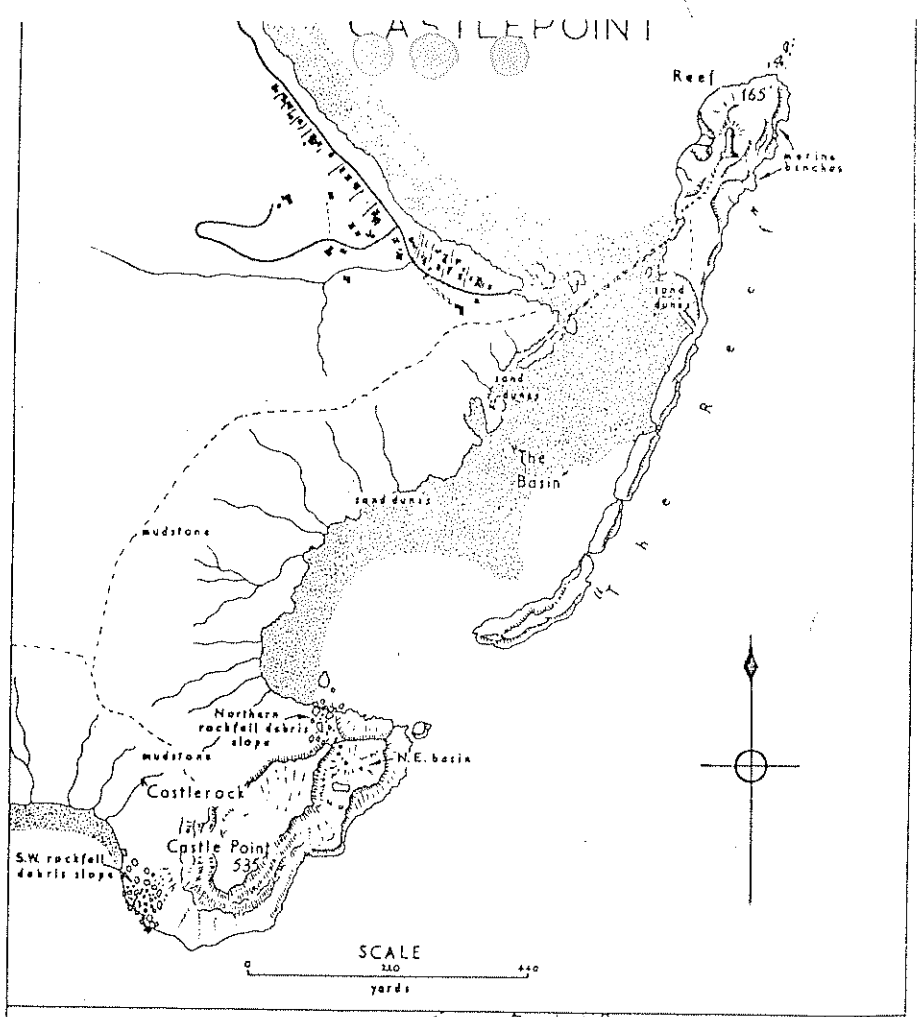


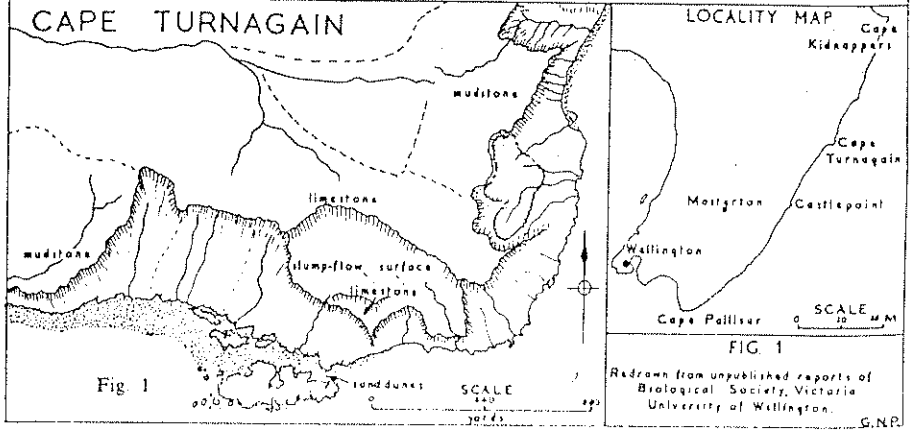


Fig. 1



# The Vegetation and Flora of Castlepoint and Cape Turnagain

*G. N. Park, Wellington*

THE Wairarapa—southern Hawke's Bay coastline displays considerable variety. Much has been written about its geomorphology and stratigraphy, but little about its botany. The vegetation has undergone widespread modification since pre-European times; pasture, secondary scrub, and stands of dying karaka are characteristic of the area today. It is only in the more inaccessible places, such as the cliffs of Castlepoint and Cape Turnagain, that anything approaching natural vegetation remains. The vegetation in these areas cannot of course be considered representative of the original vegetation of the coast as a whole.

Castlepoint and Cape Turnagain (Fig. 1) are separated by 40 miles of coastline—"broken rocks for many a weary mile" (Colenso in 1843). Both localities were named by Cook in 1769–1770 during his circumnavigation of the North Island. It was at Cape Turnagain that he realised that he had, in fact, sailed round an island.

The coast running south from Porangahau (12 miles north of Turnagain) is composed chiefly of Cretaceous and Lower- to Middle-Tertiary rocks. In contrast to the position inland, Upper Tertiary rocks outcrop in relatively few places. Limestones of this age occur only at Castlepoint and Cape Turnagain, where they form prominent headlands and reefs. These detrital shelly limestones, which weather readily to friable debris, have been correlated with the Te Aute Limestone (Upper Pliocene). Inland this forms the well known escarpments of Te Mata Peak, Kahuranaki, and the Puketoi and Maungaraki Ranges. Recent work on fossil distribution in relation to past climates suggests that the Castlepoint limestone is slightly younger than the Te Aute Limestone, being Lower Pleistocene in age. Both limestones unconformably overlie a Lower Pliocene light grey mudstone, which is also cliff-forming on the coast. Calcareous sandstone beds overlie the limestones.

The vegetation of Castlepoint and Cape Turnagain has been studied with the following people at the dates shown.

CASTLEPOINT

3—9 July 1965—P. A. Williams
Nov. 1965—Victoria University of Wellington Biological Society study group
21 Dec. 1965—A. P. Druce
Apr. 1966—G. C. Kelly, D. Wellman
24 Dec. 1966—A. P. Druce

CAPE TURNAGAIN

6 Jan. 1966—A. P. Druce
2—9 July 1966—Victoria University of Wellington Biological Society study group

The present account is a summary of articles that appeared in "Castlepoint Survey" and "Cape Turnagain Survey", unpublished reports of work carried out by V.U.W. Biological Society and private study groups. Mr A. P. Druce, Botany Division, D.S.I.R., contributed to the list of vascular plants, and Mr P. A. Williams assisted in the field study of the endemic shrub, *Senecio compactus*.

Singularly important at Castlepoint and Cape Turnagain for understanding the vegetation pattern is the nature of the parent rock. The vegetation on limestone is markedly different from that on nearby mudstone or sand. Recent and continuing natural erosion is a prominent feature, exemplified in limestone areas by cliffs and debris slopes, in mudstone areas by bare gullies and bare slip-faces, and in dune areas by blow-outs. Everywhere the soils are young. Salt spray and strong winds restrict plant growth near the sea; an outstanding example of this is the transition at Castlepoint from tussock land and herbfield to bare rock. Wind channelling and spray weathering have a marked effect on the limestone topography, and high winds blow sand and fine limestone debris against cliffs and on to marine benches.

Gull, tern and shag colonies occur on the limestone cliffs. The guano areas are colonised extensively by *Disphyma australe*, *Samolus repens* and taupata. Much of the steeper land is inaccessible to sheep and cattle. Goats are present on some Cape Turnagain cliffs.

The vegetation is described below under headings of the major landforms.

## Castlepoint

The limestone here forms two prominent topographical features—"Castlerock" (Castle Point, 535 ft.) and "The Reef" (Fig. 1). "Castlerock", with cliffs rising to 500 ft. above extensive talus and rockfall debris slopes, dominates the southern end of the area; it is joined to the mainland by a ridge of mudstone. To the north is "The Reef" (Fig. 2), a bow-shaped island connected to the shore by a wide tombolo. The lagoon formed is known locally as "The Basin". The ends of "The Reef" rise to over 100 ft. and carry vegetation, whereas the central, low portion is barren, being often swept by heavy seas. Sand has accumulated at both margins of the tombolo.

### *Limestone cliffs*

The cliffs are so steep, and erode so readily, that vegetation is absent from many areas. On the occasional ledge are patches of silver tussock and the carpet-forming grass. *Poa anceps* var. *condensata*. *Disphyma australe* and taupata occur in damper places and about bird colonies. The introduced stock, *Matthiola incana*, is very common and at a distance can be confused with *Senecio compactus* because of its similar colour. It was first recorded at Castlepoint by Kirk in 1897. *Senecio compactus* and *Phormium colensoi* are abundant in crevices and on stable, non-grassy areas. *Senecio colensoi* var. *lobulatus* is found only on the lower south-western cliffs of "Castlerock"; this is the southernmost record of the species.



Fig. 2—"The Reef" viewed from "Castlerock".

### *Limestone debris slopes*

*Talus slopes*. These areas of accumulating debris occur at the base of cliffs on "Castlerock" and "The Reef". They consist of fine material mostly but boulders are present on some slopes. The largest area is on the eastern side of "Castlerock". In the central part of this area the debris is fine and there is *Poa laevis-Scirpus nodosus* tussock land with a few scattered plants of *Phormium colensoi* and *Senecio compactus*. Similar vegetation occurs on the talus covering the lowest cliff-ledge. A hundred yards further north where boulders are numerous a different kind of vegetation has developed—open shrub/tussock land. Point analysis (50 points at two-pace intervals) gave the following percentages for crown cover in the canopy of this vegetation.

| | |
|---|---|
| *Poa laevis* | 22 |
| *Scirpus nodosus* | 22 |
| *Senecio compactus* | 18 |
| *Phormium colensoi* | 8 |
| Other plants (herbs) | 2 |
| Boulders | 8 |
| Bare ground (other than boulders) | 20 |

Flax increases towards the rockfall debris slope above the north-eastern basin (Fig. 1), described in the next section. Taupata forms a dense, six-foot high scrub in the southern third of the talus area.

Under the canopy there is a very sparse ground cover of stock, *Poa anceps* var. *condensata*, *Apium australe* and *Tetragonia trigyna*. The talus area supports a gull colony near its southern end. Beyond that there are mudstone cliffs.

A recently formed talus slope occurs at the south-western corner of "Castlerock" above an extensive rockfall debris slope (Fig. 1). This is being colonised by *Senecio compactus*, and by grasses and other herbs. The slope is not smooth in cross-section, and there is a marked difference between the vegetation of the depressions and the vegetation of the ridges. Point analysis gave the following percentages. (Each sample consisted of 100 points at single-pace intervals.)

| | *Depression* | *Ridge* |
|---|---|---|
| *Senecio compactus* | 32 | 10 |
| *Poa laevis* | 20 | 8 |
| Other plants | 4 | 12 |
| Boulders | 16 | 6 |
| Bare ground (other than boulders) | 28 | 64 |

Where fine talus reaches the sea-cliffs on the eastern side of "Castlerock" there is a transition from *Poa laevis-Scirpus nodosus* tussock land, through *P. laevis* tussock land on drier sites and *P. laevis* × *P. anceps* var. *condensata* grassland on damper sites, to *Samolus repens-Disphyma australe-Apium australe* herbfield near the cliff edge. The herbfield may from a belt up to 8 ft. wide. Herbfield also occurs on talus slopes at the base of the rock, on the stack at the north-eastern corner of the rock (Fig. 3), and at the southern end of "The Reef". The dominant species is usually *Samolus repens*. Other species present include *Apium australe*, *Disphyma australe* (often forming large, dense mats), *Senecio lautus* var. *lautus* and *Puccinellia stricta*. *Salicornia australis* is a common plant in areas drenched by salt spray. Wind terraces have formed on the talus slopes on the lagoon side of "The Reef"; these display distinct zoning of species—*Disphyma australe*, *Apium australe and Puccinellia stricta* on the faces, *Samolus repens* on the edges. The treads are bare and hollowed out.

Above the dunes forming against "The Reef", south of the lighthouse, an interesting vegetation has developed where large amounts of wind-blown sand have been added to the limestone debris. Here *Phormium colensoi*, *Coprosma acerosa*, *Pimelea arenaria* and tauhinu grow with silver tussock and *Scirpus nodosus*. *Zoisia minima* is the only species peculiar to this community.

*Rockfall debris slopes*. These most interesting areas consist of limestone blocks, up to 25 ft high, piled up at the base of cliffs. Rockfall debris slopes occur below the talus slope at the south-western corner of "Castlerock" and round most of the northern end of the rock. Smaller slopes are found at each end of "The Reef". Blocks form much of the coastline but they do not carry higher plants.



On the south-western rockfall debris slope *Senecio compactus*, up to 5 ft. high, is dominant both on and between the blocks. Point analysis of this shrub-boulder field gave the following percentages (100 points at two-pace intervals).

| | |
|---|---|
| *Senecio compactus* | 52 |
| *Poa laevis* | 4 |
| *Phormium colensoi* | 2 |
| Limestone boulders (blocks) | 36 |
| Bare ground (other than blocks) | 6 |

Fig. 3—*Phormium colensoi* × *P. tenax* tussock-boulder field with scattered plants of *Senecio compactus*, above the north-eastern basin of "Castlerock". Herbfield is present on the stack visible in the background.

*Phormium colensoi* × *P. tenax* tussock-boulder field, with scattered plants of *Senecio compactus*, is restricted here to a small valley forming the western margin of the rockfall debris slope. However, it is widespread below the cliffs above the north-eastern basin (Figs. 1 and 3).

On the northern rockfall debris slopes coastal forest species, such as karaka, kawakawa, ngaio and poroporo, produce a very different kind of vegetation (Fig. 4). Karaka, the only species attaining tree size, is confined to a few stands; these have a sparse understorey of kawakawa within the shelter of limestone blocks. Elsewhere kawakawa, ngaio and elder are important plants. In the open, grassed portions

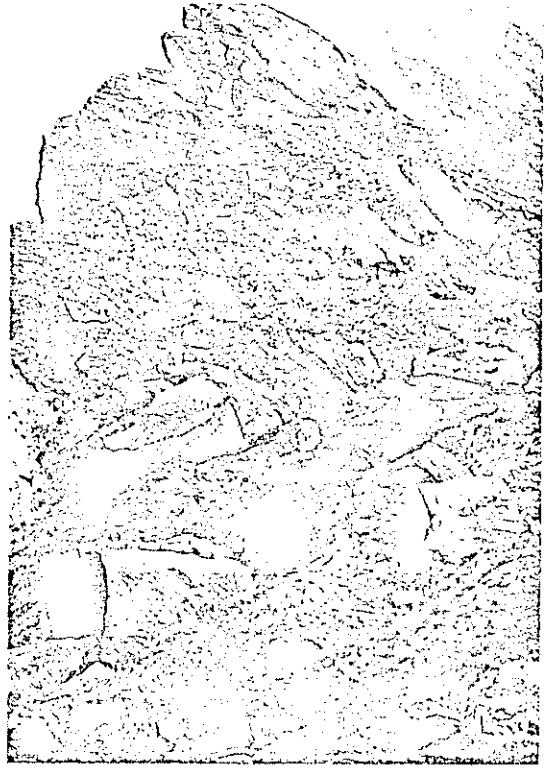

Fig. 4—Northern rockfall debris slope of "Castlerock", showing stands of karaka. *Notodanthonia racemosa* grassland covers the backslope of "Castlerock" (top, right).



of the slopes silver tussock is abundant. *Phormium tenax*, toetoe and kawakawa tend to be restricted to depressions. In the drier areas upslope and on the flat tops of some of the blocks *Senecio compactus* and *Phormium colensoi* are the major species.

*Slump area.* On the north-eastern side of "Castlerock" there is a deep basin 70 yd. by 100 yd. (Fig. 1). This appears to have been formed by the slumping of a large section of the cliffs. The mass titlted backwards as it moved downslope, and came to rest with its upper surface facing away from the sea. Subsequent rockfalls from the cliffs above have partly filled in the basin. The vegetation of the lower portion of the slump area is mostly *Phormium colensoi* × *P. tenax* tussock land.

*Limestone slopes (other than debris slopes)*

These slopes occur on the headland at the northern end of "The Reef", and on the eastern side (backslope) of "Castlerock". *Poa laevis-Scirpus nodosus* tussock land similar to that on the talus slopes is found in the former locality, but much of the plant cover has been removed by wind erosion following disturbance. Early photos of this area show a far greater cover of vegetation. On the damper eastern side a distinct belt of *Scirpus nodosus* occurs between the herbfield of the marine bench (see below) and an upper area of silver tussock. On these slopes there are a few widely spaced plants, up to 3 ft. high, of *Senecio compactus* and taupata. Colonising the wind-eroded areas that predominate on the western side of the headland are *Samolus repens, Disphyma australe* and *Senecio lautus* var. *lautus*. In a small seepage area there is *Selliera radicans-Samolus repens* herbfield. The backslope of "Castlerock" is in pasture dominated by *Notodanthonia racemosa* (Fig. 4). In this are scattered plants of silver tussock and *Scirpus nodosus*.

*Marine benches*

The limestone and calcareous sandstone beds east of the lighthouse dip slightly inland. Differential weathering by spray thrown high up on the cliffs has eroded benches at up to 80 ft. above sea level. Sand and limestone debris have accumulated in the depressions on these benches and support patches of herbfield. The debris is first colonised by *Samolus repens*. In more developed herbfield *Samolus repens* is still dominant but *Disphyma australe* and *Apium australe* have become important. *Puccinellia stricta, Senecio lautus* var. *lautus* and *Spergularia marginata* are the only other species present.

*Mudstone cliffs and slopes*

The light grey mudstone outcrops, for the most part as cliffs, at the northern and southern ends of "Castlerock", and below the lighthouse on the western side of "The Reef". The cliffs are typically not

as steep as those of limestone but they are unstable and lack an extensive plant cover. Scattered plants of stock, *Samolus repens*, *Disphyma australe*, *Plantago spathulata* and *Poa anceps* var. *condensata* constitute the only vegetation. The mudstone slopes at the back of the dunes and on the ridge adjoining "Castlerock" are in pasture, with scattered plants of silver tussock and *Scirpus nodosus*.

*Dunes*

In the broad zone of stabilised dunes behind the foredunes the vegetation is a complex of *Coprosma acerosa-Olearia solandri-Cassinia leptophylla* scrub, *Poa laevis-Scirpus nodosus* tussock land, and *Phormium tenax-Cortaderia toetoe* tussock land. There are a few scattered cabbage trees present. The unstabilised foredunes are dominated by marram grass; other species of lesser importance are pingao, *Spinifex hirsutus*, *Pimelea arenaria* and *Coprosma acerosa*.

## Cape Turnagain

Cliffs of massive mudstone up to 800 ft. high dominate most of this coastline. Only in a small area at the extremity of the Cape is the mudstone overlain by Te Aute Limestone (Fig. 1)). This forms two series of south-facing cliffs separated by an extensive, hummocky, slump-flow surface of mudstone, and limestone blocks. Just above the lower cliffs the blocks are particularly numerous and form a rockfall debris slope similar to the rockfall debris slopes at Castlepoint. There is also a rockfall debris slope just below these cliffs, which are at about 350 ft. above sea level. Below this again there are very steep mudstone slopes. The major portion of these is almost bare; the rest is scrub, forest and tussock land. Limestone debris, in the form of large boulders and talus, is spread over the mudstone, particularly in gullies, and extends down to the beach.

At the foot of the slopes sand has accumulated to form an extensive dune area covering a raised, rocky beach. More dunes are present to the west of the Cape.

*Limestone cliffs*

Vegetation is practically restricted to the upper series of cliffs, where the dominant species is *Phormium colensoi*. Between the flax plants there are low shrubs of rangiora and kawakawa. The only ground-layer plants are the ferns, *Adiantum cunninghamii*, *Asplenium anomodum* and *Blechnum* sp. (*B. capense* agg.). *Poa anceps* var. *condensata*, *Gnaphalium subrigidum*, *Hebe stricta* var. *macroura* and *Senecio colensoi* var. *obtusifolius* are the principal indigenous plants of open cliffs.

*Limestone debris slopes*

*Talus slopes*. Pasture covers the areas of talus beneath the upper cliffs. The talus below the lower cliffs is spread over parts of the steep mudstone slopes below and is discussed under a later heading.



Fig. 5—Cape Turnagain from the west. The coastal slopes are dominated by flax (*Phormium colensoi* × *P. tenax*). The Te Aute Limestone is at the top of the slopes.

*Rockfall debris slopes*. The rockfall debris slope above the lower cliffs consists of large blocks of limestone, up to 12 ft. high. There are several small stands of karaka, with which are associated kawakawa, mahoe, *Griselinia lucida* and a few cabbage trees. Near the margins flax, kawakawa and the small-leaved shrubs, *Pseudopanax anomalum*, *Olearia solandri* and tauhinu, are abundant, both on and between the blocks. Close to the upper edge of the cliffs the plant cover of the rockfall debris is sparse, consisting of scattered plants of flax, *Senecio colensoi* var. *obtusifolius*, *Vittadinia australis* and *Poa anceps* var. *condensata*.

On the rockfall debris slope below the lower cliffs the vegetation is similar to that above the north-east basin of "Castlerock". The shrub-tussock boulder field is dominated by flax, but rangiora takes the place of *Senecio compactus*. (Kirk in "The Students' Flora of New Zealand" says under *S. compactus*: "Reported from Cape Turnagain, but this requires confirmation". The report appears to have been based on a misidentification of *S. colensoi*). The only ground plants are the ferns, *Adiantum cunninghamii* and *Asplenium anomodum*. *Pimelea prostrata*, *Senecio colensoi* var. *obtusifolius* and *Poa anceps* var. *condensata* are common on the boulders.

*Slump-flow surface.* Most of this area is in pasture. A few indigenous plants occur on and around the limestone blocks scattered over the surface. *Pseudopanax anomalum* and *Olearia solandri* shrubs occur in the pasture. In a small hollow there is a raupo reed swamp.

*Mudstone slopes with limestone debris*

The vegetation of these slopes is mainly *Phormium colensoi* × *P. tenax* tussock land with scattered plants of toetoe, *Sophora tetraptera, Coprosma robusta* and *Olearia solandri*. The flax forms a particularly dense canopy; beneath it there are a few plants of *Adiantum cunninghamii* and *Asplenium anomodum* only. *Hebe stricta* var. *macroura, Senecio colensoi* var. *obtusifolius* and *Lagenophora pumila* occur in openings. On a few slopes toetoe is dominant rather than flax.

Forest and scrub are restricted to gullies. The main area of forest is a strip, 20 ft. wide, below the lower rockfall debris slope. Mahoe and rangiora, about 10 ft. high, are the principal canopy species; cabbage trees, ngaio and kowhai (*Sophora tetraptera*) emerge through these. The dense understorey is dominated by kawakawa and rangiora. Other species include flax, *Coprosma robusta*, mapou, kohuhu, and *Griselinia lucida*, the last-mentioned on limestone blocks. Ground plants, particularly *Blechnum aggregatum, Adiantum cunninghamii* and *Asplenium anomodum*, are numerous. Rangiora and flax border this strip of forest. Strips of scrub in which rangiora, mahoe and *Coprosma robusta* are prominent occur in many gullies. Towards their western end the steep mudstone slopes carry less limestone debris. The vegetation here is largely tussock land dominated by flax and toetoe. Three small stands of karaka occur at about 50 ft. above sea level.

*Mudstone cliffs and steep slopes*

The mudstone cliffs and the upper portions of the steep mudstone slopes are bare or nearly so. The chief colonising plants are *Senecio colensoi* var. *obtusifolius, Craspedia viscosa, Lagenophora pumila, Poa anceps* var. *condensata, Hebe stricta* var. *macroura* and flax. Erosion has led to a pattern in which islands of flax are surrounded by bare mudstone. This pattern is best developed on the extensive cliffs just north of the Cape. Here bare gullies separate ridges on which the principal species are flax and tutu.

*Dunes*

Both stabilised and unstabilised dunes are present at the Cape. The vegetation on unstabilised dunes is dominated by marram grass, other important species being pingao, *Spinifex hirsutus, Pimelea arenaria* and *Coprosma acerosa*. The stabilised dunes are flax-covered. Associated plants are *Pimelea arenaria, Coprosma acerosa*, toetoe and tauhinu, the first two close to the unstabilised dunes, the second two further away. *Leptocarpus simplex* is dominant on moist flats amongst the stabilised dunes.



Between the mudstone slopes and the dunes small valleys have formed parallel to the coast. Generally these support flax and toetoe, but in a few places smooth-canopied mahoe-*Coprosma robusta* scrub is found. Ngaio and cabbage trees are common in gullies and depressions at the junction of the dunes and the mudstone slopes.

## List of Indigenous Vascular Plants

(C) Castlepoint
(T) Cape Turnagain

Numbers refer to specimens in Botany Division Herbarium, Lincoln

### Trees and Shrubs

*Brachyglottis repanda* var. *repanda*—rangiora (T)
*Cassinia leptophylla* var. *leptophylla*—tauhinu (C, T)
*Coprosma acerosa* (C, T)
*C. lucida* (T)
*C. repens*—taupata (C)
*C. robusta* (T)
*Cordyline australis*—cabbage tree (C, T)
*Coriaria arborea* var. *arborea*—tutu (C, T)
*Corynocarpus laevigatus*—karaka (C, T)
*Griselinia lucida* (T)
*Hebe stricta* var. *macroura* (C, T)
*Macropiper excelsum* var. *excelsum*—kawakawa (C, T)
*Melicytus ramiflorus*—mahoe (T)
*Myoporum laetum* var. *laetum*—ngaio (C, T)
*Myrsine australis*—mapou (T)
*Olearia solandri* (C, T)
*Pennantia corymbosa*—kaikomako (T)
*Pimelea arenaria* (C, T)
*P. prostrata* s.s. (C, T)
*Pittosporum tenuifolium*—kohuhu (T)
*Pseudopanax anomalum* (T)
*Senecio compactus* (C)
*Solanum aviculare*—poroporo (C)
*Sophora microphylla*—kowhai (C)
*S. tetraptera*—kowhai (T)

### Lianes

*Clematis forsteri* (T)
*Muehlenbeckia australis* (T)
*M. complexa* (C, T)
*Parsonsia* sp. (T)

### Ferns

*Adiantum cunninghamii* (C, T)
*Asplenium anomodum* (C, T)
*A. hookerianum* s.s. (T)
*A. lucidum* s.s. (C, T)
*A.* sp. (*A. flaccidum* agg.) (C, T)
*A.* sp. × *A. lucidum* (C, T)
*Blechnum aggregatum* (*B. lanceolatum*) (T)
*B. banksii* (C)
*B.* sp. (*B. capense* agg.) (T)
*Microsorium diversifolium* (C, T)
*Pellaea rotundifolia* (T)
*Polystichum richardii* (C, T)
*Pyrrosia serpens* (C)
*Thelypteris pennigera* (T)

### Grasses

*Agropyron* sp. (a) (*A. scabrum* agg.) (C) (158845, 158852)
*A.* sp. (b) (*A. scabrum* agg.) (C, T) (158833, 158844, 159211, 159801)
*A. kirikii* (C, T)
*A.k.* × *A.* sp. (b) (C, T) (158834, 158846, 158848, 158858, 159214)
*Cortaderia toetoe*—toetoe (C, T)
*Deyeuxia billardieri* (C, T)
*D. crinita* (T)
*Festuca multinodis* (C, T)
*Lachnagrostis filiformis* var. *littoralis* (C, T)
*Notodanthonia buchanani* (C)
*N. clavata* (C, T) (adventive?)
*N. penicillata* (C) (adventive?)
*N. racemosa* (C, T) (adventive?)
*N. unarede* (C, T)
*Poa anceps* var. *anceps* (C, T)
*P.a.* var. *condensata* (C, T)

*P. laevis* var.—silver tussock (C) (158625, 158841, 158857)
*P. l. var.* × *P. anceps* var. *condensata* (C) (158835, 158839-40, 158856)
*P. anceps* var. *anceps* × *P.a.* var. *condensata* (T) (158990-1)
*Puccinellia stricta* (C)
*Spinifex hirsutus* (C, T)
*Trisetum* sp. (C, T)
*Zoisia minima* (C)

SEDGES AND RUSHES

*Carex flagellifera* (C, T)
*C. geminata* (C)
*C. pumila* (C, T)
*Desmoschoenus spiralis*—pingao (C, T)
*Juncus caespiticius* var. *bracteatus* (C)
*J. maritimus* var. *australiensis* (T)
*Leptocarpus simplex* (T)
*Schoenus nitens* s.s. (T)
*Scirpus cernuus* (C, T)
*S. nodosus* (C, T)
*Typha muelleri*—raupo (T)

HERBS (OTHER THAN FERNS, GRASSES, SEDGES AND RUSHES)

*Acaena novae-zelandiae* (C, T)
*Apium australe* (C, T)
*Calystegia soldanella* (C, T)
*Corybas macranthus* s.s. (T)
*Craspedia viscosa* (T)
*Daucus glochidiatus* (C) (collected by Miss M. Gordon)
*Dichondra repens* (C)
*Disphyma australe* (C)
*Epilobium nummularifolium* (C, T)
*Galium propinquum* (T)
*Geranium microphyllum* (C, T)
*G. sessiliflorum* var. *novae-zelandiae* (C)
*Gnaphalium luteo-album* (C, T)
*G.* sp. (*G. collinum* agg.) (C, T)
*G. subrigidum* (T)
*Haloragis erecta* (C)
*Hydrocotyle americana* (T)
*H. moschata* (T)
*Lagenophora pumila* s.s. (C, T)
*Limosella lineata* (T)
*Linum monogynum* (C, T)
*Lobelia anceps* (C)
*Microseris scapigera* var. (C) (158851)
*Microtis unifolia* (C, T)
*Myosotis pygmaea* var. *pygmaea* (C)
*Oxalis corniculata* (C ,T)
*Parietaria debilis* (C, T)
*Phormium colensoi*—flax (C, T)
*P. tenax*—flax (C, T)
*P. t.* × *P. colensoi* (C, T)
*Plantago spathulata* (C, T)
*Pterostylis banksii* var. *banksii* (T)
*Ranunculus acaulis* (C)
*R. hirtus* s.s. (T)
*Salicornia australis* (C)
*Samolus repens* (C, T)
*Schizeilema trifoliolatum* (T)
*Selliera radicans* (C, T)
*Senecio colensoi* var. *lobulatus* (C) (165403-4)
*S. c.* var. *obtusifolius* (T) (158997-159000, 159202-3, 165569)
*S. lautus* var. *lautus* (C)
*Spergularia marginata* (C)
*Tetragonia trigyna* (C)
*Thelymitra longifolia* var. *longifolia* (C)
*Vittadinia australis* (C, T)
*Wahlenbergia gracilis* s.s. (C, T)
*W.* sp. (blue fls.) (C, T)

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|---|---|
| Flora of Castlepoint: | 84 species |
| Flora of Cape Turnagain: | 89 species |
| Common to the two areas: | 56 species |
| Total flora: | 117 species |



# Matagouri in the North Island

## Part 2

*N. L. Elder, Wellington*

THE notes on the North Island distribution of *Discaria* published in Bulletin No. 33 have brought in so many additional reports of its occurrence[1] as to give a slight flavour of absurdity to any further writing up; details of habitat assist, however, in sharpening the picture of its North Island survival.

On the Horowhenua coast (Mrs Duguid) there are a number of small colonies ". . . usually just a few bushes in each and mostly on dry flats inland of the unstable dunes . . . near the lagoons south of the Ohau estuary . . . south of the Tiro-tiro-whetu dune ridge (about a mile from the beach) . . . just south of Hokio village . . . the best stand of all off the end of the Oturoa Road not far from the Manawatu River in a warm hollow between two dune ridges, about three miles from the coast. The bushes there were in fine shape and about seven feet high."

Mrs Duguid also notes that matagouri was growing in association with *Pomaderris phylicifolia* var. *ericifolia* in three of these localities: south of Hokio village, north of the Hokio Stream, and on the stony terrace at Ohau.

North of Foxton (Dr J. A. Carnahan, Canberra) a colony occurs 150 yards south of the Himatangi Beach Road and 100 yards west of Wylie's Road, on ". . . a big sand flat with some rough pasture and much scrub. The matagouri plants were few in number and rather miserable little things, spread low on sandy knolls". Dr Carnahan recollects seeing considerable rabbit-dung on the knolls. He is also fairly certain of having sighted healthy bushes of matagouri on scrub-covered dunes just northward of the mouth of the Whangaehu River.

I am reminded (Alan Esler) that Cockayne's Kapiti Report mentions flattened bushes of matagouri growing on exposed sites on boulder terraces; A. H. Reed ("Four Corners of New Zealand", p. 117) mentions plants of similar form on Orete Point near Waihau in the eastern Bay of Plenty, and Dr J. W. Dawson informs me that similar plants are found at Onoke in Palliser Bay.

At Porangahau, southern Hawke's Bay, matagouri colonies are scattered over several hundred acres opposite the mouth of the estuary, and show some points of especial interest. There are two

[1] Since this article was written the following further records have reached the editor:
Top of cliff, Lake Ferry, S. Wairarapa (N165 675088), A. P. Druce, 1947.
Roadside, 3 miles east of Ashley Clinton, Takapau Plains, Hawke's Bay, A. P. Druce, 1966.
Hillside, 1 mile S.W. of Porangahau, S. Hawke's Bay (N151 029400), A. P. Druce, 1966.