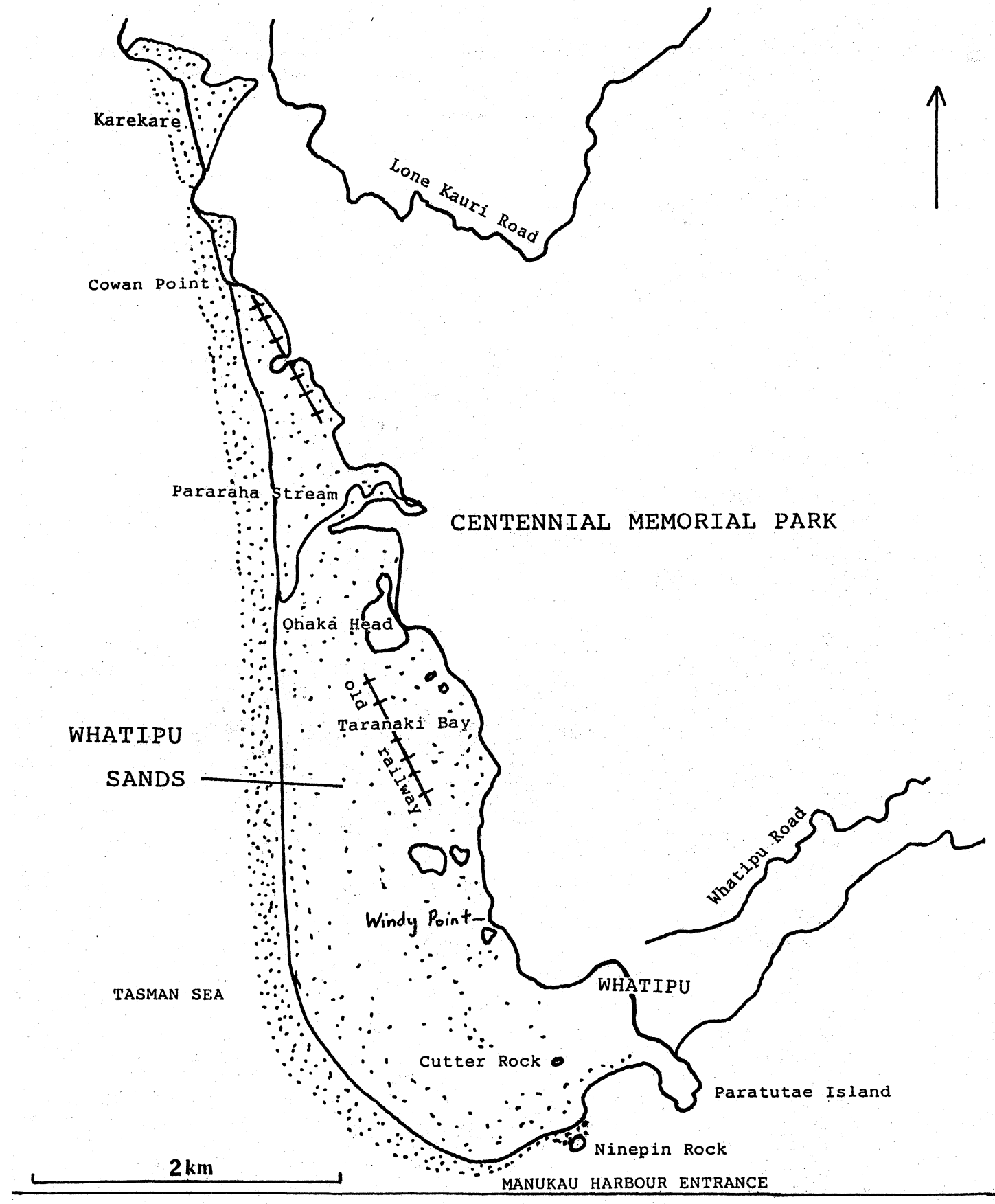

MAP 1 : WHATIPU SANDS

The Whatipu Sands was the route for a narrow gauge railway used from the 1880s to at least 1911. Much of the Waitakere kauri was hauled along this route to Paratutae wharf and waiting ships. The railway was later destroyed by storms. Relics of this former era still remain.

FORCES AT WORK

The extensive black sand flats at Whatipu are derived from weathered rhyolite from the Central North Island transported by rivers, and andesitic outcrops exposed to coastal erosion. The ocean side of Awhitu Peninsula is eroding and being transported northwards to Whatipu and beyond (Williams 1977).

Smith in 1878 recorded a story told to him by a Waiuku Maori of extensive sand country, with fresh-water lakes and clumps of manuka (Leptospermum scoparium) existing many generations ago south of the Manukau Heads.

Williams in 1977 recorded four phases in the sand fluctuations at Whatipu:

progradation	1844-1910
recession	1910-mid 1930s
progradation	mid 1930s-1954
oscillation	1954-1976-(1988)

The net effect since the mid 19th century is progradation in places of over 1 km in width. There is evidence of similar processes in other areas along Auckland's west coast (Smith 1878, Brothers 1954, Wright 1969) which were possibly caused by changing harbour hydraulics, and/or climate oscillations, and/or human impact. Williams (op.cit.) suggested the overall growth at Whatipu in recent times could be due to increased sediment supply from European large scale forest clearances in the North Island resulting in an increase in sediments transported to the coast by the rivers. With the hydrodams built in the 1950s on the Waikato River, the fluvial sediment has markedly reduced causing the erodion of the sandy Awhitu cliffs. Williams thought the relative stability of the Whatipu shoreline since the mid 1950s could be caused by any or all of the factors mentioned above.

VEGETATION AND FLORA

From 1940-54 there was rapid progradation, with the sand area being trebled at Whatipu and the coastline shifting seawards in places by up to 1 km. Consequently, colonisation by vegetation is still at an early stage with much of the area still mobile. Esler (1974) recorded that inside the 1940 shoreline, in the south, large areas of land are submerged during winter floods setting Whatipu apart from all other beaches in the Auckland region. The wetness of the depressions is because of the low topography (dunes are below 6 m a.s.l. except near the coastal cliffs) and flooding of minor streams. There are also several permanent freshwater lakes close to the cliffs. Sea water still periodically invades the sand flats north-west of Ninepin Rock.

The winter inundation of fresh water allows the development of a plant association not known elsewhere in the North Island outside the Wellington area (Manawatu) and to a lesser extent, western Northland (southern Waipoua River mouth). These low native herbfields at Whatipu are dominated by Carex pumila, Myriophyllum votchii, Lilaeopsis

novae-zelandiae, Triglochin striata, Isolepis cernua and Limosella lineata. Locally present in these herbfields may be Lobelia anceps, Eleocharis neozelandica and Selliera radicans.

The exclusion of cattle from the area since the 1970s has aided plant colonisation, although rabbit browsing is still widespread. Most of the Whatipu Sands were unvegetated in the early 1970s; marram grass (Ammophila arenaria) and tree lupin (Lupinus arboreus) were the main vegetation types recorded by Esler (op.cit.). Esler also mentions that artificial stabilisation of the sand had been attempted using exotic grasses, Lotus species, tree lupin and possibly marram grass. Marram has markedly decreased since Esler's survey and artificial stabilisation is no longer practised. Some areas have now developed into shrublands mainly of exotic species, though the tallest vegetation is a stand of cabbage trees (Cordyline australis) north of Windy Point.

Today the area has markedly changed with far more of the sand vegetated, especially in the south where there are now extensive areas dominated solely by two sand-binding natives, spinifex (Spinifex sericeus) and pingeao (Desmoschoenus spiralis). These are the only two species able to cope with the extremely mobile sand; clumps of marram grass only grow out to the landward boundary of these mobile dunes. Fleabane (Conyza albida) and hawkbit (Leontodon taraxacoides) occasionally extend out this far. Many of the mobile dunes are vegetated by only a single species; the silver coloured spinifex or the golden pingeao, reflecting their origin from a single plant. Indian doab (Cynodon dactylon) dunes recorded by Esler (op.cit.) near Cutter Rock have been replaced and although the species is still frequent on the margin of wet sand flats I never observed it playing an major dune-building role.

Purple pampas grass (Cortaderia jubata) is now locally dominant over some of the fixed dunes. An indication of how rapidly the vegetation is changing at Whatipu is the fact that pampas and pingeao did not warrant a mention by Esler in 1974. In the mid 1970s practically all the pingeao at Wahtipu was contained in 3 mounds near the shore west of Cutter Rock (pers.comm. A.E. Esler, 1988). One of these is illustrated in Elizabeth Edgar's article on rushes and sedges in New Zealands's Nature Heritage part 80. p. 2228.

In places near the Whatipu Stream the dunes are dominated by thick carpets of kikuyu (Pennisetum clandestinum) with wire vine (Muehlenbeckia complexa), tree lupin, apple of Sodom (Solanum hermannii), shrubs of boxthorn (Lycium ferocissimum) up to 4 m tall, Cyperus ustulatus and a mixture of other exotic grasses (e.g. Bromus willdenowii, Festuca arundinacea, Holcus lanatus and Lagurus ovatus). During the ABS field trip the margins of the lower Whatipu Stream were very colourful with patches of plants in full flower; yellow (Cotula coronopifolia), pink (Lythrum junceum), blue (Myosotis laxa) and white (Nasturtium officinale).

In the vicinity of Windy Point the fixed dunes are dominated by tree lupin with fleabane; marram grass is usually on the seaward side and wire vine on the landward side. Blackberry (Rubus fruticosus) and Australian fireweed (Senecio bipinnatisectus) are frequently present.

To the seaward side of the fixed dunes and to the landward side of the mobile (pingeao - spinifex) dunes on the unstable wet sand flats are the botanically fascinating native herbfields mentioned previously. Spheres of the blue-green algae, Nostoc are seasonally abundant here. Comparing

with Esler's 1974 account, Selliera radicans appears to have decreased (disappeared?) and Limosella lineata has become more common.

Between the stabilised dunes and the tall coastal cliffs are extensive older wet sand flats which are inundated in winter. During the ABS field trip most of this area had very recently dried up, illustrated by the dead and dying eels and tadpoles in the depressions; only the occasional pond remained up to about 0.5 m deep. These water levels constantly change and in recent years appear to be rising. The inner wet sand flats are dominated by sea aster (Aster subulatus), Carex pumila, Myriophyllum votchii, Juncus microcephalus; and commonly present are Triglochin striata, Cyperus eragrostis and Juncus articulatus.

The best establishment of native shrubs on the fixed dunes is just north of Windy Point with manuka locally common 1-1.5 m tall; shrubs of kawakawa (Macropiper excelsum), cabbage trees and flax (Phormium tenax); a few mahoe (Melicytus ramiflorus) and single shrubs of pohutukawa (Metrosideros excelsa), mapou (Myrsine australis) and Coprosma arborea. Otherwise, cabbage trees excluded, only occasional plants of these species (or no others) were seen on the stabilised dunes.

Several Juncus species are locally common on the sand flats (see appendix), with Juncus acutus appearing to be increasing in abundance. Between Windy Point and Pararaha is the largest area of pampas grass. It is fortunate that pampas cannot cope with wet feet or mobile sand, otherwise this species would be even more dominant. The native toetoe (Cortaderia splendens) is frequently associated with the pampas but less abundant. Just south of the Pararaha Stream are extensive flats of Leptocarpus similis.

In early February 1988 an exotic yellow flowering bladderwort (Utricularia biflora) was found in several separate colonies near the Pararaha Stream by Tom Stein. In a letter to the editor (Western Leader July 1985) Mr R. Maulder stated he planted rare New Zealand plants (Cryptostylis subulata, Utricularia australis, U. delicatula (and variants) and U. sp. aff. Australian sp.) in the Whatipu swamps - Windy Point to the swamps north of Pararaha Stream. I am opposed to such introductions because the area is valuable scientifically because of what is already present and what is establishing there naturally. Natural communities diminish in scientific value if species are deliberately introduced or removed. (Although in some circumstances, where an exotic species threatens a native species or a native community, its removal or management may be warranted.) I suspect the recent occurrence of the weedy Utricularia biflora at Whatipu is due to Mr Maulder, although its natural arrival is also a possibility.

Although in terms of higher plant species the natives only contribute 38% of the Whatipu flora, there are extensive areas dominated by them, especially in the most unstable areas (e.g. mobile dunes and in the wet hollows). Appendixed is a species list of the vascular plants of the southern Whatipu Sands.

CONCLUSION

Accretion and erosion is a natural process occurring locally along the west coast of Auckland and the Whatipu Sands could be swept away as quickly as they were formed. There are many native sand plants which are still absent from the Whatipu Sands, a reflection of their youth. Hopefully with time more will arrive here naturally. The growing human

pressure on Whatipu requires management to retain the biological and wilderness values of the area. Legal enforcement requires suitable reserve status.

Known natural values include:

* regionally unique landscape and topography
* value as a study area for sand/vegetation dynamics
* threatened, endemic plant species (pingeao and Eleocharis neozelandica)
* apparent New Zealand west coast northern limit for Schoenoplectus pungens
* largest regional resource of pingeao for Maori cultural use
* threatened, endemic ground nesting bird species (pers.comm. J.E. Dowding, 1988)
* regionally unique plant associations and
* historical sites

The area needs a designation which reflects its true values. This would best be achieved by gazetting the whole area as a Scenic Reserve (under the Reserves Act) and managing it as part of Centennial Memorial Park.

ACKNOWLEDGEMENT

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REFERENCES

Brothers, R.N. 1954. A physiographical study of recent sand dunes on the Auckland west coast. New Zealand Geographer 10(1): 47-59.

Esler, A.E. 1974. Vegetation of the sand country bordering the Waitakere Range, Auckland: the southern beaches. Proceedings of the N.Z. Ecological Society 21: 72-77.

Smith, S.P. 1878. Notes of a traditional change in the coast line at Manukau Heads. Transactions of the New Zealand Institute 11: 514-516.

Williams, P.W. 1977. Progradation of Whatipu Beach 1844-1976, Auckland, New Zealand. New Zealand Geographer 33(2): 84-89.

Wright, L.W. 1969. Coastal changes at the entrance to the Kaipara Harbour 1836-1966. New Zealand Geographer 25(1): 58-61.

APPENDIX : VASCULAR PLANTS OF THE SOUTHERN WHATIPU SANDS (just to the north of Windy Point). Unless stated observations were from 1986 - April 1988.

a = abundant
c = common
f = frequent
o = occasional
l = local
r = rare

* = adventive species
P = planted by carpark-picnic area
E = recorded by Esler (1974) and unseen by me, includes northern Whatipu
T = only by grassy track from carpark to Whatipu Stream
AKU = University of Auckland herbarium's voucher number

Ferns (4)

Cyathea medullaris o
Dicksonia squarrosa 1
Paesia scaberula 1
Pteridium esculentum 1c

Dicotyledons (98)

*Achillea millefolium o
*Ageratina riparia 1
*Alternanthera philoxeroides 1a AKU 19742
*A. sessilis 1
*Anagallis arvensis var. arvensis f
*Aster subulatus a
*Bellis perennis T
*Bidens frondosa 1c AKU 20178
*Callitriche stagnalis 1
Calystegia soldanella o
Cassinia retorta r
*Centaurium erythraea T
Centella uniflora f
*Cerastium fontanum ssp. vulgare o
*Cirsium vulgare o
*Conyza albida f
Coprosma arborea r
C. robusta o
Cotula australis E
C. coronopifolia 1a
*Crepis capillaris o
Dodonaea viscosa r
*Galium aparine o
*G. palustre 1f AKU 19738
*Geranium dissectum T
* G. homeanum T
* G. molle T
Glossostigma elatinoides 1 AKU 20144
*Gnaphalium coarctatum T
Haloragis erecta ssp. erecta o
*Hypochoeris radicata f
*Lactuca serriola/virosa o
*Leontodon taraxacoides a
Leptospermum scoparium o-1c
Leucopogon fasciculatus 1
Lilaeopsis novae-zelandiae 1f AKU 19743
Limosella lineata 1f AKU 20177
Lobelia anceps f
*Lotus pedunculatus f
*L. suaveolens a
*Ludwigia palustris E
*L. peploides ssp. montevidensis 1f
*Lupinus arboreus a
* Lycium ferocissimum f
*Lythrum hyssopifolia o
*L. junceum f AKU 19749
Macropiper excelsum var. excelsum o
Melicytus ramiflorus ssp. ramiflorus o
*Mentha pulegium o
Metrosideros excelsa r, P
Muehlenbeckia complexa 1a
Myoporum laetum var. laetum P
*Myosotis laxa ssp. caespitosa 1f
Myriophyllum propinquum 1f
M. triphyllum 1 AKU 19736
M. votchii 1a AKU 19737
Myrsine australis r
*Nasturtium officinale 1f
Oxalis rubens o
*Parentucella viscosa 1
Parietaria debilis E
*Physalis peruviana o
*Phytolacca octandra o
Pittosporum crassifolium P
*Plantago australis f
*P. lanceolata o
*P. major 1
*Polycarpon tetraphyllum f
Polygonum decipiens 1f
*Populus nigra r AKU 20181
*Prunella vulgaris o
Pseudognaphalium luteoalbum o
*Ranunculus parviflorus E
R. rivularis 1
*R. sardous o
*Rubus fruticosus agg. 1a
*Rumex acetosella f
*R. conglomeratus f
*Sagina procumbens f
*Salix ?alba r AKU 19741
Selliera radicans E
*Senecio bipinnatisectus f
S. lautus var. lautus o
*S. "setose" 1 AKU 19746
*S. skirrhodon 1c
*Silene gallica a
Solanum americanum f
*S. hermannii o
*S. nigrum o
*Soliva sessilis T AKU 19740
*Sonchus asper o
*S. oleraceus f
*Stellaria media T
Tetragonia trigyna o
*Trifolium repens f
*Ulex europaeus f
*Utricularia biflora 1c AKU 21002 (Pararaha Stream area)
*Veltereophyton dealbatum 1a

Monocotyledons (82)

*X Agropogon littoralis f
*Agrostis capillaris E
*Ammophila arenaria lf
*Anthoxanthum odoratum f
*Axonopus affinis E
Baumea articulata E
B. juncea lf
B. rubiginosa 1980, AKU 13014
*Briza maxima f
*B. minor o
*Bromus diandrus f
*B. willdenowii f
Carex flagellifera o
C. pumila a
C. testacea o
C. virgata l
*C. sp. unidentified sp. lc
AKU 19733 (Carex "6386" of Esler)
Cordyline australis f,P
*Cortaderia jubata la
C. splendens o
*Cynodon dactylon lc
*Cyperus brevifolius lc
*C. conjestus f-lc
*C. eragrostis o-lc
C. ustulatus o
*Dactylis glomerata o
Desmoschoenus spiralis la
Deyeuxia billardierei lf
*Eichhornia crassipes (pers.comm. T. Stein) - eradicated 1987
Eleocharis acuta lf
E. neozelandica E AKU 19503
*Elodea canadensis l AKU 19735
*Epidendrum sp. (pers.comm. T. Stein)
*Eragrostis brownii E
*Festuca arundinacea f
*Hedychium gardnerianum l
*Holcus lanatus o
Isolepis cernua l AKU 19734
I. nodosa f
I. prolifer la
*Juncus acutus f
*J. articulatus a
J. australis l
*J. bufonius var. bufonius o
*J. ?dregeanus lc AKU 13013
*J. effusus E
J. gregiflorus E
J. maritimus var. australiensis la
*J. microcephalus la AKU 13012
*J. tenuis l
*Kniphofia sp. r AKU 21001
*Lagurus ovatus f
Lemna minor l
Leptocarpus similis la
*Lolium perenne l
Microlaena stipoides o
Microtis unifolia o
*Ottelia ovalifolia lf AKU 19739
*Panicum dichotomiflorum o
*Paspalum dilatatum o
*P. distichum la
*P. vaginatum lc AKU 20179
*Pennisetum clandestinum la
Phormium tenax o,P
*Poa annua f
*P. trivialis f
*Polypogon monspeliensis r
Potamogeton cheesemanii l
*Romulea rosea T
Ruppia polycarpa l AKU 19744
Schoenoplectus pungens f-la
S. validus l
*Setaria geniculata l
*Sisyrinchium "blue" l AKU 19745
Spinifex sericeus la
*Sporobolus africanus f
*Stenotaphrum secundatum o
*Tradescantia fluminensis o
Triglochin striata la
Typha orientalis E
*Vulpia bromoides l
*Zantedeschia aethiopica o

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