terrestrial terraces. These terraces reflect both oscillating sea levels and the uplift of sediments by tectonic movements associated with the plate boundary. Table Flat Road which is the access to Sixtus Lodge follows one terrace level. A flat terrace above Fossil Cliff contrasts with the angle of dip of the fossiliferous strata. Other terraces are exposed in road cuttings or in deeply incised river valleys, e.g. before the bridge crossing on the Heritage Hut walk on Sunday.

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Great Barrier Island field trip, 5-9 February 2009

Ewen K. Cameron (editor)

Introduction

Great Barrier Island (Aotea) is New Zealand's fifth largest island, covering about 28,000 ha, and is 35 km long by 18 km across at the widest point. It lives up to its James Cook "Barrier" name with sandy surf beaches on the exposed eastern coast, and sheltered harbours on the western coast, often with mangroves (*Avicennia marina*). Most of Great Barrier is rugged and is of volcanic origin, the result of andesitic stratovolcanic activity 8-15 million years ago, overlaying greywacke rocks (c.150 million years old) which form the northern part of the island (Te Paparahi) and also occur around Harataonga (Moore 2004). See Fig. 1 for place names and their location.

The island has had some 700 years of Maori settlement which would have significantly impacted the coastal vegetation, and in European times areas have been cleared for farming, forestry and mining. However, over two-thirds of the island have now been left to regenerate for many decades, and are today dominated by kanuka (*Kunzea ericoides*) successional forests,and more locally broad-leaved forest. Locally in the central part of the island conifer-dominated forests grow, and small patches of original forest have survived, the best known round the island's summit, Mt Hobson (Hirakimata, 627 m asl) at the centre of the island. Today 60% of the island is reserve land administered by the Department of Conservation

Fig. 1. Location of areas visited by Auckland Botanical Society while based at Orama Camp at Karaka Bay, 5-9 Feb 2009. Drawn by EKC.

(DoC). Great Barrier has never had brush-tailed possums, in 2006 feral goats were finally eradicated from the whole island (thanks to DoC, Auckland Regional Council and the local community), fallow deer were only ever present on Motu Kaikoura and were eradicated in 2008, but feral pigs are unfortunately still present. Since Kirk (1869), nearly 600 native vascular plant species have been recorded from the island (Bartlett & Gardner 1983, Cameron et al. 2002) – just over a quarter of the total New Zealand native vascular flora.

The previous Auckland Botanical Society (ABS) field trip to Great Barrier Island was Auckland Anniversary weekend in 2002 where mainly central island areas were visited (Cameron et al. 2002). The intention of this 2009 Waitangi weekend trip was to focus on the more northern areas, close to the Orama Christian Camp at Karaka Bay where we stayed – influenced by the successful Wellington Botanical Society camp there in February 2008. While most of us concentrated on the wild vascular flora, Mike Wilcox taking advantage of favourable tides, focused on the marine algae which are reported separately (Wilcox 2009).

Trip participants (25 people) (Fig. 2): Ewen Cameron (leader), Colleen Crampton, Bev & Geoff Davidson, Anne Fraser (Aunty Anne), Shelley (coordinator) and Wolfgang Heiss-Dunlop, Pam Hubbard, Wyne Johns, Christine Major, Elaine Marshall, John Millet, Lati Moodie, Emily Roper, Mike Rowledge, Doug Sheppard, Cheryl Taylor, Pat Tunsdall, Alison Wesley, Diana Whimp, Mike and Pam Wilcox, John Wilcox, Phillip Wrigley, and Maureen Young. John Ogden (local resident) joined us for the Saturday trip.

The Orama Christian Camp at Karaka Bay (history from Stowell 2002)
We stayed at the Orama Christian Camp which began in 1965 with two rundown buildings on 345 ha of land, and was run as part of a trans-denomination Christian Trust. 'Orama' is Greek for vision. Later, 115 ha were sold to assist funding a building programme. The main focus of the Trust has been retreat, restoration and Christian training. Over the years this work has taken on many forms including education, rehabilitation, printing and publishing Christian literature and a variety of cottage industries, housing a community of some 150 people. Today the Trust leases part of the property to the Sir Edmund Hillary Outdoor Pursuits Centre which operates a marine base.

Fig. 2. Group photo after dinner at Orama Christian Camp at Karaka Bay, with the common local inhabitants – brown teal. Photo: Mike Wilcox, 7 Feb 2009.

There is a flat coastal lawn in front of the main buildings, an adjacent small stream, and a steep pine-kanuka clad backdrop at the head of an attractive bush-clad bay (Fig. 3). Semi-tame brown teal (pateke) were common along the coastal fringe and around the lower buildings, a pair of banded rail (Fig. 4) with two chicks frequented the Shady Cabin area, and kaka could be frequently seen during the day, and heard day and night. Unfortunately rabbits and two environmental weeds were also common: veldt grass (*Ehrharta erecta*) around the cabins and polygala (*Polygala myrtifolia*) shrubs on the steep coastal slopes.

In July 2008, a 2 km-long predator-proof fence was completed across the adjacent Kotuku Peninsula from Fitzroy to south end of Karaka Bay to protect 230 ha of regenerating bush (Fig. 5). The mammalian pests (rabbits, cats, mice, rats, pigs) on the peninsula will be targeted in the winter of 2009. Tawharanui Regional Park's predator-proof fence with mice and rabbits still on the wrong side shows that there are

still lessons to be learnt about predators and predator-proof fences.

Thursday (5 Feb) Leigh to Karaka Bay

Twenty-four ABS members arrived in good time for our 5 pm departure from Leigh Harbour on Thursday of the long Waitangi day-weekend. Our charter boat *Apollo* had a starter motor problem on one of the engines, and during the one-hour delay many members cooled down in the briny on the hot summer afternoon. Soon after leaving the wharf we were exposed to a 1m north-easterly swell which slowed the powerful craft a little. The upper parts of Hauturu (Little Barrier Island) were hidden in cloud but it wasn't long before we were in flat water close inshore on Hauturu's southern side where we briefly stopped while the skipper made a cuppa. Sea birds (petrels and shearwaters) were common; however, definite identifications were difficult with the constantly moving boat. We became a little uncertain as we approached Motu Kaikoura from the west, then turned northwards through the narrow gap between it and Nelson Island, emerging into the sheltered bay of Port Abercrombie and up into its northeastern arm of Karaka Bay to moor at the floating pontoon of the Orama Camp just before 8 pm. Stuart Alderman greeted us, then a short walk to the dining hall and we were welcomed with a waiting hot dinner. Diana, who separately travelled to the island, was already settled in. Emerging after dark we located our bags and sorted our accommodation, most being allocated to the Shady Cabins up a steep slope (Fig. 6).

Friday (**6 Feb**) **Whangapoua**

John Millet

At 8.30 am the full party of 25 left Orama Camp by local bus (motto: "We get everywhere – eventually") and crossed the steep northern spine of the island to Okiwi School and airstrip. Dodging the cow pats, we crossed the camping ground being grazed by a splendid herd of Mabey's cows and calves, to check out the fresh water and saline plants of the Whangapoua Estuary. This wetland and sand spit comprises the Whangapoua Conservation Area of 390 ha, and the farmland behind it is designated as the Okiwi Recreation Reserve (514 ha). Both are administered by DoC and were purchased by the Crown in 1992 (see Cameron 1999). Rugged Rakitu (Arid Island), right in front of us, is a Scenic Reserve purchased by the Crown in 1993, and the past owner, Bryce Rope, has right of grazing until 2013 (Cameron & Bellingham 2005). Ewen reminded us that this whole area (NE Great Barrier Island coast, including Rakitu/Arid Island) had been proposed to be part of a marine reserve. It failed mainly because of opposition from recreational fishing groups – the islanders themselves were split over the proposal. Whangapoua's wetland and dunes are nationally significant for the relative lack of modification and for the birdlife, on a scale which we did not fully appreciate until it was all laid out before us two days later, from the dizzy heights of Coopers Castle (Fig. 7).

Mike headed off straight away for the estuarine mangroves to capture red algae attached to pneumatophores (*Bostrichia harveyei* and *Catenella nipae*). Meanwhile, we proved that freshwater can exist so close to the shoreline by finding the freshwater *Ranunculus amphitrichus* among oioi (*Apodasmia similis*). The scrambling native bindweed, *Calystegia sepium* subsp. *roseata*, with narrow leaves and deep pink and white flowers was prominent close by. At the head of the estuary Maureen kindly introduced some of us to the delicate and creeping salt marsh *Apium* "white denticles". We proved it to be a member of the carrot family by munching on a leaf.

Out on the sand flats brown teal were industriously sifting sustenance from the tidal soup left in pools made by snapper and rays. The ducks do this with the rapid shuffling sideways action of their shiny, blue-grey beaks. Before low tide, thanks to the extraordinary submarine skills of the fearless Geoffrey, all botanists crossed the Whangapoua River dry, albeit in a rather meandering fashion. A surprising find was a patch of large green-lipped mussels growing on the sand, hard packed by the current. Their subsequent opening by some mug who had forgotten his lunch revealed that the shellfish were so skinny as to be hardly worth the carrying.

Our botany was now shared between three environments: the sand dunes, the wetland behind them, and the ocean beach. On the dunes *Spinifex sericeus*, with its barley-like malespikes, and the colourful pingao (*Desmoschoenus spiralis*), were observed to be heavily grazed by rabbits. A couple of small purple pampas grass (*Cortaderia jubata*) tussocks were decapitated. The dioecious *Muehlenbeckia complexa* was flowering profusely, so there was some interest in distinguishing male and female flowers with the aid of a lens. The blue-grey tauhinu (*Ozothamnus leptophyllus*) shrubs were flowering white and heavily on the dunes, and *Oxalis rubens* with yellow flowers was seen at the base of oioi growing in the hollows, as was *Selliera radicans*.

Lunch was by the *S.S. Wairarapa* graves (see inset), by Waikaro Point, where the geology changes from volcanic to greywacke. In the streambed behind the graves was a grove of whau (*Entelea arborescens*) and *Coprosma macrocarpa,* with *Pteris comans*, and *Geranium gardneri* (petiole hairs pointing down and outwards) growing underneath. Patches of the low creeping native grass, *Zoysia pauciflora*, was also seen fruiting here. On the steep point was a good sprawling population of the island's endemic *Hebe pubescens* subsp. *rehuarum*, and a plant of *Scandia rosifolia*.

The windbreak planted between the Mabey homestead and the foreshore showed the superior salt and wind resistance of Norfolk pine (*Araucaria heterophylla*) versus *Pinus radiata.* After lunch we walked inland past the house and discovered green fruit on the kohekohe (*Dysoxylum spectabile*) growing straight out of the trunk, as there are no possums to eat them. As we crossed the stile into Mabey Road two huge, red Brahmin ×shorthorn bulls were admired. More zoology ensued in the form of a lamb-in-drain rescue. A strong-smelling clump of wild Mexican tea (*Chenopodium ambrosioides*) stood out in the paddock, and appeared to have been dealt a dose of herbicide.

The wreck of the "Wairarapa"

John Wilcox

The Union Steam Ship Company's *Wairarapa* of 1786 tons gross register struck Miner's Head on Great Barrier Island at full speed in the early hours of the morning on 29 October 1894, with the loss of 121 lives. The ship was bound from Sydney to Auckland with 186 passengers and 65 crew and lost its bearings in heavy fog. Captain McIntosh was blamed by the Court of Inquiry for setting the wrong course down the east coast from the Three Kings Islands.

Many people perished by being swept off the decks. Those survivors who got ashore in lifeboats and life rafts, or who otherwise were able to scramble on to the rocks, were later discovered and several rescued by Maoris in boats from Katherine Bay. The steamer *Argyle* eventually picked up all the survivors and got them to Auckland on 1 November. The disaster caused widespread horror and grief throughout New Zealand.

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About 1 km along the road we explored a partially drained paddock (the large drain had been dug in 1979-80), and the native willow weed (*Persicaria decipiens*) was distinguished from the introduced *Persicaria punctata* by the pinker colour of the flowers and leaves. Here *Calystegia sepium* subsp. *roseata* was again plentiful, and Ewen was relieved to find that there were still a few plants of *Ranunculus urvilleanus* growing on the edge of the drain, 17 years after his last sighting of it in this general locality. Fine specimens of the native rush, *Juncus sarophorus* were admired (Fig. 8) and the delicately flowered swamp millet (*Isachne globosa*) topped off this very interesting wet corner, over-flown by copper butterflies whose caterpillars feed on *Muehlenbeckia complexa.*

Back on the drier bush-clad sides of Mabey Road the golden male flowers on *Collospermum hastatum* were much photographed, as were the deep purple/blue fruits of *Dianella latissima*, as Ewen introduced us to this relatively newly described plant. A large bush of *Carmichaelia australis* was seen here and *Olearia furfuracea* was flowering profusely. The long-awned native grass (*Dichelachne crinita*) and the horned orchid (*Orthoceras novae-zelandiae*) were seen on the dry road banks. Where a large raupo swamp crossed the road I was delighted to photograph the raupo (*Typha orientalis*) inflorescence, with male flowers at the top of the stalk, and female flowers below. *Epilobium pallidiflorum* was seen flowering among the swamp vegetation. An unwanted dally pine (*Psoralea pinnata*) was uprooted wantonly by the strenuous Geoff.

The bus met our party punctually at the junction of Mabey, Motairehe and Kawa Roads, so we were back in time for a swim before the 6pm dinner gong. Later some went fishing from the wharf pontoon; others explored the large camp grounds, having had no time to do so the night before.

Saturday (7 Feb): Rangiwhakaea Bay

Emily Roper

Before leaving camp all boots were scrubbed with a disinfectant ('Trigene') to lesson the likelihood of introducing or transporting the kauri fungal pathogen 'Phytophthora taxon Agathis' (PTA) – although no kauri were seen during the day's tramp. We departed at 8 am with 21 people on a short bus ride to the start of the Tataweka Track off Mabeys Road – this northern Great Barrier Island reserve is known as Te Paparahi Conservation Area. This track was formed in the early 1970s by miners prospecting for copper, and leads a direct route up to the main ridge and along to the local high point Tataweka (526 m asl). Anyone still a bit sleepy after breakfast was soon sharpened up by the steep climb. Subject to partial pre-European clearance and over 120 years of goat browsing, the broadleaf forest in this area is now regenerating nicely beneath a canopy of kanuka.

First up for botanical debate today was the differences between *Dianella nigra* and *D. latissima* (Fig. 9, Table 1). *Carex lambertiana* and hedgehog grass (*Echinopogon ovatus*) were common in the open ground provided by the track. Several specimens of the usually epiphytic *Pittosporum cornifolium* were noted along the edge of the track. Continuing up the main ridge, a few of us had a lesson in identifying the juvenile forms of *Coprosma spathulata* and *C. arborea*, with specimens of each, and also of *Coprosma rhamnoides*, growing right next to each other.

After nearly 90 minutes of climbing, the party reached the point where we were to branch off the main track and find our way down an unmarked ridge towards Rangiwhakaea Bay. Recent smashed shrubs and 'calling cards' indicated a few cattle beast were loose in the area (DoC are in the process of removing

Table 1. *Dianella latissima* and *D. nigra* leaf characters (from Heenan & de Lange 2007)

Leaf character	*Dianella latissima*	*Dianella nigra*
length (cm)	50–120	25–80
width (cm)	(1.5–)2.0–3.5	1.2–1.8
colour	Uniformly green to light green	Green to dark green, usually with obvious darker marginal bands
sheath colour	Pale green to light-yellow green	Light green to green and the margin reddish

them). Two members of the group decided at this stage that the beach back at Whangapoua beckoned, and headed back down the hill, but after a quick snack and a drink, the rest of us gamely followed John Ogden (who had joined us for the day) down the bush-clad ridge to Rangiwhakaea Bay.

Slowly picking our way downhill in crocodile formation, we saw the vegetation change as the kanuka canopy gave way to a more diverse broadleaf/podocarp forest, including miro (*Prumnopitys ferruginea*), tawa (*Beilschmiedia tawa*), hinau (*Elaeocarpus dentatus*) and a grand specimen of 'pohuturata' (*Metrosideros excelsa* ×*M. robusta*). A bit further some thought they saw a northern rata (*M. robusta*) in flower, but closer investigation showed it was *M. fulgens*. Also in flower was white maire (*Nestegis lanceolata*) by a *Mida salicifolia,* making an easy comparison of the similar-looking leaves.

Our bush crashing efforts were rewarded when we rounded the end of the spur and could take in the view of Rangiwhakaea Bay (Fig. 10), although we were rather surprised to see beach towels and footprints on the sand, and then a helicopter partly concealed at the back of the bay! Another group had beaten us to this remote spot. However, it was now noon and time for lunch on the beach in the shade of a pohutukawa and a swim in the waves. Mike headed straight for the rocky coastline.

Sandwiches eaten, some of us rock-hopped our way round to Te Kirikiri Bay just to the north where Ewen pointed out an important native herbfield community of species such as: *Leptinella dioica* (Great Barrier its northern-most distributional limit), *Fuchsia procumbens* and *Plantago raoulii*. Ewen informed us that during his survey here 20 years ago with Anthony Wright (Wright & Cameron 1985) these species occurred at most of the stream mouths along this coast to the north, and they also noted *Ophioglossum petiolatum* (the only large, secure population known in New Zealand).

By 1.30 pm it was then time to head back up the spur, returning the same way as we had come with John O setting a good pace. Rather less botanising was done on the way up compared to the outward journey, as most effort was put into heaving tired legs uphill at an even rate. Everyone made it to the top in quick time (90 minutes) and with a real sense of achievement, and proceeded back along the main Tataweka Track to be back at Mabeys Road by 4.10pm (20 minutes early!). The buses arrived, the two beach bunny's rendezvou'd, and it was back to the Camp for a well-earned high tide swim before dinner. It was a balmy evening and after dinner most congregated outside the highest Shady Cabins and admired the sunset over Hauturu (Fig. 11).

Sunday (8 Feb): Coopers Castle return

Alison Wesley

Numbers were reduced with Diana, Ewen and Cheryl flying home for other engagements. A repeat of 'Trigene' boot treatment and after a short bus ride the majority of the group set off for Coopers Castle from the top of Karaka Bay Road with much enthusiasm, if not quite as much energy as at the start of the trip. Mike pointed out the tussocks of Australian sedge (*Carex longebrachiata*) which were abundant along the lower parts of the track. The track climbed steadily followed by a series of undulations along the ridge until the short side track to Coopers Castle was reached at 450 m asl. Everyone had lunch at Coopers Castle (Fig. 12) where magnificent views to the northeast over the Whangapoua estuary were obtained (Fig. 7). Earlier on the ridge provided great views westwards, towards Motu Kaikoura and Hauturu.

Both *Rubus australis* and *R. cissoides* were seen early beside the track so it was possible to compare their different shaped leaves. Occasional miro, tawa, kahikatea (*Dacrycarpus dacrydioides*), rimu (*Dacrydium cupressinum*) and even one pukatea (*Laurelia novae-zelandiae*) were noted, and kauri rickers were seen at some distance as well as occasionally close to the track. A wide variety of ferns including *Asplenium lamprophyllum, Blechnum fraseri, Hypolepis ambigua*, and *Loxogramme dictyopteris* (syn. *Anarthropteris lanceolata*) were seen and a wider variety of filmy ferns were recognized than the

Fig. 3. Orama Christian Camp at Karaka Bay. Photo: Shelley Heiss-Dunlop, 9 Feb 2009.

Fig. 4. Banded rail by Orama Camp, Karaka Bay. Photo: Mike Wilcox, 7 Feb 2009.

Fig. 5. The recently completed predator-proof fence at Karaka Bay, cutting off the Kotuku Peninsula (230 ha). Photo: EKC, 8 Feb 2009.

Fig. 6. The Shady Cabins at sunset where most of the group stayed; the name became relevant when seeing the large pine stumps by the cabins. Photo: Cheryl Taylor, 7 Feb 2009.

Fig. 7. Whangapoua Estuary (near high tide) from Coopers Castle. Photo: Mike Wilcox, 8 Feb 2009.

Fig. 8. *Juncus sarophorus*, a fine native rush on the margin of a deep paddock drain, near Mabey Road. Photo: EKC, 6 Feb 2009.

Fig. 9. *Dianella latissima* – Rangiwhakaea Bay under kanuka. Photo: EKC, 7 Feb 2009.

Fig. 10. Rangiwhakaea Bay and coastline – first glimpse descending the ridge. Photo: EKC, 7 Feb 2009.

Fig. 11. Sunset over Wood Island (foreground), Motuhaku and Hauturu (behind); from the Shady Cabins at Orama. Photo: EKC, 7 Feb 2009.

Fig. 12. Coopers Castle – lunchtime. Photo: Alison Wesley, 8 Feb 2009.

Fig. 13. *Pseudopanax discolor* at its geographical northern limit on Coopers Castle. Photo: Alison Wesley, 8 Feb 2009.

Fig. 14. The Great Barrier endemic shrub *Olearia allomii* – the seed has dispersed, Coopers Castle. Alison Wesley, 8 Feb 2009.

Fig. 15. A large bare slip >150 m long at the head of Te Kirikiri Stream (= "Slip Stream") 26 years ago, Te Paparahi, NE Great Barrier. Photo: EKC, 4 Jan 1983.

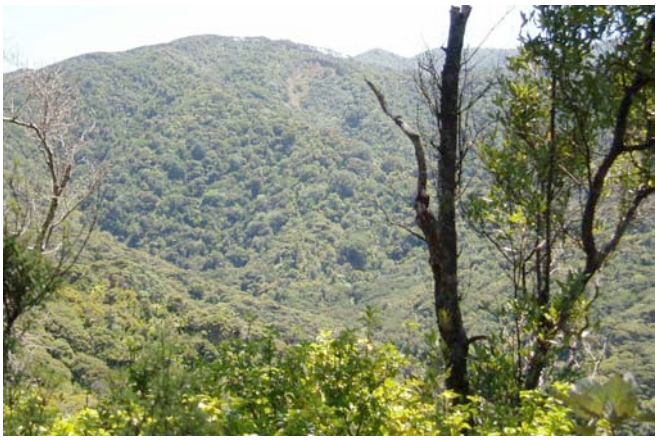

Fig. 16. The bare landslip 26 years ago at the head of Te Kirikiri Stream has now mainly healed over (just to the left of the erect dead tree). Photo: EKC, from Rangiwhakaea ridge, 7 Feb 2009.

Fig. 17. The robust form of Barrier nikau is abundant in Great Barrier forests. Photo: EKC, Te Paparahi, 7 Feb 2009.

previous day's walk. These included *Cardiomanes reniforme, Hymenophyllum dilatatum, H. flabellatum, H. revolutum, H. sanguinolentum* and *Trichomanes venosum. Cyathea dealbata*, *C. medullaris* and *Dicksonia squarrosa* were the most common tree ferns, and *C. smithii* was seen at higher altitude. There was also good taraire-puriri-nikau forest at higher elevations along with some stunted kauri.

However, it was when we reached the ridge and finally the turn off track to Coopers Castle itself that the species not seen on the previous days began to appear. The first of these was *Quintinia serrata* with its leathery serrate yellow-brown leaves. *Pseudopanax discolor* with its greenish-bronze five-finger-type leaves (Fig. 13), was greeted with great enthusiasm by Maureen, most of us being unfamiliar with it. It reaches its northern geographical limit on the Barrier Islands (Cameron 2005), south to Thames – although both Salmon (1996) and Eagle (2006) wrongly recorded it from Northland as well (EKC pers. comm.). A very short distance from this sighting, *Ixerba brexioides, Dracophyllum latifolium, Corokia buddleioides*, and finally *Olearia allomii* were identified. Initially seedlings of *O. allomii* were seen, but on the Coopers Castle summit mature shrubs with dried up flower-heads were photographed (Fig. 14). *Olearia allomii* isone of the three endemic shrubs of Great Barrier Island – the other two are: *Kunzea sinclairii* and *Hebe pubescens* subsp. *rehuarum*.

Most of the group returned via the same route to the junction of the track with the Fitzroy-Harataonga Road and then walked down the Karaka Bay Road (previously only traversed by bus) back to Orama. A small number took a longer way back and continued past the Castle (see below). Several other new species were seen while walking down the Karaka Bay Road. Perched on the cut away roadside bank *Sticherus flabellatus* was seenon two occasions. On one loop of the road a *Pittosporum* was spotted and further investigation revealed *Pittosporum ellipticum, P. huttonianum, P. umbellatum,* and *P. virgatum.* The latter was triumphantly recognized by Maureen who noted the variation in the shape of some juvenile leaves on the lower branches. *P. virgatum* has a restricted distribution from Te Paki to the Kauaeranga valley (Eagle 2006). It and *P. ellipticum* are typically associated with kauri often in secondary regrowth within kauri forest. During this whole day five *Pittosporum* species were recognized including *P. cornifolium* seen during the walk up to Coopers Castle. Mairehau (*Leionema nudum*) was also seen on frequent occasions in the roadside bush. The final find was several trees of monoao (*Halocarpus kirkii*) scattered amongst regenerating kauri.

Sunday (8 Feb): Beyond Coopers Castle - A Rewarding Diversion

Geoff Davidson

From Coopers Castle the decisive group comprising Christine, Elaine, Emily, Shelley and Wolfgang set off at a fast clip and returned to camp via Kaiarara Track, Fitzroy and Lady Track. The slow decision makers Philip, Doug and I eventually resolved to take the long route back to camp and gave chase. Obviously the first group kept up a fast pace and they were not seen again that afternoon.

The indecisive group was rewarded for making the decision to take the short diversion to the 1920s remains of a kauri dam that straddles a tributary of the Kaiarara Stream. There in the steep sided valley was a trove of species not seen elsewhere during the weekend. A sapling southern rata (*Metrosideros umbellata*) sheltered near the lookout platform below the dam. Surrounded by *Dicksonia lanata* it had presumably blown down from the summit of Mt Hobson (Hirakimata) to establish in the more benign climate of the lower altitude. Not far away *Nestegis montana* and *Phyllocladus toatoa* reinforced the concept of a remnant vegetation lingering on since the last ice-age. Of course that theory was blown by the presence of two subtropical ferns named after Cunningham - *Loxsoma cunninghamii* and *Sticherus cunninghamii*.

The only other notable find was mangeao (*Litsea calicaris*) in the scrub along the Kaiarara Bay Road side. On reaching Port Fitzroy at 5 past 5 pm we appreciated the store owner reopening the shop to allow the purchase of thirst quenchers. That and a refreshing swim was sufficient to reinvigorate the trio again, who then opted to follow the newly erected predator proof fence (Fig. 5) bordering Tony Bouzaid's private reserve (Glenfern Sanctuary). It was an extremely steep shortcut that had them gasping back to camp, but it saved a long tramp by road.

Monday (9 Feb)

The group had some choices of how to fill in the morning before the boat departed from Orama for Leigh at 2 pm. Some chose to hire kayaks (Colleen, John W & Pam H, and Shelley & Wolfgang, plus Mike as a single-skuller in a dinghy) and enjoyed the sheltered waters of Karaka Bay, with the more adventurous reaching Motu Kaikoura and also Mike inspecting Wood Island; three wandered back up Karaka Bay Road (Aunty Anne, Geoff, Maureen) to further inspect the roadside vegetation; five went over to Katherine Bay; and some remained to enjoy the Orama Camp environs.

Katherine Bay

Elaine Marshall and Christine Major

A group of Christine, Elaine, Lati, John M and Pat headed over the hill to Niramu Bay in southern Katherine Bay. The group was headed by Christine who had been briefed as to where the track started and that at 'the junction' to turn left down the hill instead of right up the hill. The track climbed steadily up the hill behind the Orama boatshed through rank open exotic grassland which soon became enclosed in manuka (*Leptospermum scoparium*) tea-tree scrub. Only beyond the entrance to the viewpoint track at the top of the hill did we find a little more variety in the native vegetation.

Having already chosen an incorrect junction to apply the left hand rule to (at the cost of a steep climb to return to the true route), the track again diverged into two. One track led down the hill to the left while the other continued straight ahead. We first chose the downward path which led to a hut with a large ancient macrocarpa tree (*Cupressus macrocarpa*) whose branches touched the ground forming a dry open shelter beneath. The beach was all boulders except at its easterly end.

The other track led down to Nimaru Bay, a lovely small sandy beach fronted by open pohutukawa trees and a clump of agaves (*Agave americana*) in flower. Beneath the pohutukawa was exotic grassland with a picnic table and a camp cooking area. On the way home a short deviation to the rocky summit viewpoint rewarded us with magnificent views of both Karaka and Katherine Bays.

Orchids recorded during the field trip

Anne Fraser

Although it was late in the season for most orchids to be seen, several genera were noted on the walks we enjoyed on Great Barrier, and much habitat was seen that would have accommodated dry shrubland species in genera such as *Acianthus, Caladenia* (*Petalochilus*) and *Pterostylis* species associated with kauri.

On the track up the long ridge towards the Tatawaka trig, *Pterostylis* species, probably *P.banksii* were seen. *Winika cunninghamii* was still in flower and photographed on a large totara and was also noted on puriri. The ridge down to Rangiwhakaea Bay yielded several groups of *Chiloglottis cornuta, Bulbophyllum pygmaeum* (syn. *Ichthyostomum pygmaeum*) and *Drymoanthus adversus*. Lots of *Earina mucronata* were seen, and at one site a plant sporting recently developed seed pods, suggesting *E. aestivalis* as it is regarded as the late flowering species. It was interesting to see *Earina* and *Winika* species on nikau and the association was evident again on the track to Coopers Castle.

On Coopers Castle track we saw an amazing number of *Earina mucronata* plants, and also noted *E. autumnalis* on taraire with long hanging stems and on the Coopers Castle rock itself *E. autumnalis* was lithophytic, in clumps with short stems, colonizing the sparse soil of the rock surface among the shrubs. With her recent interest in *Danhatchia australis,* a saphrophytic orchid species, Maureen confessed to getting' twitchy' near taraire, a favoured habitat of this species. Sure enough when we came to a nice taraire group on the ridge slope she and Alison soon turned up a small population of this difficult to see species.

The road walk back from Coopers Castle was enjoyable. There wasn't the need to see where you were putting your feet so the roadside could be scanned more closely, a habitat that soon proved rewarding. Several stems of *Thelymitra* species – their capsules mostly dehisced and seed scattered- retained some remnants of flowers to enable a guess of *T. pauciflora* (a deeply cleft post anther lobe), or *T. longifolia* (closely bunched cilia). Both these species are regarded as aggregates, groups of similar species with slightly varied characters, but aging of the flowers could have obscured important identification features. *Orthoceras novae-zeelandiae* plants were still in flower in several places. This is an attractive species the flowers alternately facing the front and away from the observer. One large plant seen had 13 flowers, the bottom capsules shedding seed and the top flowers still open.

A short walk back up the road behind camp to the kauri grove on Monday produced *B.pygmaeum* on tanekaha and rewarewa (along with *Winika cunninghamii*), and on kauri, (subsequently falling off with the bark), and a little surprisingly on white maire (*Nestegis lanceolata*). Every trunk of maire in the kauri grove was adorned with mats of this little species. This short walk was a satisfying end to an enjoyable camp, and fruitful observations of some orchids on the Barrier.

Specific comments and additions to two local lists

Ewen Cameron

Whangapoua day

We added three records to the species list of the Whangpoua estuary, wetland and dune area (see Appendix 1). The main dune hollows on the spit dominated by native herb fields which we admired in 2002 (Cameron et al. 2002: 155) were quite degraded with parts having been washed over by recent winter storms (G. Wilson pers. comm.). *Ranunculus acaulis* couldn't be located, and many of dune slack herb fields were now being dominated by the exotic long-creeping saltwater paspalum (*Paspalum vaginatum*). Once again the native dune tussock grass, *Austrofestuca littoralis,* couldn't be located – I last saw two clumps of it here in Oct 1992. However, Bec

Stanley (pers. comm.) photographed a nice fertile clump here in Oct 2007. There is a belief that cat control in the Whangapoua/Okiwi basin since 2000 to protect the brown teal meant the rabbit numbers increased which has caused the demise of the small population of *A. littoralis* (Bec Stanley pers. comm.). Fortunately it is still present on two eastern beaches south of Whangapoua (one of which is under active management). Rabbits have been sporadically controlled on the Whangapoua sand spit and at times RHD has kept their numbers down (G. Wilson pers. comm.).

The open, scrubby roadside clay bank along Mabey Road (c.200m SW of the start of the Te Paparahi Track) illustrated that we weren't in urban Auckland. Instead of weeds dominating, it was natives grasses (*Rytidosperma unarede* and *Dichelachne crinita*), scattered orchids (*Orthoceras novae-zeelandiae, Thelymitra* species), and kingfisher burrows many of them occupied. Also present was *Gleichenia dicarpa,Lycopodiella cernua, Sticherus flabellatus, Gahnia setifolia, Morelotia affinis, Leucopogon fasciculatus,* and *Pomaderris kumeraho* or was it *P. hamiltonii*? However, c.200m east Te Paparahi Track entrance there were several large passionfruit vines (*Passiflora edulis*) climbing high into kanuka by the road margins. These are of concern because this is on the southern boundary of the large northern Te Paparahi wilderness area, and it would be difficult to locate, let alone eradicate passionfruit from such a large contiguous forest.

Rangiwhakaea Bay day

Descending the ridge to Rangiwhakaea Bay reminded me of a Native Forests Action Council trip that I led down the same ridge near dusk on 19 Oct 1984 when we heard ample song of both kokako and kaka. The last time I heard kokako there was on 26 Oct 1992. The last two known Great Barrier kokako were relocated from Te Paparahi to Hauturu in 1994. When the mammalian pests are effectively controlled, it is hoped that kokako will be reintroduced to Great Barrier. The large, bare landslip present at the head of Te Kirikiri Stream in Jan 1983 (Fig. 15) appeared now to have mainly 'healed' over (Fig. 16).

Just behind Rangiwhakaea Bay beach was where the Offshore Island Group Trip (OIRG) of some 20 people camped and surveyed the adjacent 1,330 ha of northeastern Great Barrier, 31 Dec 1982 to 9 Jan 1983, and many of the resulting publications documented the natural history and geology of that area for the first time, e.g. geology (Moore & Kenny 1985), botany (Wright & Cameron 1985), avifauna (Hay et al. 1985) and herpetofauna (Newman & Towns 1985). During the OIRG survey most of the Te Paparahi forests were eaten out and severely degraded by over 124 years of feral goat and pig presence. The goats were eradicated from Te Paparahi during 1987-1992 but the pigs still remain.

Nikau is a real feature of the Great Barrier forests and is a robust form compared with the mainland forms. This form of nikau is present on both Barrier Islands and adds a wonderful presence to these forests (Fig. 17). The recently described *Dianella latissima* (Heenan & de Lange, 2007) appeared to be the only species present in the Te Paparahi forests, although the identification of some of the smaller plants was left unresolved. The larger ones looked like small flax (*Phormium*) plants, with long, pale green leaves. Using the characters of Heenan & de Lange (2007) *D. latissima* can be distinguished from *D. nigra* on leaf characters (see Table 1). For additions and comments to the eastern Te Paparahi plant list of Wright & Cameron (1985) see Appendix 1.

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Appendix 1. Additions and Comments to two local Great Barrier Island vascular plant lists.

1. Whangapoua estuary, wetlands and dunes of Cameron (1999), Deng et al. (2004), and additions by Cameron (2002) and Cameron et al. (2002).

During the Feb 2009 visit we observed the following additions (* = naturalised species):

Carex maorica – local, margin of old drainage channel, upper N end of estuary.

*Cortaderia jubata** – 2 small flowering tussocks on dunes (AK 304277); DoC will follow up on this sighting (G Wilson pers. comm.).

Microsorum pustulatum – single small plant on dune-saltmarsh boundary, SW side of main sand spit (this was previously recorded by Deng et al. (2004) but not by Cameron (references above).

*Sonchus asper** – single plant, N end of airstrip by oioi.

2. The northeastern Great Barrier Island flora list of Wright & Cameron (1985)

These comments are based on the day trip down to Rangiwhakaea Bay and back (see above), previous herbarium collections from the area, and comments by George Wilson (pers. comm.).

Additions:

Adiantum viridescens – E side, Te Kawau (= "Kokako Stream") valley, based on AK 209398 (*E.K. Cameron 6977*, 27 Oct 1992).

Alseuosmia quercifolia – wasn't observed during the OIRG survey (Wright & Cameron 1985); the first time I saw this species in NE Great Barrier Island was 3 plants to 1m tall in Te Kawau Valley close to the coast shortly after the completion of the goat eradication of 1985-1992 (AK 209399, *E.K. Cameron 6975*, 27 Oct 1992); it was pleasing to see plants to 1.8 m tall near top of the forested ridge near the start of our descent to Rangiwhakawaea Bay in Feb 2009.

*Araujiasericifera** – first record (and controlled) at Rangiwhakaea Bay in 2008 (George Wilson pers. comm.) .

Astelia trinervia – local, a few tussocks, c. halfway down the forested ridge (W side) (Feb '09).

Corybas cheesemanii – upper Te Kawau valley based on AK 209405 (*E.K. Cameron 6968*, 26 Oct 1992).

Earina aestivalis – fruiting epiphyte seen on forested ridge; *E. mucronata* also present (Feb '09).

Gahnia xanthocarpa – local, a few tussocks on the lower half of the forested ridge (Feb '09).

Pimelea longifolia – "Waterfall Stream" based on AK 278201 (*K.G. Broome*, 24 Jan 1986) – this is the northern geographical limit for the species (Burrows 2008).

Comments/clarifications

*Cortaderia selloana** – was helicopter sprayed in swamp behind Rangiwhakaea Bay c.2002, the whole area got a more thorough ground treatment in Feb 2008 (George Wilson pers. comm.); in Feb '09 we only observed dead tussocks in this area.

Dianella latissima – all clumps seen appeared to be this species – previously *Dianella* recorded as *D. nigra* – both species may be present?

Mida salicifolia – a 4 m-tall specimen seen c.2/3 down the Rangiwhakaea ridge – previously noted as 'rare' in "Waterfall Valley".

*Polypogon fugax** – not seen during recent trip, but previous voucher of ×*Agropogon littoralis* (AK 160947) is actually of this species.

Polystichum wawranum – previously recorded as *P. richardii* (AK 160828).

Prumnopitys taxifolia – a single tree observed c. 50cm dbh, c.18m tall, at the back of Rangiwhakaea Bay W-facing forested slope (Feb '09) – larger than any previously noted .

Sophora chathamica – several saplings and a large tree, lower bush margin, steep coastal slope, S side of Rangiwhakaea Bay – previously *Sophora* was recorded as *S. microphylla*.

Wahlenbergia littoricola – a single flowering plant with pale blue flowers at mouth of Te Kirikiri Bay stream (= "Slip Stream") – previously *Wahlenbergia* recorded as *W. gracilis*.