in flower, wind-pruned and hugging the rock faces. *"Awe inspiring" – Daphne.* A few plants of *M. fulgens* were also in flower - rather out of season. Other vegetation clung in damp crevices, including *Dicksonia lanata.* This small tree fern has an interesting Auckland distribution because it is absent from the Auckland mainland, Little Barrier, and is uncommon on the Coromandel Peninsula. Views from the narrow stepped and board-walked track were spectacular, out over extensive bush clad slopes of the central high ground or out to the east coast. Tui and kaka were heard, and further along the track, a kakariki (red-fronted?) was seen.

Having climbed steeply through the narrow Windy Canyon fissures, the vegetation changed. Here we found a shrubland of wind shorn kanuka, *Kunzea sinclairii,* noticeable for its often prostrate form and grey green foliage due to the silvery hairs, the rounded leathery leaved of *Olearia allomii,* (the last two shrubs both unique to Great Barrier), *Pseudopanax discolor* and mairehau (*Leionema nudum*). *Schizaea fistulosa* (common) and non-bifid *S. bifida* were found (by those who had *"got their eye in" – Maureen*) together with the summer-flowering orchid, *Orthoceras novae-zeelandiae.* Four species of club mosses were common (*Lycopodium deutero-densum, L. volubile, Lycopdiella cernua* and *L. lateralis*). There were extensive areas of *Loxsoma cunninghamii, "Oh, that luscious Loxsoma" - Enid.* Other species that stood out were *Gahnia xanthocarpa,* very sharp and shiny green tussocks, *Sticherus flabellatus,* also bright green and shining in the sun, the much duller umbrella fern, *S. cunninghamii.* Occasional kauri (*Agathis australis*) emerged through the dense vegetation, as did *Halocarpus kirkii,* mainly in juvenile form (large-leaved) but with some usefully showing the adult form (scale-leaves) on higher branches, for comparison.

In this shrubby area Ewen rescued an adult black petrel (a summer nester now restricted to the two Barrier Islands) that had crash-landed the night before, and become hung up in a tea tree by its wing (fortunately not broken). It was cautiously wrapped in a shirtfront by CJ, for lack of a stout bag, and carried on to the summit, where it was handed over to the pair of black petrol researchers. They were camped out on the summit, studying the species. *"My best memory? Coming round the corner and seeing Paul with a grin on his face holding that black petrel" – CJ.*

On an open ridge people caught their breath as David Agnew described DoC's recent management of the threatened brown teal ducks on the island whose population had halved since the 1980s. At Whangapoua wild cats were trapped (130 caught) and pukekoes reduced from 2-3000 to 800 birds. The result was a marked increase in ducks in one season. Along the open track margins a moss with papery leaves, *Pulchrinodus inflatus*, was common.

As we gradually gained height, towai (*Weinmannia silvicola*) started to dominate the forest. Here there was evidence of past logging, with a remnant of the steam haulage pulley 'arch' for the ropes that dragged logs over the ridge down to the valley, to be ferried out of Whangaparapara on the west coast. The Parker Lamb Timber Company held the license in 1924 to log this area, and logged this area for two years.

"Highlights? The magical virgin forest of yellow-silver pine" – Mike. The upper slopes of Hirakimata (40 ha), had not been logged, and towai suddenly gave way to podocarp/tawari (*Ixerba brexioides*) forest and then unique kauri and yellow-silver pine (*Lepidothamnus intermedius*), with miro *Prumnopitys ferruginea*, southern rata (*Metrosideros umbellatum*), *Dracophyllum patens*, and very locally the shrubby Parkinson's rata (*M. parkinsonii*). The latter is found only on the Barrier Islands and on the west coast of the South Island. Also present was toro (*Myrsine salicina*), toatoa (*Phyllocladus toatoa*), tawheowheo (*Quintinia serrata*), hinau (*Elaeocarpus dentatus*), *Pittosporum kirkii*, the less often seen *Archeria racemosa*, *Epacris pauciflora* var. *sinclairii*, the very variable and lush *Alseuosmia macrophylla*, *Astelia trinervia*, *Coprosma dodonaeifolia*, *Pseudowintera axillaris*, and a wide variety of ferns. *Libertia micranthus* was common on the ground. The tufted ground fern, *Trichomanes strictum* was locally dominant, *Grammatis* spp. were common as low epiphytes, the fern ally, *Tmesipteris tannensis*, with those upward 'boats' (sporangia) on the upper stem leaves stood out, and more *Dicksonia lanata* were present, with trunks typically angled along the ground, with a "plastic" feel to the fronds, and a 50/50 lamina length to stipe ratio. (Diagnostic characteristics were keenly sought by the note taker and ably supplied by the experienced in the party).

Those at the front of the party, to enlighten those following more slowly, had left a paper trail of plant labels. These clear botanical names gave way, about ten minutes before the summit, to common plant names; perhaps a sign that blood sugar levels were sinking and lunch was required?

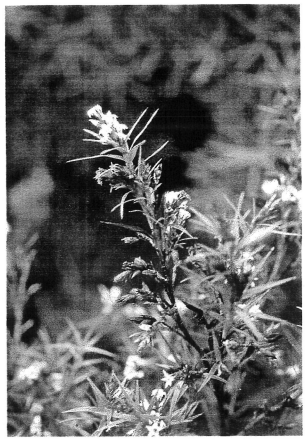
Lunch was eaten on the summit platform, which was reached by most of the party 1.30 - 2pm. The weather had closed in a little, still warm but overcast and with shifting cloud and a slight dampness in the air, which interrupted the views to the west coast. Here we met up with the two black petrel researchers who were staying in a hut near the summit. They had found 262 nests within a 30 ha area this year, and we able to have a close look at a newly hatched chick. The peak hatching period on Great Barrier is the first week in February. The chick, covered in fine dense black down, was about 6 days old and it would be 105 days before it was developed enough to leave the island.

The prominent ridges of Hirakimata are obsidian breccia, soft and pumice like in parts. These provide good footing for the adult birds to take off and we found traces of scratch marks on open rocky points, left by the birds' claws when scrambling up. It was the birds' crash landing technique that resulted in us finding the adult bird earlier.

The western ridge we descended was even steeper than the eastern, dropping down to the Kaiarara Stream valley coming out just south of Port Fitzroy by the coast. The upper part of the track down had been recently upgraded to a series of timber staircases and platforms, doing away with the muddied, shoulder high gullied and wire strop descent. The forest type changed to kohekohe (*Dysoxylum spectabile*) /taraire (*Beilschmiedia tarairi*) /nikau (*Rhopalostylis sapida*), and in places puriri (*Vitex lucens*) /nikau as we descended. More *Metrosideros*, *M. albiflora* this time with its large leaves. Near the track there were two of well-preserved kauri dams built in the 1920s (the upper one a header dam), and the stream provided numerous swimming spots, well placed to cool hot bodies. Jo, in borrowed boots,

1. **Bot Soc on the way up Hiakimata (Mt Hobson) from Windy Canyon. Looking NE over the regenerating shrubland.**
2. ***Dracophyllum patens* in flower, Te Ahumata, also seen at Windy Canyon and Hirakimata. Why is it absent from Little Barrier?**
3. **Pohutukawa, 1 m tall, in flower, Te Ahumata; stunted vegetation on mineral-rich soils.**
4. **Remains of Kaiarara Valley kauri driving dam, built in 1924.**
5. **Botanising the dune slacks, Whangapoua; with Rakitu (Arid Id) in the background.**

Photos 1&5: Mike Wilcox; 2,3&4: Ewen Cameron.



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took an involuntary swim when crossing one of the streams, wetting her only clothes. Her luggage had failed to make it past the Tryphena disembarkation process, a pitch-black lottery if you can't remember the number of the container in which you gear was stowed (it was finally returned 2 days later). Others took their clothes off first.
"My best memory? The SWIMS" – Colleen.

After 9 hours and 9.5 km of walking the buses were a welcome sight which the stragglers reached by 6pm. Botanising continued out of the windows on the long route across the island, past our starting point, back to the Backpackers. A rush for the showers, and then round the corner to the Claris Club to discuss the highlights over dinner.

Day 2: 27 Jan : Te Ahumata and Kaitoke Springs and Wetland (by Graeme Jane)

After a short bus ride we arrived at the Whangaparara Saddle. The first walk for the day was through generally low, often poor shrubland to the Te Ahumata Trig. Much of the way the track was dominated by kanuka with hakea (*H. gibbosa* & *H. sericea*) but that hid many treasures such as kauri, *Brachyglottis kirkii*, tanekaha (*Phyllocladus trichomanoides*), pohutukawa (*Metrosideros excelsa*), *Alseuosmia quercifolia*, and *Corokia buddleioides* to name a few. Along the broad track, often in the middle of it *Schizaea fistulosa* was abundant at first and was later largely replaced by the narrower headed *S. bifida*. Another common pair of swamp ferns were the *Gleichenia* species. Here they were readily distinguished: the dull *G. dicarpa* with its in-rolled margins, white under-sides and groups of 2 sori contrasted with the shiny *G. microphylla* with its flat margins and groups of 3 and occasionally 4 sori. In a patch of taller shrubs the shiny-leafed maire (*Mida salicifolia*) made its first appearance for the day.

The track provided great opportunity to study the sedges, and in one wet area Mike ably pointed out the distinguishing features of a variety of *Baumea* and *Schoenus* species: *Baumea juncea* with its hooked bract and blue-green culms; *B. tenax* with its tight clumps, red bases and oat-like heads; *B. teretifolia* scattered through the *Gleichenia* with few seed heads showing and oval stems; *B. rubiginosa* often with the single small branch in a rather dense head; *Schoenus tendo* with the hairy sheath be below the flower head; *S. brevifolius* with large seeds and stout stems and *S. maschalinus* contrasting with the other rush-like plants, forming a weft-like bright green mats in the wet keeping company with the darker green swards of *Eleocharis gracilis,* with terminal ovoid heads.

Past the track fork the scrub became shorter and rocks quite apparent. Here the local endemics *Olearia allomii* and *Kunzea sinclairii* were quite common along with *Dracophyllum patens*. Then came the find of the day: *Thelymitra cyanea* in its usual blue glory and curled yellow column horns, like merino horns within. A little further on several pale cream flowers of the same species were found. Here too in the low vegetation of the ridge our first filmy ferns - crowded in the space between rocks were *Hymenophyllum revolutum, H. multifidum* and *Trichomanes reniforme* sharing the cleft with the orchids *Bulbophyllum pygmaeum* and *Earina mucronata,* the last as a sort of canopy plant!

The summit provided good views of the island and on rocky ground amongst low, scrub quite a bundle of lycopods could be found within a few metres - they included *Lycopodium deuterodensum, L. scariosum, L. volubile, Lycopdiella cernua* and *L. lateralis.*

The return to the saddle for lunch provided opportunity for all to share finds and hints gathered on the upward journey.

After lunch we headed off for the Hot Springs via the old forestry road to Port Fitzroy. This passed through several good forest stands before we reached the turn off and provided a wide range of forest species we had scarcely seen on previous days, including a good stand of ricker kauri. Highlights here included *Mida salicifolia* with a huge range in leaf shapes from nearly oval to quite linear, often with wide variation on one tree; adult *Pittosporum virgatum* to complement the unusual-shaped juvenile leaf seen the previous day and a good suite of "kauri" plants. These included *Halocarpus kirkii, Leionema nudum, Corokia buddleioides, Pseudopanax discolor* and *Gleichenia dicarpa*. At one point a large plant of *Ileostylus micranthus* hung over the road on a huge kanuka, only the second site that it has been recorded from on the island.

After the turnoff the track followed an old tramway to the Kaitoke Wetland mostly through heavily modified kauri forest, now with few kauri, much tall kanuka and several maires (*Mida* & *Nestegis*) to test us. There were also several good patches of the giant moss, *Dawsonia superba.* Shortage of time and a desire to reach the hot springs hastened our journey over this sector. At the springs *Sticherus flabellatus* was abundant and some of us lolled back into patches of that primitive land plant, *Psilotum nudum.* Two grasses of note near the springs were *Paspalum orbiculare* and *Panicum huachucae*. While all were in the water as a treat for the bird watchers, a banded rail (evidently a regular here) darted amongst our clothes piles.

After the soak in the springs it was time to see more of the swamp plants (from the safety of the boardwalk) and revise them. The main new additions were the huge ones: *Baumea articulata* with a large dense head and internally septate stems; *Schoenoplectus tabernaemontani* with a knobby head of spikelets and the triangular stemmed *Bolboschoenus fluviatilis*. A special find was the orchid *Spiranthes novae-zelandiae* in glorious flower amongst the dense sedges. A little further on amongst raupo the huge scented-leaved Brazilian fireweed (*Erechtites valerianifolia*) towered to over 2 m. The final sector of the track was through gully forest including some huge

puriri on a flooded streambed, then back onto the road for a 2km walk back to the Backpackers.

The final excitement for the day was when one of the party rang from Kingfisher Lodge at Whangaparapara: she had exited from the Springs walk and headed the wrong way (fortunately she had enough money for a beer before ringing)!

Day 3: 28 Jan: Whangapoua Beach and Wetlands (by Mike Wilcox)

Armed with "Botany of Whangapoua wetlands and dunes" by Ewen Cameron (1999), and with the man himself leading us, we headed into what is now recognised as one of the largest and least disturbed wetlands in our region. Initially we explored the margins of a ditch and the rush-infested pastures near Okiwi airstrip, where we noted a suite of *Juncus* species including four leafy species - *J. articulatus*, *J. dichotomus*, *J. microcephalus* and *J. planifolius* - and five leafless species – *J. effusus* var. *effusus*, *J. effusus* var. *compacta*, *J. australis* (the dominant rush of the pastures), *J. sarophorus*, and *J. pallidus* (the form with a compact, not diffuse flowering head). Other plants seen in this habitat were the sedges *Eleocharis acuta*, *Isolepis distigmatosa*, and *Gonocarpus micranthus*. Sneezewort (*Centipeda minima*) occurs here, but we had no luck in locating it. Adding interest was the discovery of a freshly dead headless eel, thought at first to be a lamprey, which was subsequently brought home for the Museum by Mei Nee Lee.

Marshes immediately behind the sandy beaches of the tidal estuary were dominated by stands of bulrush (*Schoenoplectus tabernaemontani*), with flax (*Phormium tenax*), *Cyperus ustulatus*, and *Eleocharis acuta*, with also several dicot herbs prominent – *Ludwigia palustris*, *Polygonum salicifolium*, *Calystegia sepium* (the narrow-leaved native form), *Potamogeton cheesemanii*, *Lilaeopsis novae-zelandiae*, and the buttercup, *Ranunculus amphitrichus*. On the sandy estuarine margins were stands of *Baumea juncea*, with *Juncus kraussii* var. *australiensis*, *Apodasmia similis*, and *Isolepis nodosa*. The sandy beach itself had much *Carex pumila*, *Calystegia soldanella* (in flower), *Spinifex sericeus*, *Lachnagrostis billardierei*, *Zoysia pauciflora* (holding its own amongst buffalo grass, and the lovely native *Oxalis rubra*, here very diminutive, and with the flowers and fruits looking relatively large. Harestail grass (*Lagurus ovatus*) and buffalo grass (*Stenotaphrum secundatum*) abound at this site.

Phase III of the day's excursion was the crossing of the Whangapoua Estuary, which turned out to be a major event in itself. Ewen and Graeme went ahead and tested the water, but turned back after assuring themselves that the water was deep enough to seriously inconvenience the rest of the party (i.e., we would all have to swim across). Paul also made a recce and likewise got rather wet, and had to turn back. It was then left to two strong swimmers Helen and Colleen to swim across in the togs, and duly wait for the rest of the party to arrive. Later, Jo recconnoitered the water depth just inside the entrance bar, and after another hour, the water had fallen to allow us all to get across in various stages of dress (or undress). In all this fun and excitement, there had been a temporary pause in the botanising, but Maureen located *Wahlenbergia littoricola* subsp. *vernicosa* (de Lange & Cameron 1999), *Arthropodium cirratum* and *Pimelea* aff. *urvilleana* on the rocky cliffs, and also picked up a large, sea-worn 4-angled fruit of the fish poison tree (*Barringtonia asiatica*). These fruits are sometimes used as floats for fishing nets in the Pacific islands, where it is a common, spreading seaside tree.

We walked the length of Whangapoua Beach, admiring the magnificent sand dune vegetation of pingao (*Desmoschoenus spiralis*), spinifex (*Spinifex sericeus*) and sand sedge (*Carex pumila*), together with extensive populations of shore cottonwood (*Ozothamnus leptophylla*). *Austrofestuca littoralis* is present here, but we could not find it - this minor disappointment being more than made up for by grand views out across the dunes to Rakitu (Arid) Island. Dune slacks here were rather dry, but supported a thin vegetation comprising runners of sea paspalum (*Paspalum vaginatum*), scattered dwarf tufts of *Isolepis cernua*, *Carex pumila*, *Lachnagrostis billardierei*, *Selliera radicans*, *Samolus repens*, *Ranunculus acaulis*, *Lilaeopsis novae-zelandiae*, *Triglochin striata*, *Lobelia anceps* (with flowers of a deep mauve hue), hawkbit (*Leontodon taraxacoides*), and scarlet pimpernel (*Anagallis arvensis*). There was plenty of interest here to engage the attention of the visiting colony of *Botanistum prostratum* for a considerable time.

On the ornithological side, the beach and estuary yielded some groups of white-fronted tern, Caspian tern, red-billed and black-back gulls, a few banded dotterel, New Zealand dotterel, lesser knot, bar-tailed godwit, a golden plover, spur-winged plover, pied stilt, some white-faced herons, several South Island pied and variable oystercatchers, and bodies on the beach of a fairy prion, a fluttering shearwater, and a Buller's shearwater. On the creek where we went up at Mabey's farm, were goodly numbers of brown teal, quietly drifting in little groups or dozing on the bank. Our buses arrived on time to return us to the Backpackers and then down to the boat.

The return trip to Auckland on the "Jet Raider", again in fine, calm conditions, was a time to reflect on the wonderful three days we spent in good company on Great Barrier Island, from the top of Mt Hobson to the bottom of Whangapoua Estuary, and plenty in between, to admire Mt Moehau from comparatively close quarters, and to watch for sea birds. Sea birds seen on the way out and back were giant petrel, fluttering shearwater, Buller's shearwater, gannet, Arctic skua, black-backed gull, red-billed gull, and white-fronted tern. Ewen had to be restrained once again, from leaping overboard and swimming off to make a species list of Channel Island

("The Watchman") – one of his remaining unconquered islets in the Gulf.

Interesting botanical observations/collections during the Bot Soc field trip and other comments (by Ewen Cameron)

* = naturalised species

*Banksia integrifolia** single 80cm tall plant on sand dunes, addition to Whangapoua flora by Cameron (1999) (AK 255517). Seed from a banksia windbreak north of here?

Bolboschoenus fluviatilis; 240 cm tall, a very tall specimen (100-200cm in Flora of NZ, vol. II) western fringe of Kaitoke wetland, see above under Day 2 (AK 255511).

Collospermum microspermum - a few plants present (low epiphytes) on track margin in unmilled forest just NE of Hirakimata at c.500m asl; new record for the central part of Great Barrier; previously only known on Great Barrier from the northern high point at Tataweka; (AK 255501-02).

Coprosma dodonaeifolia – Hirakimata area, N geographic limit and also occurs on Little Barrier – addition to 'Limits and Status' list by Cameron (2001: 84).

Dicksonia fibrosa – single c.1.7 m tree fern roadside, south end of Tryphena-Kaitoke Rd, locality pointed out to us by Jeremy Warden; new record for Great Barrier (AK 255519).

*Erechtites valerianifolia** - 2m tall, twice the height recorded by Webb et al. (1988); see above under Day 2.

Erica pauciflora var. *sinclairii* - Hirakimata area, N geographic limit, not known on Little Barrier – addition to 'Limits and Status' list by Cameron (2001: 84).

*Gladiolus undulatus** - local in salt marsh, addition to Whangapoua flora by Cameron (1999).

Isolepis distigmatosa – wet ditch at Whangapoua, see above under Day 3; new record for Great Barrier (AK 255925). Congratulations to Mike for critically looking at this subtle species.

*Juncus microcephalus** – wet ditch, see above under Day 3; addition to Whangapoua flora by Cameron (1999) (AK 255512).

Juncus sp. - track margin, lower Te Ahumata.; the identification of this collection has varied from *J. filicaulis* to *J. gregiflorus*; more material required for a positive identification (AK 256716).

Pseudopanax arboreus x P. discolor – single plant observed between its two suspected parents by Mike on Day 2 in the shrublands east of Hirakimata; new hybrid record for Great Barrier.

Ranunculus acaulis – dune slack, addition to Whangapoua flora by Cameron (1999); see above under Day 3 (AK 255516). First spotted by Maureen.

Schoenoplectus tabernaemontani – 293 cm tall, a very tall specimen (recorded as 60-270cm tall in Flora of NZ, vol. IV), in narrow raupo wetland Tramline Track margin (AK 255509).

Schoenus maschalinus - wet ditch; addition to Whangapoua flora by Cameron (1999).

Thelymitra cyanea – Te Ahumata, new record for Great Barrier, see above under Day 2 (AK 255506); Peter de Lange (pers. comm.) has also seen this species near the Kaitoke hot pools.

Acknowledgements

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Appendix 1. Native vascular plant species list for Great Barrier and associated islands (by Ewen Cameron)

This list is based on the one for Great Barrier Island by John Bartlett and Rhys Gardner (1983), with additions from the outer islands, especially Rakitu (Arid) Island from Cameron and Wright (1982), published general additions and orchids additions from de Lange (1990, 2000), an unpublished plant list of the Windy Hill area by Cathy Jones and Catherine Beard (1994), and herbarium specimens in the Auckland Museum (AK) mainly collected since 1983 (many collected by Peter de Lange). Where there is doubt about a species being indigenous to New Zealand, it has generally been included (cf. Bartlett & Gardner 1983: 25). A draft of this list was initially collated for the Flora chapter of the *Great Barrier Island* book by Cameron (2001) but was not published. It was

also used for the Bot Soc trip. The complete naturalised flora has never been assembled but is being worked on (Cameron & de Lange *in prep.*).

A = also recorded for Arid (Rakitu) Island, from Cameron and Wright (1982)
AK/CHR = herbarium vouchers are cited for taxa that may be unclear
E = presumed extinct on Great Barrier (18 spp.)
* = no voucher specimen in AK or AKU (to focus future collecting)
† = addition to list of Bartlett & Gardner (1983); hybrids excluded

Ferns and fern allies (121 + 1 hybrid)

Adiantum aethiopicum A
A. cunninghamii A
A. diaphanum A
A. fulvum
A. hispidulum A
A. viridescens
Anarthopteris lanceolata A
Arthropteris tenella A
Asplenium bulbiferum subsp. *bulbiferum* A
Asplenium bulbiferum subsp. *gracillimum*†
A. flabellifolium
A. flaccidum A
A. haurakiense A
A. hookerianum
A. lamprophyllum† A
A. oblongifolium A
A. obtusatum subsp. *northlandicum* A
A. polyodon A
Blechnum chambersii
B. discolor
B. filiforme A
*B. fluviatile**
B. fraseri
B. membranaceum
B. novae-zelandiae A
B. norfolkianum† A only
B. procerum†
B. novae-zelandiae x *B. procerum*
Botrychium australe
Cheilanthes distans
C. sieberi subsp. *sieberi*
Ctenopteris heterophylla
Cyathea cunninghamii
C. dealbata A
C. medullaris A
C. smithii
Deparia petersenii subsp. *congrua* A
Dicksonia fibrosa†
D. lanata
*D. squarrosa**
Diplazium australe A
Doodia australis A
D. mollis
D. squarrosa†
Gleichenia dicarpa
G. microphylla
Grammitis billardierei
G. ciliata
G. magellanica subsp. *nothofageti*
*G. patagonica**
G. pseudociliata
G. rawlingsii
G. aff. *billardierei*† (CHR 367188)
Histiopteris incisa A
Huperzia varia A
*Hymenophyllum armstrongii**
H. bivalve
H. cupressiforme†
H. demissum A
H. dilatatum A
H. flabellatum A
H. flexuosum†
*H. lyallii**
H. multifidum
H. rarum A
H. revolutum
H. sanguinolentum A
H. scabrum
Hypolepis ambigua A
H. dicksonioides A
H. distans
H. lactea†
H. rufobarbata
Lastreopsis glabella A
L. hispida
L. microsora subsp. *pentangularis*
L. velutina A
Leptopteris hymenophyllioides
Lindsaea linearis
L. trichomanoides
L. viridis E
Loxsoma cunninghamii
Lycopodiella cernua A
L. lateralis
Lycopodium deuterodensum
L. scariosum
L. volubile A
Lygodium articulatum A
*Marattia salicina** E
Microsorum pustulatum subsp. *pustulatum* A
M. scandens A
Ophioglossum coriaceum A
O. petiolatum
Paesia scaberula A
Pellaea falcata†
P. rotundifolia A
Phyllioglossum drummondii† A only, E
Pneumatopteris pennigera A
Polystichum richardii A
Psilotum nudum A
Pteridium esculentum A
Pteris aff. *comans* A
P. macilenta
P. saxatilis
P. tremula A
Pyrrosia eleagnifolia A
Rumohra adiantiformis
Schizaea bifida
S. dichotoma
S. fistulosa
Sticherus cunninghamii
S. flabellatus
Tmesipteris elongata subsp. *elongata* A
T. elongata subsp. *robusta* A
T. lanceolata A
T. sigmatifolia
T. tannensis
Trichomanes elongatum
T. endlicherianum A
T. reniforme A
T. strictum
T. venosum

Conifers (13)

Agathis australis A
Dacrycarpus dacrydioides
Dacrydium cupressinum
Halocarpus kirkii
Lepidothamnus intermedius
Lidocedrus plumosa
Manoao colensoi
Phyllocladus toatoa
P. trichomanoides
Podocarpus hallii
P. totara var. *totara* A
Prumnopitys ferruginea A
*P. taxifolia**

Dicot trees and shrubs (132 + 8)

Alectryon excelsus subsp. *excelsus*
Alseuosmia macrophylla A
A. x *quercifolia* A
Archeria racemosa
*Aristotelia serrata**
Ascarina lucida
Avicennia marina subsp. *australasica*
Beilschmiedia tarairi A
B. tawa (incl. *B. tawaroa*) A
Brachyglottis kirkii var. angustior
B. kirkii var. *kirkii*
B. repanda A
Carmichaelia australis A
Carpodetus serratus
*Clianthus maximus** E
Coprosma acerosa A
C. arborea A
C. areolata
C. dodonaeifolia
C. grandifolia A
C. lucida A
C. aff. *macrocarpa* A (AK 117608)
C. propinqua var. *propinqua**
C. repens A
C. rhamnoides A
C. robusta A
C. spathulata
C. aff. *macrocarpa x C. robusta* A
Coriaria arborea A
Corokia buddleioides (incl. var. *linearis*) A
Corynocarpus laevigatus A
Cyathodes juniperina A
Dodonaea viscosa A
Dracophyllum latifolium
D. patens
D. sinclairii (incl. *D. adamsii*)
Dysoxylum spectabile A
Elaeocarpus dentatus
E. hookerianus†
E. dentatus x *E. hookerianus**
Entelea arborescens A
Epacris pauciflora var. *pauciflora*†
Epacris pauciflora var. *sinclairii*
Fuchsia excorticata A
F. procumbens
Gaulthera antipoda A
Geniostoma rupestre var. *ligustrifolium* A
Griselinia lucida
Hebe macrocarpa var. *latisepala*
H. parviflora var. *arborea*
H. pubescens
H. stricta var. *stricta* A
H. "Great Barrier" † (AK 229442)
Hedycarya arborea A
Helichrysum lanceolatum (incl. *H. aggregatum*) A
Hoheria populnea A
Ixerba brexioides
Knightia excelsa A
Kunzea ericoides subsp. *ericoides* A
K. ericoides var. *lineatum*†
K. ericoides x K. sinclairii
K. sinclairii
K. sinclairii x *Leptospermum scoparium*
Laurelia novae-zelandiae
Leionema nudum
Leptospermum scoparium A
Leucopogon fasciculatus A
L. fraseri A
Litsea calcaris A
Lophomyrtus bullata
Macropiper excelsum subsp. *excelsum* A
M. excelsum subsp. *peltatum*†
Melicope simplex
M. ternata A
Melicytus macrophyllus
M. micranthus
M. novae-zelandiae subsp. *novae-zelandiae*†
M. ramiflorus subsp. *ramiflorus* A
Metrosideros excelsa A
M. parkinsonii
M. robusta
M. umbellata
M. excelsa x *M. robusta*
M. novae-zelandiae x *M. ramiflorus*
M. robusta x *M. umbellata*
Mida salicifolia†
Myoporum laetum A
Myrsine australis A
M. salicina
Nestegis apetala A
N. cunninghamii†
N. lanceolata A
N. montana
Olearia allomii
O. furfuracea A
O. rani A
O. solandri
Ozothamnus leptophylla A
Pennantia corymbosa†
Pimelea arenaria E
P. longifolia
P. aff. *urvilleana* A
P. tomentosa
Pisonia brunoniana† A
Pittosporum cornifolium A
P. crassifolium A
*P. ellipticum**
P. eugenoides
P. huttonianum
P. kirkii
P. tenuifolium
P. umbellatum
P. virgatum
Plagianthus divaricatus
Pomaderris hamiltonii†
P. kumeraho
P. aff. *phylicifolia* A
Pouteria costata A
Pseudopanax arboreus A
P. crassifolius
P. discolor
P. lessonii A
P. arboreus x *P. discolor*
P. crassifolius x *P. lessonii*
Pseudowintera axillaris
P. colorata
Quintinia serrata
Raukaua edgerleyi
R. simplex var. *simplex*
Rhabdothamnus solandri A
Scandia rosifolia A
Schefflera digitata A
Solanum aviculare A
Sophora chathamica†
S. microphylla
Streblus banksii† A
*S. heterophyllus**
*Syzygium maire**
Toronia toru
Vitex lucens A
Weinmannia sylvicolia A

Mistletoes (3)

Ileostylus microphyllus†
Korthalsella salicornioides
*Trilepidea adamsii** E

Dicot herbs (112)

Acaena anserinifolia A
*A. novae-zelandiae**
Anaphalioides trinervis
Apium prostratum subsp. *prostratum* A
A. "white denticles" (AK 183981)
*Atriplex hollowayi** E
Callitriche muelleri A
Cardamine debilis A
Celmisia major var. *major*
Centella uniflora A
Centipeda minima

Chenopodium glaucum A
Colensoa physaloides† A only
Cotula australis A
C. coronopifolia
Crassula sieberiana A
?*Dactylanthus taylorii**†
Daucus glochidiatus
Dichondra repens A
Disphyma australis subsp. *australis* A
Drosera binata A
D. auriculata A
D. spathulata
Einadia triandra A
E. trigonos subsp. *trigonos* A
*Elatine gratioloides**
Elatostemma rugosum
Epilobium nerteroides
E. nummulariifolium
E. pallidiflorum
*E. pedunculare**
E. pubens
E. rotundifolium A
Euchiton audax A
E. gymnocephalus A
E. involucratus
E. sphaericus
*Euphorbia glauca** E
Galium propinquum
*G. trilobum**
Geranium homeanum†
G. potentilloides A
G. retrorsum
*Glossostigma elatinoides**
Gonocarpus incanus (incl. *G.* aff. *montanus*) A
G. micranthus subsp. *micranthus*
*Gratiola nana** E
G. sexdentata†
Haloragis erecta subsp. *erecta* A
Hydrocotyle elongata
H. heteromeria
*H. microphylla**†
H. moschata A
H. novae-zelandiae
Hypericum japonicum
Lagenifera pumila A
Lepidium oleraceum
Leptinella dioica subsp. *dioica*
L. squalida subsp. *squalida* E
L. tenella
Lilaeopsis novae-zelandiae
Limosella lineata
Linum monogynum A
Lobelia anceps A
Myosotis spathulata var. *spathulata*
*Myriophyllum triphyllum** E
*M. votchii**
*Nertera depressa**
N. dichondrifolia
N. villosa†
Oxalis exilis† A
O. rubens A
Parietaria debilis A
Pelargonium inodorum A
Peperomia urvilleana A
P. "purple vein" † (AK 206056)
Picris burbidgei A
*Plantago raoulii**
*Polygonum plebeium**† E
P. salicifolium A
Pratia angulata
Pseudognaphalium luteoalbum† A
Ranunculus acaulis
R. amphitrichus A
R. reflexus A
R. urvilleanus†
Rorippa divaricata A
*R. palustris** E
?*Rumex flexuosus** E
Samolus repens A
Sarcocornia quinqueflora subsp. *quinqueflora* A
Scleranthus biflorus
Selliera radicans A
Senecio biserratus
S. glomeratus
S. lautus var. *lautus* A
S. marotiri†
S. minimus
S. quadridentatus
S. repangae subsp. *repangae*†
*S. scaberulus** ?A
Solanum americanum† A
*Spergularia marginata** A
Stellaria parviflora A
Tetragonia tetragonoides†
T. implexicoma A
Utricularia novae-zelandiae E
Veronica plebeia†
*Vittadinia australis** E
Wahlenbergia littoricola subsp. *vernicosa* A
W. violacea†

Dicot climbers (20 +1)
Calystegia sepium
C. soldanella A
C. tuguriorum
Clematis cunninghamii A
C. paniculata A
Ipomoea cairica
Metrosideros albiflora
M. carminea A
M. diffusa
M. fulgens
M. perforata A
Muehlenbeckia australis
M. complexa A
Parsonsia capsularis A
P. heterophylla
Passiflora tetrandra
Rubus australis
R. cissoides A
*R. schmidelioides**† (Jones & Beard 1994)
R. australis x *R. cissoides**
Sicyos australis A

Monocot climbers (2)
Freycinetia banksii A
Ripogonum scandens A

Grasses (32)
Amphibromus fluitans†
Austrofestuca littoralis†
Austrostipa stipoides
Bromus arenarius E
Cortaderia fulvida
C. splendens A
Deyeuxia avenoides† A
D. quadrisecta
Dichelachne crinita A
D. inaequiglumis
D. micrantha
Echinopogon ovatus A
Elymus multiflorus A
*E. solandri**
*Hierochloe redolens** E
Isachne globosa
Lachnagrostris billardierei A
L. filiformis A
L. littoralis subsp. *littoralis* A
Microlaena avenacea
M. polynoda
*M. stipoides** A
Oplismenus hirtellus subsp. *imbecillis* A
Paspalum orbiculare A
Poa anceps A
Rytidosperma biannulare A
R. gracile A
R. unarede A
Spinifex sericeus A
Trisetum arduanum
Zoysia minima
Z. pauciflora

Orchids (49)
Acianthus sinclairii A
Adelopetalum tuberculatum (ex *Bulbophyllum*)*
Chiloglottis cornuta
Corunastylis pumila (ex *Genoplesium*)
Corybas cheesemanii
*Cryptostylis oblonga**†
Danhatchia australis
Drymoanthus adversus A
Earina aestivalis†
E. autumnalis A
E. mucronata A
Gastrodia cunninghamii
G. aff. *sesamoides*
Ichthyostomum pygmaeum (ex *Bulbophyllum*) A
Microtis parviflora†
M. unifolia A
*Nematoceras acuminata** (ex *Corybas*)
N. macrantha (ex *Corybas*)
N. rivularis (ex *Corybas*)
*N. trilobus** (ex *Corybas*)
Orthoceras novae-zeelandiae
*Petalochilus alatus**† (ex *Caladenia*)
P. bartlettii ?† (ex *Caladenia*)
*P. chlorostylus**† (ex *Caladenia*)
*P. pusillus**† (ex *Caladenia*)
Prasophyllum aff. *colensoi*
P. aff. patens E
Pterostylis agathicola
*P. alobula**†
P. banksii A
*P. brumalis**†
*P. cardiostigma**†
P. gramineat†
P. paludosa†
P. trullifolia
Singularybas oblongus (ex *Corybas*)
Spiranthes novae-zelandiae
Stegostyla atradenia (ex *Caladenia*)
Thelymitra aemula†
T. carnea†
T. colensoi†
T. cyanea†
T. formosa†
T. aff. *ixiodes*†
T. longifolia A
*T. pauciflora**†
*T. puchella**
T. tholiformis†
Winika cunninghamii A

Other monocots (92)
Apodasmia similis
Arthropodium candidum
A. cirratum A
Astelia banksii A
A. grandis
A. solandri A
A. trinervia
Baumea arthrophylla
B. articulata
B. juncea
B. rubiginosa
B. tenax
B. teretifolia
Bolboschoenus fluviatilis
B. medianus
Carex breviculmis A
C. dissita
C. flagellifera A
C. forsteri
C. inversa A
C. lambertiana
C. lessoniana
C. litorosa E
C. maorica
C. pumila
*C. secta var. secta**
C. solandri
C. spinirostris A
C. subdola†
C. testacea
C. virgata A
Collospermum hastatum A
C. microspermum†
Cordyline australis A
C. banksii
C. pumilio
Cyperus ustulatus A
Desmoschoenus spiralis
Dianella nigra A
Eleocharis acuta A
E. gracilis A
E. neozelandica†
E. sphacelata
Fimbristylis velata†
Gahnia lacera
G. pauciflora
*G. setifolia**
G. xanthocarpa
Isolepis cernua A
I. distigmatosa†
I. inundata A
I. nodosa A
I. prolifer† A
I. reticularis A
Juncus australis
*J. caespiticus**
J. edgariae A
J. kraussii var. *australiensis* A
J. pallidus A
J. pauciflorus A
J. planifolius A
J. prismatocarpus
J. sarophorus†
J. usitatus A
Lepidosperma australe
L. laterale
Libertia grandiflora
L. ixioides
L. micrantha (ex *L. pulchella*)
Luzula picta var. *picta*
Machaerina sinclairii A
Morelotia affinis A
Phorium cookianum
P. tenax A
Potamogeton cheesemanii
Rhopalostylis sapida A
Schoenoplectus tabernaemontani A
Schoenus apogon
S. brevifolius
*S. carsei**
S. maschalinus
S. tendo
Sparganium subglobosum
Tetraria capillaris
Triglochin striata
*Typha orientalis** A
Uncinia banksii A
U. distans
U. scabra
U. uncinata† A
*U. zotovii**†
Zostera novazelandica