A visit to the Whatipu Sands, west Auckland

Ewen K. Cameron

Thirty-eight people gathered in the Whatipu car park, at the north head of the Manukau Harbour on 24 November 2012 for the monthly Auckland Bot Soc (ABS) field trip. Since 1998 ABS has had three previous trips to this general area: southern Whatipu on 21 November 1998 led by me; the northern end of this coastal sand flat and wetland complex from Karekare south to the Pararaha Stream on 21 February 2004 (Cameron 2004); and via the Buck Taylor Track, down the Pararaha Valley and north along the beach to Karekare on 19 September 2009 led by Sandra Jones.

The "Whatipu Sands" is coastal accretion land in the southwest corner of the Waitakere Ranges lying between Paratutai Island (see footnote) north to Cowan Point, and bounded by the volcanic sea cliffs, the Tasman Sea and the mouth of the Manukau Harbour (Fig. 1). In 2002 it was gazetted as the Whatipu Sands Scientific Reserve owned by the Crown and managed by the Auckland Council, covering some 820 ha and in places over 1 km wide. The rapid build-up of sand at Whatipu mostly took place during the 1930s-1940s (Esler 1974, Williams 1977, Pegman & Rapson 2005, Hayward 2008). This is just the latest phase of a longer term dynamic process, in which a vast amount of sand is slowly being moved northwards along the coast. A similar large sand flat was present off the Awhitu Peninsula to the south until about 200 years ago, when it was eroded away. In the first half of the 19th century some of the offshore Manukau Harbour Bar was a dry vegetated island but the sand has now moved north (Hayward 2008). Sand is now advancing into Karekare Bay and further north (Hayward 2008, Cameron & Wilcox 2012). Possibly the origin of this sand was the Taupo eruption of about 1,800 years ago, transported down the Waikato River and is now moving north along the west coast by the net effect of longshore drift (B.W. Hayward pers. comm.). The black colour of the sand is due to the iron content (titano-magnetite), for which it is commercially extracted south of the Manukau Harbour at Glenbrook and c.150 km further south of Taharoa. Most of the modern black sand north of the Waikato River mouth comes down the Waikato and then north by longshore drift; Taranaki lahars and ash supply the black sand further south (B.W. Hayward pers. comm.).

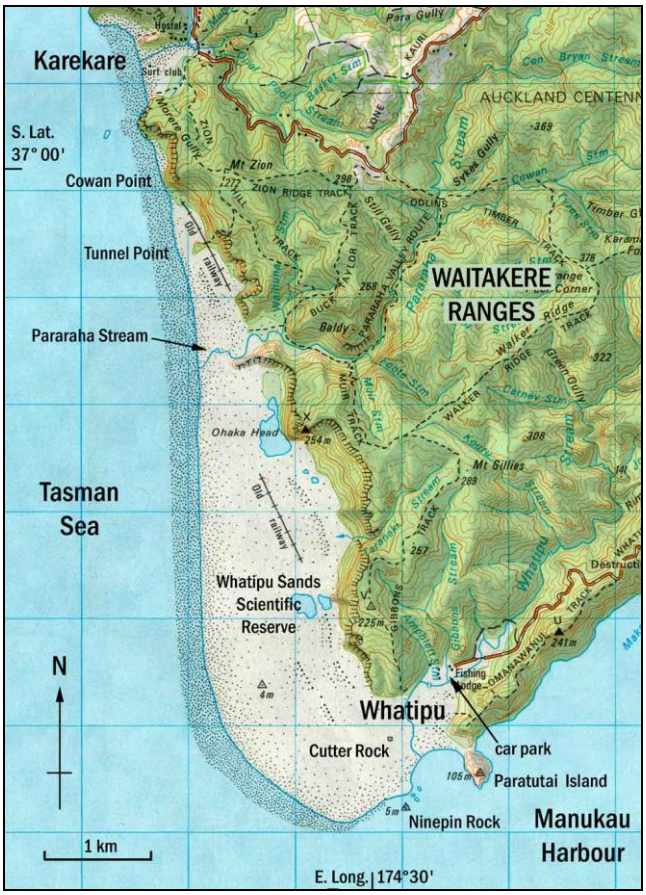

Fig. 1. Location and place names of southern Whatipu, west Auckland. Based on NZMS 260 Q11 map, modified by Joshua Salter.

The Whatipu Sands contains many unusual plant species and botanical features for the Auckland region including: native herbfields, sand-binding species, and wetlands (Cameron 1989, 2006; Pegman & Rapson 2005) which were enjoyed during the field trip. The first of these was at the mouth of the Whatipu Stream, west of Paratutai, where *Schoenoplectus pungens* was locally common. In the Auckland region this species is mainly confined to the west coast and reaches its New Zealand northern geographical limit about 70 km further up this coast at the Waionui Inlet (Cameron 2005). At the Whatipu Stream mouth both *S. pungens* and the taller, related *S. tabernaemontani* occurred close together. However, their habitats differed: *S. pungens* with the 3-sided stem was on the wet sand flat, and adjacent to it *S. tabernaemontani,* with the round stem, was in the standing water. By this non-flowing stream mouth, and along the back of this beach for over 100 m, tuffs of *Carex pumila* leaves were present with fruiting spikes. In 2001 there was a considerable loss of beach front here (Pegman 2001). Over 200 m inland Cutter Rock stood out amongst the low dune vegetation – in 2007 a large section of this landmark rock just fell off.

Footnote

" 'Paratutai' comes from the high tidal level changes around the island – 'paratu-tai', and is verified traditionally and on early maps; the spelling 'Paratutae' was sadly promoted by Jack Diamond and has an unfortunate meaning related to having loose bowels." Graeme Murdoch pers. comm.)

Fig. 2. A once extensive herbfield dominated by *Triglochin striata* and *Myriophyllum votchii*, northwest of Cutter Rock. Background: Paratutai Island; Cutter Rock in front. Photo: EKC, 8 Feb 1989.

Fig. 3. An incipient sand dune forming, starting with the establishment of a single pingao on the wet sand flat, trapping air-blown dry sand and increasing in size. Photo: Melanie Dixon, 24 Nov 2012.

Fig. 4. Field trip participants spread out over the Whatipu sand dunes. Foreground: oioi (*Apodasmia similis*). Background: Paratutai I. Photo: EKC, 24 Nov 2012.

The native herbfields were once extensive along many of the Whatipu wet sand flats. The last really extensive one was just NW of Ninepin. It was some 500 m long by up to 100 m across, looking in places like a bowling green (Fig. 2) and it was present up until at least 2003 (EKC pers. obs.). Change may have been due to the invasion of saltwater paspalum (*Paspalum vaginatum*) combined with the changes in freshwater levels? Today *Carex pumila* dominates the former herbfield area together with saltwater paspalum. We ventured up the coast between the inland margin of the mobile foredunes and the western margin of the extensive wetland. The foredunes 4-6 m tall were dominated by the two sand-binding natives, pingao (*Ficinia spiralis*) and spinifex (*Spinifex sericeus*). We observed a young pingao dune in the making (Fig. 3). The adjacent wetland contained open areas of water and extensive swards of oioi (*Apodasmia similis*) which frequently extended into the seasonally dry dune areas (Fig. 4). In the open wetlands the native 'water lily' (*Potamogeton cheesemanii*) was frequently present (Fig. 5). The water level of occasional ephemeral wet sand hollows on the eastern side of the foredunes had recently receded, revealing wet margins containing swards to some 10 m long of a stonewort (*Nitella hyalina*), *Lilaeopsis novae-zelandiae* (Fig. 6), *Myriophyllum votchii, Triglochin striata*, and in one place *Ruppia polycarpa* with obvious white peduncles. Other species present included *Lobelia anceps, Isolepis cernua*, *Cotula coronopifolia* (local), and the exotic *Juncus sonderianus*.

We had to proceed some 6 km along the beach to the Pararaha Stream mouth to see the leafless nationally threatened *Eleocharis neozelandica* (Figs. 7-9). The red-brown sward c.10 m × 3 m along a wide part of the stream would be submerged with slightly higher water levels; low plants of *Schoenoplectus pungens* were present behind. Along the margin a little further up the stream we recorded the following natives: *Limosella lineata* (still submerged), *Myriophyllum triphyllum* in deeper water, its emergent stem tips with red bracts visible above the water, *M. propinquum*, *Macharina articulata*, *M. juncea*, *Ruppia polycarpa*, and locally a stand of raupo (*Typha orientalis*), along with exotics: *Azolla pinnata*, *Landoltia punctata*, *Myosotis laxa* (flowering), *Galium palustre* (flowering), and *Vellereophyton dealbatum* (flowering on the wet sand).

The shrubby tree lupin (*Lupinus arboreus*) used to be a prominent weed on the Whatipu dunes (Esler 1974, EKC pers. obs.) until the late 1980s when it suddenly died back here and simultaneously throughout New Zealand (Williams 1988, Cameron & Wright 1989). This demise was due to lupin blight now known to be caused by the fungus, *Colletotrichum lupini*, which is clonal, comprising a single Vegetative Compatibility Group – i.e. no

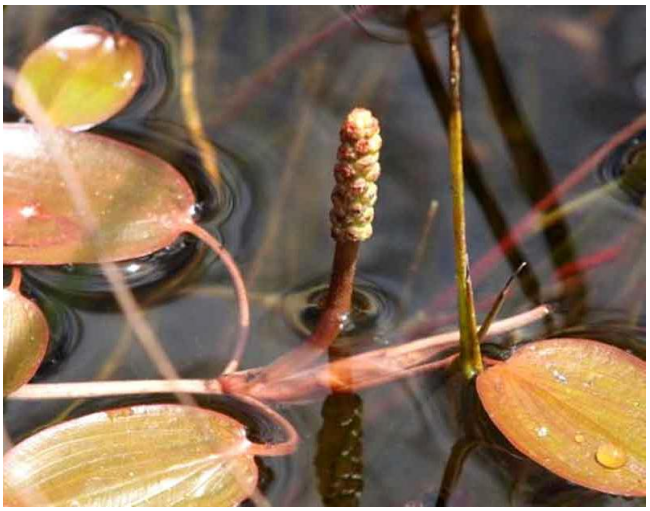

Fig. 5. Native "water lily" (*Potamogeton cheesemanii*) with flower spike, locally common in the more permanent Whatipu wetlands. Photo: Philip Moll, 24 Nov 2012.

Fig. 6. The tiny native tape-measure plant (*Lilaeopsis novae-zelandiae*) – one of the wonderful components of the Whatipu wet sand flat-herbfields. Photo: Philip Moll, 24 Nov 2012.

Fig. 7. *Eleocharis neozelandica* (stems 3–4 cm long), lower Pararaha Str. margin. Photo: Philip Moll, 24 Nov 2012.

Fig. 8. Geoff Davidson admiring the tiny *Eleocharis neozelandica*, utilising his newly found 'cushion', lower Pararaha Stream. Photo: EKC, 24 Nov 2012.

Fig. 9. Rhys Gardner inspecting the *Eleocharis neozelandica* sward, exposed by receding water level of the Pararaha Stream. Photo: EKC, 24 Nov 2012.

Fig. 10. Tree lupin appears to be on a comeback at Whatipu - at least temporarily. Photo: EKC, 24 Nov 2012.

Fig. 11. Pampas grasses used to locally dominate areas of the Whatipu dunes like this track to Paratutai Island. Thanks to the Auckland Council only scattered young pampas plants (*Cortaderia jubata*) were evident during our recent visit. Photo: EKC, 11 May 2003.

recombination is happening (Peter Johnston pers. comm.). Since the arrival of the blight, tree lupin has been present only as scattered small plants at Whatipu. Therefore it was a surprise to see healthy and robust stands of tree lupin in full flower along the margins of the Whatipu wetlands during the field trip (Fig. 10). Perhaps a resistant strain of tree lupin has evolved, or was it just because last season was poor for the disease (Peter Johnston pers. comm.)? A visit about 15 km north to the Te Henga sand dunes in January 2013 revealed that tree lupin was also exhibiting a bit of a come-back there as well (EKC, pers. obs.).

Until recently, pampas grasses (*Cortaderia jubata* and *C. selloana*) have been on the increase at Whatipu, over the last two decades dominating considerable areas on the sand (Fig. 11) and adjacent coastal cliffs. It has now has been reduced to scattered young plants thanks to selective herbicide spraying from a helicopter. Over the last three years Auckland Council has also been carrying out an annual, local ground control of invasive paspalums (*Paspalum distichum* and *P. vaginatum*) at Whatipu where the threatened *Eleocharis neozelandica* occurs, mainly on the margin of the Pararaha Stream (Holly Cox pers. comm.).

Addition to the Whatipu Sands from the ABS field trip on 24 November 2012

The only addition from the field trip to my partially published species list of the Whatipu Sands (Cameron 1989, 1991) of some 285 vascular species was *Orobanche minor* (voucher AK 335345). A few plants of this were spotted by Frances and Josh in the fixed dunes on the track margin from the car park towards Paratutai Island. The plants were among *Muehlenbeckia complexa*, catsear (*Hypochaeris radicata*) and exotic grasses.

Additions to the Whatipu Sands from the ABS field trip on 21 November 1998

The most interesting addition was the single small plant of the fern, *Psilotum nudum* (a fern that has lost most of its complex features), growing on the fixed sand by the track to Paratutai Island near the beach (not vouchered). This was the first record for the Whatipu Sands and it also appeared to be to be the first record for the Waitakere Ecological District. The first Waitakere collection in the Auckland Museum herbarium was from Laingholm in 2007 by Shirley Tomlinson (AK 300617). Other 1998 additions to the Whatipu Sands list included the native *Passiflora tetrandra* (AK 237520), and three exotics: *Ehrharta erecta* (AK 237526), *Geranium purpureum* (AK 237521) and *Poa pratensis* (AK 237525).

Fungi seen during the field trip – by Peter Johnston

Three mycologists attended the field trip. One of the great things for a mycologist going into the field with botanists is that all those small, insignificant but taxonomically special plants get noticed. It is these kinds of plants for which there is often a very poor understanding of their associated fungal pathogens. Whatipu has some special plants, but although we searched long and hard on plants such as *Lilaeopsis novae-zelandiae* and *Eleocharis neozelandica* nothing new was found. We did find three rusts, the rarely collected native species *Puccinia maurea* on *Carex pumila*, and a couple of exotic rusts on weeds (*Puccinia hieracii* var. *hypochaeridis* on *Hypochaeris radicata*, *Uromyces anthyllidis* on *Lotus suaveolens*). All three collections are useful for the on-going Landcare Research project Barcoding New Zealand's Rust Fungi. We were also hoping to see some mushrooms, common on dunes in some parts of the country, but perhaps not in the Auckland area. None were found on this field trip – perhaps because they are not there, but as it is with mushrooms, perhaps because they chose not to fruit on the day we visited. Such is the life of a mycologist.

Vertebrate fauna seen during the field trip

Birds: Paradise shelduck (scattered pairs throughout), shoveler (small group of females), pheasant (commonly heard), pied stilt (a nesting pair?), NZ dotterel, black-backed gull, white-fronted tern, skylark, NZ pipit (common on fore dunes), welcome swallow, blackbird, silvereye, yellowhammer, and house sparrow.

Mammals: rabbit droppings and partial rabbit burrows were seen throughout the dune areas.

Amphibians: exotic Australian frogs (*Litoria* sp.) were commonly heard but not seen.

Participants

Jane Andrews, Sel Arbuckle, Hugo Baynes, Jan Butcher, Ewen Cameron (leader), Lisa Clapperton, Holly Cox, Brian Cumber, Bev & Geoff Davidson, Neil Davies, Melanie Dixon, Frances Duff, Abigail Forbes, Rhys Gardner, Louise Gauld, Nick & Stanley Goldwater, Sharen Graham, Leslie Haines, Marcel Horvath, Peter Hutton, Peter Johnston, Theresa Lebel, Helen Lyons, Melissa Marler, Philip Moll, Maj Padamsee, Juliet Richmond, Emily Roper, Joshua Salter, Jennifer Shanks, Val Tomlinson, Harold Waite, Liz Walker, David Wilson, Philip Wrigley and Maureen Young.

Acknowledgements

I thank Bruce Hayward (Geomarine Research), Peter Johnston (Landcare Research), Graeme Murdoch (historian) and Holly Cox (Auckland Council) for specialist information; Philip Moll and Melanie Dixon for the use of photographs taken during the field trip; and Joshua Salter for Figure 1.

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Bot Soc's Gondwanan ramble at the Auckland Botanical Gardens 1 December 2012

Mike Wilcox

Bec Stanley organised this event, attended by a gathering of 25 people. We assembled at the Logan Campbell building, starting with a delicious pot-luck buffet lunch.

Then followed a brief workshop on the Restionaceae – a Gondwanan, monocot family. Mike had prepared a handout, outlining the features of the family, and there were plants of each of the four New Zealand native representatives on hand for examination, thanks to Geoff Davidson. These were *Sporadanthus ferrugineus*, *Sporadanthus traversii*, *Apodasmia similis*, and *Empodisma "minus"*. Actually, Geoff's specimen of the latter – from Northland – was a metre-long, stout plant, very unlike the more diminutive form of *E. minus* encountered in mountain mires, and is in fact a newly described species, *Empodisma robustum* (Wagstaff & Clarkson 2012).

Fig. 1. Our group admiring the African Garden. Photo: P. Moll, 1 Dec 2012.