

(*Melicactus novae-zelandiae*), large-leaved milk tree (*Streblus banksii*) and parapara (*Pisonia brunoniana*). Stock should be excluded from all the bush areas.

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Vegetation and Flora of Claude Stream Valley and Hogs' Hill Bush, Whitford, southeast Auckland

E K Cameron

Introduction

On 21 May 2005, 45 people gathered at the end of Waikopua Road, 4.5km south of the Whitford Village on the Whitford-Maraetai Road, for the monthly Auckland Botanical Society (ABS) field trip. We visited the Claude Stream Valley forest (c.145ha) that is owned mainly by Manukau City Council (MCC), and also includes two private blocks (Graeme Currie and Barry and Una Grieve).

At the time of our visit the forest was threatened by proposals to expand the existing Whitford Quarry and associated Whitford Landfill (when quarrying is completed the void will be filled up with refuse) to the northeast and east into the western catchment of the Claude Stream Valley. The quarry is owned by MCC and since December 2004 managed by Fulton Hogan Ltd. After our visit Fulton Hogan announced a revised proposal; which would have less impact on the Claude Stream Valley, by focusing on expansion to the southeast and south (Hogs' Hill) rather than northeast and east as proposed at the time of our visit. A group of concerned local residents, the Whitford Residents' and Rate Payer's Association (WRRRA), are challenging the proposed quarry and landfill expansions into the forest areas.

The trip was attended by: Chris Ashton, Tricia Aspin, Harry Beacham, Anthony Bellvé (WRRRA and co-leader), Ewen Cameron (co-leader), Tim Carter, Leonie Clunie, Colleen Crampton, Brian Cumber, Geoff Davidson, Frances Duff, Josh Salter, Morag Fordham, Rhys Gardner, Richard Gillies, Anne Grace, Leslie Haines, Rosa Henderson, Ken Haydock, Marcel

Horvath, Peter Hutton, Anthea Johnson, Lynden Johnson, Mike Johnson, Sandra Jones, Joan Kember, Helen Lyons, Jenny Lux, Elaine Marshall, Cara Nicholson, Douglas Nicholson, Ros Nicholson, Helen Preston-Jones, Mags Ramsay, Juliet Richmond, Clive Shirley, Catherine Tuck (WRRRA), Bev Wade, Barrie Waterhouse (Whitford Quarry Community Committee (WQCC) & WRRRA), Alison Wesley, Mike Wilcox, Tony Williams, Derek Williamson, Primrose Williamson and Maureen Young.

During the ABS field trip we visited the Claude Stream Valley area, including the eastern side of the quarry. During the earlier field trip reconnoitre (4 May 05) and again later, I also visited, in the company of Anthony Bellvé, Christine Maslowski and Barrie Waterhouse, the hill (Hogs' Hill) south of the quarry. Now with the revised proposal, Hogs' Hill bush is threatened directly by the quarry and landfill expansions. Hogs' Hill is contiguous with the Claude Stream Valley and is included in my account, of the four trips undertaken on: 6 November 2004, 4 and 21 May 2005 and 10 October 2005.

Vegetation Descriptions

Claude Stream Valley

The Claude Stream flows north into the Waikopua Estuary and out to Whitford Bay between Howick and Beachlands and then into the Tamaki Strait (see Fig. 1). The base rock, greywacke, is exposed along parts of the stream bed, especially where there are waterfalls. The valley is steep and dissected by the narrow Claude Stream and its four tributaries on the eastern side. Most of the bush was untracked and the

ground cover and shrub layer in places was rather open. Although the MCC land has been fenced for c.15 years, cattle, goats and sheep have had sporadic access, which explains the openness of some of the forested ridges. Possums are present and bait stations have been sporadically used. The forest varied from tall kanuka (*Kunzea ericoides* s.l.) regeneration with some manuka (*Leptospermum scoparium*) on the margins to good kauri (*Agathis australis*) (Fig. 2) – tanekaha (*Phyllocladus trichomanoides*) dominated regeneration on the ridges, grading into broadleaf forest in the gullies.

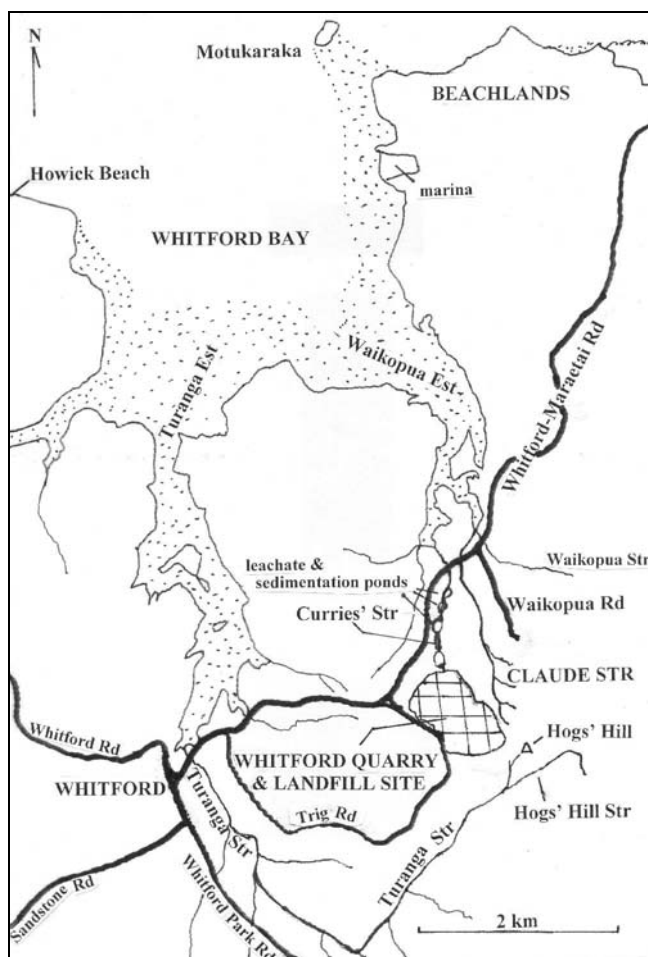


Fig. 1. Location of Claude Stream Valley, Hogs' Hill and Whitford quarry and landfill site, Whitford, southeast Auckland.

The canopy of the gully bottoms was broadleaf forest dominated by taraire (*Beilschmiedia tarairi*) with kohekohe (*Dysoxylum spectabile*), puriri (*Vitex lucens*) and karaka (*Corynocarpus laevigatus*) with a sub-canopy of nikau (*Rhopalostylis sapida*), mamaku (*Cyathea medullaris*) and locally, wheki (*Dicksonia squarrosa*). The shrub and ground cover was in places rather sparse but included hangehange (*Geniostoma ligustrifolium*), supplejack (*Ripogonum scandens*), parataniwha (*Elatostema rugosum*), and many fern species, e.g., *Blechnum filiforme*, kiokio (*B. novae-zelandiae*), *Deparia petersenii*, *Lastreopsis glabella*, *Microsorium scandens* and *Trichomanes elongatum*. The main epiphytes were two tank lily species, *Collospermum hastatum* and *Astelia solandri*.



Fig. 2. Christine Maslowski and Anthony Bellvé by a regenerating kauri in the Claude Stream Valley, Manukau City Council land. Photo: 2005.

The ridge forest between the tributaries was usually dominated by tall pole kauri 40-50cm dbh, with tanekaha, occasional rimu and sometimes a few skinny senescent kanuka. Sub-canopy trees present included white maire (*Nestegis lanceolata*), tree coprosma (*Coprosma arborea*), miro (*Prumnopitys ferruginea*) and ponga (*Cyathea dealbata*). The shrub and ground cover was sparse in places (past animal browsing?), but in other places it included small shrubs of toropapa (*Alseuosmia × quercifolia*), shining karamu (*Coprosma lucida*), *Coprosma spathulata*, kiekie (*Freycinetia banksii*), kauri grass (*Astelia trinervia*), *Gahnia lacera*, *G. pauciflora*, tangles of *Lygodium articulatum*, ground ferns (*Blechnum fraseri*, hound's tongue fern (*Microsorium pustulatum*)), in one place *Pittosporum cornifolium* as a low epiphyte on a kauri, and locally clumps of milk-moss (*Leucobryum candidum*) on the ground.

Locally along the western ridge margin of the Claude Stream Valley among 4-6m manuka were small pockets of gumland-type¹ vegetation. The association included: shrubs of manuka, prickly mingimingi (*Leptecophylla juniperina*), akepiro (*Olearia furfuracea*) and shiny karamu; sedges (*Schoenus tendo*,

¹ For a definition of "gumland" vegetation see Beever (1982)

Lepidosperma australe and *Gahnia xanthocarpa*); a clubmoss (*Lycopodium deuterodensum*); ferns (*Lindsaea linearis*, *Gleichenia microphylla*, bracken (*Pteridium esculentum*) and kiokio); *Gonocarpus incanus*; and lichens (especially *Cladina confusa*).

Although most of the large trees (e.g. kauri, tanekaha, taraire, puriri), were in the size range of 40-60cm dbh, there were occasional much larger, and presumably much older, kauri, rimu (*Dacrydium cupressinum*) and puriri c.1m in diameter. These larger trees must be survivors of the event from which the rest of the forest is recovering.

Hogs' Hill

The runoff from this hill flows into four streams, coalescing down to three which discharge separately into the Turanga and Waikopua Estuaries (see Fig. 1). The north-eastern and eastern area drains into the Claude Stream Valley. The immediate area above the quarry drains straight into the quarry itself and then into Curries' Stream, which flows into the Waikopua Estuary a few hundred meters west of the Claude Stream mouth. The south-eastern and southern area of Hogs' Hill flows south into the Hogs' Hill Stream, whereas the south-western flank of the Hogs' Hill flows into the Turanga Stream. The two streams converge further down in the valley to become the Turanga Stream proper, which passes west to the Whitford Golf Course and then swings north around through the eastern side of Whitford Village and into the head of the Turanga Estuary.

The rather flat top of Hogs' Hill used to be farmed until c.1950 then gorse took over until it was shaded out by manuka and kanuka regeneration (Graeme Curry pers. comm. to Anthony Bellvé). It is so named, because it earlier supported a population of feral pigs primarily living off the bracken fern. It is also known as the O'Brien Block – after the previous owner before MCC purchased 89ha (220 acres) including this block in 1970. Due to rather old boundary fences, sheep and goats have access to the area. A bait control program limits the number of possums.

The hill is crowned with youthful-looking kanuka and manuka 6-7m tall with an understorey 0.5-2.0m tall of young ponga, hangehange, *Coprosma rhamnoides*, mingimingi (*Leucopogon fasciculatus*) and gorse (*Ulex europaeus*) (mainly dying out - too shady). The ground cover in places is dense meadow rice grass (*Microleana stipoides*), and there are also frequent patches of *Nertera dichondrifolia*, *Oplismenus hirtellus*, an exotic moss (*Pseudoscleropodium purum*) and locally bracken. Scattered among the vegetation was occasional putaputaweta (*Carpodetus serratus*), mapou (*Myrsine australis*), pole tanekaha and the native climber, clematis (*Clematis paniculata*). Locally on the western side was a large puriri (1.3m in diameter) (Fig. 3), associated with three totara

Podocarpus totara), kahikatea (*Dacrycarpus dacrydioides*), tanekaha, two milk trees (*Streblus heterophyllus*), the climber *Parsonsia heterophylla* and the epiphytic orchid *Earina mucronata*. Close by were nikau, taraire, rewarewa (*Knightia excelsa*), lancewood (*Pseudopanax crassifolius*) and a rimu. Above the quarry face the understorey of the kanuka-manuka was dominated by dense regeneration of young mapou, mahoe (*Melicactus ramiflorus*), pigeonwood (*Hedycarya arborea*), hangehange, ponga, gorse and woolly nightshade (*Solanum mauritianum*), all 0.5-1.5m tall.



Fig. 3. Large squat puriri on western side of Hogs' Hill and Christine Maslowski. Photo: 17 October 2005.

At the top of the steep slope of the western margin of Hogs' Hill summit plateau were groups of taraire-dominated forest with trees to 60cm dbh and c.15m tall, associated mainly with tanekaha, kanuka, nikau, mamaku, ponga and rather bare ground covered in taraire leaves. Further down the slope tawa (*Bellschmiedia tawa*), kohekohe, karaka and puriri were present, and even the occasional pole kauri, culminating in tall diverse broadleaf forest along Turanga Stream. The south-western ridge supports a large grove of rimu that extends down into the valley floor, where a much larger grove flourishes (Anthony Bellvé pers. comm.).

Active quarry face

Predominantly a bare surface, but it is interesting to note the scattered plants establishing there – which were mainly weed species: Australian fireweed (*Senecio bipinnatisectus*), blackberry (*Rubus fruticosus* agg.), Chinese privet (*Ligustrum sinense*), gorse, Himalayan honeysuckle (*Leycesteria formosa*), inkweed (*Phytolacca octandra*), kikuyu grass (*Pennisetum clandestinum*), pampas grass (*Cortaderia selloana*), tarweed (*Parentucellia viscosa*), woolly nightshade and the native rush, *Juncus usitatus*. This is also a good place to see the local geology - the weathered Waitemata sediments ("overburden" to the quarry operators) and Te Kuiti Coal Measures, overlying the sought after greywacke rock.

Flora

See Appendix 1 for a species list compiled during the four trips to the area, and Appendix 2 for the fungi recorded by Clive Shirley during the ABS field trip. A total of 182 vascular plants were recorded during the four visits (see Table 1 & Appendix 1), of which 82% were native. One hundred and fifty native vascular species is a good total considering the number of habitats were limited, e.g. no wetland, no coast and extremely limited "gumland". There appeared to be no threatened or endangered species present (c.f. de Lange et al. 2004). There was a good mix of representative species as expected for the north side of the Hunua Ranges. Most of the naturalised species were around the open margins of the forest and the quarry area.

Table 1. Vascular plant totals from Appendix 1 under the different plant groupings.

Plant group	Native	Naturalised	Totals
Ferns & fern allies	49	-	49
Conifers	7	-	7
Dicots	58	23	81
Monocots	36	9	45
Totals	150	32	182

Current conservation values of the forested area Claude Stream Valley

It is a continuous forest in a sheltered north-facing valley, with an interesting mosaic of advanced regenerating forest types with conifers dominating the ridges, grading through to broadleaf species dominating the gully bottoms. On the valley fringes (east and west sides) kanuka and manuka still dominate. The diversity of the native vascular plants (other biota not recorded) was high. North-facing forest like this is less common today than south-facing; because of the warmer climate it is more suitable for conversion to farming or plantation forestry. Taraire likes a warm climate and was the dominate canopy tree in the gullies and mid-slopes – as a forest type taraire approaches its southern limit

not far to the south in the Hunua Ranges. When visiting the valley, because of the steepness, it appeared to be quite remote. The lack of weed species was quite remarkable for such a forest area close to urban Auckland and the few weed species observed were all on the outer fringes – not in the forest. During each visit kereru (native pigeons), were observed – presumably attracted by the fleshy fruit of the broadleaf trees and the safety of tall forest.

The Claude Stream catchment has been decreed a "Natural State area" by Judge Turner in 1977 and Judge Whiting in 1996. However MCC is challenging the earlier decisions in its applications to expand the Whitford Quarry and the Whitford Landfill.

Hogs' Hill

Hogs' Hill is at the crossroads for three water catchments. It is clothed in youthful forest on top with more mature forest on the steeper flanks and the bare quarry face to the north. With time the summit vegetation currently dominated by kanuka and manuka will be replaced with much longer living trees, many of which have already established there.

Botanical Society field trip (21 May 2005)

The stormy weather that had wrecked havoc in the Bay of Plenty (Tauranga and Matata) during the week cleared for our Saturday field trip. From Waikopua Road we accessed the eastern side of the Claude Stream Valley via the private land of Barry and Una Grieve, through open kanuka (8-15m tall) with regenerating natives including totara, tanekaha, kauri, taraire and tree ferns. Cattle had access to this area, although a few months later it was fenced as a bush block. In a stand of regenerating kauri a pole matai (*Prumnopitys taxifolia*) was spotted and several ground orchids were also added onto the draft species list. From a decaying log on the ground (taraire?) there was an impressive growth of coral fungus (*Hericium coralloides*) bursting out, c.40cm across. See Appendix 2 for the fungi recorded by Clive Shirley during the trip. We climbed over the fence marking the boundary of the private and MCC land and made our way down under tall forest to the narrow Claude Stream where broadleaf forest dominated. We then went over several of the small tributaries on the eastern side of the main stream, alternating with broadleaf forest by the streams and kauri regeneration on the ridges. While admiring the different ferns in one of the gullies we disturbed a German or common wasp nest and fortunately only two people were stung. We lunched on one of these ridges and heard about the proposed quarry expansion eastwards into this valley from Anthony Bellvé and had a lesson from Barrie Waterhouse on the local geology.

After lunch we crossed the Claude Stream itself and worked up the steep forested western side, emerging onto the ridge and then out of the bush to look down

into the quarry and landfill site. Anthony Bellvé pointed out a little generator building that produces power from the gas given off from the landfill. Then we followed a 4WD track along the ridge and found evidence of a stand of 10-12 kanuka trees, c.10m tall, which recently had been illegally cut down (for firewood?). The annual rings of two photographed stumps (20-25cm diameter) numbered c.63 and 70 (Tim Martin pers. comm.). Just below this area (upper margin of Claude Stream Valley) was a small area of gumland-type vegetation as described above.

We then descended via a more northerly route back down to the Claude Stream coming out close to the fence line. On a curving stream bank where the greywacke was exposed there was a nice colony of the tiny filmy fern *Trichomanes endlicherianum* associated with a mat of bryophytes, including the large thalloid liverwort *Monoclea forsteri*. Just before a waterfall (4-6m tall?) we headed up the slope on the eastern side and rejoined the farm track that we started on and back to the road and our cars at 2.40pm. A smaller group then drove round to Trig Road and viewed the quarry from the west side with a commentary from Barrie Waterhouse, then onto the Brickworks Cafe at Whitford for coffee to complete the day.

Birds recorded

Birds seen during the visits: fantail, goldfinch, grey warbler, harrier (gliding above), kereru, kingfisher, Indian myna, paradise duck (flying up the valley), rosella, tui and welcome swallow.

Acknowledgements

Dr Anthony Bellvé (WRRRA), Barrie Waterhouse (WQCC, WRRRA) and Dr Christine Maslowski (Whitford LCLC: Whitford Landfill Community Liaison Committee) – for inviting me to visit the area, guiding me around during each visit and informing me of the issues; Barry and Una Grieve – local landowners for allowing land access; Mark Cameron, Quarry Manager for permission for quarry access; Rodger Jordan for landfill site access; Tim Martin for counting the kanuka rings; Clive Shirley for the list of fungi; Mike Wilcox for the list of participants; and ABS members for their contributions during the field trip.

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Quarry expansion: perceived impacts on the bush

The revised proposed quarry and landfill expansion still threatens to lower the ridge between the quarry and the Claude Stream Valley close to Hogs' Hill by some 20 vertical meters and remove most of Hogs' Hill (judging by the pegs on the ground and their maps) (see Fig. 1). Hogs' Hill on the eastern side, which the present proposed quarry expansion would remove, was clothed in good forest of mixed broadleaf (including taraire to 0.5m dbh and a puriri >1m diameter), tanekaha and kanuka.

The only place where the weed species were common was on the quarry face (see above) and to a lesser extent open areas near the quarry. The expansion of the quarry will certainly increase the potential for weeds to increase and spread.

The proponents for the quarry expansion take the view that it would threaten only the younger, less valuable forest (Boffa Miskill 2005), which in part is true. But it's seen as taking a big bite out of a contiguous natural area, which fragments the existing forest, increases the edge effects (e.g. increases exposure, desiccation and the potential for weed invasion), effects three different catchments by changing the surface water runoff and would alter the ground water table. The bush around the existing quarry needs protection not quarrying because: lowland forest has been severely reduced in New Zealand, especially north-facing forest; good biodiversity; lack of weeds; and riparian protection.

Appendix 1. Vascular plant species list of Claude Stream Valley and Hogs' Hill, Whitford, southeast Auckland.

Key

a = abundant

c = common

o = occasional

l = local

s = scarce (<5 plants seen)

* = naturalised species

	Claude Str v.	Hogs' Hill		Claude Str v.	Hogs' Hill
Ferns & fern allies (49 + 0)			<i>Tmesipteris elongata</i>		
<i>Adiantum cunninghamii</i>	l			c	lc
<i>Adiantum fulvum</i>		l	<i>Tmesipteris lanceolata</i>	o	o
<i>Adiantum hispidulum</i>	s		<i>Tmesipteris tannensis</i>	l	
<i>Asplenium bulbiferum</i>	o		<i>Trichomanes elongatum</i>	lc	
<i>Asplenium flaccidum</i>	o	o	<i>Trichomanes endlicherianum</i>	l	
<i>Asplenium lamprophyllum</i>	l		<i>Trichomanes venosum</i>	l	
<i>Asplenium oblongifolium</i>	o		Conifers (7 + 0)		
<i>Asplenium polyodon</i>	o	o	<i>Agathis australis</i>	c	l
<i>Blechnum chambersii</i>	l		<i>Dacrycarpus dacrydioides</i>	o	o
<i>Blechnum discolor</i>	l		<i>Dacrydium cupressinum</i>	lc	o
<i>Blechnum filiforme</i>	lc	lc	<i>Phyllocladus trichomanoides</i>	c	lc
<i>Blechnum fluviatile</i>	s		<i>Podocarpus totara</i>	o	o
<i>Blechnum fraseri</i>	lc	l	<i>Prumnopitys ferruginea</i>	o	o
<i>Blechnum membranaceum</i>	lc	lc	<i>Prumnopitys taxifolia</i>	s	
<i>Blechnum novae-zelandiae</i>	lc	lc	Dicots (58 + 23)		
<i>Cyathea dealbata</i>	c	la	<i>Acmena smithii*</i>	s	
<i>Cyathea medullaris</i>	lc	a	<i>Alseuosmia xquercifolia</i>	lc	
<i>Deparia petersenii</i>	lc	lc	<i>Beilschmiedia tarairi</i>	c	c
<i>Dicksonia squarrosa</i>	lc	o	<i>Beilschmiedia tawa</i>	o	o
<i>Diplazium australe</i>	s		<i>Brachyglottis kirkii</i> (terrestrial)	s	
<i>Doodia australis</i>	lc	o	<i>Brachyglottis repanda</i>	s	o
<i>Gleichenia microphylla</i>	l		<i>Callitriche muelleri</i>	l	lc
<i>Histiopteris incisa</i>		lc	<i>Carpodetus serratus</i>	o	o
<i>Huperzia varia</i>	s		<i>Centella uniflora</i>	lc	l
<i>Hymenophyllum demissum</i>	o		<i>Cirsium vulgare*</i>	o	l
<i>Hymenophyllum sanguinolentum</i>	l		<i>Clematis paniculata</i>	o	lc
<i>Lastreopsis glabella</i>	lc		<i>Conyza albida*</i>		o
<i>Lastreopsis hispida</i>	o	o	<i>Coprosma arborea</i>	lc	o
<i>Lastreopsis microphylla</i>	l		<i>Coprosma grandifolia</i>	o	o
<i>Leptopteris hymenophylloides</i>	o	o	<i>Coprosma lucida</i>	o	o
<i>Lindsaea linearis</i>	l		<i>Coprosma rhamnoides</i>	o	o
<i>Lindsaea trichomanoides</i>	l		<i>Coprosma robusta</i>		l
<i>Lycopodium deuterodensum</i>	l		<i>Coprosma spathulata</i>	c	l
<i>Lycopodium volubile</i>		l	<i>Corynocarpus laevigatus</i>	o	o
<i>Lygodium articulatum</i>	o	o	<i>Dichondra repens</i>	l	
<i>Microsorium pustulatum</i>	o	o	<i>Digitalis purpurea*</i>	l	l
<i>Microsorium scandens</i>	c	o	<i>Dysoxylum spectabile</i>	o	o
<i>Paesia scaberula</i>	l	l	<i>Elaeocarpus dentatus</i>	s	
<i>Pneumatopteris pennigera</i>	l	o	<i>Elatostema rugosum</i>	lc	lc
<i>Pteridium esculentum</i>	l	o	<i>Euchiton gymnocephalus</i>		l
<i>Pteris macilentia</i>	o	l	<i>Fuchsia excorticata</i>	s	
<i>Pteris tremula</i>	o	o	<i>Galium propinquum</i>		lc
<i>Pyrrosia eleagnifolia</i>	o	o			

Appendix 2. Fungi list of the Claude Stream Valley recorded during the Botanical Society field trip by Clive Shirley.

<i>Agaricus</i> sp.	<i>Entoloma haastii</i>	<i>Notholepiota areolata</i>
<i>Amanita nehuta</i>	<i>Favolaschia calocera</i>	<i>Pleurotus</i> sp.
<i>Artomyces turgidus</i>	<i>Ganoderma applanatum</i>	<i>Porphyrellus viscidus</i>
<i>Aseroe rubra</i>	<i>Hericium coralloides</i>	<i>Ramaria junquilleo-vertex</i>
<i>Boletus leptosperm</i>	<i>Laccaria tetraspora</i>	<i>Russula acrolamellata</i>
<i>Camarophyllus patinicolor</i>	<i>Lepiota</i> sp.	<i>Russula macrocystidiata</i>
<i>Campanella tristis</i>	<i>Leucocoprinus fragilissimus</i>	<i>Weraroa erythrocephala</i>
<i>Clavaria sulcata</i>	<i>Mycena austrororida</i>	<i>Xeromphalina tenuipes</i>
<i>Cyptotrama asprata</i>	<i>Mycena</i> sp.	

Additional fern records from Mt Egmont National Park

Barbara Parris

Barry Hartley compiled a list of vascular plants in Mt Egmont National Park (Keen, 2005) that is a valuable resource for botanists visiting the area. On checking his ferns against my lists of species seen during visits from 1969 to 1971, I noted the following omissions from his list: *Grammitis patagonica*, *G. poeppigiana*,

Hymenophyllum bivalve, *H. villosum*, *Pteridium esculentum* and *Sticherus cunninghamii*. Of these species, *Grammitis poeppigiana* was seen by Enid Asquith on the Bot. Soc. visit of 26-28 March 2005, but it would be interesting to know whether the other five species still occur on the mountain.

Reference

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Centennial Park, Campbells Bay, North Shore City

Richard Hursthouse, John Morton & Pat Morton

Location and description

Centennial Park comprises approximately 70ha within the Campbells Bay catchment. The catchment itself is approximately 166 hectares. The Campbells Bay stream has two main tributaries, the north and the south and drains to Campbells Bay, one of the East Coast beaches of the North Shore. The top of the catchment is mainly comprised of the 45ha Pupuke Golf Course bordering East Coast Rd and Kowhai Rd, with a maximum height of approx 60m asl. The Northern catchment is mainly housing, whereas 28ha of regenerating native bush surrounds the southern branch and its tributaries, albeit with housing on both flanks. There are also significant fields of grass and introduced bulbs in the southern catchment with an area of planted exotic trees interspersed with native planting. The Campbells Bay Tennis club has 6 courts in this area surrounded by exotic and native trees.

History

The park was originally set aside as reserve in 1884, the golf club being established in 1914. Significant native and exotic planting occurred around the NZ Centenary in 1940, when the park was named Centennial Park. Planting around that time included an avenue of Pohutukawa stretching from Rae Rd to the Beach Rd entry, now on the notable trees list of North

Shore City. Unfortunately during the war years the valley was bulldozed by the army to provide line of sight from at least three pillboxes in the upper valley. The park was left to regenerate until 1977, when workmen clear felled approximately a hectare of regenerating bush near the tennis club. This sparked off the eventual establishment of the Centennial Park Bush Society, which has worked in the park since then under the leadership of Mrs Pat Morton, until 1996, when Pat retired as chairperson. Work included ongoing weed control, planting and track work, but also the inevitable politics and advocacy to council and the community. Since 2003 there has been renewed interest with significant work occurring under the leadership of RH.

The golf club

The golf club lease includes a number of bush remnants and eucalypt plantations. This article does not attempt to describe the vegetation on the golf club lease. However there is a plan for tree management on the golf club prepared in 2000. A significant bush remnant in the headwaters of the Northern branch of the stream is listed as a significant area in the North Shore ecology study. It is heavily invaded with invasive weeds but is the subject of an Ecological Restoration