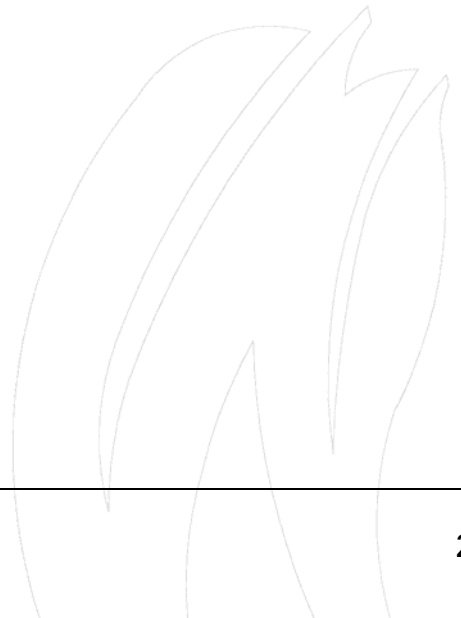


City of Marion Street Tree Strategy



1. Contents

1. Contents.....	2	5.19 Safety	10
2. Executive Summary	3	5.20 Climate Change.....	10
3. Introduction	4	6. Enquiries & Registration	11
3.1 Links to Key Council Strategic Documents ..	4	6.1 Enquiries	11
4. Street Tree Vision	5	6.2 Registration	11
5. Street Tree Considerations	6	6.3 Additional Copies	11
5.1 Street Trees as an Asset	6	7. Selected References	12
5.2 Image & Identity.....	6	7.1 General References	12
5.3 Contribution to Urban Water Management ..	7	7.2 General Internet References	12
5.4 Biodiversity	7	7.3 Image References	12
5.5 Reduce Air Pollution and Carbon Capture ...	7		
5.6 Improve Visual Amenity	7		
5.7 Reduction of High Temperatures in Built Up Areas (Urban Heat Island Effect)	7		
5.8 Provide a Sense of Wellbeing.....	7		
5.9 Legibility of the Street Network	8		
5.10 Traffic Calming.....	8		
5.11 Habitat for Birds and Other Animal Life.....	8		
5.12 Positive Effect on Property Value	8		
5.13 Services.....	8		
5.14 Pruning & Maintenance.....	8		
5.15 Exotics versus Natives.....	8		
5.16 Deciduous versus Evergreen.....	9		
5.17 Time.....	9		
5.18 Site Conditions.....	9		



2. Executive Summary

The City of Marion is seeking to enhance its street tree provision and amenity, and provide a strategy for future planting and maintenance that is sympathetic to new and existing developments as well as areas of environmental and cultural significance. This has inspired the development of a Street Tree Strategy that will enhance existing and future streetscapes.

The streetscape contributes strongly to the image of the City and provides one of the first impressions that both visitors and residents form, whether they are visiting for a period of time or just passing through.

Street trees are a major component of the presentation of our streetscapes and so it is vital that they are planned, planted and managed in a strategic and sustainable way.

The Street Tree Strategy includes four additional parts:

- *Part One – Street Tree Descriptions* (attached) provides a description of each approved tree and its attributes.
- *Part Two – Long Term Program (to be developed)* provides a planting guide and long term program of street tree works within the City of Marion.
- *Part Three – Installation and Maintenance Details (to be developed)* outlines the typical standards for installation and long term management of street trees including root barriers and details to capture, utilise and cleanse stormwater.
- *Part Four – Street Tree Policy (to be developed)* proposes Council policies in relation to street trees.

The Strategy recommends various approaches for existing streetscapes. These include:

- The replanting of complete streets
- Filling the gaps within streets where the existing dominant tree type is deemed appropriate
- The replacement of certain inappropriate species once existing trees are in decline or causing problems

- The utilisation of native trees in key locations to encourage biodiversity and to attract and support native wildlife

During the investigation for this Strategy, two landscape character units within the City of Marion were identified – the Plains Landscape (north of Seacombe Road) and the Southern Hills Landscape (south of Seacombe Road). A list of suitable street tree species has been prepared for each zone.

Species selection is based on:

- suitability to environmental conditions
- the ability to enhance the landscape and neighbourhood character within each zone
- the suitability to perform as a street tree

The Street Tree Strategy will be used as a basis in the formulation of future planning, management and enhancement of streetscape amenity within the City of Marion. The Strategy provides the direction of street tree provision throughout the City and will assist residents, developers and external agencies in understanding Councils vision to achieve cohesive and sustainable streetscapes.

3. Introduction

This document has been developed by the City of Marion to provide a long term vision and program of works for the provision of street trees throughout the Council area.

Street trees play a major role in the amenity and character of the City. They are assets that are recognised to provide a number of tangible and intangible benefits:

- Image and identity at neighbourhood and regional scales
- Contribute to urban water management
- Biodiversity
- Reduce air pollution and carbon capture
- Improve visual amenity
- Reduction of high temperatures in built up areas (Urban Heat Island Effect)
- Sense of wellbeing
- Assists in the legibility of the street network
- Traffic calming
- Habitat for birds and other animal life
- Positive effect on property value

Council also recognises the problems associated with providing, managing and maintaining trees within the urban environment:

- Service damage and/or conflict, both above and below ground
- Pruning and ongoing maintenance
- Exotic species versus native species
- Deciduous species versus evergreen species
- Time taken for trees to grow before the intended height and form is realised
- Site conditions, including soil, microclimate and climate change
- Safety considerations, including sight distances, trip and slip hazards, limb drop etc.

This Strategy aims to maximise the positive contributions of street trees whilst minimising the associated problems.

The benefits and issues above are explained in more detail in section 5. Street Tree Considerations.

3.1 Links to Key Council Strategic Documents

City of Marion Strategic Plan 2006-2020

The *City of Marion Strategic Plan 2006-2020* is built upon the four pillars of sustainability, which are:

- Social
- Cultural
- Economic
- Environmental

The Strategic Plan aims to achieve this sustainable future through:

- Community Wellbeing
- Cultural Vitality
- Dynamic Economy
- Healthy Environment

The streetscapes and associated street trees of Marion are vital in achieving this vision. As such, this strategy has been developed with this vision integral to the process.

Urban Form & Neighbourhood Character Study

The *Urban Form & Neighbourhood Character Study* identifies the existing neighbourhood character and proposes the desired form and character of urban development throughout the City of Marion. This document highlights the need to establish a street tree planting program that will increase amenity and reinforce the desired character of each identified neighbourhood.

3.2 Strategy Review

This Strategy, similar to its primary topic, is a dynamic and living thing. This enables the provision of street trees to respond to a changing environment e.g. climate change, a changing community, a changing plant industry, changing standards and changing technologies and materials. It is envisaged that this strategy will be updated as the need arises to cater for these changes.

A registration system has been established to ensure that the most current information is available – Refer to 6. Enquiries & Registration.

4. Street Tree Vision

The City of Marion will be recognised for its street trees, which provide amenity and character throughout the City and within its individual neighbourhoods.

Marion's street trees enhance amenity and character, increase biodiversity, respond to climate change, offer relief to the increased temperature of urban areas, and utilise stormwater wherever practical.

Where possible, each property will have at least one street tree on each frontage, and potentially more where there is adequate space, to assist in achieving this vision.

5. Street Tree Considerations

For trees to function in the urban environment and streetscape to their maximum potential, the requirements of the trees, the community and the Council must be taken into account.

Unfortunately there is no such thing as the perfect street tree, which meets the needs of all concerned. This Strategy provides a variety of trees that have been deemed suitable according to the following considerations.

5.1 Street Trees as an Asset

Council expends a lot of time, effort and money to provide and maintain street trees. As such it seems appropriate that street trees should be classed as assets with a financial value. However, from a purely financial accounting perspective the concept of applying a value to street trees is not very productive. This is based on the idea that something is only worth what someone else is willing to pay for it.

However, during the development process, a large number of trees are removed to make way for new development. This results in the associated amenity and benefit of those trees being lost until a replacement tree or trees is replanted and over time managed to achieve a similar amenity. As an example, a single allotment is split into two blocks. As the existing tree is often where the driveway is planned to go, it is removed. Currently, when this is approved, the requirement on behalf of the applicant is to pay only for the removal and in some cases, where space is available, the costs of planting a replacement. The replacement however can never match the size and aesthetics that the original tree offered due to the many years of growth and maintenance.

To compensate for this asset loss, many local governments negotiate with the developer / property owner to pay a calculated value of any trees that they identify for removal during the Development Assessment process. There are various models to establish a financial value of a tree. Two of the most widely used and easily applied is the Thyer Tree Valuation Method and

the Modified Burnley Method. As an example, the Modified Burnley Method uses the base value of a replacement from a nursery or tree farm (including supply and installation) and multiplies it as a ratio of the size of the existing tree, its form and vigour, and its life expectancy.

The applicant then agrees to pay the calculated value as part of the development approval process.

This concept of negotiation and agreement during the development assessment process will form part of the policy review and development to be undertaken in *Part 4 – Street Tree Policy*.

Additionally, good tree canopy cover also provides an identified benefit to other Council assets. Road surfaces and associated infrastructure have been found to last longer due to the sun protection offered by appropriately planted and managed street trees. This has substantial benefits to Council from an asset management and financial point of view.

The carbon capture of trees is also a significant benefit. This is discussed in greater detail in 5.5 Reduce Air Pollution and Carbon Capture.

5.2 Image & Identity

Street trees provide a very strong sense of identity to a street, especially where avenues of single species are used. Street trees are often the element that people associate with particular streets, and even suburbs, and are a proven method of reinforcing an existing neighbourhood character or establishing a new one.

Due to the nature of trees, this identity is often a seasonal identity. This can be spectacular floral displays or the colour transformation of leaves as the seasons change.

As stated previously, the *Urban Form & Neighbourhood Character Study* identifies the existing neighbourhood character and proposes the desired form and character of urban development throughout the City of Marion. This document has highlighted the need to establish a street tree planting program that will assist in this

endeavour by increasing the amenity and reinforcing the desired character and identity of each neighbourhood.

5.3 Contribution to Urban Water Management

Trees are known to intercept and slow stormwater, which in turn decreases the likelihood of flooding and erosion. Appropriately selected trees can also assist in improving water quality.

Additionally, there is an opportunity to utilise stormwater for passive irrigation of street trees and other vegetation. This Water Sensitive Urban Design (WSUD) approach has the potential benefit of reducing peak stormwater flows, improving stormwater quality and relieving pressure on existing or new infrastructure.

Part 3 – Installation and Maintenance Details will provide details for various scenarios as to how this can be achieved.

5.4 Biodiversity

The use of a large range of native and indigenous species, as identified in this document, will assist in increasing biodiversity in an environmentally positive way. This is a key direction in Council's Strategic Plan under the theme Healthy Environment: *HE3 Protect and enhance biodiversity*. The strategies under this direction demonstrate Council's commitment to enhance biodiversity and to increase the planting of native and indigenous plants.

5.5 Reduce Air Pollution and Carbon Capture

Trees are well known for their ability to convert carbon-dioxide into oxygen. They are also an effective way to remove other air-borne pollutants.

It is estimated that approximately 30 to 40 mature trees are required to store the carbon produced by one person, or 500 trees are required to absorb the 5 tonnes of greenhouse gas emitted by a 4 cylinder car driven 20 000 kilometres per year.

In general, two mature trees are needed to supply the oxygen needs of each person.

5.6 Improve Visual Amenity

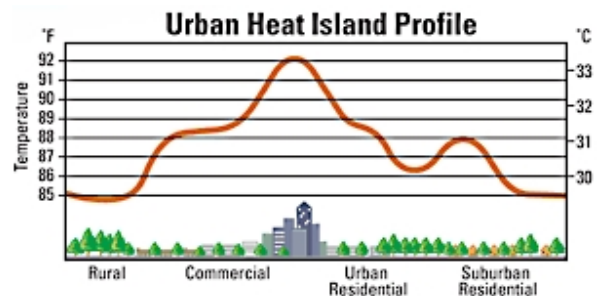
Trees are generally known to improve the visual amenity of a place. Studies have concluded that the 'greener' a location the more visually appealing it is.

5.7 Reduction of High Temperatures in Built Up Areas (Urban Heat Island Effect)

Good tree canopy cover, particularly over hard, impermeable surfaces, drastically reduces heat being reflected and/or a build up of heat within the various surfaces. Trees can reduce asphalt temperatures by as much as 13°C and the inside temperature of a car in a carpark by 17°C.

The Urban Heat Island Effect or build up of heat in constructed materials has been linked to health problems, particularly in the young and elderly during the summer months.

The following image provides a typical profile of temperature ranges throughout various environments and the effect of the shade cover provided by trees.



<http://www.epa.gov/heatisd/about/index.html>

The reduction of heat build up also reduces the demand for artificial cooling. This obviously has a positive impact on reducing power generation and consumption, which in turn reduces carbon emissions.

5.8 Provide a Sense of Wellbeing

Vegetation and natural surroundings are proven to improve and enrich health and wellbeing. In one study, patients that were exposed to views of nature required less medication and healed faster than those who did not have these natural views.

“Green” environments can increase concentration, reduce stress and lead to feelings of satisfaction, optimism and wellbeing generally.

5.9 Legibility of the Street Network

Street trees are a very effective method of reinforcing the street network. Most people respond to visual cues and as such the use of distinct trees on different streets assists people to navigate their way through the street network system.

5.10 Traffic Calming

Tree lined streets are perceived as being narrower. This narrowing effect, at a subconscious level, generally reduces the speed at which people drive.

Street trees also provide an effective buffer between pedestrians and vehicles.

5.11 Habitat for Birds and Other Animal Life

It is reported that tree canopy cover on private land is declining at a rate of 5% per year. This is having a dramatic effect on the numbers of native birds and animals in the urban environment.

Large mature street trees are very important in attracting and supporting our native wildlife. They provide food and habitat, and establish corridors for movement between natural areas for many species of insect, bird and other animal life.

5.12 Positive Effect on Property Value

It is also well documented that large healthy street trees adds to the value of a property. Some sources report that the value of property can be up to 20% higher in areas planted with trees when compared with similar areas that have few trees.

5.13 Services

The planting of inappropriate trees near services, including overhead and underground services is of serious concern from both a Council perspective and from the service providers themselves. Inappropriately chosen, planted and maintained trees can cause service disruptions from branches or trees falling onto power and

telephone lines, roots blocking drains, lifting and cracking public infrastructure or private property, bush fires etc.

Appropriate selection, placement and maintenance of trees can minimise the risk of these events occurring.

Maintenance however needs to be undertaken carefully and professionally to ensure that the health and amenity of the tree itself is considered. This should be done in collaboration with the service provider to ensure that the needs of all are achieved.

5.14 Pruning & Maintenance

All assets need maintenance. Trees in particular need to be carefully managed and maintained to ensure that the ultimate outcome is achieved.

Most trees require some level of formative and ongoing pruning to ensure good form, maximum tree health and to reduce risk.

Part 3 – Installation and Maintenance Details will provide pruning details and ongoing maintenance requirements.

5.15 Exotics versus Natives

There is a lot of debate about exotic trees versus natives, their benefits and their problems. Council recognises that if the species is chosen appropriately, carefully considering and weighing up environmental, social, cultural and economic factors, then each type has their place in the urban environment.

Part 1 – Street Tree Descriptions identifies a number of tree species that are better suited to the relatively harsh urban streetscape environment and specific site conditions. Approximately two-thirds of these are native, indicating Council's commitment to promoting and planting native and indigenous plants to enhance biodiversity.

5.16 Deciduous versus Evergreen

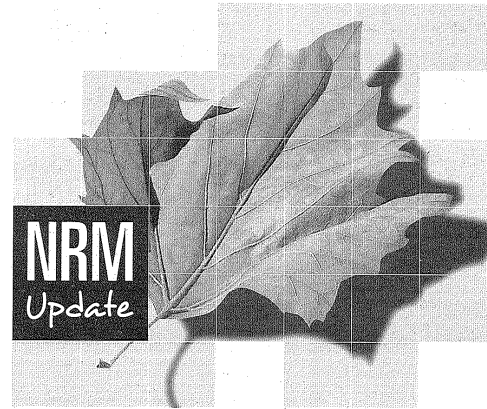
Another debate that occurs is the benefits and problems of either deciduous or evergreen trees.

One of the primary benefits of deciduous species, apart from the typically stunning autumn displays and often equally stunning floral displays, is that of the warmth of the sun is able to penetrate during winter months, making it a much more pleasant pedestrian environment and reducing the reliance on artificial heating. Once again, this has a positive impact on reducing power generation and consumption, which in turn reduces carbon emissions.

The following newspaper notices by the State Government highlight some of the issues between deciduous and evergreen trees. These issues have also been recognised in the selection of species in *Part 1 – Street Tree Descriptions*, by limiting the use of some trees in and around natural areas and waterways. This is important where leaf litter, seeds and the like can enter natural water courses and have the potential to cause environmental harm.



Southern Times, May 9, 2007:page 24



Time to clear those Autumn leaves.

Autumn has arrived and our streets are awash with leaves of gold. A pretty picture to some, but a potential hazard to our environment. Deciduous leaves washed down our stormwater drains into local creeks and rivers can cause great harm to aquatic life as they decay quickly, robbing the water of its oxygen. Leaves from native trees break down more slowly so aren't such a threat, however, they too can cause a problem if excessive amounts of native plant matter enters the stormwater system at one time.

You can do your bit this Autumn.

You can help protect these fragile ecosystems. Simply rake up the leaves around your garden, the footpath and on the street and then dispose of them in your green waste or compost bin. It's an easy way everyone can contribute to better natural resources management (NRM).

For more tips on how to help, call us today on 8273 9100 for a brochure or visit our website www.amlnrm.sa.gov.au



Government of South Australia
Adelaide and Mount Lofty Ranges
Natural Resources Management Board

Southern Times, April 30, 2008:page 7

Council recognises the benefits of specific deciduous trees in certain situations. Council also recognises the positive benefits of selected native species. Each type has a role to play in establishing or strengthening neighbourhood character and to provide environmental benefits.

5.17 Time

Trees need time to mature and to reach their full potential. As identified previously, trees are an asset that require resources to manage. To maximise the benefit of the asset and minimise the resources that go into managing the asset, species that offer a reasonable life expectancy have been chosen.

Careful species selection will ensure that the maximum life time benefit is achieved while understanding the fact that it may take many years to get there.

5.18 Site Conditions

Each tree planting site is different. The width of the verge varies from location to location, soil type varies, services may be present, the site may be fully exposed to the elements including coastal exposure and the inherent salt implications, the

ground may be constantly moist or always dry, compacted or high in organic matter etc.

Similarly, each tree species is different in regards to the site conditions that can be tolerated in order for the tree to thrive.

Tree species selection should always match the tree to the site and its respective conditions.

5.19 Safety

The selection and placement of trees is essential in minimising risk and maximising public safety.

Many trees are known for their habit of dropping limbs large or small, the dropping of fruit or nuts and even leaves that can cause slip or trip issues.

Knowledge of these issues as they relate to individual species means that the risk can either be eliminated or suitably managed.

The list of suitable street trees species have been selected to minimise risk, with any particular issues being clearly identified to allow suitable management of the risk and in turn maximise public safety while still achieving the other objectives of the Strategy.

5.20 Climate Change

Climate change and its likely effects are well publicised. From a street tree provision perspective, two primary factors must be considered in selecting appropriate species:

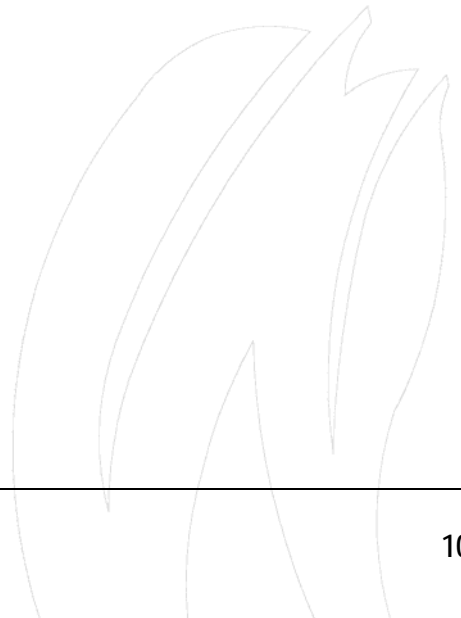
1. The ability of the tree to reduce the impacts of the causes of climate change; and
2. The effect of climate change itself on the suitability of certain tree species

The ability of trees to reduce the impacts and/or causes of climate change has previously been well described in this section of the Strategy i.e. reduction of heat island effect, carbon capture, reduction in the need for artificial heating and cooling, which in turn reduces energy consumption and therefore carbon emissions.

However, the likely changes in climate, such as less rainfall but more intense storm events, hotter

summers and drier winters, needs to be considered when selecting tree species. This consideration is not just to ensure that the tree will survive and thrive in these conditions but that any potential for environmental harm is reduced. For example a tree may become 'weedy' under certain climatic conditions and has a negative impact on biodiversity and the natural environment.

The species selected in the Street Tree Strategy have been chosen to maximise the positive contributions of trees by taking into consideration the issues identified, whilst minimising potential problems and the associated costs of provision and management.



6. Enquiries & Registration

6.1 Enquiries

For general comments or enquiries regarding the contents of this Strategy please contact:

David Chick
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 Ph. 08 7420 6451
 Fax. 08 8375 6699
 Email: david.chick@marion.sa.gov.au

6.2 Registration

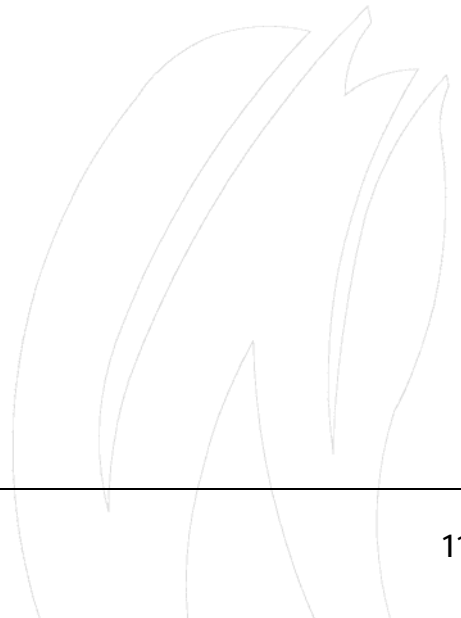
This Strategy will be updated on a regular basis. Users should ensure that the version being used is the latest available. To assist us in keeping you up to date, please complete the following registration details or email these details to: david.chick@marion.sa.gov.au

Full Name:
 Title:
 Company Name:
 Mailing Address:
 Suburb:
 State:
 Postcode:
 Email Address:
 Telephone Number:

6.3 Additional Copies

This Strategy is available in hard copy or is available online at: www.marion.sa.gov.au

To order a hard copy version, please contact:
 David Chick
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 Fax. 08 8375 6699
 Email: david.chick@marion.sa.gov.au



7. Selected References

7.1 General References

Multiple sources of information have been utilised. The following are the primary and major references utilised:

Bagust, P & Tout-Smith, L 2005 *The Native Plants of Adelaide*, Urban Forest Biodiversity Program, Department for Environment and Heritage, Adelaide

City of Holdfast Bay 2001 *Street Tree Strategy*, City of Holdfast Bay, Adelaide

City of Wanneroo 2005, *City of Wanneroo Street Tree Masterplan*, City of Wanneroo, Wanneroo

City of Yarra 2004 *Yarra Street Planting Precinct Masterplans*, City of Yarra, Melbourne

ETSA Utilities (Date Unknown), *Tree Planting Near Powerlines*, ETSA Utilities, Adelaide

Foster, K (Date Unknown), *Tree Protection Guidelines*, Brisbane City Council, Brisbane

Holliday, I 2003, *A Field Guide to Australian Trees – Third Edition*, Reed New Holland, Sydney

Johnson, T 2007, *Treenet Trials*, proceedings of the 8th National Street Tree Symposium, Adelaide

Lord, E, E & Willis, J, H 1999 *Shrubs and Trees for Australian Gardens*, Lothian Books, Victoria

SA Water (Date Unknown), *Tree Planting Guide*, SA Water, Adelaide

State Flora – Belair National Park, Adelaide

Wrigley J,W & Fagg, M 1997, *Australian Native Plants – Fourth Edition*, Reed Books, Victoria

7.2 General Internet References

The following web sites were accessed during the research for this Strategy from July 2007 to May 2008:

<http://globalioweather.com>

www.anbg.gov.au

www.arboret.com.au

www.asgap.org.au

www.austrafloora.com

www.australianplantssa.asn.au

www.australiaplants.com

www.charlessturt.sa.gov.au

www.esc.nsw.gov.au

www.flemings.com.au

www.florabase.dec.wa.gov.au

www.forestfarmers.com.au

www.metrotrees.com.au (particularly the tree handbook section)

www.onkapinga.net/about/issues

www.plantnet.rbgsyd.nsw.gov.au

www.treelogic.com.au

www.treenet.com.au

www.victor.sa.gov.au

www.weeds.org.au

www.whitehorse.vic.gov.au

www.winterhill.com.au

7.3 Image References

The source of each image is provided below all images.