The Northward March of *Pterostylis cardiostigma* D. Cooper

Maureen Young

On 24.11.90 a Forest and Bird field trip was held in a patch of privately owned bush on the Mahurangi Peninsula near Warkworth. The bush has been fenced for 15 years and occupies a series of gullies. The canopy is largely kanuka, with some puriri, tawa and miro.

About a dozen plants of P. cardiostigma were found at quite widely spaced intervals along the track. Most of the flowers were withering, but two were still in their prime. The plants had the unmistakable look of the species - strong growth form with reddish stems, reddish midribs to the leaves, and narrow, upward pointing flowers with short, red lateral sepals. The largest plant was 50cm tall.

Four days later three more plants of P. cardiostigma were found in second growth bush near the Waiwhiu river, north of the Dome. This site is 17 km to the north-west of the first. The flowers on these plants were withering, but when compared with the flowers of P. banksii, plants of which were growing nearby, still showed the features of P. cardiostigma.

Vegetation and Flora of Chatswood Reserve, North Shore City, Auckland

David A. Norton

INTRODUCTION

The vegetation of the Chelsea Estate and Kauri Point Centennial Park have been described by Ogden (1981) and Odgen et al. (1989) respectively. In this article, a preliminary description of the vegetation of the adjacent Chatwood Reserve is presented and a preliminary species list for this reserve is appended.

The Chatwood Reserve occupies part of the catchment of Duck Creek which drains into Waitemata Harbour. The reserve lies between Porritt Avenue and Chelsea View Drive, with the main valley orientated approximately northwest-southeast. Several smaller gullies running off both sides are also included within the reserve. There appears to be some uncertainty over the actual boundaries of the reserve at the southeastern end, but the total area is about 10 ha. Although Duck Creek and the subsidary gullies are deeply incised, more gentle terrain occurs higher up the valley sides where spur angles ease. The reserve is almost entirely surrounded by housing, except at the southeastern end where it abuts on to the Chelsea estate.

The reserve is almost entirely forested, although the nature of the forest varies considerably. The history of the reserve was not investigated, but it would seem likely that kauri was extracted from this area in the past. Evidence of past fires is also apparent, especially in the young stands of kanuka on the upper valley sides. It can be inferred that much of this area has been burnt at various times in the recent past, but the deepest parts of the main valley probably were little affected. Fire is likely to be one of the major causes of

the vegetation pattern now apparent in the reserve.

FLORA

A total of 111 species of indigenous vascular plant species were recorded from the reserve, of which 39 were ferns and fern allies, 5 conifers, 47 dicotyledonous angiosperms and 20 monocotyledonous angiosperms. This is fewer than the 127 indigenous species recorded for Kauri Point Centennial Park, but given that many of the indigenous species in the latter area were confined to coastal or wetland habitats, the forest flora of Chatswood Reserve is actually considerably richer than that for Kauri Point Centennial Park. This is particularly evident with the fern flora; 39 species recorded in Chatswood Reserve compared to only 20 in Kauri Point Centennial Park. Naturalised species were not recorded in this survey of Chatswood Reserve, although many were present, especially near houses.

Two species of particular interest occur in Chatswood Reserve. Loxsoma cunninghammii, a forest floor fern, is a nationally restricted species in New Zealand (Given 1981) and although not formally threatened, is classified as local in its distribution. Once widespread, this species is now restricted to a limited number of sites throughout its northern North Island range. A healthy population is present within the reserve. Nothofagus truncata (hard beech), a widespread forest tree in parts of the southern North Island and northwestern South Island, is only known from a few scattered localities from Auckland northwards (Wardle 1984). A number of trees are present within the reserve.

PLANT COMMUNITIES

The whole reserve can be considered in general as kauri-podocarp-hard beech-broadleaved forest, although the specific pattern appears largely dependent on disturbance (fire) history. Excluding disturbance, the only other major influence on the vegetataion relates to the incised gullies, with some species (e.g., nikau and mamaku) largely confined to these sites. Presumably these gullies experience a more equable micro-climate (especially with respect to relative humidity) than occurs on the spurs. This effect may have been heightened with earlier forest clearance; edge effects associated with this would have modified micro-climates near the edges of the reserve.

A full range of kauri stands in various stages of development are present in the reserve. These range from ricker stands with kanuka still present, through regenerating forest with tanekaha codominant with kauri, to 'mature' forest with large ($>$1 m dbh) kauri and various broadleaved angiosperm trees (e.g., white maire, tawa). The best area of 'mature' kauri, with tawa, tarairi and white maire in the canopy, occurs near the head of the reserve below Chelsea View Drive. However, over much of the reserve kauri are smaller (usually $<$ 1 m dbh) and tanekaha abundant. Rewarewa is also common. These kauri-tanekaha stands appear typical of those developing towards 'mature' kauri forest after past disturbance and often have a few old senescing kanuka still present. Other common plants included heketara, hangehange, and karamu in the shrub stratum, and cutty grass on the forest floor. Kiekie often forms dense thickets in more open areas and is the dominant liane. When kanuka is the dominant canopy species, the diversity of other plants is usually low.

Odgen (1983), Ahmed & Ogden (1987) and Ogden et al. (1987) provide a full discussion of kauri forest dynamics while McKelvey & Nicholls (1959) describe forest communities containing kauri in Northland.

Hard beech is not present throughout the reserve, but is confined to the main valley where trees occur in groups on the spurs above the incised stream. Hard beech trees were generally small (30-50 cm dbh) and most groups included some dead trees. Most larger hard beech showed some signs of canopy dieback. Hard beech seedlings and saplings were present, but were not abundant. A more detailed study of the hard beech in this reserve, and other adjacent reserves, would provide a more detailed insight into its ecological position in these forests.

Seven trees were cored within the reserve in order to obtain approximate tree ages. The results are presented in Table 1. No estimates were obtained for two trees, hard beech 1 and kahikatea. The first had a rotten centre that resulted in the extraction of a short core only, while the core extracted from the kahikatea was badly fragmented. The best portion of this core, the outer 16 cm, showed surprisingly wide growth rings (mean width of 5.2 mm), with the largest being about 11 mm wide. However, and estimate of tree age was not possible.

Table 1: Estimates of tree ages based on increment cores. See Norton et al. (1987) for more details on methods used. the hard beech cores reached the tree centre.

	diameter (m)	core length (m)	core age (years)	est. tree age (years)
kauri 1	1.70	0.36	158	373
kauri 2	0.84	0.35	171	205
kauri 3	1.04	0.35	152	235
kahikatea	1.06	0.16	31	NA
hard beech 1	0.29	-	-	105
hard beech 2	0.32	-	-	105

The second and third hard beech trees cored yielded ages of about 105 years to tree centre. Allowing for growth to coring height, it is likely that these trees are about 125 years old. They were located immediately above the track not far from the Mappin Place entrance (just past the water viaduct). Although on the smaller side of most mature hard beech trees within the reserve (30-50 cm dbh), it would seem likely that most hard beech are under 200 years old. This is comparatively young for hard beech where many will live for 400-500 years (Wardle 1984).

The three kauri cored did not yield exact ages as none of the cores reached the tree centre. Estimation of tree age by extrapolating mean ring-width from the core over the missing portion gave estimates of about 370 years for kauri 1 (probably the largest kauri in the reserve) and 205 and 235 years for the smaller kauri 2 & 3. Kauri 2 & 3 were located on the ridge near the head of the reserve, while kauri 1 was located closer to Mappin Place. It is likely that these ages are under-estimates as growth is often suppressed towards the centre of kauri trees (Norton et al. 1987, Ahmed & Ogden 1987). As the cores did not extend this far in, it was not possible to take this suppressed growth into account in estimating tree age. More likely age estimates may be around 450-500 years for kauri 1, and around 300-350 years for kauri 2 & 3. Further cores would be needed to confirm this. These ages are less than the 'normal attainable age' of around 600-700 years for kauri (Ahmed & Ogden 1987) and suggests that these trees have probably not yet reached maximum age.

VALUES OF CHATSWOOD RESERVE

Although I am not familiar with all the forested reserves in North Shore City, Chatswood Reserve would seem to me to have some important values. It contains two species locally or regionally rare, and supports a surprisingly diverse flora. Perhaps more importantly it provides an opportunity for urban people to experience nature close to their homes. This is becoming an increasingly important factor as our society becomes more urbanised.

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CHECKLIST OF THE INDIGENOUS VASCULAR PLANTS OF CHATSWOOD RESERVE

This list is based on visits over two days in April 1990 for about 7 hours in total. Most of the time was spent close to the tracks which allowed the majority of the reserve to be visited. The main areas not visited were between Fitzpatric Place and Portsea Place, and between Homewood Place, Ravenstone Place and Onetaunga Road.

Taxonomy follows 'Flora of NZ' vols 1-4 and revisions in Connor & Edgar (NZJB 25, 1987), and Brownsey & Smith-Dodsworth (1989) for ferns. Identifications that require further field verification are given in brackets.

Ferns and fern allies

ASPLENIACEAE
Asplenium bulbiferum - hen and chickens fern
Asplenium flaccidum - hanging spleenwort
Asplenium oblongifolium - shining spleenwort
Asplenium polyodon

BLECHNACEAE
Blechnum chambersii
Blechnum discolor - crown fern
Blechnum filiforme - thread fern
Blechnum fraseri
Blechnum procerum - small kiokio
Blechnum sp. 1 - kiokio
Doodia media - rasp fern

CYATHEACEAE
Cyathea dealbata - ponga
Cyathea medullaris - mamaku

DENNSTAEDTIACEAE
Paesia scaberula - matata
Pteridium esculentum - bracken fern

DICKSONIACEAE
Dicksonia squarrosa - wheki

DRYOPTERIDACEAE
Deparia petersenii

GLEICHENIACEAE
Gleichenia microphylla - tangle fern
Sticherus cunninghamii - umbrella fern, tapuwae kotuku

GRAMMITIDACEAE
Anarthropteris lanceolata - lance fern
Grammitis ciliata

HYMENOPHYLLACEAE
Hymenophyllum demissum - filmy fern
Hymenophyllum rarum - filmy fern
Hymenophyllum revolutum - filmy fern
Hymenophyllum sanguinolentum - filmy fern
Trichomanes elongatum - bristle fern
Trichomanes reniforme - kidney fern

LOXSOMATACEAE
Loxsoma cunninghamii

LYCOPODIACEAE
Lycopodium deuterodensum - puakarimu

OSMUNDACEAE
Leptopteris hymenophylloides - heruheru

POLYPODIACEAE
Phymatosorus diversifolius - hound's tounge fern
Pyrrosia eleagnifolia - leather-leaf fern

PSILOTACEAE
Tmesipteris elongata
Tmesipteris tannensis
Tmesipteris sp. (?*sigmatifolia*)

PTERIDACEAE
Adiantum cunninghamii - maidenhair fern
Pteris tremula - turawera

SCHIZAEACEAE
Lygodium articulatum - mangemange

THELYPTERIDACEAE
Pneumatopteris pennigera - gully fern

Conifers
ARAUCARIACEAE
Agathis australis - kauri

PODOCARPACEAE
Dacrycarpus dacrydioides - kahikatea
Dacrydium cupressinum - rimu
Phyllocladus trichomanoides - tanekaha
Prumnopitys ferruginea - miro

Dicot angiosperms

ARALACEAE
Pseudopanax arboreus - five finger
Pseudopanax crassifolius - lancewood
Schefflera digitata - pate

ASTERACEAE
Brachyglottis repanda - rangiora
Olearia furfuraceae
Olearia rani - heketara

CARRIFOLIACEAE
Alseuosmia macrophylla

CHLORANTHACEAE
Ascarina lucida - hutu

CORIARIACEAE
Coriaria arborea - tutu

CORNACEAE
Corokia buddleioides- korokiotaranga

CORYNOCARPACEAE
Corynocarpus laevigatus - karaka

CUNONIACAEAE
Weinmannia silvicola - towai

ELAEOCARPACEAE
Elaeocarpus dentatus - hinau

EPACRIDACEAE
Cyathodes juniperina - mingimingi
Leucopogon fasiculatus - mingimingi
Dracophyllum sinclairii

FAGACEAE
Nothofagus truncata - hard beech

LAURACEAE
Beilschmeidia tarairi - tarairi
Beilschmeidia tawa - tawa

LOBELIACEAE
Lobelia anceps

LOGANIACEAE
Geniostoma rupestre - hangehange

MELIACEAE
Dysoxylum spectabile - kohekohe

MONIMIACEAE
Hedycarya arborea - pigeonwood

MYRSINACEAE
Myrsine australis - mapou
Myrsine salicina - toru

MYRTACEAE
Kunzea ericoides - kanuka
Leptospermum scoparium - manuka
Metrosideros diffusa - climbing rata
Metrosideros excelsa - pohutukawa
Metrosideros perforata - climbing rata

OLEACEAE
Nestegis lanceolata - white maire

PITTOSPORACEAE
Pittosporum tenuifolium - kohuhu

PROTEACEAE
Knightia excelsa - rewarewa
Persoonia toru - toru

RANUNCULACEAE
Clematis paniculata - puawhanganga

RHAMNACEAE
Pomaderris kumeraho - kumeraho

ROSACEAE
Rubus schmidelioides - bush lawyer

RUBIACAEAE
Coprosma grandifolia - raurekau
Coprosma lucida - karamu
Coprosma rhamnoides
Coprosma robusta - karamu
Coprosma spathulata
Nertera depressa

RUTACEAE
Phebalium nudum - mairehau

SANTALACEAE
Mida salicifolia - maire

SCROPHULAREACEAE
Hebe macrocarpa

VIOLACEAE
Melicytus ramiflorus - mahoe

Monocot angiosperms
ASPHODELACEAE
Astelia fragrans
Astelia trinervia
Cordyline sp. (?*pumilo*) - ti koraha
Cordyline australis - cabbage tree, ti
Corollospermum hastatum

CYPERACEAE
Baumea rubigenosa
Carex dissita
Gahnia lacera - cutty grass
Gahnia xanthocarpa - cutty grass
Lepidosperma australe
Uncinia clavata - hook grass
Uncinia sp. (?*banksii*) - hook grass

ARECACEAE
Rhopalostylis sapida - nikau palm

PANDANACEAE
Freycinetia baueriana - kiekie

PHORMIACEAE
Dianella nigra
Phormium tenax - flax

POACEAE
Microlaena avenaceae - bush rice grass
Rytidosperma gracile
Oplismenus hirtellus

RIPOGONACEAE
Ripogonum scandens - supplejack