

A PLAN OF MANAGEMENT
FOR
SOUTH TURRAMURRA BUSHLAND

Bushland on the eastern side of the Upper Lane Cove River
adjoining Fox Valley and South Turramurra

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INTRODUCTION

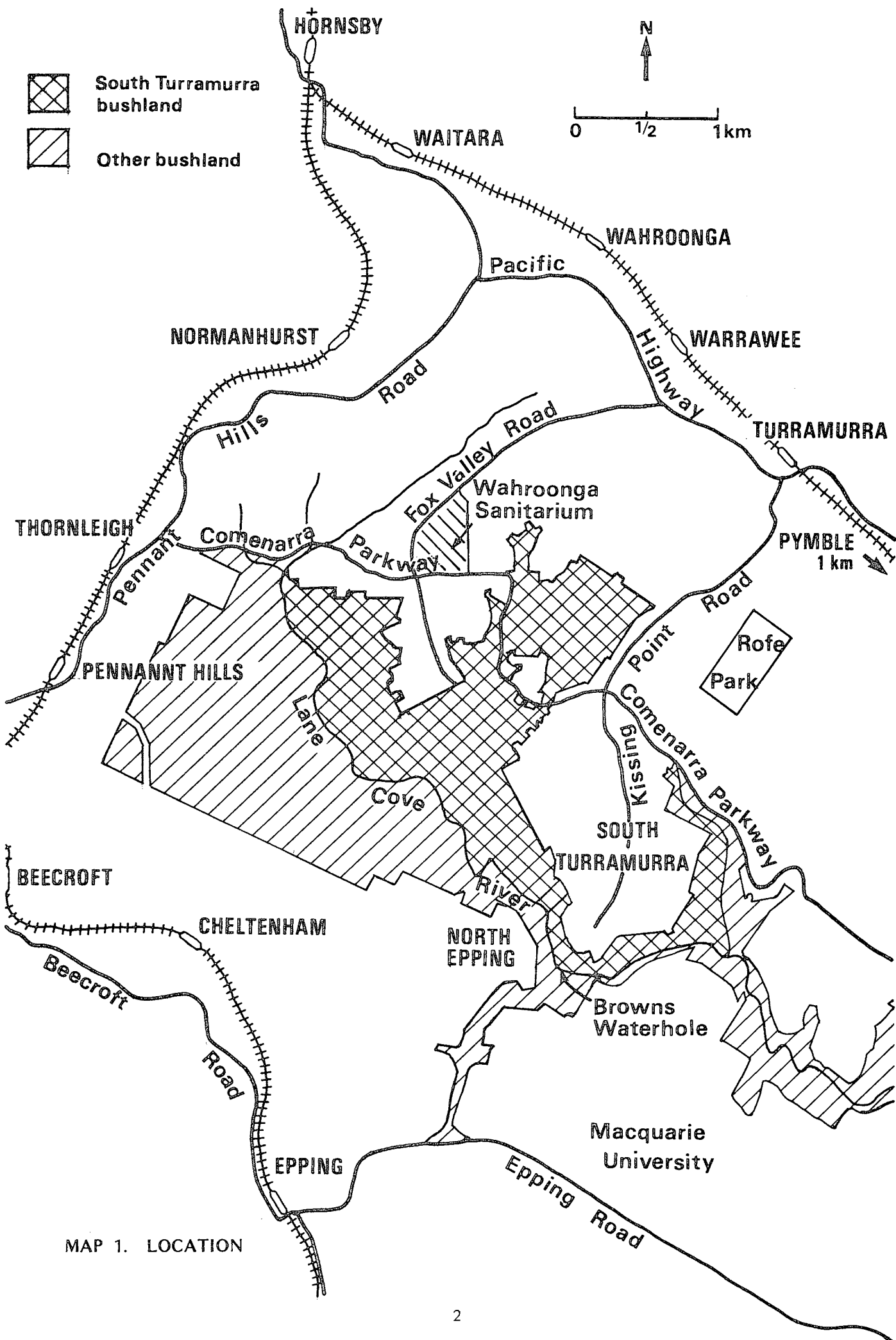
Urban bushland provides valuable green space in fairly densely populated areas. South Turrumurra Bushland provides an aesthetic pleasure necessary in a stressful world and fulfils a psychological need by its very presence. Its space and greenness bring peace, and provide a place for resting and relaxing. It is of sufficient size to provide some of the elements of a wilderness experience while being within easy walking distance of its built-up perimeter.

The Lane Cove River bushland, of which South Turrumurra Bushland is a part, is recognised as an important conservation area by residents and biologists. Local groups have published management plans, for example Buchanan (1979a), Beecroft Cheltenham Civic Trust (1976), and scientific and educational interests have published several booklets about the River in recent years. (Stephens, 1978; State Pollution Control Commission, 1978; Shearer and Jenkins, 1979; Nature Conservation Council, 1979).

A proposed "Planning Policy for the Lane Cove Valley" was prepared by the Union of Lane Cove Valley Conservationists in 1982 and is currently being assessed by the State Government (U.L.C.V.C – Proposed Planning Policy for Lane Cove Valley (1983) Unpublished paper.)

One of the most important urban bushland problems, weed invasion, is also receiving increasing attention (Adamson and Buchanan, 1974; Adamson, 1977; Buchanan, 1979b; Bradley).

Beecroft Cheltenham Civic Trust (1976) described the resources of, and recommended appropriate management for, the bushland on the western side of the Lane Cove River from Browns Waterhole in the south to the Comenarra in the north. With the publication of this plan, the vast majority of the publicly owned bushland in the Lane Cove River catchment north of Browns Waterhole will have been described.



MAP 1. LOCATION

CHAPTER 1

GENERAL DESCRIPTION

South Turramurra Bushland is part of one of two valleys, Middle Harbour Creek and the Lane Cove River, deeply incised into the Hawkesbury Sandstone in the northern part of Sydney. These valleys help to give the northern suburbs a unique appearance and break many of the suburbs into distinct units.

1.1 LOCATION (Map 1)

South Turramurra Bushland is shown on Maps 63 and 64 in Gregory's Street Directory and Maps 27 and 39 in the UBD Sydney. It is located on the eastern side of the upper Lane Cove River.

1.2 SIZE AND SHAPE

South Turramurra Bushland is slightly larger than 300 hectares, while the Wahroonga Sanitarium bushland discussed in this Management Plan is approximately 10 hectares.

As can be seen in Map 1, South Turramurra Bushland is a long thin strip. Rough calculations have shown that the boundary is approximately 20 kilometres long, and of this 14 kilometres is in contact with roads or houses. This is to the advantage of residents who like to live adjoining bush. However, it does mean that a very long boundary is in contact with the deleterious effects of urban development such as soil disturbance, changes in drainage patterns, and the dumping of garden and other rubbish (Buchanan 1979).

1.3 STATUS AND OWNERSHIP (Map 2)

Most of South Turramurra Bushland is under the care, control and management of Ku-ring-gai Municipal Council.

There are some privately owned parcels of land which exist within the Management Plan area. These are zoned as County Open Space and are situated between the Comenarra Parkway and the proposed expressway, near the Stainsby Close/Howson Avenue housing development. They are all in the process of being acquired by the Department of Planning and Environment for use as open space. Under the provisions of the State Planning Authority Act of 1963, the N.S.W. Planning and Environment Commission then places this land under the care, control, and manage-

ment of Ku-ring-gai Municipal Council for use as a public park, public reserve or public recreation area and stipulates that it must be used only for passive recreation.

The Lane Cove River State Recreation Area Trust controls land at the northern end of the bushland. The land east of Fox Valley Road is owned by Wahroonga Sanitarium and is mentioned in the Management Plan as it contains a substantial area of an increasingly rare plant community which is considered worthy of preservation.

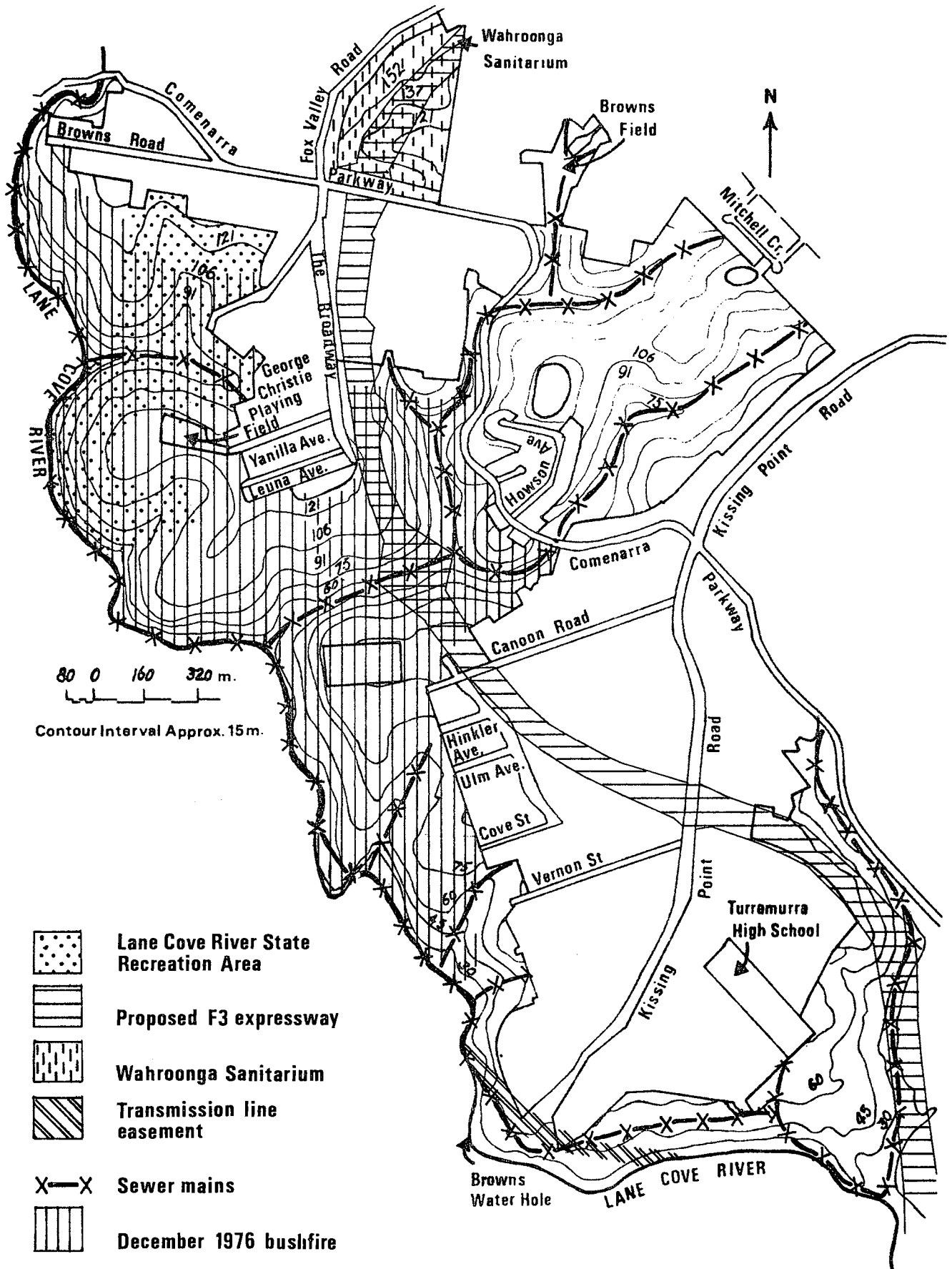
Rofe Park was acquired by Ku-ring-gai Municipal Council in 1927, when the widow of Thomas Rofe gave it to them in the form of a Trust. Under the terms agreed to it was to be used 'for a public park and reserve, and for the preservation of flora and fauna.' Council manages the Park and can vary the terms of the Trust only with the consent of the executors of Thomas Rofe.

1.4 HISTORY

Aboriginal man has left little identifiable evidence of his presence in South Turramurra Bushland. Rock carvings are scattered throughout the suburban area and there are six sets of foot prints (possibly kangaroo) carved in a rock in the vicinity of the southern end of Kissing Point Road. Four of these sets are in a line.

The early 1800's saw the arrival of the first Europeans in the area. These were loggers who sought the fine timbers of the North Shore forests. In particular Turpentine, Blackbutt, Mahogany and stringybarks were shipped from Fiddens Wharf (West Killara) to the Sydney Cove colony for building. Much of South Turramurra Bushland consists of an infertile valley and trees suitable for building purposes grow in the more fertile soils along the Lane Cove River and some creeks. It appears that only these areas were logged.

Two of the roads in the north-west of the Management Plan area date from this period. In the 1820's Pennant Hills Road joined the Parramatta and the North Shore settlements along the approximate route of the present Pennant Hills Road, Comenarra Parkway, Fox Valley Road and Pacific Highway. Only tracks led further north. Before the construction of the Comenarra Parkway (opened 1974) convict stone work (cut sandstone blocks) and cobbles were still present at the Lane Cove River and Coups Creek crossings. Little evidence now remains of these works but a cobbled road, Muttama Street, at Fox Valley is still present.



MAP 2. SHOWING AREAS CONTROLLED BY THE LANE COVE RIVER STATE RECREATION TRUST, PROPOSED EXPRESSWAY, TRANSMISSION LINE EASEMENT, SEWER MAINS AND AREAS BURNT BY THE DECEMBER 1979 BUSHFIRE.

Large scale firewood collection was undertaken concurrently with, and following logging but as the upper Lane Cove River valley was rugged and access difficult this area was largely ignored.

Many of the early settlers, for example John Brown who acquired land in Wahroonga and Fox Valley, combined tree felling operations with the development of orchards. Orchards were the major industry of settlers through most of the nineteenth century but only a few small pockets of the Management Plan area were put under orchards because of its infertility and ruggedness. South Turramurra Bushland undoubtedly supplied settlers with many resources, for example firewood and game such as wallabies and parrots.

Sandstone from the area was often used for the foundations of houses during the early part of the twentieth century. However, this industry was not long lived because of the cost of excavation and the proximity of the brick-works at Thornleigh.

The need for reservation of land on the Lane Cove River for public enjoyment was recognised early – in 1889 Fiddens Wharf and a surrounding 18 acres of land was gazetted as a public recreation area. This seems to have established the upper Lane Cove Valley as a 'Green Belt', in principle at least. Under the Deed of Trust of 1926, which transferred the land to the Cumberland County Council, this became established in law.

The upgrading of Kissing Point Road in the 1950's led to increased subdivision of the orchards for housing in South Turramurra. The last major subdivision in the area was in 1963, when the Marcus Clarke estate (from West Pymble to Wahroonga along the Comenarra Parkway) was released. Between the 1961 and 1976 census the population figures more than doubled for South Turramurra and Fox Valley.

The 'Green Belt' had been firmly established in 1958 by the Cumberland County Council, when most of the land was transferred to Ku-ring-gai Municipal Council for safe keeping under the zoning 10A – Open Space. This represented the set bounds of urban development.

Some relevant history books are listed in Suggested Reading.

1.5 CLIMATE

Two of the nearest weather recording stations are Turramurra (approximately 180 m) and Pymble (136 m). The highest rainfall in the metropolitan area falls over these elevated parts of the northern suburbs. Both Turramurra and Pymble receive an average of over 1400 mm per



Old Road Built of Sandstone "Cobbles"

annum, while Pennant Hills receives a lower average of 1040 mm. The annual average maximum and minimum temperatures are approximately 22°C and 11°C respectively (Department of Science and the Environment, 1979).

1.6 GEOLOGY AND LANDSCAPE

The majority of the area consists of Hawkesbury Sandstone laid down in the Triassic Period. The ridges, such as those at the end of Canoon Road and Yanilla Avenue, are near the boundary of the Hawkesbury Sandstone with the Wianamatta Shale and much ironstone gravel is present.

The land falls steeply from these ridge tops (approximately 150 m above sea level) in a series of cliffs and sandstone benches to the valleys. The area is broken by south to west flowing tributaries of the Lane Cove River, which is incised on the eastern and southern boundaries of South Turramurra Bushland.

Wianamatta Shale, which forms a clay capping on high ridges, is absent from the Management Plan area but a deep shale soil is present near Fox Valley Road in the land owned by Wahroonga Sanitarium.

A diatreme (a volcanic pipe or vent forced through the enclosing rock by the explosive energy of gas charged magmas) is present in Browns Field. Diatremes near Sydney consist of breccia, dolerite and basalt. This diatreme is a collapse feature and the flat bottomed elliptic shape of this valley is very different from the narrow V-shaped valleys in the remainder of the area.

1.7 VEGETATION

Survey Method

The vegetation was initially mapped using aerial photographs from the Cumberland 1978 series (1:16 000), and the Cumberland 1970 series. Both series were used as much of the bushland was burnt in December 1976 (Map 2) and recent photographs were sometimes difficult to interpret.

The vegetation structure was checked, the dominant species mapped and a species list was compiled during field surveys in October and November 1979. Most survey work was done by walking along tracks which were visible on aerial photographs. This method gave rapid results but resulted in some habitats being poorly sampled, e.g. undisturbed densely shaded creek beds. Many of the smaller species or species which were not flowering were probably not recorded. No attempt was made to record the majority of the Restionaceae, Cyperaceae and Gramineae, all of which are monocotyledons. Some records are included from Buchanan (1978). The species lists are presented in Appendix A and B.

The vegetation maps (Maps 3 and 4) are only approximate as there are usually no clear boundaries between different structures or dominant species.

Structure (Table 1, Map 3)

The structure (height and density) of the vegetation was classified according to Specht (1970).

TABLE 1.
STRUCTURAL FORMS OF VEGETATION
(after Specht, 1970.)

| LIFE FORM AND HEIGHT OF TALLEST STRATUM | PROTECTIVE FOLIAGE COVER OF TALLEST STRATUM | | | |
|---|---|--------------------|-----------------|---------------------|
| | DENSE (70-100%) | MID DENSE (30-70%) | SPARSE (10-30%) | VERY SPARSE (<10%) |
| Trees >30m | Tall closed-forest | Tall open-forest | Tall woodland | Tall open-woodland |
| Trees 10-30m | Closed-forest | Open-forest | Woodland | Open-woodland |
| Trees 5-10m | Low closed-forest | Low open-forest | Low woodland | Low open-woodland |
| Shrubs 2-8m | Closed-scrub | Open-scrub | Tall shrubland | Tall open-shrubland |
| Shrubs 0-2m | Closed heath | Open-heath | Low shrubland | Low open-shrubland |

In general there is an increase in the height of the vegetation from the ridge tops to the valley floors. This increase corresponds to an increase in soil fertility, slightly less sunlight, less wind and less evaporation.

The southern ridges (including the area near Turrumurra High School) are covered by low woodland/low open-woodland with small areas of closed-scrub. The most northern ridge, immediately south of Browns Road, is covered by a taller formation of woodland/open-forest. The valley sides are commonly covered by woodland/open-forest and open forest/tall open-forest is present on parts of the lower slopes and valley bottoms.

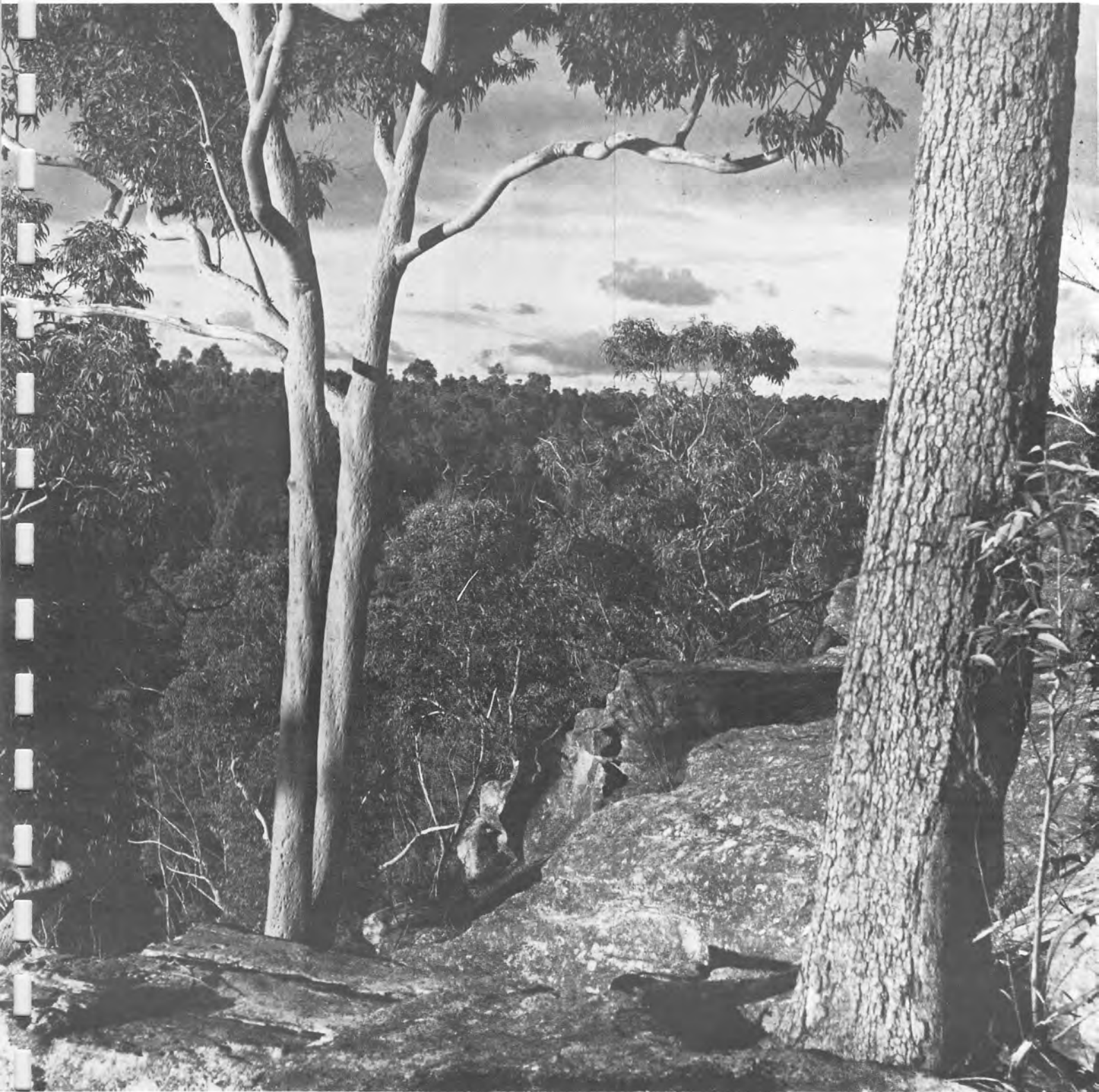
Open-forest/tall open-forest is present on the ridge capped by Wianamatta Shale in the land owned by Wahroonga Sanitarium.

There is only a small area of closed-forest (rainforest) in South Turrumurra Bushland. It is present on the diatrene in Browns Field.

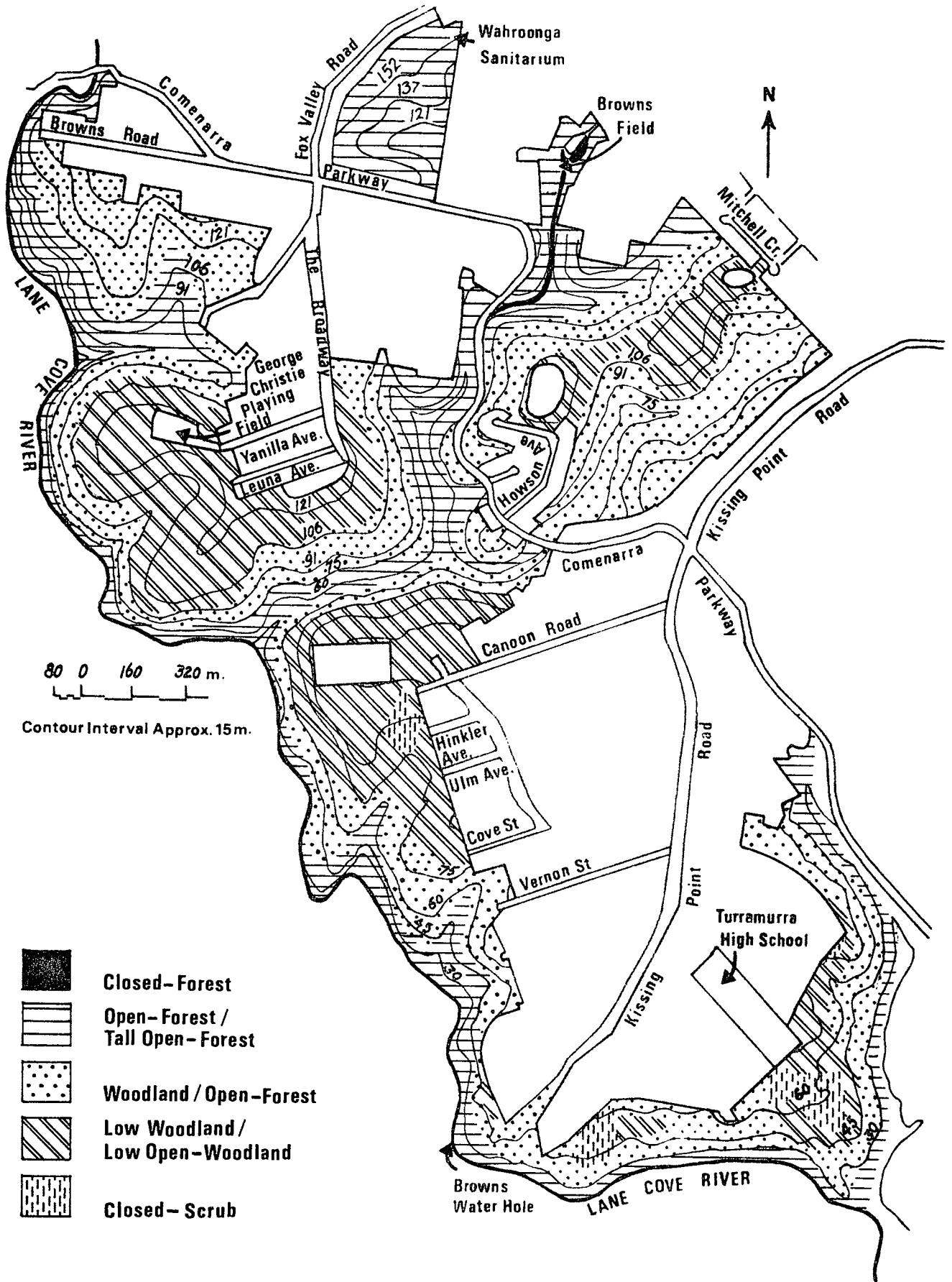
Dominant Species (Map 4) - Common Names are listed in Appendix C

The dominant species are the most common in the tallest layer of the vegetation. In this area there is generally a change of dominant species when the structure changes.

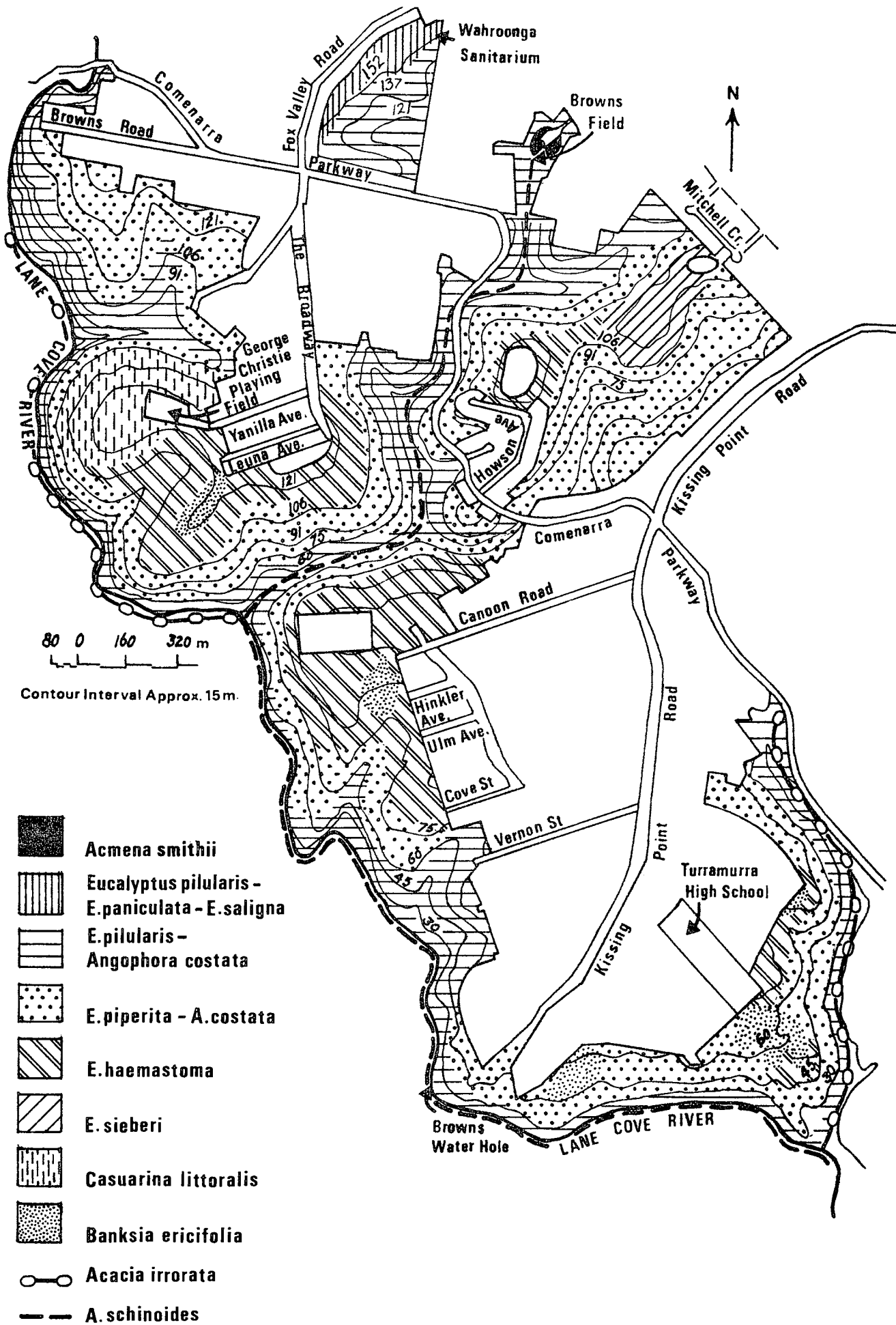
All areas of closed-scrub appear to be dominated by *Banksia ericifolia*, although the areas burnt in 1976 were difficult to assess.



A view over the Valley



MAP 3. SKETCH OF THE VEGETATION STRUCTURE



MAP 4. SKETCH OF THE DOMINANT NATIVE PLANT SPECIES

The low woodland/low open-woodland is usually dominated by *Eucalyptus haemastoma* (Scribbly Gum). The area near Mitchell Crescent is dominated by *Eucalyptus sieberi* (Black Ash). This species was not recorded elsewhere in South Turrumurra Bushland, but one specimen remains at the end of Canoon Road. Some of the low woodland/low open-woodland near the George Christie Playing Field appears to have been dominated by *Casuarina littoralis* (Black She-Oak) before the 1976 fire and there was dense seedling regrowth of this species at the time of the field survey.

The woodland/open-forest is mostly dominated by *Eucalyptus piperita* (Sydney Peppermint) and *Angophora costata* (Smooth-barked Apple), but in some areas *Eucalyptus pilularis* (Blackbutt) is very abundant.

Virtually all areas of open-forest/tall open-forest are dominated by *E. pilularis* and *A. costata* but *Syncarpia glomulifera* (Turpentine) is often common. The only substantially different area is the shale soil on the Wahrenonga Sanitarium land. Here the open-forest/tall open-forest is dominated by a mixture of *E. pilularis*, *E. paniculata* (Grey Ironbark) and *E. saligna* (Sydney Blue Gum), with other species such as *E. resinifera* (Red Mahogany) present.

The small patch of closed-forest on the diatrema is dominated by *Acmena smithii* (Lillypilly).

Areas Worthy of Special Protection

(a) Ridges

Most of the ridges in the upper Lane Cove Valley, north of Browns Waterhole, have been used for housing or active recreation facilities as they are relatively flat and easy to develop. The undeveloped ridges and the remaining areas of the developed ridges should therefore be carefully preserved as diverse examples of ridge top vegetation.

In South Turrumurra Bushland, ridge top areas are dominated by *Eucalyptus haemastoma* (probably the most widespread ridge top association), *E. sieberi* association, *E. piperita* — *Angophora costata* association, *Casuarina littoralis* association and *Banksia ericifolia*.

The wildflower display is most spectacular on these ridge tops. The main threat to the ridge tops is further development of ovals and playing fields.

(b) Valleys

The Lane Cove River and most of its tributaries now have sewer mains along their creek beds. These beds are often unsightly with fragmented concrete, pipes and construction rubbish. The severe mechanical disturbance along the

creek beds has resulted in serious damage to plant communities and massive weed invasion.

Several small creeks have not had sewer mains laid along their beds. These are valuable examples of undamaged creek beds and vegetation. The vegetation along two of these creeks demonstrates the diversity of the creek vegetation.

The creek draining from between Yanilla and Leuna Avenues has an attractive rocky and sunlit bed. Even near the junction with the Lane Cove River closed-forest species such as *Ceratopetalum apetalum* (Coachwood) are absent. Instead there is a diverse community of shrubs and herbs such as *Baeckea linifolia*, *Goodenia heterophylla*, *Drosera spathulata*, *Gleichenia dicarpa*, *Leptospermum flavescens* and *Actinotus minor*.

The creek draining from between Cove and Vernon Streets is weed infested near these streets, but nearer the river it has a plant community dominated by dense *C. apetalum* which results in a shady, cool environment.

There are remarkably few weeds along these creeks and they should be carefully weeded and protected against deleterious influences.

(c) The Diatreme

The uncleared parts of the diatreme and the vegetation immediately downstream to the Comenarra Parkway should be carefully preserved as this vegetation is quite unlike any other in the upper Lane Cove Valley.

The rich soil is of volcanic origin and this is the only area which supports a true rainforest (closed-forest).

Table 2 lists the species which were confined to or most abundant in this area. The most abundant tree species is *Acmena smithii* (Lillypilly), but other species such as *Doryphora sassafras* (Sassafras), *Ficus coronata* (Sandpaper Fig), and *Ceratopetalum apetalum* (Coachwood) are common and *Schizomeria ovata* (White Cherry) and others are present. In the area immediately around the playing field eucalypts are absent, but the *E. pilularis* and *Syncarpia glomulifera* along the creek were by far the largest seen during the survey. The understorey by the creek is similar to that on the diatreme because the rich soil is washed downstream.

A sewer main has been laid along the creek and as a result there are major weed problems in some sections. Correct management should enable these areas to be rehabilitated. The numerous children who visit the playing field in the centre of the diatreme also play in the closed-forest and there is evidence of over-use and trampling of the understorey.



Tall Closed-Heath

TABLE 2
PLANTS RESTRICTED TO THE DIATREME AND IMMEDIATELY DOWNSTREAM
OR PLANTS FAR MORE ABUNDANT IN THE DIATREME VALLEY THAN IN ANY
OTHER VALLEY IN THE MANAGEMENT PLAN AREA

| | |
|-----------------------------------|----------------------------------|
| PTERIDOPHYTA | ANGIOSPERMAE continued |
| Adiantaceae | Cunoniaceae |
| * <i>Adiantum silvaticum</i> | <i>Schizomeria ovata</i> |
| Aspidiaceae | Myrtaceae |
| * <i>Polystichum australiense</i> | * <i>Acmena smithii</i> |
| Athyriaceae | * <i>Rhodomyrtus rubescens</i> |
| * <i>Athyrium australe</i> | Moraceae |
| ANGIOSPERMAE | <i>Ficus coronata</i> |
| Monimiaceae | Vitaceae |
| * <i>Doryphora sassafras</i> | * <i>Cissus antarctica</i> |
| * <i>Wilkiea huegeliana</i> | <i>C. hypoglauca</i> |
| Lauraceae | Meliaceae |
| * <i>Cryptocarya glaucescens</i> | * <i>Synoum glandulosum</i> |
| Menispermaceae | Verbenaceae |
| <i>Sarcopetalum harveyanum</i> | * <i>Clerodendrum tomentosum</i> |
| Proteaceae | Smilacaceae |
| * <i>Grevillea mucronulata</i> | <i>Smilax australis</i> |
| Passifloraceae | Palmae |
| <i>Passiflora herbertiana</i> | * <i>Livistona australis</i> |

* only recorded on the diatreme and immediately downstream.

(d) The Wahroonga Sanitarium Land

Although privately owned this land has been included as it contains a remnant of the formerly widespread Wianamatta Shale plant community. No bushland of this type is included in South Turramurra Bushland. The species were recorded separately for this land (Appendix A) and, as can be seen, many species recorded on the Sanitarium land were not recorded elsewhere, e.g. *Hibbertia scandens*, *Poranthera microphylla*, *Rubus parvifolius*, *Acacia stricta* and *Astroloma humifusum*.

It is recommended that the Sanitarium land be managed to preserve this community.

Distribution of some Rare or Interesting Species

The species confined to the diatreme and the Sanitarium land have already been noted (Table 2, Appendix A), but there are other species which deserve mention. Some of the species which were recorded in low numbers and which were only present in a small area are listed in Table 3.

TABLE 3
DISTRIBUTION OF SOME OF THE RARER PLANT SPECIES

| SPECIES | APPROXIMATE PLACE RECORDED |
|-------------------------------|------------------------------------|
| <i>Cheilanthes tenuifolia</i> | Near Browns Road |
| <i>Davillia pyxidata</i> | Near Browns Road |
| <i>Podocarpus spinulosus</i> | Near Koombalah Avenue |
| <i>Pavonia hastata</i> | Near Browns Road |
| <i>Angophora bakeri</i> | Near Ashburton Avenue |
| <i>Eucalyptus multicaulis</i> | Near Leuna Avenue |
| <i>Eucalyptus squamosa</i> | Near Leuna Avenue |
| <i>Eriostemon myoporoides</i> | Near George Christie Playing Field |
| <i>Epacris longiflora</i> | Near Browns Road |
| <i>Goodenia dimorpha</i> | Near Ashburton Avenue |
| <i>Olearia tomentosa</i> | Near Kingsford Avenue |

Two eucalypts, *E. haemastoma* and *E. sieberi* have an unexplained distribution. *E. haemastoma* is absent from the ridge immediately south of Browns Road, but it is common on other ridges. *E. sieberi* is very abundant on the ridge near Mitchell Crescent but, as previously mentioned, it was not recorded elsewhere in the bushland. *Banksia ericifolia*, so common on the ridges and upper slopes along the Lane Cove River south of Leuna Avenue, was not recorded on the Browns Road ridge and was extremely rare on the ridge between Howson Avenue and Mitchell Crescent.

E. multicaulis (Whipstick Ash) is described as uncommon in the Flora of the Sydney Region, while *E. squamosa* (Scaly Bark) is even less common. It is listed by Leigh, Briggs and Hartley (1981) in "Rare or Threatened Australian Plants" as a species which is restricted to highly specific habitats and which is therefore possibly endangered over a long period through continued depletions.

Only one *Callistemon* species, *C. citrinus* has been recorded on the western side of the upper Lane Cove Valley (Beecroft Cheltenham Civic Trust, 1976), but four species were recorded on the eastern side (Appendix A).

The distribution of two abundant acacias along the watercourses is shown on Map 3. Although trees of the two bipinnate acacias, *A. irrorata* and *A. schinoides*, are present on the diatrema, *A. schinoides* is by far the most common of the two along the creek to the Lane Cove River. Upstream along the river, *A. irrorata* is abundant and *A. schinoides* virtually absent, but downstream of this junction *A. schinoides* dominates dramatically. *A. irrorata* is again common along the creek draining behind the High School, but *A. schinoides* dominates along the river below this junction.

Weeds

There are three main types of areas that are invaded by introduced or weed species.

The first area is along the creeks disturbed by the Metropolitan Water Sewerage and Drainage Board during sewer main construction and along the service trails near the valley floor. The lower sides of the service trails where maximum disturbance of the soil and drainage has occurred, are usually the most weed infested. Common introduced species in these areas include *Ranunculus repens* (Buttercup), *Rubus vulgaris* (Blackberry), *Duchesnea indica* (Wild Strawberry), *Ligustrum lucidum* (Large-leaved Privet), *Ligustrum sinense* (Small-leaved Privet), *Lonicera japonica* (Honeysuckle), *Eupatorium adenophorum* (Crofton Weed), *E. riparian* (Mist-flower) and *Tradescantia albiflora* (Wandering Jew).

The second area is around playing fields and service trails on ridges and valley sides. The weed problem is not as severe here as it is in the valleys as growing conditions are harsher, but introduced species are present on the disturbed soil. *Cortaderia seloana* (Pampas Grass) and *Coreopsis lanceolata* are becoming increasingly common in these areas and both species were recorded in mechanically undisturbed sites on the ridge tops. The grasses *Cynodon dactylon* (Common Couch) and *Pennisetum clandestinum* (Kikuyu) are common around playing fields and service trails, as are other grasses and species such as *Hypochaeris radicata* (Catsear), *Bidens pilosa* (Cobblers Peg) and *Sida rhombifolia* (Paddy's Lucerne).

The third area is near houses where land is subject to additional run-off, is often contaminated by nutrients and has garden rubbish dumped on it. All these factors encourage weed invasion. The area near Browns Road is particularly affected by diverse and dense weed growth. *Ipomoea indica* (Morning Glory) cascades 36 m from Browns Road to the River below. The weeds in these areas vary according to the situation and include all the above species as well as garden species which do not normally grow in the bush, for example Geraniums.

1.8 FAUNA

Mammals

The mammal list has been prepared using the study 'The Impact of Man on the Mammals and Birds of the Lane Cove River Valley' by Sarah S. Stephens for the Australian National Parks and Wildlife Service.

Most of the animals are found in dense bush, but some are found in all types of vegetation.

A. stuartii favours dense stands of *Banksia ericifolia*, and was found to be detrimentally affected by the wildfire of 1976, being either unable to move out of the fire zone or unable to survive in alternative habitats.

Before 1976 there were confirmed sightings by zoologists of Swamp Wallabies (1950-51), a Koala (1967) and an Eastern Native Cat (1970).

The introduced Fox (*Vulpes vulpes*) has been sighted.

The Lane Cove Valley being an island of bushland isolated by urban development is subject to many pressures which alter the habitats of mammals. The large numbers of domestic cats fringing the bush also have a great impact on the populations of birds, mammals and reptiles. They are known to be not only extremely efficient predators, but also to continue to hunt even while being adequately fed.

The pressure of such a large predator population, maintained by feeding, cannot be ignored especially in an urban island situation where there is a negligible source of recolonizing native animals and where the predator population virtually encircles the prey.

TABLE 4
NATIVE MAMMALS KNOWN TO OCCUR IN THE AREA

| SCIENTIFIC NAME | COMMON NAME |
|---------------------------------|--------------------------|
| MARSUPIALIA | |
| Dasyuridae | |
| <i>Antechinus stuartii</i> | Stuart's marsupial mouse |
| Peramelidae | |
| <i>Perameles nasuta</i> | Long-nosed bandicoot |
| Phalangeridae | |
| <i>Trichosurus vulpecula</i> | Brush-tailed possum |
| Petauridae | |
| <i>Petaurus breviceps</i> | Sugar glider |
| <i>Pseudocheirus peregrinus</i> | Ringtailed possum |
| MONOTREMATA | |
| Tachyglossidae | |
| <i>Tachyglossus aculeatus</i> | Spiny ant-eater |



Fan-Tailed Cuckoo

Birds of the Upper Lane Cove River Valley

The Upper Lane Cove River Valley is rich in bird species, 164 having been recorded above De Burgh's Bridge. This abundance of species is made possible by the food and shelter provided in a variety of habitats ranging from the heaths and scrubs of the ridges, down through the woodlands to the tall eucalyptus forest and gully rainforest along the creeks and the River itself.

In contrast to the lower reaches of the River, the Upper Valley lacks a variety of waterbirds. This is due to the absence of pools of the correct salinity and depth and to the lack of mangroves and mudflats which provide feeding opportunities for the groups of birds commonly known as waterfowl and waders. However, it is interesting that since the Stephens report on "The impact of Man on the Mammals and Birds of the Lane Cove River Valley" was published in 1978, members of the N.S.W. Field Ornithologists' Club have recorded 35 species in the Upper Valley that were not previously listed, and a number of these are associated with the Dam at Avondale Golf Club (approximately 0.5 km east of Rofe Park). This is a larger body of water than the natural pools along the Upper River, and is fed by a creek rising on the watershed of the North Shore Ridge near the Warragal Road railway bridge. The associated gully vegetation from the ridge to the creek junction with the Lane Cove River is important for bird life. Residents overlooking this gully have reported sightings of the Powerful Owl and the White-headed Pigeon, both rare species in the Sydney area, demonstrating the value of this habitat as a bird refuge.

The Yellow-tufted Honeyeater is not commonly found in the Upper Valley. For some reason which has not yet been fully explained, this honeyeater is restricted to particular localities within its overall range which meet the birds' ecological needs. Woodland near Rofe Park is one of the few places along the Upper Lane Cove River Valley that is colonised by this bird.

The secluded closed forest along the River in the Upper Valley provides a suitable habitat for birds that are otherwise rare in the Sydney area. These are the White-headed Pigeon, the Topknot Pigeon and the Green-winged Pigeon. Usually associated with rainforest, these are close to the southern limit of their range in Sydney, and are found along the River and nearby gullies between South Turramurra and Wahroonga.

The section of the Valley above Browns Waterhole is also the haunt of the Powerful Owl and the Gang-gang Cockatoo, both very rare in Sydney. Records of the Powerful Owl, collated over the past eight years by local birdwatchers, are now producing a picture of its status in suburban Sydney. Until recently it was thought to be 'confined to the ranges'. A record of

the Gang-gang nesting at South Turramurra in 1977 is the first breeding recorded for this species in the County of Cumberland (Rogers and Lindsey, Eds. N.S.W. Bird Report for 1977, Australian Birds 13,12).

The Peregrine Falcon, now a very rare species threatened with extinction in many parts of the world, may occasionally be seen along the same section of the Valley. It relies on the flat rocky edges of the ridges where it butchers prey, and any development that encroaches on these rocks will lead to the disappearance of the Peregrine from the Valley.

The closed-scrub of the ridges and hillsides offers habitat for honeyeaters that depend on vegetation such as *Banksia ericifolia* for food and shelter. White-cheeked and New Holland Honeyeaters in particular use this winter flowering banksia for food resources of nectar and insects, and for sheltered nest sites deep in the thickets.

It is fortunate that in 1985 a wide range of habitat still exists along the Upper Valley, not only for the maintenance of resident birds, and for summer visitors that arrive from the north in October, but also as a migration route for birds in passage along the Valley during normal seasonal migration from the south.

These movements have been studied for over 20 years by S. G. Lane and more recently by other members of the Bird Study Association (formerly the Bird Banders' Association), and there are now banding sites located along the Valley between North Ryde and Pennant Hills. Two of these sites are within the area covered by this Management Plan.

These banding studies have established that there is a local movement of birds along the Valley. Which is also on the migration path of the Silvereye, a species proven by banding studies to migrate between Tasmania and South-east Queensland.

In comparing the birds listed for Ku-ring-gai Chase National Park and the Lane Cove River Valley, it is interesting to see that Ku-ring-gai Chase has 186 spp. and the Lane Cove Valley 183 out of a total for both of 220 species (Stephens, p119). As mentioned, the Upper Valley lacks the habitat that supports waterfowl and waders, and this accounts for its lower total in relation to the Valley as a whole.

There are a number of significant omissions among the ground dwelling birds. Such species as the Superb Lyrebird, Spotted Quail-thrush and the Australian Ground-thrush almost certainly occurred here at the time of the first European settlement, but have been excluded, probably quite early in the history of Sydney, by timber getting, encroaching farms and more lately by suburban expansion

with attendant domestic animals, foxes and hunters reducing the ground dwelling birds to a point where survival was no longer possible.

All the existing habitat must be retained in good condition if it is to continue to support the present range of species and overall numbers of birds in the Valley. The loss of some habitats would significantly reduce bird populations. In particular, loss of Banksia species would affect honeyeaters dependent on this flora for food and nesting sites. So also would loss of understorey shrubs in the open forest result in the loss of those species that elect to nest in these low vegetation layers where they also find food. Loss of trees in the forest and woodland could only result in decimation of bird populations depending on nectar and insects found in the canopy of a dry sclerophyll forest. Loss of hollows for nesting sites would adversely affect Kookaburras and various Cockatoos and Rosellas.

As development of the ridges continues, it becomes more important to manage the remaining heath and closed scrub to ensure that it remains a viable bird habitat. Any management plan should also consider the long term effect on bird populations of any attempt to modify the understorey of the Eucalyptus forest as part of a fire protection program. Vegetation reduced to a single understorey of blady grass and bracken fern will not support the birds normally associated with this level of a dry sclerophyll forest or woodland. The loss of suitable habitat will always result in the loss of the species of birds dependent on that habitat.

The list of birds found in the Upper Lane Cove River Valley, Appendix D, has been compiled from the personal records of members of the N.S.W. Field Ornithologists' Club who are residents of the area and who have a long term association with its natural habitats. Bird lists from "A Plan of Management for Pennant Hills Park" (Beecroft Cheltenham Civic Trust 1976) and "The Impact of Man on the Mammals and Birds of the Lane Cove River Valley" by Sarah S. Stephens (Environmental and Urban Studies Report No. 34, 1978, Macquarie University) have also been consulted. The common names of birds are those used by Peter Slater in his "Field Guide to Australian Birds", Vols. 1 & 2.

Reptiles and Amphibians

The reptiles and amphibians of the Valley are highly varied and many would be considered beautiful. Moreover, because of their relative abundance of species and restricted mobility compared with mammals and birds, the reptiles and frogs provide the best indicators of changes in the Valley, which are mainly brought about by man.

The known species are listed in Appendix E. Dr. Harold Cogger of the

Australian Museum would be pleased to receive reports of any additional sightings.

Cogger (1979 – revised edition) is a valuable reference book.

1.9 DEVELOPMENTS (Map 2)

Metropolitan Water Sewerage & Drainage Board (M.W.S. & D.B.)

Sewer mains have been laid along the river and most of its tributaries. Access tracks have been constructed from nearby streets as well as along the mains. The construction work has destroyed much of the natural creek vegetation and has aided the massive invasion of weeds such as *Ligustrum sinense* (Small-leaved Privet). The work has also destroyed most of the natural creek beds.

Power Lines

A 30 m wide transmission line easement crosses the area at the end of Kissing Point Road.

Fire Trails

Fire trails have been constructed to aid bushfire control.

Tracks

The larger tracks, including service trails for the M.W.S. & D. B., power lines and fire fighting are shown on Map 5.

The Proposed F3 Freeway (The Lane Cove Valley Freeway)

If this expressway is constructed it will cause widespread damage, particularly between Canoon Road and Leuna Avenue. Construction work across this deep valley will probably cause a severe siltation downstream. This will dramatically worsen the problems of erosion, native plant deaths and weed invasion.

The latest information available from the Department of Main Roads is that construction will not begin for at least ten years.

Playing Fields and Ovals

There are several developed sporting areas on ridges on the perimeter of the area under discussion. The George Christie Playing Fields,



Eastern Bearded Dragon

Howson Oval, Browns Field and the complex at Canoon Road are used all year round by schools and groups for soccer, cricket, rugby league, netball and tennis. There are tennis courts behind Leuna Avenue and a playing field near Mitchell Crescent.

1.10 POLLUTION

There are many forms of pollution affecting the Bushland. The unnaturally high run-off of stormwater from urban areas into bushland is a form of pollution as it causes damage by erosion and siltation. Stormwater also carries in pollutants in the form of undesirable plant parts, contaminants such as detergents, weedicides, fertilizers and insecticides and non-putrescible matter such as drink cans and plastics.

Water from swimming pool leaks and back-flushing into the bush or into stormwater drains can also cause damage by altering the natural water balance of the soil and by contaminating the air and water with chlorine.

Garden clippings and prunings are also a form of pollution as such dumps are unsightly, cause a change in the soil nutrient status and introduce undesirable plants, for example, Wandering Jew. Dumping of non-putrescible matter and littering with drink cans, plastics and papers is now universally condemned. Garden rubbish dumping and thoughtless littering are certainly more common than the dumping of non-putrescible matter and household rubbish in South Turrumurra Bushland.

Noise is also a pollutant. The public address systems at sporting areas can be heard over wide areas of the Bushland and urban development in South Turrumurra. Noise from unauthorized motor vehicles, e.g. motor bikes, within the Bushland is perhaps one of the most annoying forms of noise pollution.

1.11 INCORPORATION INTO PRIVATE GARDENS

When the Bushland behind houses becomes weed-infested or is regarded as a fire hazard, the bush or weeds are sometimes chopped down and the public land is incorporated into the private backyard by the planting of garden plants. Despite the extremely long boundary of South Turrumurra Bushland very few examples of this practice were seen. It does however exist and should be discouraged.

CHAPTER 2

MANAGEMENT

Continual intensive maintenance is not required in bushland as natural ecosystems are self-maintained by a complex system of natural processes. These processes often result in cyclic changes so that bushland is not a static system. However, bushland does always appear natural if it has not been interfered with by man. The major aim of management should therefore be to preserve South Turramurra Bushland against harmful man-caused problems such as erosion, weed invasion and frequent fire, so that it can regenerate in its natural state.

2.1 SPECIFIC OBJECTS OF MANAGEMENT

- (1) To maintain South Turramurra Bushland in its natural state.
- (2) To protect the area against erosion, weed invasion and other damaging effects.
- (3) To rehabilitate any areas damaged by erosion, weed invasion and fire.
- (4) To encourage appropriate recreational and educational use of the area.

2.2 ACCEPTABLE ACTIVITIES AND USES

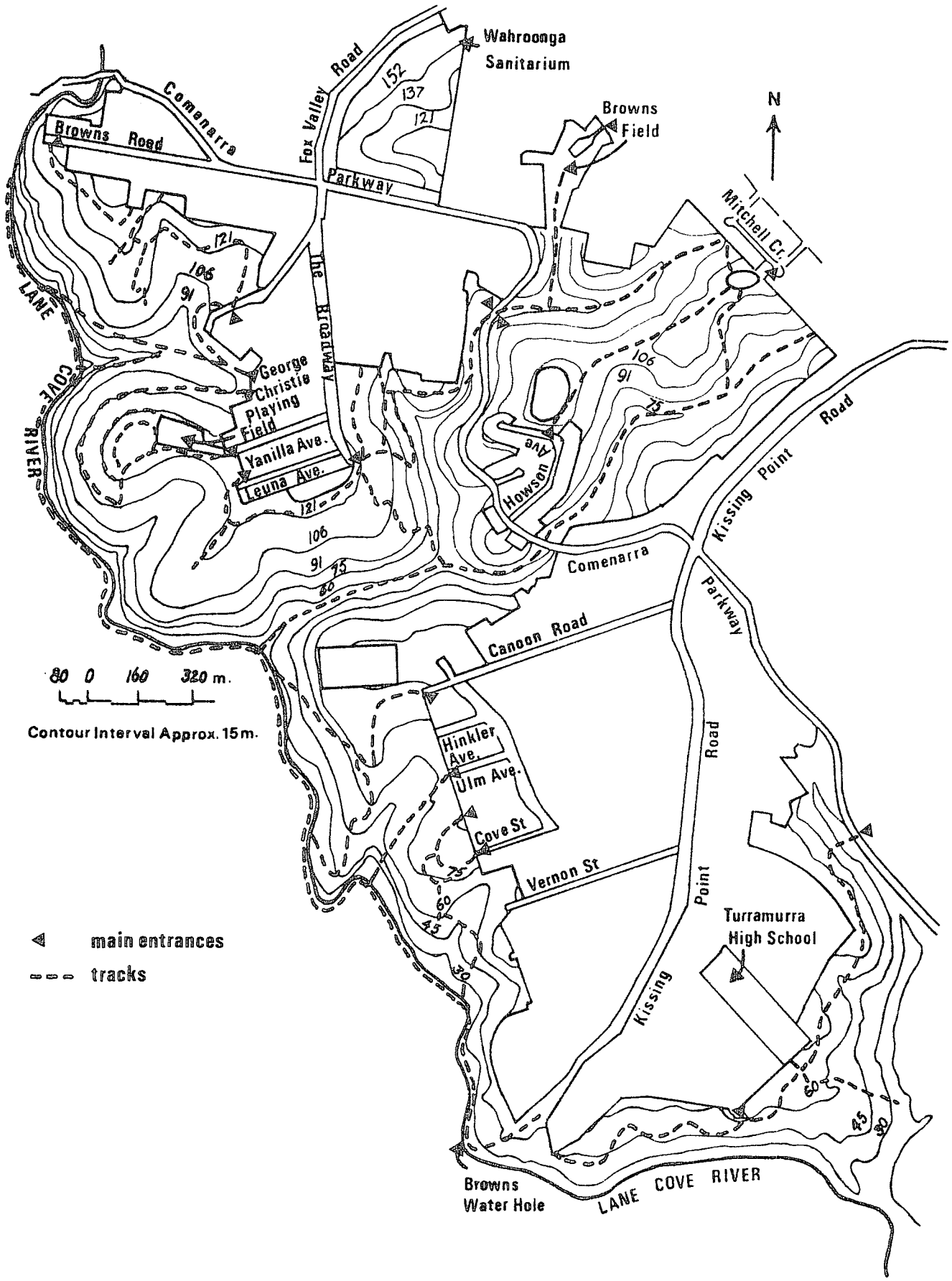
South Turramurra Bushland is an ideal adventure playground for children living nearby. No planner can provide such a diverse and exciting range of aids for imaginative games. Planning authorities often forget that children like to test their physical and mental skills in a wide range of activities – not just in competitive team games or on formal playing equipment.

The Bushland also provides a peaceful and beautiful environment for the more contemplative types of recreation by adults and children alike.

Many individualistic or small group activities such as picnicking, jogging, walking, photography and nature study are enhanced by natural bushland. South Turramurra is also ideally suitable for group activities such as walks.

2.3 ACTIVITIES TO BE DISCOURAGED

The following activities are to be discouraged because of their adverse effects on the bushland and because they interfere with other people's enjoyment of a diverse and peaceful environment.



MAP 5. SKETCH OF THE MAIN TRACKS

- (1) Powered vehicles, other than essential service vehicles, should not be permitted because they cause erosion, have high noise levels, may cause fires by emitting sparks and are a danger to walkers.
- (2) Horse-riding. This causes track erosion, introduces weeds and is a danger to walkers.
- (3) Cycling. This activity is only acceptable on service trails where it can cause minimal damage.
- (4) Hunting and firearms within the Bushland should be strictly prohibited.
- (5) Collection of fauna, flora and other natural materials such as rocks, soil, dead timber and leaf-litter for general purposes should be prohibited except for scientific and educational purposes. Permission must be sought from Council.
- (6) Rockclimbing that damages rock faces is unwelcome.
- (7) Orienteering and other intensive activities can cause damage to the bush.
- (8) Domestic Pets. These should only be allowed in the Bushland when under complete verbal or physical control.

2.4 ACCESS (Map 5)

External access is from numerous roads around the perimeter of the Bushland. No extra parking is necessary as parking is available in these roads and at Canoon Road, Howson Oval and George Christie Playing Field.

Internal access is by service roads and walking tracks. Service roads should be maintained to prevent erosion and any damage caused by the presence of these roads should be repaired with sensitivity. The S.T.E.P. walking track must be maintained by sympathetic use of hand tools.

2.5 UNCONSTRUCTED ROADS

The construction of roads, or the extension of roads, that are shown on the Ku-ring-gai Planning Scheme but are not yet constructed, should not proceed. All of these roads should be officially closed.



The Urban Fringe — Fraught with Problems
Note the Weeds, Pampas Grass and Willow.

2.6 FACILITIES

No facilities are required (e.g. rubbish bins, toilets, barbecue areas). All rubbish must be carried out.

Picnic fires must be lit in safe places and extinguished before they are left. All safety rules and fire bans must be strictly observed.

Signposting, in a discreet and aesthetic manner, on the main branches of the larger tracks is recommended.

2.7 PROTECTION

The area must be protected against all harmful factors that detract from its conservation, recreational, educational and aesthetic values.

Erosion

Increased run-off from urban areas has caused increased erosion and siltation of creeks. The present rapid entry of urban run-off into the bush should be slowed at the entry to the bush wherever possible, so that these problems are minimised.

The destruction of natural vegetation cover and the alteration of drainage patterns by the construction of service roads has resulted in erosion of the roads themselves and localised erosion and siltation of adjoining bushland. The appropriate bodies should minimise erosion and rectify in a sensitive way the damage which has already occurred. If necessary, damaged areas should be planted with species indigenous to South Turrumurra Bushland. Disused service roads should be blocked off and left to regenerate naturally.

Repetitive maintenance of service roads by heavy equipment should be discouraged because it generally makes the surface more liable to erosion.

Creek crossings of a ford type should be constructed where necessary to provide a firm base without impeding natural water flow.

Weeds

The three main types of areas that weed species commonly invade have been described in Section 1.7, and introduced species are listed in Appendix B.

It is recommended that South Turrumurra Bushland be weeded by the Bradley method as this is the only proven method. It is based on sound ecological principles and has been used successfully in many parts of Sydney. This method is the only one which emphasises minimal soil disturbance (disturbed soil favours weed

species) and careful retention of the native plants present as these are the plants that will regenerate. Small tools, usually only secateurs, trowel and knife are therefore used. The general principles to be followed are:-

- (1) working from good areas towards bad ones.
- (2) keeping the soil deeply mulched.
- (3) allowing regeneration to dictate the rate of clearing.

In South Turrumurra Bushland there are so many areas that would respond well to this method that it is difficult to set an exact order of priorities. Those areas least infested by weeds, e.g. ridges and upper valley sides, should be walked over periodically (once every 6 months to 2 years) and any observed weeds removed. A map and accurate records should be kept of date, area checked and species removed.

Those areas more weed infested but still with plenty of native plants should also be tackled. This includes the upper side of service trails near the valley floor, some areas near houses and some of the areas considered worthy of special protection. Simply because of the rarity of the plant community on the diatrema, it should receive high priority although it will need skilled bush regenerators to avoid damaging the site.

The heavily weed infested areas should not be touched until good bush immediately adjoins it. This may take many years but if the Bradley method is used these areas may regenerate. If mass clearing is used these areas will be covered with more diverse and denser weeds. It is therefore strongly recommended that mass clearing by poison or mechanical means **not** be undertaken in any of the Bushland.

Priorities for regeneration by the Bradley Method are therefore:-

- (1) The diatrema and immediately downstream.
- (2) The creek draining from between Cove and Vernon Streets.
- (3) The creek draining from between Yanilla and Leuna Avenues.
- (4) The closed-scrub in the vicinity of Canoon Road.
- (5) The upslope side of service roads along the creeks and valleys.

The dumping of garden refuse, rubbish and the planting of known plant nuisances by residents on the perimeter should be discouraged as they all increase the quantity of weeds in the Bushland.



Scribbly Gum with Heath Banksia

Pollution Control

All forms of pollution listed in Section 1.10 should be controlled wherever possible, as they decrease the conservation, recreational, educational and aesthetic values of South Turrumurra Bushland.

Fire

Fire is one of the most important factors influencing the appearance of the bush and the survival and abundance of plant and animal species.

The following fire control policy is therefore recommended.

- (1) The Bushland Management Committee of S.T.E.P. should be consulted before any decision is taken by Council to clear or burn in South Turrumurra Bushland.
- (2) There should be a fire protection system for reserve neighbours, as the residential area from Browns Road to the end of Kissing Point Road, is at the top of the fire vulnerable westerly-facing slope.
- (3) A firebreak approximately 30 metres wide should be provided at the Bushland boundary. The first 6 metres of the break should be constructed by trittering where the ground is suitable. For unsuitable ground, S.T.E.P. recommends that the area be treated by Selective Hand Clearing (Petersen, 1983) by Council, or by residents adjoining the reserve. Islands of native trees and shrubs could be retained if not a direct threat to houses.

Mowing by residents would also be permissible in this 6 metre strip. The remainder of the break (approximately 24 metres), should be maintained essentially as native bushland, with undergrowth progressively reduced towards the houses, and trees retained. The firebreak should be maintained as often as necessary to keep the fire hazard at an acceptable level.

- (4) The network of service trails is considered adequate for fire fighting purposes. No more should be constructed.
- (5) Residents should be educated about simple fire precautions both prior to a fire (i.e. no rubbish near or under the house) and during a fire. This education should be in the form of the excellent leaflet produced by Council, and each November Council should distribute it to residents on the Bushland verge. These residents should also be offered instruction in the use of simple fire-fighting tools such as McLeod tools and backpacks.

- (6) The combination of firebreaks and education will reduce panic and risk to property during wildfires.
- (7) S.T.E.P. is aware that fire is a factor of the environment, that the fuel load will increase and that the composition of the bush will change if fire is excluded permanently. Nevertheless, it has been observed that regeneration is poor and weed invasion is heavy if low-intensity, cool season control burning is employed in these small urban bushlands. Hot summer wildfires are bound to occur from time to time, and these both remove excess fuel and promote better regeneration of native plants. S.T.E.P. believes therefore, that low intensity control burning is contra-indicated and that reliance for protection should be placed on the measures referred to above.

2.8 STAFFING

Interested persons and groups should help in the management of the area. It is recommended that bush regeneration teams be financed by Council to weed the Bushland by the Bradley Method. The supervisors of the teams should be approved by the National Trust of Australia (N.S.W.) as they have had wide experience in this field. Supervisors must be responsible for team control and all decisions related to bush regeneration. Local residents should be encouraged to participate in these teams.

More rangers should be appointed so that areas such as South Turrumurra Bushland are patrolled more frequently. It is recommended that such rangers be capable of policing regulations, identifying areas of bushland that need remedial action, such as areas of erosion, and recommending to Council and interested groups sound and sensitive action in accordance with this Management Plan.

The appointment of Honorary Rangers should be considered by Council.

2.9 EDUCATION AND RESEARCH

Brochures about features of the area, care of the Bushland and information on tracks should be prepared and distributed by S.T.E.P.

The careful use of the area by primary, secondary and tertiary institutions should be encouraged. Any additional information discovered during educational use should be placed with Ku-ring-gai Council Information Librarian for public use.

Labels of an educational nature on selected sections of track should be considered.



Tall Blackbutts

2.10 FUTURE MANAGEMENT

Four options are presented:-

- (1) A Trust be formed.
- (2) The area be administered as a State Recreation Area.
- (3) A 530A Committee be formed in conjunction with Ku-ring-gai Council.
- (4) Council maintains the area in the short-term in full consultation with the S.T.E.P. Committee.

At the time of publication S.T.E.P. recommends the fourth option. In the long-term S.T.E.P. recommends that all the remaining bushland in the Lane Cove Valley be incorporated into a reserve for passive recreation and be managed as a whole by the National Parks and Wildlife Service.

2.11 ACTION PLAN

- (1) A bush regeneration programme should be implemented, based on the Bradley Method and financed by Council.
- (2) Leaflets should be prepared by S.T.E.P. about tracks and areas of interest, so that visitors' understanding of the area is enriched.
- (3) Rangers should be appointed by Council.
- (4) The S.T.E.P. track is to be maintained by S.T.E.P.
- (5) Signposts and labels are to be considered.

REFERENCES

- Adamson, D. (1977) 'Privet and the Problem of Control of Exotic Plants in Urban Bushland.' Submission to the Noxious Plants Advisory Commission of N.S.W.
- Adamson, D. and Buchanan, R. (1974) Exotic Plants in Urban Bushland in the Sydney Region. Proc. Weed. Soc. N.S.W. 6, 24-27.
- Becroft Cheltenham Civic Trust (1976) 'A Plan of Management for Pennant Hills Park and some Surrounding Bushland.'
- Bradley, J. (no date) 'Bush Regeneration.' Mosman Parklands and Ashton Park Association.
- Buchanan, R. (1978) 'The Impact of the Proposed Development of Land Canoon Road, South Turramurra on the Upper Lane Cove Valley.' (unpublished).
- Buchanan, R. (1979a) 'Mowbray Park. Description and Management.' Mowbray Park Preservation Society.
- Buchanan, R. (1979b) Edge Disturbance in Natural Areas. Aust. Parks and Recreation. August, 39-43.
- Cogger, Harold. (1979 - Revised Edition) 'Reptiles and Amphibians of Australia.' A.H. and A. W. Reed, Sydney
- Department of Science and the Environment (1979) 'Climatic Survey Sydney, Region 5, N.S.W.' Australian Government Publishing Service.
- Leigh, J; Briggs, J. and Hartley, W. 'Rare or Threatened Australian Plants' Australian National Parks and Wildlife Service, Special Publication(7) (1981).
- Nature Conservation Council of N.S.W. (1979) 'A Report on Urban Bushland in the Sydney Metropolitan Area. 2. Hornsby-Upper North Shore and Lane Cove Valley.'
- Petersen, H. (1983) 'Fire Hazard Reduction by Selective Hand Clearing' Willoughby Council, Urban Bushland Management Symposium, Speeches and Discussion.
- Shearer, W. G. and B. W. Jenkins (Eds.) (1979) 'Resource Book for Field Studies in the Ryde District.' Association for Environmental Education (N.S.W.) Sydney.



A Shady Rock Pool

- Specht, R. L. (1970) 'Vegetation.' In 'The Australian Environment.' Ed. G. W. Leeper. C.S.I.R.O. and Melbourne University Press, Melbourne.
- State Pollution Control Commission and Department of Education (no date) 'Lane Cove River as a Teaching Resource.'
- State Pollution Control Commission (1978) 'The North West Passage. Lane Cove River. Man and His Environment.'
- Stephens, S. S. (1978) 'The Impact of Man on the Mammals and Birds of the Lane Cove River Valley.' Prepared for the Australian National Parks and Wildlife Service. Environmental and Urban Studies Report No. 34, Macquarie University.
- Union of Lane Cove Valley Conservationists, (1983), 'Proposed Planning Policy for Lane Cove Valley.' Unpublished paper.

SUGGESTED READING - HISTORY

- Hornsby Historical Society (1979) 'Pioneers of Hornsby Shire.' Library of Australian History, Sydney.
- Ku-ring-gai Historical Society (1973) 'Ku-ring-gai. A Collection of Early Photographs in the Possession of the Society.'
- Ollif, L. (1973) 'There Must Be A River. History of the Shire of Hornsby.' Printed by Neo-Graphic Printing Co. Pty. Ltd.
- Russell, E. (1970) 'Lane Cove, 1788-1970. A North Shore History.' The Council of the Municipality of Lane Cove.
- Thorne, L. G. (1979) 'A History of North Shore Sydney, From 1788 to Today.' Angus and Robertson Publishers, Sydney.

APPENDIX A

NATIVE PLANT SPECIES RECORDED FROM SOUTH TURRAMURRA BUSHLAND
APRIL 1978 AND OCTOBER – NOVEMBER 1979

| PTERIDOPHYTA | MANAGEMENT PLAN AREA | WAHROONGA SANITARIUM LAND |
|------------------------------------|-------------------------|---------------------------------|
| Psilotaceae | | |
| <i>Psilotum nudum</i> | x | x |
| Schizaeaceae | | |
| <i>Schizaea bifida</i> | x | |
| Gleicheniaceae | | |
| <i>Gleichenia dicarpa</i> | x | |
| <i>G. microphylla</i> | x | |
| <i>Sticherus flabellatus</i> | x | |
| Hymenophyllaceae | | |
| <i>Hymenophyllum cupressiforme</i> | x | |
| Cyatheaceae | | |
| <i>Cyathea australis</i> | x | |
| <i>Culcita dubia</i> | x | x |
| Dennstaedtiaceae | | |
| <i>Pteridium esculentum</i> | x | x |
| <i>Histiopteris incisa</i> | x | |
| Lindsaeaceae | | |
| <i>Lindsaea linearis</i> | x | x |
| <i>L. microphylla</i> | x | x |
| Adiantaceae | | |
| <i>Adiantum aethiopicum</i> | x | x |
| <i>A. hispidulum</i> | x | |
| <i>A. silvaticum</i> | x | |
| <i>Cheilanthes tenuifolia</i> | x | x |
| <i>C. distans</i> | x | |
| Grammitidaceae | | |
| <i>Grammitis billardieri</i> | x | |
| Davalliaceae | | |
| <i>Davallia pyxidata</i> | x | |
| Aspidiaceae | | |
| <i>Polystichum australiense</i> | x | |
| Athyriaceae | | |
| <i>Athyrium australe</i> | x | |
| <i>A. japonicum</i> | x | |
| Aspleniaceae | | |
| <i>Asplenium flabellifolium</i> | x | |
| Blechnaceae | | |
| <i>Blechnum cartilagineum</i> | x | x |
| <i>B. ambiguum</i> | x | |
| <i>B. sp.</i> | x | |
| <i>Doodia aspera</i> | x | x |
| <i>D. caudata</i> | x | |

| | MANAGEMENT PLAN AREA | WAHROONGA SANITARIUM LAND |
|----------------------------------|-------------------------|---------------------------------|
| GYMNOSPERMAE | | |
| Podocarpaceae | | |
| Podocarpus spinulosus | x | |
| ANGIOSPERMAE | | |
| Dicotyledones | | |
| Monimiaceae | | |
| Wilkiea huegeliana | x | |
| Lauraceae | | |
| Cryptocarya glaucescens | x | |
| Cassythaceae | | |
| Cassytha pubescens | x | x |
| C. paniculata | x | |
| Ranunculaceae | | |
| Clematis aristata | x | x |
| Menispermaceae | | |
| Stephania japonica var. discolor | x | x |
| Sarcopetalum harveyanum | x | |
| Violaceae | | |
| Viola hederacea | x | |
| Polygalaceae | | |
| Comesperma ericinum | x | |
| C. defoliatum | x | |
| C. volubile | x | x |
| Tremandraceae | | |
| Tetratheca pilosa | x | |
| Droseraceae | | |
| Drosera spathulata | x | |
| D. peltata | x | |
| D. auriculata | x | |
| Oxalidaceae | | |
| Oxalis corniculata | x | |
| Geraniaceae | | |
| Geranium homeanum | x | x |
| Haloragaceae | | |
| Haloragis teucroides | x | x |
| Thymelaeaceae | | |
| Pimelia linifolia | x | |
| Proteaceae | | |
| Petrophile pulchella | x | |
| Isopogon anethifolius | x | |
| I. anemonifolius | x | |
| Conospermum longifolium | x | |
| Persoonia laurina | x | x |
| P. lanceolata | x | |
| P. levis | x | x |
| P. linearis | x | x |
| P. pinifolia | x | x |
| Banksia ericifolia | x | |

| | MANAGEMENT PLAN AREA | WAHROONGA SANITARIUM LAND |
|-----------------------------|-------------------------|---------------------------------|
| ANGIOSPERMAE (cont.) | | |
| Dicotyledones | | |
| Banksia spinulosa | x | x |
| B. marginata | x | |
| B. aspleniifolia | x | |
| B. serrata | x | |
| Hakea gibbosa | x | |
| H. sericea | x | x |
| H. propinqua | x | |
| H. teretifolia | x | |
| H. dactyloides | x | |
| H. salicifolia | x | |
| Grevillea buxifolia | x | |
| G. mucronulata | x | |
| G. speciosa | x | |
| G. sericea | x | |
| G. linearifolia | x | |
| Lomatia myricoides | x | |
| L. silaifolia | x | x |
| Telopea speciosissima | x | |
| Xylomelum pyriforme | x | x |
| Lambertia formosa | x | |
| Dilleniaceae | | |
| Hibbertia scandens | | x |
| H. dentata | x | |
| H. bracteata | x | |
| H. astrotricha | x | |
| H. spp. | | |
| Pittosporaceae | | |
| Pittosporum undulatum | x | x |
| P. revolutum | x | |
| Bursaria spinosa | x | x |
| Billardiera scandens | x | x |
| Passifloraceae | | |
| Passiflora herbertiana | x | |
| Hypericaceae | | |
| Hypericum japonicum | x | |
| Elaeocarpaceae | | |
| Elaeocarpus reticulatus | x | x |
| Sterculiaceae | | |
| Commersonia fraseri | x | |
| Lasiopetalum ferrugineum | x | x |
| Malvaceae | | |
| Pavonia hastata | x | |
| Euphorbiaceae | | |
| Poranthera microphylla | | x |
| P. ericifolia | x | |

| | MANAGEMENT PLAN AREA | WAHROONGA SANITARIUM LAND |
|--|-------------------------|---------------------------------|
|--|-------------------------|---------------------------------|

ANGIOSPERMAE (cont.)

Dicotyledones

| | | |
|--------------------------|---|---|
| Micrantheum ericoides | x | x |
| Phyllanthus thymoides | x | x |
| Ricinocarpos pinifolius | x | |
| Amperea xiphoclada | x | x |
| Breynia oblongifolia | x | |
| Glochidion ferdinandi | x | x |
| Omalanthus populifolius | x | x |
| Cunoniaceae | | |
| Callicoma serratifolia | x | x |
| Ceratopetalum gummiferum | x | |
| C. apetalum | x | |
| Schizomeria ovata | x | |
| Baueraceae | | |
| Bauera rubioides | x | |
| Rosaceae | | |
| Rubus hillii | x | |
| R. parvifolius | | x |
| Mimosaceae | | |
| Acacia ulicifolia | x | x |
| A. stricta | | x |
| A. myrtifolia | x | x |
| A. linifolia | x | x |
| A. suaveolens | x | x |
| A. oxycedrus | x | |
| A. longissima | x | |
| A. longifolia | x | x |
| A. floribunda | x | x |
| A. elata | x | |
| A. schinoides | x | |
| A. terminalis | x | |
| A. irrorata | x | |
| A. parramattensis | x | x |
| Papilionaceae | | |
| Gompholobium latifolium | x | |
| G. grandiflorum | x | |
| Daviesia ulicifolia | | x |
| Pultenaea daphnoides | x | x |
| P. retusa | | x |
| P. stipularis | x | |
| P. flexilis | x | x |
| P. elliptica | x | |
| Phyllota phyllicoides | x | |
| Dillwynia retorta | x | |
| Sphaerolobium vimineum | x | |
| Viminaria juncea | x | |

| | MANAGEMENT PLAN AREA | WAHROONGA SANITARIUM LAND |
|-----------------------------|-------------------------|---------------------------------|
| ANGIOSPERMAE (cont.) | | |
| Dicotyledones | | |
| Hovea linearis | x | x |
| H. longifolia | x | |
| Platylobium formosum | x | x |
| Bossiaea obcordata | x | x |
| B. heterophylla | x | |
| B. scolopendria | x | |
| Kennedia rubicunda | x | x |
| Hardenbergia violacea | x | x |
| Glycine sp. | x | x |
| Myrtaceae | | |
| Austromyrtus tenuifolia | x | |
| Acmena smithii | x | |
| Backhousia myrtifolia | x | |
| Syncarpia glomulifera | x | x |
| Tristania laurina | x | |
| Angophora hispida | x | |
| A. costata | x | x |
| A. bakeri | x | |
| Eucalyptus paniculata | | x |
| E. sieberi | x | |
| E. saligna | x | x |
| E. multicaulis | x | |
| E. haemastoma | x | |
| E. resinifera | | x |
| E. gummifera | x | x |
| E. squamosa | x | |
| E. pilularis | x | x |
| E. piperita | x | |
| Leptospermum attenuatum | x | x |
| L. flavescens | x | |
| L. juniperinum | x | |
| L. squarrosum | x | |
| L. arachnoides | x | |
| Kunzea capitata | x | |
| K. ambigua | x | |
| Callistemon salignus | x | |
| C. rigidus | x | |
| C. citrinus | x | |
| C. linearis | x | |
| Melaleuca nodosa | x | |
| M. hypericifolia | x | |
| Baeckea linifolia | x | |
| B. diosmifolia | x | |
| Darwinia biflora | x | |
| D. fascicularis | x | |

ANGIOSPERMAE (cont.)

Dicotyledones

| | | |
|-------------------------------|---|---|
| Casuarinaceae | | |
| <i>Casuarina torulosa</i> | x | x |
| <i>C. littoralis</i> | x | x |
| Ulmaceae | | |
| <i>Trema aspera</i> | | |
| Moraceae | | |
| <i>Ficus coronata</i> | x | |
| <i>F. rubiginosa</i> | x | |
| Celastraceae | | |
| <i>Maytenus silvestris</i> | x | x |
| Stackhousiaceae | | |
| <i>Stackhousia viminea</i> | x | |
| Rhamnaceae | | |
| <i>Pomaderris discolor</i> | x | x |
| <i>P. sp.</i> | x | |
| Vitaceae | | |
| <i>Cissus hypoglauca</i> | x | x |
| <i>C. antarctica</i> | x | |
| Santalaceae | | |
| <i>Leptomeria acida</i> | x | |
| Rutaceae | | |
| <i>Boronia ledifolia</i> | x | |
| <i>B. floribunda</i> | x | |
| <i>B. pinnata</i> | x | |
| <i>Ziera pilosa</i> | x | |
| <i>Z. smithii</i> | x | x |
| <i>Correa reflexa</i> | x | |
| <i>Phebalium dentatum</i> | x | |
| <i>Eriostemon myoporoides</i> | x | |
| Meliaceae | | |
| <i>Synoum glandulosum</i> | x | |
| Sapindaceae | | |
| <i>Dodonaea triquetra</i> | x | x |
| Araliaceae | | |
| <i>Astrotricha latifolia</i> | x | |
| <i>Polyscias sambucifolia</i> | x | x |
| Umbelliferae | | |
| <i>Actinotus helianthi</i> | x | |
| <i>A. minor</i> | x | |
| <i>Centella asiatica</i> | x | x |
| <i>Hydrocotyle acutiloba</i> | x | |
| <i>Platysace linearifolia</i> | x | |
| <i>P. lanceolata</i> | x | x |
| <i>Xanthosia tridentata</i> | x | |
| <i>X. pilosa</i> | x | x |

ANGIOSPERMAE (cont.)

Dicotyledones

Epacridaceae

| | | |
|-------------------------------|---|---|
| <i>Styphelia triflora</i> | x | |
| <i>Astroloma humifusum</i> | | x |
| <i>Brachyloma daphnoides</i> | x | |
| <i>Monotoca scoparia</i> | x | |
| <i>Leucopogon lanceolatus</i> | x | x |
| <i>L. microphyllus</i> | x | |
| <i>L. ericoides</i> | x | |
| <i>L. juniperinus</i> | | x |
| <i>Acrotriche divaricata</i> | x | |
| <i>Trochocarpa laurina</i> | x | |
| <i>Epacris longiflora</i> | x | |
| <i>E. microphylla</i> | x | |
| <i>E. pulchella</i> | x | |
| <i>Woolfsia pungens</i> | x | |
| <i>Dracophyllum secundum</i> | x | |

Loganiaceae

| | | |
|------------------------------|---|--|
| <i>Logania albiflora</i> | x | |
| <i>Mitrasacme polymorpha</i> | x | |

Oleaceae

| | | |
|----------------------------|---|--|
| <i>Notelaea longifolia</i> | x | |
|----------------------------|---|--|

Apocynaceae

| | | |
|----------------------------|---|--|
| <i>Parsonsia straminea</i> | x | |
|----------------------------|---|--|

Asclepiadaceae

| | | |
|-----------------------------|---|---|
| <i>Marsdenia suaveolens</i> | x | |
| <i>Tylophora barbata</i> | x | x |

Rubiaceae

| | | |
|----------------------------|---|---|
| <i>Morinda jasminoides</i> | x | x |
| <i>Pomax umbellata</i> | x | |
| <i>Opercularia aspera</i> | x | x |

Myrsinaceae

| | | |
|---------------------------|---|--|
| <i>Rapanea variabilis</i> | x | |
|---------------------------|---|--|

Campanulaceae

| | | |
|-------------------------|---|--|
| <i>Wahlenbergia sp.</i> | x | |
|-------------------------|---|--|

Lobeliaceae

| | | |
|----------------------------|---|---|
| <i>Pratia purpurascens</i> | x | x |
|----------------------------|---|---|

Stylidiaceae

| | | |
|--------------------------------|---|--|
| <i>Stylidium graminifolium</i> | x | |
| <i>S. lineare</i> | x | |

Goodeniaceae

| | | |
|---------------------------------|---|---|
| <i>Goodenia stelligera</i> | x | |
| <i>G. dimorpha var dimorpha</i> | x | |
| <i>G. hederacea</i> | x | |
| <i>G. heterophylla</i> | x | x |
| <i>Scaevola ramosissima</i> | x | |
| <i>Dampiera stricta</i> | x | |

ANGIOSPERMAE (cont.)

Dicotyledones

Compositae

| | | |
|---------------------|---|---|
| Olearia microphylla | x | |
| O. tomentosa | x | |
| Senecio lautus | x | |
| Cassinia uncata | x | |
| C. aculeata | x | x |
| C. denticulata | x | x |
| Helichrysum elatum | x | |
| H. scorpioides | | x |

Convolvulaceae

| | | |
|-----------------|--|---|
| Dicondra repens | | x |
|-----------------|--|---|

Bignoniaceae

| | | |
|--------------------|---|---|
| Pandorea pandorana | x | x |
|--------------------|---|---|

Acanthaceae

| | | |
|---------------------------|---|---|
| Brunoniella sp. | | x |
| Pseuderanthemum variabile | x | x |

Verbenaceae

| | | |
|-------------------------|---|--|
| Clerodendrum tomentosum | x | |
|-------------------------|---|--|

Lamiatae

| | | |
|--------------------|---|--|
| Hemigenia purpurea | x | |
|--------------------|---|--|

Monocotyledones

Liliaceae

| | | |
|------------------------------|---|---|
| Blandfordia nobilis | x | |
| Thysanotus tuberosus | x | |
| Caesia parviflora | x | |
| Dianella caerulea | x | x |
| Dianella revoluta (glaucous) | x | |
| Stypandra caespitosa | x | |
| Tricoryne simplex | x | |
| Laxmannia gracilis | x | |
| Burchardia umbellata | x | |

Smilacaceae

| | | |
|--------------------|---|---|
| Smilax glycyphylla | x | x |
| S. australis | x | x |

Philesiaceae

| | | |
|-----------------------|---|---|
| Eustrephus latifolius | x | x |
|-----------------------|---|---|

Iridaceae

| | | |
|--------------------|---|--|
| Patersonia sericea | x | |
| P. glabrata | x | |

Xanthorrhoeaceae

| | | |
|----------------------|---|---|
| Xanthorrhoea arborea | x | x |
| X. media | x | x |
| Lomandra gracilis | x | |
| L. longifolia | x | x |
| L. obliqua | x | x |

| | MANAGEMENT PLAN AREA | WAHROONGA SANITARIUM LAND |
|-----------------------------------|-------------------------|---------------------------------|
| ANGIOSPERMAE (cont.) | | |
| Moncotyledones | | |
| L. glauca | x | |
| L. multiflora | x | x |
| Haemodoraceae | | |
| Haemodorum planifolium | x | |
| Typhaceae | | |
| Typha sp. | x | |
| Palmae | | |
| Livistona australis | x | |
| Orchidaceae | | |
| Thelymitra ixioides | x | |
| T. pauciflora | x | |
| Calochilus robertsonii | x | x |
| Diuris aurea | x | |
| Orthoceras strictum | x | |
| Prasophyllum elatum | x | |
| P. woollsii | x | |
| Caleana major | x | x |
| Paracaleana minor | x | |
| Acianthus caudatus | x | |
| A. exsertus | x | |
| A. fornicatus | x | |
| Eriochilus cucullatus | x | |
| Lyperanthus suaveolens | x | |
| Caladenia carnea | x | |
| C. testacea | x | |
| Glossodia major | x | |
| Corybas aconitiflorus | x | |
| C. unguiculatus | x | |
| Cryptostylis erecta | x | |
| C. subutata | x | |
| Pterostylis nutans | x | |
| P. acuminata | x | |
| P. curta | x | |
| P. pedunculata | x | |
| P. grandiflora | x | |
| P. obtusa | x | |
| P. longifolia | x | |
| Spiranthes sinensis ssp australis | x | |
| Dendrobium linguiforme | x | |
| Dipodium punctatum | x | |
| Cymbidhum suave | x | |

MANAGEMENT
PLAN AREA

WAHROONGA
SANITARIUM
LAND

ANGIOSPERMAE (cont.)

Moncotyledones

Restionaceae

Lepyrodia scariosa

x

Empodisma minor

x

Cyperaceae

Cyathochaeta diandra

x

Ptilantherium deustum

x

Lepidosperma laterale

x

x

Gahnia sp.

x

x

Caustis flexuosa

x

C. pentandra

x

Gramineae

Echinopogon caespitosa

x

Entolasia stricta

x

x

Oplismenus sp.

x

x

Imperata cylindrica

x

x

Themeda australis

x

APPENDIX B

WEED SPECIES RECORDED FROM SOUTH TURRAMURRA BUSHLAND
APRIL 1978 AND OCTOBER – NOVEMBER 1979

| | MANAGEMENT PLAN AREA | WAHROONGA SANITARIUM LAND |
|-------------------------------------|-------------------------|---------------------------------|
| PTERIDOPHYTA | | |
| Oleandraceae | | |
| <i>Nephrolepis cordifolia</i> | x | |
| ANGIOSPERMAE | | |
| Dicotyledones | | |
| Lauraceae | | |
| <i>Cinnamomum camphora</i> | x | x |
| Ranunculaceae | | |
| <i>Ranunculus repens</i> | x | |
| Cruciferae | | |
| <i>Rorippa nasturtium-aquaticum</i> | x | |
| Polygonaceae | | |
| <i>Rumex sagittatus</i> | x | |
| <i>Polygonum capitatum</i> | x | |
| Oxalidaceae | | |
| <i>Oxalis</i> sp. | x | |
| Tropaeolaceae | | |
| <i>Tropaeolum majus</i> | x | |
| Passifloraceae | | |
| <i>Passiflora edulis</i> | x | x |
| Ochnaceae | | |
| <i>Ochna serrulata</i> | x | x |
| Malvaceae | | |
| <i>Sida rhombifolia</i> | x | |
| Rosaceae | | |
| <i>Duchesnea indica</i> | x | |
| <i>Rubus vulgaris</i> | x | x |
| <i>R. roribaccus</i> | | x |
| <i>Pyracantha angustifolia</i> | x | |
| <i>Cotoneaster glaucophylla</i> | x | |
| Caesalpiniaceae | | |
| <i>Cassia</i> sp. | x | |
| Papilionaceae | | |
| <i>Teline monospeulana</i> | | |
| <i>Vicia tetrasperma</i> | | |
| Salicaceae | | |
| <i>Salix babylonica</i> | x | |
| Moraceae | | |
| <i>Morus</i> sp. | x | |
| Sapindaceae | | |
| <i>Cardiospermum grandiflorum</i> | x | |

| ANGIOSPERMAE (cont.) | MANAGEMENT PLAN AREA | WAHROONGA SANITARIUM LAND |
|-------------------------------------|-------------------------|---------------------------------|
| Dicotyledones | | |
| Anacardiaceae | | |
| Rhus succedanea | x | |
| Umbelliferae | | |
| Hydrocotyle bonariensis | x | |
| Oleaceae | | |
| Olea africana | x | x |
| Ligustrum lucidum | x | |
| L. sinense | x | x |
| Apocynaceae | | |
| Nerium sp. | x | |
| Caprifoliaceae | | |
| Lonicera japonica | x | |
| Plantaginaceae | | |
| Plantago lanceolata | x | x |
| Asteraceae | | |
| Eupatorium adenophorum | x | x |
| E. riparium | x | |
| Conyza floribundus | x | |
| Bidens pilosa | x | x |
| Coreopsis lanceolata | x | |
| Senecio mikanioides | x | |
| Chrysanthemoides moniliferum | | x |
| Hypochoeris radicata | x | x |
| Solanaceae | | |
| Solanum mauritianum | x | |
| Convolvulaceae | | |
| Ipomoea indica | x | |
| Acanthaceae | | |
| Thunbergia alata | x | |
| Verbenaceae | | |
| Verbena bonariensis | x | |
| Lantana camara | x | x |
| Monocotyledones | | |
| Commelinaceae | | |
| Tradescantia albiflora | x | |
| Liliaceae | | |
| Asparagus densiflorus cv. sprengeri | x | |
| Gramineae | | |
| Cortaderia selloana | x | |
| Cynodon dactylon | x | |
| Paspalum dilatatum | x | |
| Pennisetum clandestinum | x | |
| Andropogon virginicus | x | |
| Zingiberaceae | | |
| Hedychium gardnerianum | x | |

APPENDIX C

LIST OF COMMON PLANT NAMES

| | | |
|--------------------------------|---|------------------------|
| <i>Acacia irrorata</i> | | Blue-skin |
| <i>A. stricta</i> | | Straight Wattle |
| <i>Acmena smithii</i> | | Lillypilly |
| <i>Actinotus minor</i> | - | Lesser Flannel Flower |
| <i>Angophora costata</i> | - | Smooth-barked Apple |
| <i>Astroloma humifusum</i> | - | Cranberry Heath |
| <i>Baeckia linifolia</i> | - | Flax-leaf Heath-myrtle |
| <i>Banksia ericifolia</i> | - | Heath Banksia |
| <i>Bursaria spinosa</i> | - | Blackthorn |
| <i>Callistemon citrinus</i> | - | Crimson Bottle-brush |
| <i>Casuarina littoralis</i> | - | Black She-oak |
| <i>Ceratopetalum apetalum</i> | - | Coachwood |
| <i>Doryphora sassafras</i> | - | Sassafras |
| <i>Drosera spathulata</i> | - | Rosy Sundew |
| <i>Eucalyptus haemastoma</i> | - | Scribbly Gum |
| <i>E. paniculata</i> | - | Grey Ironbark |
| <i>E. pilularis</i> | - | Blackbutt |
| <i>E. piperita</i> | - | Sydney Peppermint |
| <i>E. resinifera</i> | - | Red Mahogany |
| <i>E. saligna</i> | - | Sydney Blue Gum |
| <i>E. sieberi</i> | - | Black Ash |
| <i>Ficus coronata</i> | - | Sandpaper Fig |
| <i>Gleichenia dicarpa</i> | - | Pouched Coral-fern |
| <i>Goodenia heterophylla</i> | - | Variable Goodenia |
| <i>Hibbertia scandens</i> | - | Guinea Flower |
| <i>Leptospermum flavescens</i> | - | Yellow Tea-Tree |
| <i>Poranthera microphylla</i> | - | Small Poranthera |
| <i>Rubus parvifolius</i> | - | Native Raspberry |
| <i>Schizomeria ovata</i> | - | White Cherry |
| <i>Syncarpia glomulifera</i> | - | Turpentine |
| <i>Trema aspera</i> | - | Native Peach |

APPENDIX D

LIST OF BIRDS IN THE SOUTH TURRAMURRA AREA - UPPER LANE COVE RIVER VALLEY

| BIRD | HABITAT | COMMENTS |
|------------------------------|--------------------------------|---|
| 1. Australian Little Grebe | Avondale Dam | Not recorded on the River above De Burgh's Bridge. |
| 2. Little Pied Cormorant | Waterholes | Recorded overhead |
| 3. Pied Cormorant | Waterholes | Recorded overhead |
| 4. Little Black Cormorant | Waterholes | Recorded overhead |
| 5. White-necked Heron | Shallow water | A rare visitor |
| 6. White-faced Heron | Shallow water | Rare breeding resident |
| 7. White Egret | Shallow water | Recorded overhead |
| 8. Nankeen Night Heron | Creek vegetation | Rare |
| 9. White Ibis | Mud & shallow water | A rare visitor |
| 10. Black Swan | Large ponds | Rare, not found in natural pools above Bridge |
| 11. Black Duck | Waterholes | Common breeding resident |
| 12. Mallard | Waterholes | Uncommon |
| 13. Chestnut Teal | Avondale Dam | Not found in natural pools above De Burgh's Bridge |
| 14. Wood Duck | Avondale Dam | Not found in natural pools above De Burgh's Bridge |
| 15. Black-shouldered Kite | Open grass with sparse timber | Uncommon breeding resident |
| 16. Crested Hawk | Forest | Uncommon visitor |
| 17. Brown Goshawk | Forest | Uncommon visitor |
| 18. Little Eagle | Forest | Uncommon visitor |
| 19. White-breasted Sea-eagle | Estuaries, rivers | Uncommon, formerly bred in vicinity of Avondale Dam |
| 20. Little Falcon | Forest near creeks | Uncommon |
| 21. Peregrine Falcon | Usually associated with cliffs | Rare |
| 22. Nankeen Kestrel | Grass & light timber | Uncommon visitor |

| | | |
|---------------------------------|-------------------------------------|---|
| 23. Brown Quail | Grass | Uncommon |
| 24. Dusky Moorhen | Shallow water | Uncommon resident |
| 25. Swamphen | Shallow water | Rare visitor from downstream |
| 26. Coot | Waterholes | Uncommon |
| 27. Masked Plover | Grassland | Common breeding resident |
| 28. Black-fronted Dotterel | Muddy edges of dams and swamps | Accidental |
| 29. Topknot Pigeon | Rainforest | Rare visitor |
| 30. White-headed Pigeon | Rainforest | Uncommon visitor |
| 31. Domestic Pigeon | Common visitor overhead | Exotic species |
| 32. Brown Pigeon | Rainforest edge | Uncommon visitor |
| 33. Spotted Turtle Dove | Chiefly suburban also bushland | Common breeding resident |
| 34. Peaceful Dove | Woodland and open forest | Uncommon breeding resident |
| 35. Green-winged Pigeon | Rainforest | Very rare visitor |
| 36. Common Bronzewing | Open forest floor | Rare visitor |
| 37. Brush Bronzewing | Dense vegetation in deep gullies | Rare visitor |
| 38. Wonga Pigeon | Rainforest and ridges | Rare visitor |
| 39. Rainbow Lorikeet | Forest | Common breeding resident |
| 40. Scaly-breasted Lorikeet | Forest | Uncommon visitor |
| 41. Musk Lorikeet | Forest | Uncommon visitor |
| 42. Little Lorikeet | Forest | Uncommon visitor |
| 43. Gang-gang Cockatoo | Forest | Rare breeding resident |
| 44. Sulphur-crested Cockatoo | Forest | Common breeding resident, population increasing fast. |
| 45. Galah | Grassland and forest | Common breeding resident |
| 46. Cockatiel | Grass and woodland | Uncommon, probably aviary escapee |
| 47. Princess Parrot | Grassland and forest along water | Aviary escapee |
| 48. King Parrot | Forest | Uncommon breeding resident |

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|-----------------------------|---------------------------------|---|
| 49. Crimson Rosella | Forest | Common breeding resident |
| 50. Eastern Rosella | Forest | Common breeding resident |
| 51. Port Lincoln Parrot | Woodland | Rare, aviary escapee |
| 52. Oriental Cuckoo | Open-forest | Very rare visitor |
| 53. Pallid Cuckoo | Woodland | Migrant, now rare |
| 54. Brush Cuckoo | Forest | Uncommon migrant |
| 55. Fan-tailed Cuckoo | Woodland and forest | Common breeding resident |
| 56. Horsfield Bronze Cuckoo | Forest | Uncommon breeding migrant |
| 57. Golden Bronze Cuckoo | Forest | Common breeding resident |
| 58. Koel | Rainforest and thick vegetation | Common migrant, often near houses |
| 59. Boobook Owl | Forest | Common breeding resident |
| 60. Barking Owl | Forest | Uncommon breeding resident |
| 61. Powerful Owl | Deep Gullies | Rare breeding resident |
| 62. Barn Owl | Open woodland | Uncommon |
| 63. Sooty Owl | Dense forest | Rare, probably accidental |
| 64. Tawny Frogmouth | Forest | Common breeding resident |
| 65. White-throated Nightjar | Woodland and dry ridges | Uncommon |
| 66. Spine-tailed Swift | Aerial, over undulations | Common migrant |
| 67. Fork-tailed Swift | Aerial | Uncommon, occurs in flocks with previous sp. |
| 68. Azure Kingfisher | Larger pools along River | Uncommon |
| 69. Laughing Kookaburra | Forest and woodland | Common, needs termite nests and tree hollows for breeding |
| 70. Sacred Kingfisher | Forest and woodland | Common, needs termite nests and tree hollows for breeding |
| 71. Dollar Bird | Forest and woodland | Common migrant. Needs nesting hollows |

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| 72. Welcome Swallow | Avoids forest | Common, breeding |
| 73. Magpie-lark | Open-forest | Less common than previously Breeding resident |
| 74. Black-faced Cuckoo-shrike | Forest and woodland | Common breeding resident |
| 75. Little Cuckoo-shrike | Forest and woodland | Uncommon breeding resident |
| 76. Cicada-bird | Forest | Uncommon breeding migrant |
| 77. Red-wiskered Bul-bul | Forest, thick creekside vegetation | Common breeding exotic |
| 78. Blackbird | Closed forest, thick creekside vegetation | Uncommon exotic |
| 79. Eastern Whipbird | Lower levels of forest. in gullies | Common breeding resident |
| 80. Superb Blue Wren | Forest, lower levels. and heath | Common breeding resident |
| 81. Variegated Wren | Forest, lower levels and heath, woodland | Common breeding resident |
| 82. Golden-headed Cisticola | Grassland and rank vegetation | Uncommon, associated with old farming land |
| 83. White-throated Warbler | Forest and woodland | Common migrant |
| 84. Brown Warbler | Forest along watercourses | Common breeding resident |
| 85. Little Thornbill | Forest and woodland | Uncommon visitor |
| 86. Striated Thornbill | Forest | Common breeding resident |
| 87. Brown Thornbill | Lower levels of forest | Common breeding resident |
| 88. White-browed Scrub-wren | Lower levels of forest | Common breeding resident |
| 89. Scarlet Robin | Forest | Rare visitor |
| 90. Rose Robin | Forest | Uncommon visitor |
| 91. Southern Yellow Robin | Forest, gardens | Common breeding resident |
| 92. Grey Fantail | Forest, woodland | Common breeding resident |
| 93. Rufous Fantail | Closed forest, thick vegetation near water | Uncommon migrant |
| 94. Willie Wagtail | Avoids rainforest | Common breeding resident |

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|--------------------------------|----------------------------|---|
| 95. Leaden Flycatcher | Forest, woodland | Uncommon migrant |
| 96. Satin Flycatcher | Forest, woodland | Uncommon migrant |
| 97. Black-faced Flycatcher | Closed-forest and gullies | Uncommon migrant |
| 98. Rufous Whistler | Open-forest and woodland | Common breeding migrant |
| 99. Golden Whistler | Closed-forest, rainforest | Common breeding resident |
| 100. Grey Shrike-thrush | Forest and woodland | Common breeding resident. Nests in hollows |
| 101. Eastern Shrike-tit | Forest | Uncommon breeding resident |
| 102. Orange-winged Sittella | Forest | Uncommon breeding resident |
| 103. White-browed Tree-creeper | Forest | Common breeding resident. Nests in hollows |
| 104. Mistletoe-bird | Forest | Uncommon visitor |
| 105. Spotted Pardalote | Forest and woodland canopy | Common breeding resident |
| 106. Striated Pardalote | Forest canopy | Uncommon breeding resident |
| 107. Grey-breasted Silvereye | Heath and forest | Common breeding resident and seasonal migrant |
| 108. Eastern Spinebill | Heath, woodland and forest | Common breeding resident |
| 109. Lewin Honeyeater | Closed-forest | Uncommon breeding resident |
| 110. White-eared Honeyeater | Heath and open forest | Uncommon breeding resident |
| 111. Yellow-tufted Honeyeater | Woodland and open forest | Uncommon |
| 112. Yellow-faced Honeyeater | Heath, woodland and forest | Common breeding resident, migrating flocks |
| 113. Brown-headed Honeyeater | Woodland and forest | Uncommon visitor |
| 114. White-naped Honeyeater | Woodland and open forest | Uncommon migrant |
| 115. Noisy Friarbird | Open forest and woodland | Uncommon |
| 116. New Holland Honeyeater | Heath and woodland | Common breeding resident |

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| 117. White-cheeked Honeyeater | Heath and woodland | Common breeding resident |
| 118. Tawny-crowned Honeyeater | Heath | Uncommon |
| 119. Noisy Miner | Woodland and open forest | Common breeding resident |
| 120. Little Wattlebird | Heath and open forest | Common breeding resident |
| 121. Red Wattlebird | Open forest | Common breeding resident |
| 122. Red-browed Finch | Forest understorey and grassy areas | Common breeding resident |
| 123. Double-bar Finch | Grassy woodland | Uncommon |
| 124. House Sparrow | Near houses and cultivation | Common breeding resident |
| 125. Goldfinch | Gardens and overgrown farmland | Rare visitor, exotic |
| 126. English Starling | Gardens and cultivation | Common breeding resident, exotic |
| 127. Indian Mynah | Gardens and cultivation | Common breeding resident, exotic |
| 128. Olive-backed Oriole | Forest and woodland | Common, breeding |
| 129. Spangled Drongo | Forest | Uncommon migrant |
| 130. White-browed Wood-swallow | Woodland | Rare |
| 131. Dusky Wood-swallow | Forest and woodland | Rare |
| 132. Grey Butcher-bird | Forest | Common breeding resident |
| 133. Black-backed Magpie | Open timber and gardens | Common breeding resident |
| 134. Pied Currawong | Forest and wooded gardens | Common breeding resident |
| 135. Satin Bower-bird | Rainforest and closed- forest | Uncommon breeding resident |
| 136. Australian Raven | Forest and woodland | Common breeding resident |
| 137. Little Raven | Woodland | Rare and probably accidental |

1985 ADDENDA TO APPENDIX D

| | | | |
|------|------------------------------|------------------------|-------------------------------------|
| 3A | Black Cormorant | Avondale Dam | Rare visitor |
| 6A | Cattle Egret | Grass and light timber | Rare visitor |
| 7A | Plumed Egret | Flooded grassland | Rare visitor |
| 9A | Straw-necked Ibis | Grassland | Rare visitor |
| 23A | Banded Landrail | Swamp and watercourses | Rare resident |
| 37A | Crested Pigeon | Chiefly suburban | Uncommon breeding resident |
| 42A | Yellow-tailed Cockatoo | Forest | Uncommon winter visitor |
| 45A | Long-billed Corella | Forest and gardens | Rare aviary escapee |
| 45B | Little Corella | Forest and gardens | Aviary escapee probably breeding |
| 45C | Major Mitchell's Cockatoo | Forest and gardens | Rare aviary escapee |
| 48A | Superb Parrot | Forest and gardens | Rare aviary escapee |
| 50A | Red-rumped Parrot | Grassland | Aviary escapee |
| 58A | Channel-billed Cuckoo | Forest | Uncommon migrant |
| 72A | Tree Martin | Forest | Uncommon visitor |
| 72B | Australian Pipit | Grassland | Uncommon breeding resident |
| 76A | White-winged Triller | Woodland | Rare breeding migrant |
| 82A | Rufous Songlark | Grass and woodland | Rare migrant |
| 82B | Brown Songlark | Grass and woodland | Rare migrant |
| 87A | Yellow-tailed Thornbill | Grass and woodland | Uncommon breeding resident |
| 88A | Flame Robin | Woodland and forest | Rare migrant |
| 89A | Red-capped Robin | Woodland | Rare visitor |
| 91A | Brown Flycatcher | Woodland | Rare resident |
| 96A | Restless Flycatcher | Grass and Woodland | Rare visitor |
| 108A | Scarlet Honeyeater | Forest | Rare visitor |
| 111A | White-plumed Honeyeater | Woodland | Uncommon resident |
| 123A | Spice Finch | Grassland | Uncommon |
| 128A | Southern Figbird | Forest | Rare Visitor |

APPENDIX E

REPTILES AND AMPHIBIANS

AMPHIBIANS

Family: *Leptodactylidae* (Southern frogs)

| | |
|---------------------------------|-----------------------------------|
| <i>Heleioporus australiacus</i> | (Giant Burrowing Frog) |
| <i>Limnodynastes dumerilii</i> | (Eastern Banjo Frog) |
| <i>L. peronii</i> | (Brown-striped Frog) ('duc' call) |
| * <i>L. tasmaniensis</i> | (Spotted Grass Frog) |
| <i>Pseudophryne australis</i> | (Red-crowned Toadlet) |
| <i>P. bibronii</i> | (Brown Toadlet) |
| <i>Ranidella signifera</i> | (Common Eastern Froglet) |

Family: *Hylidae* (Tree frogs)

| | |
|------------------------|---|
| * <i>Litoria aurea</i> | (Green and Golden Bell Frog) ¹ |
| <i>L. caerulea</i> | (Green Tree Frog) |
| * <i>L. citropa</i> | (Blue Mountains Tree Frog) |
| <i>L. dentata</i> | (Bleating Tree Frog) |
| <i>L. fallax</i> | (Eastern Dwarf Tree Frog) |
| * <i>L. freycineti</i> | (Freycinet's Frog) |
| * <i>L. lesueurii</i> | (Lesueur's Frog) |
| <i>L. peronii</i> | (Peron's Tree Frog) |
| <i>L. phyllochroa</i> | (Leaf Green Tree Frog) |
| <i>L. verreauxii</i> | (Verreaux' Frog) |

REPTILES

Family: *Chelidae* (Side-necked turtles)

| | |
|------------------------------|------------------------------------|
| <i>Chelodina longicollis</i> | (Eastern Snake-necked Turtle) |
| <i>Emydura</i> sp. | (Short-necked Turtle) ² |

Family: *Gekkonidae* (Geckos)

| | |
|--------------------------------|------------------------------|
| <i>Diplodactylus vittatus</i> | (Wood Gecko) |
| <i>Oedura lesueurii</i> | (Lesueur's Velvet Gecko) |
| <i>Phyllurus platurus</i> | (Southern Leaf-tailed Gecko) |
| <i>Underwoodisaurus millii</i> | (Thick-tailed Gecko) |

Family: *Pygopodidae* (Legless or snake lizards)

| | |
|--------------------------|-------------------------|
| <i>Lialis burtonis</i> | (Burton's Snake-lizard) |
| <i>Pygopus lepidopus</i> | (Common Scaly-foot) |

Family: Agamidae (Dragons)

| | |
|-------------------------------|---|
| <i>Pogona babata</i> | (Eastern Bearded Dragon or Jew Lizard) |
| <i>A. muricatus</i> | (Jacky Lizard) |
| <i>Physignathus lesueurii</i> | (Eastern Water Dragon) |

Family: Varanidae (Goannas)

| | |
|-----------------------|----------------------------------|
| <i>Varanus varius</i> | (Lace Monitor or Lace Goanna) |
|-----------------------|----------------------------------|

Family: Scincidae (Skinks)

| | |
|---------------------------------|-------------------------------------|
| <i>Cryptoblepharus virgatus</i> | (Eastern Snake-eyed Skink) |
| <i>Ctenotus robustus</i> | (no widely accepted common name) |
| <i>C. taeniolatus</i> | (Copper-tailed Skink) |
| <i>Egernia cunninghami</i> | (Cunningham's Skink) |
| <i>E. whitii</i> | (White's Skink) |
| <i>Lampropholis delicata</i> | (Common garden Skinks) |
| <i>L. guichenoti</i> | (Common garden Skinks) |
| <i>L. mustelina</i> | (Weasel Skink) |
| <i>Leiopisma platynotum</i> | (Red-throated Skink) |
| <i>Saiphos equalis</i> | (Three-toed Skink) |
| <i>Sphenomorphus quoyii</i> | (Eastern Water Skink) |
| <i>Tiliqua scincoides</i> | (Eastern Blue-tongue) |

Family: Typhlopidae (Blind snakes)

| | |
|----------------------------------|---------------|
| <i>Ramphotyphlops nigrescens</i> | (Blind Snake) |
|----------------------------------|---------------|

Family: Boidae (Boas and Pythons)

| | |
|---------------------------|---------------------------|
| * <i>Morelia spilotes</i> | (Diamond Snake or Python) |
|---------------------------|---------------------------|

Family: Colubridae (Colubrid Snakes)

| | |
|---------------------------------|--------------------|
| <i>Boiga irregularis</i> | (Brown Tree Snake) |
| <i>Dendrelaphis punctulatus</i> | (Green Tree Snake) |

Family: Elapidae (Elapid Snakes - Cobras, Mambas, etc.)

| | |
|----------------------------------|-----------------------------|
| * <i>Acanthophis antarcticus</i> | (Death Adder) |
| <i>Cacophis squamulosus</i> | (Golden-crowned Snake) |
| * <i>Cryptophis nigrescens</i> | (Small-eyed Snake) |
| <i>Furina diadema</i> | (Red-naped Snake) |
| <i>Hemiaspis signata</i> | (Black-bellied Swamp Snake) |

- | | | |
|---|---|---|
| * | <p><i>Notechis scutatus</i></p> <p><i>Pseudechis porphyriacus</i></p> <p><i>Pseudonaja textilis</i></p> <p><i>Vermicella annulata</i></p> | <p>(Eastern Tiger Snake)</p> <p>(Red-bellied Black Snake)</p> <p>(Eastern Brown Snake)</p> <p>(Bandy Bandy)</p> |
|---|---|---|

- * Known to have occurred in the Valley, but uncertain as to persistence.

NOTES:

1. *Litoria aurea*: exists in surrounding areas, may also inhabit the Valley.
2. *Emydura* sp.: occurrence as an indigenous species uncertain.