**Rosaceae**
**Crataegus monogyna*
**Duchesnea indica*
**Prunus laurocerasus* (cult.)
**Pyrus communis* (cult.)
*Rubus cissoides*
**Rubus fruticosus*

**Rousseaceae**
*Carpodetus serratus*

**Rubiaceae**
*Coprosma areolata*
*Coprosma lucida*
*Coprosma rhamnoides*
*Coprosma robusta*
*Nertera depressa*
*Nertera dichondrifolia*

**Salicaceae**
**Populus* sp.

**Sapindaceae**
*Alectryon excelsus* (cult.)

**Solanaceae**
**Brugmansia sanguinea* (cult., garden)
*Solanum americanum*
**Solanum mauritianum*
**Solanum nigrum*
**Solanum pseudocapsicum*

**Theophrastaceae**
*Samolus repens*

**Violaceae**
*Melicytus ramiflorus*

**Vitaceae**
**Vitis vinifera*

**Monocots**

**Agavaceae**
**Furcraea foetida* (cult., garden)

**Araceae**
**Zantedeschia aethiopica*

**Arecaceae**
**Phoenix canariensis* (cult., garden)
*Rhopalostylis sapida* (cult., garden)
**Trachycarpus fortunei* (cult., garden)

**Asteliaceae**
*Collospermum hastatum*

**Cyperaceae**
*Baumea juncea*
*Baumea teretifolia*
*Baumea tenax*
*Carex flagellifera*
*Carex solandri*
*Carex virgata*
*Cyperus ustulatus*
*Ficinia nodosa*
*Gahnia setifolia*
*Gahnia xanthocarpa*
*Isolepis cernua*
*Isolepis reticularis*
*Schoenus maschalinus*
*Schoenus tendo*
*Uncinia banksii*
*Uncinia uncinata*

**Hemerocallidaceae**
*Dianella nigra*
*Phormium tenax*

**Iridaceae**
**Gladiolus undulatus*
**Watsonia meriana* cv. *bulbillifera*

**Juncaceae**
*Juncus edgariae*
**Juncus effusus*
*Juncus kraussii*
**Juncus tenuis*
*Juncus usitatus*

**Juncaginaceae**
*Triglochin striata*

**Laxmanniaceae**
*Cordyline australis*
*Cordyline pumilio*

**Lemnaceae**
*Lemna minor*

**Orchidaceae**
*Acianthus sinclairii*
*Corybas cheesemanii*

**Poaceae**
**Bambusa* (cult.)
**Cortaderia selloana*
**Dactylis glomerata*
**Holcus lanatus*
**Lolium perenne*
*Oplismenus hirtellus*
**Paspalum dilatatum*
**Pseudosasa japonica* (cult.)
**Schedonorus phoenix*

**Restionaceae**
*Apodasmia similis*

**Zingiberaceae**
**Hedychium flavescens*
**Hedychium gardnerianum*

# Regenerating bush, northern bank of the Orewa River

**E K Cameron**

On 23 September 1996 I inspected c.350m strip of riverine regenerating native forest, 20-40m in width, covering nearly 1 ha, on the north side of the Orewa River on Mr Kivitt's property for about 1.5 hours by the end of Kowhai Road. Map reference NZMS 260 R10 602105, 0-40m asl. At that time this area was one of the options being considered for the proposed new Northern Motorway crossing of the Orewa River. The new bridge was eventually built just over 1km to the west (Fig. 1).

The bush is about 1km east of the original Henry William Bartlett property off Kowhai Road (originally Pilchers Road) also on the north side of the river. Henry married Caroline Blake of "Bankside" and after Frank (1896-1979) and his two sisters were born the family moved to Bankside on the south side of the river about 1908/09. When I attended the Auckland Bot Soc trip to Bankside on 16 July 2005, led and reported on by Wilcox (2005), to the south side of the Orewa River nearly opposite the bush I visited nearly ten years before, it prompted me to record this previous survey without revisiting the site.

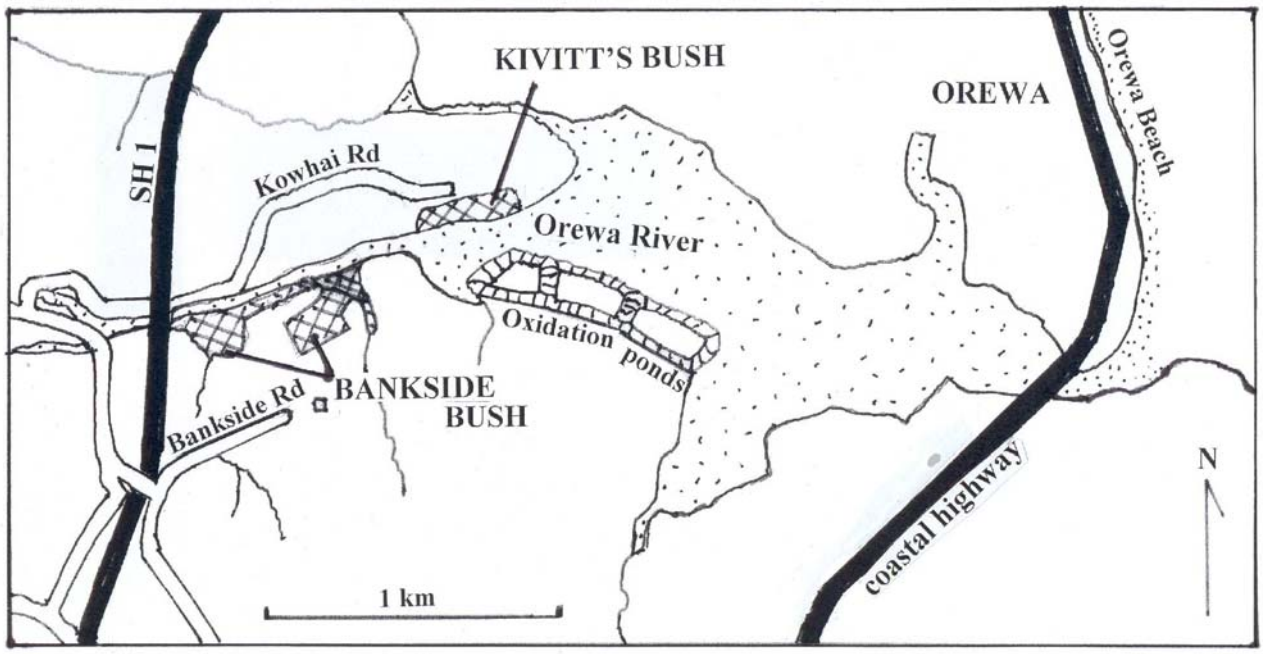


**Fig. 1. Location of the surveyed bush block on Kivitt's property, north side of Orewa River, Orewa.**

The forest on the northern bank of the Orewa River was fenced by a permanent hot wire along its northern boundary. Grazed pasture existed above the hot wire and included one area of eaten out bush, mainly ponga (*Cyathea dealbata*) and mapou (*Myrsine australis*), 4-5 m tall. Below the hot wire the native bush was in reasonable condition but a little more open than expected, presumably a result of past stock browsing.

Seventy-two species of vascular plants and one hybrid were recorded in this fenced riverine forest which is a reasonable species diversity for an area this small (see Appendix 1). Although naturalised species were not recorded they were few in number and there were no aggressive environmental weeds present. Mature cultivated timber trees of blackwood (*Acacia melanoxylon*), gum trees (*Eucalyptus* spp.) and macrocarpa (*Cupressus macrocarpa*) existed as occasional trees or small stands within or adjacent (uphill boundary) to the native forest. Blackwoods and eucalypts suggest that Frank Bartlett may have recommended these species to his neighbour Vivian Stoney (Jean Smith pers. comm.). Under one of the large macrocarpa trees were abundant small bright green hummocks of the exotic moss, *Fissidens taxifolius* (AK 229272).

The bush canopy was continuous and consisted mainly of mapou and ponga 4-6 m tall, commonly with emergent mature kowhai (*Sophora chathamica*) 8-12 m tall; and occasional even taller emergent totara (*Podocarpus totara*), kahikatea (*Dacrycarpus dacrydioides*) or kauri (*Agathis australis*) 40-50 cm diameter. Various sedges (*Carex*, *Gahnia* and *Uncinia* spp.) formed the main ground cover. Regeneration was healthy, totara seedlings and saplings were common. The bush extended down to the tidal river margin where mangroves (*Avicennia marina*) were present.

An unexpected discovery were three hard beech (*Nothofagus truncata*) trees, 4-8 m tall, and two hinau (*Elaeocarpus dentatus*) trees, both less than 3 m above sea level. Hard beech is rather local in the Rodney Ecological District and the closest known population to this site is behind Hatfields Beach some 4.3km to the north (*Wright 8885*, Apr 1989, c.80m asl, AK 183111), and perhaps from a similar distance to the southwest at Jolly's Bush, Pine Valley Road, White Hills, April 1945 (from a pressed specimen held by Jean Smith, pers. comm.). At this latitude hinau is usually found at higher altitudes.

**Comparison with Bankside**

Although no threatened species were found the vascular flora does contain special values. Interestingly 21 of these species were not recorded from the larger area at "Bankside" on the south side of the river (cf. Wilcox 2005). However, 14 of these 21 species do appear in the unpublished 1940s "Checklist of plants at Bankside" by Dan Hatch and Frank Bartlett (see Appendix 1).

Bankside plantation forest (Fig. 1) covers c.7ha and is dominated by planted and naturalising timber species, mainly gum and wattle trees, but it also contains a reasonably diverse native understorey and native riverine margin. There are probably four main reasons why most of these 21 species are apparently absent from Bankside today: bush clearance, temperature, humidity and browsing. The rather steeper and higher north side of the river is south-facing and therefore a cooler site compared with the north-facing, low-lying

Bankside site which may account for the presence of hard beech and hinau virtually at sea level. The Bankside forest was rather open and lightly grazed by cattle when Bot Soc visited it, whereas stock were excluded from the northern bush surveyed. This means the northern bush would have been wetter and more humid which helps to explain the presence of two wet-loving ferns: a filmy fern (*Hymenophyllum rarum*) and *Pneumatopteris pennigera*. The absence of most of the other 17 species I think is due to bush clearance and/or those being palatable to cattle and being selectively grazed to local extinction at Bankside. Note – there used to be two solitary rewarewa trees on the neighbouring Bankside farm, saved when the bush was cleared for pasture; and while Bankside was in Bartlett ownership (until the early 1990s) the bush areas were strictly fenced from cattle and ferns used to be plentiful (Jean Smith pers. comm.).

**Conclusions**

Riverine forest is important as it forms a buffer between the land and the water, slowing the movement of water and filtering out sediments. Many lowland areas in the Rodney Ecological District have lost their riverine vegetation. Therefore this strip of regenerating riverine bush just under 1ha with mature kowhai and presence of hard beech and hinau is locally important, and compliments the riverine bush on the opposite side of the river at Bankside.

**Acknowledgements**

Jean Smith (daughter of Frank Bartlett) and Mike Wilcox for comments on the draft article and copy of the Bankside 1940s species list, David Slaven for company in the field in 1996, and Jessica Beever for the moss (*Fissidens*) identification.

**References**

Hatch, E.D.; Bartlett, F.W. 1940s: Checklist of plants at Bankside. Unpublished, copy held by Auckland Museum. 9p.
Wilcox, M.D. 2005: Bartlett's Forest, Bankside Road, Silverdale. *Auckland Botanical Society Journal 60(2):* 56-63.

## Appendix 1. Native vascular plants on the northern Orewa River margin in 1996

Key
a = abundant
c = common
o = occasional
l = local
s = scarce (<5 plants seen)
* = not recorded at Bankside in 2005 (cf. Wilcox 2005)
** = not recorded for Bankside in the 1940s (cf. Hatch & Bartlett 1940s) or 2005

| **Ferns (14)** | |
|---|---|
| *Adiantum cunninghamii** | o |
| *Asplenium flaccidum* | o |
| *Asplenium oblongifolium* | o |
| *Asplenium polyodon* | o |
| *Blechnum novae-zelandiae* | lc |
| *Cyathea dealbata* | a |
| *Cyathea medullaris* | o |
| *Doodia australis* | o-lc |
| *Hymenophyllum rarum** | l |
| *Microsorum pustulatum* | o |
| *Pneumatopteris pennigera*** | lc |
| *Pteridium esculentum* | o |
| *Pteris tremula* | o |
| *Pyrrosia eleagnifolia* | l |

| **Gymnosperms (6)** | |
|---|---|
| *Agathis australis* | o |
| *Dacrycarpus dacrydioides* | o |
| *Dacrydium cupressinum* | s |
| *Phyllocladus trichomanoides* | o |
| *Podocarpus totara* | c |
| *Prumnopitys ferruginea*** | s |

| **Dicots (36)** | |
|---|---|
| *Avicennia marina* | la |
| *Carpodetus serratus* | o |
| *Clematis paniculata** | o |
| *Coprosma areolata* | s |
| *Coprosma grandifolia** | s |
| *Coprosma lucida* | s |
| *Coprosma rhamnoides* | o |
| *Coprosma robusta* | o |
| *Dichondra repens* | lc |
| *Elaeocarpus dentatus*** | s |
| *Geniostoma ligustrifolium* | o |
| *Haloragis erecta** | **s** |
| *Hebe macrocarpa*** | o |
| *Hedycarya arborea* | s |
| *Knightia excelsa** | o |
| *Kunzea ericoides* | c |
| *Leptecophylla juniperina* | o |
| *Leptospermum scoparium* | o |
| *Leucopogon fasciculatus* | o |
| *Lobelia anceps* | lc |
| *Melicytus ramiflorus* | o |
| *Metrosideros excelsa** | s |
| *Metrosideros perforata* | s |
| *Myrsine australis* | a |
| *Nertera dichondrifolia* | o |
| *Nestegis lanceolata*** | o |
| *Nothofagus truncata** (AK 229362) | s |
| *Olearia furfuracea* | s |
| *Pittosporum tenuifolium* | s |
| *Pseudopanax arboreus* | s |
| *Pseudopanax crassifolius* × *P. lessonii* | s |
| *Pseudopanax lessonii* | s |
| *Rubus cissoides* | o |
| *Sophora chathamica* (AK 229361) | c |
| *Toronia toru*** (AK 229363) | s |
| *Vitex lucens* | s |

| **Monocots (17)** | |
|---|---|
| *Astelia trinervia*** | s |
| *Carex lambertiana** | o-lc |
| *Carex virgata* | o |
| *Cordyline australis* | s |
| *Gahnia lacera** | c |
| *Gahnia setifolia* | o |
| *Juncus edgariae* | o |
| *Microlaena stipoides** | o-lc |
| *Oplismenus hirtellus* | c |

| | | | | | |
|---|---|---|---|---|---|
| *Phormium tenax* | l | *Ripogonum scandens** | lc | *Uncinia banksii* | c |
| *Poa anceps** | lc | *Rytidosperma* sp.* | o | *Uncinia uncinata* | a |
| *Rhopalostylis sapida* | o | *Schoenus tendo* | s | | |

# Field Trip: Plants of the Auckland Zoo. 20/08/05

**Mike Wilcox, Maureen Young, Hugo Baynes**

Bot. Soc. held a trip to the Zoo on 20 August 2005 to look at the plants there. Those attending were: Enid Asquith, Shirley Bollard, Jan Butcher, Michelle Butcher, Pam Carmont, Steve Cook, Brian Cumber, Frances Duff, Colleen Foster, Gladys Goulstone, Fran Hintz, Annette Lindsay, Jenny Lux, Elaine Marshall, Alistair MacArthur, Morag MacDonald, Garry McSweeney, Marjorie Newhook, Helen Preston-Jones, Juliet Richmond, Jan Riddick, Peter Riddick, Josh Salter, Nancy Smith, Val Smith (Wellington Bot Soc), Pat Seyb, Alison Wesley, Jacqui Walters (visitor), Mike Wilcox, Maureen Young. Hugo Baynes (Senior Team Leader- Horticulture, Auckland Zoo) was the principal guide for our walkabout.

The purpose of the visit was to get acquainted with the various theme plantings such as Northern New Zealand coast at the Sealionshores exhibit, African savanna at the Pridelands and Hippo river enclosures, the rainforest areas and also to record the native species and varied exotic plants throughout the Zoo. We found the plants at the Zoo to be a great feature in their own right, and much more significant than just a backdrop or habitat for the animals. There are old trees dating back to the Zoos' beginnings in the 1920's and a great variety of subsequent plantings including those associated with relatively recent modifications to enclosure habitats, borders and the new education centre. We highlight here just a few of the plants we saw, followed by more or less complete lists of New Zealand native plants and of exotic woody plants and the larger monocots.

**New Zealand native plants**

The list of species is impressive, covering ferns, monocots, herbs, and woody plants. There is an especially interesting area in Sealionshores around the penguin aviary and Sealion underwater viewing area. Here we saw in flower Cook Strait kowhai (*Sophora molloyi*) – a short squat species, kaka beak (*Clianthus puniceus*), yellow native broom (*Carmichaelia williamsii*), and also *Myrsine aquilonia* (from the Poor Knights Is) which lacks the divaricating habit of *M. divaricata*. Also coastal ribbonwood (*Plagianthus divaricata*), taupata (*Coprosma repens*) of various island provenances, native spurge (*Euphorbia glauca*), *Pimelea arenaria*, *Coprosma acerosa* and *Coprosma virescens near the native freeflight aviary* – with an attractive, tangly divaricating habit. The grasses *Anemanthele lessoniana* and *Poa cita* were used very effectively as ground cover, supported by sedges such as *Carex testacea* and *Carex trifida*.

The coast milk tree (*Streblus banksii*) is one of the most prominent native trees throughout the Zoo, and it was in flower, as was one of our northern forest hebes, *Hebe diosmifolia* with delicate lilac-coloured blossoms.

**Exotic plants: trees and shrubs**

Auckland Zoo has an outstanding collection of African plants, having successfully established southern and east African trees and shrubs bordering the enclosures for giraffe, rhinoceros and lion and other African mammals. Many of these interesting introductions, rarely seen in New Zealand, were sourced from Geoff Etherington, Nelson. Among the prized specimens there are *Afrocarpus falcatus, Afrocarpus gracilior, Alberta magna, Allophylus abyssinica, Croton megalocarpus, Cunonia capensis, Cussonia paniculata, C. spicata, Dombeya burgessiae, Dombeya cacuminum* (from Madagascar)*, D. torrida, Dovyalis caffra, Euphorbia ingens, Filicium decipiens, Grewia occidentalis, Greyia radlkoferi, Greyia sutherlandii, Hagenia abyssinica, Harpephyllum caffrum, Heteromorpha trifoliata, Khaya nyasica, Loxostylis alata, Nuxia floribunda, Podocarpus henkelii, Premna maxima, Schotia brachypetala,* and *Vitex keniensis.* A magnificent flowering specimen of *Dombeya cacuminum* - surely one of Auckland's best flowering trees - attracted much admiration with its large red, hanging blossoms with curious patches of yellow on the petals (actually patches of pollen), and the specimens of *Afrocarpus falcatus* (overhanging the hippo pond), *Podocarpus henkelii* (overhanging Motions Creek near the western overbridge), and *Nuxia floribunda* (with spectacular sprays of small white fragrant blossoms) were particularly impressive.

Australian trees are also prominent. *Eucalyptus grandis*, *E. saligna*, *E. pilularis* and *E. botryoides* are the Zoo's main large eucalypts. The Proteaceae family is represented by *Banksia integrifolia*, *Macadamia tetraphylla*, and the beautiful, red-flowered *Stenocarpus sinuatus*.

Turning to Central and South America, the Zoo has *Schinus molle* and *S. terebinthifolius*, two species of *Chorisia* – *C. speciosa* (very thorny stems) and *C. insignis* (smooth stems)*, Chiranthodendron pentadactylon, Casimiroa edulis, Schizolobium parahyba, Jacaranda mimosifolia* and *Inga edulis.*