TANE 25, 1979

INDIGENOUS VASCULAR PLANTS OF THE SERPENTINE AREA OF SURVILLE CLIFFS AND ADJACENT CLIFF TOPS, NORTH-WEST OF NORTH CAPE, NEW ZEALAND

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SUMMARY

An annotated list of indigenous vascular plants from the serpentine area of Surville Cliffs and adjacent cliff tops, north-west of North Cape, is presented. Of the 144 species listed 95 are not recorded by either Wheeler (1963), or Beever and Jane (1967). Some general impressions of the cliff vegetation are given.

INTRODUCTION

This list is a by-product of a short visit we made (8, 9 April, 1979) to the Surville Cliffs serpentine area, North Cape Scenic Reserve, to study the three locally-endemic species and subspecies of *Coprosma*. It was only after we realised that a number of the vascular plants on the cliffs had not been recorded by Wheeler (1963), or Beever and Jane (1967), that we decided to compile a check-list. In view of the short time available, one and a half days, it is very probable that the list is still incomplete.

The Surville Cliffs constitute the northernmost part of the North Island of New Zealand and rise at their highest point nearly 200m above the sea (Fig. 1). The serpentine part of the cliffs is about 3km long (Thomson *et al.* 1974) and of this we examined about 1km (NZMS 1 N1 and 2 490553 to 500556) (Fig. 2). We climbed down the cliffs in three places, but were able to reach the beach in only two. In addition we traversed across the upper part of the cliffs and along the edge of the plateau. The total distance covered, up and down, and along, was approximately 3km.

It was not our purpose to study and analyse the vegetation of the cliffs—that remains to be done. All that we will do here is to record some general impressions.

VEGETATION OF THE CLIFFS

The cliffs are very steep, the average slope being almost 45°. The actual surface, however, is very uneven, easier slopes (30°-40°) being interspersed with numerous vertical rock faces (Fig. 2). With the exception of the near-

vertical coastline cliffs, some 25m or so high, most parts of the cliffs can be reached if care is taken. In only a few places is the vegetation continuous enough to be classed as forest or scrub. The patches of forest, 2-4-(10)m tall, are dominated by pohutukawa (see list for scientific names), and the associated species are houpara, kawakawa, ngaio, mahoe, karaka and taupata, the last-mentioned occurring only near the sea. The more important scrub species, up to 2m tall, are houpara, tanekaha, karo, mapou, poataniwha, small-leaved mahoe, *Hebe ligustrifolia, Coprosma rhamnoides, Parsonsia capsularis,* hangehange, toetoe, flax and *Astelia banksii.*

Most of the vegetation on the cliffs is discontinuous. These open cliff communities, usually less than 1m tall, are extremely variable, changing with the slope (30°-90°), with the degree of fragmentation of the serpentine rock (massive blocks to fine debris), and from ridge to gully. The stiff, silvery tussocks of *Astelia banksii* are everywhere conspicuous on the steepest cliffs. The scrub species mentioned above occur more frequently in gullies where rock debris has accumulated. Additional shrubs occurring in open communities only are kanuka, *Coprosma* sp. (unnamed), *Hebe* sp. (unnamed), *Corokia cotoneaster, Pomaderris oraria, P. prunifolia, Pimelea prostrata* var. *erecta, Cyathodes parviflora,* and, occasionally, *Helichrysum aggregatum* and *Olearia albida.* Scattered ferns, grasses, sedges and other herbaceous plants are found in rock crevices and on rock debris (*Adiantum pubescens, Doodia media, Agropyron kirkii, Deyeuxia billardieri, Rytidosperma* spp., *Carex spinirostris, Stipa stipoides, Arthropodium cirratum, Haloragis erecta, Wahlenbergia* sp. and a few adventives). However, the vegetation of the cliffs is predominantly woody, with herbaceous plants other than toetoe, flax and *Astelia banksii* playing only a very minor role. Everywhere except on the taller trees and shrubs the parasite, *Cassytha paniculata,* spreads its stringy stems.

Seedlings of a number of the trees and shrubs are notably absent. No seedlings of pohutukawa, mahoe, karaka, karo, mapou, poataniwha, small-leaved mahoe, *Coprosma* sp. (unnamed), or *C. spathulata* were seen. The cliffs face north and with their 45° slope must receive the maximum heat from the sun. Even in April the heat was intense.

Other striking features of this unique vegetation are, firstly , the importance of the semi-lianoid habit in a number of the plants. The term 'semi-lianoid' is used, since the elongated stems do not climb, but scramble or trail down the cliffs through other plants. Michie (1957) was the first to comment on this habit of several of the species on the cliffs. The most extreme and remarkable example is the endemic subspecies of *Coprosma spathulata.* Elsewhere *C. spathulata* is an erect shrub up to 2m or more tall; here it is a low-growing shrub producing long flexible stems which occasionally root on coming in contact with soil in crevices. The largest plant we saw, trailing downslope under pohutukawa, had stems 5m long. Other plants producing semi-lianoid or straggling stems, sometimes several metres

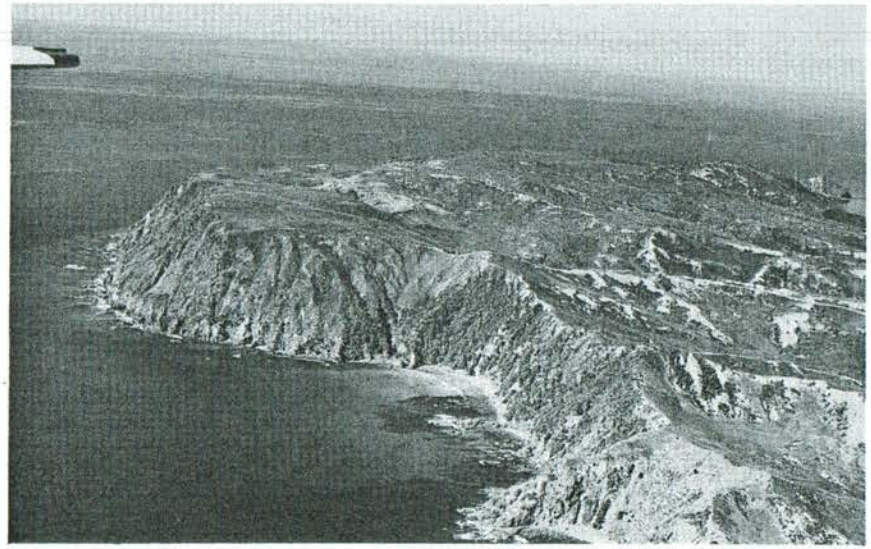

Fig. 1. View east, from the Surville Cliffs on the left to Murimotu Island upper right, showing the remnant ultramafic plateau. The boundary between serpentinite and gabbro (left), and basalt (right) is just to the right of the small gully running down the cliffs towards the camera, left of centre. The fire-induced forest-versus-scrub vegetation boundary visible in the gully runs diagonally across the geological boundary. Photograph: G.C. Kelly.

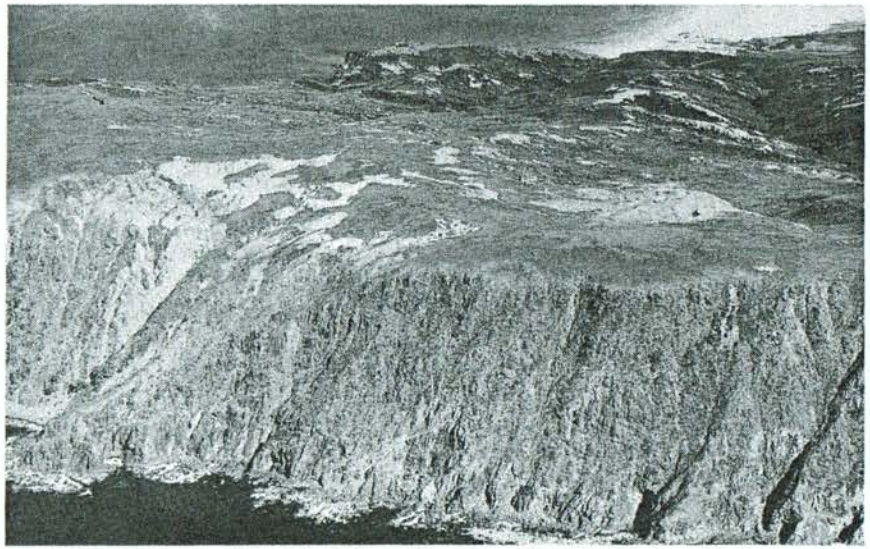

Fig. 2. The northernmost Surville Cliffs (right) and the 700m of cliffs immediately east, looking south over eroding laterites, the serpentine mine, the dissected basalt landscape beyond, and Waikuku Beach. The cliffs visible comprise the main area covered in compiling the list of vascular plants. Photograph: G.C. Kelly.

long, are *Pittosporum pimeleoides* var. *major, Coprosma rhamnoides* subspecies (*C. neglecta*), *Genoistoma ligustrifolium* var. *crassum, Parsonsia capsularis* var. (not a true liane), *Phyllocladus trichomanoides* var., *Pseudopanax lessonii* var., and *Pittosporum crassifolium* var. Another eight, similarly low-growing but whose stems can hardly be described as semi-lianoid, are *Leptospermum ericoides, Cassinia leptophylla* var. (*C. amoena*), *Corokia cotoneaster* var., *Cyathodes parviflora* var., *Coprosma* sp. (unnamed; aff. *C. obconica*), *Hebe* sp. (unnamed), *Pomaderris oraria* var. *novae-zelandiae,* and *P. prunifolia* var. *edgerleyi.* There almost appears to be a continuum in the degree of stem elongation, from *Coprosma spathulata* and *Parsonsia capsularis* at one end to *Cyathodes parviflora* and *Hebe* sp. at the other. (The degree to which these modifications are inherited is poorly known; the little that is known is set down in the annotated list.) Twelve of these 16 shrubs that are of lower stature than their nearest relatives are thought to be local serpentine endemics (see below). That so many plants (over 20% of the woody plants present, belonging to 10 different families) show a degree of convergence to a common growth from in this area is a remarkable result of evolution, suggesting intense selection in an unique environment.

A second striking feature of the vegetation in the area we looked at was the absence of any significant amount of dead wood on the trees and shrubs. Also we saw no evidence of browsing or fire on the cliffs. It seems that fires which have burnt the plateau at intervals have stoped at the cliff edge, at least in the 1km-long stretch we surveyed. If fires have burnt the cliff vegetation they must have occurred some considerable time ago. The overall impression, albeit subjective, of the vegetation on the cliffs is one of comparative stability in an environment that places great restraints on plant growth because of the special nature of the rock and the severe droughts that occur.

LOCAL ENDEMICS AND OTHER PLANTS WITH RESTRICTED DISTRIBUTIONS

The following 15 plants are either locally endemic (E) or found in only one or a very few localities in New Zealand other than the North Cape area (R). Some have been ranked (as sp., ssp., or var.) differently at one time or another by different authors; the alternative rankings are given below.

Ranking favoured here	Other ranking
Phyllocladus trichomanoides var. (E)	*C. amoena* (Cheeseman 1897b)
Cassinia leptophylla var. (E)	
Coprosma sp. (unnamed; aff. *C. obconica*) (E)	*C. neglecta* (Cheeseman 1912)
C. rhamnoides ssp. (E)	
C. spathulata ssp. (E)	
Corokia cotoneaster var. (E)	
Cyathodes parviflora var. (E)	
Geniostoma ligustrifolium var. *crassum* (E)	(not accepted by Allan 1961)
Hebe sp. (unnamed) (E or R?) (Note 1)	*Veronica speciosa* var. *brevifolia* (Cheeseman 1906)
	Hebe macrocarpa var. *brevifolia* (Moore 1961)
Parsonia capsularis var. (E)	
Pittosporum crassifolium var. (E)	
P. pimeleoides var. *major* (Cheeseman 1906, Cooper 1956) (E or R?) (Note 2)	*P. michiei* (Allan 1961)
Pomaderris oraria var. *novae-zelandiae* (R) (Note 3)	
Pseudopanax lessonii var. (R) (Note 4)	
Haloragis erecta ssp. *cartilaginea* (Orchard 1975) (E)	*H. cartilaginea* (Cheeseman 1897b)

Note 1: This species may also occur at Pukekarea (Cheeseman 1897a, as *Veronica speciosa*) and Whangarei Heads (Moore 1961, as *Hebe macrocarpa* var. *brevifolia or H.m.* var. *latisepala*). However, a recent search at Whangarei Heads (Mt Manaia and Bream Head) by Mr C. Ogle (pers. comm.) failed to turn up either of these species, only another unnamed one. A search should be made at the Pukekarea locality.

Note 2: Has apparently been "collected once from C. Maria Van Dieman" (Johnstone 1969, as *P. michiei*).

Note 3: Also occurs at Scott's Point, Maunganui Bluff, and Whangarei Heads (Allan 1961).

Note 4: Also at Te Huka Bay, 8km WSW of Surville Cliffs (J.K.B., CHR 353488).

Note 5: Johnstone (1969) lists as endemic to North Cape Scenic Reserve *Weinmannia silvicola* var. and "dwarf or prostrate forms (which may be genuine varieties)" of the following additional species: *Melicope simplex, Pittosporum umbellatum, Coprosma* sp., *Weinmannia silvicola* or *Pittosporum umbellatum.* The forms of the other species did not strike us as being particularly unusual. Specimens of *W. silvicola,* collected by R.H. Michie and labelled "North Cape" (CHR, *n.v.*) have very small adult leaves and long racemes of pink flowers. They came not from the serpentine but from scrub near the Spirit's Bay Road, c. 17km to the south-west (R.H. Michie pers. comm.; see also CHR 309669-70, *J.K.B.*)".

None of the local endemics appear to be in danger of extinction. Most of them occur in great abundance; the two exceptions are *Coprosma spathulata* ssp. and *Pittosporum pimeleoides* var. *major.* We counted the number of plants of *Coprosma spathulata* we saw and the total was eight. As mentioned in the introduction we covered a distance of approximately 3km, so if we assume we saw all plants present within 5m either side of us the area surveyed would be 30,000m². The total area of serpentine cliffs and adjacent cliff tops, as measured from Figs 2 and 3 (Thomson *et al.* 1974), is about 1,100,000m². The total population of *C. spathulata* is therefore estimated to be $8 \times \frac{1\,100\,000}{30\,000}$, say 300. We did not count the individuals of *P. pimeleoides,* but there were at least twice as many, possibly four times as many, as there were of *C. spathulata.* The population of *P. pimeleoides* is therefore put at 600-1000 individuals.

Notes on the list

If the name used is different from that in the standard floras (Allan 1961; Moore and Edgar 1970; Cheeseman 1925—grasses only) the previous name is added in brackets.

Unless otherwise indicated plants are common or abundant.

Both "variety" ("var.") and "subspecies" ("ssp.") are used in the sense of a "geographically separated and morphologically distinct part of a species" (Gould 1978). Traditionally "var." has been used in New Zealand, but the trend now is to use "ssp." (e.g. Lloyd 1972, Orchard 1975). In *Coprosma* for the present list "ssp." is used since one of us (A.P.D.) is at present revising the genus.

In compiling the present list we have had made available to us an unpublished one entitled "Species List of Kerr Pt Cliffs" made by Mr W.D. Burke in 1966. Plants seen by Mr Burke but not by us have been incorporated, and the records attributed to Burke (unpubl.). We are not aware of the precise area covered by Mr Burke, but suspect that it extended beyond the limits of serpentine. For this reason—not to mention the shortness of our visit—the list below cannot be considered a definitive one for the serpentine area.

Abbreviations used:

aff.: affinities with
agg.: aggregate, comprising more than one species
CHR: specimen in Botany Division, DSIR, herbarium, Lincoln
incl.: include (in concept of taxon)
s.s.: *sensu stricto,* in a narrow sense, excluding species other than the original in an aggregate, e.g. *Coprosma lucida* s.s. (incl. *C. australis*) indicates that *C.l.* var. *angustifolia* and *C.l.* var. *obovata* are *excluded* as belonging to a separate species (*C. dodonaeifolia*), but *C. australis* (A. Rich.) Robinson (non *C. australis* Oliver 1935) is included as being part of the same species.
★ is used for intergrading intraspecific taxa (X for interspecific hybrids only).
* indicates that the plant is not listed by Wheeler (1963), or Beever and Jane (1967), for either "cliff communities" or "plateau scrub".

Specimen	Comments	CHR No.
GYMNOSPERM TREES		
Phyllocladus trichomanoides var.	Tanekaha. Scrub on the cliffs. This differs from the typical variety in having longer phylloclades, which may be up to twice as long as broad. Plants on the cliffs are typically low-growing (usually less than 2m tall), with semi-lianoid lower branches often forming a dense and tangled cover of vegetation. One seedling brought into cultivation (A.P.D.), has however, grown into a slender, erect sapling 2m tall and similar in habit (but not in the shape of the phylloclades) to plants of the typical variety grown nearby. Trees cultivated in Mr R.H. Michie's garden and in the Kaitaia Domain are now c. 7m tall. Their phyllodes are slightly larger than those of the typical variety; also, their lower branches have grown downwards and rooted close to the trunk. We conclude that while the habit developed on the serpentine is environmentally induced, there are probably genetical differences between the two varieties.	354823
MONOCOT TREES AND SHRUBS		
*Cordyline australis**	Cabbage tree. A few small trees on the cliffs.	
C. banksii.	Recorded by Wheeler (1963) from "plateau scrub".	
DICOT TREES, SHRUBS AND LIANES		
Brachyglottis repanda var. *repanda**	Rangiora. A few small shrubs under pohutukawa on the cliffs.	
Cassinia leptophylla var. *leptophylla** (incl. *C.l.* var. *spathulata, C. fulvida* var. *fulvida,* and *C. retorta)*	Tauhinu. Recorded (as *C. retorta)* from "slope above Kerr Point" and "plateau scrub" by Carse (1930) and Thomson *et al.* (1974), respectively, but not seen by us. There is very great variation in *C. leptophylla* in both North and South Islands, and there seems little point in naming races apart from the following. (For a discussion, "Why we should not name races", see Gould 1978.)	
C.l. var. (*C. amoena*).	Scrub, mainly on the edge of the plateau.	354810

Specimen	Comments	CHR No.
C.l. var. *leptophylla*★ var. (*C. amoena*)*	Intermediates are recorded by Carse (1930) and Johnstone (1969), as *C. leptophylla* X *C. amoena.*	
Cassytha paniculata.	Everywhere on shrubs.	
*Coprosma crassifolia**	A few shrubs on the cliffs.	
C. lucida s.s.* (incl. *C. australis)*	Shiny-leaved karamu. A few plants in scrub on the edge of the plateau.	326129
C. macrocarpa ssp.*	Forest and scrub on the cliffs. Plants growing in the open showed severe die-back in April 1979. The drupes of the mainland ssp. are much smaller than those of ssp. *macrocarpa* of the Three Kings Is.	326118-20
C. parviflora s.s.*	Scattered plants in scrub both on the plateau and on the cliffs. *C. parviflora* is a species restricted to Northland, north of about Dargaville.	326108-10
C. repens	Taupata. Cliffs near the sea.	326111
C. rhamnoides ssp. *rhamnoides** (incl. *C. polymorpha*)	A few erect plants seen in short scrub on the edge of the plateau may be this or they may be intergrades with the following. *C. rhamnoides* is an extremely variable species throughout New Zealand. However, one race does seem distinctive enough to warrant naming as a subspecies and that is the following, restricted to the serpentine area.	
C.r. ssp. (*C. neglecta*)*	Scrub on the edge of the plateau and on the cliffs. Oliver (1935)suggested that *C. neglecta* might be a hybrid between *C. repens* and *C. rhamnoides.* However, its abundance in the serpentine area together with its stipule morphology render this hypothesis untenable. (The hybrid does occur elsewhere in New Zealand but is very uncommon.) The subspecies differs from typical *C. rhamnoides* in its low-growing habit, and its tendency, especially on the cliffs, to produce semi-lianoid stems that scramble through other plants. Such stems may reach 2m in length. Plants retain their low-growing habit in cultivation. Fruiting observed January (J.K.B.), April; drupes orange or red.	354826-31

Specimen	Comments	CHR No.
C.r. ssp. *rhamnoides*★ ssp. (*C. neglecta*)*	See note under *C.r.* ssp. *rhamnoides.*	354832
C. spathulata ssp.*	A few plants in short scrub on the edge of the plateau, and a few on the cliffs in scrub and under pohutukawa. This distinctive subspecies was apparently first collected by "W.D.B. and G.K.R." in 1964 (WELTU 10497), but the specimen was not filed in the herbarium until May 1979, by which time other plants had been discovered by one of us (J.K.B., January 1979). The habit and abundance are discussed in earlier sections of this paper. The stipules are identical with those of typical *C. spathulata,* but the leaves are slightly different. No fruiting or flowering plants and no seedlings were seen in April 1979.	326125-8
C. sp.* (unnamed; aff. *C. obconica*)	Open rocky places on the cliffs, especially towards the top. This species has previously been determined as *C. acerosa* (Wheeler 1963), *C. propinqua* (H. Powell, AK 36254; A.E. Wright, AK 138487), and *C. obconica* (W. Burke, WELTU 10476-8). The apiculate tip to *some* of the leaves and the densely hairy stipules—the glandular denticles are completely obscured—indicate a close relationship with *C. obconica.* But whereas *C. obconica* is an erect plant with obconic drupes streaked and blotched very dark violet, the Surville Cliffs species is low-growing with unpigmented globose drupes, though so far only a few drupes have been seen in the latter species. The leaves differ too, being considerably larger in the Surville Cliffs species. Further study may of course show that we are dealing with but one species; initially, however, it seems best to postulate that there are two. The nearest locality for *C. obconica* is Mataroa, northwest of Taihape, 740km SSE of North Cape. Fruiting was very poor in April 1979 and as with *C. spathulata* no seedlings were seen. Flowers are unknown; if *C. obconica* is any guide, they should appear in mid-winter. In both the unnamed sp. and in *C. spathulata* ssp. stems may root when they touch the ground.	326121-4

Specimen	Comments	CHR No.
Coriaria arborea var. *arborea**	Tutu. Listed by Burke (unpubl.).	
Corokia cotoneaster var.	Small-leaved korokio. Open places on the cliffs. Plants in the serpentine area are prostrate. A seedling brought into cultivation four years ago has developed into a sprawling shrub 75cm diam., 25cm tall.	354820
Corynocarpus laevigatus	Karaka. A few small trees associated with pohutukawa on the cliffs.	
*Cyathodes fasciculata**	Mingimingi. Short scrub.	
C. fraseri s.s.	Patotara. Short scrub.	
C. juniperina	Prickly mingimingi. Scrub. The leaves of plants in the serpentine area are 10mm or more long by 1.5-2.5mm wide. The veins of the leaves are branched.	354817-8
C. parviflora var.	Short scrub on the edge of the plateau and open places on the cliffs. Plants are prostrate, and remain so in cultivation (Michie 1957).	326200
Dodonaea viscosa var.*	Akeake. A few small saplings of the usual New Zealand form of the species in scrub on the edge of the plateau.	
*Fuchsia procumbens**	Listed by Burke (unpubl.) but probably not present in serpentine area.	
*Gaultheria antipoda**	A few plants in scrub on the edge of the plateau.	
Geniostoma ligustrifolium var. *crassum*	Hangehange. Scrub on the cliffs. Another local endemic that shows a tendency to produce semi-lianoid stems. We have no reports of its growth form in cultivation.	326103 326191
*Hebe ligustrifolia**	Many small plants in short scrub on the edge of the plateau. Scattered, often taller (to 2m), plants in scrub on the cliffs.	326104 354803-5

Specimen	Comments	CHR No.
H. sp (unnamed; included in *Veronica speciosa*, as var. *brevifolia*, by Cheeseman 1906; and in *H. macrocarpa*, as var. *brevifolia*, by Moore 1961).	Short scrub, on the edge of the plateau mainly. Specific status should be given to this *Hebe*. There has been no evidence of crossing with either *H. speciosa* or *H. macrocarpa*, where these species have been grown beside it over a period of many years (A.P.D.). Hair (1967) gives the chromosome number as n = 20 for *H. speciosa*, n = 40 for *H. macrocarpa*, and N = 59 for *H.m.* var. *brevifolia*. Cheeseman (1897a, p.363) records that "a single plant often forms a clump 2 yards or more in diameter." The low-growing habit of this *Hebe* is retained in cultivation and the stems commonly root where they touch the ground (A.P.D.).	326192-3
Helichrysum aggregatum (*H. glomeratum*)	A small group of plants, with many dead branches, in scrub on the cliffs.	326199
*Korthalsella salicornioides**	Mistletoe. Listed by Burke (unpubl.).	
*Knightia excelsa**	Rewarewa, New Zealand honeysuckle. A few small saplings in scrub on the cliffs.	
Leptospermum ericoides	Kanuka. Short scrub on the edge of the plateau and in open places on the cliffs. Most plants semi-prostrate; leaves linear. We have no reports of the form taken by cultivated plants.	
L. scoparium	Manuka. Scrub on the edge of the plateau.	
*Litsea calicaris**	Mangeao. Listed by Burke (unpubl.). Probably not in serpentine area.	
Macropiper excelsum var. *excelsum**	Kawakawa. Forest on the cliffs.	326196
Melicope simplex	Poataniwha. Scrub on the cliffs.	326173
*Melicytus micranthus** (incl. *M.m.* var. *microphyllus*)	Small-leaved mahoe. Scrub on the cliffs.	
M. ramiflorus ssp. *ramiflorus**	Mahoe. A few shrubby plants in short forest on the cliffs.	
*Metrosideros excelsa**	Pohutukawa. Forming patches of forest on the cliffs, mostly short (2-4m), but locally taller (10m) on the sides of a gully near the sea.	

Specimen	Comments	CHR No.
*Muehlenbeckia complexa**	Small-leaved pohuehue. Cliffs near the sea.	354801
Myoporum laetum var. *laetum*	Ngaio. A few plants on the cliffs; shrubby in the open, of tree size in pohutukawa forest near the sea.	354806-7
*Myrsine australis**	Mapou, red matipo. Scrub on the cliffs.	
*Olearia albida** (incl. *O.a.* var. *angulata*)	Scattered shrubs on the cliffs.	326176
Parsonsia capsularis var.	Scrub and open places on the cliffs. Discussed by Allan (1961, p.554). The habit is semi-lianoid like a majority of the local endemics. Michie (1957) records that this plant "has no twining or climbing tendencies".	326165 326170
Pimelea prostrata var. *erecta*	Short scrub on the edge of the plateau and in open places on the cliffs. We doubt that this and *P. prostrata* s.s. are really conspecific.	326183-6
Pittosporum crassifolium var.*	Karo. Several groups of shrubs on the cliffs. In this distinct variety the leaf blade is rather abruptly narrowed to the petiole, and is obovate to broad elliptic-obovate in shape; the tomentum is usually ferruginous. Its capsule is bivalved, about half the size of that of the typical variety and has a ferruginous (rather than grey) tomentum. Like tanekaha, plants on the cliffs are low-growing and show a tendency to produce semi-lianoid branches. As plants have apparently not been cultivated before, it will be some years before we know whether this habit is environmentally induced, or inherited.	354815-6
P. pimeleoides var. *major* (*P. michiei*)	Scattered plants in scrub on the cliffs. This is another local endemic that produces semi-lianoid stems that scramble through neighbouring plants and occasionally root. The habit is retained in cultivation (A.P.D.; J.K.B.; Michie 1957). This plant has been grown in Kaitaia since 1945 (R.H. Michie's garden), where it freely hybridizes with the typical variety to produce fertile intermediate offspring. (CHR 353548-9). An estimate of the population size is given in an earlier section of this paper.	326175

Specimen	Comments	CHR No.
Pomaderris ericifolia (*P. phylicifolia* var. *ericifolia*)	Scattered plants of this and the following species in scrub on the edge of the plateau.	
P. kumeraho	Kumarahou.	
P. oraria var. *novae-zelandiae*	This and the following species in short scrub, mainly on the edge of the plateau.	
P. prunifolia var. *edgerleyi*		
*Planchonella novo-zelandica**	Tawapou. One tree seen on the side of a gully near the sea.	326187
Pseudopanax lessonii var.	Houpara. Very abundant on the cliffs, forming patches of dense scrub and, in a few places, short forest in association with pohutukawa. The habit is similar to that of tanekaha—low-growing with semi-lianoid lower branches. The leaves are smaller than those of typical *P. lessonii* and the leaflets number (1)-3-(5) rather than (3)-5. These differences are retained by plants cultivated since 1945 in R.H. Michie's garden and in the Kaitaia Domain.	
Rubus cissoides var. *cissoides**	Bush lawyer. Listed by Burke (unpubl.).	
*Tetragonia trigyna**	New Zealand climbing spinach. Cliffs near the sea.	
LYCOPODS		
*Lycopodium cernuum**	A few plants in scrub on the edge of the plateau.	
*L. deuterodensum**	Scrub on the edge of the plateau.	
FERNS		
*Adiantum cunninghamii**	Maiden-hair. Listed by Burke (unpubl.).	
A. pubescens (*A. hispidulum*)*	Rock crevices on the cliffs.	
Asplenium flaccidum ssp. *flaccidum**	Listed by Burke (unpubl.) and mapped for general area by Brownsey (1977).	
A. oblongifolium (*A. lucidum*)*	A few plants on the cliffs.	

Specimen	Comments	CHR No.
A. sp. (unnamed; included in *A. obtusatum*, as ssp. *northlandicum*, by Brownsey 1977)	Coastal cliffs. Brownsey (1977) gives the chromosome number as n = 144, compared to n = 72 for *A. obtusatum* s.s. The remarks of Darlington (1978), quoted below, lead us to conclude that the northern plants constitute a distinct *biological* species, despite the few morphological differences that distinguish them from southern plants (*A. obtusatum*). "Every new polyploid begins as the smallest of all populations, a unique individual. And it is cut off from its parental diploid stock, often forever. It is therefore at once a potential new species" (p.451).	326178
A. oblongifolium X *A.* sp. (unnamed)*	One plant on coastal cliff. Identified by Dr P.J. Brownsey.	326179
Blechnum sp.* (*B. capense* agg.)	Listed by Burke (unpubl.).	
*Botrychium australe**	Parsley fern. Recorded by Findlayson (1945) from the plateau.	
Cyathea sp.*	Tree fern. Listed by Burke (unpubl.).	
Doodia media ssp. australis*	Open places on the cliffs.	
*Gleichenia microphylla**	Scrub on the edge of the plateau.	
*Lindsaea linearis**	Short scrub on the edge of the plateau.	
*Phymatosorus diversifolius (Phymatodes diversifolium)**	Hound's tongue. A few plants in forest on the cliffs.	
*Polystichum richardii**	Shield fern. A few plants under pohutukawa on the cliffs.	
Pteridium esculentum (P. aquilinum var. *esculentum)**	Bracken. Scrub on the edge of the plateau.	
*Pyrrosia serpens**	Rocks in forest.	
Sticherus cunninghamii (Gleichenia cunninghamii)	Umbrella fern. Recorded by Wheeler (1963) from "plateau scrub".	
*S. flabellatus (Gleichenia flabellata)**	Umbrella fern. A few plants in scrub on the edge of the plateau.	326188

Specimen	Comments	CHR No.
ORCHIDS		
Acianthus fornicatus var. *sinclairii**	Listed by Burke (unpubl.).	
*A. reniformis**	Scrub on the edge of the plateau.	
Corybas spp.	Spider orchids. Wheeler (1963) records two species from "cliff communities" and "plateau scrub".	
Microtis unifolia	Recorded by Wheeler (1963) from "cliff communities" and "plateau scrub".	
*Prasophyllum pumilum**	A few plants in scrub on the edge of the plateau; flowering April 1979.	326197
*Pterostylis alobula**	Green-hood orchid. This and the following species listed by Burke (unpubl.).	
*P. trullifolia**	Green-hood orchid.	
Thelymitra intermedia	Sun orchid. This and the following species recorded by Wheeler (1963) from "cliff communities" and "plateau scrub".	
T. longifolia	Sun orchid. Also recorded by Rae (1970).	
GRASSES		
*Agropyron kirkii (A. multiflorum)**	Blue grass. Scattered plants in rock crevices on the cliffs.	354802
*Cortaderia splendens**	Toetoe. Cliffs.	326095
*Deyeuxia billardieri**	Wind grass. Open places on the cliffs.	
Dichelachne sciurea	Plume grass. Open places on the cliffs.	326096
*Microlaena stipoides**	Rice-grass. Short scrub on the edge of the plateau.	
*Oplismenus imbecillus (O. undulatifolius)**	Forest on the cliffs.	
*Rytidosperma biannulare**	Danthonia. This and the following species in short scrub on the edge of the plateau and in open places on the cliffs.	326093
... (Danthonia pilosa var. *racemosa)**	Danthonia.	326094
	Danthonia. Cliffs.	358347

Specimen	Comments	CHR No.
SEDGES		
Baumea articulata	Recorded by Wheeler (1963), as *Cladium articulatum* from "plateau scrub". Probably not in serpentine area.	
*B. juncea**	Short scrub on the edge of the plateau and abundant in one of the few seepages on the cliffs.	326174
*Carex breviculmis**	Scattered plants in short scrub on the edge of the plateau.	
*C. spinirostris**	Cliffs.	326167 354808-9
*Cyperus ustulatus**	Cliffs near the sea.	
*Gahnia lacera**	Cliffs.	
*Lepidosperma australe**	Four-square sedge. This and the following five species in short scrub on the edge of the plateau.	
*L. filiforme**		
L. laterale		326177
Morelotia affinis		
*Schoenus apogon** (incl. *S.a.* var. *caespitans*?)		326194
*S. brevifolius**		
*S. tendo**	Short scrub on the edge of the plateau. One patch seen on the cliffs.	
*Scirpus nodosus**	Cliffs near the sea.	
*Uncinia uncinata**	Hook-grass. Scattered plants in scrub and forest on the cliffs.	
RUSHES		
Juncus gregiflorus	Recorded by Wheeler (1963), as *J. polyanthemos* from "cliff communities" and "plateau scrub". It seems an unlikely plant to find on the cliffs.	
MONOCOT HERBS OTHER THAN ORCHIDS, GRASSES, SEDGES, RUSHES		
Arthropodium cirratum	Rengarenga. Open places on the cliffs.	
Astelia banksii	Very abundant on the cliffs.	326166
Dianella nigra	Turutu, blueberry. Scrub on the edge of the plateau.	
Libertia ixioides	New Zealand iris. A few plants under pohutukawa on the cliffs.	326190

Specimen	Comments	CHR No.
Phormium tenax	New Zealand flax. Cliffs. A few plants in scrub on the edge of the plateau.	
COMPOSITE HERBS		
Ghaphalium audax s.s.*	Cudweed. Short scrub on the edge of the plateau and in open places on the cliffs.	
*G. sphaericum**	Cudweed. Open places at the top of the cliffs.	
G. sp. (*G. luteo-album* agg.)*	Cudweed. Cliffs near the sea. A coastal species; leaves mostly oblong-spathulate to narrowly oblong, rounded.	326168
Lagenifera pumila (Lagenophora pumila)	Recorded by Beever and Jane (1967), from "cliff communities" and "plateau scrub".	
*Picris hieracioides**	Scattered plants in open places at the top of the cliffs.	326198
Senecio lautus ssp. *lautus**	Cliffs near the sea.	
DICOT HERBS OTHER THAN COMPOSITES		
Apium prostratum ssp. *prostratum* (incl. *A.p.* ssp. *p.* var. *filiforme*) *(A. australe)**	Sea celery. Cliffs near the sea.	
*Centella uniflora**	Short scrub on the edge of the plateau.	
Chenopodium sp. (cf. *C. allanii*)*	A few plants, without fruit, seen on cliffs near the sea. Two are being grown on for later determination.	326171-2
*Crassula sieberiana (Tillaea sieberiana)**	Listed by Burke (unpubl.).	
*Dichondra repens**	Open places on the cliffs. A few plants in short scrub on the edge of the plateau.	
Disphyma australe ssp. *australe*	New Zealand ice-plant. Cliffs near the sea.	
*Drosera auriculata**	Sundew. List by Burke (unpubl.).	
D. binata	Sundew. A few plants in wet places in scrub on the edge of the plateau. Recorded by Wheeler (1963) from "cliff communities".	
D. pygmaea	Sundew. This and the following species recorded by Wheeler (1963) from "cliff communities" and "plateau scrub". These, and *D. binata* above, seem unlikely plants to find on the cliffs.	
D. spathulata	Sundew	
Epilobium sp.*	Willow-herb. Recorded by Michie (1957) from the cliffs.	

Specimen	Comments	CHR No.
*Gonocarpus incanus (Haloragis incana)**	Short scrub on the edge of the plateau.	2214356
Haloragis erecta ssp. *cartilaginea (H. cartilaginea).*	Open places on the cliffs.	326189
*Lepidium oleraceum**	Cook's scruvy-grass. Recorded by Cheeseman (1897a) from "cliffs near the North Cape". Probably not in serpentine area.	
*Lobelia anceps**	Cliffs. A few plants in scrub on the edge of the plateau.	
*Oxalis exilis**	Scattered plants of this, and what appear to be two other species, on cliffs near the sea.	
O. sp. (*O. corniculata* agg.)*	Leaves glabrous.	354811
O. sp. (*O. corniculata* agg.)*	Leaves hairy.	326195
Peperomia urvilleana	Scattered plants on rocks under pohutukawa on the cliffs.	
Plantago raoulii	Plantain. Recorded by Wheeler (1963) from "cliff communities". Probably not in serpentine area.	
*Pratia physaloides**	Colensoa. A few plants under pohutukawa on the cliffs.	
Sarcocornia quinqueflora (Salicornia australis)	Glasswort. Recorded by Wheeler (1963) from "cliff communities".	
*Scleranthus biflorus**	Listed by Burke (unpubl.).	
Wahlenbergia sp. (*W. gracilis* agg.)*	Harebell. Open places on the cliffs. Flowers pale lilac.	354812-4
DOUBTFUL ERRONEOUS RECORDS NOT INCLUDED IN THE MAIN LIST		
Coprosma acerosa	Recorded by Wheeler (1963, p.65) from "open steep faces". We saw none there and presume the record is based on a misidentification of *C.* sp. (unnamed; aff. *C. obconica*).	
C. repens X *C. rhamnoides*	Oliver (1935) suggests that *C. neglecta* is this hybrid. We feel certain this is not the case (see discussion in main list).	
Dracophyllum urvilleanum	Recorded by Wheeler (1963) from "cliff communities" and "plateau scrub". Presumably the record was based on a misidentification of *D. lessonianum*, though we did not see this species in the serpentine area.	
Gonocarpus aggregatus (Haloragis depressa) and *Gonocarpus montanus (Haloragis procumbens).*	These two species were recorded from "plateau scrub" by Beever and Jane (1970) and Rae (1970), respectively. Both records were probably based on a misidentification of *Gonocarpus incanus.*	

Specimen	Comments	CHR No.
Hebe adamsii	Recorded from "cliff communities" and "plateau scrub" by Wheeler (1963) who suggests it may be a form of *Hebe speciosa* var. *brevifolia*. We know nothing about it. Moore (1961) lists it as a hybrid and suggests that "parents are *H. ligustifolia* and *H. macrocarpa* var. *brevifolia*".	
H. ligustrifolia X *H.* sp. (unnamed).	Recorded by Findlayson (1945), as *H.l.* X *H. speciosa* var. *brevifolia*, and by Johnstone (1969), as *H.l.* X *H. macrocarpa* var. *brevifolia*. We saw no evidence to suggest that the two species hybridise in the serpentine area.	
H. speciosa	Cheeseman (1897a) initially recorded the serpentine (endemic?) species as *Veronica speciosa.*	
Olearia furfuracea	Recorded by Wheeler (1963) from "cliff communities" and "plateau scrub". As the only species we saw, *O. albida*, was not recorded by Wheeler, we wonder whether a mistake in identification was made; or possibly both species are present.	
Parsonsia heterophylla	Recorded by Wheeler (1963). Based on a misidentification of *P. capsularis* var.	
Phormium cookianum	Recorded by Wheeler (1963) from "cliff communities" and "plateau scrub". The only species we saw was *P. tenax* (not recorded by Wheeler). Possibly both species are present.	
Pittosporum umbellatum	Recorded by Cheeseman (1897a, p.363) from the precise area we looked at, and by Johnstone (1969) from the Reserve. As neither author mentions the very distinctive variety of *P. crassifolium* growing on the serpentine cliffs we wonder whether this is not another case of mistaken identity. The nearest locality for *P. umbellatum* that is known to us (J.K.B.) is Whatuwhiwhi, c.65km SE of Surville Cliffs.	
Pomaderris polifolia (P. phylicifolia var. *polifolia)*	Recorded by Wheeler (1963) from "cliff communities" and "plateau scrub". We think this is a mistake. Wheeler also reports that ". . . . many intergrading types have been observed between the species of *Pomaderris* in the area". On our brief visit we saw nothing to confirm this.	
Tetragonia tetragonioides	Recorded by Wheeler (1963) from "cliff communities". Possibly based on a misidentification of *T. trigyna.*	

ACKNOWLEDGEMENTS

We thank Dr E. Edgar for identifying several grasses, Dr P.J. Brownsey for a fern identification, and Mr G.C. Kelly for providing the photographs. Dr I.A.E. Atkinson read the manuscript.

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