Tree Assessment

Alterations & Additions

10 Wirringulla Ave Elvina Bay

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Figure 1. Tree survey / Site Plan Figure 2. Site Photos Table 1. Existing Tree Schedule Notes

1.0 Introduction

This Tree Assessment & Management Plan has been prepared for Stephen Crosby on behalf of client M McKensey.

This report is to accompany a development application to Northern Beaches Council for alterations & additions to the existing dwelling at Lot 3 DP 1023404 10 Wirringulla Ave Elvina Bay.

The report includes:

- · an overview of existing indigenous trees;
- · a photographic record of existing trees, and site conditions
- an assessment of the health and condition of existing trees within 5m of the proposed development;
- an assessment of the likely impact of the proposed development on existing trees and vegetation;
- recommendations for the protection of existing trees to be retained to in accordance with AS 4970 Protection of Trees on Development Sites. Standards (2009).
- details of exclusion / protective fencing required prior to commencement of construction works;

The following documentation has been reviewed in preparation of this Tree Assessment Report:

- Site Plan, Lower Floor Plan & Sections Alterations & Additions 10 Wirringulla Ave Elvina Bay prepared by Stephen Crosby and Associates dated September 2020;
- AS 4970 Protection of Trees on Development Sites Standards Australia (2009) and
- Northern Beach Council Exempt Tree Species List.

Prior to finalizing proposed building footprint & development design consultation with Steve Crosby & Mark McKensey was undertaken to identify significant trees & required minimum setbacks to excavation. The aim was to identify & consider the retention of significant trees in relation to footprint location and building design.

2.0 Proposed Development

The proposed development is for alterations & additions including extension to the existing dwelling and new deck.

Four (4) existing trees are located within 5m of the proposed development.

Two (2) existing trees are proposed for removal (Trees 2 & 3)

3.0 Site Description

The property includes an existing residential dwelling, water tank and wastewater treatment and disposal system at Lot 3 DP 1023404 10 Wirringulla Ave Elvina Bay.

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The property has a north easterly aspect, is located on the southern side of Elvina Bay and slopes down to the Pittwater Waterway.

Existing vegetation supports remnant indigenous trees characteristic of fragmented & modified Pittwater Spotted Gun Forest Endangered Ecological community;

Indigenous trees include immature, semi-mature & mature specimens of *Corymbia maculata* (Spotted Gum), *Allocasuarina torulosa* (Forest Oak) and *Angophora costata* (Sydney Red Gum).

Indigenous understory vegetation has been substantially removed from throughout the property.

4.0 Tree Assessment

To be read in conjunction with Figure 1 Tree Survey, Figure 2 Site Photos and Table 1 in Appendix.

Four (4) existing trees (Trees 1 - 4) are located within 5m of the proposed development.

Indigenous understory vegetation has been substantially removed from throughout the property.

Tree assessment is based on Visual Tree Assessment (VTA) and similar tree assessment guidelines (Dunster, Smiley, Matheny & Lilly 2013, Mattheck, 1999 and Matheny and Clark, 2004 & 1999).

Site inspection was conducted by Julia Stanton on 27th September 2020. The assessment includes details of the health, condition and impact of the proposed development on all trees within 5m of the proposed development,

The inspection and assessment was from ground level, no aerial or subterranean inspections were carried out. The report includes the following information (Refer Table 1 Appendix):

- botanical name, common name, diameter at breast height (DBH), height, canopy spread, tree health, form, tree defects, site conditions, hazard rating, Health & Condition rating* SULE rating**;
- an assessment of the potential impact of the proposed development
- recommendations of tree protection and management prior to, during and post construction; and
- a site plan and photographic record of existing trees and site conditions.

This report is not intended as a comprehensive Tree Risk /Hazard assessment however management recommendations have been included for Tree 5 an over mature specimen of *Allocasuarina torulosa* (Forest Oak) located more than 5m from the proposed development located towards the rear of the property.

5.0 Discussion Development Impacts

Refer to Figure 1 Tree Survey, Figure 2 Site Photos

The most common impacts of development on existing trees include:

- · significant changes to natural soil levels;
- excavation and mechanical damage to existing root system;
- · mechanical damage to trunk and branches;
- soil compaction or inversion of soil profile, resulting in reduced soil water and air movement;
- changes in natural hydrology, increased nutrient levels, changes to soil pH and soil contamination.

Estimating the extent of the root system of an existing tree is often used as the basis for assessing the potential adverse impact of a development on a tree. The area of significant root system (structural & feeder) that a tree relies on for survival is often calculated by the use of formulae related to the diameter of the trunk. Various terms and formulae exist to describe the area of root system that requires protection and in which development should be limited or excluded. These terms include Tree Protection Zone (TPZ) and Structural Root Zone (SRZ) or Primary Root Zone (PRZ) and Critical Root Zone (CRZ).

Calculating the area of a root system that requires protection is often used to predict the potential adverse impact of a proposed development on the root system of existing trees. It is noted that the definition and formulae for calculating the area of root system that requires protection is considered a guide in estimating the extent of the root system of a tree.

When assessing the potential adverse impact of a proposed development on an existing tree the following must be considered:

- the type and extent of development, including building envelope, services and landscaping.
- · extent of excavation
- use of machinery or vehicles on site
- the area of a root system identified as requiring protection or management during development, and establishment of a (TPZ)
- an assessment of the subject tree including species, age, vigor, vitality, health and condition; and
- · site and soil characteristics.

Development activity does not necessarily need to be excluded from within the calculated SRZ & TPZ, provided tree sensitive construction techniques are utilized and specific tree protection & management are implemented,

Some level of development activity within an identified SRZ & TPZ such as minor excavation, minor fill and changes to hydrological patterns are often within acceptable limits when specific tree management and protection recommendations and sensitive construction techniques are adopted.

5.1 Potential adverse impacts of the proposed development on existing trees. Refer to detailed assessment in Table 1.

Four (4) existing trees are located within 5m of the proposed development. Two (2) existing trees are proposed for removal Trees 2 & 3

Trees located within 5m of the proposed addition

Trees proposed for removal

Two (2) existing trees (Trees 2 & 3) are within direct conflict of the proposed alterations & additions and are proposed for removal.

Tree 2 is a semi-mature specimen of *Corymbia maculata* (Spotted Gum) in Fair health & condition, & of poor - fair form, with moderate epicormics growth & suppressed development of crown. This tree is in direct conflict with the addition and is proposed for removal.

Tree 3 is a semi-mature specimen of *Corymbia maculata* (Spotted Gum) in fair health & poor condition & form. The trunk & canopy contains epicormics growth and canopy has a significantly reduced crown. This tree is in direct conflict with the addition and is proposed for removal.

Trees to be retained

Tree 1 is a mature specimen of *Corymbia maculata* (Spotted Gum) in good health & condition. This tree is located adjacent to the existing concrete stairs & 2.75m from the addition footprint 6m from excavation to accommodate the corner post pier footings. The excavation for the proposed development is located outside the calculated SRZ (Structural Root Zone) & TPZ (Tree Protection Zone). This tree is to be protected & retained and TPZ /Exclusion fencing & trunk protection is to be establish prior to the commencement of site works. Excavation within 5m is to be undertaken by hand.

Tree 4 is a mature specimen of *Corymbia maculata* (Spotted Gum) in fair – good health & condition & of good form, located on the adjacent to the existing stairs. This tree is located 0.5m from the edge of the proposed deck & 2m & 3m from excavation to accommodate pier footings. Excavation for one pier footing is within the calculated SRZ and within the calculated TPZ for the other footing.

This tree is to be protected & retained and TPZ /Exclusion fencing & specifically trunk protection is to be establish prior to the commencement of site works. Excavation within 5m is to be undertaken by hand, final footing location is to be flexible to accommodate the retention of any significant if they are encountered.

To manage encroachment into calculated SRZ & TPZ, tree protection and sensitive construction techniques such as hand excavation of pier footings with flexibility of final footing locations are to be implemented Tree Protection recommendations in accordance with AS 4970 Protection of Trees on Development Sites. Australian Standards (2009), Refer to Figure 1 recommended Tree Protection Zones (TPZ).

Recommendations to minimise the potential adverse impact of the proposed development on existing trees to be retained include:

- Establishing adequate Tree Protection Zones & specifically trunk protection prior to the commencement of construction of the proposed development. Tree protective fencing & trunk protection must be maintained for the duration of construction works;
- Adopting & implementing sensitive construction techniques specifically undertaking all excavation within 5m of existing trees by hand, and flexibility in final footing location;

Vegetation proposed for removal

There is no significant indigenous understory vegetation proposed for removal.

6.0 Tree and Vegetation Protection and Management Recommendations. Recommendations have been included for the protection and management of existing indigenous trees and vegetation.

Recommendations:

- Tree & soil protective zones & trunk protection are to be established prior to commencement of site works (Specifically for Trees 1, 4).
 Fencing is to be maintained for the duration of construction works.
 Refer to Figure 1 for recommended tree protective / exclusion fencing.
- Specifically trunk protection is required for Trees 1 & 4. Suitable trunk protection would include geotextile or similar as padding covered with timber battens or sheet metal strapped together. Trunk protection must not be nailed to the trunk of trees.
- Excavation for pier footings, is to be undertaken by hand.
- Final footing locations are to be flexible to avoid damage to structural roots that may be encountered.
- Structural roots greater than 50mm must not be cut. If roots greater than 50mm are encountered during excavation and cannot be avoided the project arborist is to be notified. The project arborist is to assess and report on the likely impact of damage to the roots on the health and structural stability of the tree.
- Exclusion fencing / Tree Protective fencing is to be maintained for the duration of building work.
- Materials to be stored in designated storage areas, suitable storage areas include existing paved and areas more than 5m from all existing trees to be retained.
- There is to be no storage of materials or disposal of excavated soil, or building waste, within 5m of existing trees to be retained or designated Tree Protection Zones (TPZ).
- Excavated soil is not to be disposed of or stored within 5m of existing trees, and is to be removed from site if required.
- Ensure minimum three (3) replacement indigenous canopy tree plantings to compensate for tree removal & to enhance the ecological values of the site.
- Tree 5 is an over mature specimen of Allocasuarina torulosa (Forest Oak) in poor health & condition, with significant lower trunk decay. This tree is in decline & recommended for removal.
- Crown maintenance pruning (removal of dead, diseased & defective branches) is recommended for all trees to be retained.
- All pruning works is to be undertaken by an experienced and qualified arborist in accordance with AS4373- 2007 Pruning of Amenity Trees.
- It is recommended a qualified arborist undertake an assessment of the health, condition and hazard potential of existing trees every 12 months.

7.0 Conclusions

The proposed development is for alterations & additions including extension to the existing dwelling and new deck.

Prior to finalizing proposed building footprint & development design consultation with Steve Crosby & Mark McKensey was undertaken to identify significant trees & required minimum setbacks to excavation. The aim was to identify & consider the retention of significant trees in relation to footprint location and building design and adopting & implementing sensitive construction techniques.

Four (4) existing trees are located within 5m of the proposed development.

Two (2) existing trees are proposed for removal (Trees 2 & 3).

Tree 2 is a semi-mature specimen of *Corymbia maculata* (Spotted Gum) in Fair health & condition, & of poor - fair form, with moderate epicormics growth & suppressed development of crown. This tree is in direct conflict with the addition and is proposed for removal.

Tree 3 is a semi-mature specimen of *Corymbia maculata* (Spotted Gum) in fair health & poor condition & form. The trunk & canopy contains epicormics growth and canopy has a significantly reduced crown. This tree is in direct conflict with the addition and is proposed for removal.

In addition Tree 5 is an over mature specimen of *Allocasuarina torulosa* (Forest Oak) in poor health & condition, with significant lower trunk decay. This tree is in decline & recommended for removal.

Existing trees to be retained (Trees 1 & 4) are unlikely to be adversely effected by the proposed development provided tree protection and management recommendations detailed in Sections 6 of this report are adopted & implemented.

Julia Stanton B.Sc. (Environmental and Urban Horticulture)

20th October 2020

Arborist/Bushland Management Consultant

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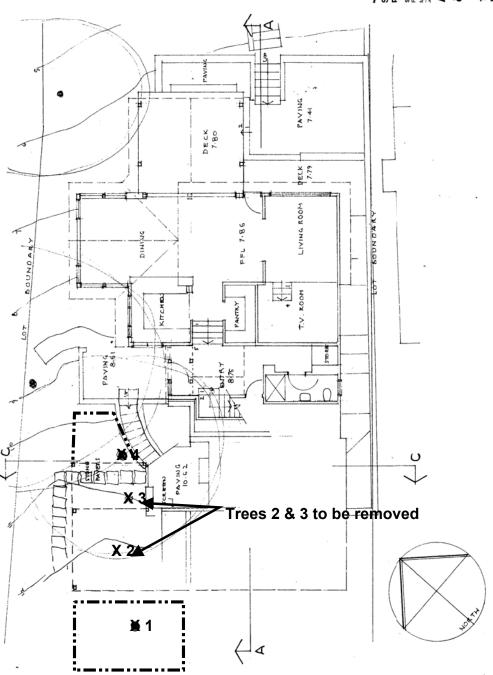
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------ Tree protection fencing Exclusion fencing & trunk protection

Site Plan / Tree Survey
10 Wirringulla Ave
Elvina Bay

X 5 Tree 5 in poor health & condition To be removed

Figure 1



Photo 1 Trees 1, 2, 3 & 4



Photo 2 Tree 2



Photo 5 Tree 5



Photo 3 Trees 3 & 4



Photo 4 Trees 4,3,2 & 1

Site Photos 10 Wirringulla Ave Elvina Bay September 2020 Table 1 Existing Trees with 5m of proposed development 10 Wirringulla Ave Elvina Bay

Tree	Botanical	Common	Age	Hgt	Av.	DBH	DGL	Health	Condition	Site Condition	Comments	Sule	H&C	Hazard
No.	Name	Name		m	Can	mm	mm						rate	rating
1	Corymbia maculata	Spotted Gum	M	19	8m	550	570	Good Vigorous foliage in crown Minor epicormics growth	Good Fair – good form.	Remnant indigenous tree located adjacent to existing concrete stairs.	Retain & protect Calculated SRZ 2.5m Building foot print @ 2.75m. Excavation for corner pier footings located at 6m within calculated TPZ. Tree & trunk protection required.	2	4	Low
2	Corymbia maculata	Spotted Gum	Sm	11	3m	200	220	Fair Sparse foliage in crown, epicormics growth.	Fair Suppressed development of crown	Remnant indigenous tree.	Removal proposed. In direct conflict with proposed addition.	3	2	Mediu m
3	Corymbia maculata	Spotted Gum	M	12	3m	400	410	Fair Significantly reduced crown, epicormics growth	Poor - fair Poor form	Remnant indigenous tree located 0.5m from existing retaining wall.	Removal proposed. In direct conflict with proposed Pier footings for inclinator track at 3.75m.	3	2	Mediu m

Tree No.	Botanical Common Name	Age	Hgt m	Av. Can	DBH mm	DGL mm	Health	Condition	Site Condition	Comments	Sule	H&C rate	Hazard rating
No. 4	Name Spotted Gum	M	m 23	12m	mm 650	mm 680	Good Minor epicormics growth	Fair – good Good form Lower limb pruning .	Remnant indigenous tree located adjacent to existing stairs	Retain & protect Calculated SRZ 2.75m Located 0.5m from proposed deck & 2 & 3m from excavation to accommodate deck footings. Proposed deck is with calculated SRZ & TPZ The adverse impact of the proposed development can be minimized by adopting and implementing specific tree protection and management recommendations, including incorporating sensitive construction methods, under taking all excavation within 5m by hand, flexibility of final location of pier footings. Flexibility of footing location provides the opportunity to protect and retain structural roots that may be encountered during excavation.	2	4	Mediu m

Tree	Botanical	Common	Age	Hgt	Av.	DBH	DGL	Health	Condition	Site Condition	Comments	Sule	H&C	Hazard
No.	Name	Name		m	Can	mm	mm						rate	rating
5	Allocasuari	Forest	OM	12	5m	650	750	Poor	Poor	Remnant	Remove	4a	2	High
	na torulosa	Oak						Reduced	Large basal	indigenous tree	On the basis of poor			
								foliage in	trunk wound	located rear of	health & condition			
								crown	with significant	property more				
									decay.	than 5m from				
									Leaning towards	proposed				
									the dwelling.	development.				

Notes

Hgt = Height in metres, Age = Age Class, Av Can = Average Canopy Spread in metres, DBH = Diameter @ breast height (1.5m) in millimetres

I = Immature, Sm = Semi-mature, M = Mature, Om = over-mature

NOTES

Hgt = Height in metres, Age = Age Class, Av Can = Average Canopy Spread in metres DBH = Diameter @ breast height (1.5m) in millimetres

Age classess (I) *immature* refers to a well established but juvenile tree. (S) Semi-mature refers to a tree at growth stages between immaturity and full size. (M) *Mature* refers to a full sized tree with some capacity for further growth. (O) *Overmature* refers to a tree about to enter decline or already declining.

Health refers to the tree's vigour as exhibited by the crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and the degree of dieback. **Condition** refers to the tree's form & growth habit, as modified by its environment. And includes the state of the scaffold (ie trunk and major branches), including structural defects such as cavities, crooked trunks or weak trunk/branch junctions (inclusions) and condition of the root system. These are not directly connected with health and it is possible for a tree to be healthy but in poor condition.

Adapted from Matheny and Clark (1999) Conducting a Resource Evaluation, from *Care and Management of Trees on Development Sites Proceedings of the 2nd NAAA Tree Management Seminar and Workshop.*

- * H & C (Heath & Condition) rating summary of the health and structure of the tree on a scale of 0 5
- **5** A healthy vigorous tree, little if any signs / symptoms of disease or stress with good structure and form typical of the species
- **4** Trees with some evidence of decline in vigour, minor twig die back, small amount of dead wood, good form and structure.
- **3** A tree with only moderate vigour, presence of moderate amounts of twig die back and dead wood, crown may be thinning, moderate form, or a tree with some branch or trunk damage but canopy/ foliage cover good, or a tree with good overall condition, but poor form.
- **2** A tree in a state of decline, large amount of twig die back or epicormic growth, dieback of medium to large branches, cause of decline cannot be rectified or alleviated. Or a tree with significant structural defects (inclusions, root girdling, and cavities) which cannot be rectified or satisfactorily remediated.
- **1** A tree in serve decline, die back of dominant branches or trunk, large amounts of twig die back or the majority of foliage epicormic. Cause of decline cannot be rectified or alleviated. Or a tree with significant structural defects (inclusions, root girdling, and cavities) which cannot be rectified or remediated.
- 0 Dead tree

**SULE categories (Barrell.

Safe Useful Life Expectancy Categories (Updated 01/04/01) Barrell (2001)

1: Long SULE: Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.

- (a) Structurally sound trees located in positions that can accommodate future growth.
- (b) Trees that could be made suitable for retention in the long term by remedial care.
- (c) Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long-term retention.

2: Medium SULE: Trees that appeared to be retainable at the time of assessment for 15-40 years with an acceptable level of risk.

- (a) Trees that may only live between 15 and 40 more years.
- (b) Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.
- (c) Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (d) Trees that could be made suitable for retention in the medium term by remedial tree care.

3: Short SULE: Trees that appeared to be retainable at the time of assessment for 5-15 years with an acceptable level of risk.

- (a) Trees that may only live between 5 and 15 more years.
- (b) Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
- (c) Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (d) Trees that require substantial remedial tree care and are only suitable for retention in the short term.

4: Remove: Trees that should be removed within the next 5 years.

- (a) Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
- (b) Dangerous trees because of instability or recent loss of adjacent trees.
- (c) Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
- (d) Damaged trees that are clearly not safe to retain.
- (e) Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- (f) Trees that are damaging or may cause damage to existing structures within 5 years.
- (g) Trees that will become dangerous after removal of other trees for the reasons given in (a) to (t).
- (h) Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.

5: Small, young or regularly pruned: Trees that can be reliably moved or replaced.

- (a) Small trees less than 5m in height.
- (b) Young trees less than 15 years old but over 5m in height.
- (c) Formal hedges and trees intended for regular pruning to artificially control growth.

DEFINITIONS (From Tree Risk Assessment Manual ISA (2013), Australian Standard *Protection of Trees on Development Sites* 2009 Australian Standards AS 4373 – 2007 Pruning of Amenity Trees, Matheny and Clark, 1994 and 2004)

Co-dominant stems – stems or trunks of about the same size originating from the same position from the main stem. When the stem bark ridge is turned upwards the union is strong, when the ridge turns inwards the union is weak.

Critical Root Zone (CRZ) – an offset 5 x the trunk diameter of a tree. Within this area significant structural roots are usually encountered. Elevated construction may be possible within this area, subject to an assessment of the subject tree including age, vigor, health and condition and root zone assessment. Specific tree management and protection recommendations and construction techniques required.

C & PRZ – **Critical and Primary root zone** - The definition and formulae for calculating the C & PRZ of a tree is to be considered only a guide to determine the extent of a trees root system. The C & PRZ calculation should be used in conjunction with an assessment of the subject tree including age, vigor, health and condition, site and soil characteristics and root zone assessment, when assessing the potential adverse impact of a proposed development on a tree.

Crown lifting – the removal of the lowest branches.

Crown Thinning – General pruning with the additional removal of secondary branches whist retaining the main structural branches of the tree.

Crown Maintenance General – pruning which consists of removal of dead, diseased, dying, defective and conflicting branches.

Deadwooding - removal of deadwood

DGL- Trunk diameter at ground level

Endemic – having a natural distribution confined to a particular geographic region.

Hazard- situation or condition that is likely to lead to a loss, personal injury property damage, a likely source of harm.

Hazard abatement- Reduction in the likelihood that failure of a tree or a part will result in injury to people or damage to property.

Indigenous - native to the area not introduced

Locally native flora and fauna – plants and animals that are native in Pittwater at any stage of life cycle

Lopping- random cutting of branches or stems between branch union or internodes. This is an unacceptable practice.

Primary Root Zone (PRZ) – an offset 10 x the trunk diameter of a tree. Within this area significant feeder roots area usually encountered. Excavation and fill may possible within this area, subject to an assessment of the subject tree including age, vigor, health and condition and root zone assessment. Specific tree management and protection recommendations and construction techniques required.

Risk – The combination of the likelihood of tree failure and severity of the potential consequences. The likelihood of tree failure occurring and affecting a target and severity of the consequences.

Selective pruning – The removal of identified branches that are causing a specific problem. These branches shall be specified.

Senescence - The process of aging and death.

Significant Trees - trees that contribute substantially, either individually or as a component of a tree group to the landscape character, amenity, cultural values or biodiversity of their locality.

Structural Root Zone (SRZ) The portion of the root plate comprised primarily of structural woody roots (integral with the soil profile) providing the main mechanical support and anchorage of a tree, calculated in accordance with AS 4970:2009, expressed as a radial dimension in metres from the centre of the trunk.

Target - People or property potentially affected by tree failure

Tree Protection Zone (TPZ) - A specified area at a given distance from the trunk set aside for the protection of a trees root system and canopy during land development works to ensure the long term viability and stability of a tree, calculated in accordance with AS 4970:2009.

Table 2 Indigenous plant species suitable for revegetation

Botanical Name Common Name

Ground Covers

Adiantum aethiopicum Brachycome angustifolia Dianella caerulea Dichondra repens Doodia aspera Echinopogon caespitosus Entolasia marginata Gymnostachys aceps Hardenbergia violocea Hibbertia scandens Hydrocotyle peduncularis Lomandra longifolia Microlaena stipoides Pallea falcata Pandorea pandorana

Poa affinis Viola hederacea

Pratia purpurescens

Shrubs

Acacia floribunda Acacia implexa Acacia longissima Dodonea triquerta Goodenia ovata Indigophora australis Pittosporum revolutum Podolobium ilicifolium Polyscias sambucifolia Pultenea daphnoides

Small Trees / Large Shruns

Acmena smithii Backhousia mvrtifolia Banksia integrifolia Allocasuarina torulosa Ceratapetalum gummiferum Elaeocarpus reticulatus Ficus coronata Livistona australis

Canopy Trees

Angophora costata Angophora floribunda Corymbia maculata Eucalyptus paniculata Eucalyptus botryoides Syncarpia glomulifera Native Maidenhair Native Daisv Blue Flax Lilly Kidney Weed Rasp Fern Hedgehog Grass Right-angled Grass Settlers Flax Happy Wanderer Snake Vine Hydrocotyle Mat-rush Weeping Grass Sickle Fern Wonga wonga vine

White Root Poa

Native Violet

Wattle Wattle Wattle Hop Bush Yellow Hop Bush Indigo-pea

Rough-fruit Pittosporum Native Holly Elderberry Panax Pea Flower

Lilly Pilly Grev Mrvtle Coast Banksia Forest She-Oak **NSW Christmas Bush** Blueberry Ash Sandpaper Fig Cabbage Tree

Sydney Red Gum Rough-bark apple Spotted Gum Grey Iron Bark Bangalay gum Turpentine