Missing Jigsaw Pieces

The Bushplants of the Cooks River Valley

Doug Benson Danie Ondinea Virginia Bear

THIS book is about plants, landscapes, history and people.
Through photographs, original drawings and a lively text, we hope to present a broader perspective of the natural landscape of the Cooks River Valley.

Despite the degradation of the last 200 years the Valley still contains much that is natural and of intrinsic interest and value (our jigsaw pieces). These features are vulnerable and need protection. Councillors, council staff, landscapers, bush regenerators and local people all have a part to play.

Missing Jigsaw Pieces describes the main plant communities and illustrates at least sixty of the native plant species. A full list of about 600 species provides information for restoring some of these communities.

Why not take this book with you and explore the Valley for yourself!

Cover: Sydney Long *By Tranquil Waters*
1894, oil on canvas, 111.1 x 183.7cm
The Art Gallery of New South Wales

Pimelea linifolia in flower at Campsie Bushland. (August 1998)

Pimelea linifolia in flower at Campsie Bushland. (August 1998)

Moss carpet under the *Kunzea ambigua* scrub following rain, Campsie. (August 1998)

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Virginia Bear

ROYAL BOTANIC GARDENS SYDNEY

with assistance from the
Cooks River Foreshores Working Group

This book is dedicated to Professor George Seddon;
his books – integrating botany, geology, history, literature
and landscape – and his words on landscape and gardens
have provided inspiration and direction for us.

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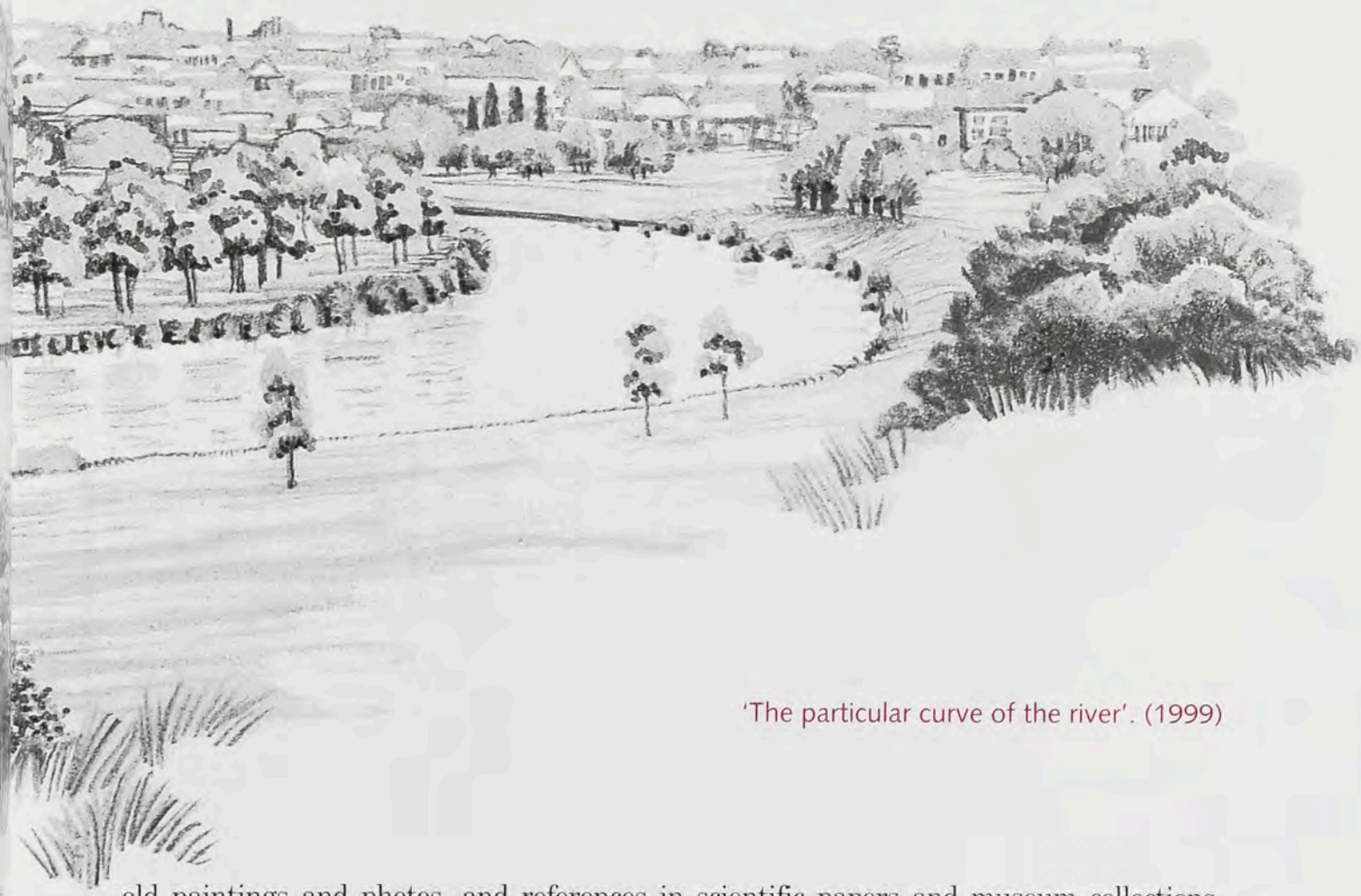
Introduction

Captain Cook hardly mentioned the Cooks River. In their accounts of the *Endeavour's* visit to Botany Bay in April 1770, the first European landfall on the eastern coast of Australia, Captain James Cook and the young naturalist Joseph Banks make only passing mention of the small river that was later to take the name of the Great Navigator, though Cook shows it on his map of Botany Bay.

Captain John Hunter explored the River in September, 1789, nineteen years later; 'this river, as far as I went up, which was about five miles, is all shoal [shallow] water.' 'An arm of the sea' was the succinct description of Lieutenant William Bradley of the *Sirius* when he charted the course of the Cooks River in December, 1789.

After the establishment of the settlement at Sydney Cove in 1788, the search for potential agricultural lands was directed to exploring the fertile floodplain of the Hawkesbury-Nepean River, the woodlands of the Cumberland Plain of Western Sydney, and to crossing the sandstone barrier of the Blue Mountains. The small river that drained into the north-west of Botany Bay from then-unnamed Chullora, Belmore, Canterbury, Marrickville, Rockdale and Bardwell Park was of little importance.

As a result there is little first-hand historical information describing the landscape, vegetation and wildlife of the Cooks River Valley at the time of first settlement. But we can build up a picture of how it must have been from a number of sources including historical accounts and journals, miscellaneous nineteenth century references to the Valley, clues in



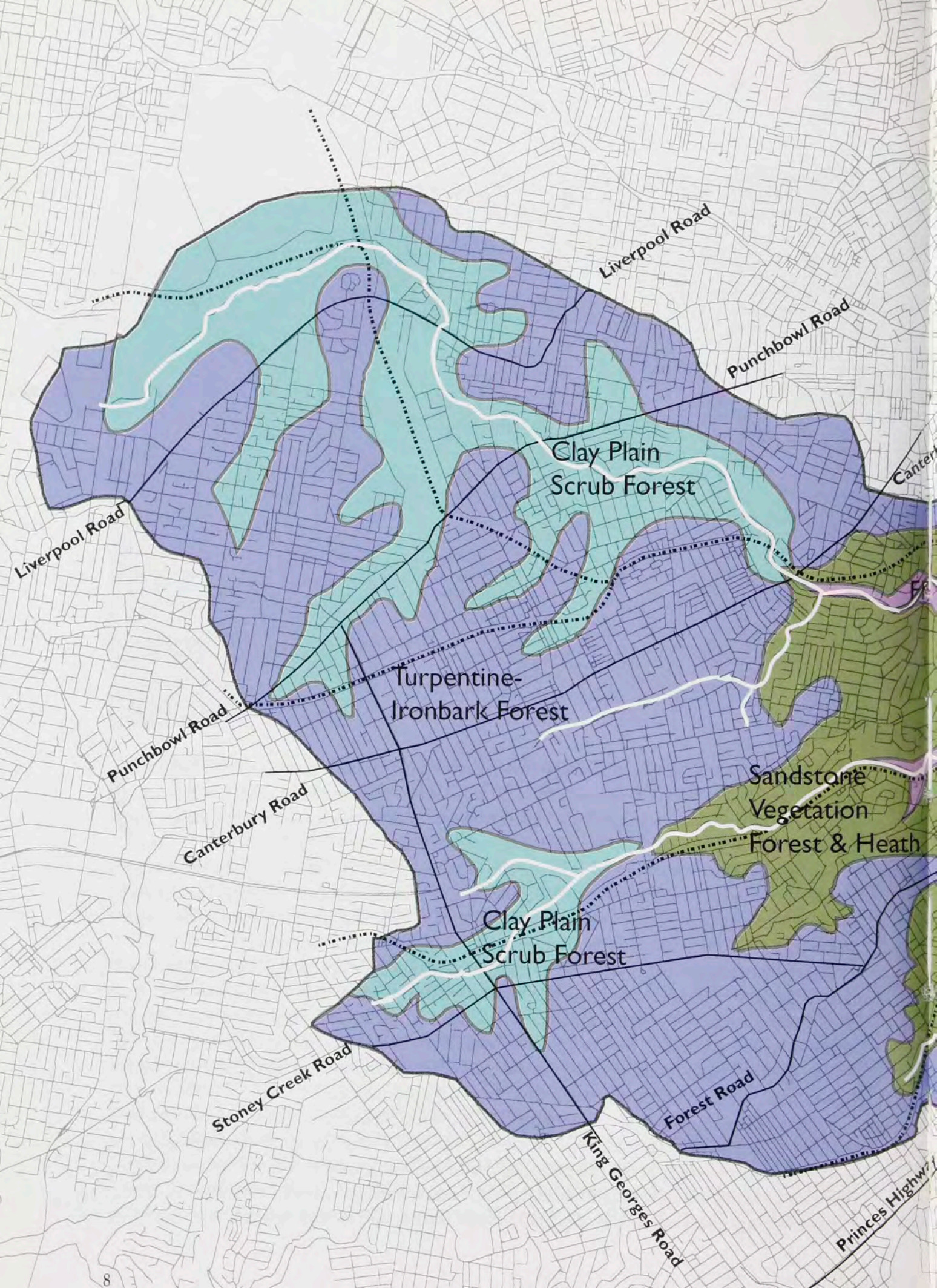
'The particular curve of the river'. (1999)

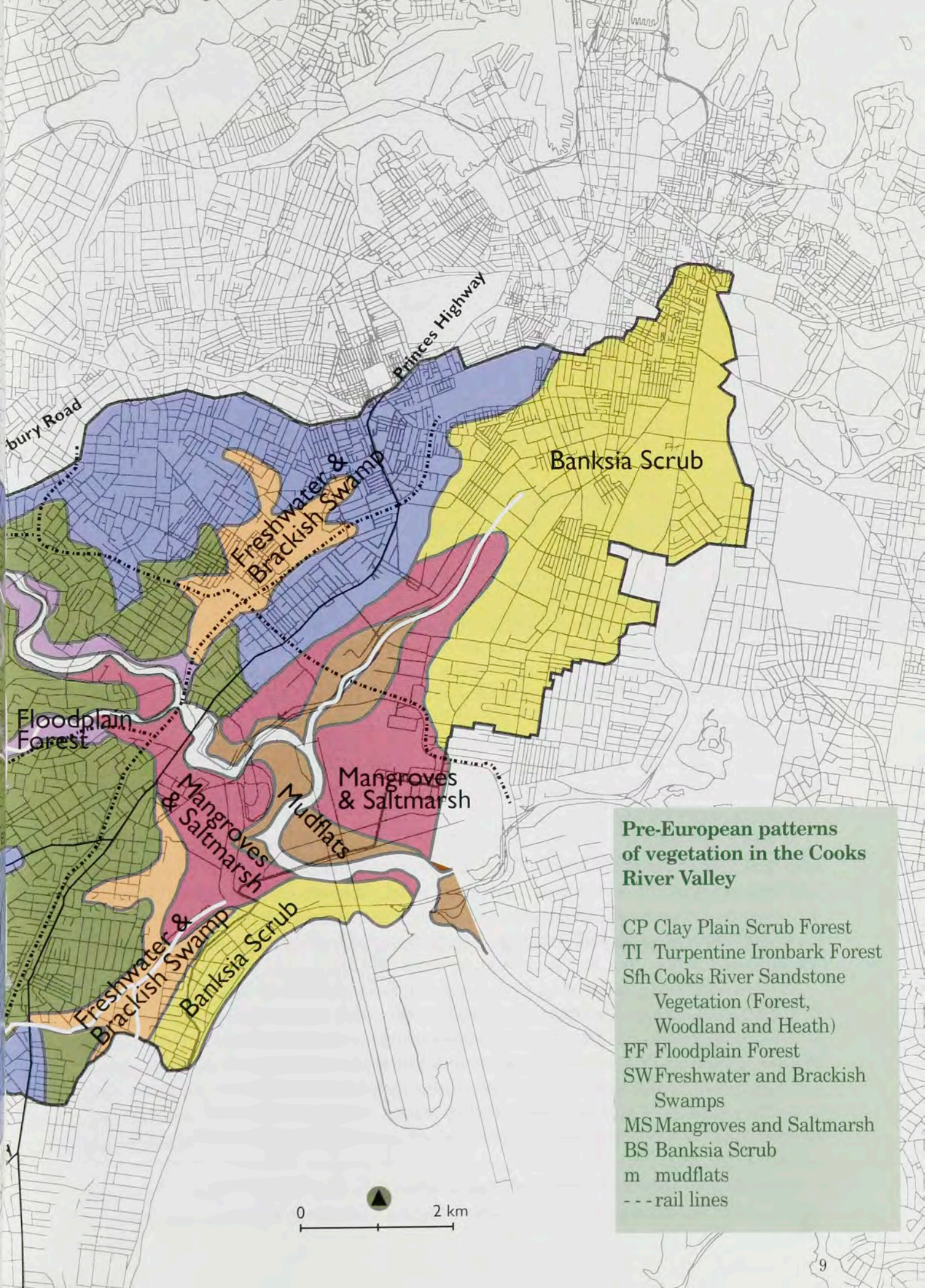
old paintings and photos, and references in scientific papers and museum collections. The strongest evidence for developing a picture of the past landscape is provided by the remnants of the landscape, geology, vegetation and plants species persisting today. These are the jigsaw pieces that we have been searching for.

In this book we have tried to describe the landscapes of the Valley and the remnants of bushland. We describe the plant communities and provide pictures and short notes on 60 of the characteristic plants. We end with a list of nearly 600 plants native to the Valley, information we hope can also be used to restore and replant these habitats.

Today mention of the Cooks River is often met with jest or derision, evoking a picture of a drain, a totally degraded river system without hope or virtue; that is, to people other than the local residents. They know much of it as a place of parks and grass albeit with a much-polluted and maltreated waterway. This book is to give hope and encouragement. The Valley still contains much that is natural and of intrinsic interest and value (our jigsaw pieces), but these features are vulnerable and need protection.

Councillors, council officers, managers, landscapers, bush regenerators and local people all have a part to play. Indeed we all learn more by doing than by simply seeing. Along the way we will learn some of the complexities of nature, and experience satisfaction in seeing plants and wildlife habitat restored. It is worth doing for this alone. Let us appreciate and value the plants and wildlife of the Cooks River Valley, and work to ensure their survival.


Liverpool Road
Punchbowl Road
Clay Plain
Scrub Forest
Liverpool Road
Turpentine-
Ironbark Forest
Punchbowl Road
Canterbury Road
Sandstone
Vegetation
Forest & Heath
Clay Plain
Scrub Forest
Stoney Creek Road
Forest Road
King Georges Road



Pre-European patterns of vegetation in the Cooks River Valley

CP Clay Plain Scrub Forest
TI Turpentine Ironbark Forest
Sfh Cooks River Sandstone Vegetation (Forest, Woodland and Heath)
FF Floodplain Forest
SW Freshwater and Brackish Swamps
MS Mangroves and Saltmarsh
BS Banksia Scrub
m mudflats
- - - rail lines

Understanding the landscapes of the past and present

This book is more than a list of plants and pictures. We hope to encourage a broader vision of the natural landscape and the way the plants fit in. To do this we need to begin by looking at the landscape of the Valley, and its history.

The Cooks River Valley has more than just an ill-treated river running between parks and houses. These are major elements of the present landscape certainly, but landscapes have more than their immediate physical dimensions. They have a past history, elements of which may be recognisable in current features; the worn sandstone rocks on the ridgetop, a lone Blackbutt tree, the particular curve of the river, an old rock wall.

Recognising the significance of a particular feature while we are walking along the riverbank, or noticing a particular vista at a rest stop, provide us with that extra dimension, or perhaps escape, that is the essence of recreation. We want to show you some of these landscape elements and the plants that are part of them. We want to create images of past landscapes too, and suggest possible future landscapes. We hope you will see the important role plants play in the Valley and its future.

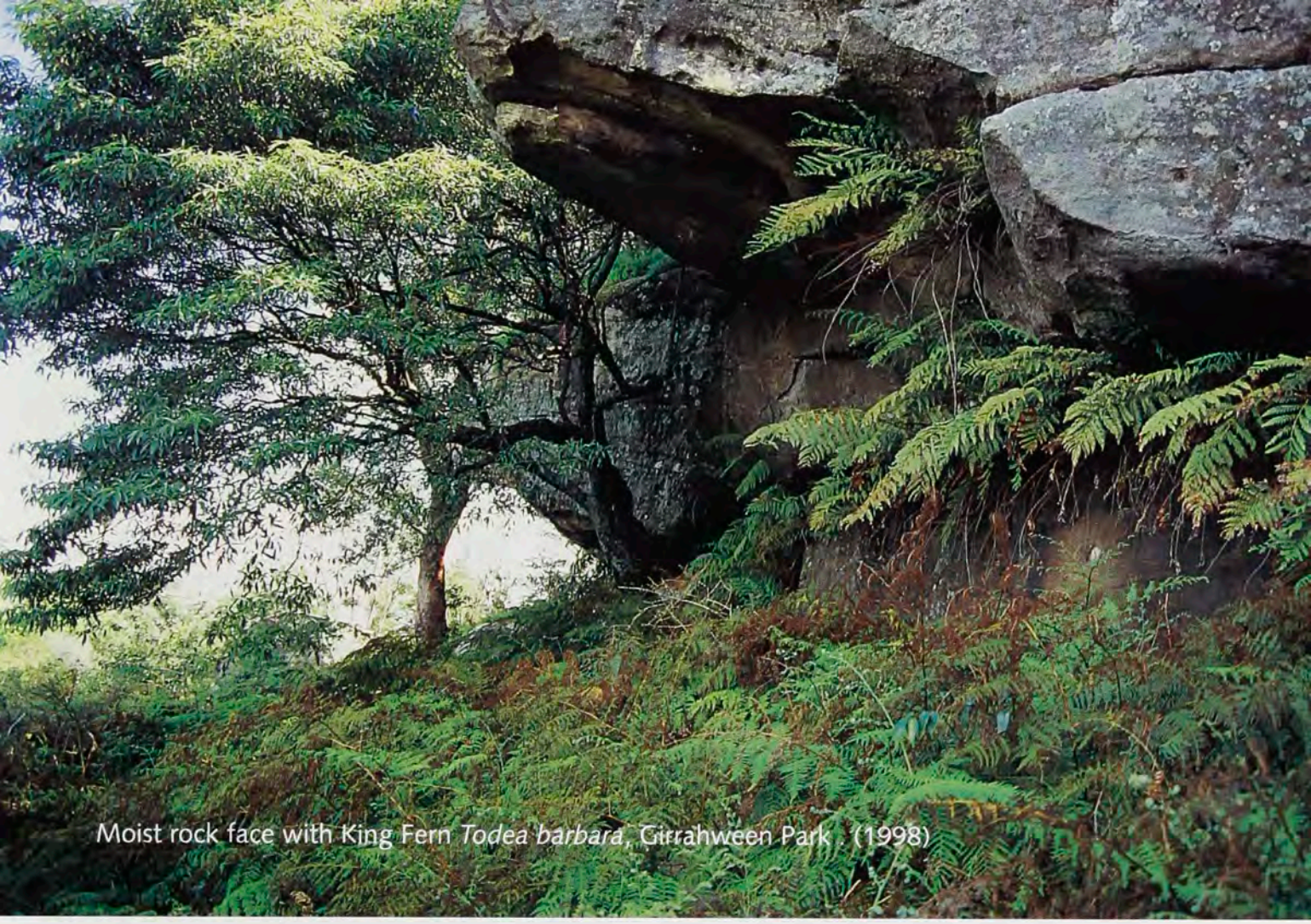
Two hundred and thirty million years ago...

About 230 million years ago, at the beginning of the Triassic Period, rivers eroding the inland mountains began delivering large quantities of sand, silt and clay to the coast. From time to time there were 'mega-floods', when huge volumes of water carried enormous amounts of sediment. These sediments accumulated as an enormous delta, filling the area now occupied by Sydney Basin. They buried the swamps that had formed over millions of years during the Permian Period, turning them to coal and shale. Hundreds of metres of sandy sediments were compacted and cemented with clay and iron minerals into sandstone, to become the Hawkesbury Sandstone. The finer silt and clays became mudstones and shales, today's Wianamatta Shale.

By about 190 million years ago, at the end of the Triassic Period, sediment accumulations had stopped. Australia was still part of the supercontinent *Gondwana*. But pressures building up within the earth's crust had begun to split it apart. Over the next 140 million years during the Jurassic and Cretaceous Periods, the continents slowly separated. Africa and South America separated early from Antarctica. Australia, still joined to Antarctica, moved slowly northwards, finally separating about 40 million years ago.

As the continental plates moved further apart to form the Tasman Sea, there was highland uplift and volcanic activity in south-eastern Australia. Deep-seated crustal pressures under Sydney caused the Blue Mountains and coastal areas to rise and the Cumberland Plain of Western Sydney to be lowered, relative to the coast. Earth movements were slow and the erosion of the rivers such as the Cooks, kept pace, cutting through the erosion resistant sandstone that remained as higher plateaus near the coast. Dune sands were blown inland from the coast. During the last 100 000 years colder and warmer climatic periods alternated.

About 20 000 years ago, during the coldest part of the last of the Pleistocene ice ages, the sea fell to its lowest level, 120–140 m below the present level. As it rose again to reach



Moist rock face with King Fern *Todea barbara*, Girrahween Park . (1998)

its present level, about 6000 years ago, the sea drowned the coastal valleys to form Broken Bay, Sydney Harbour, Botany Bay, and the estuary of the Cooks River.

The evolution of plant species and the changing distribution patterns of vegetation have been in response to these changes in climate and landform. At different times moister rainforests or drier eucalypt forests would have predominated in the Cooks River Valley, though the rainforests would have generally been on the higher-nutrient or 'better' soils formed from shales or alluvium. The drier eucalypt or sclerophyll forests would have predominated on the 'poorer' soils – the more sandy and lower-nutrient sandstone and sand dune soils.

The Cooks River Valley at the time of European contact: a jigsaw of interlocking parts

Now let us try to re-create the Cooks River Valley as it might have been as a 'natural landscape', when its appearance was determined by the interactions between the plants, rocks, soils and climate; indeed as it might have been at the time of Cook's visit in 1770, or the First Fleet in 1788. Our primary information sources are remnant features that survive from that time, and extrapolation based on an understanding of ecological processes.

The River has changed. Many of the banks are now concrete or iron, and the floodplains are now parks, but other features, like the prominent sandstone hill slopes of Earlwood, Undercliffe and South Marrickville, still remain. Despite the houses, sandstone cuttings and steep slopes indicate that the land here was once rugged, and the soils shallow and sandy.

Papery bark of *Melaleuca decora*

Extrapolating from our experience of sandstone soils elsewhere we know that shrubby woodland and forest would have occurred on this type of land before settlement. The natural heath, woodland and forest that still survives in Girrahween Park, Earlwood, along Wolli Creek, confirms this. We can also establish, using other geology and soil clues, and experience from other sites, that the clay soils on Wianamatta Shale, for example through Dulwich Hill and Canterbury, would have had different vegetation, with different tree species, bigger forest trees and a more grassy groundcover than on the sandstone.

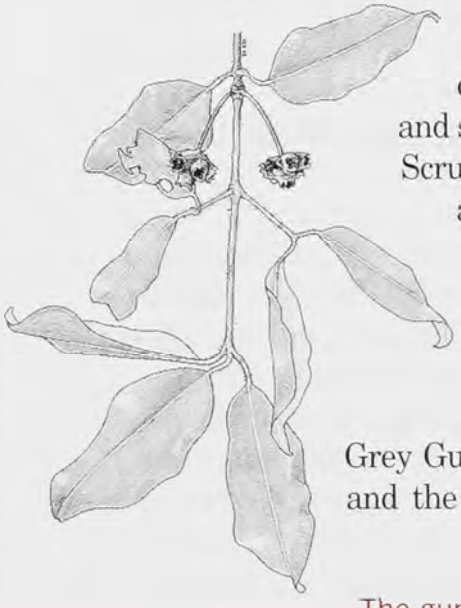
Climate, particularly rainfall, is important in determining what sorts of plant and vegetation would have occurred. The western part of the Cooks Valley receives less rain than the east and this would have had an influence on the type of trees to be found there. The clay soils further west, from Campsie to Chullora, would have had a more shrubby, paperbark-dominated understorey, particularly where it was more poorly-drained.

These patterns are confirmed by the first-hand historical information we have, notably the journals of James Cook, Joseph Banks, Watkin Tench, William Bradley and later writers, as well as other historical references like old paintings and photos.

We have been able to recognise a number of different landscapes for the Cooks River Valley with associated 'vegetation types' or 'plant communities'. These are recurring groups of plants and animals associated with particular soil and habitat features that are likely to have occurred together naturally. Now, try to imagine a scene over 200 years ago in a part of the Valley familiar to you.

Once upon-a-time...

Once upon-a-time a fresh, clean Cooks River rose amongst gentle hills that supported the plant community we now call **Cooks River Clay Plain Scrub Forest**, at Chullora (about 20 km from the coast and about 60 m elevation), and wound gently south-east through forests, heaths and swamps to enter the northern side of Botany Bay. In the Clay Plain Scrub Forest the trees would have formed a dense forest in some places, and a more open woodland in others, perhaps with smaller trees, but generally with a shrubby or scrubby understorey of the papery-barked Paperbarks of the species *Melaleuca decora* and *Melaleuca nodosa*.



Taller 'Gum tree' species would have included dark-trunked Ironbarks such as Broad-leaved Ironbark *Eucalyptus fibrosa*, the Grey Gum *Eucalyptus punctata* with its seasonal patches of orange bark, and the Woollybutt *Eucalyptus longifolia,* with its flowers in clusters of

The gun turret seedcapsules of Turpentine *Syncarpia glomulifera*

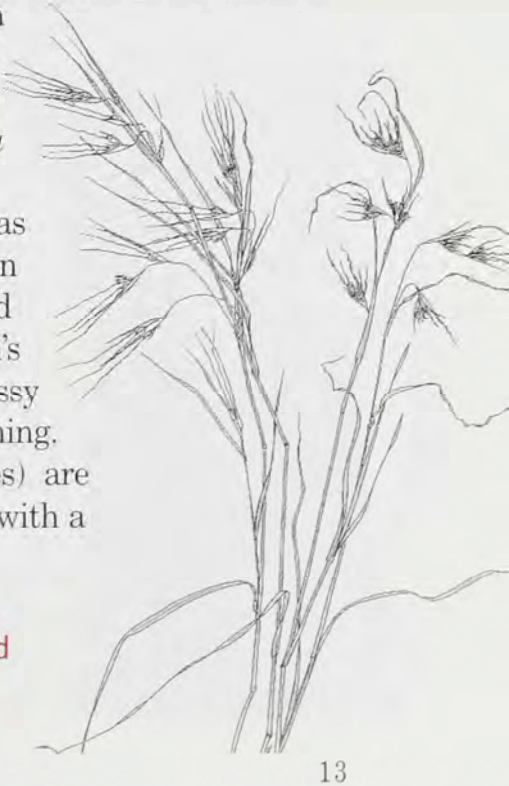
three. There would have also been some trees of Turpentine *Syncarpia glomulifera* and extensive thickets of the now rare shrub, Downy Wattle *Acacia pubescens*.

Herbs such as the Daisy *Chrysocephalum apiculatum* would have been common in the Turpentine-Ironbark Forest.

Most of the upper catchment has clay soils developed on Wianamatta Shale. Cooks River Clay Plain Scrub Forest occurred on the poorly-drained shale lowlands along the broad shallow valleys and on clay loams on adjacent hillsides. It occurred extensively in areas such as Greenacre, Strathfield and Campsie and upper Wolli Creek around Beverly Hills and Kingsgrove.

On the better-drained Wianamatta Shale country away from the River, particularly along the ridges followed by Canterbury Road through Dulwich Hill, Belmore, Lakemba and Wiley Park for example, and the ridges followed by Forest Road through Bexley and Hurstville, would have been what we call **Turpentine-Ironbark Forest**. This forest, growing here on the deep clay soils, would have had Turpentine trees *Syncarpia glomulifera* with seedcapsules shaped like gun turrets, and dark furrowed Ironbark trees such as Broad-leaved Ironbark *Eucalyptus fibrosa* and Grey Ironbark *Eucalyptus paniculata*.

A generally grassy understorey appears to have been characteristic of the forests on the well-drained Wianamatta Shale soils. The grassy groundcover would have included the distinctive Kangaroo Grass *Themeda australis*, Wallaby Grass *Danthonia tenuior*, Three-awned Speargrass *Aristida vagans* and probably Blady Grass *Imperata cylindrica*. There would also have been scattered shrubs of Blackthorn *Bursaria spinosa*, the orange-flowered pea *Daviesia ulicifolia* and the pink-flowered pea *Indigofera australis*.



The dark furrowed ironbark of Broad-leaved Ironbark *Eucalyptus fibrosa* and (right) the distinctive Kangaroo Grass *Themeda australis*.

'Kangoroo Ground: good Land' was the name given to the country between Cooks River and Parramatta Road according to Captain Watkin Tench's 1793 map, evidently indicating grassy areas suitable for pasture and farming. Kangaroos (as opposed to Wallabies) are grass eaters and tend to favour sites with a

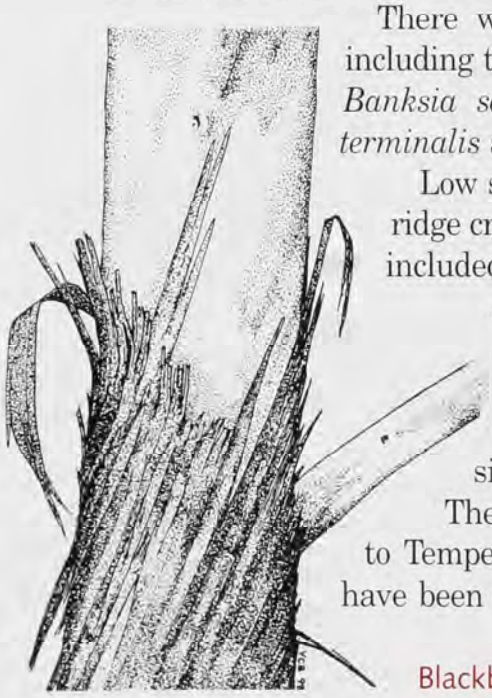
The pinkish Smooth-barked Apple *Angophora costata*

well-developed grass sward and relatively few shrubs (Pratten 1993). In a 1791 list of trees 'Brown Bark'd Gum Tree', probably our Blackbutt *Eucalyptus pilularis*, was described by Lieutenant William Bradley as occurring in the 'Kanguroo Ground', growing 'to the height of 80 or 100 feet without a branch, some have been cut which were 9 or 10 inches diameter at 80 feet from the base & quite sound,...'

Sydney's characteristic Hawkesbury Sandstone was exposed on steep slopes along the Cooks River in South Marrickville, Dulwich Hill and Undercliffe, along Wolli and Bardwell Creeks from Earlwood to Bexley North, and around Arncliffe and Rockdale. The sandy, generally shallow and rocky soils here would have had more shrubby vegetation than on the clay soils of the Wianamatta Shale. There would have been forest on sheltered hillsides, and woodland and heath on the exposed sites.

Captain Watkin Tench, Captain of the Marines with the First Fleet, was not impressed with the country south of the Cooks River he visited in December 1789. 'The few remarks which I was able to make on the country through which we had passed, were such as will not tempt adventurers to visit it on the score of pleasure or advantage. The soil of every part of the peninsula, which we had traversed, is shallow and sandy, and its productions meagre and wretched. When forced to quit the sand, we were condemned to drag through morasses, or to clamber over rocks, unrefreshed by streams, and unmarked by diversity.'

In the **Forest and Woodland** of this **Cooks River Sandstone Vegetation** would have been trees of pinkish Smooth-barked Apple *Angophora costata*, contrasting with Sydney Peppermint *Eucalyptus piperita* and Blackbutt *Eucalyptus pilularis*, both trees with rough-barked trunks and smooth branches. Red Bloodwood *Corymbia* (formerly known as *Eucalyptus*) *gummifera* with its urn-shaped fruit and the scribbly-barked Scribbly Gum *Eucalyptus haemastoma* also occurred.



Blackbutt *Eucalyptus pilularis*, with its rough-barked trunk

There would have been a varied, distinctly shrubby understorey including the Tea-tree *Leptospermum polygalifolium*, Old Man Banksia *Banksia serrata* with its warty bark, the Sunshine Wattle *Acacia terminalis* and the purple-flowered climbing pea *Hardenbergia violacea*.

Low shrubby **Heath** would have grown on the shallow soils along ridge crests and exposed rock platforms. Common plants would have included white-flowered *Kunzea ambigua*, sweet-scented *Acacia suaveolens*, Native Fuchsia *Epacris longiflora*, *Dillwynia retorta*, *Lomandra longifolia*, *Dianella revoluta* and the bright yellow-flowered climber *Hibbertia scandens*. There would have been localised sedge swamps in poorly-drained sites.

The floodplain of the Cooks River from Canterbury downstream to Tempe, entrenched mostly between sandstone valley sides, would have been flooded periodically, particularly when high tides backed up

Scribbles on the Scribbly Gum *Eucalyptus haemastoma*, the exposed tunnels of moth larvae.

Woodland on sandstone, Girrahween Park, Earlwood. (1990)

flooding river flows. During these floods, clay and sandy sediments would have been washed downstream and deposited to build up a deep fertile alluvial soil. Some silt is deposited by floods even today (but the most conspicuous detritus are pieces of plastic).

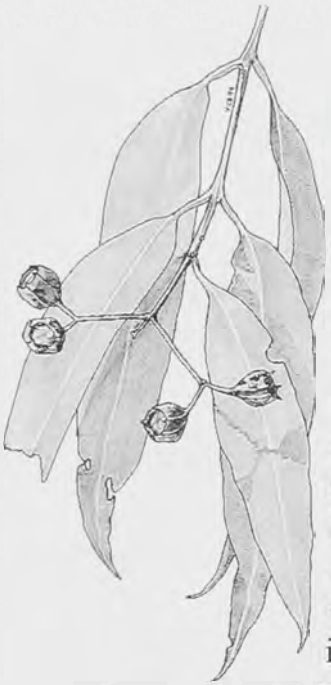
The **Floodplain Forest** on these soils would have had tall trees of species that grow well on fertile soils but can also cope with periodic flooding. Near the estuary, where there was also a salt influence, there were the needle-leaved Swamp Oaks *Casuarina glauca*, with patches of Swamp Mahogany *Eucalyptus robusta* and paperbarks, probably *Melaleuca styphelioides*, *Melaleuca ericifolia* and *Melaleuca linariifolia*. Further up the River and on the more sheltered sites there may have been Rough-barked Apple *Angophora floribunda*, Forest Red Gum *Eucalyptus tereticornis* and Sydney Blue Gum *Eucalyptus saligna*. There would have been shrubs including Blackthorn *Bursaria spinosa*, native groundcovers—*Commelina cyanea*, *Microlaena stipoides*, *Lomandra longifolia*, and *Juncus usitatus*, and ferns, Bracken Fern *Pteridium esculentum* and Harsh Ground Fern *Hypolepis muelleri*.

Floodplain Forest on black alluvial soils along Wolli Creek (known in 1833 as Cabbage Tree Creek), included *Eucalyptus robusta*, *Casuarina glauca*, the paperbark *Melaleuca linariifolia*, Lillypilly *Acmena smithii* and presumably Cabbage Palms *Livistona australis*, though no palms have survived here.

The lower part of the Cooks River, below somewhere near Canterbury was estuarine, and saltwater and tidal movements influenced the River's vegetation patterns. Lieutenant William Bradley of HMS *Sirius* explored the Cooks River by boat in December 1789. 'I found it to be a Creek of about 8 miles length to the NW with a winding shoal channel and end in a drain to a swamp, all saltwater'.

Mudflats, bare areas exposed at low tide, were a feature of the estuary of the Cooks River, according to historical accounts and old

Old Man Banksia *Banksia serrata* with its warty bark.

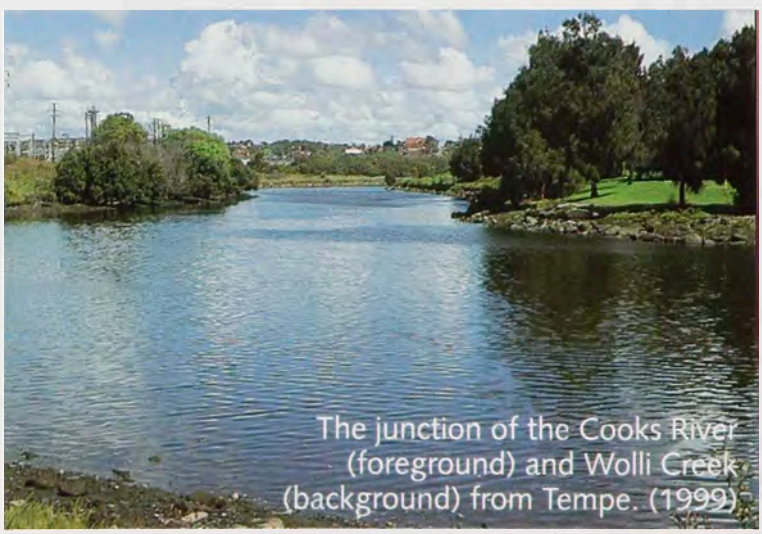


Rough-barked Apple *Angophora floribunda*

photos. About a week after Bradley's boat trip, Captain Watkin Tench with a military detachment marched overland to the River. The crossing place appears to have been just upstream of the junction with Wolli Creek. Here they had previously waded 'breast-high through two arms of the sea, as broad as the Thames at Westminster'. According to Tench 'these passing-places consist only of narrow slips of ground, on each side of which are dangerous holes'. A little further on Tench and his detachment tried to cross Muddy Creek. 'Knowing the value of time, I directly bade them to push through, and every one began to follow as well as he could. They who were foremost had not, however, got above half over when the difficulty of progress was sensibly experienced. We were immersed, nearly to the waist in mud, so thick and tenacious, that it was not without the most vigorous exertion of every muscle of the body, that the legs could be disengaged. When we had reached the middle, our distress became not only more pressing, but serious, and each succeeding step, buried us deeper.' Tench and his men survived with the help of tree branches thrown to them by men on the creek bank.

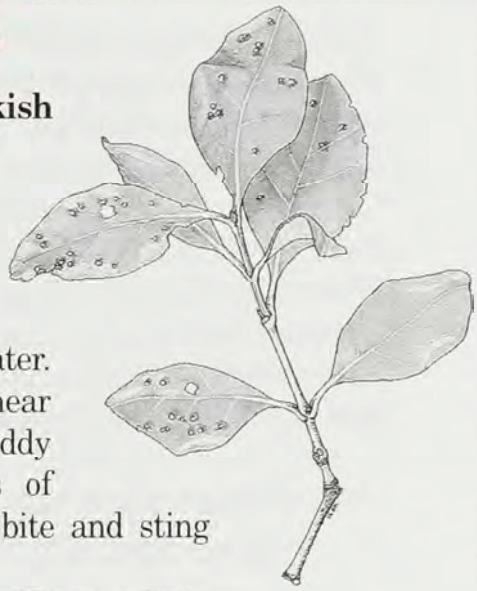
Mangroves and Saltmarsh flats extended across the estuary of the Cooks River, in lower Wolli Creek, in Muddy Creek and in Sheas Creek (now the Alexandra Canal). According to the botanist, Arthur Hamilton, who wrote a scientific account of Sydney saltmarshes in 1919, there were forests of Grey Mangrove *Avicennia marina*, with its characteristic, aerating vertical roots (pneumatophores) projecting above the mud, collecting silt and detritus, in the tide-flooded zone on the seaward side of the estuary and along the Cooks River itself. The other Sydney mangrove, the River Mangrove *Aegiceras corniculatum,* was uncommon in the estuary and mainly confined to tidal riverbanks, always behind the Grey Mangrove.

On the landward side of the mangrove zone was a carpet of lowgrowing saltmarsh, dominated by Samphire *Sarcocornia quinqueflora* and Seablite *Suaeda australis*. Patches of *Juncus kraussii*, and the salt couches *Sporobolus virginicus* and *Zoysia pungens* occurred on the margins of the saltmarsh. Photos from 1919 indicate extensive mats of Samphire. Between the tide-flooded saltmarsh and the *Casuarina glauca* floodplain forest, Hamilton describes, a mainly bare zone, The Dry Salt Plain, with 'detritus heaps and ridges usually formed round the decaying stumps and roots of the dead mangroves or other obstructions, and the pools, channels, and moist depressions, harbouring a few hardy pioneers, chiefly fugitives from the other formations, which eventually prepare the habitat for the advent of the fluvial vegetation. The detritus heaps are frequently coated with a sward of *Sporobolus virginicus* and outlined with an edging of *Sarcocornia*.'



The junction of the Cooks River (foreground) and Wolli Creek (background) from Tempe. (1999)

Brackish or slightly salty conditions would have occurred back from the estuary receiving freshwater drainage and occasional river



The paired opposite leaves of Grey Mangrove *Avicennia marina*

flooding. There would have been **Freshwater and Brackish Swamps** in these sites. The great Gumbramorra Swamp between Marrickville and Sydenham was a good example. There would have been reeds and sedges, *Phragmites australis*, *Schoenoplectus validus*, *Bolboschoenus caldwellii* and knotweeds *Persicaria decipiens* and *Persicaria lapathifolia* depending on local areas of fresh and brackish water.

Tench's party spent the night of 15th December 1790 near a 'fresh water swamp', possibly in Rockdale on upper Muddy Creek, where 'weariness is denied repose by swarms of musquitoes and sand-flies, which in the summer months bite and sting the traveller, without measure or intermission.'

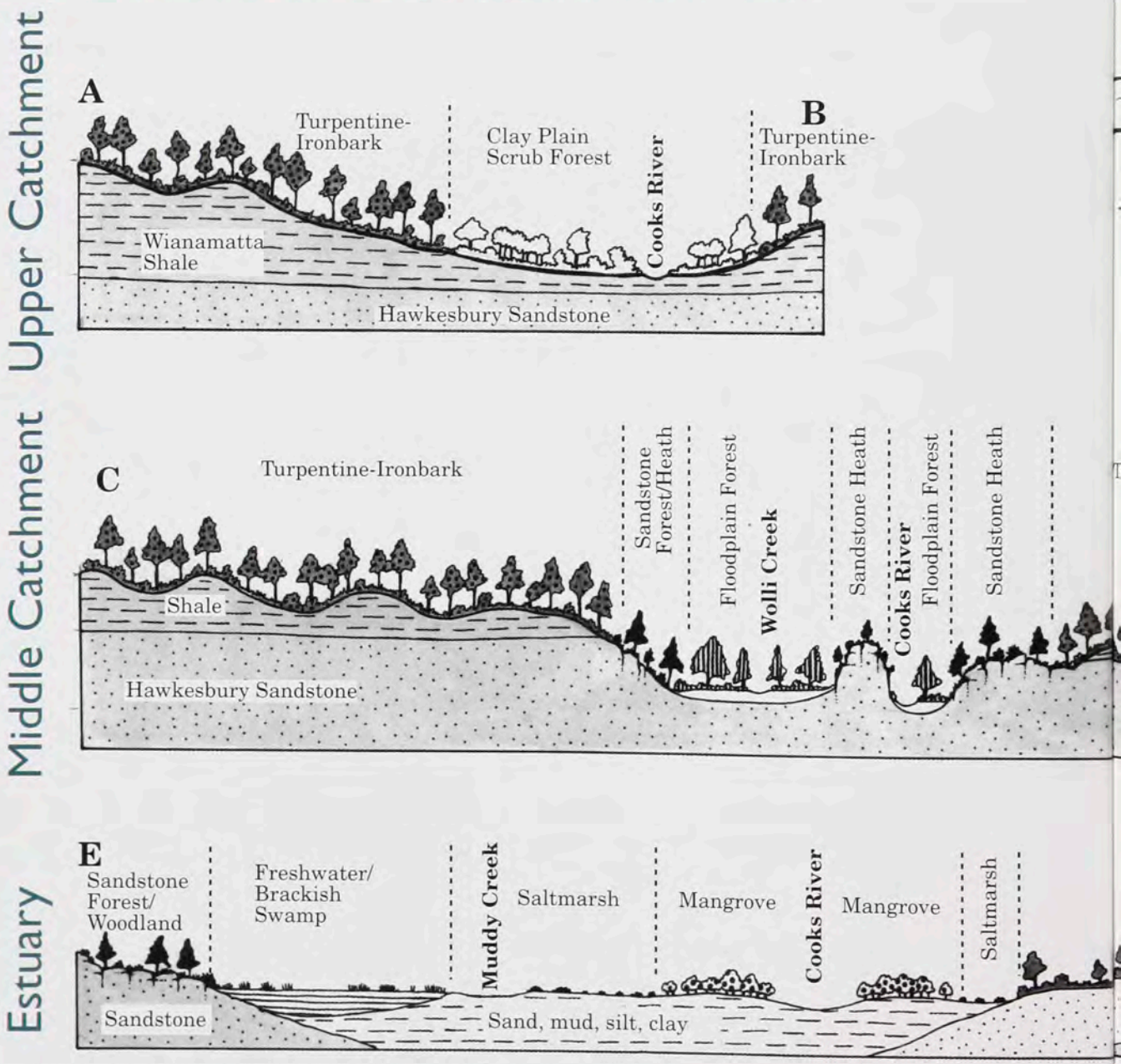
'We had passed through the country, which the discoverers of Botany Bay extol as "some of the finest meadows in the world". These meadows, instead of grass, are covered with high coarse rushes, growing in a rotten spungy bog, into which we were

Plan of the estuary of the Cooks River below Tempe Dam prepared for the Surveyor-General in 1889, showing areas of 'mud flat dry at low tide', 'mangroves', 'salt water swamp' and 'low scrubby ground'. Most of the 'fascine-dyke' edging to widen and realign the river channel had already been completed by that time. (Sydney Water Plan)

plunged knee-deep at every step.' reported Tench in December 1790, after his unsuccessful search for Aborigines south of the Cooks River near Muddy Creek. While the location of the good land that Cook and Banks described has remained a mystery ever since, there is no doubt that there were extensive swamps in the lower Cooks Valley.

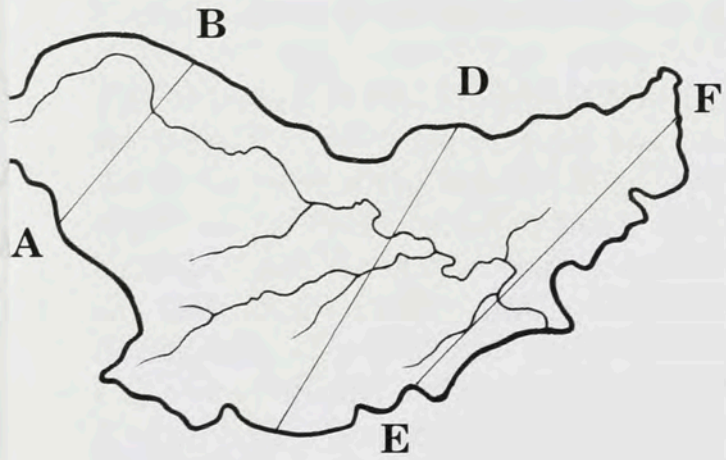
On sandy country behind Lady Robinsons Beach and up to a kilometre inland, and draining to Muddy Creek, were a series of north-south beach sand ridges and swamps. Trees of '*Eucalyptus pilularis, Eucalyptus botryoides, Eucalyptus robusta, Banksia integrifolia*, and *Angophora lanceolata* [=*costata*] are the common large plant growths of the sandy waste, while *Eucalyptus robusta* and *Casuarina glauca* are the common large growths of the swampy areas,' reported the geologist E.C. Andrews in 1912. Of one of these

Schematic cross sections across the Cooks River Valley showing likely distribution of plant communities in relation to landform and geology in pre-European times.



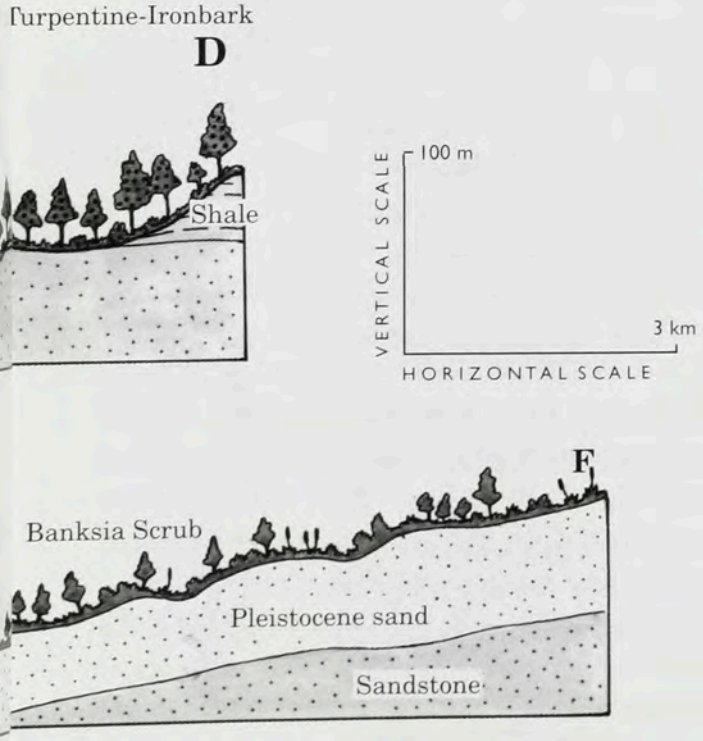
swamps, Pat Moore's or Patmore Swamp, 'a fairly heavy growth of bang alleys [*Eucalyptus botryoides*] and swamp mahogany trees [*Eucalyptus robusta*] abutted on the western side of this swamp—notable trees in every way, either in girth or foliage they were, and no undergrowth, but a fine coating of native grasses of a meadow character,' was how a local resident recalled them as being in the 1870s (Carruthers 1925).

The extensive Pleistocene/Holocene sand sheets of the Eastern Suburbs extend into the Cooks River catchment between Surry Hills and Mascot and behind Lady Robinsons Beach on the western side of Botany Bay. Joseph Banks appears to have landed hereabouts on 4th May 1770. 'Myself in the afternoon ashore on the NW side of the bay [Botany Bay], where we went a good way into the countrey which in this place is very sandy and resembles something our Moors in England, as no trees grow upon it but every thing is coverd with a thin brush of plants about as high as the knees. The hills are low and rise one above another a long way into the countrey by a very gradual ascent, appearing in every respect like those we were upon.'



The shrub-dominated vegetation on this sandy country would have been **Banksia Scrub**, the western edge of the Eastern Suburbs Banksia Scrub—varied heath, scrub and low forest vegetation with a rich variety of shrubs, including Wallum Banksia *Banksia aemula*, Broom Heath *Monotoca elliptica*, Pink Wax Flower *Eriostemon australasius*, Wedding Bush *Ricinocarpus pinifolius* and Grasstree *Xanthorrhoea resinifera*.

Frederick Mackie described vegetation between Waterloo and Botany in the 1850s; 'Walked yesterday to Botany Bay, a distance of 8 or 10 miles from our lodgings: The road lies over low sand hills covered with small scrub and various flowers. The sand in many places has almost the whiteness of snow and so little mixture of earth is there in it that it would doubtless be entirely destitute of vegetation but for the moisture of it; water is found about 2 ft. below the flat surface. The moister places were generally pink with the flowers of *Sprengelia Incarnata*, intermixed with Boronias, *Bauera rubioides*, *Crowea saligna*, Hibbertias and many other plants.'



The Cooks Valley as an Aboriginal landscape

Shellfish from the estuary: Sydney Cockle, Mud Whelk and Mud oyster

Of course, in reality, the Valley and its vegetation has not been 'natural', but has been influenced by Aboriginal people who have lived in the Sydney region for many thousands of years.

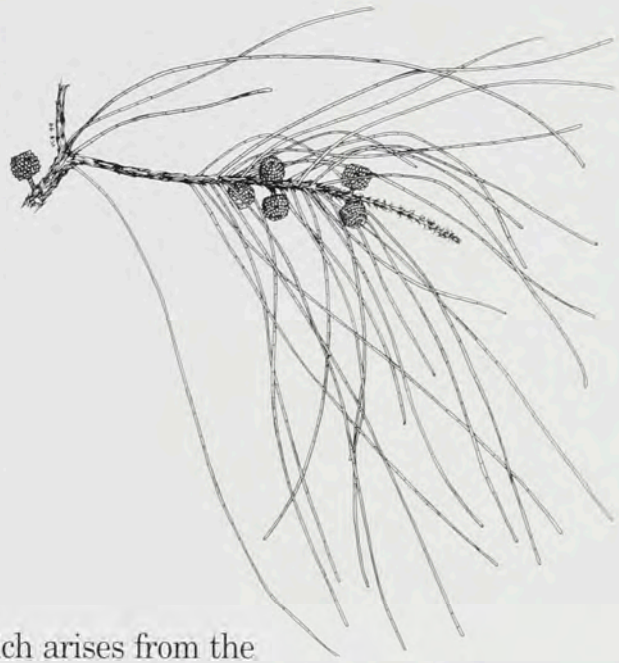
About 6 000 years ago, as the climate stabilised following the end of the last ice age, Aboriginal people concentrated on the sea coast and along the major rivers. The natural vegetation patterns would also have been changing in response to the warmer climatic conditions just as climatic changes induced by our 'global warming' will affect present-day vegetation despite protection in national parks and wilderness areas. The Aboriginal lifestyle would have interacted with the natural vegetation patterns and, while not altering natural plant patterns substantially, there would have been some local habitat modification. For example, the woodland and forest vegetation had already evolved in a fire-prone environment with fires started by lightning. Aboriginal activity is likely to have increased fire frequencies in some habitats, for example in grassy forests on the floodplain where food was plentiful, but had less impact on the shrubby woodland habitats where there were fewer food resources.

We have very few records of the lifestyles of the Aboriginal people of the Cooks River—various clans of the Darug language people. Cook and Banks describe the fishing activities of Aboriginal people around Botany Bay but not specifically from the Cooks River though activities here would have been similar. The estuary would have provided fish and shellfish, and Swamp Oak *Casuarina glauca* bark for canoes.

Watkin Tench searched a village '(if five huts deserve the name)' on the western bank of the Cooks River where it joined Botany Bay but found 'nothing except fish gigs'. According to Tench, Aboriginals in Sydney lived mainly off fishing. 'The fish-gigs and spears are commonly

◀ Slender Knotweed *Persicaria decipiens*
Leaves and seed capsules of *Melaleuca decora*

Swamp Oak *Casuarina glauca* with its seed cones



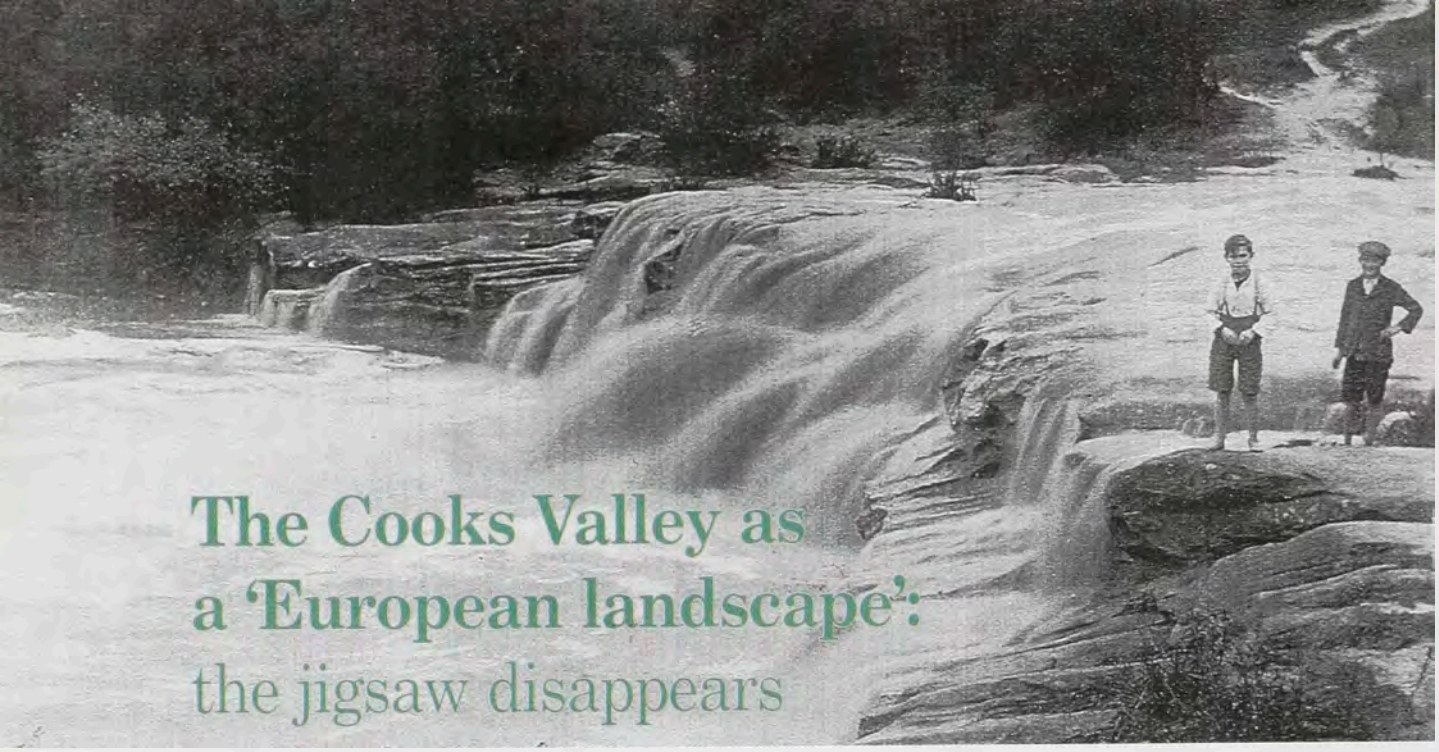
(but not universally) made of the long spiral shoot, which arises from the top of the yellow gum-tree [*Xanthorrhoea*], and bears the flower: the former have several prongs, barbed with the bone of kanguroo; the latter are sometimes barbed with the same substance; or with the prickle of the sting-ray; or with stone; or hardened gum; and sometimes simply pointed.'

Women fished with hook and line while men used the fish-gig. Tench writes 'When prevented by tempestuous weather, or any other cause, from fishing, these people suffer severely. They have no resource, but to pick up shell-fish, which may happen to cling to the rocks, and be cast on the beach; to hunt particular reptiles and small animals, which are scarce; to dig fern root in the swamps; or to gather a few berries, destitute of flavour and nutrition, which the woods afford.' Tench probably underestimated the food resources available from the bush. The Floodplain Forests would have had other foodplants while the Turpentine-Ironbark Forest on the deep clay soils would have been hunting grounds for kangaroos and other game.

The Aboriginal people were devastated by contact with European diseases. Lieutenant William Bradley reported on September 30, 1789 that 'Captain Hunter returned from Botany Bay, having survey'd the Bay and taken an eye sketch of the branches, all except that to the NW which they only traced a few miles; they met but few Natives those were all friendly. In some of the Caves, skeletons of some & loose bones of others were found, which had no doubt died of the small pox by their bodies not having been removed.'

In December 1790 after the spearing of the Governor's gamekeeper, Tench was sent out (rather unwillingly) with about 40 soldiers to the Cooks River area on two punitive expeditions. On the 15th December they reached Lady Robinson Beach near Brighton-le-sands and found 'five Indians' 'whom we attempted to surround; but they penetrated our design, and before we could get near enough to effect our purpose, ran off. We pursued; but a contest between heavily-armed Europeans, fettered by ligatures, and naked unencumbered Indians, was too unequal to last long. They darted into the wood and disappeared.' Neither expedition achieved its objectives.

Rock Oysters still grow on rocks in the Cooks River estuary, while Mullet, Bream and Flathead still swim in the water. The middens, piles of discarded shells left on the foreshores were used by Europeans to make building lime. The large shells of the Mud Oysters, also eaten by Aboriginal people, may be seen along the bank of the River, though these have been dumped as fill after dredging.



The Cooks Valley as a 'European landscape': the jigsaw disappears

The visit by the *Endeavour* in 1770 and the occupation of Sydney Cove in 1788 marked the end of thousands of years of relative stability for the Cooks River Valley landscape and its plants and wildlife. European changes began in the 1790s with the decimation of the Aboriginal society and the development of farms. Subsequent settlement of the Cooks Valley saw the destruction of almost all the elements of the existing natural landscape, either deliberately or unintentionally.

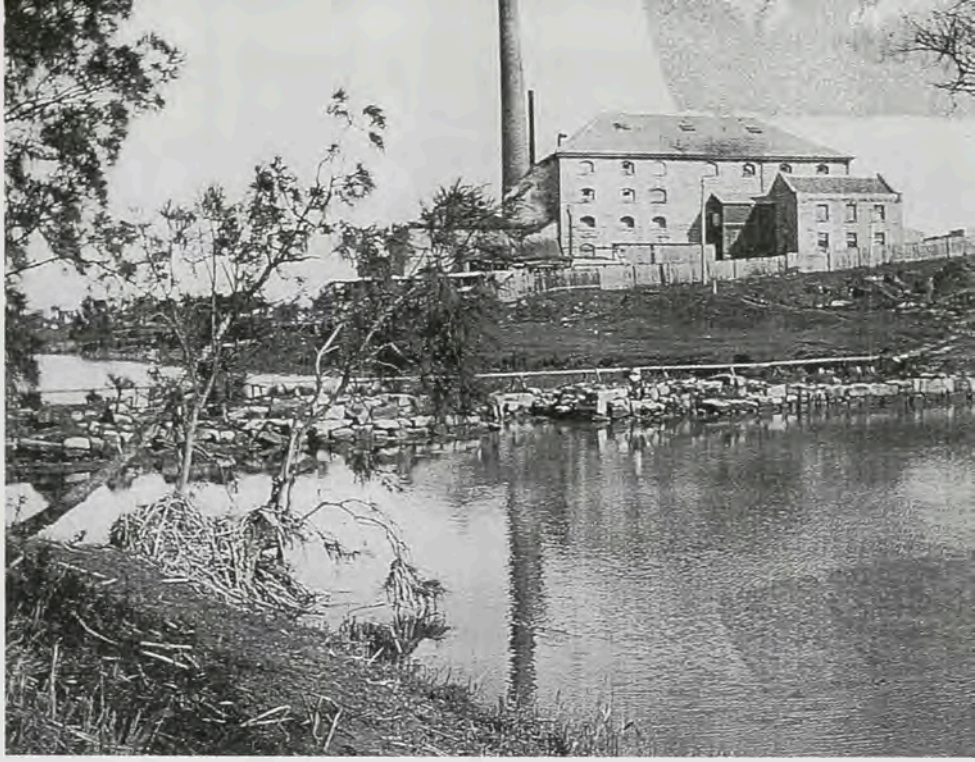
Like removing the pieces of a jigsaw—the Aboriginal occupants were pushed out and the big forest trees were removed, cut for building materials and to open up the land to grazing by cattle, horses, goats and sheep. The introduction of grazing animals themselves led to the removal of native groundplants and shrubs, while rabbits and foxes, introduced as game, hastened the decline of the native wildlife. Suburban settlement led to the final eradication of most of the natural bushland that had survived the farming days, while introduced or 'exotic' plant species became weeds and invaded the surviving remnants.

But let's go through this period of change again in a bit more detail, looking particularly at the destruction of the plants.

Making way for farms: Cutting and clearing the Turpentine-Ironbark Forest and the Floodplain Forests

The priority for the first European settlers was to provide food for themselves, and to find land suitable for farming. The Turpentine-Ironbark Forest and the Floodplain Forests grew on the best agricultural soils and were sought first. The 'Kangoroo Ground' the 'good Land' between the Cooks River and Parramatta Road was soon recognised and by 1793, for example, Richard Johnson, the Chaplain of the colony, had taken up land at Canterbury. By the end of November 1793 he had cleared his fifty acres and brought another thirty under cultivation (Pratten 1993).

The timber of the Swamp Oak *Casuarina glauca* trees growing in the Floodplain Forests split easily to make excellent roof shingles for the settlers' slab huts and the brick or stone houses of the gentry. The bigger *Eucalyptus* trees in the Turpentine-Ironbark Forest were cut out by the timbergetters. For example, on the estate of 'Bexley' in 1833 there were



Left; Cup and Saucer Creek, Canterbury, 1901 —it is hard to imagine the sandstone rapids and surrounding *Kunzea* scrub— replaced by the present concrete-lined channel. Right: The Canterbury Sugar-works, built in 1840, was an early industrial development on the River. By the turn of the century there was still an old dam on the river and most of the riverbank vegetation except a few Swamp Oaks, had been cleared.

(Canterbury City Council Library)

'valuable quantities of timber...stringy and ironbark, black-butt, mahogany, shingle-oak, turpentine, red, blue and whitegum, honeysuckle for ship and boat builders, and white wood of a large size, so much used by coach-builders and others' (Robinson 1987). Tree species evidently referred to in this list are *Eucalyptus globoidea, Eucalyptus paniculata, Eucalyptus pilularis, Eucalyptus resinifera,* shingle-oak *Casuarina glauca* or *Allocasuarina torulosa, Syncarpia glomulifera* and probably *Eucalyptus tereticornis, Eucalyptus saligna* and *Eucalyptus haemastoma.* 'Honeysuckle' is probably *Banksia serrata* and 'white wood', Coachwood *Ceratopetalum apetalum.* It is unusual to be able to specifically identify trees in historical lists as accurately as this. Most writers used terms such as gum, stringybark, ironbark and mahogany very loosely (botanically speaking).

Clearing for agriculture continued throughout the nineteenth century and photos from that time show open country with scattered trees. Some of the Turpentine-Ironbark Forest on poorer soils west of Canterbury survived longer. These forests were finally destroyed by the surge of suburban growth that followed the opening of the Bankstown railway line, beginning at Hurlstone Park and Canterbury in the 1890s, and moving westwards through Campsie, Belmore, Lakemba and Punchbowl in the 1920s and '30s. These forests have now almost completely disappeared.

The impact of industry: Cutting the Mangroves, filling the Saltmarsh and dredging the Mudflats

In the early nineteenth century, mangrove wood was burnt to supply barilla, an alkaline ash used for the manufacture of soap. In 1828 there were 'two or three Manufactories of Soap' at Botany Bay, though by 1831 it was reported that 'The soap boilers still suffer considerable restriction from the insufficient supply of mangrove ashes' (Benson & Howell 1990). The extensive mangrove forests in the estuary of the Cooks River must have been an important source of wood for these factories.

The increasing rural development of the Valley created a demand for water and in 1840 a dam was constructed on the Cooks River at Tempe, supposedly to supply water to Sydney, though water above the dam remained brackish. By 1870 the River was polluted

Illawarra Road bridge (Riverside Bridge) looking north from Earlwood towards Marrickville, 1901. A few Swamp Oaks *Casuarina glauca* survive along the River in a rural landscape that is rapidly becoming suburban.
(Canterbury City Council Library)

General view of Rockdale Sewage Farm showing pastures and crops with a line of Mangroves indicating the course of the River. View taken from Arncliffe looking east from Marsh St near Valda Ave (after disuse in 1916).
(Sydney Water Archives)

with sewage and rubbish, and the dam was silting up as a result of soil runoff from agricultural, industrial and suburban development in the catchment. In 1895, the unsanitary conditions caused public alarm and the Tempe Dam was lowered, though this provided only temporary improvement.

In the 1890s, engineering works were carried out to make a canal of the Cooks River below the dam and along Sheas Creek. These involved the construction of fascine dykes or walls along the edge of the main channel and filling the wetlands on the landward side. Extensive areas of mangroves, mudflats and saltmarsh were filled and almost all the estuarine swamps downstream of the Princes Highway were destroyed.

In 1925 a body of citizens formed the Cooks River Improvement League to try to clean up the continually deteriorating River. Pressure on the government led to the concreting of the upper reaches of the River between Canterbury and Strathfield as Depression relief work in the 1930s. This was followed by the 1946 Cooks River Improvement Act, the removal of the tidal gates at Tempe, and the dredging of the River and the filling of the low-lying wetlands for parklands.

Re-opening the River to tidal flushing improved conditions for wildlife for a short time and in the 1940s clean sandy reaches with plentiful prawns are remembered by local

Construction of the Western suburbs outfall sewer west of Princes Highway, Arncliffe in 1895 showing extensive market gardens on alluvial soil. Market gardens were common along creeks and swamps in the lower Cooks valley and the few remaining along Muddy Creek are an important link with this past. (Rockdale Library Local History Collection).

Below:
Riverbank reconstruction at Campsie, looking upstream near Lindsay Street, 1938. (Government Printing Office Collection, State Library of New South Wales)

residents. However sheet iron pilings replaced the riverbanks between Hurlstone Park and Marrickville in the 1950s and increasing pollutants and silt in stormwater and industrial waste have again degraded the River. In 1950 the River channel below Tempe was diverted to the south-east partly through Muddy Creek to join Botany Bay at Kyeemagh to allow upgrading of Kingsford Smith Airport. The old meandering River channel was filled in and concreted over.

Today concrete or iron embankments have replaced almost all the natural riverbanks, and the adjacent floodplain has been filled, but short sections of the river at Canterbury still have fringing banks of Common Reed *Phragmites australis*, with occasional patches of recolonising Grey Mangroves *Avicennia marina*.

Clearing of the Banksia Scrub

The low-lying barren sandy country of the Botany area was of limited value for agriculture but, with easy access to the city and port, was suitable for industry. The ready availability of water was important and the earliest industry, Simeon Lord's wool washery, was

located on the Botany Swamps in 1815. Other industrial development took place late in the nineteenth century, using the plentiful supply of groundwater under the sand.

By 1882 the wildflower attractions of the Banksia Scrub noted earlier by Frederick Mackie were disappearing. *An Illustrated Guide to Sydney* lamented that in the country along Botany Road beyond Waterloo, 'Market gardens have usurped the place of the bright Epacris and the varied Boroniae. Vegetable life is but the counterpart of animal life—the uncultured must give way. There are, of course, a few specimens of wild flora, but in nothing like their old magnificence. Those who remember the road to Botany in years gone by are not surprised at the name given by the first discoverer [James Cook]...We know most of the wild flower regions of the colony, but none to compare in variety and richness with Botany, as it was.' (Benson & Howell 1990).

The Rockdale Sewage Farm operated at the northern end of Lady Robinsons Beach west of the original mouth of the Cooks River from 1886 to 1916 turning the sandy ridge behind the beach and adjacent estuarine areas into irrigated crop fields and pastures.

In the 1920s and '30s houses were built on the sand ridges. No remaining natural areas of Banksia Scrub remain in the Cooks River Valley.

Draining and filling—
the Loss of the Freshwater and Brackish Swamps

From the time of Captain Watkin Tench the swamps were generally regarded as useless. The freshwater swamps had some potential as agricultural land and some swamps near the estuary, particularly along Muddy Creek, were converted to market gardens. The Rockdale Sewage Farm supported irrigated crops and pastures on former swampland by draining and adding nightsoil.

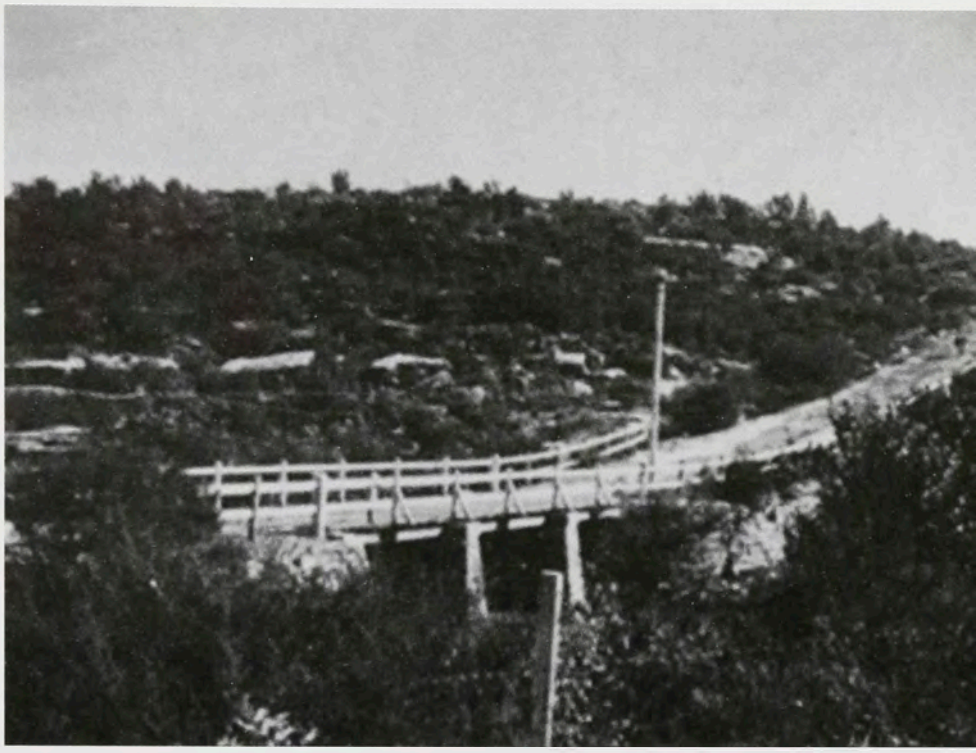
Other swamps were drained to provide suburban and industrial land. Marrickville's Gumbramorra Swamp was developed as the estate of Tramvale but the area was still notoriously floodprone until the construction of stormwater canals and the large stormwater basin at Sydenham in the 1890s. Smaller swamps were destroyed by filling with degraded, and often contaminated, soil material to become parks and golfcourses as the River was channelled and the banks replaced with concrete or iron.

The impact of suburbs:
The destruction of the Cooks River Sandstone Vegetation and the Cooks River Clay Plain Scrub Forest

The rugged Hawkesbury Sandstone outcrops with steep hillsides and cliffs were not useful for farming and grazing and remained relatively undisturbed up to 1900 after which trams, buses and cars improved access and encouraged suburban subdivision. Suburban development crept down from the shale ridges onto the sandstone slopes at South Marrickville, Dulwich Hill and Hurlstone Park in the late 1890s to 1920s, while the high plateau of Undercliffe and Earlwood was mainly developed in the 1920s.

Further south, Arncliffe, Banksia, Bardwell Park and Rockdale occupy steeper sandstone country, the nature of which gave the name to Rockdale. The bushland began to disappear under houses from the 1880s onward. 'ARNCLIFFE—a new suburb on the

Illawarra Line where, in spite of the speculative builder and thousands of excursionists the native flowers of Australia are still to be found in profusion,' reported an 1889 guidebook (Benson & Howell 1990). The builders won the day, though some Sandstone Vegetation has managed to survive along the steeper parts of Wolli and Bardwell Creeks.



Extensive sandstone heath and scrub covered the hills around the Bardwell Creek shown here at Jubilee Bridge, Bexley Road in 1914. (Rockdale Library Local History Collection)

Probably the last area of vegetation to be directly impacted by large scale development was the Cooks River Clay Plain Scrub Forest of the upper Cooks River. The low-nutrient soils and poor drainage where this plant community occurred had left these areas unaffected by rural activities and the lack of public transport made them unsuitable for housing. After World War II, however, the increased use of private cars led to the expansion of suburbs around Bankstown such as Greenacre, Chullora and Yagoona. Between 1950 and 1970 the Cooks River Clay Plain Scrub Forest of the upper Cooks was largely destroyed. Remnants survive in Rookwood Cemetery and at Chullora.

Artists and the River

All traces of the Aboriginal art and engravings that would have been found on the sandstone rock platforms and overhangs of the Valley have been lost, though the Aboriginal people of Botany Bay were portrayed by early colonial artists such as Joseph Lycett. The Cooks River itself, meandering between low hills and mangroves was not considered 'picturesque'.

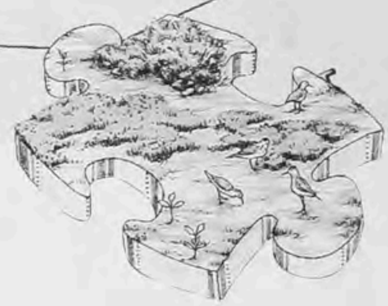
In the 1840s Alexander Spark of Tempe provided a 'salon' that drew artists including Jacob Janssen, Maurice Felton, Conrad Martens and John Skinner Prout. These artists habitually modified the landscape to make a more attractive composition. The trees and hills were heightened, the swamps and mangroves banished.

By the 1880s the 'undulating sandy hills entirely covered with brushwood' were becoming suburbia and the River was popular for picnicking, swimming and boating. *By Tranquil Waters* (1894) painted near Tempe by the young art student Sydney Long, then living in Newtown, captures the mood of the River at that time. Considered mildly shocking it was purchased by the Art Gallery of New South Wales—the flautist in the foreground reappears many times in Long's mythic landscapes.

Plan of Cooks River immediately downstream of Sheas Creek prepared for the Surveyor-General in 1882 showing extent of 'mudflats' and 'mangroves' and 'salt water swamp'.

Is anything left?

Exploring the Valley for jigsaw pieces



What jigsaw pieces are left? We can explore different parts of the Valley looking for remnants and clues, a remnant of forest—a surviving native bush plant, recolonisation of sites by mangrove or saltmarsh plants. Let's begin our exploration in the estuary.

Searching the estuary

The once-extensive estuary of the Cooks River, with its meandering channel and mudflats and mangroves, has disappeared under Sydney Airport. The River now reaches Botany Bay along a concrete channel that diverted its course back up Muddy Creek and cut through the sandy shoreline to join Botany Bay west of its original mouth. It is hard to visualise the original river. Perhaps the most tangible evidence of the original vegetation patterns are some plans prepared in the 1880s for the Surveyor-General. These show the once-extensive areas of 'mud flat dry at low tide', 'mangrove scrub', 'salt water swamp' (probably saltmarsh) and 'low scrubby ground' (possibly *Melaleuca ericifolia*).

However estuarine plants are hardy and vegetation still survives close to the River, on low-lying land subject to periodic flooding, or with saline soils that few weeds can survive in. **Grey Mangrove *Avicennia marina*** is the most conspicuous estuarine plant. Grey

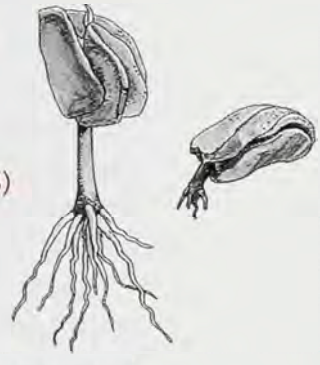
Mangrove shrubs, from seedlings to 4 m high, colonising silt deposits or along semi-natural banks, are a conspicuous feature along the River between Tempe and Croydon Park, and along Wolli Creek and Muddy Creek. They provide important habitat and shelter for waterbirds, fish and other aquatic animals. Grey Mangrove seeds are shed already sprouting, and these, spread by the tide, colonise banks of silt and mud. The smaller River Mangrove *Aegiceras corniculatum* has completely disappeared from the River. Saltmarsh plants are small and low growing and have not survived as well as the Grey Mangrove. However, at Riverine (now Barton) Park near the soccer stadium, a surprising area of saltmarsh has survived. Known locally as the **Landing lights saltmarsh** this gives a good idea of how large areas of the original estuary may have once appeared. Dominated by Samphire *Sarcocornia quinqueflora*, this is the largest substantial remaining expanse of saltmarsh left on the Cooks. Saltmarsh plants may take on distinct coloration, and *Sarcocornia* saltmarsh here may have attractive purplish tints in winter. Other saltmarsh plants, *Sporobolus virginicus*, Seablite *Suaeda australis* and *Triglochin striata* may also occur in these sites, but are generally rare now.

Estuarine wetlands followed Wolli Creek, as far as the weir at Turrella, where patches of mangrove and saltmarsh can still be seen. There are localised patches of *Sarcocornia quinqueflora* plants on the banks of the Cooks River at **Gough Whitlam Park** at Undercliffe where there is still a natural earth bank. At Marrickville, saltmarsh plants are attempting to colonise the tops of the iron banks. At **Eve Street Wetlands**, Arncliffe, open pools with fringing sedgeland and saltmarsh vegetation are being rehabilitated by Sydney Water, though this is now in the path of the proposed M5 Motorway.

The large shells of mud oysters and other shells now found along the banks reminds us of the plentiful foods that the River once provided for Aboriginal people. The shells found now probably come from dredge material used as fill when the artificial banks were constructed. Some Aboriginal shell middens may still exist.

The Dry Salt Plain, the extensive zone of bare saline ground that occurred between the saltmarsh and the

Grey Mangroves *Avicennia marina* and healthy saltmarsh along a semi natural shoreline at Warren Park, Marrickville.(1996)



Sprouting seedlings of Grey Mangrove *Avicennia marina* ▶

Saltmarsh and Grey Mangroves at Riverine (Barton) Park, Rockdale. (1998)

Phragmites australis, Common Reed

Natural banks along the Cooks River at Canterbury with Common Reed *Phragmites*, scattered mangroves backed by a line of Swamp Oak *Casuarina glauca*. (1997)

Casuarina forest described by Arthur Hamilton in 1919 seems to have completely disappeared. **Mudflats** exposed at low tide were conspicuous features of the estuary, according to historical accounts and old photos, and have also been destroyed. Limited areas of Mudflats are now forming upstream, and will gradually become colonised by mangroves, ultimately improving river wildlife habitats.

Iron riverbanks have been constructed along the River through much of Marrickville and Dulwich Hill, but at Hurlstone Park and Canterbury some natural sections of riverbank remain. These are fringed with Common Reed *Phragmites australis*, which would have once been common all along the River. *Phragmites* is a tall grass that can grow in shallow water and wet soil and spreads by rootsuckers to provide bank protection. There are some larger patches of *Phragmites* along lower Wolli Creek; probably all that remains of the original **Freshwater and Brackish Swamps**. The giant concrete stormwater retention basin at Sydenham is a reminder of the long-gone Gumbramorra Swamp.

Many Swamp Oaks *Casuarina glauca*, a characteristic tree of the **Floodplain Forest** have been planted along the River in recent years (particularly since the 1970s) but there are also still occasional, naturally-occurring remnant trees. These may be larger and older or they may be growing in odd places where they are unlikely to have been deliberately planted. There are also occasional remnant trees of Rough-barked Apple *Angophora floribunda* along Wolli and Bardwell Creeks but apart from these, little else remains of the Floodplain Forest. Some of the older, dense *Casuarina* plantings along the cycleway, particularly along the narrow channel of the upper Cooks River in Strathfield South, do seem to capture the ghost of the tall shadowy forest that would have been a distinctive part of the local landscape here.

Interestingly, prehistoric remains of the Floodplain Forest were discovered in 1896 when

Sheas Creek was channelled as the **Alexandra Canal**. Here, near the end of Campbell Road, St Peters, the geologists R. Etheridge, T.W. Edgeworth David and J.W. Grimshaw, uncovered a number of tree stumps, some still rooted in their original positions in dark clayey sand and covered in peaty material, beneath about 2 m of estuarine deposits. They were positioned about 3 m below the current low tide level. The stumps, up to 75 cm in diameter and some charred, were identified as trees of *Eucalyptus botryoides* ('Swamp Mahogany'), *Banksia serrata* and probably *Eucalyptus resinifera*. This forest would appear to have been inundated by the rise in sea level about 6 000-8 000 years ago. Bones of a Dugong were also uncovered, as well as stone 'tomahawks', evidence that Aboriginal people occupied the area at this time.

During tunnelling for the new airport railway under Cooks River in 1997, wood of Red Mahogany *Eucalyptus resinifera* was uncovered. It was dated as between 8 430 and 8 950 years BP (Before Present) by the University of Sydney and confirms the earlier findings.

Of the **Banksia Scrub** we have found no remains at all in the Cooks River Valley though there are small remnants nearby—in the Botany Swamp wetlands in the Eastlakes Golf Course, on sand hills near Wentworth Avenue, on Bonnie Doon Golf Course and at Banksmeadow Public School. The Eastern Suburbs Banksia Scrub is now listed as an Endangered Ecological Community under the *NSW Threatened Species Conservation Act* and these remnants, some only represented by tiny patches of Grass Trees *Xanthorrhoea resinifera* and heath plants, are now protected.

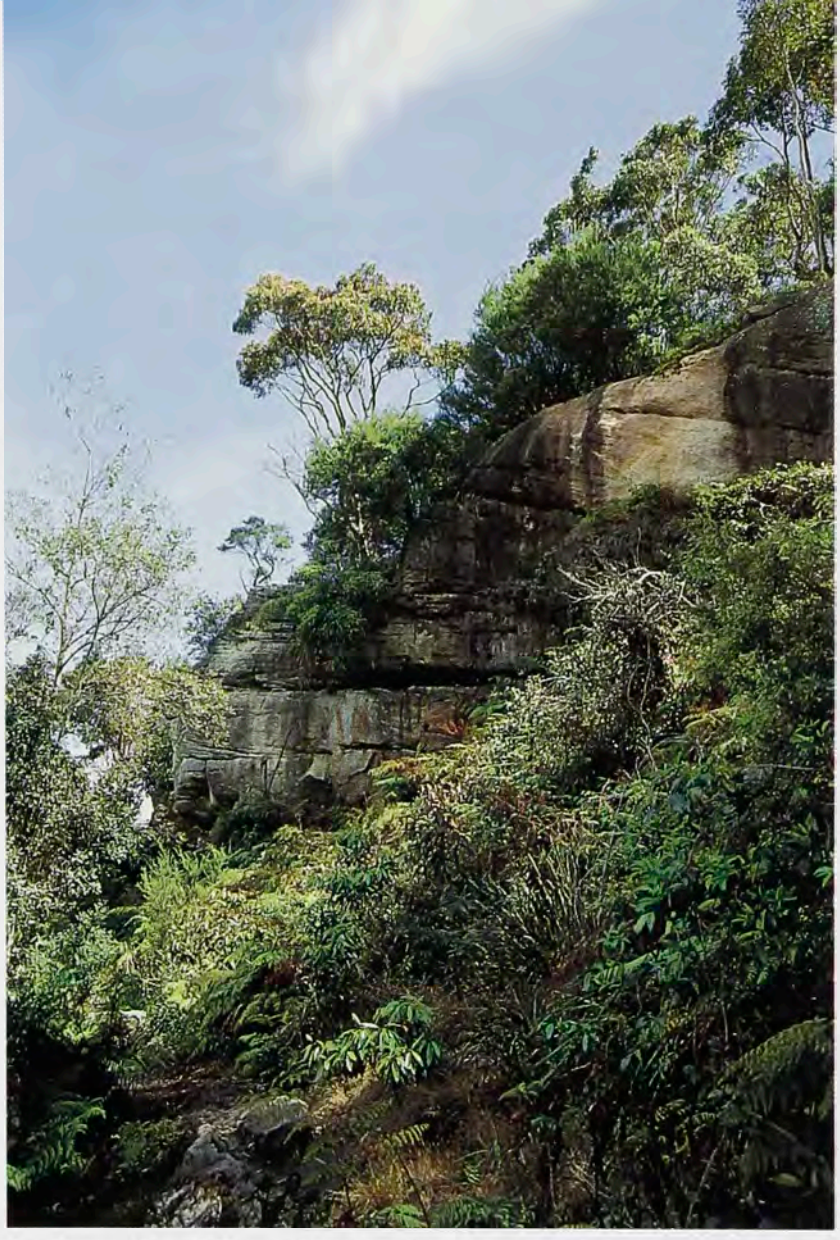
And in **Leo Smith Reserve** at Hawthorne Street, Ramsgate, trees of Smooth-barked Apple *Angophora costata* and 'Bang alley' *Eucalyptus botryoides*, with an understorey of shrubs including *Monotoca elliptica, Breynia oblongifolia*, Old Man Banksia *Banksia serrata*, Sydney Golden Wattle *Acacia longifolia*, Bracken Fern *Pteridium esculentum*, and scramblers *Hibbertia scandens* and *Billardiera scandens* still grow on the sands behind Lady Robinsons Beach, as described by geologist Andrews in 1912.

Exploring the sandstone landscapes

Apart from the River itself, the sandstone hillsides are probably the strongest visual geographic feature of the Valley. The rugged nature of the sandstone landscape is still evident even when covered with houses, as in Earlwood, Hurlstone Park and Canterbury, and indeed has been accentuated in places by steep cuttings left by quarries and road-works. **Sandstone hillsides** sloping steeply down to the River are evident in Earlwood and Undercliffe, and along Wolli Creek at Turrella.

In some places native plants have managed to persist on steep out-of-the-way slopes. There are remnants of the sandstone woodland at Riverview Road, Undercliffe, for example. Here, on steep slopes below home units, are trees of Blackbutt *Eucalyptus pilularis* and Smooth-barked Apple *Angophora costata*, with smaller trees of Cheese Tree *Glochidion ferdinandii, Acacia implexa* and *Allocasuarina littoralis*. The understorey is weedy but includes the native Matrush *Lomandra longifolia* and Bracken Fern *Pteridium esculentum*. These remnants are important landscape features when viewed from other parts of the Valley, such as across from Marrickville. They are also very vulnerable. The trees may be lost as housing developments expand, or killed by disturbance to the roots or changes in drainage patterns. The smaller plants may be crowded out by weeds.

Sheltered sandstone cliffs and railway cuttings may still have native plants particular-



Rugged Hawkesbury Sandstone country near Earlwood. (1998)

ly ferns, Coral Fern *Gleichenia dicarpa*, Bat's Wing Fern *Histiopteris incisa*, Soft Bracken *Calochlaena dubia* or Bracken *Pteridium esculentum*, but also Kangaroo Grass *Themeda australis* or shrubby *Kunzea ambigua*. There are some lovely Blackbutt *Eucalyptus pilularis* trees on the steeper slopes of Earlwood.

Shrubs of *Kunzea ambigua* and some *Lomandra longifolia* survive on the sandstone railway cutting at Kays Avenue, Dulwich Hill. (1995)

Sandstone outcrops are conspicuous in **quarries and cuttings** at Turrella, Earlwood and Undercliffe. Sandstone is exposed along the Princes Highway at Arncliffe. Growing on the sandstone of the railway cutting between Arncliffe and Banksia are Coral Fern *Gleichenia dicarpa* and *Kunzea ambigua*. These and other species are also found in railway cuttings at Dulwich Hill. In Earlwood are remnant Blackbutts

Eucalyptus pilularis and Port Jackson Figs *Ficus rubiginosa*, with small patches of shrubs, particularly *Kunzea ambigua*. A relatively recent loss was a large remnant Blackbutt tree cut down on Marrickville Golf Course.

However there are several places where extensive sandstone bushland was kept as open space and not cleared for housing. These remain much as they did when Captain Cook and Joseph Banks visited the nearby shores of Botany Bay in 1770.

The northern side of **Wolli Creek** valley is a rugged landscape with steep sandstone hillsides and cliffs. The largest surviving bushland area is at Earlwood, in **Girrahween Park**. Here there is Eucalypt woodland with trees of the Smooth-barked Apple *Angophora costata*, Blackbutt *Eucalyptus pilularis*, Sydney Peppermint *Eucalyptus piperita*, Red Bloodwood *Corymbia gummifera*, and Turpentine *Syncarpia glomulifera*, with a varied shrub understorey. Prominent species you will see are the Old Man Banksia *Banksia serrata* with its 'Big Bad Banksia Men' cones, Teatree *Leptospermum polygalifolium*, Sunshine Wattle *Acacia terminalis*, Hopbush *Dodonaea triquetra*, Matrush *Lomandra longifolia*, Bracken *Pteridium esculentum*, Sarsparilla *Smilax glyciphylla* and *Kennedia rubicunda*. There are more localized occurrences of Geebung *Persoonia levis* and Mountain Devil *Lambertia formosa*. Plants of the rare Downy Wattle *Acacia pubescens* do not occur naturally here but have been planted near the main path. This is a species of the Clay Plain Scrub Forest not the Sandstone Woodland. Planting of non-indigenous species such as this into bushland where it does not naturally occur is not appropriate, despite its status as an endangered species. The bushland here in Girrahween Park is in good condition despite high visitation and use. This is because of the regular bush regeneration and maintenance programs. Without this care, weeds will invade and bushland quality will deteriorate.

A walking track to the east of Girrahween Park passes below steep sandstone cliffs with native ferns, *Gleichenia dicarpa, Christella dentata, Calochlaena dubia* and occasionally King Fern *Todea barbara* on moist sheltered slopes. Further on, the track will take you to **Nannygoat Hill**. Climb to the summit for superb views over the valley. Between the expansive rock outcrops are shrubby heathplants of *Kunzea ambigua, Acacia suaveolens* and *Monotoca elliptica*, a plant more commonly found on coastal sand dunes. Smaller plants include the lily *Dianella revoluta* and the more common Matrush *Lomandra longifolia* and Bracken *Pteridium esculentum*.

More extensive areas of heath can be seen between **Unwin Street and Bayview Avenue, Undercliffe**. On a rocky sandstone outcrop here are shrubs of *Kunzea ambigua, Melaleuca nodosa, Dillwynia retorta* and the wattles *Acacia suaveolens, Acacia longifolia, Acacia falcata* and *Acacia ulicifolia*. The striking red

Prominent sandstone hillsides, such as here at Undercliffe Road, help us to appreciate the nature of the landscape under the suburbs. (1999)

Impressive Grasstrees *Xanthorrhoea arborea* in Bardwell Valley Bushland. (1999)

tubular flowers of the small Native Fuchsia *Epacris longiflora* may be particularly conspicuous.

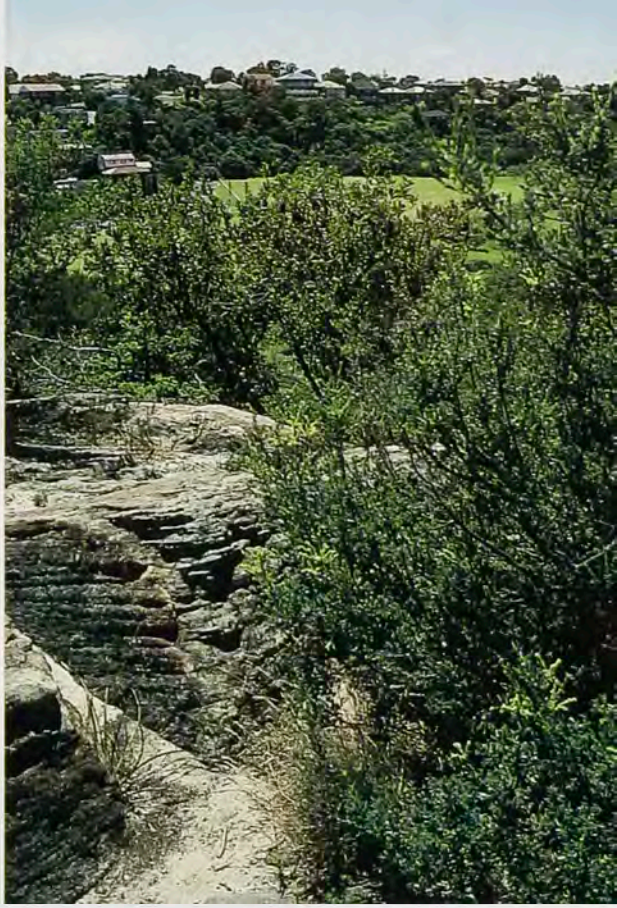
Bardwell Creek flows into Wolli Creek. Along the **Bardwell Valley Parklands** of upper Bardwell Creek valley between Preddys Road and Bexley Road is open-woodland of *Angophora costata* and *Eucalyptus piperita*, *Eucalyptus pilularis*, *Eucalyptus haemastoma* and Turpentine *Syncarpia glomulifera* with a shrubby understorey of many different plant species. These include the Grasstree *Xanthorrhoea arborea*, *Lomatia silaifolia*, *Banksia spinulosa*, *Persoonia linearis*, *Polyscias sambucifolius*, Sunshine Wattle *Acacia terminalis*, *Kunzea ambigua*, Bracken Fern *Pteridium esculentum*, Soft Bracken *Calochlaena dubia*, Kangaroo Grass *Themeda australis* and Barbed Wire Grass *Cymbopogon refractus*. The blue flowers of *Commelina cyanea* are very conspicuous after autumn rains. Along the Creek there have been plantings of Lilly Pilly *Acmena smithii*, Water Gum *Tristaniopsis laurina*, *Acacia floribunda* and Bottlebrush *Callistemon*, among natural remnants of *Acmena*, *Pittosporum undulatum*, *Pteridium esculentum* and *Kunzea ambigua*. There has also been planting of Matrush *Lomandra longifolia* here and elsewhere and it is instructive to see differences in the leaf shape and colour in these planted ones compared to the local indigenous form. Where possible, local sources should be used to retain local gene pools rather than mixing them up.

Between Bexley Road and the **Bardwell Valley Golf Course** is shrubland with *Kunzea ambigua* and Black Sheoak *Allocasuarina littoralis* and heath with *Epacris pulchella*, *Epacris longiflora*, *Epacris microphylla*, *Astroloma pinifolium* and *Styphelia tubiflora*. Some of it is on shallow skeletal soil on an old quarry site. The bared rock has kept the taller growing shrub species out, allowing the heath species, which are now rare in this part of Sydney, to survive.

Remaining vegetation along Wolli Creek is mainly on the Earlwood side, but **Stotts Reserve** at Bexley North has a rare remnant of Sydney Blue Gum *Eucalyptus saligna* open-forest along a side creek. There is also a more typical woodland area with Smooth-barked Apple *Angophora costata* and Sydney Peppermint *Eucalyptus piperita*.

Views and outlooks To appreciate the natural shape of the Cooks Valley (the body obscured beneath the skin of urban development), visit one of the high points and observe the shape of the land. The cross-section diagrams on page 18 may help you to understand the shape of the Valley.

The high sandstone plateau of Undercliffe-Earlwood is a major feature viewed across the River from Marrickville or across the Creek at Arncliffe. Take the time to view the lower Valley from a highpoint, such as the sandstone knoll of Warren Park, at South Marrickville. From here look downstream towards the airport and the factories that now cover the estuary and try to imagine the Cooks River meandering through saltmarsh and mangroves to Botany Bay. Look across the middle Valley from rocky outcrops in Marrickville Golf Course behind the clubhouse. Trace the curves of the River to the west.



The rocky summit of Nannygoat Hill provides great outlooks over the Wolli Creek valley. (RBG-JP 1990)

Imagine the landscape as it would have been 200 years ago without the houses, roads, and cars.

From the summit of Nannygoat Hill, Earlwood there are splendid views over the Wolli Creek giving a real sense of the topography of this part of the Valley. To the north a small valley joins Wolli Creek coming from the south-west and flowing north-easterly. Wetland remnants with Common Reed *Phragmites australis* and further down Grey Mangroves *Avicennia marina* are dissected by parks and weedy areas. The main ridge from Earlwood to Undercliffe to the north has remnants of sandstone woodland from Wavell Parade, eastward to the Unwin Street-Bayview Avenue heath. To the east beyond the airport are glimpses of Botany Bay. To the south beyond Wolli and Bardwell Creeks, are the prominent sandstone knolls of Arncliffe flanked by sandstone cuttings and old quarries.

Northern views from Hill Street on one of these Arncliffe knolls take in Wolli Creek, Nannygoat Hill and beyond to the city and Chatswood. From here and looking to the west towards Girrahween, the northern slopes of Wolli Creek appear to have a surprising amount of Eucalypt woodland. On an old quarry cutting nearby at the end of Pindari Place, remnant plants of *Kunzea ambigua, Allocasuarina littoralis, Acacia suaveolens, Lomandra longifolia, Ficus rubiginosa* and *Gleichenia dicarpa* cling to a sandstone cliff.

The sandstone-sided valley of the lower Cooks River can also be appreciated from the railway, between Dulwich Hill and Canterbury Stations, and contrasted with the flatter, more featureless Wianamatta Shale country of the catchment west of Canterbury. In cuttings between Marrickville and Hurlstone Park, interesting exposures of the sandstone with thin cappings of shale can be seen. Small patches of Coral Fern *Gleichenia dicarpa* have managed to persist on some of the moister, sheltered sandstone cuttings, though herbicide spraying by railway management has taken its toll. Similarly, lower Wolli Creek Valley between Tempe Station and Bardwell Park differs markedly from its western catchment.

Any remnants of the Turpentine-Ironbark forests?

The gently sloping Wianamatta Shale country of the middle and upper catchment has been almost completely covered with houses and roads. The Turpentine-Ironbark Forests that once covered much of Marrickville, Dulwich Hill, Canterbury, Campsie, Belmore Lakemba, Wiley Park, Kingsgrove, Earlwood and Bexley have almost completely disappeared. But a few clumps of remnant trees, their significance generally unrecognised, remain as evidence of this formerly extensive forest.

The best remnants are in the western part of the Catchment. In the south-western corner of **Wiley Park** on the busy corner of Canterbury Road and King Georges Road are trees of Broad-leaved Ironbark *Eucalyptus fibrosa* and Grey Box *Eucalyptus moluccana*, important remnants of the original Turpentine-Ironbark Forests. A few years ago, native understorey species still grew, but unfortunately cleaning up and landscaping has replaced

Remnant Turpentine trees *Syncarpia glomulifera* at South Strathfield in 1992. They have now been incorporated into shrub plantings in Maria Reserve.

A small patch of shale overlying sandstone at Dulwich Hill Railway station still retains native grasses, predominantly Kangaroo Grass *Themeda australis*—
a last tiny remnant of the 'Kangoroo Ground: good land', shown on Watkin Tench's 1793 map of the 'Country Contiguous to Port Jackson'. (1995)

these with exotic shrubs and Kikuyu grass. Other remnant trees growing elsewhere in the Park are a Woollybutt *Eucalyptus longifolia* near the amphitheatre, and remnant Turpentines *Syncarpia glomulifera*, Rough-barked Apples *Angophora floribunda*, Red Mahoganies *Eucalyptus resinifera* and Grey Boxes *Eucalyptus moluccana*.

There are also remnant trees of *Melaleuca decora, Eucalyptus moluccana and Syncarpia glomulifera* in gardens along The Boulevard, Wiley Park and in the grounds of Wiley Park and Lakemba Public Schools.

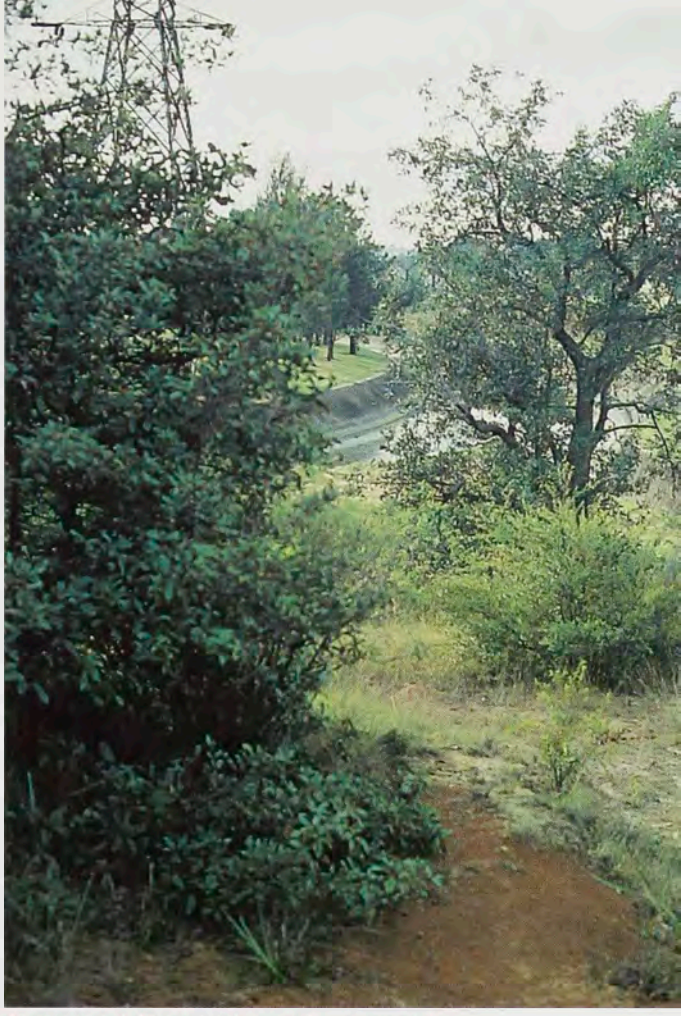
At Birrong, on the far western edge of the Cooks River catchment is **Potts Hill**, at 66 m elevation the highest point in the catchment. Here, within the land around the Sydney Water reservoirs (and not accessible to the public), are forest remnants with Broad-leaved Ironbark *Eucalyptus fibrosa* and Grey Box *Eucalyptus moluccana* and an understorey of grasses, herbs and small shrubs including *Microlaena stipoides, Dianella revoluta, Pratia purpurascens, Calotis cuneifolia, Cheilanthes sieberi*, and the yellow pea-flowered shrubs *Dillwynia sieberi, Daviesia ulicifolia* and *Podolobium ilicifolium*. This probably represents the western limit of the Sydney Turpentine-Ironbark Forest and the species composition indicates an intergrading with the Cumberland Plain Woodland of Western Sydney.

Also within the Sydney Water land is an unusual outcrop of the Potts Hill Sandstone, a sandstone strata in the Wianamatta series with a very limited occurrence. Though much of the outcrop has been quarried, there are remnant trees of Blackbutt *Eucalyptus pilularis* and Rough-barked Apple *Angophora floribunda*, with groundcover plants of Mutton Wood *Rapanea variabilis, Lomandra longifolia*, the Native Raspberry *Rubus parvifolius*, Blady Grass *Imperata cylindrica*, Wonga Vine *Pandorea pandorana, Indigofera australis, Breynia oblongifolia* and *Leucopogon juniperinus*.

Much less remains of the Turpentine-Ironbark Forests further east. Some Turpentine trees, *Syncarpia glomulifera*,

in the upper part of the Bardwell Valley are probably indicative of enrichment by shale downwash. Along the Cooks River in **Maria Reserve, Strathfield**, isolated old remnant Turpentines trees have been protected and surrounding areas landscaped with a mixture of locally native and other native trees and shrubs.

In Dulwich Hill a large Turpentine tree on private property in The Parade, Dulwich Hill would appear from its size, shape and location to be a remnant tree from the Turpentine-Ironbark Forest as would Turpentine trees beside the railway line just east of Hurlstone Park Station. A couple of trees in the grounds of the Maronite School on Wardell Road at Marrickville may be remnants—a Turpentine, two Blackbutts *Eucalyptus pilularis* and a Red Mahogany *Eucalyptus resinifera* near the sunken pool and a Bangalay *Eucalyptus botryoides* at the eastern end of the grounds. Trees along the perimeter walls include native species but are clearly plantings. There is a White Stringybark *Eucalyptus globoidea* in the nearby Gilbert Barry Reserve, on Wardell Road which, from its size and shape, could also be a remnant tree.



Remnant Turpentines *Syncarpia glomulifera* at the Campsie Bushland. The orange shale soil is being colonised by native grasses. (1994)

Probably the most interesting survival in this area however, is a small patch of native grassland of Kangaroo Grass *Themeda australis* and Plume Grass, species of *Dichelachne*, on the edge of the railway cutting at the city end of **Dulwich Hill Railway Station**. The grassland is confined to the thin layer of shale soil overlying the sandstone that is exposed in the cutting and is an amazing survival of the grassland understorey of the 'Kangoroo Ground' shown on Watkin Tench's 1793 map.

Remnants of the Clay Plain Scrub Forest in the upper Cooks Valley

More remains of the Cooks River Clay Plain Scrub Forest than of the Turpentine-Ironbark Forests. The soils of the upper Cooks Valley were poorer for farming and these areas with their Clay Plain Scrub Forest were not developed for housing until after the Second World War when the car made access easier. Large, often low-lying sites were occupied by industry and remnant bush sometimes survived in these places.

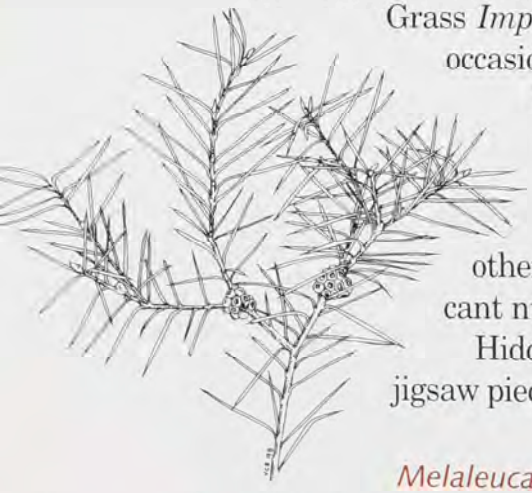
The **Campsie Bushland** is a surprising piece of the jigsaw. Surviving on the banks of the Cooks River as part of a proposed motorway easement and surrounded by the highly urbanised suburbs of Campsie, Belfield, Enfield and Croydon Park is a small patch of scrub and grassland with some trees and a surprising variety of native plants. On bare reddish clay soils are small shrubs and grasses; red-flowered Native Cranberry *Astroloma humifusum*, Purple Burr-daisies *Calotis cuneifolia*, yellow-flowered *Goodenia hederacea* and Three-awned Speargrass *Aristida* species, with Lichens and Mosses after rain. There

At Campsie Bushland orange Kangaroo Grass *Themeda australis* on the upper slopes contrast with Bracken *Pteridium esculentum* downslope. (1998)

Grasstrees, *Xanthorrhoea*, in the Campsie Bushland. (1994)

are sprawling colonising plants of *Kunzea ambigua*, 1–3 m in height, where the bush is gaining on the clear ground and ground orchids such as *Microtis unifolia*, conspicuous when in flower. Populations of *Calotis cuneifolia, Hibbertia serpyllifolia* and *Podolobium ilicifolia* are some of the few natural occurrences surviving in Western Sydney.

On the eastern edge, on the slope towards the River, is the greatest diversity with shrubby Turpentine trees *Syncarpia glomulifera*, some very impressive clumps of Grasstree *Xanthorrhoea media* and Riceflower *Pimelea linifolia*, Teatree *Leptospermum trinervium* and Matrush *Lomandra longifolia*. Banks on the northeast corner run down to the Cooks River with grassy bands of Kangaroo Grass *Themeda australis*, Blady Grass *Imperata cylindrica* and Bracken Fern *Pteridium esculentum*, and occasional bushes of Blackthorn *Bursaria spinosa* giving a naturalistic bank and contrasting with the manicured lawns and willows of the opposite side. One of the reasons for the vigorous native plant growth is that the natural soils have been essentially unmodified and have not received nutrients in runoff from other areas. In comparison, the areas with filled soil have a significant number of weeds.



Melaleuca nodosa with its clustered seed capsules

Hidden away in suburban Greenacre is **Coxs Creek**, another of our jigsaw pieces. After entering along a suburban laneway you will see a dense

clump of Melaleuca Paperbark scrub with *Melaleuca styphelioides*, *Melaleuca decora* and *Melaleuca nodosa*, screening out suburb and industry. Birds and frogs abound in wet weather as many water channels converge here; this was once part of a broader, clay-lined creekline system. Smaller native plants include *Pultenaea flexilis*, *Macrozamia communis*, the Bottlebrushes *Callistemon pinifolius*, *Callistemon linearis* and *Callistemon rigidus*, *Dianella*, *Pratia purpurascens*, *Ozothamnus diosmifolius*, Rock Fern *Cheilanthes sieberi*, and occasional trees of Broad-leaved Ironbark *Eucalyptus fibrosa*, miraculously surviving to show what this part of the Clay Plain Scrub Forest was like.

Nearby, but quite different, another jigsaw piece is **Norfolk Reserve** in Norfolk Road, Greenacre. This also has Clay Plain Scrub Forest but on a higher and drier site than Coxs Creek. A cleared play area in front leads to dense shrubby Melaleuca Paperbark scrub, mainly *Melaleuca decora* and *Melaleuca nodosa,* with trees of Woollybutt *Eucalyptus longifolia* and Broad-leaved Ironbark *Eucalyptus fibrosa*. There is a diverse shrubby understorey including Hopbush *Dodonaea triquetra*, *Acacia falcata*, Wonga Vine *Pandorea pandorana*, Mutton Wood *Rapanea variabilis*, *Goodenia ovata*, Black Wattle *Acacia decurrens*, Blackthorn *Bursaris spinosa*, Native Cherry *Exocarpos cupressiformis*, *Rulingia dasyphylla*, Daisy Bush *Olearia microphylla*, *Notelaea* and the vulnerable Downy Wattle *Acacia pubescens*. In spring there are patches of delicate Greenhood orchids *Pterostylis nutans* while after rain the Lichen ground covers take on renewed life. As a small reserve this area is always vulnerable to weed invasion and disturbance along its edges as well as deliberate dumping of waste materials. It is important that bushland margins are clearly defined and that any disturbance to these areas causes an immediate public outcry.

At **Chullora** in the old railway workshops land, much surviving bushland will be destroyed by the new National Rail Corporation development. This was fiercely opposed by local residents but the official response, to replant 'similar' bushland in a more convenient place, fails to recognise the inherent value of the authentic vegetation and that this cannot be replaced by native plantings, however careful the reconstruction.

Rookwood Cemetery is on the divide between the Cooks River (which flows to Botany Bay), Haslams Creek (flowing to the Parramatta River) and Saltpan Creek (flowing to the Georges River). The south-eastern corner of this great Victorian cemetery drains to the Cooks and here, under power transmission wires and abutting a currently expanding burial area, is another remnant of Clay Plain Scrub Forest. This is dominated by dense Paperbarks, *Melaleuca decora* and *Melaleuca nodosa*, with trees of Woollybutt *Eucalyptus longifolia*, and smaller plants, spiky *Lissanthe strigosa*, Purple Burr-daisies *Calotis cuneifolia* and purplish-leaved *Pratia purpurascens*. In an open site which had been partly ripped and strewn with branches with seed capsules, seedlings of both *Melaleuca decora* and *Melaleuca nodosa* as well as the spiny-leaved *Hakea sericea* were establishing after recent rain.

Rookwood has another remnant of Clay Plain Scrub Forest, though in a better-drained site, further over in Haslem Drive (and part of the Parramatta River catchment). Here is scrub with shrubs of *Pultenaea villosa*, *Dillwynia parvifolia*, *Kunzea ambigua*, *Acacia pubescens*, *Leptospermum trinervium*, *Olearia microphylla* and grassland with Kangaroo Grass *Themeda australis* and Bladey Grass *Imperata cylindrica*. Ornamental Freesias, originally planted around graves, have naturalised in the bushland here.

Map showing location of some of our jigsaw pieces

The Cooks Valley as an Australian landscape—
Putting back some of the jigsaw

The first efforts to use appropriate local native plant species in landscape and rehabilitation projects for the Cooks Valley were made during the 1970s. A far-sighted report by the Total Environment Centre described the native vegetation and recommended the protection of remnants and replanting using local native species. Major plantings of a limited range of local tree species were made, in particular of Swamp Oak *Casuarina glauca* and Swamp Mahogany *Eucalyptus robusta*. As one of the first major attempts in Sydney to use indigenous native species in their original habitat, perhaps this could be regarded as the beginning of the development of an Australian landscape for the Cooks. The results of these earlier plantings can clearly be seen. Rows and clumps of Swamp Oaks, grassy picnic areas and sports fields, children's play equipment and high numbers of visitors. The plantings provide an important background to these activities. There are even waterbirds.

But since the 1970s we have begun to recognise the importance of protecting our natural biodiversity, that is the total assemblage of plants, animals including insects and other invertebrates, microbes etc., together with their specific habitats and environments. Worldwide, we now recognise the importance of rainforests, the Amazon, estuaries, whales, wilderness, the Antarctic and more. At the local scale, what survives of the natural habitats of the Cooks Valley is our part of this world biodiversity.

Bringing together the plants and the landscapes—
What could be achieved?

We have identified many of the jigsaw pieces of vegetation. Some are already protected. The Sydney Turpentine-Ironbark Forests and the Cooks River Clay Plain Scrub Forest are listed as Endangered Ecological Communities under the **NSW Threatened Species Conservation Act** (1995). Some plant species also have particular protection. *Acacia pubescens* is listed as a Vulnerable species; *Wahlenbergia multicaulis* is listed as an Endangered Population in the council areas of Auburn, Bankstown, Strathfield and Canterbury. Remnants of the Turpentine-Ironbark Forest at Wiley Park, Potts Hill, Maria Reserve and Dulwich Hill Railway Station and remnants of the Clay Plain Scrub Forest at Campsie Bushland, Coxs Creek, Norfolk Reserve, Chullora and Rookwood Cemetery are covered by the Act.

The value of the bushland in the sandstone parklands of Wolli Creek (Girrahween Park—Nannygoat Hill—Unwin St and Bayview Ave), Stotts Reserve and along Bardwell Creek (Bardwell Valley Parklands and Bardwell Valley Golf Course) has also been finally recognised and the motorway which threatened them for many years is now to be tunnelled underneath rather than built through.

But the other small bushland remnants particularly in the main Cooks Valley still need protection, especially those in odd places such as along the railway lines, beside footpaths, in golf courses, and in other areas which are likely to be sprayed to 'tidy up'. Because these plants are growing wild they may present a 'weedy' appearance to people who do not recognise them, or understand their special values.

Look around your part of the Valley for remnants of native vegetation, perhaps growing out of roadside cuttings, along railway lines, in cemeteries and old industrial sites, mature native trees in parks and school grounds. Identify the type of habitat and the plants, using this book and others in the reference list, and work towards getting the site protected formally by Council (on their planning maps, Local Environment Plans (L.E.P.s), Significant Tree Register, heritage lists, etc). Talk with Council staff involved in natural resource management (Environment Officer, Heritage staff, Parks/Open Space Managers) and especially those involved with maintenance (Bushland Officers, Landscape and Parks staff, etc.). Try to get the site identified visibly with signs and fencing, and spread public information by letterboxing, on-site information days, stories in local papers, and by talking to local schools and community groups interested in heritage and environment. Identifying these sites publicly will help protect the native plants from being accidentally sprayed with herbicides or mowed, and from

Remnant Turpentine trees *Syncarpia glomulifera* and Blackthorn *Bursaria spinosa* beside the railway east of Hurlstone Park Station. (1996)

Kangaroo Grass *Themeda australis* and other native plants sometimes survive in out-of-the-way places such as old cemeteries, as here at St Stephens Newtown (1998)

other inappropriate management and landuse practices.

Consider initiating a community project to help restore your local remnant vegetation. Approach Council staff about developing a community restoration project that fits in with future plans for the area, and uses appropriate methods. Experienced bush regenerators and local naturalists will be able to give you advice. If it is an Endangered Ecological Community under the **NSW Threatened Species Conservation Act** (1995) the National Parks and Wildlife Service of NSW will need to be consulted about any restoration project. With community and Council support, apply for a grant to help fund your project, perhaps to remove degrading elements such as weeds and litter, or dumped garden waste and soil from the site, or to install signs or appropriate protective fencing. When considering the removal of building materials, pipes, etc. remember they may be providing important shelter for lizards, frogs and insects. Planting locally native climbing plants and shrubs to screen the unnatural habitat and reduce further dumping may be a better alternative.

As a guide to the plant diversity of the Cooks River Valley and to assist with selection of appropriate plant material we have put together a list of the native species that occur or occurred in the Valley (pages 66-79). This has been based on our study of bushland remnants, together with herbarium collections, flora surveys done by both professional and local people, and historical references, old photos and pictures. The list includes up to 600 native species giving some idea of the original variety of the flora of the Valley. We have indicated the different plant communities that plants may have occurred in and have provided photos of some of the plants. Pictures of the others can be found in some of the reference books we have recommended. Better still have a look for them in your local bushland or grow some of them in your garden.

However, to achieve the bigger picture, a strategic effort by many players will be needed. This will involve Councils and their staff (planners, landscape staff, engineers, park management and maintenance staff, bush regeneration teams), contractors and wildlife people, all working together with local people. A big step forward has been the ***Cooks River Foreshores Strategic Plan***, a 3 volume publication prepared in 1997 for the Cooks River Regional Working Party (Clouston 1997).

Part of the Vision for the Cooks River in the Strategic Plan is:

As a generous River corridor the foreshores will create an ideal opportunity to restore and conserve a range of native plant communities and wildlife habitats, establishing a link from the River's beginning in Bankstown to its issue into Botany Bay, and The River and its catchment will be managed to assist the natural recovery of the water quality, aquatic life and Riverbed profile, enhanced by riverbanks that reflect a more natural character.

While we obviously can't re-establish all of the natural vegetation systems in the Cooks River Valley, we can ensure that the jigsaw pieces that still exist are looked after, with weed species removed and protective buffer zones around the edges. In places they can be connected with corridors of sympathetic landscape to maximise wildlife habitat such as along creeklines, roadsides and railway lines. This can be done in areas in public ownership but backyards can contribute with appropriate plantings, particularly of shrubs that provide habitat for small bush-birds.

Volume 2 of the *Cooks River Foreshores Strategic Plan* details important planning strategies for *Natural Conservation and Restoration*, and *Water and Riverbank Management*. There is an important section on Management and Design Principles with good ideas for the provision of natural banks to replace the currently deteriorating iron and concrete edges.

There is also an interesting section on ***Demonstration Sites*** where treatments for particular sites are outlined in detail. These sites include Strathfield Golf Course; Water Street, Strathfield; Canterbury Road bridge crossing, Canterbury; The Warren/ Richardsons Lookout, Marrickville; and Holbeach Avenue, Tempe Boat Harbour. These sites all provide some opportunities for the introduction of semi-natural habitat using local native plants.

Near Steel Park Marrickville riverbanks have been reformed using large rocks to create more wildlife habitat and a more attractive appearance. (1999)

Deteriorating iron riverbank. Perhaps Swamp Oaks *Casuarina glauca* and Common Reed *Phragmites australis*, already growing further upstream, could be established at sites like this to provide bank stability in anticipation of the removal of the artificial bank. (1997)

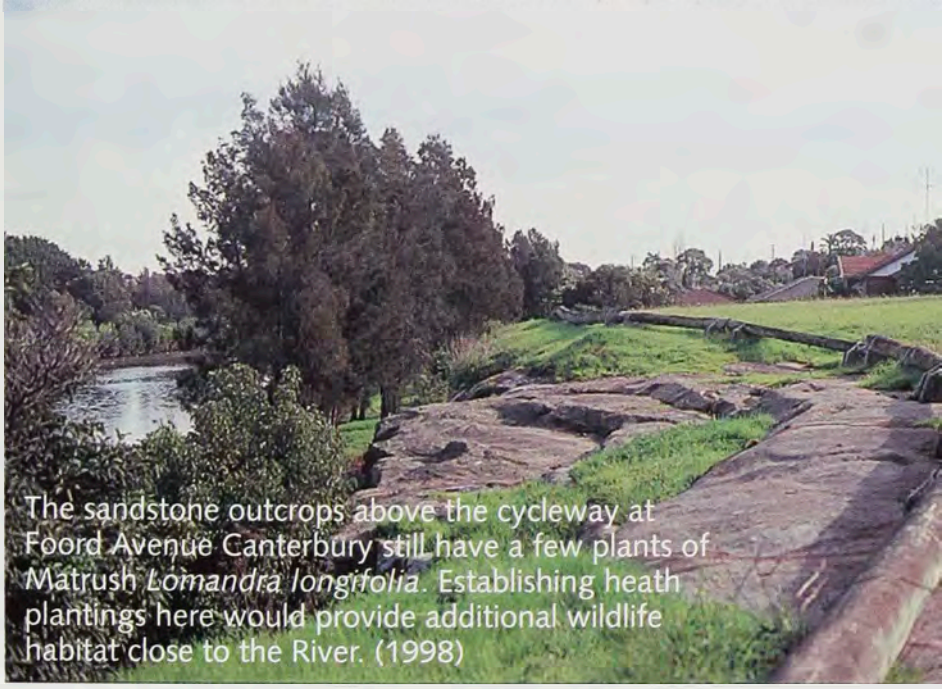
Remnant Turpentine-Ironbark Forest at Wiley Park. By 1999 the native groundcover has been lost but could be re-established.

Work on The Warren/Richardsons Lookout demonstration site is well advanced. Here the riverbanks have been reconstructed with large sandstone boulders to protect against wave action and the soil between planted with local native ground species including Matrush *Lomandra longifolia* and the fern *Hypolepis muelleri*. Boundaries and edges are important in both ecology and park management and here the natural water habitat of the River grades directly into the re-created natural habitat. This provides shelter for water-birds and allows water-dispersed plants such as coastal saltbushes to colonise. The paved cycleway provides a convenient-to-manage edge on the pedestrian access side. Further back from the River, grouped plantings of appropriate trees and shrubs have been made to provide Floodplain habitat, while Sandstone Woodland species have been used on the prominent sandstone outcrops nearby.

Other places along the River are crying out for similar habitat re-creation. The zone between the river's edge and the cycleway/pathway could be developed as natural habitat in many places. For example, along the bank downstream of the old Sugarmill at Canterbury are patches of Common Reed *Phragmites australis* and Swamp oak *Casuarina glauca* forming good riverbank habitat. Both these species can spread by root suckers. Allowing these plants to spread along behind the rusting iron sheeting is likely to allow natural bank stabilisation to be in place, ready when the iron rusts away. Already some iron sections have become loose and trial planting of these bank stabilising species could be undertaken. At present any spread of these plants is deterred by herbicide spraying.

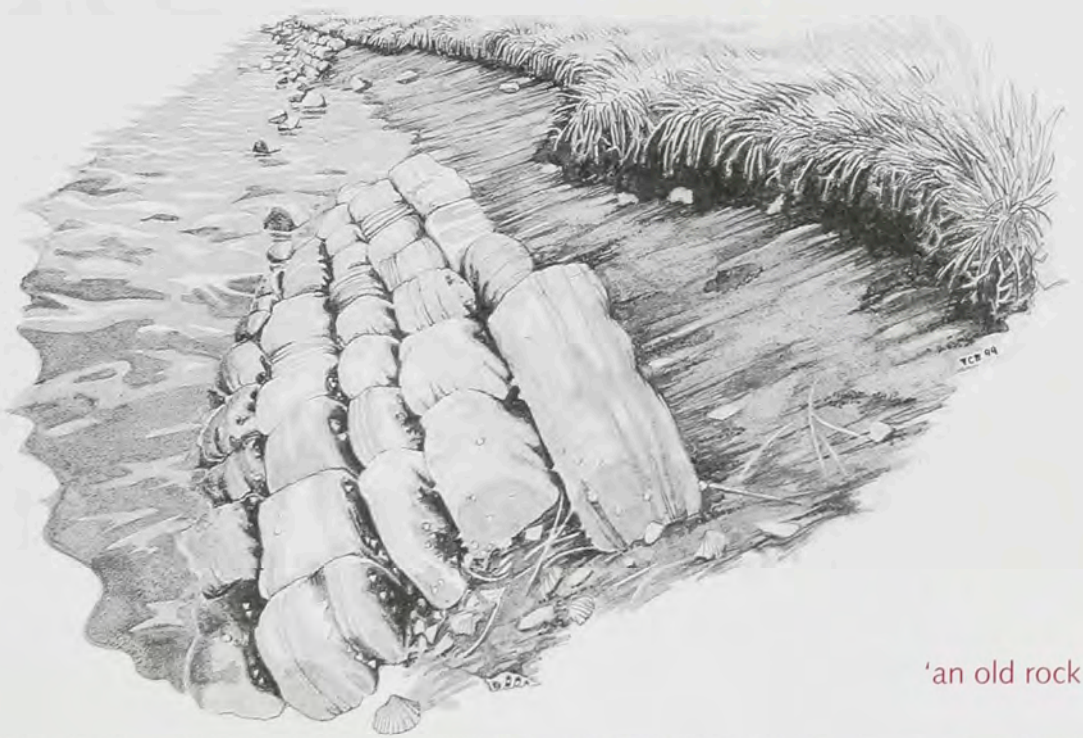
On its prominent corner at Wiley Park, the Turpentine-Ironbark Forest remnant is an important landmark but there is no natural regeneration of the original native Broad-leaved Ironbark *Eucalyptus fibrosa* and Grey Box *Eucalyptus moluccana* trees because of frequent mowing and dense mulch. To maintain the naturalness of this site, mowing needs to be less frequent to allow recruitment of native trees, planted non-local native trees

should be removed (there are plenty of similar planted trees elsewhere in Wiley Park) and some local native understorey species reintroduced. Kangaroo Grass *Themeda australis*, Wallaby Grass *Danthonia*, Blackthorn *Bursaria spinosa*, purple-flowered *Hardenbergia violacea*, or the wattles *Acacia parramattensis* or the rare *Acacia pubescens* would be appropriate. This could be done slowly, in small areas, with signs to explain what was being done. An area of relatively little usage, because of traffic noise, could become a valuable wildlife habitat and protect the important remnant trees. Seed from other remnant trees growing elsewhere in the Park such the Woollybutt *Eucalyptus longifolia* the Turpentines *Syncarpia glomulifera*, Rough-barked Apples *Angophora floribunda* or Red Mahoganies *Eucalyptus resinifera* could be used to provide additional trees to maintain the local genetic pool.



The sandstone outcrops above the cycleway at Foord Avenue Canterbury still have a few plants of Matrush *Lomandra longifolia*. Establishing heath plantings here would provide additional wildlife habitat close to the River. (1998)

The sandstone outcrops in the Valley could be a focus for habitat with Sandstone Woodland and Heath species, e.g. *Kunzea ambigua*, *Melaleuca nodosa*, *Pteridium esculentum*, *Acacia suaveolens* and *Acacia terminalis*. Interesting cuttings, rock shelves and rocky slopes are often just covered with Kikuyu grass and the edges sprayed with herbicide. Potential sites for sandstone habitat re-creation occur along the River edge in Marrickville Golf Course upstream of the clubhouse for example, or at the end of Foord Avenue, Canterbury where heathplants could be established on top of a sandstone cutting alongside the few remnant plants of *Lomandra longifolia*. Heath and Woodland plants could be established in sites away from the River such as in Burnett Street, Hurlstone Park or along Cup and Saucer Creek channel. There are many others.



'an old rock wall'

2000 and beyond...

Sydney is one of the few major cities that can take pride in having an urban population living closely to where natural ecosystems still survive. Suburbs to the north and south of Sydney are renowned for their bushland but after more than a century of intensive urban and industrial expansion the bushland of the Cooks River catchment has mostly gone.

As scientists we have searched the Valley for bushland fragments, our jigsaw pieces, and tried to piece together some of the past natural patterns of the Valley. The process has made us see the Valley in a new light. We have been surprised by the wildlife diversity that still remains in 1999 in this most suburban valley. Our jigsaw pieces are large and small, most are on publicly-owned land, some are cared for by bush regenerators and local residents, some managed by councils and protected by state legislation. The tiny sites are certainly vulnerable, but more to ignorance than deliberate destruction—vulnerable particularly to herbicide sprays, mowing and cleaning up by council, railway, roadwork or golfcourse staff. Knowledge of their location and importance should be incorporated into management plans, but a wider knowledge of the importance of remnant bushland in the general community is needed to back this up. This is happening.

But perhaps the biggest future changes to the Valley will come through the development of areas of re-created habitat. Landscape ecology will combine the planting of appropriate local trees, shrubs and groundplant communities with sensitive engineering to replace the iron and concrete riverbanks, install naturally functioning wetlands and bring back more of the birds and other wildlife. The bringing together of the natural, the landscaped and the utilitarian was not fully recognised 30 years ago but is the challenge for the 2000s.

Our jigsaw pieces are important. They are the local populations of plants and animals that have evolved in this place in the world. Protecting them is our contribution to worldwide conservation. Through them we can get a tangible idea of the existence of past landscapes, and recognition of the great changes we have wrought. They are, in a sense, living museum pieces, but they are more. Our jigsaw pieces provide the clues, the information enabling us to integrate the future development of the parklands and open space into an ecologically meaningful landscape, a future Australian landscape for the Cooks River Valley.

Sweet-scented *Acacia suaveolens*

Brief descriptive notes of some Cooks River native plants

Plants of the Clay Plain Scrub Forest

Acacia parramattensis ▶

Quick-growing tree, 4-12 m high, with feathery bipinnate leaves and pale yellow flowers, November-February. May spread vegetatively by root-suckering to form groves, and by hard-coated soil-stored seed that germinates after fire or disturbance. Provides seed and shelter for native birds and attracts butterflies, moths, bees and beetles. Propagate from heat-treated seed.

PHOTO RBG-JH

Family FABACEAE

Acacia pubescens Downy Wattle ▶

Bushy, hairy shrub to 3.5 m high with bipinnate leaves, and golden yellow flower heads in September. Seeds mature October-December, hard-coated; stems killed by fire but resprouts from rootsuckers. Attracts many native butterflies, beetles and other insects and provides seed for birds. Propagate from heat-treated seed. Listed as a Vulnerable Species under the *NSW Threatened Species Conservation Act*.

Family FABACEAE

Acacia ulicifolia Prickly Moses ▶

Shrub to 2 m high with narrow spiky leaves. Pale yellow flowers, April-November. Plants killed by fire. Hardcoated seeds remain dormant in the soil until fire or disturbance breaks the hard coat. Provides seed and shelter for native birds, and attracts butterflies and native bees. Propagate from heat-treated seed.

Family FABACEAE

The similar looking *Acacia brownii* found in Clay Plain Scrub Forest has longer, thinner 'leaves' and brighter yellow flowers.

◀ *Astroloma humifusum*
Native Cranberry

Low mat-forming shrub with red tubular flowers, often hidden in foliage, at any time of year. Reddish, slightly succulent fruits, mature mainly July-October, were an Aboriginal food source.

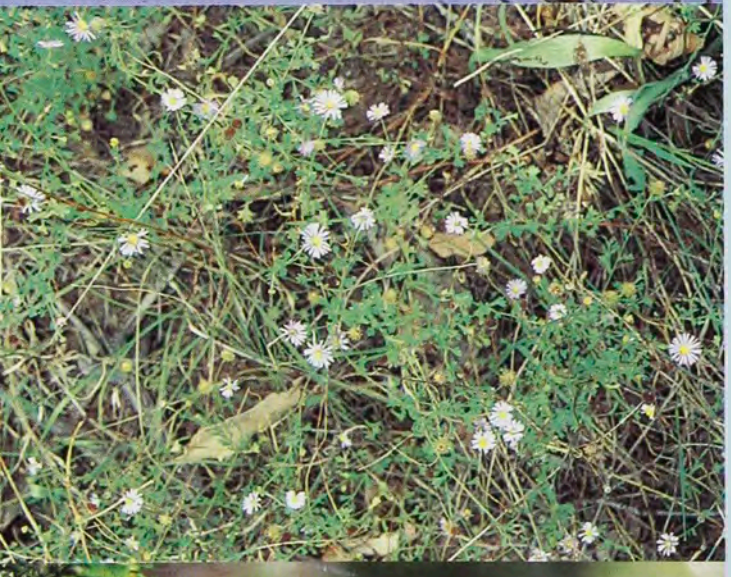
Family EPACRIDACEAE

◀ Callistemon pinifolius

Shrub to 2.5 m high with yellowish-green bottle-brush flowers October-November. Woody capsules with tiny seeds persisting on stems for up to 3 years. Plants resprout after fire. Provides food for native birds and insects. Propagate from seed.

PHOTO RBG-JB

Family MYRTACEAE



◀ *Calotis cuneifolia*
Blue Burr Daisy

Low-growing herb to 0.5 m with white or lilac daisy flowers, August-May, developing into a burr fruit that is probably animal-dispersed. Propagate from seed.

Family ASTERACEAE

◀ *Dillwynia sieberi*

Small shrub 1-2 m high with cylindrical leaves and yellow 'bacon and egg' pea flowers, April-November. Plants killed by fire, seeds remaining dormant in the soil until fire or disturbance breaks the hard coat. Attracts butterflies, beetles and native bees. Propagate from heat-treated seed. [Previously *Dillwynia juniperina*]

Family FABACEAE

Eucalyptus fibrosa
Broad-leaved Ironbark

Longlived tree 10-20m high with persistent ironbark throughout. Flowers white, November - February. Seed capsule retained on tree for up to a year. Resprouts along trunk and branches after fire. Important habitat tree providing food and shelter for small bush-birds, possums and insects. Also provides nectar and pollen for Grey-headed and Little Red Flying-foxes. Propagate from seed.

Family MYRTACEAE

Hakea sericea

Spreading bushy shrub 1-3 m high with cylindrical sharp-pointed leaves. White flowers in winter to early spring. Thick woody capsule 25 mm long with 2 winged seeds. Killed by fire and recolonises from seed shed from capsules which open after fire. Propagate from seed. Provides food and shelter for small bush-birds and attracts native bees and moths. Family PROTEACEAE

Melaleuca decora Paperbark

Tall shrub or small tree 5-7 m high with paperbark. Flowers white, September-January. Small seed in capsules retained on plant for up to a year. Resprouts after fire from epicormic shoots or lignotuber. Propagate from seed. Provides food and shelter for small bush-birds, insects and possums.

Family MYRTACEAE.

Melaleuca nodosa Paperbark

Shrub 1-4 m high with corky-papery bark, sometimes forming thickets. Flowers white to yellow, September-November. Woody capsules in spherical clusters retained on plant for several generations. Resprouts after fire from epicormic shoots or lignotuber. Propagate from seed. Provides food and shelter for small bush-birds, insects and possums. Family MYRTACEAE.

Plants of the Turpentine-Ironbark Forest

◀ *Acacia binervia* Coast Myall

Erect or spreading tree 5-16m tall, with attractive bluish-grey foliage and dark fissured bark. Cylindrical bright yellow flower spikes, August-October. Seeds dispersed by ants. Killed by fire and re-establishes from hard-coated soil-stored seed that is stimulated to germinate by disturbance or fire. Provides food and shelter for small bush-birds, insects and Common Ringtail Possums. Propagate from heat-treated seed.

PHOTO RBG-JH

Family FABACEAE

◀ *Acacia decurrens* Black Wattle

Quick-growing tree, 5-15 m tall, branches and trunk smooth green when young with thin flanges or 'wings' running lengthways, bark becoming rough brown-black when old, leaves bipinnate ('feathery'). Brilliant display of spherical golden flower heads, July-September, seed matures November-January, dispersed by ants and possibly birds, hard-coated, forms soil seed bank. Fire kills adults but seeds germinate. Provides food and shelter for small bush-birds, insects and possums. Parrots eat immature seeds. Propagate from heat-treated seed. Family FABACEAE

◀ *Adiantum aethiopicum* Maidenhair Fern

Attractive fern of damp situations that can spread by underground rhizomes, to form sizeable clumps. Fine shiny dark brown stalks grow 20-50cm high, unfurling into fronds with delicate fan-shaped leaflets. Minute spores are shed sporadically through the year and dispersed widely by wind, but need moist conditions to establish. Colonises semi-protected positions, e.g. clay banks and sheltered rock crevices. Propagate by division of clumps with rhizomes or by spores. PHOTO RBG-JP

Family ADIANTACEAE

Bursaria spinosa Blackthorn ▶

Slow-growing but long-lived prickly shrub, small leaves with spines. Fragrant white flowers January-August but peaking in summer, followed by purse-like fruit capsule containing one flattened brown seed, shed at maturity (by June), wind-dispersed locally. Resprouts from base after fire and may form dense thickets. Provides food and shelter for small bush-birds and insects. Propagate from seed or cuttings.

Family PITTOSPORACEAE

Clematis aristata, Clematis glycinoides var. glycinoides Old Man's Beard, Headache Vine

Only small differences in leaf and anther shape separate these two vines that scramble over shrubs and up trees, becoming woody with age. ▶ Both have large sprays of striking cream to white flowers, late winter-early summer; the distinguishing feature between the two species is a long (>1mm) appendage on the anthers in *Clematis aristata,* absent or like a small knob in *Clematis glycinoides.* The trifoliate leaves are shiny green, with teeth less conspicuous or absent in Clematis glycinoides. Seeds are dispersed by wind, each having a feathery plume, and mature in clusters, giving the appearance of fluffy balls. Provides nest sites and seed for small bush-birds, and attracts native butterflies. Propagate from seed or stem cuttings. Family RANUNCULACEAE

Commelina cyanea ▶

Mid-blue flowers distinguish this trailing native herb with succulent leaves and stems from the more rampant white-flowered exotic weed Wandering Jew *Tradescantia fluminensis* [formerly *T. albiflora*]. *Commelina*'s growth rate varies markedly with the seasons, being fastest in summer before flowering, and slowing as the plant dies back partially in winter. It resprouts again in November from trailing stem nodes that have taken root, or from seed, and can colonise bare or disturbed ground quite quickly during this rapid growth phase. Attracts native bees. Propagate from stem cuttings. Family COMMELINACEAE

◀ *Daviesia ulicifolia*

Spreading shrub to 2 m high with sharp-pointed narrow leaves. Pea-flowers yellow/red, August-December. Plants killed by fire. Seeds remain dormant in the soil until fire or disturbance breaks the hard coat. Attracts butterflies, beetles and native bees. Propagate from heat-treated seed.

Family FABACEAE

◀ *Indigofera australis*

Spreading shrub to 2.5 m high with pinnate leaves with 11-25 leaflets. Pea-flowers pink, August-November. Pod 25-45 mm long with several spotted seeds. Suckers from rootstocks and lateral roots after fire. Seeds remain dormant in the soil until fire or disturbance breaks the hard coat. Attracts butterflies, beetles and native bees. Propagate from heat-treated seed.

Family FABACEAE

◀ *Microlaena stipoides var. stipoides*
Weeping Meadow Grass

Widespread perennial grass of low tussocky habit, forms drooping seed heads readily during spring to autumn in response to soil moisture. Coloniser, can establish and spread from seed on open ground relatively easily, dies back in drought but resprouts after rain, also resprouts after fire. Grows better in partial shade, in medium-nutrient soils, but will survive in open areas as initial cover while shrubs and trees grow. Attracts butterflies and was eaten by wombats. Propagate from seed or division of tussocks. PHOTO RBG-JH

Family POACEAE

Olearia microphylla Snow Bush ▶

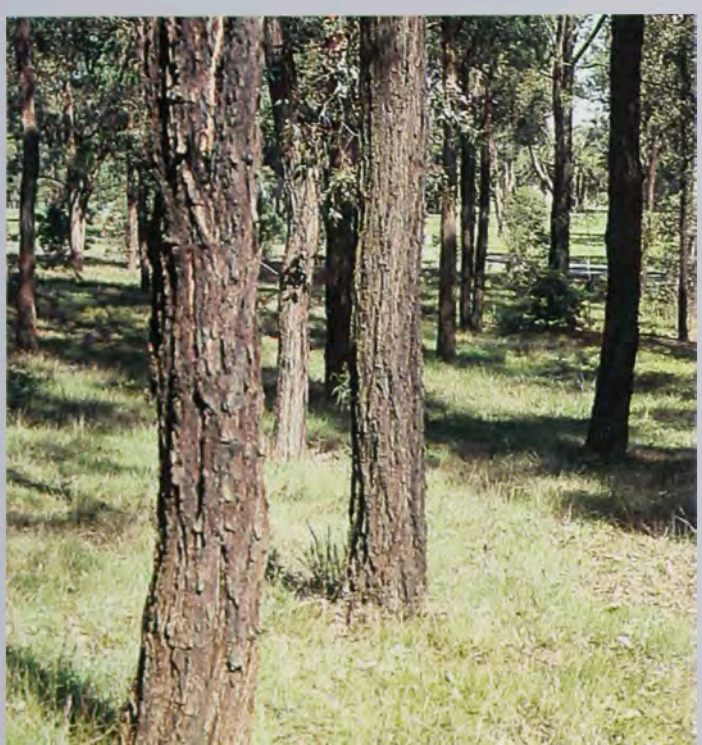
Shrub to 2 m high with masses of attractive white daisy flowers, June-October. Killed by fire. Attracts butterflies. Family ASTERACEAE

Syncarpia glomulifera Turpentine

Longlived tree with fibrous to stringy persistent bark. Flowers cream, August-December. Seed retained in woody compound capsule (like a gun turret) on tree for up to a year. Resprouts along ▶ trunk and branches after fire. Provides food for native birds and insects including cicadas. Important source of nectar and pollen for Grey-Headed and Little Red Flying-foxes. Propagate from seed. Family MYRTACEAE.

Themeda australis
Kangaroo Grass

Loose tussocky perennial grass to 1.2 m high. Attractive when flowering with fanshaped, triangular seedheads, often tinted bronze or purplish on long stems. Resprouts after fire but can't survive repeated mowing. Attracts butterflies and was eaten by wombats. Propagate from tussock division. Family POACEAE ▶



Remnant Turpentine-Ironbark Forest forest at Potts Hill with Broad-leaved Ironbark *Eucalyptus fibrosa* and healthy native groundcover of grasses and small shrubs. (1998)

Plants of the Sandstone Vegetation forest and woodland

◀ *Acacia terminalis* Sunshine Wattle

Shrub generally 1-2 m high with fernlike or 'bipinnate' leaves. Pale yellow to white flowers, February-October. Plants killed by fire, the seeds remaining dormant in the soil until fire or disturbance breaks the hard coat. Provides seed and shelter for native birds, and attracts butterflies, beetles and native bees. Propagate from heat-treated seed. Family FABACEAE

◀ *Angophora costata* Smooth-barked Apple

Longlived tree to 30 m with twisted branches and smooth pink, grey or cream bark shedding in scales. Flowers cream, November-December. Seed shed from woody capsule at maturity. Resprouts along trunk and branches after fire. Important habitat tree providing food and shelter for small bush-birds, possums, Grey-headed and Little Red Flying-foxes and insects. Propagate from seed.

Family MYRTACEAE

◀ *Eucalyptus piperita* Sydney Peppermint

Longlived tree 10-20 m high with persistent, shortly fibrous bark on trunk and lower branches. Leaves with strong peppermint scent when crushed. Flowers white, December-January. Seed capsule retained on tree for up to a year. Resprouts along trunk and branches after fire. Important habitat tree providing food and shelter for small bush-birds, possums, and insects. Propagate from seed. PHOTO RBG-JB

Family MYRTACEAE

Ficus rubiginosa Port Jackson Fig ▶

Small to large longlived tree, sometimes buttressed; young stems rusty-hairy and leaf stalks less than 4 cm long. Figs 10-20 mm diameter, yellow turning red, often warty. Bird or animal-dispersed and may establish on dry rocky slopes and cliffs. The closely related Moreton Bay Fig *Ficus macrophylla* did not occur naturally in the Cooks River Valley but has been planted in some places. It has longer leaf stalks and larger figs. Provides food and shelter for small bush-birds, possums, Grey-headed Flying-foxes and insects.

Family MORACEAE

Gleichenia dicarpa Coral Fern ▶

Attractive fern with long creeping rhizome growing on moist sandstone outcrops and cuttings. Provides nest sites and shelter for small bush-birds and mammals. Very difficult to transplant and grow. Family GLEICHENIACEAE

Hardenbergia violacea False Sarsparilla

Trailing vine with sprays of intense purple pea-flowers, appearing mid-winter to spring. Hard-coated seeds are dispersed by ants and stored in the soil until stimulated to germinate by fire or abrasion. May resprout from the base after fire if ▶ rootstocks survive the heat. Attracts butterflies, moths and native bees. A popular native plant in gardens, propagate from cuttings or heat-treated seed. Family FABACEAE

Kennedia rubicunda Dusky Coral Pea, Red Kennedy Pea

Trailing plant that grows vigorously over bare ground or shrubs, in full sun or light shade. Compound leaves have three rounded leaflets, and large bright red pea-flowers appear late winter to mid-summer, followed by brown furry seed pods. Seeds have a food body attractive to ants, that disperse the seeds to their nests, where the food body ▶ is eaten, and the seeds remain dormant in the soil until fire or disturbance breaks the hard coat. Attracts butterflies and native bees and provides nest sites and shelter for small bush-birds. Propagate from heat-treated seed or by cuttings from firm young growth. PHOTO RBG-JP

Family FABACEAE

Plants of the Sandstone Vegetation —heath

◀ *Acacia suaveolens* Sweet Wattle

Relatively shortlived slender shrub to 2.5 m with angular branches. Pale yellow flowers, April-September. Plants killed by fire. Seeds remain dormant in the soil until fire or disturbance breaks the hard coat. Attracts butterflies and beetles and provides seed for native birds. Propagate from heat-treated seed.

Family FABACEAE

◀ *Acacia myrtifolia*
Red Stemmed Wattle

Erect to spreading shrub 0.3-3 m high with reddish branches. Pale yellow flowers, June-October. Plants killed by fire. Seeds remain dormant in the soil until fire or disturbance breaks the hard coat. Attracts butterflies, beetles and native bees. Propagate from heat-treated seed. PHOTO RBG-JB
Family FABACEAE

◀ *Dillwynia retorta*

Erect to spreading shrub to 3m high with long cylindrical twisted leaves. Pea flowers yellow, May-November. Plants killed by fire. Seeds remain dormant in the soil until fire or disturbance breaks the hard coat. Attracts butterflies, beetles and native bees. Propagate from heat-treated seed.

Family FABACEAE

Epacris longiflora ▶
Native Fuchsia

Open, straggling shrub up to 2 m high. Striking red tubular flowers with white lobes, August-April. Killed by fire and regenerates from soil-stored seed. Provides nectar to honeyeaters and insects such as butterflies and native bees. Once a common sight on rocky sandstone outcrops close around Sydney and used as a popular decorative motif in the nineteenth and early twentieth centuries. Now less common due to loss of habitat to housing. Family EPACRIDACEAE

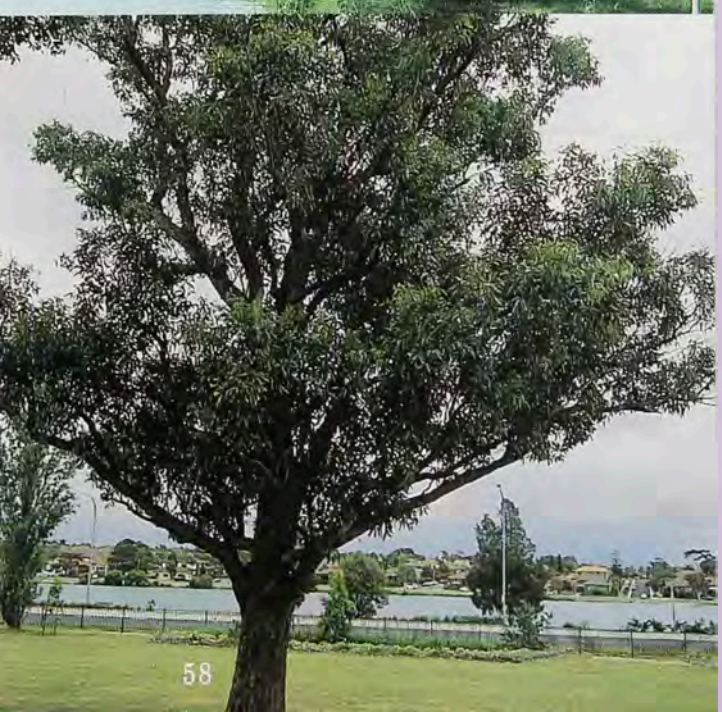
Kunzea ambigua ▶

Dense shrub 1-3 m high, living about 15-40 years. Masses of cream flowers, October- January. Seeds small, wind and water dispersed. Killed by fire and reestablishes from seed, coloniser of exposed, periodically wet soils and subsoils. Important habitat plant providing food and shelter for small bush-birds and insects, and shelter for Long-nosed Bandicoots. Propagate from seed. PHOTO RBG-JP

Family MYRTACEAE

Lomandra longifolia Mat-rush ▶

Tough plant forming dense tussocks of thick leaves, up to 1 m high. In Spring, flower heads form with cylindrical spiky clusters of small yellow flowers. Different male and female inflorescences form on separate plants, but look similar. Burnished brown capsules mature between October and June, opening to reveal seeds which are dispersed by ants. There is limited spread from rhizomes, but the plant is long-lived and resprouts after fire. Provides shelter and seed for birds, attracts butterflies and was eaten by wombats. Propagate from seed or by division of clumps. Family LOMANDRACEAE



Plants of the Floodplain Forest

◀ *Angophora floribunda*
Rough-barked Apple

Medium-sized tree to 30 m, long-lived but slow-growing, with rough furrowed bark on trunk and convoluted branches. White flowers, November-March. Sheds seed from ridged fruit capsules at maturity, young plants may colonise open areas. Resprouts along trunk and branches after fire. Important habitat tree providing food and shelter for small bush-birds, possums, Grey-headed and Little Red Flying-foxes and insects. Propagate from seed.

Family MYRTACEAE

◀ *Casuarina glauca* Swamp Oak

Tree to about 10 m with hard furrowed bark and grey-green needle-like foliage. Male and female flowers on separate trees, females produce woody cones 8-20 mm long (January-September), with winged, wind-dispersed seeds, retained on tree for some time. Quick-growing coloniser, seeds germinate without treatment; long-lived, capable of root suckering to form small groves, probably resprouts or root suckers after fire. Widespread in estuarine areas. Provides food and shelter for small bush-birds and insects. Propagate from seed (seedlings need light) or large cuttings.

Family CASUARINACEAE

◀ *Eucalyptus robusta*
Swamp Mahogany

Longlived tree to 25 m with persistent rough bark. Flowers white, peak May-June. Seeds shed from capsules at maturity. Resprouts along trunk and branches after fire. Important habitat tree providing food and shelter for small bush-birds, possums, Grey-headed Flying-foxes and insects, and was eaten by Koalas. Propagate from seed.

Family MYRTACEAE

Melaleuca styphelioides
Prickly-leaved Tea Tree

Shrub or medium-sized paperbark tree to 20 m, with small sharp-pointed leaves, small white-cream 'bottlebrush' flowers in November-February. Small woody fruit capsules are retained on plant, eventually releasing wind-dispersed fine seed, no dormancy or soil-stored seed bank. Tolerant to waterlogging, probably resprouts after fire. Provides food and shelter for native birds, insects and the Common Ringtail Possum. Propagate from seed. PHOTO RBG-JH

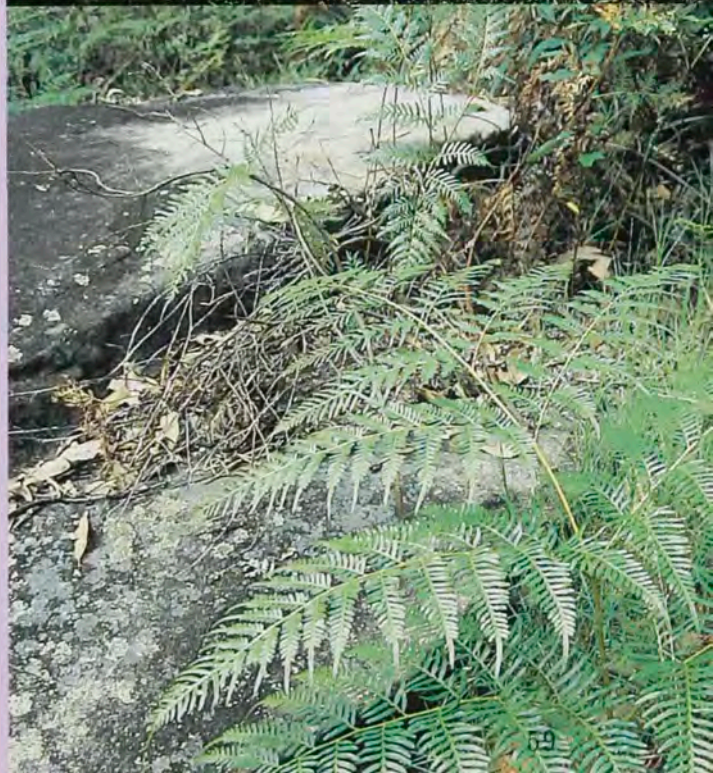
Family MYRTACEAE

Melaleuca linariifolia
Snow-in-Summer

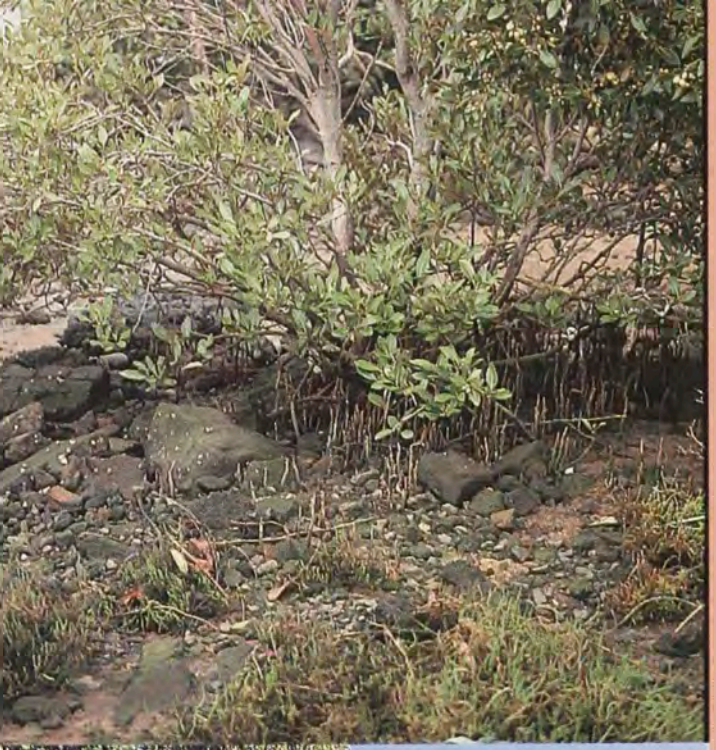
Small paperbark tree to 10 m high with narrow blue-green leaves and showy cream 'bottlebrush' flowers in October-January. Small woody fruits persist around the stem, opening to shed fine, wind-dispersed seed. Seedlings recruit in bare areas. Resprouts after fire, tolerates periodic inundation. Provides food and shelter for native birds, insects and the Common Ringtail Possum. Propagate from seed or by cuttings from firm young growth. PHOTO RBG-JP Family MYRTACEAE

Pteridium esculentum
Bracken Fern

Tough fern with stiff, glossy, dark green fronds to 1.5 m high spreading by long creeping rhizome. Occurs in a range of habitats in full sun to light shade and may be useful in restoration of harsh sites. Resprouts after fire. Provides important shelter and nest sites for the Superb Fairy-wren (Blue Wrens) and attracts native insects. Transplant in Spring or early Autumn using undamaged portion of rhizome including shoot apex and leaf primordia as well as dormant buds if possible, with adequate length of older rhizome to provide storage reserves during establishment period. Family DENNSTAEDTIACEAE



Ferns suitable for more sheltered sites are Harsh Ground Fern *Hypolepis muelleri* and Soft Bracken *Calochlaena dubia*.



Plants of the Mangroves and Saltmarsh

◀ *Avicennia marina* Grey Mangrove

Small tree or shrub growing in the intertidal zone, with aerating roots (pneumatophores), projecting above the surrounding mud. Flowers February-March, seed mature October-November, germinating before fruit falls. Sprouting seed dropped from tree in December and dispersed by tidal water to colonise mud banks. Important habitat tree providing food and shelter for native birds, fish and other aquatic animals. Family AVICENNIACEAE

◀ *Juncus kraussii* Sea Rush

Tussock-forming, strongly rhizomatous perennial rush with golden brown cylindrical, pointed leaves and clustered tiny flowers. Confined to estuarine saline and brackish sites at or above mean high tide level and often growing with *Casuarina glauca*. Attracts butterflies and provides seed for birds.

Family JUNCACEAE

The similar looking but 'sharper-spined' *Juncus acutus* is an introduced, relatively aggressive weed that has established in some estuarine areas and should be removed where possible.

◀ *Sarcocornia quinqueflora* Samphire

Herb to 30 cm high with succulent, prostrate, leafless, jointed stems. Seeds water-dispersed. Plants tolerant to salt and waterlogging. Food-plant of the Saltpan Blue butterfly caterpillar.

Family CHENOPODIACEAE

Suaeda australis Seablite ▶
Erect shrubby plant with succulent leaves 1-4 cm long, new growth often bright yellowish green, older growth becoming purple. Flowers Spring-Summer, fruit water-dispersed.

Family CHENOPODIACEAE

Triglochin striatum
Slender erect rhizomatous perennial, often tiny (less than 5 cm), with threadlike leaves. Inflorescence spikelike in warmer months. Attracts butterflies and other insects. Very rare along Cooks River. Family JUNCAGINACEAE ▶

Black-winged Stilts feeding in Saltmarsh at Rockdale

Plants of the Freshwater and Brackish Swamps

◀ *Bolboschoenus fluviatilis*

Aquatic perennial sedge to 2m high, triangular stems bearing long narrow drooping leaves with prominent midvein; flowers October-January. Seed a nut, 2-4 mm long, August-March. Grows in shallow freshwater with creeping rhizomes, main growth in summer. Provides shelter and nesting material for waterbirds, and attracts native bees. Rare in the Cooks Valley. Propagate by division in warm weather, or by transplanting dormant tubers. PHOTO RBG-JH

Family CYPERACEAE

◀ *Juncus usitatus*

Tough tussocky perennial with narrow stems with short sheathing leaves, and may grow over 1 m tall, with loose clusters of brown seed capsules remaining on stems for many months following flowering spring-summer or after rain. Coloniser, spreads by short rhizomes, or tiny seeds dispersed by wind or water, that germinate without treatment and establish best in open areas. Provides shelter and seed for native birds, and attracts butterflies. Propagate by seed or division of rhizomes. PHOTO RBG-JP

Family JUNCACEAE

◀ *Persicaria decipiens*
Slender Knotweed

Upright or trailing red stems, lanceolate leaves often marked with a central dark red patch, cylindrical spikes of small pink flowers November-June. In warmer months will grow vigorously in moist fertile soil to give dense ground cover up to 1 m tall. Coloniser species with some spread by rooting at nodes, resprouts after flooding, dies back in winter or drought. Occurs in drainage ditches and wetlands. Provides shelter and seed for birds.

Family POLYGONACEAE

Phragmites australis

Common Reed

Robust grass, with erect cane-like stems known to reach 6 m but 2 m more usual, occurring on water margins on river banks and wetlands. Plume-like flower heads August-October and March-June. An important bank stabiliser able to spread by rhizomes in shallow water and wet soil. Food-storing rhizomes resprout after hot fire, dies back in winter. Provides shelter and nesting sites for birds, and attracts butterflies. Propagate by division.

Family POACEAE

Schoenoplectus validus

Tall aquatic rhizomatous perennial, cylindrical blue-green stems to 3 m, leaves reduced to sheaths <10 cm, clustered inflorescence enclosed in brown scales, on stalks near end of stem. Shiny brownish-black seeds 2.5 mm, shed January-May. Coloniser, main growth October-April. Provides shelter and nesting material for waterbirds and attracts native bees. Rare in the Cooks Valley. Propagate by division. Family CYPERACEAE

Typha orientalis

Broad-leaved Cumbungi, Bullrush

Erect aquatic reed, generally about 2 m tall with strap-like leaves 2-3 cm wide. Flower head a brown velvety cylinder that breaks into a myriad of seeds with attached silky hairs. Quick-growing coloniser, seeds dispersed widely by wind and water, and clumps spread vegetatively by thick rhizomes. Flowers in warmer months, November-May, dies back in winter. Grows in still or slow-moving fresh or brackish water up to 2 m deep. Provides food, shelter and nesting sites for birds. Propagate by division. Family TYPHACEAE

Plants of the Banksia Scrub

◀ *Banksia aemula* Wallum Banksia

Longlived bushy shrub or robust tree to 8 m with warty bark and serrated leaves. Large greenish flowerheads, March-June. Cone 4-20 cm long with seeds retained in capsules and shed after fire. Mature plants resprout after fire. Provides food and shelter for native birds, insects and possums. Propagate from seed. Family PROTEACEAE

The similar looking Old Man Banksia *Banksia serrata* is common in Cooks River Sandstone Woodland.

◀ *Eriostemon australasius*
Pink Wax Flower

Erect bushy shrub 1-2 m high, leaves aromatic when crushed. Beautiful pink flowers with 5 petals and 10 stamens, in Spring. Attracts native insects. PHOTO RBG-JB Family RUTACEAE

◀ *Hibbertia scandens*
Climbing Guinea Flower

Sprawling climber with stems 4-10 m long. Large showy yellow flowers with musty odour, April-November. Seed enclosed by orange-reddish aril, flesh distasteful. Resprouts after fire. Provides fruit for native birds and attracts butterflies, beetles and native bees. Family DILLENIACEAE

Lambertia formosa ▶
Mountain Devil, Honey Flower

Longlived shrub to 2 m with sharp pointed leaves in whorls of 3. Distinctive red tubular flowers. Hard woody fruit with a short beak and 2 horns giving the 'mountain devil' appearance. Mature plants resprout after fire. Provides nectar and shelter for native birds. Propagate from seed.

Family PROTEACEAE

Monotoca elliptica ▶

Longlived bushy shrub or small tree to 4 m. Tiny white-cream flowers, July-September. Small fleshy orange or red fruit, August-November. Resprouts after fire. Provides fruit and shelter for native birds and attracts butterflies. Germination slow. Family EPACRIDACEAE

Ricinocarpos pinifolius ▶
Wedding Bush

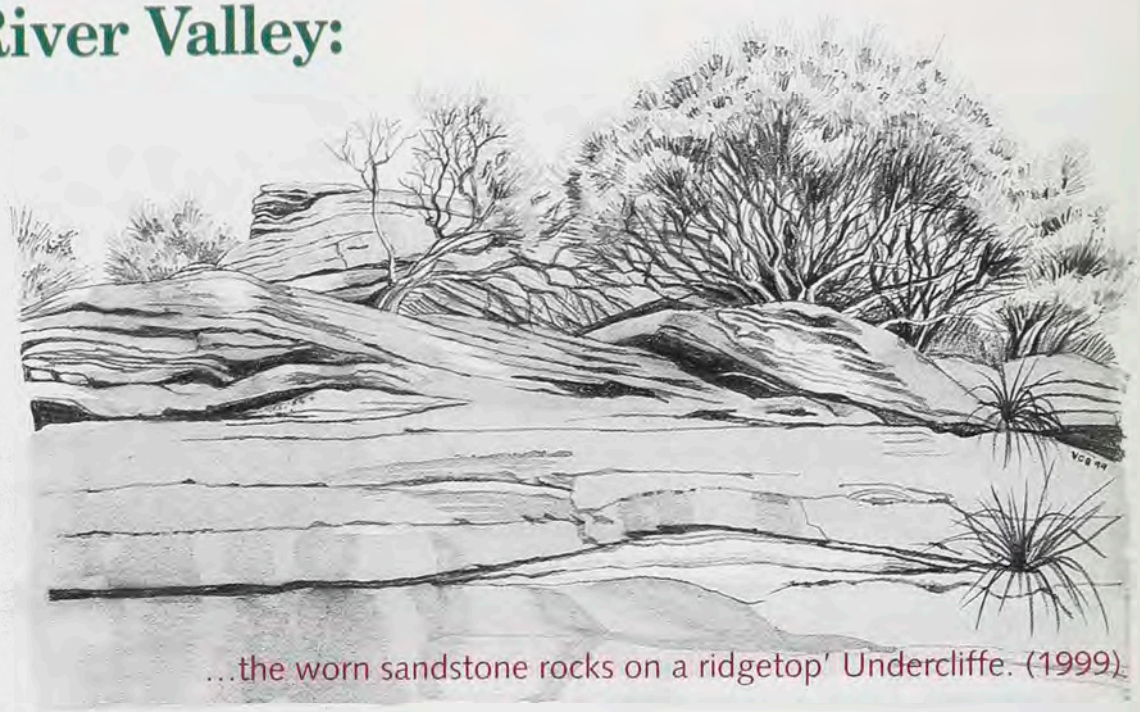
Erect to spreading shrub 1-3 m high. Showy white flowers, July-October and globular spiny seed capsule. Resprouts after fire. Difficult to grow from seed. Family EUPHORBIACEAE

Species of *Xanthorrhoea* ▲
Grasstrees

Perennial plant with head of grasslike leaves on short stem or stem underground. Tiny flowers clustered at top of distinctive woody 'spear'. Resprout after fire. Provide seed and nectar for native birds, pollen and nectar for Grey-headed Flying-foxes and attract beetles and native bees. There are several species native to the Cooks River Valley including *Xanthorrhoea arborea*, *Xanthorrhoea resinifera* and *Xanthorrhoea media*.

Family XANTHORRHOEACEAE

Native Plants of the Cooks River Valley: a full list



...the worn sandstone rocks on a ridgetop' Undercliffe. (1999)

Species Name [ ] = previously used name

Growth form t = tree , s = shrub, g = groundcover, grass or low shrub (<0.5m), f = fern, v =vine

Plant Community

CP = **C**lay **P**lain Scrub Forest
Sf = **S**andstone **f**orest and woodland
FF = **F**loodplain **F**orest
MS = **M**angroves and **S**altmarsh
TI = Sydney **T**urpentine **I**ronbark Forest
Sh = **S**andstone **h**eath
Sw = Freshwater and Brackish **Sw**amps
BS = **B**anksia **S**crub

Presence √= naturally occurring population—1999, h = historical record, p = possibly occurred

Local Site For some species, the local site is an example of where the plant may be seen, though many species will occur in other sites as well. For information on more locations for each plant species see Volume 3 of the *Cooks River Foreshores Strategic Plan* at your local Council.

Abbreviations for Local Sites

Bardwell = remnants in Bardwell Valley Parklands along Bardwell Creek; **Bayview** = Bayview Avenue remnant, Undercliffe; **Campsie** = Third Avenue remnant, Campsie; **Canterbury** = along the Cooks River at Canterbury; **Chullora** = remnants on National Rail Corporation property, Chullora; **Coxs Creek** = Coxs Creek bushland, Greenacre; **Girrahween** = Girrahween Park, Earlwood in the Wolli Creek Valley; **M'ville** = along the Cooks River at Marrickville; **M'ville Golf** = remnants on Marrickville Golf Course; **Nannygoat** = Nannygoat Hill, Finlays Avenue, Earlwood in the Wolli Creek Valley; **Norfolk** = Norfolk Reserve remnant, Chullora; **Railway** = Railway remnants between Livingstone Road, Marrickville and Hurlstone Park Station; **Rockdale** = Rockdale Wetlands including Eve Street wetlands, Arncliffe and the saltmarsh near the Airport landing lights in Riverine (Barton) Park, Kyeemagh; **Rookwood** = Rookwood Cemetery remnants; **Stotts** = Stotts Reserve, Bexley North; **Wiley Park** = remnant trees in Wiley Park, corner Canterbury and King Georges Roads

This information has been adapted, with some changes, from Clouston (1997) *Cooks River Foreshores Strategic Plan: Volume 3* prepared for the Cooks River Regional Working Party.

Species name	Common name	Growth Form	Clay Plain Scrub	Turpentine Ironbark	Stone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/S'marsh	Banksia Scrub	Presence	Local site
Acacia binervia [Acacia glaucescens]	Coast Myall	t	CP	TI	Sf						✓	Girrahween
Acacia brownei	Prickly Moses	s	CP								✓	Coxs Creek
Acacia bynoeana		s			Sh						h	
Acacia decurrens	Sydney Green Wattle	t	CP	TI		FF					✓	Norfolk
Acacia falcata	Sickle Wattle	s/t	CP	TI	Sf						✓	Norfolk
Acacia floribunda	Sally Wattle	s/t	CP		Sf	FF					✓	Stotts
Acacia genistifolia			CP								✓	
Acacia hispidula		s			Sf						✓	
Acacia implexa	Hickory	s/t	CP	TI							✓	
Acacia linifolia	Flax-leaved Wattle	s			Sf						✓	Stotts
Acacia longifolia	Sydney Golden Wattle	s	CP	TI		Sh	FF			BS	✓	Bayview
Acacia longissima		s	CP	TI							✓	Rookwood
Acacia myrtifolia	Myrtle Wattle	s	CP	TI		Sh					✓	Girrahween
Acacia obtusifolia		s	CP								✓	Rookwood
Acacia parramattensis	Parramatta Green Wattle	s/t	CP	TI	Sf						✓	Campsie
Acacia pubescens	Downy Wattle	s	CP	TI							✓	Chullora
Acacia sophorae	Coast Wattle	s								BS	p	Rockdale
Acacia stricta		s	CP	TI							✓	Girrahween
Acacia suaveolens	Sweet-scented Wattle	s				Sh				BS	✓	M'ville Golf
Acacia terminalis	Sunshine Wattle	s			Sf	Sh					✓	Bardwell
Acacia ulicifolia	Prickly Moses	s	CP		Sf	Sh				BS	✓	Campsie
Acaena novae-zelandiae	Bidgy-widgy	g	CP								✓	
Acianthus exsertus	Gnat Orchid	g				Sh					✓	
Acmena smithii	Lillypilly	t			Sf		FF				✓	Girrahween
Actinotus helianthi	Flannel Flower	g				Sh					✓	Stotts
Actinotus minor		g				Sh				BS	h	
Adiantum aethiopicum	Maidenhair Fern	f	CP	TI	Sf						✓	Chullora
Aegiceras corniculatum	River Mangrove	s/t						Sw			p	
Agrostis aemula	Blown Grass	g	CP								✓	Chullora
Agrostis avenacea	" "	g	CP	TI							✓	Coxs Creek
Agrostis billardieri	" "	g						Sw			✓	Rockdale
Allocasuarina littoralis	Black She-oak	s/t	CP		Sf	Sh				BS	✓	Girrahween
Alphitonia excelsa	Red Ash	t			Sf					BS	✓	Bardwell
Alternanthera denticulata	Lesser Joyweed	g	CP				FF	Sw			✓	Rockdale
Amperea xiphoclada		s								BS	p	
Amyema congener subspecies congener	Mistletoe	s	CP		Sf	Sh					✓	Girrahween
Amyema gaudichaudii	"	s	CP								✓	Coxs Creek
Amyema pendulum	"	s			Sf						✓	
Angophora bakeri	Narrow-leaved Apple	t	CP								✓	Rookwood
Angophora costata	Smooth-barked Apple	t			Sf					BS	✓	Girrahween
Angophora floribunda	Rough-barked Apple	t	CP	TI	Sf		FF				✓	Chullora

Species name	Common name	Growth Form	Clay Plain Scrub	Turpentine Ironbark	S'stone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/S'marsh	Banksia Scrub	Presence	Local site
Angophora hispida	Dwarf Apple	s				Sh					h	
Anisopogon avenaceus	Oat Speargrass	g	CP			Sh					✓	Rookwood
Aotus ericoides	" "	s			Sf	Sh				BS	✓	Girrahween
Aristida ramosa	Three-awn Speargrass	g	CP	TI		Sh					✓	Chullora
Aristida vagans	" "	g	CP	TI	Sf	Sh					✓	Stotts
Aristida warburgii		g	CP		Sf						✓	Coxs Creek
Arthropodium milleflorum	Vanilla Lily	g	CP								✓	
Asplenium australasicum	Bird's Nest Fern	f			Sf						✓	
Asplenium flabellifolium	Necklace Fern	f			Sf						✓	Girrahween
Astroloma humifusum	Native Cranberry	g	CP	TI		Sh					✓	Campsie
Astroloma pinifolium		g				Sh					✓	Bardwell
Atriplex australasica	Saltbush	g	CP				FF		MS		✓	Chullora
Atriplex semibaccata	Berry Saltbush	g	CP				FF		MS		✓	
Avicennia marina var. australasica	Grey Mangrove	s/t							MS		✓	Rockdale M'ville, Canterbury
Azolla filiculoides var. rubra		f						Sw			h	
Baeckea linifolia		s			Sf						✓	
Banksia aemula	Wallum Banksia	s								BS	p	
Banksia integrifolia	Coastal Banksia	t			Sf					BS	✓	Bardwell
Banksia oblongifolia		s				Sh					✓	Girrahween
Banksia serrata	Old Man Banksia	s/t			Sf	Sh				BS	✓	Nannygoat
Banksia spinulosa	Hair-pin Banksia	s	CP			Sh					✓	Stotts
Bauera rubioides	Dog Rose	s			Sf					BS	✓	Bardwell
Baumea articulata	Twig-rush	g						Sw		BS	p	
Baumea juncea		g						Sw			p	
Billardiera scandens	Apple Berry	v	CP	TI	Sf	Sh				BS	✓	Girrahween
Blandfordia nobilis	Christmas Bells	g				Sh					h	
Blechnum cartilagineum	Gristle Fern	f			Sf						✓	Rockdale
Blechnum indicum	Bungwall Fern	f				Sh				BS	✓	
Bolboschoenus caldwellii		g	CP					Sw			✓	Rookwood
Bolboschoenus fluviatilis [Scirpus fluviatilis]		g						Sw			✓	Rockdale
Boronia polygalifolia	Milkwort Boronia	g	CP								✓	Coxs Creek
Bossiaea heterophylla		s			Sf	Sh				BS	✓	Stotts
Bossiaea prostrata		g	CP								✓	Rookwood
Bothriochloa decipiens		g	CP								✓	Chullora
Bothriochloa macra		g	CP	TI							✓	Rookwood
Brachyloma daphnoides		s				Sh				BS	✓	
Breynia oblongifolia	Breynia	s	CP	TI	Sf		FF			BS	✓	Rookwood
Burchardia umbellata	Milkmaids	g				Sh					✓	
Bursaria spinosa	Blackthorn	s	CP	TI	Sf		FF				✓	Campsie
Caesia parviflora [Caesia vittata]	Grass-lily	g	CP			Sh					✓	

Species name	Common name	Growth Form	Clay Plain Scrub	Turpentine Ironbark	S'stone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/S'marsh	Banksia Scrub	Presence	Local site
Callicoma serratifolia	Black Wattle	s/t			Sf						✓	Girrahween
Callistemon citrinus	Bottlebrush	s				Sh				BS	✓	Bardwell
Callistemon linearis	"	s	CP			Sh					✓	Coxs Creek
Callistemon pinifolius	"	s	CP								✓	Railway
Callistemon rigidus	"	s	CP								✓	Rookwood
Callitriche stagnalis		g	CP								✓	
Calochilus campestris	Copper Beard Orchid	g				Sh					✓	
Calochlaena dubia [Culcita dubia]	Soft Bracken Fern	f	CP		Sf						✓	Bardwell
Calotis cuneifolia	Blue Burr-daisy	g	CP	Tl							✓	Campsie
Calotis lappulacea	Yellow Burr-daisy	g	CP								✓	
Calystegia sepium	Bindweed	v	CP								✓	
Capillipedium spicigerum	Scented Top Grass	g	CP								✓	
Carex appressa		g	CP					Sw			✓	Chullora
Carex fascicularis		g						Sw			p	Rockdale
Carpobrotus glaucescens	Pig Face	g						Sw			p	Rockdale
Cassinia aculeata		s		Tl							h	
Cassinia arcuata		s	CP	Tl							✓	Chullora
Cassinia aureonitens		s			Sf						h	
Cassinia longifolia		s		Tl							h	
Cassinia quinquefaria		s		Tl							h	
Cassinia trinerva		s								BS	p	
Cassinia uncata		s		Tl							h	
Cassytha glabella	Devil's Twine	v	CP								✓	Coxs Creek
Cassytha pubescens [Cassytha paniculata]	" "	v	CP	Tl		Sh				BS	✓	
Casuarina glauca	Swamp Oak	t	CP				FF	Sw	MS		✓	Rockdale
Cayratia clematidea		v		Tl							✓	
Centaurium spicatum		g	CP								✓	Chullora
Centella asiatica		g	CP	Tl				Sw		BS	✓	Coxs Creek
Centipida minima		g					FF	Sw			✓	
Centrolepis fascicularis		g				Sh					✓	
Centrolepis strigosa		g	CP								✓	
Ceratopetalum apetalum	Coachwood	t			Sf						✓	Girrahween
Ceratopetalum gummiferum	Christmas Bush	s/t			Sf	Sh					✓	Girrahween
Cheilanthes sieberi	Rock Fern	f	CP	Tl		Sh					✓	Coxs Creek
Chiloglottis reflexa	Ant Orchid	g				Sh					✓	
Chionochloa pallida [Danthonia pallida]	Silvertop Wallaby Grass	g	CP								✓	
Chloanthes stoechadis		g				Sh					h	
Chloris truncata	Windmill Grass	g	CP								✓	Rookwood
Christella dentata		f	CP		Sf		FF				✓	
Chrysocephalum apiculatum [Helichrysum apiculatum]	Yellow Buttons	g	CP	Tl							✓	Campsie

Species name	Common name	Growth Form	Clay Plain Scrub	Turpentine Ironbark	S'stone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/S'marsh	Banksia Scrub	Presence	Local site
Chrysocephalum semipapposum	Yellow Buttons	g	CP								✓	Rookwood
Cissus hypoglauca	Native Grape	v			Sf						✓	Girrahween
Cladium procerum	Tall Twig Rush	g					Sw				p	
Clematis aristata	Old Man's Beard	v	CP	TI							✓	Norfolk
Clematis glycinoides	" " "	v		TI	Sf						✓	Girrahween
Clerodendrum tomentosum		s	CP	TI	Sf						✓	Girrahween
Commelina cyanea		g	CP	TI	Sf		FF	Sw		BS	✓	Bardwell
Conospermum longifolium	Cone-seed	s				Sh					h	
Convolvulus erubescens	Bindweed	v	CP	TI							✓	Chullora
Correa reflexa		s	CP	TI		Sh					✓	
Corybas aconitiflorus	Cradle Orchid	g				Sh					✓	Bardwell
Corymbia gummifera [Eucalyptus gummifera]	Red Bloodwood	t			Sf	Sh				BS	✓	Girrahween
Cotula australis		g					FF	Sw		BS	✓	
Cotula coronopifolia	Water Buttons	g	CP				FF	Sw	MS		✓	Rockdale
Crassula helmsii		g						Sw			h	
Crassula sieberana		g				Sh					✓	
Cyathea australis	Rough Treefern	f			Sf						✓	Bardwell
Cyathochaeta diandra		g	CP								✓	
Cyclosorus interruptus [Cyclosorus gongylodes]	Shield Fern	f								BS	p	
Cymbopogon refractus	Barbed-wire Grass	g	CP	TI	Sf						✓	Railway
Cyperus difformis		g	CP					Sw			✓	
Cyperus enervis		g			Sf						✓	
Cyperus gracilis		g	CP								✓	
Cyperus imbecillis		g			Sf						✓	
Cyperus laevigatus		g						Sw			p	
Cyperus mirus		g		TI							✓	
Cyperus polystachyos		g	CP								✓	
Cyperus sanguinolentus		g	CP					Sw			✓	
Cyperus sphaeroideus		g						Sw			✓	
Dampiera stricta		g				Sh				BS	h	
Danthonia linkii var. linkii	Wallaby Grass	g	CP								✓	Chullora
Danthonia setacea	" "	g	CP	TI							✓	Coxs Creek
Danthonia tenuior	" "	g	CP	TI	Sf	Sh					✓	Campsie
Daviesia ulicifolia		s	CP	TI							✓	Rookwood
Dendrobium teretifolium	Pencil Orchid	g					FF				h	
Dendrophthoe vitellina	Mistletoe	s	CP	TI	Sf						✓	Norfolk
Desmodium rhytidophyllum		v	CP								✓	Rookwood
Deyeuxia quadriseta	Bent grass	g	CP								✓	Chullora
Dianella caerulea		g	CP	TI	Sf	Sh				BS	✓	Girrahween
Dianella caerulea var. producta		g	CP								✓	Coxs Creek

Species name	Common name	Growth Form	Clay Plain Scrub	Turpentine Ironbark	S'stone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/S'marsh	Banksia Scrub	Presence	Local site
Dianella longifolia var. longifolia [Dianella laevis]		g	CP	TI						BS	✓	Railway
Dianella revoluta		g	CP	TI							✓	Coxs Creek
Dichelachne crinita		g		TI		Sh				BS	✓	Bardwell
Dichelachne inaequiglumis	Plume Grass	g	CP	TI							✓	
Dichelachne micrantha	" "	g	CP	TI	Sf	Sh					✓	Chullora
Dichelachne parva	" "	g	CP								✓	
Dichelachne rara	" "	g	CP	TI	Sf						✓	Coxs Creek
Dichondra repens	Kidney Weed	g	CP	TI		Sh				BS	✓	Wiley Park
Digitaria diffusa		g				Sh					✓	Stotts
Digitaria parviflora		g				Sh					✓	
Dillwynia parviflora	Bacon and Eggs	s	CP	TI							✓	Chullora
Dillwynia retorta [includes subspecies A]	" "	s	CP			Sh					✓	Stotts
Dillwynia sieberi [previously included in Dillwynia juniperina]	" "	s	CP	TI							✓	Norfolk
Dodonaea triquetra	Hop Bush	s	CP	TI	Sf						✓	Norfolk
Dodonaea viscosa	" "	s		TI							h	
Drosera auriculata	Sundew	g				Sh					✓	
Drosera peltata	"	g	CP			Sh		Sw			✓	
Drosera spathulata	"	g				Sh					✓	
Echinopogon caespitosus var. caespitosus	Hedgehog Grass	g	CP	TI							✓	Chullora
Echinopogon ovatus	" "	g	CP			Sh					✓	Stotts
Einadia hastata [Rhagodia hastata]	Berry Saltbush	g	CP	TI							✓	Coxs Creek
Einadia nutans [including subspecies linifolia]	Climbing Saltbush	g	CP								✓	
Einadia polygonoides		g	CP								✓	Chullora
Einadia trigonos subspecies trigonos		g	CP	TI							✓	
Elaeocarpus reticulatus	Blueberry Ash	t		TI	Sf					BS	✓	Girrahween
Elatine gratioloides		g	CP								✓	
Eleocharis acuta	Spike-rush	g	CP								✓	Chullora
Eleocharis cylindrostachys	"	g	CP								✓	
Elymus scaber	Wheatgrass	g	CP								✓	
Entolasia marginata		g	CP	TI	Sf						✓	Chullora
Entolasia stricta		g	CP	TI	Sf					BS	✓	Coxs Creek
Epacris longiflora	Native Fuchsia	s	CP		Sf	Sh					✓	Bayview
Epacris microphylla	Heath	s				Sh					✓	Bardwell
Epacris pulchella	"	s	CP			Sh					✓	Stotts
Epacris purpurascens var. purpurascens		s	CP								✓	Rookwood
Epaltes australis		g	CP								✓	Chullora
Epilobium billardieranum [including subspecies cinereum and subspecies hydrophilum]		g	CP	TI	Sf						✓	

Species name	Common name	Growth Form	Clay Plain Scrub	Turpentine Ironbark	S'stone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/S'marsh	Banksia Scrub	Presence	Local site
Epilobium hirtigerum		g	CP								✓	
Eragrostis benthamii	Love Grass	g	CP								✓	Chullora
Eragrostis brownii	" "	g	CP	TI	Sf	Sh					✓	Coxs Creek
Eragrostis elongata	" "	g	CP								✓	Chullora
Eragrostis leptostachya	" "	g	CP			Sh					✓	Coxs Creek
Eragrostis parviflora	" "	g	CP								✓	
Eriochloa pseudoacrotricha	Early Spring Grass	g	CP								✓	
Eriostemon australasius	Pink Wax Flower	s								BS	p	
Eriostemon scaber (now Philotheca scaber)	Wax Flower	s				Sh					✓	
Eucalyptus botryoides	Bangalay	t			Sf		FF			BS	✓	Rockdale
Eucalyptus capitellata	Brown Stringbark	t	CP								✓	Chullora
Eucalyptus crebra	Narrow-leaved Ironbark	t	CP								✓	Norfolk
Eucalyptus eugenioides	Thin-leaved Stringybark	t	CP								✓	Rookwood
Eucalyptus fibrosa subspecies fibrosa	Broad-leaved Ironbark	t	CP	TI							✓	Wiley Park
Eucalyptus globoidea	White Stringybark	t	CP	TI							✓	Rookwood
Eucalyptus gummifera [see Corymbia gummifera]	Red Bloodwood											
Eucalyptus haemastoma	Scribbly Gum	t			Sf	Sh				BS	✓	Bardwell
Eucalyptus longifolia	Woollybutt	t	CP	TI							✓	Norfolk
Eucalyptus moluccana	Grey Box	t	CP	TI							✓	Wiley Park
Eucalyptus obstans	Port Jackson Mallee	s/t				Sh					h	
Eucalyptus paniculata	Grey Ironbark	t		TI							✓	Coxs Creek
Eucalyptus pilularis	Blackbutt	t		TI	Sf					BS	✓	Girrahween
Eucalyptus piperita	Sydney Peppermint	t			Sf						✓	Bardwell
Eucalyptus punctata	Grey Gum	t		TI	Sf						✓	Stotts
Eucalyptus resinifera	Red Mahogany	t	CP	TI						BS	✓	Coxs Creek
Eucalyptus robusta	Swamp Mahogany	t					FF	Sw		BS	✓	Rockdale
Eucalyptus saligna	Sydney Blue Gum	t		TI	Sf		FF				p	Stotts
Eucalyptus tereticornis	Forest Red Gum	t	CP	TI			FF				✓	Chullora
Eustrephus latifolius	Wombat Berry	v	CP	TI	Sf	Sh					✓	Norfolk
Exocarpos cupressiformis	Native Cherry	t	CP	TI	Sf						✓	Norfolk
Ficus rubiginosa	Port Jackson Fig	t	CP	TI	Sf						✓	Girrahween
Fimbristylis dichotoma		g	CP			Sh					✓	
Gahnia clarkei	Sword Grass	g				Sh		Sw			✓	Stotts
Geranium homeanum		g	CP								✓	Chullora
Gleichenia dicarpa	Coral Fern	f	CP		Sf			Sw			✓	Railway
Gleichenia microphylla	" "	f			Sf						✓	
Glochidion ferdinandi	Cheese Tree	t	CP	TI	Sf					BS	✓	Girrahween
Glycine clandestina		v	CP	TI	Sf	Sh					✓	Stotts
Glycine microphylla		v	CP			Sh					✓	Rookwood
Glycine tabacina		v	CP	TI		Sh					✓	Chullora
Gnaphalium involucratum		g	CP								✓	

Species name	Common name	Growth Form	Clay Plain Scrub	Turpentine Ironbark	S'stone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/S'marsh	Banksia Scrub	Presence	Local site
Gnaphalium sphaericum		g	CP								✓	Chullora
Gompholobium minus		g	CP								✓	Rookwood
Gonocarpus micranthus		g								BS	h	
Gonocarpus salsoloides		g								BS	p	
Gonocarpus tetragynus		g	CP								✓	
Gonocarpus teucrioides		g	CP	TI		Sh				BS	✓	Girrahween
Goodenia bellidifolia		g	CP	TI							✓	Chullora
Goodenia hederacea		g	CP	TI		Sh					✓	Coxs Creek
Goodenia ovata		s		TI							✓	Norfolk
Goodenia paniculata		g	CP								✓	Chullora
Goodenia stelligera		g								BS	p	
Grevillea buxifolia	Grey Spider flower	s				Sh					✓	Girrahween
Grevillea mucronulata		s				Sh					✓	Stotts
Grevillea sericea	Pink Spider Flower	s				Sh					✓	Girrahween
Grevillea sphacelata		s				Sh					✓	Bardwell
Hakea dactyloides		s			Sf	Sh					✓	Stotts
Hakea sericea		s	CP			Sh					✓	Chullora
Hardenbergia violacea		v	CP	TI	Sf	Sh					✓	Bayview
Helichrysum scorpioides	Everlasting Daisy	g	CP								✓	Rookwood
Hemarthria uncinata		g				Sh		Sw			✓	
Hibbertia aspera		s	CP	TI	Sf	Sh					✓	Chullora
Hibbertia bracteata		s			Sf						✓	
Hibbertia dentata		v			Sf						✓	Girrahween
Hibbertia diffusa		g	CP	TI	Sf						✓	
Hibbertia empetrifolia		g	CP			Sh					✓	Bardwell
Hibbertia pedunculata		g	CP	TI							✓	Chullora
Hibbertia scandens	Snake Vine	v		TI	Sf	Sh				BS	✓	Rockdale
Hibbertia serpyllifolia		g	CP			Sh					✓	Campsie
Hibiscus diversifolius		s						Sw			h	
Histiopteris incisa	Batswing Fern	f	CP		Sf						✓	Girrahween
Hovea linearis		s			Sf						✓	Bardwell
Hybanthus monopetalus		g			Sf						h	
Hydrocotyle peduncularis	Pennywort	g	CP		Sf						✓	Coxs Creek
Hypericum gramineum		g	CP			Sh					✓	Girrahween
Hypolaena fastigiata		g								BS	p	
Hypolepis muelleri	Harsh Ground Fern	f	CP		Sf		FF	Sw		BS	✓	Chullora
Imperata cylindrica var. major	Blady Grass	g	CP	TI	Sf					BS	✓	Campsie
Indigofera australis	Native Indigo	s	CP	TI							✓	Chullora
Isachne globosa	Swamp Millet	g						Sw			✓	
Isolepis inundata		g	CP					Sw			✓	Chullora
Isolepis nodosa		g						Sw	MS		✓	Rockdale
Isopogon anemonifolius	Drumsticks	s				Sh					✓	Bardwell

Species name	Common name	Growth Form	Clay Plain Scrub	Turpentine Ironbark	Sstone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/Smarsh	Banksia Scrub	Presence	Local site
Jacksonia scoparia		s				Sh					✓	
Juncus continuus		g	CP								✓	Chullora
Juncus flavidus		g	CP								✓	
Juncus homalocaulis		g	CP								✓	Coxs Creek
Juncus kraussii		g					FF		MS		✓	Rockdale
Juncus pallidus		g						Sw		BS	✓	
Juncus planifolius		g	CP			Sh					✓	
Juncus procerus		g	CP								✓	
Juncus remotiflorus		g	CP								✓	
Juncus subsecundus		g	CP								✓	
Juncus usitatus		g	CP				FF	Sw			✓	Coxs Creek
Kennedia rubicunda	Dusky Coral Pea	v	CP	TI	Sf	Sh					✓	M'ville Golf
Kunzea ambigua	Tick Bush	s	CP	TI		Sh				BS	✓	Nannygoat
Kunzea capitata		s				Sh					h	
Lagenifera stipitata		g			Sf						✓	
Lambertia formosa	Mountain Devil	s				Sh				BS	✓	Girrahween
Lasiopetalum ferrugineum var. ferrugineum	Rusty Petals	s				Sh					✓	Bardwell
Lasiopetalum parviflorum		s	CP								✓	Rookwood
Laxmannia gracilis	Slender Wire-lily	g	CP			Sh					✓	Coxs Creek
Lepidosperma gunnii [Lepidosperma lineare]		g	CP								✓	Coxs Creek
Lepidosperma laterale		g	CP	TI		Sh				BS	✓	Norfolk
Leptomeria acida	Native Currant	s	CP			Sh					✓	Norfolk
Leptospermum arachnoides		s				Sh				BS	h	
Leptospermum continentale		s								BS	p	
Leptospermum juniperinum		s				Sh					h	
Leptospermum laevigatum	Coastal Tea-tree	s								BS	p	
Leptospermum polygalifolium [Leptospermum flavescens]	Tea-tree	s	CP		Sf	Sh	FF	Sw			✓	Stotts
Leptospermum trinervium [Leptospermum attenuatum]		s	CP		Sf	Sh				BS	✓	Campsie
Lepyrodia scariosa		g				Sh				BS	✓	Stotts
Leucopogon amplexicaulis		s			Sf						✓	
Leucopogon ericoides	Beard-heath	s				Sh				BS	✓	Stotts
Leucopogon juniperinus	" "	s	CP	TI		Sh					✓	Chullora
Leucopogon lanceolatus	" "	s			Sf						✓	Girrahween
Leucopogon microphyllus	" "	s				Sh					✓	
Lindsaea linearis	Screw Fern	f				Sh					✓	
Lindsea microphylla	Lacy Wedge Fern	f				Sh					✓	Stotts
Linum marginale	Native Flax	g	CP	TI							✓	Chullora
Lissanthe strigosa	Native Cranberry	s	CP	TI		Sh					✓	Campsie
Livistonia australis	Cabbage Palm	t			Sf						p	
Lobelia alata		g	CP				FF	Sw	MS	BS	✓	Chullora

Species name	Common name	Growth Form	Clay Plain Scrub Forest	Turpentine Ironbark Forest	S'stone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/S'marsh	Banksia Scrub	Presence	Local site
Lobelia dentata		g			Sf						✓	Stotts
Lobelia gracilis		g			Sf						✓	
Logania albiflora		s			Sf						✓	
Lomandra cylindrica	Mat-rush	g	CP	Tl							✓	
Lomandra filiformis [includes subspecies coriacea and subspecies filiformis]	" "	g	CP	Tl		Sh					✓	Coxs Creek
Lomandra glauca	" "	g		Tl		Sh				BS	✓	Stotts
Lomandra longifolia	" "	g	CP	Tl	Sf	Sh	FF			BS	✓	Nannygoat
Lomandra multiflora [includes subspecies multiflora]	" "	g	CP			Sh					✓	Coxs Creek
Lomandra obliqua	" "	g	CP			Sh					✓	Campsie
Lomatia silaifolia	Crinkle Bush	s			Sf	Sh					✓	Bardwell
Lythrum hyssopifolia		g					FF	Sw			✓	Rockdale
Macrozamia communis	Burrawang	s			Sf						✓	
Macrozamia spiralis		s	CP								✓	
Marsdenia suaveolens		v			Sf						✓	Bardwell
Maytenus silvestrus		s	CP	Tl							✓	Norfolk
Melaleuca deanei		s				Sh					h	
Melaleuca decora		t	CP	Tl							✓	Chullora
Melaleuca ericifolia	Paperbark	s/t	CP					Sw	MS	BS	✓	Rockdale
Melaleuca erubescens	"	s	CP								✓	Rookwood
Melaleuca linariifolia	Snow-in-summer	t	CP			Sh	FF	Sw			✓	Coxs Creek
Melaleuca nodosa		s	CP	Tl		Sh					✓	Chullora
Melaleuca quinquenervia	Broad-leaved Paperbark	t						Sw			h	
Melaleuca styphelioides	Prickly-leaved Paperbark	t	CP		Sf		FF				✓	Coxs Creek
Melaleuca thymifolia		s				Sh					✓	
Micrantheum ericoides		s	CP			Sh					✓	Rookwood
Microlaena stipoides	Weeping Meadow Grass	g	CP	Tl	Sf		FF			BS	✓	Chullora
Microtis parviflora	Slender Onion Orchid	g	CP								✓	
Microtis unifolia	Common Onion Orchid	g	CP								✓	
Mimulus repens	Creeping Monkey-flower	g						Sw	MS		✓	Rockdale
Mirbelia rubiifolia		g	CP								✓	Chullora
Mitrasacme paludosa		g								BS	h	
Monotoca elliptica		s				Sh				BS	✓	Nannygoat
Monotoca scoparia		s				Sh				BS	✓	Girrahween
Muellerina celastroides	Mistletoe	s			Sf						✓	Stotts
Muellerina eucalyptoides	"	s	CP								✓	Rookwood
Myriophyllum gracile		g								BS	h	
Notelaea longifolia	Mock Olive	s	CP	Tl	Sf						✓	Norfolk
Notelaea ovata	" "	s			Sf					BS	✓	Bardwell
Olax stricta		s	CP								✓	
Olearia microphylla	Daisy Bush	s	CP	Tl	Sf						✓	Chullora
Olearia viscidula	" "	s	CP								✓	

Species name	Common name	Growth Form	Clay Plain Scrub	Turpentine Ironbark	S'stone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/S'marsh	Banksia Scrub	Presence	Local site
Omalanthus nutans [Omalanthus populifolius]	Bleeding Heart	s/t	CP	TI	Sf					BS	✓	
Omphacomeria acerba		s				Sh					✓	Stotts
Opercularia aspera	Stink Weed	s				Sh	FF				✓	
Opercularia diphylla		g	CP								✓	Coxs Creek
Opercularia varia		g	CP	TI							✓	
Oplismenus aemulus		g		TI	Sf	Sh					✓	
Oplismenus imbecillis		g				Sh					✓	
Orthoceras strictum	Horned Orchid	g	CP								✓	
Oxalis exilis		g	CP	TI							✓	
Oxalis perennans		g	CP								✓	Coxs Creek
Oxylobium ilicifolium [see Podolobium ilicifolium]												
Ozothamnus diosmifolius [Helichysum diosmifolium]	Everlasting	s	CP	TI	Sf	Sh				BS	✓	Coxs Creek
Pandorea pandorana	Wonga-wonga Vine	v	CP	TI	Sf	Sh					✓	Norfolk
Panicum obseptum	Panic	g						Sw			✓	Rockdale
Panicum simile	"	g	CP	TI	Sf						✓	Coxs Creek
Paspalidium distans		g	CP	TI							✓	Chullora
Paspalum distichum [Paspalum paspalodes]	Water Couch	g	CP				FF	Sw			✓	Rockdale
Patersonia fragilis		g				Sh					✓	
Patersonia glabrata		g				Sh					✓	Girrahween
Patersonia longifolia		g	CP								✓	Rookwood
Pelargonium inodorum		g	CP		Sf						✓	Chullora
Pellaea falcata var. falcata	Sickle Fern	f			Sf						✓	
Persicaria decipiens		g	CP				FF	Sw			✓	Rockdale
Persicaria hydropiper		g						Sw			✓	Rookwood
Persicaria lapathifolia		g						Sw			✓	
Persicaria orientalis		g						Sw			h	
Persicaria strigosa [Polygonum strigosum]		g						Sw			✓	
Persoonia lanceolata	Geebung	s				Sh				BS	✓	
Persoonia laurina	"	s			Sf	Sh					✓	Girrahween
Persoonia levis	"	s			Sf	Sh					✓	Stotts
Persoonia linearis	"	s		TI	Sf						✓	Bardwell
Petrophile pulchella	Cone-sticks	s				Sh					h	
Philotheca salsolifolia		s								BS	h	
Philydrum lanuginosum	Woolly Frogmouth	g	CP		Sf			Sw			✓	Chullora
Phragmites australis	Common Reed	g	CP				FF	Sw	MS		✓	Canterbury
Phyllanthus gasstroemii		s	CP	TI							✓	
Phyllanthus hirtellus [Phyllanthus thymoides]		g	CP	TI		Sh					✓	
Pimelea linifolia	Rice Flower	s	CP		Sf	Sh				BS	✓	Girrahween
Pittosporum revolutum		s	CP	TI	Sf					BS	✓	

Species name	Common name	Growth Form	Clay Plain Scrub	Turpentine Ironbark	Stone forest/wd	Sandstone heath	Floodplain Forest	Fwater/Brackish Sw	Mangroves/Smarsh	Banksia Scrub	Presence	Local site
Pittosporum undulatum	Sweet Pittosporum	t	CP	TI	Sf					BS	✓	
Platylobium formosum		s			Sf						✓	Bardwell
Platysace lanceolata	Native Parsnip	s				Sh					✓	Girrahween
Platysace linearifolia		s			Sf	Sh					✓	Stotts
Poa affinis		g	CP	TI	Sf	Sh					✓	Bardwell
Poa sieberiana		g	CP								✓	
Podocarpus spinulosus	Plum Pine	s				Sh					✓	
Podolobium ilicifolium [Oxylobium ilicifolium]	Native Holly	s	CP	TI							✓	Campsie
Polymeria calycina	Swamp Bindweed	v	CP								✓	Chullora
Polyscias sambucifolia	Elderberry Panax	s	CP	TI	Sf					BS	✓	Campsie
Pomaderris discolor		s			Sf						✓	
Pomaderris elliptica		s	CP								✓	Rookwood
Pomaderris ferruginea		s	CP		Sf						✓	
Pomaderris intermedia [Pomaderris sieberana]		s			Sf	Sh					✓	Girrahween
Pomaderris lanigera		s	CP								✓	Norfolk
Pomaderris ligustrina		s	CP								✓	Rookwood
Pomax umbellata		g	CP	c	Sf	Sh				BS	✓	
Poranthera corymbosa		s			Sf						h	
Poranthera microphylla		g	CP	TI	Sf	Sh					✓	Chullora
Potamogeton ochreatus		g						Sw			✓	Coxs Creek
Potamogeton pectinatus		g						Sw			✓	Chullora
Potamogeton tricarinatus [including Potamogeton australiensis]		g						Sw			✓	Rockdale
Pratia purpurascens		g	CP	TI	Sf						✓	Campsie
Pseuderanthemum variabile		g		TI	Sf						✓	
Pseudonaphalium luteo-album [Gnaphalium luteo-album]		g	CP								✓	
Psilotum nudum		f			Sf						✓	Bardwell
Pteridium esculentum	Bracken Fern	f	CP	TI	Sf	Sh	FF			BS	✓	Girrahween
Pterostylis concinna	Greenhood Orchid	g				Sh					✓	Stotts
Pterostylis grandiflora	" "	g				Sh					✓	
Pterostylis nutans	" "	g				Sh					✓	Girrahween
Ptilothrix deusta [Ptilanthelium deustum]		g	CP								✓	Rookwood
Pultenaea daphnoides		s			Sf						✓	
Pultenaea linophylla		s			Sf						✓	Girrahween
Pultenaea paleacea		s	CP								✓	
Pultenaea retusa		s	CP								✓	Chullora
Pultenaea stipularis		s			Sf						h	
Pultenaea villosa		s	CP	TI							✓	Coxs Creek
Ranunculus inundatus	Buttercup	g	CP					Sw			✓	Rookwood
Ranunculus lappaceus		g	CP								✓	

Species name	Common name	Growth Form	Clay Plain Scrub	Turpentine Ironbark	S'stone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/S'marsh	Banksia Scrub	Presence	Local site
Rapanea variabilis	Mutton Wood	s	CP	TI	Sf						✓	Norfolk
Restio tetraphyllus var. meiostachyus	Tassel-cord Rush	g					Sw				p	Rockdale
Rhytidosporum procumbens [Billardiera procumbens]	Appleberry	g	CP								✓	Chullora
Rorippa laciniata	Marsh-cress	g					Sw				h	
Rubus parvifolius	Native Raspberry	v		TI							✓	
Rulingia dasyphylla [Rulingia pannosa]	Kerrawang	s	CP								✓	Norfolk
Rumex brownii		g	CP	TI		FF	Sw				✓	Rockdale
Ruppia maritima		g						MS			h	
Samolus repens	Creeping Brookweed	g						MS			✓	Rockdale
Sarcocornia quinqueflora	Samphire	g						MS			✓	Rockdale, M'ville
Sarcopetalum harveyanum	Pearl Vine	v			Sf						✓	Girrahween
Scaevola calendulacea	Fan Flower	g					Sw				h	
Scaevola ramosissima	" "	g				Sh					h	
Schoenoplectus litoralis [Scirpus litoralis]	Club-rush	g					Sw				h	
Schoenoplectus validus [Scirpus validus]	" "	g	CP				Sw				✓	Coxs Creek
Schoenus apogon		g	CP	TI							✓	Chullora
Schoenus melanostachys		g			Sf						✓	Stotts
Sclerolaena muricata var. villosa	Black Rolypoly	g	CP								✓	
Selliera radicans		g						MS			h	
Senecio diaschides		g	CP								✓	
Senecio hispidulus var. hispilulus		g	CP	TI	Sf						✓	Rookwood
Senecio lautus [including subspecies dissectifolius]		g	CP			FF	Sw				✓	Rockdale
Senecio linearifolius		g	CP								✓	Chullora
Senecio minimus		s	CP								✓	
Senecio quadridentatus		g	CP								✓	Coxs Creek
Smilax glyciphylla		v	CP	TI	Sf						✓	Girrahween
Solenogyne bellioides		g	CP								✓	Wiley Park
Spirodela species	Duck Weed	g					Sw				✓	
Sporobolus diander		g		TI							h	
Sporobolus elongatus		g	CP								✓	Chullora
Sporobolus virginicus	Sand Couch	g						MS			✓	Rockdale
Stackhousia monogyna		g			Sf						h	
Stackhousia viminea		g	CP	TI							✓	Chullora
Stipa pubescens	Speargrass	g	CP	TI							✓	Campsie
Stipa rudis subspecies nervosa	"	g	CP	TI							✓	
Stipa rudis subspecies rudis	"	g	CP								✓	Chullora
Stylidium graminifolium	Trigger Plant	g			Sf	Sh					✓	

Species name	Common name	Growth Form	Clay Plain Scrub Forest	Turpentine Ironbark Forest	S'stone forest/wd	Sandstone heath	Floodplain Forest	F'water/Brackish Sw	Mangroves/S'marsh	Banksia Scrub	Presence	Local site
Styphelia triflora	Five-corners	s			Sh						h	
Styphelia tubiflora		s			Sh						✓	Bardwell
Suaeda australis		g							MS		✓	Rockdale, M'ville
Syncarpia glomulifera	Turpentine	t	CP	TI	Sf						✓	Wiley Park
Syzygium paniculatum	Magenta Lillypilly	t			Sf						✓	Girrahween
Tetragonia tetragonoides	Warrigal Cabbage, New Zealand Spinach	g							MS		✓	Rockdale, M'ville
Tetratheca juncea		g	CP			Sh					h	
Thelymitra pauciflora	Slender Sun Orchid	g	CP								✓	Chullora
Themeda australis	Kangaroo Grass	g	CP	TI	Sf	Sh				BS	✓	Campsie
Todea barbara	King Fern	f			Sf						✓	Girrahween
Trachymene incisa subspecies incisa		g				Sh				BS	✓	
Trema aspera	Native Peach	s/t			Sf		FF				✓	
Triglochin procerum [now Triglochin microtuberosum and Triglochin rheophilum]	Water Ribbons	g						Sw			✓	Rockdale
Triglochin striatum	" "	g							MS		✓	Rockdale
Tristaniopsis laurina	Water Gum	t			Sf						✓	Girrahween
Tylophora barbata		v		TI	Sf						✓	Girrahween
Typha orientalis	Bullrush	g	CP					Sw			✓	Coxs Creek
Utricularia uliginosa		g								BS	h	
Velleia lyrata		g				Sh					h	
Vernonia cinerea var. cinerea		g	CP								✓	Rookwood
Veronica calycina	Speedwell	g			Sf						✓	
Veronica plebeia	"	g	CP	TI	Sf						✓	Bardwell
Viminaria juncea	Golden Spray	s	CP			Sh		Sw		BS	✓	Coxs Creek
Viola hederacea	Native Violet	g					FF			BS	p	
Wahlenbergia gracilis	Native Bluebell	g	CP	TI	Sf	Sh	FF	Sw		BS	✓	Campsie
Wahlenbergia littoricola	" "	g	CP								✓	Chullora
Wahlenbergia multicaulis	" "	g	CP								✓	Chullora
Wahlenbergia stricta	" "	g	CP								✓	Rookwood
Wilsonia backhousei		g							MS		h	
Xanthorrhoea arborea	Grass-tree	g			Sf						✓	Bardwell
Xanthorrhoea media	" "	g	CP			Sh					✓	
Xanthorrhoea resinifera [Xanthorrhoea resinosa]	" "	g								BS	p	
Xanthosia pilosa		g			Sf	Sh					✓	Stotts
Xanthosia tridentata		g			Sf	Sh					✓	Girrahween
Xylomelum pyriforme	Woody Pear	s/t			Sf					BS	✓	Stotts
Zieria pilosa		s				Sh					✓	Bardwell
Zieria smithii		s	CP	TI	Sf						✓	Norfolk
Zornia dyctiocarpa var. dyctiocarpa		g	CP								✓	Chullora
Zoysia macrantha [Zoysia pungens]	Coast Couch	g							MS		h	

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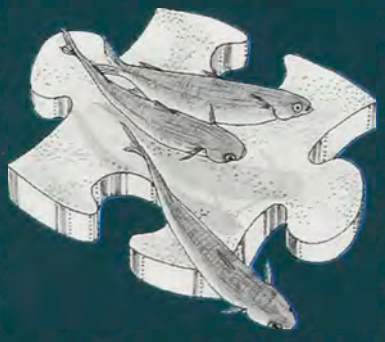
Doug Benson is Senior Plant Ecologist at the Royal Botanic Gardens, Sydney. He is the author of many scientific papers on the native vegetation of the Sydney area as well as a number of books including *Taken for Granted: the Bushland of Sydney and its suburbs* and *Rare Bushland Plants of Western Sydney.*

Danie Ondinea advises on vegetation management, environmental education and, her great passion, wildlife habitat creation. She has an historic link with the Cooks River. In 1809 her convict great-great-great grandfather Edward Redmond was granted land on the original mouth of the River.

Virginia Bear, currently the bushland management officer at Baulkham Hills Shire, has been involved in bush regeneration projects around Sydney since the late 1980s, and worked for a while at Wolli Creek. She hopes that we will eventually learn to properly appreciate our natural legacy, and her artistic endeavours are usually directed to that aim.



Back cover: Semi-natural river bank vegetation at Hurlstone Park with Swamp Oak *Casuarina glauca,* Common Reed *Phragmites australis* and Grey Mangrove *Avicennia marina* (1997).

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ROYAL BOTANIC GARDENS SYDNEY