REPORT:

ARBORICULTURAL IMPACT ASSESSMENT

27 Manning Street,
Oyster Bay NSW

Prepared 24 April 2021
Our Ref: 6832
Contents

Preface 3
Introduction 3
Summary 3
1.0 Aims 4
2.0 Objectives 4
3.0 Methodology 4
4.0 Pruning Standards 5
5.0 Tree Assessments 6
   • Assessment of a stand of trees
   • Observations
   • Discussions
5.0 Conclusion & Recommendations 8
Disclaimer 8

Tables
1.0 General description and Schedule of works of trees. 6

Appendices
Appendix A  IACA Significance of a Tree, Assessment Rating System (STARS) (IACA, 2010) ©
Appendix B  Matrix - Sustainable Retention Index Value (SRIV), Version 4, (IACA, 2010) ©
Appendix C  Glossary of terminology
Appendix D  Survey of Subject Tree/s
PREFACE

Redgum Horticultural has prepared this report for and on behalf of Mr Adam Mckean (the applicant) c/- 27 Manning Street, Oyster Bay NSW. Mr. Neville Shields (the author) attended 27 Manning Street, Oyster Bay NSW (the site), on 16 April 2021, there was only one tree assessed and its growing environment was examined. The site is subject to a Development Application and this report and any works recommended herein, that require approval from the consenting authority, forms part of that development application. There are other trees within and adjacent to the property that are not within the scope of works for this report.

INTRODUCTION

The land is situated in the Sutherland Shire Council (the Council) Local Government Area (LGA) and the trees are protected under Council’s Local Environmental Plan (LEP) & Development Control Plan (DCP) 2015. The Council is the consenting authority for development works on the site. This report involves 1 tree (the tree), as indicated on Site Plan A – Survey of Subject Trees (Appendix D) and considers its removal as it is positioned within the proposed driveway footprint. The tree is considered as 1 stand, as marked on Appendix D, Site Plan A – Survey of Subject Trees.

The site is comprised of one residential block with proposed alterations and additions to the front of the existing residence including a double garage and turning bay, a second living room and master bedroom, requiring the removal of this specimen situated within the site. As part of the Landscape Plan where appropriate, the tree cover on the site will be enhanced by planting with advanced specimens/s of appropriate tree species for the space available above and below ground being soil volumes available and to prevent future conflict between trees and built structures.

The proposed building design and its configuration and infrastructure were arrived at prior to the undertaking of an arboricultural assessment of the trees on the site to determine their significance by Redgum Horticultural.

The Summary lists the general condition of each tree and a summary of works in Table 1.0. In section 5.0 each individual tree is described in greater detail including protective or remedial works. Tree maintenance works including pruning, removal or transplantation are detailed in section 4.0.

SUMMARY

This report considers 1 tree, identified as Tree 1, and recommends for its removal as the structural root zone is within the proposed driveway footprint. It is recommended for removal and replacement with super advanced specimens in 75 or 100 litre bags size stock within more appropriate positions within the development. Replacement of this specimen needs to be mindful of their spatial requirements to allow them to grow to maturity and not be impeded by the built structure.

The general condition of each tree and a summary of works are listed in Table 1.0.
1.0 AIMS

1.1 Detail the condition of the trees on the site or on adjoining sites where such trees may be affected by the proposed works, by assessment of individual specimens or stands, and indicate remedial works or protection measures for their retention in a safe and healthy condition, or a condition not less than that at the time of initial inspection for this report, or in a reduced but sustainable condition due to the impact of the development but ameliorated through tree protection measures able to be applied, and will consider the location and condition of the trees in relation to the proposed building works, or recommend removal and replacement where appropriate.

1.2 Provide as an outcome of the assessment, the following: a description of the trees, observations made, discussion of the effects the location of the proposed building works may have on the trees and make recommendations required for remedial or other works to the trees, if and where appropriate.

1.3 Determine from the assessment as detailed in 1.2 a description of the works or measures required to ameliorate the impact upon the trees to be retained, by the proposed building works or future impacts the trees may have upon the new building works if and where appropriate, or the benefits of removal and replacement if appropriate for the medium to long term safety and amenity of the site.

2.0 OBJECTIVES

2.1 Assess the condition of the subject trees.

2.2 Determine impact of development on the subject trees.

2.3 Provide recommendations for retention or removal of the subject trees.

3.0 METHODOLOGY

Note: Individual methodologies applied as applicable.

3.1 The method of assessment of tree/s applied is adapted from the principles of visual tree assessment undertaken from the ground, which considers:

1. Tree health and subsequent stability, both long and short term
2. Sustainable Retention Index Value (SRIV) Version 4 (IACA 2010) ©
3. Hazard potential to people and property
4. Amenity values
5. Habitat values
6. Significance

3.2 This assessment is undertaken using standard tree assessment criteria for each tree based on the values above and is implemented as a result of at least one comprehensive and detailed site inspection to undertake a visual tree assessment from the ground of each individual tree, or stand of trees, or a representative population sample. Any dimensions recorded as averages, or by approximation are noted accordingly.
3.3 This report adopts Australian Standard AS4970 2009 *Protection of trees on development sites* as a point of reference and guide for the recommended minimum setbacks from the centre of a tree’s trunk to development works and the distances may be increased or decreased by the author in accordance with AS4970 – Section 3.3.4 as a result of other factors providing mitigating circumstances or constraints as indicated by but not restricted to the following:

1. Condition of individual trees,
2. Tolerance of individual species to disturbance,
3. Geology e.g. physical barriers in soil, rock floaters, bedrock to surface
4. Topography e.g. slope, drainage,
5. Soil e.g. depth, drainage, fertility, structure,
6. Microclimate e.g. due to landform, exposure to dominant wind,
7. Engineering e.g. techniques to ameliorate impact on trees such as structural soil, gap graded fill, lateral boring,
8. Construction e.g. techniques to ameliorate impact on trees such as pier and beam, bridge footings, suspended slabs,
9. Root mapping,
10. Physical limitations - existing modifications to the environment and any impact to tree/s by development e.g. property boundaries, built structures, houses, swimming pools, road reserves, utility services easements, previous impact by excavation, or construction in other directions, soil level changes by cutting or filling, existing landscaping works within close proximity, modified drainage patterns,
11. Extraneous factors e.g. potential future impacts from development on adjoining land when the tree is located on or near to a property boundary.

3.4 Trees in groups may be referred to as stands and a stand may exclusively contain specimens to be either retained or removed or a combination of both. A stand may be used to discuss all the trees on a given site to expedite their assessment or refer to trees growing proximate to one another or within a defined space. Stands may be comprised by mass boundary or screen plantings, to form a group of the same or a mixture of taxa. Each stand is considered as a single unit with each component tree assessed and expressed in tabular form or indicated by a given percentage as a population sample of each stand. Where it is appropriate for a stand of trees to be retained in full or part, the location and setback of Tree Protection Zone fences or works, are prescribed to provide for the preservation of the stand or selected component trees, in a condition not less than that at the time of initial inspection for its incorporation into the landscape works for the site, or in a reduced but sustainable condition due to the impact of the development but ameliorated through tree protection measures.

3.5 The meanings for terminology used herein are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009. An extract from the IACA Dictionary forms a glossary of terms included as Appendix C.

4.0 PRUNING STANDARDS

4.1 Any pruning recommended in this report is to be to the Australian Standard® AS4373 *Pruning of amenity trees* and conducted in accordance with the NSW Work Cover Authority Code of Practice, Tree Work, 2007.

4.2 All pruning or removal works are to be in accordance with the appropriate Tree Management Policy where applicable, or Tree Management Order (TMO), or Tree Preservation Order (TPO).

4.3 Tree maintenance work is specialised and in order to be undertaken safely to ensure the works carried out are not detrimental to the survival of a tree being retained, and to assist in the safe removal of any tree, should be undertaken by a qualified arboriculturist with appropriate competencies recognised within the Australian Qualification Framework, with a minimum of 5 years of continual experience within the industry of operational amenity arboriculture, and covered by appropriate and current types of insurance to undertake such works.
Table 1.0 General condition and Schedule of works of trees. Trees described in greater detail in section 5.0.

<table>
<thead>
<tr>
<th>Redgum Tree No.</th>
<th>Genus and species</th>
<th>Common name</th>
<th>Condition</th>
<th>Description of work to be done</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Harpephyllum caffrum</td>
<td>Kaffir Plum</td>
<td>G</td>
<td>Remove and replace with by new plantings as per Landscape Plan.</td>
</tr>
</tbody>
</table>

5.0 TREE ASSESSMENT – Assessment of a stand of Trees

<table>
<thead>
<tr>
<th>Tree No.</th>
<th>Genus &amp; Species Common Name</th>
<th>Age</th>
<th>Vigour</th>
<th>Condition</th>
<th>1. SRV</th>
<th>Crown Form</th>
<th>Crown Spread approx. metres</th>
<th>Orientation</th>
<th>HT. Approx. metres</th>
<th>DBH in mm @ 1.4m, or other, as indicated</th>
<th>Trunk Lean</th>
<th>Trunk Orientation</th>
<th>Roots Evident at Root Crown</th>
<th>Trunk Lean</th>
<th>Pests, Diseases &amp; Damage</th>
<th>Branch Bank Included</th>
<th>Form D</th>
<th>Form D %</th>
<th>Form P</th>
<th>Form P %</th>
<th>Form N/A</th>
<th>Retention Value</th>
<th>Significance scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Harpephyllum caffrum</td>
<td>M</td>
<td>GV</td>
<td>G</td>
<td>MGVG – 10</td>
<td>1</td>
<td>D 10</td>
<td>7</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>80</td>
<td>520</td>
<td>2/S</td>
<td>ST</td>
<td>YES</td>
<td>NO</td>
<td>P</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kaffir Plum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments: Trunk with moderate lean to the south, self-correcting. Centre lopped out.
Observations / Discussion

5.2 The report considers a planted mature exotic evergreen specimen within the current proposal which is positioned where the structural root zone is within the proposed driveway footprint and is recommended for removal and replacement with super advanced specimens in 75 or 100 litre bags size stock within more appropriate positions within the development. Replacement of this specimen needs to be mindful of their spatial requirements to allow them to grow to maturity and not be impeded by the built structure. There are other mature tree specimens within the property that form a link to the local amenity and are to be retained as components of the ongoing landscape.

Tree Significance

5.3 Significant Trees as established by the Rating System for Tree Significance – IACA (2009), Appendix A.

<table>
<thead>
<tr>
<th>Significant Scale</th>
<th>Retention Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – High</td>
<td>High – Priority for Retention</td>
</tr>
<tr>
<td>2 – Medium</td>
<td>Medium – Consider for Retention</td>
</tr>
<tr>
<td>3 – Low</td>
<td>Low – Consider for Removal</td>
</tr>
<tr>
<td></td>
<td>Remove - Priority for Removal</td>
</tr>
</tbody>
</table>

Tree Retention Value

5.4 See Appendix A for Retention Value Matrix.

Demolition and Tree Removal/s

5.5 Tree 1: Harpephyllum caffrum - Kaffir Plum; located within the front of the property and is positioned where the structural root zone is within the proposed driveway footprint. If this current proposed development is approved, then this specimen cannot be retained and is recommended to be removed and replaced as part of the proposed landscape works.

Specific - Tree Protection works – During Construction

5.6 Trees to be removed are to be replaced with advanced specimens being mindful of the space limitations of the new use of the site. The advanced trees should be in areas along the boundaries of the site. The planting in these locations will provide the maximum benefit to the surrounding properties by screening views to and from the site and the plantings included in the proposed landscape plan. The replacement trees will be in positions where they may grow to maturity unhindered and will not conflict with built structures or utility services and in greater numbers than the trees removed should provide a net increase in the local amenity.
6.0 CONCLUSION & RECOMMENDATIONS

6.1 The tree to be removed is to be undertaken in accordance with section 4.0, parts 4.1 - 4.3. As the tree is nominated for removal, replacement species in accordance with the associated Landscape documentation for the development is recommended. Where appropriate, the Landscape Plan will include planting with new trees including street tree/s.

6.2 Tree removal near retained specimens is to be undertaken in accordance with Discussion Point 4 on page 5 of this report.

6.3 Each of the replacement are to be a vigorous specimen with a straight trunk, gradually tapering and continuous, crown excurrent, symmetrical, with roots established but not pot bound in a volume container or approved similar and be maintained by an appropriately qualified and experienced landscape contractor for up to one (1) year after planting, or as appropriate.

It is often a consequence of redevelopment, and subject to the nature of the proposed land use that some or all of the trees present on the site prior to that redevelopment may be required to be removed and replaced with new tree plantings in different locations. This may be dependent upon the type of development and its design constraints and the requirements of the local planning instruments and any Landscape Design Codes if existing. Where tree removal is required for this development, it is considered that those trees identified within this report are not sustainable within the context of the proposed development. Where tree retention has been considered, those trees are expected to survive the redevelopment process and remain stable and viable. The retention and protection of existing trees on site is a significant aspect of the development process, allowing those trees as components of the current curtilage to be transferred to the new dwellings for incorporation into the landscaping works for the site. The retention of some or all of the existing trees contributes to: the preservation of local amenity, screening of views to and from the site, and a balance to the scale and bulk of buildings, while maintaining elements of a continuous landscape, providing a more harmonious integration and transition of the use of the land.

If all the recommendations and procedures detailed herein are adhered to, some or all of the trees the subject of this report will continue, or will be replaced with more appropriate plantings in suitable locations, or enhanced by additional new plantings, and will grow to develop as important landscape components providing elements of long term amenity for the property and its owners or occupants, and the local community.

The recommendations made in this report are subject to approval by the consent authority.

As a renewable and dynamic natural resource, the urban tree and the growing environment essential for its survival must be understood and carefully managed to balance its needs with those of people. It is crucial that as required; this resource be planned for, planted, nurtured, protected, maintained and replaced, to ensure appropriateness and suitability of new plantings and trees retained, for safety and viability, so that it remains vital, and is sustainable in continuity.

Neville Shields: MAIH-RH0166
Principal Consultant (Director)
IACA-ACM0072003
neville@redgumhrt.com.au

Diploma of Horticulture – Arboriculture (AQF5) 2005,
Work Place Assessment & Training Certificate; (AQF4) 2001,
Associate Diploma of Horticulture – Park Management; 1987
Horticulture Certificate; 1994
Urban Pest Control Certificate; 1983
Member of: Institute of Australia Consulting Arboriculturists (IACA), 2003
International Society of Arboriculture (ISA), 2005
Australian Institute of Horticulture (AIH) 2000
& Arboriculture Australia (AA) 2015

DISCLAIMER
The author and Redgum Horticultural take no responsibility for actions taken and their consequences, contrary to those expert and professional instructions given as recommendations pertaining to safety by way of exercising our responsibility to our client and the public as our duty of care commitment, to mitigate or prevent hazards from arising, from a failure moment in full or part, from a structurally deficient or unsound tree or a tree likely to be rendered thus by its retention and subsequent modifications to its growing environment either above or below ground contrary to our advice.

REFERENCES
Appendix A
IACA Significance of a Tree, Assessment Rating System (STARS) ©
(IACA 2010) ©

In the development of this document IACA acknowledges the contribution and original concept of the Footprint Green Tree Significance & Retention Value Matrix, developed by Footprint Green Pty Ltd in June 2001.

The landscape significance of a tree is an essential criterion to establish the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree. To assist this process all definitions for terms used in the Tree Significance - Assessment Criteria and Tree Retention Value - Priority Matrix, are taken from the IACA Dictionary for Managing Trees in Urban Environments 2009.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of High, Medium and Low significance in the landscape. Once the landscape significance of an individual tree has been defined, the retention value can be determined.

**Tree Significance - Assessment Criteria**

1. **High Significance in landscape**
   - The tree is in good condition and good vigour;
   - The tree has a form typical for the species;
   - The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
   - The tree is listed as a Heritage item, Threatened Species or part of an Endangered ecological community or listed on Councils Significant Tree Register;
   - The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
   - The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
   - The tree’s growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa in situ - tree is appropriate to the site conditions.

2. **Medium Significance in landscape**
   - The tree is in fair-good condition and good or low vigour;
   - The tree has form typical or atypical of the species;
   - The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area
   - The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street,
   - The tree provides a fair contribution to the visual character and amenity of the local area,
   - The tree’s growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa in situ.

3. **Low Significance in landscape**
   - The tree is in fair-poor condition and good or low vigour;
   - The tree has form atypical of the species;
   - The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings,
   - The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area,
   - The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms and can easily be replaced with a suitable specimen,
   - The tree’s growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa in situ - tree is inappropriate to the site conditions,
   - The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms,
   - The tree has a wound or defect that has potential to become structurally unsound.

**Environmental Pest / Noxious Weed Species**
- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties,
- The tree is a declared noxious weed by legislation.

**Hazardous/Irreversible Decline**
- The tree is structurally unsound and/or unstable and is considered potentially dangerous,
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group.

Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety e.g. hedge.
### Table 1.0 Tree Retention Value - Priority Matrix.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Significance in Landscape</td>
<td>Significance in Landscape</td>
<td>Significance in Landscape</td>
<td>Environmental Pest / Noxious Weed Species</td>
<td></td>
</tr>
<tr>
<td>1. Long &gt;40 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Medium 15-40 Years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Short &lt;1-15 Years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dead</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Legend for Matrix Assessment

**Priority for Retention (High)** - These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 Protection of trees on development sites. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone.

**Consider for Retention (Medium)** - These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.

**Consider for Removal (Low)** - These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.

**Priority for Removal** - These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

### REFERENCES


### Appendix B

**Matrix - Sustainable Retention Index Value (SRIV)**

Version 4, 2010

Developed by IACA – Institute of Australian Consulting Arboriculturists [www.iaca.org.au](http://www.iaca.org.au)

The matrix is to be used with the value classes defined in the Glossary for Age / Vigour / Condition. An index value is given to each category where ten (10) is the highest value.

#### Age Class

<table>
<thead>
<tr>
<th>Age Class</th>
<th>Good Vigour &amp; Good Condition</th>
<th>Good Vigour &amp; Fair Condition</th>
<th>Good Vigour &amp; Poor Condition</th>
<th>Low Vigour &amp; Good Condition</th>
<th>Low Vigour &amp; Fair Condition</th>
<th>Low Vigour &amp; Poor Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(Y)</strong></td>
<td>YGVG - 9</td>
<td>YGVF - 8</td>
<td>YGVP - 5</td>
<td>YLVG - 4</td>
<td>YLVF - 3</td>
<td>YLVP - 1</td>
</tr>
<tr>
<td>Young</td>
<td>Index Value 9</td>
<td>Index Value 8</td>
<td>Index Value 5</td>
<td>Index Value 4</td>
<td>Index Value 3</td>
<td>Index Value 1</td>
</tr>
<tr>
<td></td>
<td>Retention potential - Long Term. Likely to provide minimal contribution to local amenity if height &lt;5 m. Retain, move or replace.</td>
<td></td>
<td>Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height &lt;5 m. Low-medium potential for future growth and adaptability. Retain, move or replace.</td>
<td>Potential for longer with improved growing conditions. Likely to provide minimal contribution to local amenity if height &lt;5 m. Medium potential for future growth and adaptability. Retain, move or replace.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>(M)</strong></td>
<td>MGVG - 10</td>
<td>MGVF - 9</td>
<td>MGVP - 6</td>
<td>MLVG - 5</td>
<td>MLVF - 4</td>
<td>MLVP - 2</td>
</tr>
<tr>
<td>Mature</td>
<td>Index Value 10</td>
<td>Index Value 9</td>
<td>Index Value 6</td>
<td>Index Value 5</td>
<td>Index Value 4</td>
<td>Index Value 2</td>
</tr>
<tr>
<td><strong>(O)</strong></td>
<td>OGVG - 6</td>
<td>OGVF - 5</td>
<td>OGVP - 4</td>
<td>OLVG - 3</td>
<td>OLVF - 2</td>
<td>OLVF - 0</td>
</tr>
<tr>
<td>Over-mature</td>
<td>Index Value 6</td>
<td>Index Value 5</td>
<td>Index Value 4</td>
<td>Index Value 3</td>
<td>Index Value 2</td>
<td>Index Value 0</td>
</tr>
</tbody>
</table>

---

An index value is given to each category where ten (10) is the highest value.
Appendix C

Glossary

From

Dictionary for Managing Trees in Urban Environments by Draper BD and Richards PA 2009,
Institute of Australian Consulting Arboriculturists (IACA), CSIRO Publishing, Collingwood, Victoria, Australia.

Age of Trees

Age Most trees have a stable biomass for the major proportion of their life. The estimation of the age of a tree is based on the knowledge of the expected lifespan of the taxa in situ divided into three distinct stages of measurable biomass, when the exact age of the tree from its date of cultivation or planting is unknown and can be categorized as Young, Mature and Over-mature (British Standards 1991, p. 13, Harris et al, 2004, p. 262).

Young Tree aged less than <20% of life expectancy, in situ.

Mature Tree aged 20-80% of life expectancy, in situ.

Over-mature Tree aged greater than >80% of life expectancy, in situ, or senescent with or without reduced vigour, and declining gradually or rapidly but irreversibly to death.

Condition of Trees

Condition A tree’s crown form and growth habit, as modified by its environment (aspect, suppression by other trees, soils), the stability and viability of the root plate, trunk and structural branches (first (1st) and possibly second (2nd) order branches), including structural defects such as wounds, cavities or hollows, crooked trunk or weak trunk/branch junctions and the effects of predation by pests and diseases. These may not be directly connected with vigour and it is possible for a tree to be of normal vigour but in poor condition. Condition can be categorized as Good Condition, Fair Condition, Poor Condition and Dead.

Good Condition Tree is of good habit, with crown form not severely restricted for space and light, physically free from the adverse effects of predation by pests and diseases, obvious instability or structural weaknesses, fungal, bacterial or insect infestation and is expected to continue to live in much the same condition as at the time of inspection provided conditions around it for its basic survival do not alter greatly. This may be independent from, or contributed to by vigour.

Fair Condition Tree is of good habit or misshapen, a form not severely restricted for space and light, has some physical indication of decline due to the early effects of predation by pests and diseases, fungal, bacterial, or insect infestation, or has suffered physical injury to itself that may be contributing to instability or structural weaknesses, or is faltering due to the modification of the environment essential for its basic survival. Such a tree may recover with remedial works where appropriate, or without intervention may stabilise or improve over time, or in response to the implementation of beneficial changes to its local environment. This may be independent from, or contributed to by vigour.

Poor Condition Tree is of good habit or misshapen, a form that may be severely restricted for space and light, exhibits symptoms of advanced and irreversible decline such as fungal, or bacterial infestation, major die-back in the branch and foliage crown, structural deterioration from insect damage e.g. termite infestation, or storm damage or lightning strike, ring barking from boer activity in the trunk, root damage or instability of the tree, or damage from physical wounding impacts or abrasion, or from altered local environmental conditions and has been unable to adapt to such changes and may decline further to death regardless of remedial works or other modifications to the local environment that would normally be sufficient to provide for its basic survival if in good to fair condition. Deterioration physically, often characterised by a gradual and continuous reduction in vigour but may be independent of a change in vigour, but characterised by a proportionate increase in susceptibility to, and predation by pests and diseases against which the tree cannot be sustained. Such conditions may also be evident in trees of advanced senescence due to normal phenological processes, without modifications to the growing environment or physical damage having been inflicted upon the tree. This may be independent from, or contributed to by vigour.

Senescent / Moribund Advanced state of decline, dying or nearly dead.

Dead Tree is no longer capable of performing any of the following processes or is exhibiting any of the following symptoms;

Processes
Photosynthesis via its foliage crown (as indicated by the presence of moist, green or other coloured leaves);
Osmosis (the ability of the root system to take up water);
Turgidity (the ability of the plant to sustain moisture pressure in its cells);
Epicormic shoots or epicormic strands in Eucalypts (the production of new shoots as a response to stress, generated from latent or adventitious buds or from a lignotuber);
Symptoms
Permanent leaf loss;
Permanent wilting (the loss of turgidity which is marked by desiccation of stems leaves and roots);
Abscission of the epidermis (bark desiccates and peels off to the beginning of the sapwood).

Removed No longer present, or tree not able to be located or having been cut down and retained on a site, or having been taken away from a site prior to site inspection.
Branch

**Branch** An elongated woody structure arising initially from the trunk to support leaves, flowers, fruit and the development of other branches. A branch may itself fork and continue to divide many times as successive orders of branches with the length and taper decreasing incrementally to the outer extremity of the crown. These may develop initially as a gradually tapering continuation of the trunk with minimal division as in a young tree or a tree of excurrent habit, or in a sapling, or may arise where the trunk terminates at some distance from the root crown, dividing into first order branches to form and support the foliage crown. In an acaulescent tree, branches arise at or near the root crown. Similarly branches may arise from a sprout mass from damaged roots, branches or trunk.

**Orders of branches** The marked divisions between successively smaller branches (James 2003, p. 168) commencing at the initial division where the trunk terminates on a deliquescent tree or from lateral branches on an excurrent tree. Successive branching is generally characterised by a gradual reduction in branch diameters at each division, and each gradation from the trunk can be categorised numerically, e.g. first order, second order, third order etc. (See Figure 21.)

Crown

**Canopy** 1. Of multiple trees, the convergence, or merging in full or part, of the crowns of two or more trees due to their proximity, or where competition for light and space available in a forest environment is limited as each tree develops forming a continuous layer of foliage. 2. Used as a plural for crown. 3. Sometimes synonymously used for crown (USA).

**Crown** Of an individual tree all the parts arising above the trunk where it terminates by its division forming branches, e.g. the branches, leaves, flowers and fruit; or the total amount of foliage supported by the branches. The crown of any tree can be divided vertically into sections and can be categorised as lower crown, mid crown and upper crown (Figure 8). For a leaning tree these can be divided evenly into crown sections of one-third from the base to apex. The volume of a crown can be categorised as the inner crown, outer crown and outer extremity of crown.

**Lower crown** The proximal or lowest section of a crown when divided vertically into one-third (⅓) increments. See also Crown, Mid crown and Upper crown.

**Mid crown** The middle section of a crown when divided vertically into one-third (⅓) increments. See also Crown, Lower crown and Upper crown.

**Upper crown** The distal or highest section of a crown when divided vertically into one-third (⅓) increments. See also Crown, Mid crown and Lower crown.

**Crown Projection (CP)** Area within the dripline or beneath the lateral extent of the crown (Geiger 2004, p. 2). See also Crown spread and Dripline.

**Dripline** A line formed around the edge of a tree by the lateral extent of the crown. Such a line may be evident on the ground with some trees when exposed soil is displaced by rain shed from the crown. See also Crown Projection.

Crown Form of Trees

**Crown Form** The shape of the crown of a tree as influenced by the availability or restriction of space and light, or other contributing factors within its growing environment. Crown Form may be determined for tree shape and habit generally as Dominant, Codominant, Intermediate, Emergent, Forest and Suppressed. The habit and shape of a crown may also be considered qualitatively and can be categorized as Good Form or Poor Form.

**Good Form** Tree of typical crown shape and habit with proportions representative of the taxa considering constraints such as origin e.g. indigenous or exotic, but does not appear to have been adversely influenced in its development by environmental factors in situ such as soil water availability, prevailing wind, or cultural practices such as lopping and competition for space and light.

**Poor Form** Tree of atypical crown shape and habit with proportions not representative of the species considering constraints and appears to have been adversely influenced in its development by environmental factors in situ such as soil water availability, prevailing wind, cultural practices such as lopping and competition for space and light; causing it to be misshapen or disfigured by disease or vandalism.

**Crown Form Codominant** Crowns of trees restricted for space and light on one or more sides and receiving light primarily from above e.g. constrained by another tree/s or a building.

**Crown Form Dominant** Crowns of trees generally not restricted for space and light receiving light from above and all sides.
Crown Form Emergent Crowns of trees restricted for space on most sides receiving most light from above until the upper crown grows to protrude above the canopy in a stand or forest environment. Such trees may be crown form dominant or transitional from crown form intermediate to crown form forest asserting both apical dominance and axillary dominance once free of constraints for space and light.

Crown Form Forest Crowns of trees restricted for space and light except from above forming tall trees with narrow spreading crowns with foliage restricted generally to the top of the tree. The trunk is usually erect, straight and continuous, tapering gradually, crown often excurrent, with first order branches becoming structural, supporting the live crown concentrated towards the top of the tree, and below this point other first order branches arising radially with each inferior and usually temporary, divergent and ranging from horizontal to ascending, often with internodes exaggerated due to competition for space and light in the lower crown.

Crown Form Intermediate Crowns of trees restricted for space on most sides with light primarily from above and on some sides only.

Crown Form Suppressed Crowns of trees generally not restricted for space but restricted for light by being overtopped by other trees and occupying an understorey position in the canopy and growing slowly.

Deadwood

Deadwood Dead branches within a tree’s crown and considered quantitatively as separate to crown cover and can be categorised as Small Deadwood and Large Deadwood according to diameter, length and subsequent risk potential. The amount of dead branches on a tree can be categorized as Low Volume Deadwood, Medium Volume Deadwood and High Volume Deadwood. See also Dieback.

Deadwooding Removing of dead branches by pruning. Such pruning may assist in the prevention of the spread of decay from dieback or for reasons of safety near an identifiable target.

Small Deadwood A dead branch up to 10mm diameter and usually <2 metres long, generally considered of low risk potential.

Large Deadwood A dead branch >10mm diameter and usually >2 metres long, generally considered of high risk potential.

High Volume Deadwood High Volume Deadwood Where >10 dead branches occur that may require removal.

Medium Volume Deadwood Where 5-10 dead branches occur that may require removal.

Low Volume Deadwood Where <5 dead branches occur that may require removal.

Dieback

Dieback The death of some areas of the crown. Symptoms are leaf drop, bare twigs, dead branches and tree death, respectively. This can be caused by root damage, root disease, bacterial or fungal canker, severe bark damage, intensive grazing by insects, abrupt changes in growth conditions, drought, water-logging or over-maturity. Dieback often implies reduced resistance, stress or decline which may be temporary. Dieback can be categorized as Low Volume Dieback, Medium Volume Dieback and High Volume Dieback.

High Volume Dieback Where >50% of the crown cover has died.

Medium Volume Dieback Where 10-50% of the crown cover has died.

Low Volume Dieback Where <10% of the crown cover has died. See also Dieback, High Volume Dieback and Medium Volume Dieback.

Epicormic shoots

Epicormic Shoots Juvenile shoots produced at branches or trunk from epicormic strands in some Eucalypts (Burrows 2002, pp. 111-131) or sprouts produced from dormant or latent buds concealed beneath the bark in some trees. Production can be triggered by fire, pruning, wounding, or root damage but may also be as a result of stress or decline. Epicormic shoots can be categorized as Low Volume Epicormic Shoots, Medium Volume Epicormic Shoots and High Volume Epicormic Shoots.

High Volume Epicormic Shoots Where >50% of the crown cover is comprised of live epicormic shoots.

Medium Volume Epicormic Shoots Where 10-50% of the crown cover is comprised of live epicormic shoots.

Low Volume Epicormic Shoots Where <10% of the crown cover is comprised of live epicormic shoots.
General Terms

Cavity A usually shallow void often localized initiated by a wound and subsequent decay within the trunk, branches or roots, and beneath bark, and may be enclosed or have one or more opening.

Decay Process of degradation of wood by microorganisms (Australian Standard 2007, p. 6) and fungus.

Hazard The threat of danger to people or property from a tree or tree part resulting from changes in the physical condition, growing environment, or existing physical attributes of the tree, e.g. included bark, soil erosion, or thorns or poisonous parts, respectively.

Included bark 1. The bark on the inner side of the branch union, or is within a concave crotch that is unable to be lost from the tree and accumulates or is trapped by acutely divergent branches forming a compression fork. 2. Growth of bark at the interface of two or more branches on the inner side of a branch union or in the crotch where each branch forms a branch collar and the collars roll past one another without forming a graft where no one collar is able to subsume the other. Risk of failure is worsened in some taxa where branching is acutely divergent or acutely convergent and ascending or erect.

Hollow A large void initiated by a wound forming a cavity in the trunk, branches or roots and usually increased over time by decay or other contributing factors, e.g. fire, or fauna such as birds or insects e.g. ants or termites. A hollow can be categorized as an Ascending Hollow or a Descending Hollow.

Risk The random or potentially foreseeable possibility of an episode causing harm or damage.

Significant Important, weighty or more than ordinary.

Significant Tree A tree considered important, weighty or more than ordinary. Example: due to prominence of location, or in situ, or contribution as a component of the overall landscape for amenity or aesthetic qualities, or curtilage to structures, or importance due to uniqueness of taxa for species, subspecies, variety, crown form, or as an historical or cultural planting, or for age, or substantial dimensions, or habit, or as remnant vegetation, or habitat potential, or a rare or threatened species, or uncommon in cultivation, or of aboriginal cultural importance, or is a commemorative planting.

Substantial A tree with large dimensions or proportions in relation to its place in the landscape.

Sustainable Retention Index Value (SRIV) A visual tree assessment method to determine a qualitative and numerical rating for the viability of urban trees for development sites and management purposes, based on general tree and landscape assessment criteria using classes of age, condition and vigour. SRIV is for the professional manager of urban trees to consider the tree in situ with an assumed knowledge of the taxon and its growing environment. It is based on the physical attributes of the tree and its response to its environment considering its position in a matrix for age class, vigour class, condition class and its sustainable retention with regard to the safety of people or damage to property. This also factors the ability to retain the tree with remedial work or beneficial modifications to its growing environment or removal and replacement. SRIV is supplementary to the decision made by a tree management professional as to whether a tree is retained or removed (IACA - Institute of Australian Consulting Arboriculturists 2005).

Visual Tree Assessment (VTA) A visual inspection of a tree from the ground based on the principle that, when a tree exhibits apparently superfluous material in its shape, this represents repair structures to rectify defects or to reinforce weak areas in accordance with the Axiom of Uniform Stress (Mattheck & Breloer 1994, pp. 12-13, 145). Such assessments should only be undertaken by suitably competent practitioners.

Leaning Trees

Leaning A tree where the trunk grows or moves away from upright. A lean may occur anywhere along the trunk influenced by a number of contributing factors e.g. genetically predetermined characteristics, competition for space or light, prevailing winds, aspect, slope, or other factors. A leaning tree may maintain a static lean or display an increasingly progressive lean over time and may be hazardous and prone to failure and collapse. The degrees of leaning can be categorized as Slightly Leaning, Moderately Leaning, Severely Leaning and Critically Leaning.

Slightly Leaning A leaning tree where the trunk is growing at an angle within 0°-15° from upright.

Moderately Leaning A leaning tree where the trunk is growing at an angle within 15°-30° from upright.

Severely Leaning A leaning tree where the trunk is growing at an angle within 30°-45° from upright.

Progressively Leaning A tree where the degree of leaning appears to be increasing over time.

Static Leaning A leaning tree whose lean appears to have stabilized over time.

Periods of Time

Periods of Time The life span of a tree in the urban environment may often be reduced by the influences of encroachment and the dynamics of the environment and can be categorized as Immediate, Short Term, Medium Term and Long Term.

Immediate An episode or occurrence, likely to happen within a twenty-four (24) hour period, e.g. tree failure or collapse in full or part posing an imminent danger.

Short Term A period of time less than <1 – 15 years.

Medium Term A period of time 15 – 40 years.

Long Term A period of time greater than >40 years.
**Roots**

First Order Roots (FOR) Initial woody roots arising from the *root crown* at the base of the *trunk*, or as an *adventitious root mass* for structural support and stability. Woody roots may be buttressed and divided as a marked gradation, gradually tapering and continuous or tapering rapidly at a short distance from the root crown. Depending on soil type these roots may descend initially and not be evident at the root crown, or become buried by changes in soil levels. Trees may develop 4-11 (Perry 1982, pp. 197-221), or more first order roots which may radiate from the trunk with a relatively even distribution, or be prominent on a particular aspect, dependent upon physical characteristics e.g. leaning trunk, *asymmetrical crown*; and constraints within the growing environment from topography e.g. slope, soil depth, rocky outcrops, exposure to predominant wind, soil moisture, depth of water table etc.

**Orders of Roots** The marked divisions between woody roots, commencing at the initial division from the base of the trunk, at the *root crown* where successive branching is generally characterised by a gradual reduction in root diameters and each gradation from the trunk and can be categorized numerically, e.g. first order roots, second order roots, third order roots etc. Roots may not always be evident at the root crown and this may be dependent on species, age class and the growing environment. Palms at maturity may form an adventitious root mass.

**Root Plate** The entire root system of a tree generally occupying the top 300-600mm of soil including roots at or above ground and may extend laterally for distances exceeding twice the height of the tree (Perry 1982, pp. 197-221). Development and extent is dependent on water availability, soil type, soil depth and the physical characteristics of the surrounding landscape.

**Root Crown** Roots arising at the base of a trunk.

**Zone of Rapid Taper** The area in the root plate where the diameter of *structural roots* reduces substantially over a short distance from the trunk. Considered to be the minimum radial distance to provide structural support and *root plate* stability. See also *Structural Root Zone (SRZ)*.

**Structural Roots** Roots supporting the infrastructure of the *root plate* providing strength and stability to the tree. Such roots may taper rapidly at short distances from the *root crown* or become large and woody as with gymnosperms and dicotyledonous angiosperms and are usually 1st and 2nd order roots, or form an *adventitious root mass* in monocotyledonous angiosperms (palms). Such roots may be crossed and grafted and are usually contained within the area of *crown projection* or extend just beyond the *dripline*.

**Symmetry**

**Symmetry** Balance within a *crown*, or *root plate*, above or below the axis of the trunk of branch and foliage, and root distribution respectively and can be categorized as *Asymmetrical* and *Symmetrical*.

**Asymmetrical** Imbalance within a crown, where there is an uneven distribution of branches and the foliage *crown* or *root plate* around the vertical axis of the trunk. This may be due to *Crown Form Codominant* or *Crown Form Suppressed* as a result of natural restrictions e.g. from buildings, or from competition for space and light with other trees, or from exposure to wind, or artificially caused by pruning for clearance of roads, buildings or power lines. An example of an expression of this may be, *crown asymmetrical, bias to west*.

**Symmetrical** Balance within a crown, where there is an even distribution of branches and the foliage crown around the vertical axis of the trunk. This usually applies to trees of *Crown Form Dominant* or *Crown Form Forest*. An example of an expression of this may be *crown symmetrical*.

---

**Figure 22 Orders of Roots.**

**Figure 27 Symmetry within crown.**
Trunk

Trunk A single stem extending from the root crown to support or elevate the crown, terminating where it divides into separate stems forming first order branches. A trunk may be evident at or near ground or be absent in acaulescent trees of deliquescent habit, or may be continuous in trees of excurrent habit. The trunk of any caulescent tree can be divided vertically into three (3) sections and can be categorized as Lower Trunk, Mid Trunk and Upper Trunk. For a leaning tree these may be divided evenly into sections of one third along the trunk.

Acaulescent A trunkless tree or tree growth forming a very short trunk. See also Caulescent. (See Fig. 21)

Caulescent Tree grows to form a trunk. See also Acaulescent. (See Fig. 21)

Lower trunk Lowest, or proximal section of a trunk when divided into one-third (⅓) increments along its axis. See also Trunk, Mid trunk and Upper trunk.

Mid trunk A middle section of a trunk when divided into one-third (⅓) increments along its axis. See also Trunk, Lower trunk and Upper trunk.

Upper trunk Highest, or distal section of a trunk when divided into one-third (⅓) increments along its axis. See also Trunk, Lower trunk and Mid trunk.

Diameter at Breast Height (DBH) Measurement of trunk width calculated at a given distance above ground from the base of the tree often measured at 1.4 m. The trunk of a tree is usually not a circle when viewed in cross section, due to the presence of reaction wood or adaptive wood, therefore an average diameter is determined with a diameter tape or by recording the trunk along its narrowest and widest axes, adding the two dimensions together and dividing them by 2 to record an average and allowing the orientation of the longest axis of the trunk to also be recorded. Where a tree is growing on a lean the distance along the top of the trunk is measured to 1.4m and the diameter then recorded from that point perpendicular to the edge of the trunk. Where a leaning trunk is crooked a vertical distance of 1.4m is measured from the ground. Where a tree branches from a trunk that is less than 1.4m above ground, the trunk diameter is recorded perpendicular to the length of the trunk from the point immediately below the base of the flange of the branch collar extending the furthest down the trunk, and the distance of this point above ground recorded as trunk length. Where a tree is located on sloping ground the DBH should be measured at half way along the side of the tree to average out the angle of slope. Where a tree is acaulescent or trunkless branching at or near ground an average diameter is determined by recording the radial extent of the trunk at or near ground and noting where the measurement was recorded e.g. at ground.

Vigour

Vigour Ability of a tree to sustain its life processes. This is independent of the condition of a tree but may impact upon it. Vigour can appear to alter rapidly with change of seasons (seasonality) e.g. dormant, deciduous or semi-deciduous trees. Vigour can be categorized as Normal Vigour, High Vigour, Low Vigour and Dormant Tree Vigour.

Normal Vigour Ability of a tree to maintain and sustain its life processes. This may be evident by the typical growth of leaves, crown cover and crown density, branches, roots and trunk and resistance to predation. This is independent of the condition of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.

High Vigour Accelerated growth of a tree due to incidental or deliberate artificial changes to its growing environment that are seemingly beneficial, but may result in premature aging or failure if the favourable conditions cease, or promote prolonged senescence if the favourable conditions remain, e.g. water from a leaking pipe; water and nutrients from a leaking or disrupted sewer pipe; nutrients from animal waste, a tree growing next to a chicken coop, or a stock feed lot, or a regularly used stockyard; a tree subject to a stringent watering and fertilising program; or some trees may achieve an extended lifespan from continuous pollarding practices over the life of the tree.

Low Vigour Reduced ability of a tree to sustain its life processes. This may be evident by the atypical growth of leaves, reduced crown cover and reduced crown density, branches, roots and trunk, and a deterioration of their functions with reduced resistance to predation. This is independent of the condition of a tree but may impact upon it, and especially the ability of a tree to sustain itself against predation.
## Appendix D

### Site Plan A - Survey of Subject Trees

This report has relied upon the following plan/s and documents which have been reproduced from electronic transmission and no longer to original scale.

**Legend**

XX Trees numbered in blue are recommended for removal.

Note: trees indicated, unnumbered are either shrubs, or trees of species, of dimensions, or condition class not protected by the Tree Preservation Order or trees not affected by the proposed works or not within the scope of works for this report.

<table>
<thead>
<tr>
<th>Redgum Tree No.</th>
<th>Genus and species</th>
<th>Common name</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Harpephyllum caffrum</td>
<td>Kaffir Plum</td>
<td>Remove and replace</td>
</tr>
</tbody>
</table>

---

Redgum Horticultural 2021, Ref: 6832  
Report: Arboricultural Impact Assessment; 27 Manning Street, Oyster Bay NSW.