

# STREET TREE MASTERPLAN

26<sup>th</sup> September 2017



Town of Cottesloe

# WHAT IS A STREET TREE MASTER PLAN?

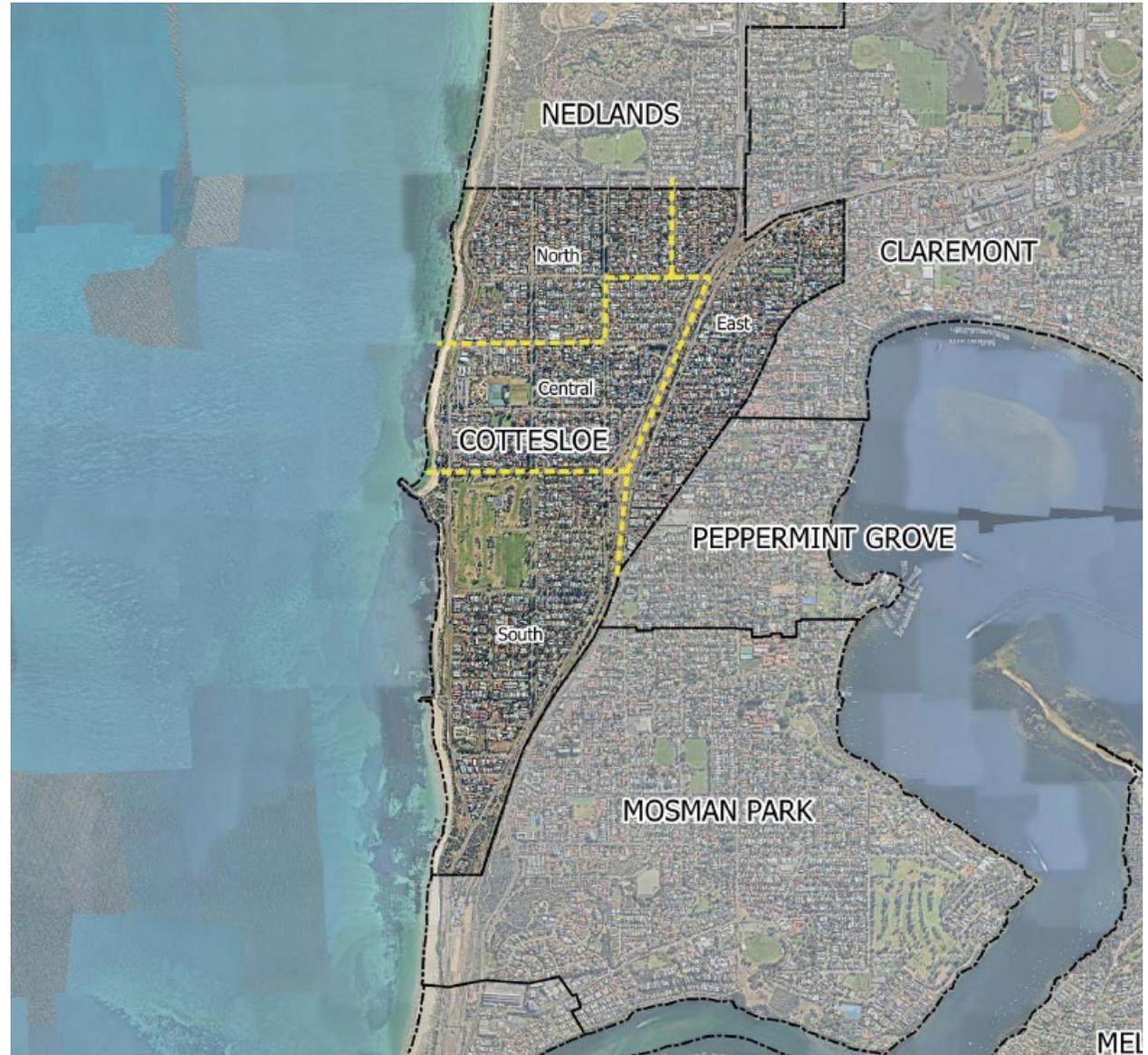
**THE STREET TREE MASTERPLAN IS A TOOL DESIGNED TO HELP IMPLEMENT THE TOWN OF COTTESLOE'S STREET TREE POLICY, BY PRESCRIBING A SUITABLE TREE SPECIES FOR PLANTING WITHIN EACH STREET.**

The plan identifies a cohesive palate of trees to plant on residential verges within the town, fulfilling the Town's objectives to:

- Select and maintain street trees, which enhance both existing and future streetscapes;
- Create a setting in sympathy with the function and appearance of the adjacent land uses, a safe and comfortable pedestrian environment, and cater for vehicular traffic;
- Promote the use of indigenous trees, to extend the habitat of native birds and animals in urban areas.



Town of Cottesloe



# HOW DO WE DECIDE WHAT SPECIES TO USE?

Street trees are often subject to extremely hostile environments in which they must survive and grow. When selecting trees for the urban environment it is critical to identify species that can grow into healthy, long lived trees while minimizing conflicts between trees and the surrounding urban infrastructure, residents and road users.

The key principles considered when selecting species for this street tree master plan included:

- Provision of safe and attractive street trees that enhance the amenity of residents, pedestrians and buildings plus are sensitive to the landscape, infrastructure and environmental conditions;
- Provision of shade for street users in summer months and streetscape appeal;
- Contribute to a recognizable identity or 'sense of place' for streets and the town, by implementing and maintaining street tree themes. For example, the Norfolk Island Pines on Broome Street;
- Expand and contribute to the overall urban forest and canopy coverage for the Town;
- Contribute to the long-term sustainability and efficient environmental management for the Town.

**The range of criteria used to evaluate the tree species master list is outlined in the following:**

## Deciduous or evergreen

Both deciduous and evergreen species have been provided in the master list. Deciduous species offer numerous benefits in urban streetscapes, such as shade during summer and sun during the winter. However, deciduous species are generally less tolerant of harsh heat and drought conditions. They are also commonly exotic species, therefore lack many of the ecosystem benefits provided by native trees.

## Proven track record

Track record is an important criteria for tree selection. Management and replacement of street trees is a significant cost to the town and trees are important to local residents. Therefore it is important that the selected species has a track record of performance in the local area. However, it is important to trial new species in some areas in order to identify previously unused species that are more suitable to the local conditions and requirements, particularly in the event of changing environmental conditions and the possibility of future introduction of new pests and pathogens (i.e. improved resilience).

## Speed of growth

Ideally fast growing trees will be selected to quickly reach maturity and form the desired canopy coverage. However, speed of growth is generally inversely related to species longevity. Therefore, a compromise needs to be reached.

## Damage to infrastructure

Trees are often blamed for damaging infrastructure due to the expansion of roots under roads and pathways as well as disturbance of underground services. In many cases this is the result of poor species selection for the location. In this plan careful consideration has been given to matching tree species to the size of verge within a street, as well as avoiding species which are known to have problematic root systems.

## Drought tolerance

Soils within the Town of Cottesloe are predominantly coastal sands with low water holding capacity. Across much of the area, there is only a shallow soil layer above limestone bedrock, making these soils very prone to rapid drying of the soil profile and subsequent water-stress of existing trees. Furthermore, many of the street trees in the

Cottesloe area are reliant on a limited reserve of fresh groundwater. As a result, drought tolerance is a key criteria used for tree selection in this plan.

## Pollution tolerance

Urban trees must deal with a range of pollutants, particularly from vehicle exhausts. Pollutant chemicals can often cause damage to leaves and shoots, species with a demonstrated tolerance to urban conditions in the Perth metropolitan region have been selected.



Figure 1: Declining Melaleuca quinquenervia showing extensive leaf yellowing.

## Coastal exposure

Strong winds and saline aerosols coming from the ocean severely restrict the ability for many tree species to thrive in the coastal location of the Town of Cottesloe. Proximity to the coastline and the degree of shelter on each street has been considered when determining an appropriate species.



Figure 2: *Melaleuca quinquenervia* causing damage to road and curbing on Jarrad St.

### **Pest and disease tolerance**

A successful street tree requires little management intervention post-establishment, therefore tree species must be free from common pest and disease problems encountered within Perth.

### **Diversity**

Diversity of species within the town is important from a number of perspectives. Street trees play an important role in the overall biodiversity of the town and a wide range of tree species provides habitat for a diverse range of fauna such as insects and birds. Furthermore diverse landscapes are more resilient to pest and disease outbreaks and present a sensible risk mitigation strategy in the event of changing climatic conditions.

### **Structural integrity**

Some tree species are more prone to limb failure than others. Trees susceptible to frequent limb failure are not suitable to street tree planting.

### **Shedding characteristics**

All trees shed leaves, flower and fruit at certain times of year. In certain species, however, shedding can cause environmental and public safety concerns.

### **Tolerance to pruning**

Urban trees frequently require pruning to allow clearance from pedestrians, vehicles and other infrastructure. Therefore selected species must be tolerant to regular pruning without adversely impacting tree aesthetics or longevity.

### **Form**

Form and scale of tree species is an important consideration. Trees forming a strong single trunk with a uniform canopy are generally preferred in the urban setting. This is important to allow free movement for vehicles and pedestrians at ground level. The tree canopy should give enough shade to provide a comfortable pedestrian environment without feeling claustrophobic and damp during the winter.

### **Scale**

Matching the size of tree to the scale of the street and planting area is important. A tree which is too large is likely to cause damage to road and pavement surfaces as the tree grows and cause conflict with adjacent residents. Trees which are too small for a verge area may look out of place and may not provide the desired canopy and shading characteristics to the streetscape.

### **Climate change tolerance**

Our best predictions for the future climate of the region is for increasing temperatures and reducing rainfall. The precise magnitude and timing of the changes are not known, however it is important to plan for the lifespan of the tree and select species which are still likely to thrive under changing environmental conditions. Selection of a diverse mix of species is important as it creates a more resilient tree population and reduces the level of risk of the population to such factors.

### **Availability**

It is important the species selected are readily available in large quantities from nurseries so that replacement trees can be easily sourced when required. Care should be exercised to only select quality nursery stock to maximise the chances of successful tree establishment.

## **FAQ**

### **How will the masterplan be implemented?**

The masterplan will be used to guide the Town's standard tree replacement and planting program. Proposed changes to streetscape themes will occur gradually as trees die naturally over time. There is no intention to remove healthy, structurally sound trees.

### **What about potential conflict with solar panels on houses?**

The proposed tree species includes a range of deciduous options which allow increased solar access during the winter when solar radiation is at its lowest. Also care has been taken to match the scale of trees selected to the scale of each street to minimise potential impacts on residential properties.

### **Does the Masterplan consider existing street tree themes?**

Yes, in most cases the existing street tree theme will be maintained. New themes are generally proposed where there are; few established trees, no cohesive theme, or existing trees are not thriving.

### **Does the masterplan include trees that support native fauna?**

Yes a range of native and local species have been selected in keeping with the Town's Street Tree Policy, which aims to promote indigenous flora and fauna.

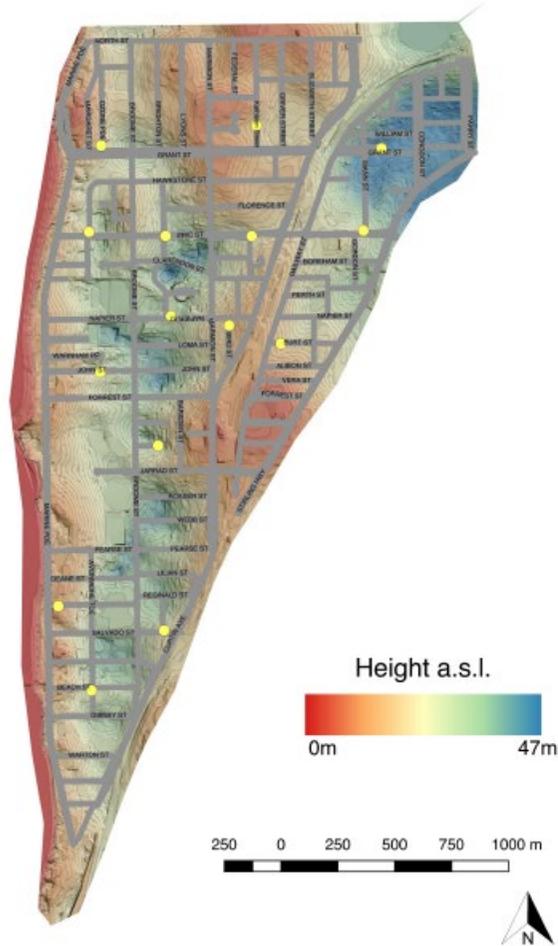


Figure 3: Map of the Town of Cottesloe showing land elevation. Yellow circles indicate the location of soil sampling points

### Soil Characteristics

Surface soil (0-10cm) and sub-soil (30-40cm) samples were collected at a range of location throughout the Town of Cottesloe to help inform the tree selection process.

### pH

Soil pH levels were in the alkaline and highly-alkaline range throughout the Town of Cottesloe. Surface soil pH ranged from 6.7 to 8.6 and subsoils ranged from 7.1 to 9.0.

Alkaline soils restrict the availability of a range of key plant nutrients such as Phosphorous, Iron, Manganese and Zinc.

Street trees must be highly adapted to live in alkaline soil conditions if they are to thrive within the Town of Cottesloe.

### Salinity

Despite being close to the coast, soil salinity levels are low throughout the Town of Cottesloe. This is likely the result of the sandy soils which allow salt imported by ocean winds to quickly leach below the root zone.

### Nutrient content

Sandy soils within the Town of Cottesloe contain very low levels of organic matter and all plant nutrients. Very low levels of Iron and Manganese were observed which is typical of alkaline soils and consistent with a range of leaf nutrient deficiency symptoms observed in some tree species.

### Organic carbon

Organic carbon content of soils was very low, ranging from 0.23% to 3.02%. Higher organic carbon levels were associated with higher levels of availability of most essential nutrients.

Soil organic matter is very important, especially in sandy soils, because it increases water and nutrient retention properties of the soil and activity of beneficial soil organisms.



Relative leaf nutrient content

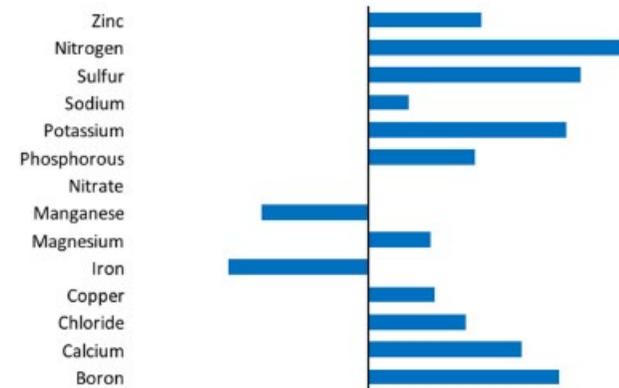


Figure 4: Top: Leaves from the declining tree pictured in Figure 1, showing distinct yellowing (left), particularly prominent between the leaf veins when compared to healthy leaves (right). This is typical of Iron and Manganese deficiency, consistent with the leaf nutrient analysis. Bottom: Relative leaf nutrient content from healthy (right) and declining (left) Melaleuca quinquenervia.

# EASTERN WARD

ROAD NAME	EXISTING TREE	PROPOSED TREE	COMMENT
Albion St	<i>Triadica sebiferum</i>	<i>Eucalyptus torquata</i>	Secondary <i>Eucalyptus torquata</i>
Alexandra Ave	<i>Erythrina indica</i>	<i>Erythrina indica</i>	Good canopy cover
Balfour St	<i>Lophostemon confertus</i>	<i>Lophostemon confertus</i>	
Boreham St	Mixed	<i>Agonis flexuosa</i>	mixed <i>Lophostemon confertus</i> , <i>Agonis flexuosa</i> , <i>Callistemon</i>
Brixton St	<i>Platanus x acerifolia</i>	<i>Platanus x acerifolia</i>	Good looking planes, embayed trees
Burt St	<i>Triadica sebiferum</i>	<i>Triadica sebiferum</i>	Several recently established trees in poor condition
Clive Rd	No trees	nil	no verge
Congdon St	<i>Ficus</i> sp.	<i>Corymbia maculata</i> , <i>Araucaria heterophylla</i> on median	Large median containing <i>Araucaria heterophylla</i> , with diverse mix of native trees below. Very wide avenue would suit a tall framing tree on verge. Existing <i>Ficus</i> poorly suited
Curtin Road Service Road	Mixed	<i>Quercus suber</i>	
Dalgety St	<i>Triadica sebiferum</i>	<i>Pyrus ussuriensis</i>	<i>Pyrus</i> better adapted to alkaline conditions
Edward St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Elizabeth St	<i>Lophostemon confertus</i>	<i>Allocasuarina fraseriana</i>	Several box trees is poor condition
Eric St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
Forrest St	<i>Agonis flexuosa</i> , and <i>Araucaria heterophylla</i>	<i>Agonis flexuosa</i> , and <i>Araucaria heterophylla</i>	Verge gives way top median containing <i>Araucaria heterophylla</i> half way up street
Gordon St	<i>Agonis flexuosa</i>	<i>Melaleuca quinquenervia</i>	<i>Melaleuca quinquenervia</i> theme emerging
Grant St	<i>Agonis flexuosa</i> , <i>Erythrina indica</i>	<i>Agonis flexuosa</i> , <i>Araucaria heterophylla</i> on median	<i>Araucaria heterophylla</i> on median
Greenham St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	Southern verge has a mix of Norfolk Island Pine, <i>Melaleuca</i> and sheoak
Hillside Ave	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Jarrad St	<i>Melaleuca quinquenervia</i>	<i>Melaleuca quinquenervia</i>	Few trees, opportunity for improvement of busy road
Knowles St	<i>Agonis flexuosa</i>	<i>Eucalyptus nicholii</i>	Some older trees in poor condition
Lane St	No trees	No trees	No verge
Mann St	<i>Melaleuca quinquenervia</i>	<i>Melaleuca quinquenervia</i>	
Melville St	Mixed	<i>Pyrus ussuriensis</i>	Mixed exotic <i>Jacaranda</i> , tallow, <i>Callistemon</i>
Napier St	<i>Eucalyptus cladocalyx</i>	<i>Eucalyptus cladocalyx</i>	
Napoleon St	<i>Fraxinus angustifolia</i>		Embayed trees Commercial street. Pending council decision
North St	<i>Agonis flexuosa</i>	<i>Casuarina equisetifolia</i>	Isolated trees in moderate to poor condition
Parry St	<i>Agonis flexuosa</i> , <i>Araucaria heterophylla</i> on median	<i>Corymbia maculata</i> , <i>Araucaria heterophylla</i> on median	Very large median with <i>Araucaria heterophylla</i> and a range of other secondary species including <i>Agonis flexuosa</i> . Large avenue, would suit tall framing tree on verge
Perth St	<i>Lophostemon confertus</i>	<i>Eucalyptus torquata</i>	Secondary mix of <i>Agonis flexuosa</i> , <i>Callistemon</i> , <i>Triadica sebiferum</i> . Narrow verge will suit Coral Gum
Railway St, South of Albion	No trees	No trees	No verge
Railway St, Eric to Grant	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
Railway St, Albion to Eric	<i>Araucaria heterophylla</i> with <i>callistemon</i> secondary,	<i>Araucaria heterophylla</i> with <i>callistemon</i> secondary	
Railway St, Congdon to Parry	<i>Prunus cerasifera</i>	<i>Prunus cerasifera</i>	Commercial area containing <i>Prunus cerasifera</i> as a feature
Railway St, Grant to Congdon	Mixed	Mixed	Mixed <i>Allocasuarina fraseriana</i> , <i>Eucalyptus leucoxylon</i> and others
Salisbury St	<i>Lophostemon confertus</i>	<i>Agonis flexuosa</i>	Some <i>Lophostemon confertus</i> in moderate to poor condition, existing <i>Agonis</i> look healthy
Seaview Tce	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
Stirling Hwy	No trees	nil	No verge space currently available for planting
Vera St	<i>Triadica sebiferum</i>	<i>Ulmus parvifolia</i>	Mixed species on southern verge
Wentworth St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
West Coast Hwy	No trees	No trees	
William St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	No verge on west
Windsor St	<i>Lophostemon confertus</i>	<i>Melaleuca quinquenervia</i>	Some trees in moderate condition

# NORTHERN WARD

ROAD NAME	EXISTING TREE	PROPOSED TREE	COMMENT
Ackland Wy	<i>Agonis flexuosa</i>	<i>Allocasuarina fraseriana</i>	Agonis in moderate condition
Andrews Pl	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	Secondary mixed exotic species in variable condition
Brighton St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Broome St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
Chamberlain St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Federal St	<i>Agonis flexuosa</i>	<i>Eucalyptus nicholii</i>	Agonis in poor condition. <i>E.nicholii</i> will provide more open feel at ground level
Florence St	<i>Agonis flexuosa</i>	<i>Allocasuarina fraseriana</i>	Several agonis in poor condition with some recent deaths
Grant St	<i>Araucaria heterophylla</i>	<i>Melaleuca lanceolata</i> on verge, <i>Araucaria heterophylla</i> on median	Mixed species on side verges, lack of trees near coast
Griver St	Mixed	<i>Eucalyptus gomphocephala</i>	Existing mix mainly <i>Araucaria heterophylla</i> , <i>Lophostemon confertus</i> , <i>Agonis flexuosa</i> . Large verge suited to Tuart
Hamersley St	<i>Agonis flexuosa</i>	<i>Casuarina equisetifolia</i>	Secondary <i>Araucaria heterophylla</i> . <i>Casuarina</i> better suited to street size and coastal proximity
Hawkstone St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Kathleen St	<i>Lophostemon confertus</i>	<i>Lophostemon confertus</i>	<i>Lophostemon confertus</i> pruned under powerline
Knowles St	<i>Agonis flexuosa</i>	<i>Eucalyptus nicholii</i>	Some older trees in poor condition
Little Marine Pde	No trees	nil	Costal scrub, no trees
Lyons St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Margaret St	<i>Melaleuca lanceolata</i>	<i>Melaleuca lanceolata</i>	Mix of other species including olive
Marine Pde	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	Isolated areas with <i>Araucaria heterophylla</i>
Marmion St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
North St	<i>Agonis flexuosa</i> , <i>Araucaria columnaris</i> on median	<i>Casuarina equisetifolia</i> , <i>Araucaria heterophylla</i> on median	Isolated trees in moderate to poor condition
Ozone Pde	<i>Melaleuca lanceolata</i>	<i>Melaleuca lanceolata</i>	Occasional <i>Araucaria heterophylla</i> and <i>Metrosideros excelsa</i>
Torrens Ct	<i>Erythrina indica</i>	<i>Erythrina indica</i>	
Torrens St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	

# CENTRAL WARD

ROAD NAME	EXISTING TREE	PROPOSED TREE	COMMENT
Athelstan St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	Secondary <i>Melaleuca quinquenervia</i> , and <i>Callistemon</i>
Bird St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Birkbeck Ave	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	Some <i>Agonis</i> showing stress, death of recent replant
Broome St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
Bryan Wy	No trees	nil	
Chamberlain St	<i>Agonis flexuosa</i>	<i>Melaleuca lanceolata</i>	<i>Agonis</i> in moderate condition. tea tree better suited to coastal conditions
Charles St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	<i>Triadica sebiferum</i> and <i>Lophostemon confertus</i> on eastern verge
Charles St Service Rd			Shared verge with Eric St
Clarendon St	<i>Agonis flexuosa</i>	<i>Melaleuca lanceolata</i>	<i>Agonis</i> in poor condition, tea tree better site close to the coast
Curtin Ave, North of Jarrad	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	<i>Erythrina indica</i> and <i>Lophostemon confertus</i> on western verge where space permits. Opportunity to develop area around train station as a Natural Area.
Eileen St	<i>Araucaria heterophylla</i>	<i>Melaleuca lanceolata</i>	Small verge for <i>Araucaria heterophylla</i> , canopy thinning.
Eric St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	Recently establish Norfolk pine theme, trees ca. <10 years
Florence St	<i>Erythrina indica</i>	<i>Erythrina indica</i>	Range of other mixed species present
Gadsdon St	<i>Araucaria heterophylla</i>	<i>Allocasuarina fraseriana</i>	Exposed position
Geraldine St	<i>Agonis flexuosa</i>	<i>Allocasuarina fraseriana</i>	Sheoak better suited closer to the coast
Haining Ave	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Hawkstone St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	Some canopy thinning present
Henry Rd	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	Some older trees in poor condition
John St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i> planted between parking bays
John St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
Kiln Lane	<i>Metrosideros excelsa</i>	<i>Callistemon 'Kings Park Special'</i>	New development, recent landscaping. <i>Araucaria heterophylla</i> as a feature tree. <i>Metrosideros excelsa</i> generally performing poorly in the area
Loma St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	Mix of <i>Erythrina</i> , <i>Callistemon</i> and <i>Agonis</i> also present
Marine Pde	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i> , as feature tree.	Secondary <i>Allocasuarina equisetifolia</i> and <i>Metrosideros excelsa</i>
Marmion St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	A mix of other species present
Millers Ct	Mixed	<i>Ulmus parvifolia</i>	Cul-de-sac, resident maintained verges
Nailsworth St	<i>Melaleuca lanceolata</i>	<i>Melaleuca lanceolata</i>	Verge variable in width
Napier St	<i>Agonis flexuosa</i>	<i>Eucalyptus gomphocephala</i>	Large verge, <i>Araucaria heterophylla</i> near coast. Tuart a better match than Peppermints for the street size. Well suited to conditions
Overton Gdns	<i>Melaleuca lanceolata</i>	<i>Melaleuca lanceolata</i>	No verge, median only. <i>Metrosideros excelsa</i> also present in in poor condition
Warnham Rd	<i>Melaleuca lanceolata</i>	<i>Melaleuca lanceolata</i>	

# SOUTHERN WARD

ROAD NAME	EXISTING TREE	PROPOSED TREE	COMMENT
Avonmore Tce	<i>Melaleuca lanceolata</i>	<i>Melaleuca lanceolata</i>	
Barsden St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	10m verge on east only
Beach St	<i>Melaleuca lanceolata</i>	<i>Melaleuca lanceolata</i>	Norfolk on north-western verges. Emerging tea tree theme
Broome St	No Trees	<i>Araucaria heterophylla</i>	
Broome St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
Curtin Ave, North of Jarrad	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	<i>Erythrina indica</i> and <i>Lophostemon confertus</i> on western verge where space permits. Opportunity to develop area around train station as a Natural Area.
Curtin Ave, South of Jarrad	mixed	<i>Melaleuca lanceolata</i> , <i>Eucalyptus nicholii</i> , <i>Allocasuarina fraseriana</i> , <i>Melaleuca quinquenervia</i> , <i>Agonis flexuosa</i> , <i>Eucalyptus erythrocorys</i> , <i>Melaleuca huegelii</i> , <i>Eucalyptus foecunda</i> , <i>Eucalyptus lehmannii</i> , <i>Callitris pressii</i> , <i>Eucalyptus utilis</i> , <i>Callistemon viminalis</i>	Good stand of tuart along rail corridor. Mix of dense tree and shrub species on western verge as a visual and audio barrier
Deane St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
Finney St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Forrest St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
George St	<i>Lophostemon confertus</i>	<i>Lophostemon confertus</i>	
Gibney St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
Graham Ct	<i>Melaleuca quinquenervia</i>	<i>Melaleuca quinquenervia</i>	
Jarrad St, West of Broom st	No trees	No trees	Golf course entrance road
Jarrad St, Curtin ave to Broom	<i>Melaleuca quinquenervia</i>	<i>Melaleuca quinquenervia</i>	
Lilian St	<i>Lophostemon confertus</i>	<i>Pyrus usseriensis</i>	Recent planting of <i>Triadica sebiferum</i> in moderate condition, verge too small for <i>Lophostemon</i>
Lilian St Service Rd	Mixed	<i>Agonis flexuosa</i>	
Macarthur St	<i>Melaleuca quinquenervia</i>	<i>Olea europaea</i>	More trees required
Macarthur St Service Rd	<i>Melaleuca quinquenervia</i>	<i>Olea europaea</i>	
Marine Pde, South of life saving club	No trees	No trees	No verge residential side
Marine Pde, North of life saving club	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	Secondary <i>Allocasuarina equisetifolia</i> and <i>Metrosideros excelsa</i>
Pearse St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	
Princes St	<i>Melaleuca lanceolata</i>	<i>Melaleuca lanceolata</i>	Tea tree is well adapted to the coast and low lying to avoid obstructing views
Princes St, East of Broom	<i>Triadica sebiferum</i>	<i>Triadica sebiferum</i>	
Princes St Service Rd	Mixed	<i>Eucalyptus sargentii</i>	
Reginald St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Rosendo St	<i>Melaleuca lanceolata</i>	<i>Melaleuca lanceolata</i>	Some <i>Araucaria heterophylla</i> in moderate condition
Rosser St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Salvado St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	Some mixed eucalypt species towards Curtin ave.
Stanhope St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	
Sydney St	<i>Araucaria heterophylla</i>	<i>Melaleuca lanceolata</i>	5m verge on north. Tea tree better match for size and conditions
Sydney St Service Rd	<i>Erythrina indica</i>	<i>Melaleuca lanceolata</i>	Tea tree is a good match for the conditions and better noise dampening
Warton St	<i>Araucaria heterophylla</i>	<i>Araucaria heterophylla</i>	Young <i>Araucaria heterophylla</i> on southern verge. mixed shrub on northern side
Webb St	<i>Agonis flexuosa</i>	<i>Agonis flexuosa</i>	Isolated specimens in poor condition
Webb St Service Rd	Mixed	<i>Callistemon 'Kings Park Special'</i>	

# SPECIES USED IN MASTERPLAN



## EXISTING

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### Native

**Peppermint, Wonnil** *Agonis flexuosa*

**Coral tree** *Erythrina indica*

**Rottneest Island Tea Tree, Moonah** *Melaleuca lanceolata*

**Queensland Box** *Lophostemon confertus*

**Broad-leaved paperbark** *Melaleuca quinquenervia*

**Sugar Gum** *Eucalyptus cladocalyx*

### Exotic

**Chinese Tallow** *Triadica sebiferum*

**Purple-leaved plum** *Prunus cerasifera*

**Norfolk Island Pine** *Araucaria heterophylla*

**London Plane** *Platanus x acerifolia*

## NEW

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### Native

**Western Sheoak, Condil** *Allocasuarina fraseriana*

**Coral Gum** *Eucalyptus torquata*

**Spotted Gum** *Corymbia maculata*

**Narrow Leaf Black Peppermint** *Eucalyptus nicholii*

**Coastal Sheoak** *Casuarina equisetifolia*

**Salt River Gum** *Eucalyptus sargentii*

**Bottle Brush** *Callistemon 'Kings Park Special'*

**Tuart** *Eucalyptus gomphocephala*

### Exotic

**Olive** *Olea europaea*

**Chinese Elm** *Ulmus parvifolia*

**Cork Oak** *Quercus suber*

**Manchurian Pear** *Pyrus ussuriensis*

# Peppermint, Wonnil

*Agonis flexuosa*

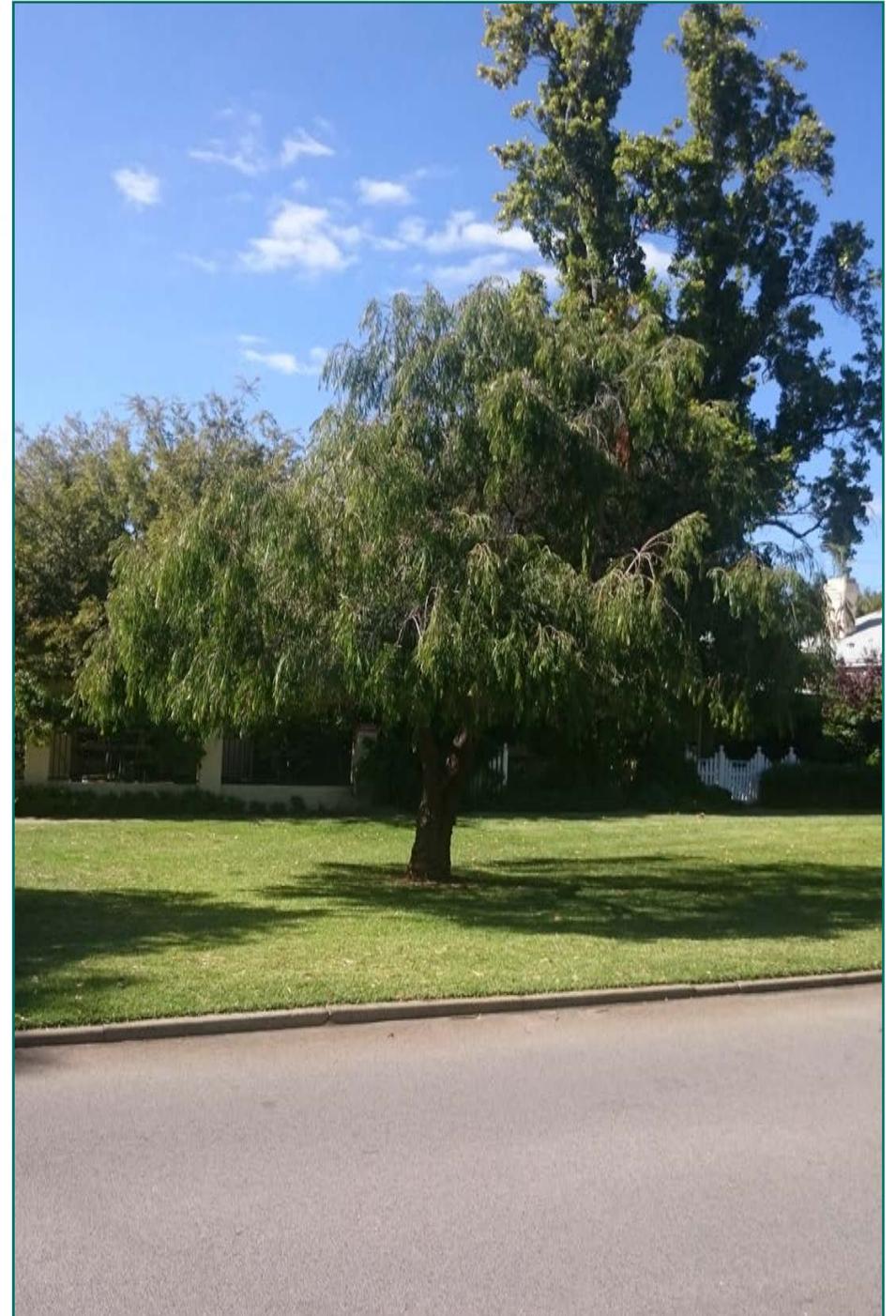
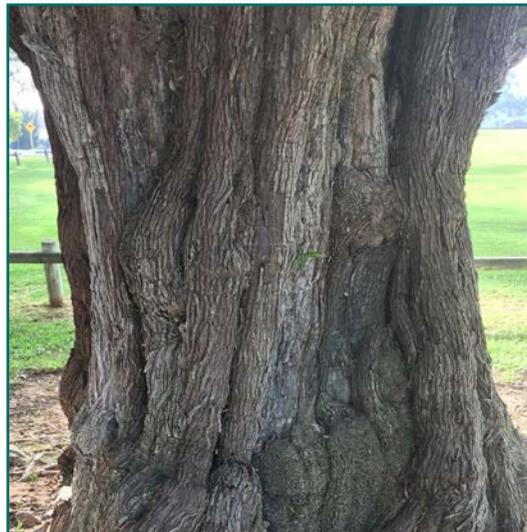
**NATIVE:** Endemic to Cottesloe area

**HEIGHT:** 10m

**BARK:** Rough grey/brown bark. Trunk can become thick and gnarled in older trees

**FLOWERS:** Small white flowers produced in late winter and autumn

**FOLIAGE:** Slender soft foliage



# Western Sheoak

*Allocasuarina fraseriana*

**Origin:** Western Australia

**Height:** 15m

**Bark:** Rough brown bark

**Flowers:** Insignificant brown flowers, forming small cone-like fruits

**Foliage:** 'Leaves' consists of slender green branchlets called cladodes



A green watercolor-style map of Norfolk Island is positioned behind the title text.

# Norfolk Island Pine

*Araucaria heterophylla*

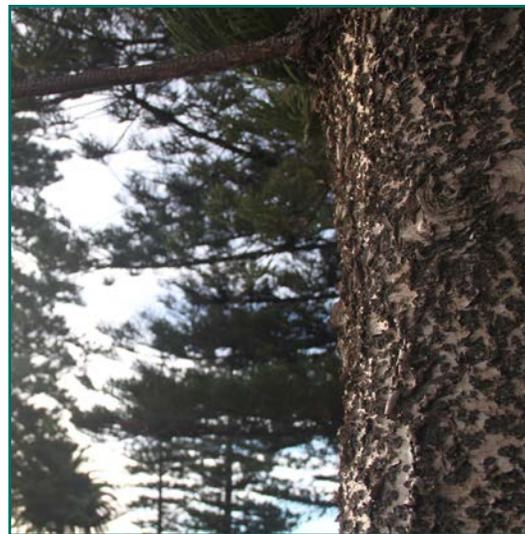
**Origin:** Endemic to Norfolk Island

**Height:** up to 50m

**Bark:** Grey/black flaking bark

**Flowers:** nil

**Foliage:** distinct uniform branching pattern, with short needle-like leaves



# Bottlebrush

*Callistemon 'Kings Park Special'*

**Origin:** Australia

**Height:** 6m

**Bark:** Stringy grey

**Flowers:** Spectacular deep-red 'bottlebrush' shaped flower spikes in spring and early summer

**Foliage:** Slender dark green leaves.



# Coastal Sheoak

*Casuarina equisetifolia*

**Origin:** Native to coastal areas of northern and eastern Australia as well as southern Asia

**Height:** up to 15m

**Bark:** Rough grey bark

**Flowers:** Insignificant flowers, forming small cone-like fruits

**Foliage:** Pendulous green-grey foliage



# Spotted Gum

*Corymbia maculata*

**Origin:** South eastern Australia

**Height:** 30m

**BARK:** Tall straight trunk with smooth white/grey/pink bark shedding in irregular patches to produce a 'spotted' appearance

**FLOWERS:** White flowers produced in winter

**FOLIAGE:** Long dark green leaves forming an open canopy



# Coral Tree

*Erythrina indica*

**Origin:** Northern Australia and Southern Asia

**Height:** 15m

**Bark:** Smooth grey/brown bark

**Flowers:** Crimson pea-shaped flowers occurring in clusters in late winter and spring

**Foliage:** Deciduous. Broad, wedge shaped leaves



# Sugar Gum

*Eucalyptus cladocalyx*

**Origin:** South Australia

**Height:** 30m

**Bark:** Mottled, colourful yellow to orange smooth bark

**Flowers:** Cream/white coloured flowers in the summer

**Foliage:** Dark glossy green leaves



Napier st, East of Railway Parade

# Tuart

*Eucalyptus gomphocephala*

**Origin:** Endemic to Cottesloe and the Swan Coastal Plain

**Height:** up to 25m

**Bark:** Rough, fibrous grey bark

**Flowers:** White flowers appear in mid-summer to mid-autumn

**Foliage:** Glossy thin light-green leaves



# Narrow Leaf Black Peppermint

*Eucalyptus nicholii*

**Origin:** New South Wales

**Height:** 15m

**Bark:** Distinctive dark furrowed bark

**Flowers:** White flowers occurring in late summer and autumn

**Foliage:** Dull blue-green leaves



# Salt River Gum

*Eucalyptus sargentii*

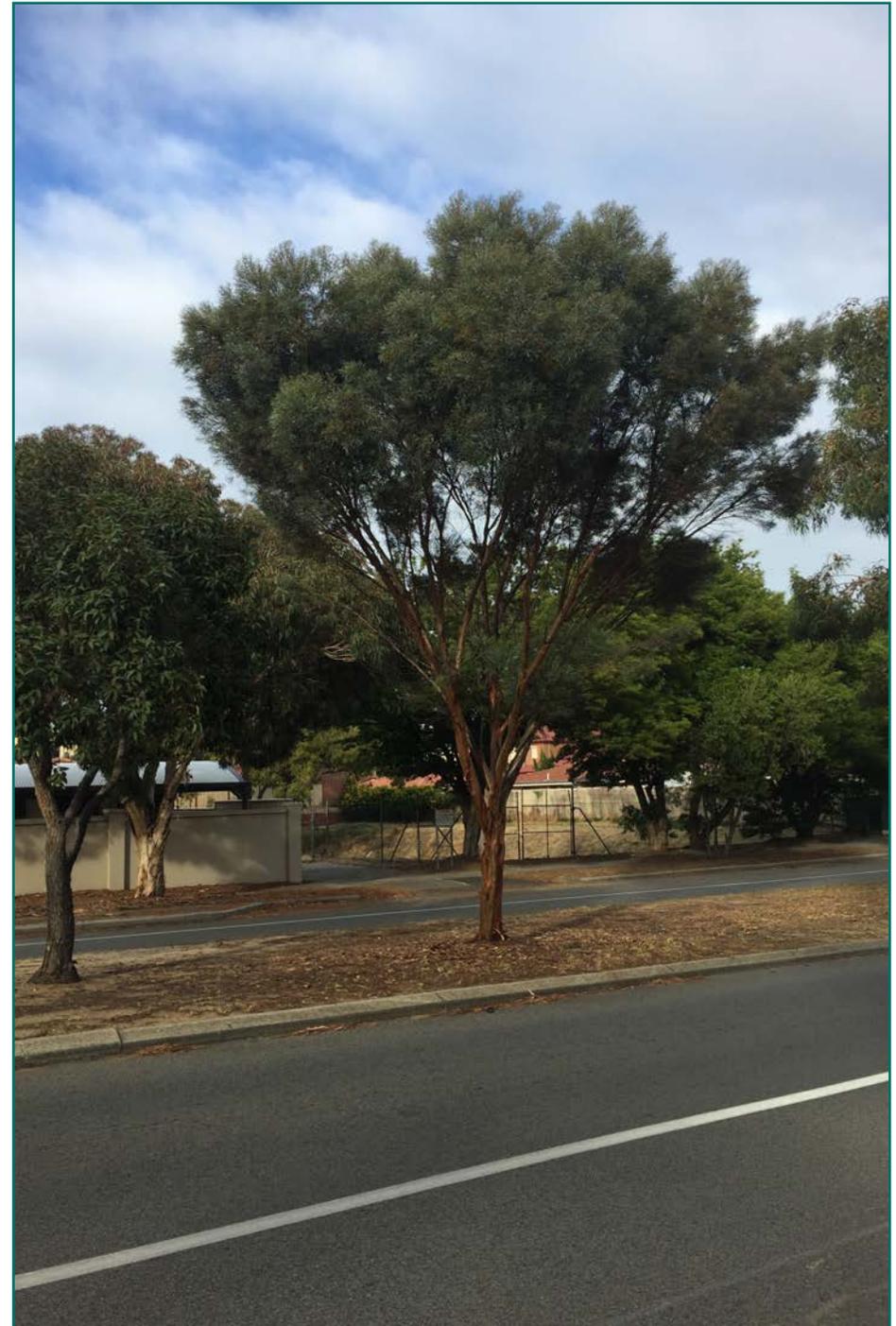
**Origin:** Western Australia

**Height:** 15m

**Bark:** Persistent on the main trunk, but smooth, glossy, grey to copper coloured on the upper branches

**Flowers:** Cream coloured flowers in the spring

**Foliage:** Narrow leaves, up to 15mm wide



# Coral Gum

*Eucalyptus torquata*

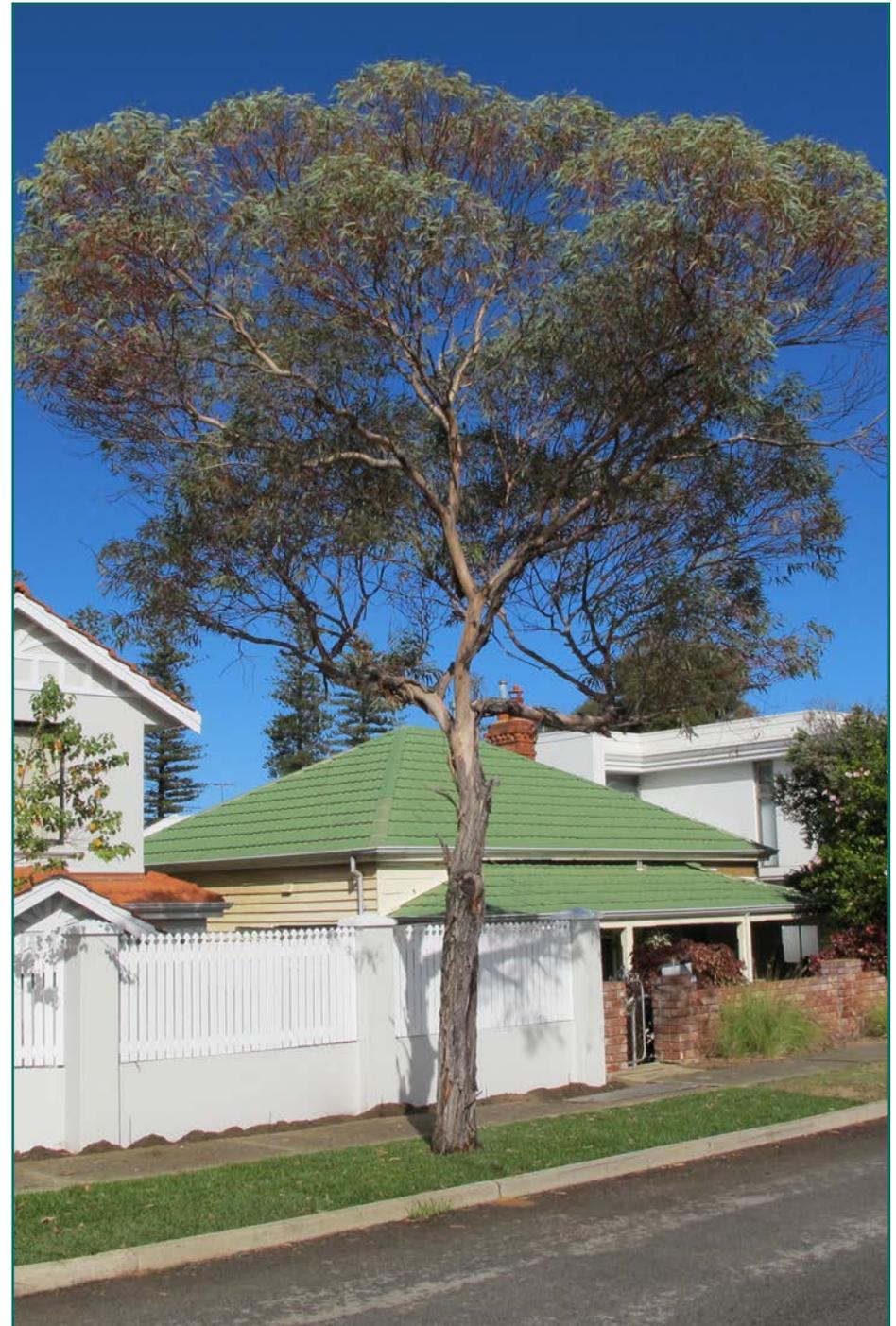
**Origin:** Western Australia

**Height:** 10m

**Bark:** Persistent, rough, grey bark

**Flowers:** Ornamental buds and fruit, red/cream flower August to December

**Foliage:** Blue/green leaves



# Queensland Box

*Lophostemon confertus*

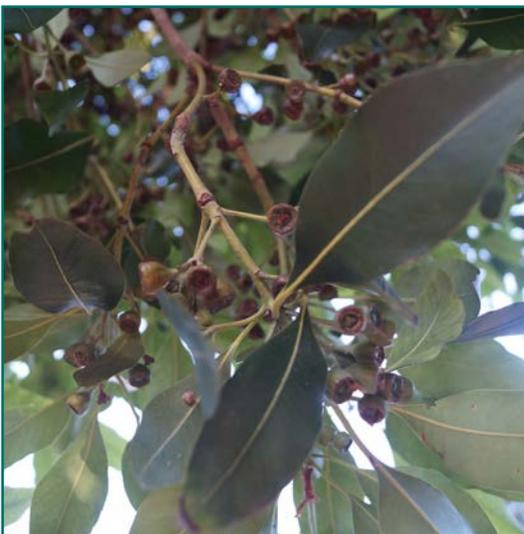
**Origin:** Queensland and New South Wales

**Height:** 15m

**Bark:** Smooth beige coloured bark

**Flowers:** Small white flowers in autumn and winter

**Foliage:** Thick glossy leaves



# Rottnest Island Teatree, Moonah

*Melaleuca lanceolata*

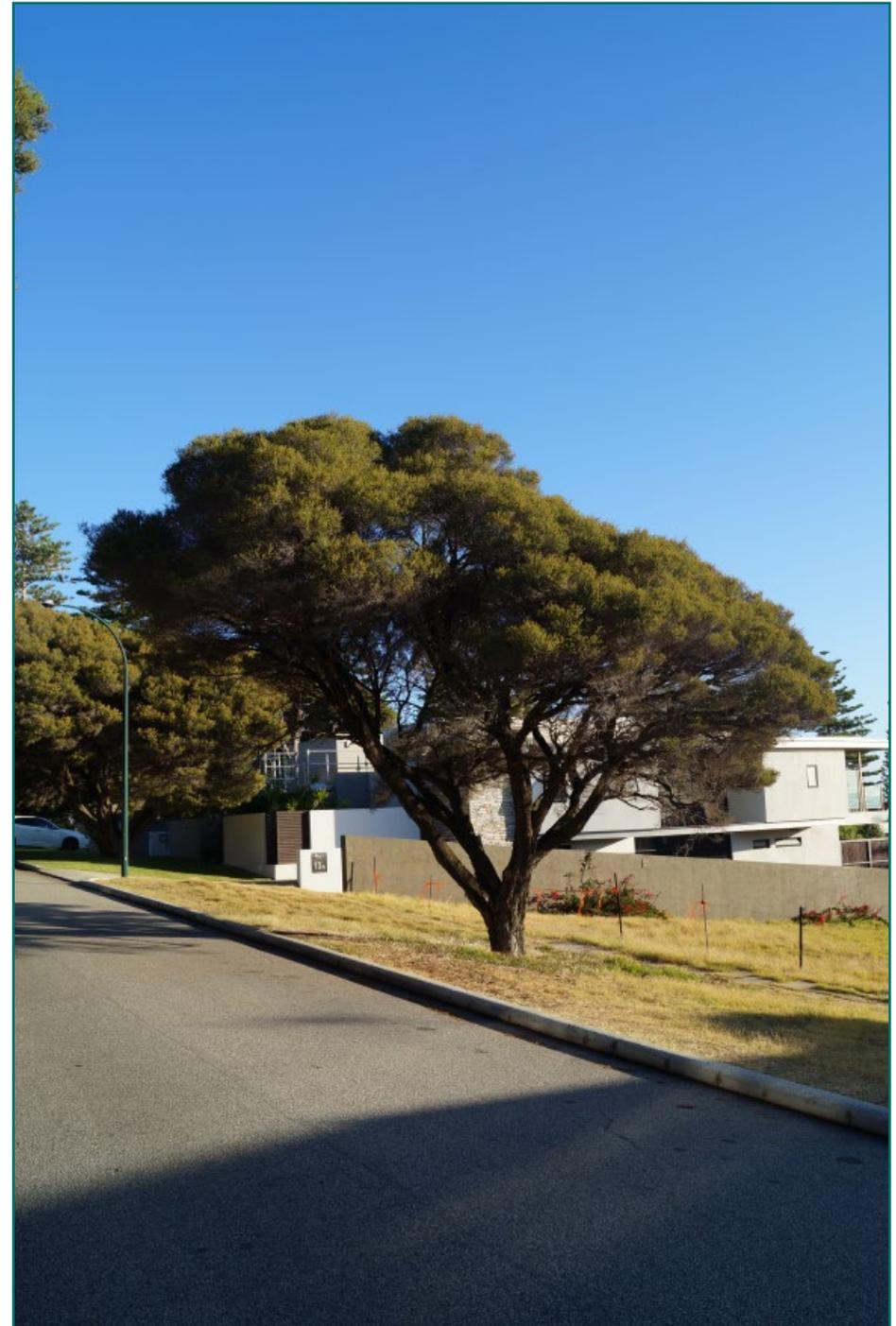
**Origin:** Endemic to Cottesloe area, but common to coastal area of Australia

**Height:** up to 8m

**Bark:** Grey/black stringy bark

**Flowers:** Small white brush-shaped flowers occurring in summer

**Foliage:** Small, slender, dark-green leaves



# Broad Leaved Paperbark

*Melaleuca quinquenervia*

**Origin:** Eastern Australia

**Height:** 15m

**Bark:** Soft, white/beige, papery bark

**Flowers:** Attractive white/cream colours flowers in autumn and winter

**Foliage:** Leathery, lance shaped leaves





**Origin: Mediterranean Basin**

**Height: 10m**

**Bark: Rough grey bark**

**Flowers: Low fruiting varieties available suited to street planting**

**Foliage: Dark silvery leaves**



# London Plane

*Platanus x acerifolia*

**Origin:** A hybrid of *Platanus orientalis* (oriental plane) and *Platanus occidentalis* (American sycamore)

**Height:** up to 30m

**Bark:** Smooth cream coloured bark shedding in flakes, producing a mottled appearance

**Flowers:** Insignificant flowers develop in to spherical seed-ball hanging from pendulous stems

**Foliage:** Broad maple-shaped leaves



# Purple Leaved Plum

*Prunus cerasifera*

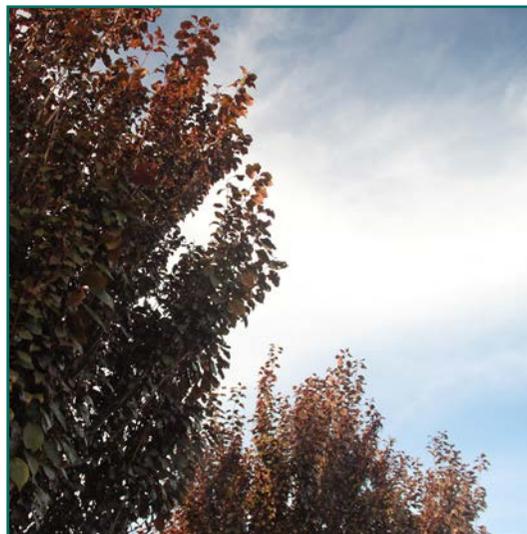
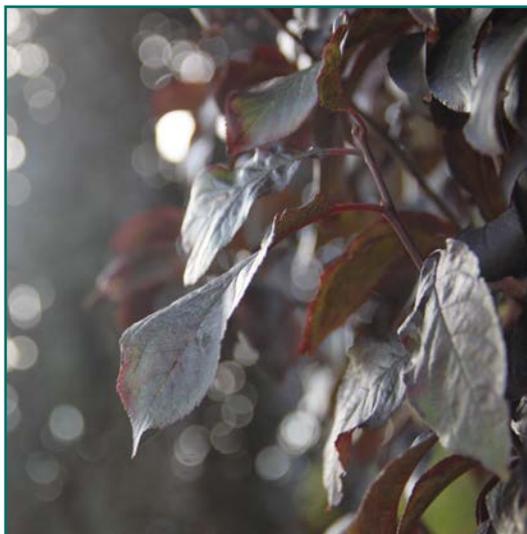
**Origin:** Asia and Europe

**Height:** 5m

**Bark:** Smooth dark

**Flowers:** Pink-white flowers emerge in spring before foliage

**Foliage:** Dark-purple deciduous leaves



# Manchurian Pear

*Pyrus usseriensis*

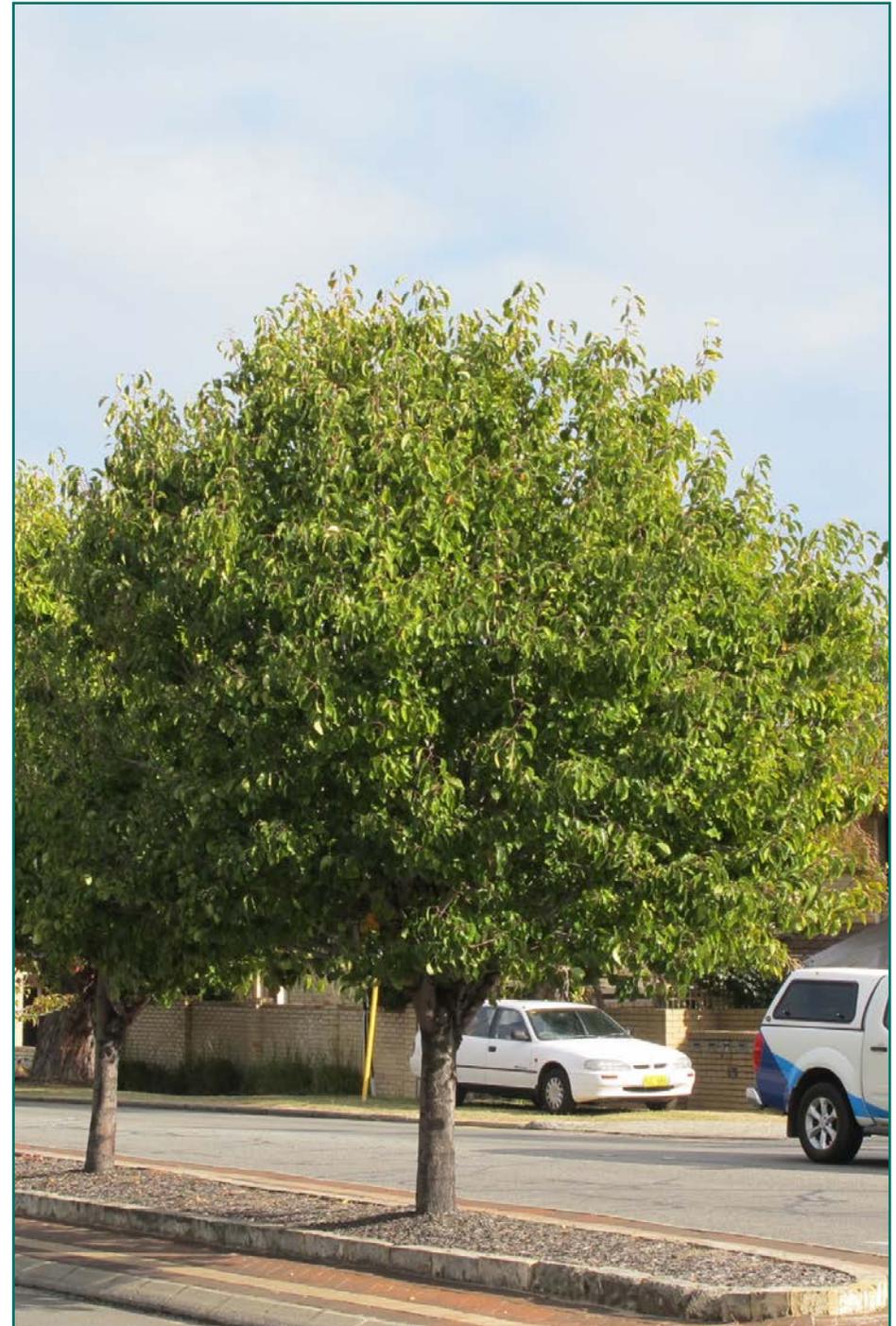
**Origin:** Western China

**Height:** up to 10m

**Bark:** Smooth brown bark

**Flowers:** Masses of small white flowers in spring

**Foliage:** Compact rounded canopy. Rounded green leaves, turning reds and yellow in the autumn



# Cork Oak

*Quercus suber*

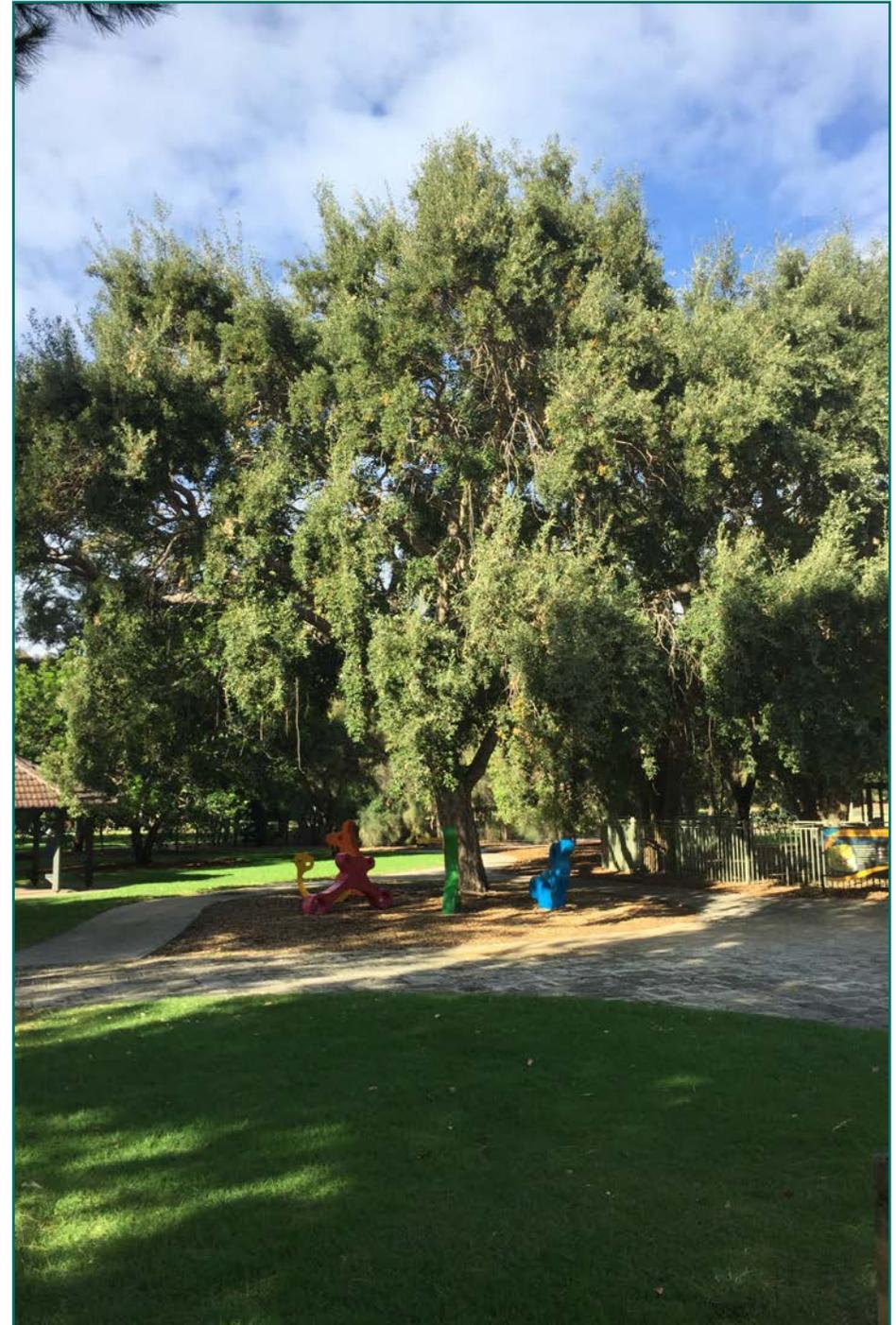
**Origin:** Mediterranean Basin

**Height:** 18m

**Bark:** Known for its deeply furrowed cream/brown bark, used to make cork

**Flowers:** Insignificant

**Foliage:** Small dark green leaves



# Chinese Tallow

*Triadica sebifera*

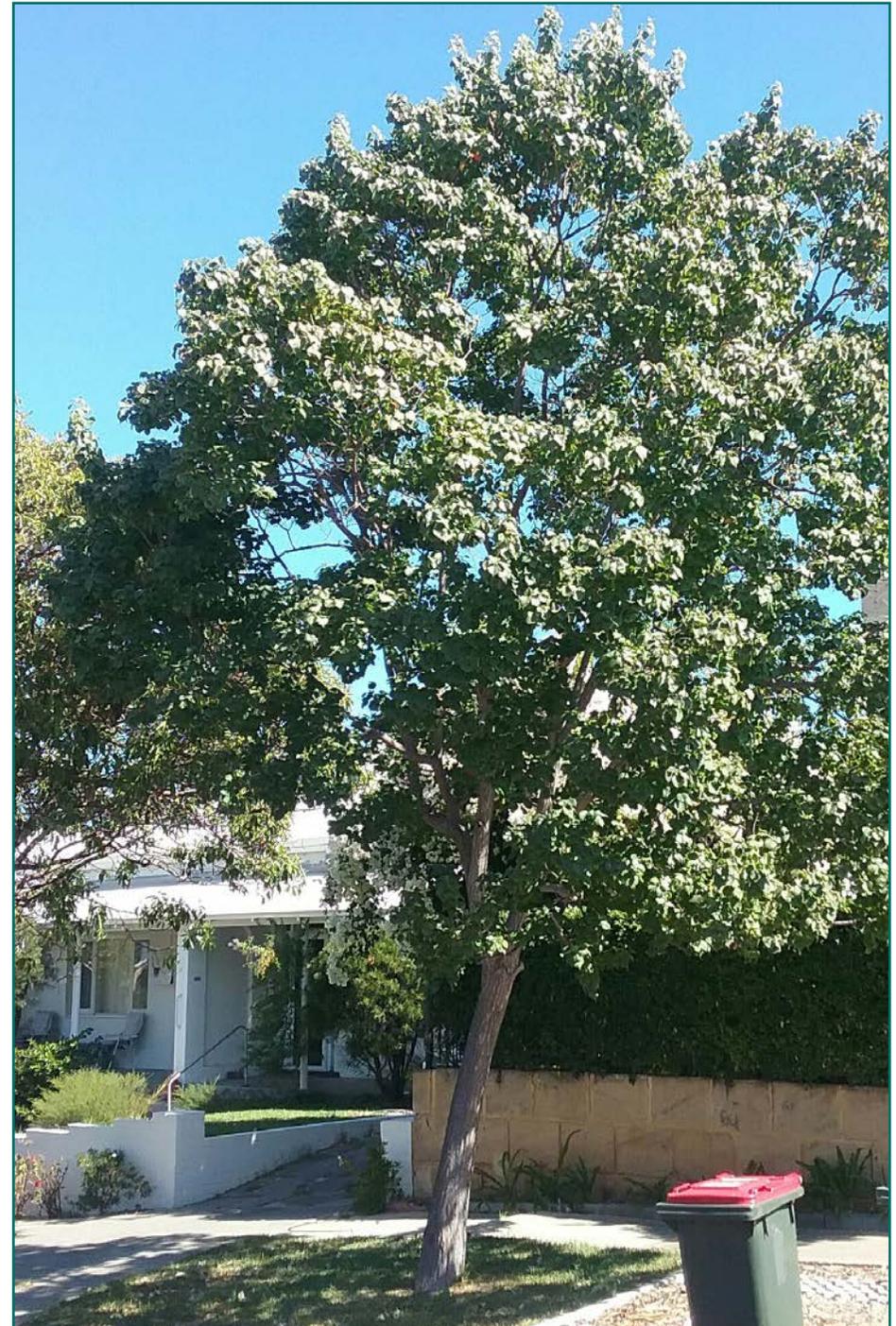
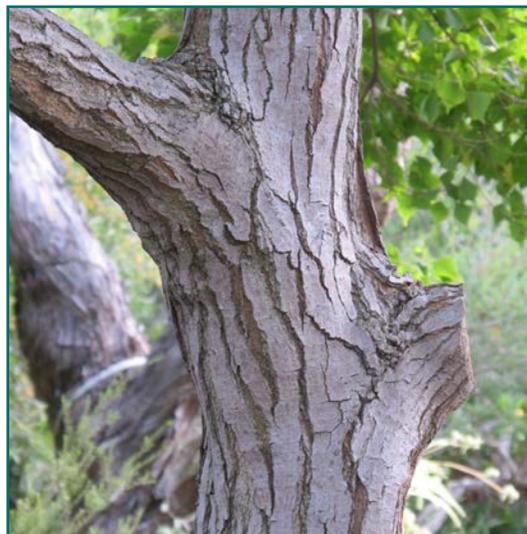
**Origin:** Warm temperate area of China and Japan

**Height:** up to 12m

**Bark:** Smooth grey bark

**Flowers:** Inconspicuous green/yellow flowers

**Foliage:** Deciduous. Heart shaped green leaves, becoming yellow and red during autumn



# Chinese Elm

*Ulmus parvifolia*

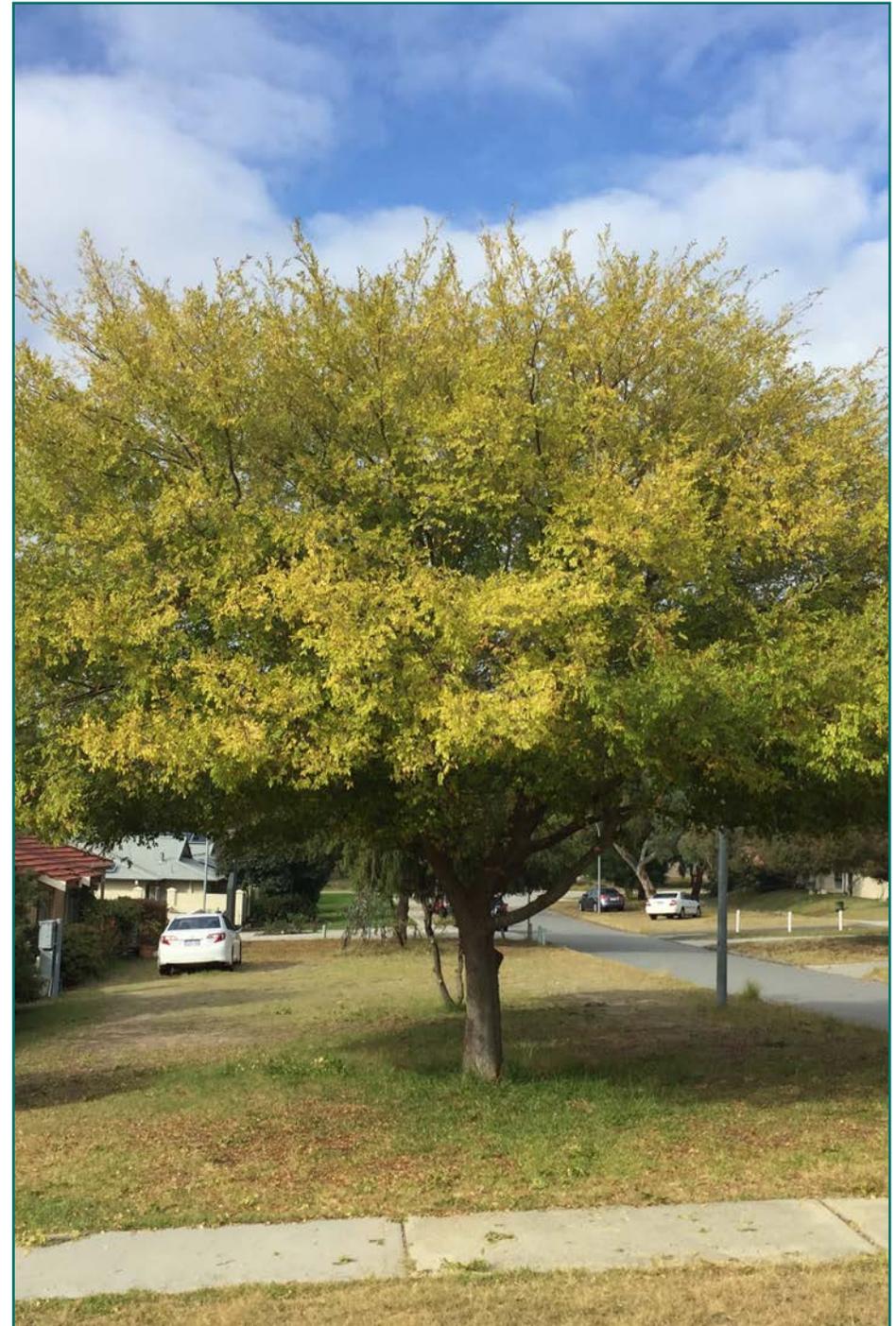
**Origin:** Eastern Asia

**Height:** 12m

**Bark:** Mottled grey, red and cream coloured bark

**Flowers:** Inconspicuous green flowers

**Foliage:** Semi-deciduous, small oval shaped dark-green leaves with serrated edges



# Peppermint, Wonnil

*Agonis flexuosa*



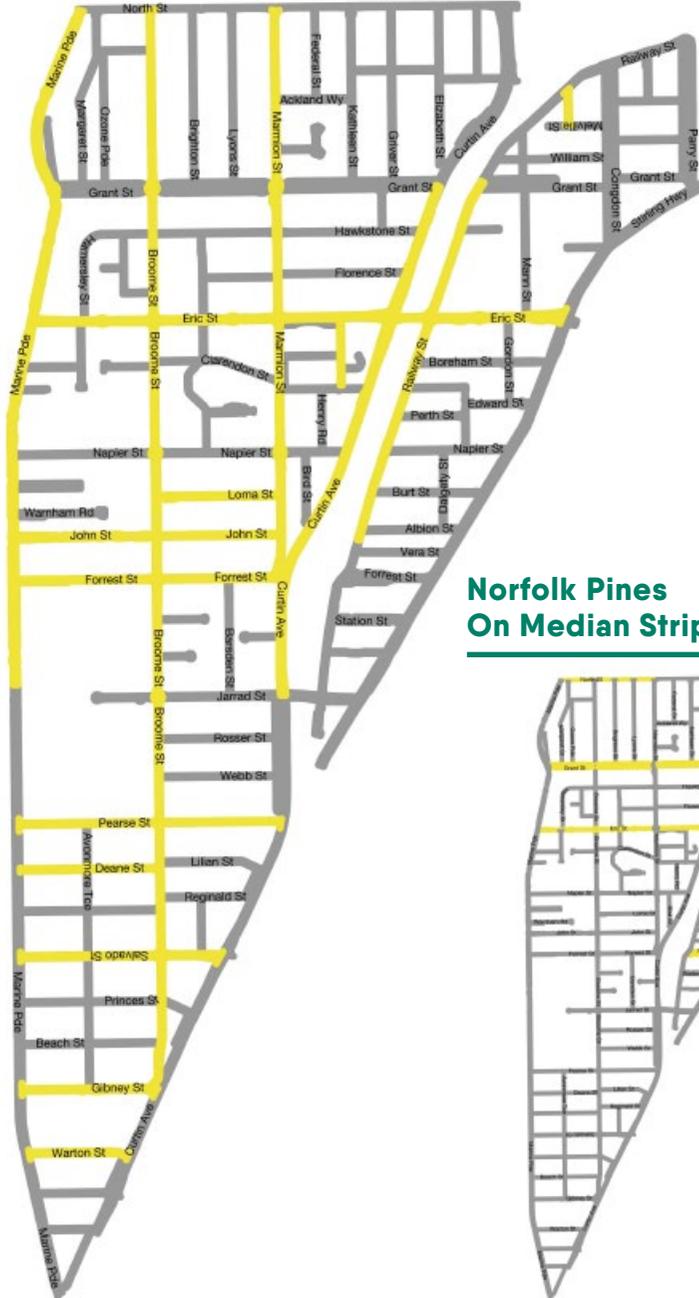
# Western Sheoak, Condil

*Allocasuarina fraseriana*



# Norfolk Island Pine

*Araucaria heterophylla*



## Norfolk Pines On Median Strips



# BottleBrush

*Callistemon*



# Coastal Sheoak

*Casuarina equisetifolia*



# Spotted Gum

*Corymbia maculata*



# Coral Tree

*Erythrina indica*



# Sugar Gum

*Eucalyptus cladocalyx*



# Tuart

*Agonis flexuosa*



# Narrow Leaf Black Peppermint

*Eucalyptus nicholii*



# Salt River Gum

*Eucalyptus sargentii*



# Coral Gum

*Eucalyptus torquata*



# Queensland Box

*Lophostemon confertus*



# Rottneest Island Tea Tree, Moonah

*Melaleuca lanceolata*



# Broad Leaved Paperbark

*Melaleuca quinquenervia*



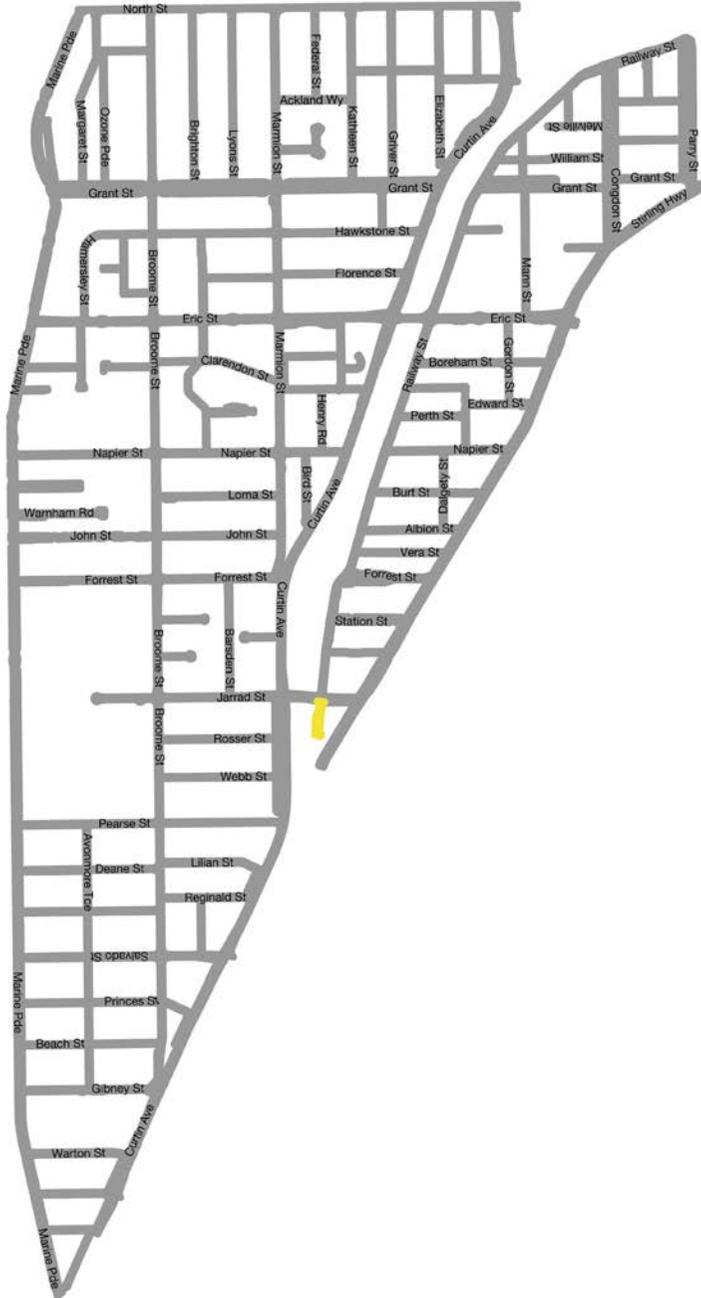
# Olive

*Olea europaea*



# London Plane

*Platanus x acerifolia*



# Purple Leaved Plum

*Prunus cerasifera*



# Manchurian Pear

*Pyrus ussuriensis*



# Cork Oak

*Quercus suber*



# Chinese Tallow

*Triadica sebiferum*



# Chinese Elm

*Ulmus parvifolia*



# Mixed



# No Tree



# Native And Exotic Trees

