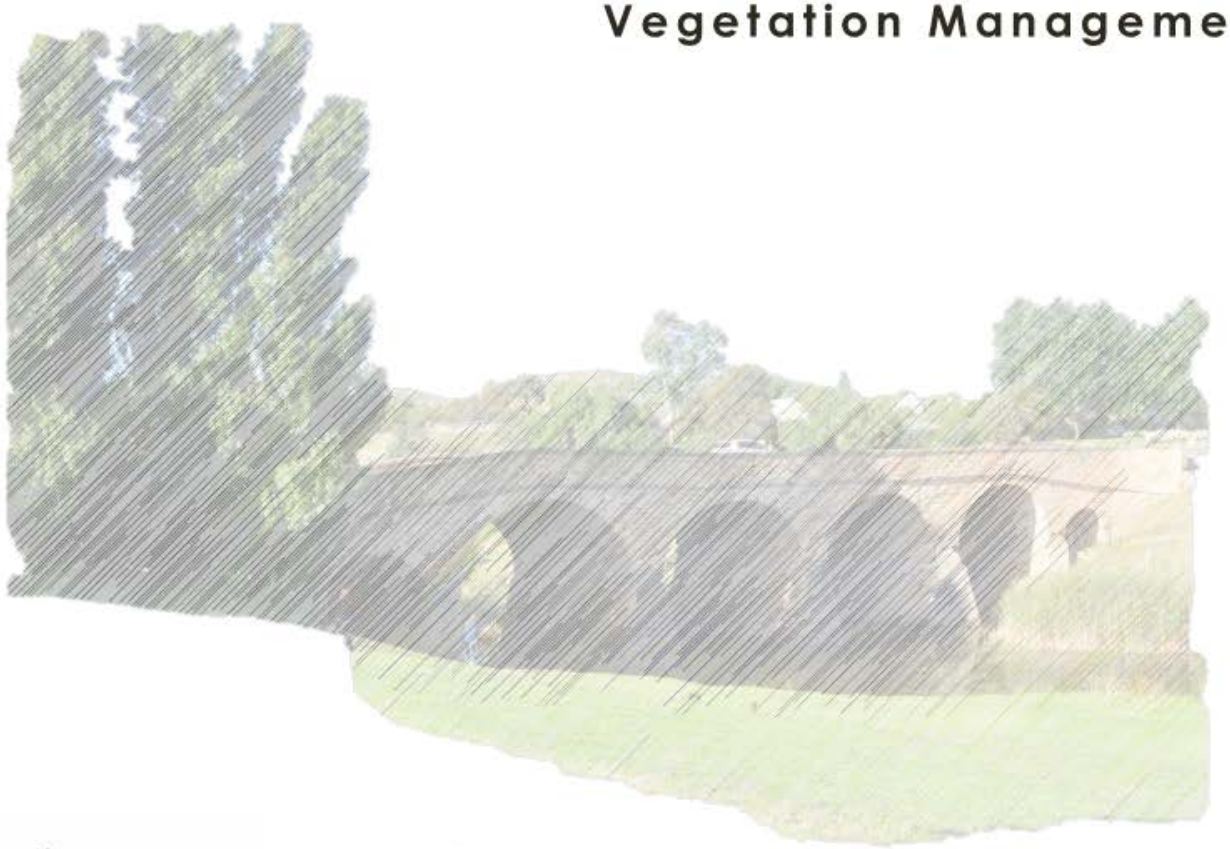
ATTACHMENT 1

Richmond Bridge
Vegetation Management Plan



landscape impressions

Draft for Consultation

5 June 2015

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Acknowledgements

We would like to acknowledge the input of Selena Dixon, Lillian Reardon and Darren McConnon (State Growth); Russell Dobie (Heritage Tasmania); Gary Evans (Crown Land Services, DPIPWE); Sally Taylor, Ian Preece, Matthew Graham (Clarence City Council); Heather Chong (CCC and Richmond Advisory Committee) and the residents of Richmond who participated in the Community Walk and Talk on February 11 for their contribution to this Draft Vegetation Management Plan. Further consultation will occur as we progress this plan to its final version.

Introduction

Background:

The Clarence City Council advertised an Invitation for Quotations (Q1019-14) in December 2014 for the provision of consultancy services for the preparation of a Vegetation Management Plan for the Richmond Bridge and its setting.

GHD in association with Landscape Impressions submitted a Tender and was awarded the contract in January 2015.

Fieldwork and consultation commenced in mid-January 2015. A draft VMP was submitted to Council and State Government agencies in early April 2015. This Draft is now presented for broader community consultation.

Purpose:

In January 2010, a Conservation Plan for the Richmond Bridge (1997) was reviewed by GHD under a commission by the former Department of Infrastructure Energy and Resources.

A number of policy recommendations of the 2010 Richmond Bridge Conservation Management Plan (CMP) related to the assessment, maintenance and renewal of vegetation in the vicinity of the Richmond Bridge. This Vegetation Management Plan responds to those policy recommendations.

Clarence City Council's brief for the Vegetation Management Plan set out requirements for the key elements of the plan, including;

Site Analysis – including consideration of the site's history, the cultural heritage value and significance of existing plantings and other relevant existing site conditions such as weeds, public use, aesthetics, access, infrastructure, etc.

Analysis of existing Vegetation Conditions – including the engagement of an arborist to assess the current health and estimated lifespan of the historic and naturalised plantings.

Weed management strategy – including the consideration of the existing site planting conditions, any weed issues and ongoing management activities.

Future planting Strategy/plan – addressing the long term conservation of the historic and aesthetic setting of the Bridge.

Methodology:

Consultations with the Clarence City Council, Heritage Tasmania, the Department of State Growth and the Department of Primary Industries, Parks, Water and Environment Crown Land Services were undertaken to gather information pertinent to vegetation management from the perspectives of each authority.

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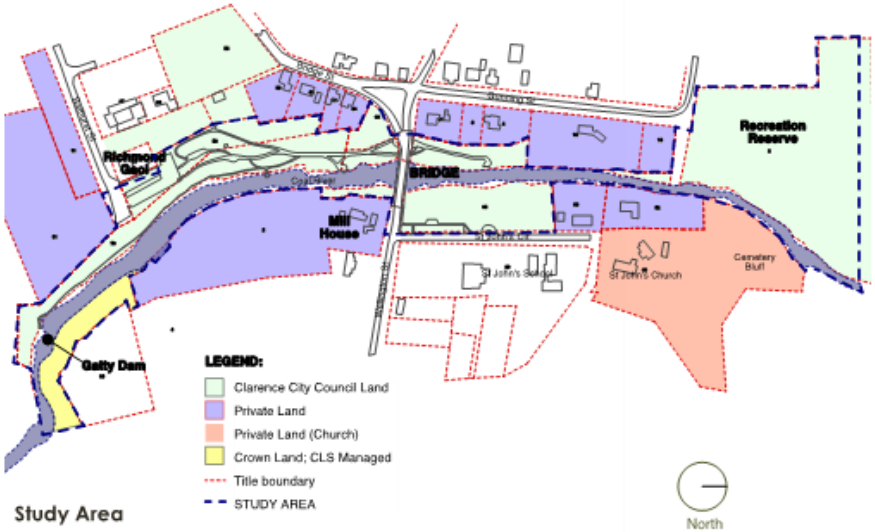


Study Area

Introduction…

Don Thomson, Registered Landscape Architect and Principal of Landscape Impressions, undertook site inspections and fieldwork during January and February 2015 to undertake the Site Analysis and weed assessment components of the project.

Arborist and Environmental Consultant Philip Jackson undertook an assessment of trees throughout the study area and provided a report to inform decisions about the longer-term strategy for vegetation management across the study area.

A 'Community Walk and Talk' was held on February 11 as a preliminary information-sharing opportunity and data collection tool.

Fourteen local residents attended the 'Walk and Talk' and provided input into a range of vegetation management issues. This event enabled a range of issues to be discussed in detail and proved to be a very useful information gathering technique.

A web-based survey was also conducted to seek community feedback on the proposed 'management zone' delineation and the priorities and issues identified for the broad management zones presented. Six people responded to the survey over the 2 weeks it was open. There was general agreement by respondents with the delineation of the Management Zones and their prioritisation. However, some respondents thought that all the zones were of high priority. It is true that all zones are important, but the prioritisation suggested in this Draft report refers mainly to the allocation of funds and other resources.

Discussions were held (in person or by phone) with adjacent landholders after distributing an earlier draft of this plan, in late April 2015. One of the key discussion points in these meetings was the management and succession of trees on private land that form important components of the 'borrowed landscape'.

The adjacent landholders were generally supportive of the proposed vegetation management actions and are willing to continue discussions about ongoing succession planning.

This Draft Vegetation Management Plan forms another opportunity for community input into the management of the landscapes around the Richmond Bridge. Feedback on this draft plan will be used to fine-tune the final Vegetation Management Plan before it is presented to Clarence City Council.

Site Analysis for Vegetation Management Plan

Historical Context:
The Richmond Bridge was completed in September 1824 and open to traffic in January 1825 (THC, 2015). It is widely recognised as Australia's oldest bridge that continues to serve its original purpose (DIER, 2010).

In 2005, the Richmond Bridge was included on the National Heritage List, in recognition of its outstanding value to the nation (DIER, 2010). It was listed on the Tasmanian Heritage Register in September 1999 (THC, 2015).

The setting of the Richmond Bridge is cited in the documentation around its historical value as being a critical component of the historical value of the Bridge. The protection and enhancement of critical views to and from the Bridge is critical to the continued appreciation of this significant historical asset by visitors and locals alike.

Cultural Context:
The Richmond Bridge is in itself an outcome of the rapid development of the region after land grants were distributed in 1808. The importance of the Coal River valley as 'the granary of the Australian Colonies' and for sheep and cattle grazing meant that a reliable crossing point over the Coal River was required (THC, 2015). The Bridge pre-dates the construction of the Richmond town; its construction was a catalyst for the town's development.

The community values the Bridge structure because it reflects the early development of Richmond and because of its association with the penal system.

Images of the Bridge and its setting have been featured in state, national and international tourism promotions since the 1920s. It is one of the most widely photographed historic sites in Tasmania (THC 2015).

The Richmond Bridge and its surrounds is an important place because of its aesthetic values. It is widely appreciated by locals and visitors alike and features as the subject of many artistic pursuits, especially by painters and photographers.

Landscape Context:
The contemporary landscape of the Richmond Bridge precinct is an outcome of a range of processes through time, both 'deliberative' and 'accidental'. Whilst there are some remnants of historic plantings (e.g. the Pine trees on the western banks; the Lombardy Poplars either side of the eastern approach to the Bridge), most of the oldest plantings have declined and been replaced by naturalised specimens of the same species. The landscape of the Richmond Bridge has never been a 'designed' landscape and much of its character comes from this 'naturalised' vegetation (DIER, 2010; THC, 2015).

Exotic and native vegetation has become naturalised and the management activities of Council and adjacent landholders has had a large influence on the landscape character of the place now.

It is therefore not considered appropriate to design the landscape of the Richmond Bridge to fine detail. It is appropriate to let the landscape continue to evolve with similar character to the current landscape.

Making strategic interventions over time will shape the structure and character of the future landscape. The Vegetation Management Principles of this Plan (next page) have been developed to guide a coordinated, strategic approach to the long-term evolution of this landscape.

Whilst it is recommended that the vegetation of this landscape be allowed to continue to evolve, there are some elements of the built landscape that require attention, such as path levels and drainage, signage and the location of specific facilities such as rubbish bins, seating, etc. It is recommended therefore that a landscape masterplan and review of 'built elements' in the landscape be undertaken by Council within the next two to 5 years.

See **Site Analysis Plan** for viewshed analysis and further notes on vegetation character.

Vegetation Management Plan Structure and Principles

STRUCTURE OF THE VEGETATION MANAGEMENT PLAN

This Plan is designed to guide the actions of Clarence City Council and its works teams, adjacent landholders to the study area and the local community.

It is presented in six main parts:

1. A description of key 'Management Zones' and the 'objectives' for those zones, which inform decisions about their management.
2. Weed Management Strategy, which outlines a strategic approach to weed management across the site and presents guidelines for the management of key weed species.
3. Planting guide and schedule, which highlights key strategic plantings, recommends species for planting across the site in the future and guides the placement of planted vegetation.
4. A guide to aquatic vegetation/river management.
5. A guide to the long-term management of the 'borrowed' landscape (i.e. the broader landscape of Richmond and surrounds as a visual backdrop to the Richmond Bridge precinct.
6. A Vegetation Management Action Plan, which prescribes priority actions for the short-term (1 to 3 years).

VEGETATION MANAGEMENT PRINCIPLES:

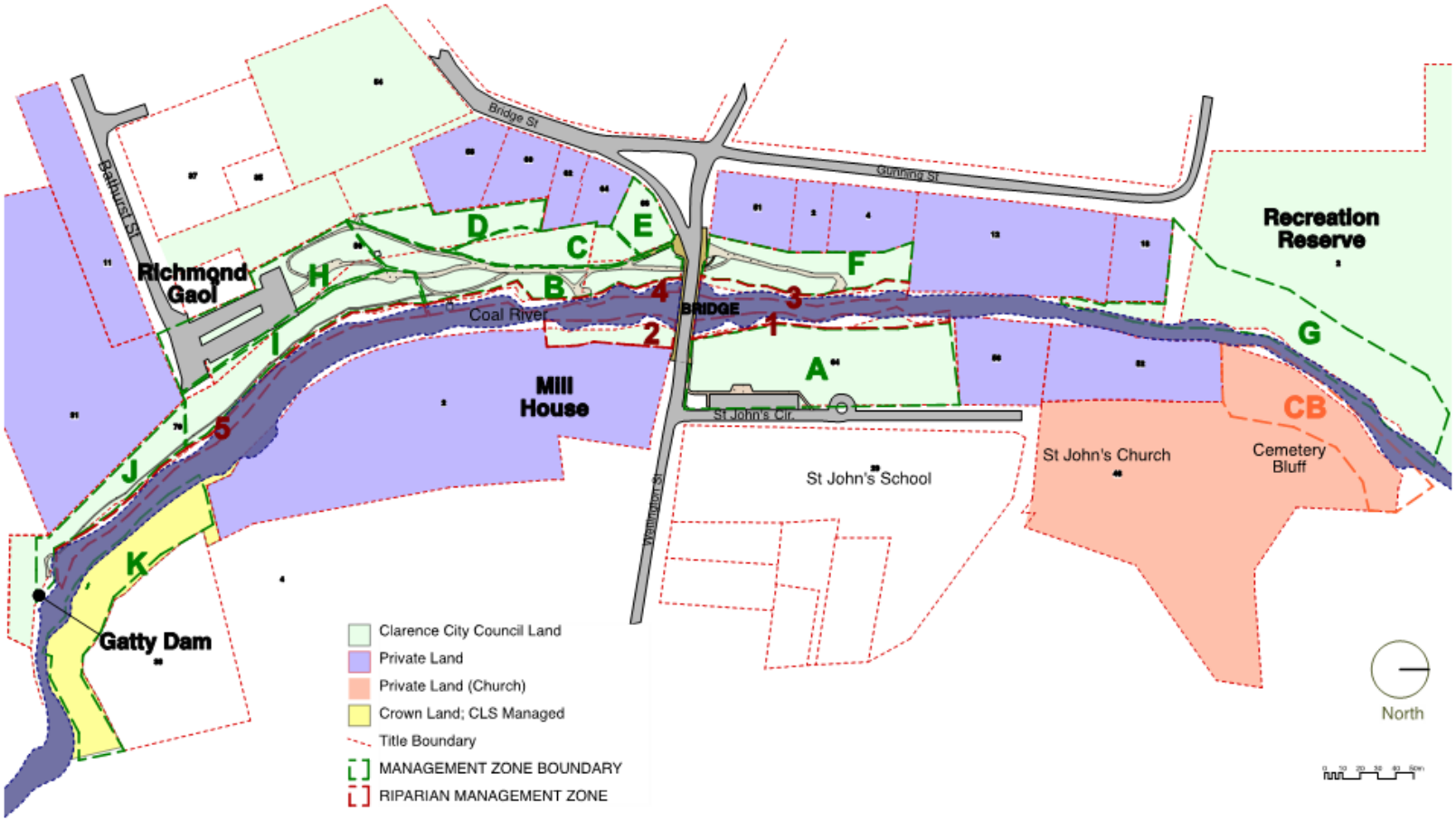
This Vegetation Management Plan for the Richmond Bridge precinct has been informed by the following principles:

- Preserve historical and cultural values in the landscape, including views to and from the bridge.
- Provide a safe and pleasant environment from which to enjoy the character and ambience of the Richmond Bridge.
- Respect and celebrate the values that combine to make this an attractive and characterful 'place'.
- Ensure a relatively smooth succession of vegetation over time so that drastic or sudden landscape changes are minimised.
- Ensure 'weeds' are not allowed to spread to neighbouring properties.
- Minimise the financial burden of management and maintenance of the landscape to current and future generations.
- The character of the place is to be preserved over time by maintaining, as far as possible, vegetation type and structure similar to the current (2015) landscape.
- Historically important species, which are often now declared weed species, should be replaced with modern cultivars of the same variety to preserve landscape character whilst minimising management costs and damage to historical or cultural assets.

RATIONALE FOR THE DEFINITION OF MANAGEMENT ZONES

The division of the publicly accessible lands alongside the Coal River upstream and downstream of the Richmond Bridge into 'Management Zones' is based on the rationale that different areas of the precinct have unique landscape characteristics that warrant different approach to landscape management.

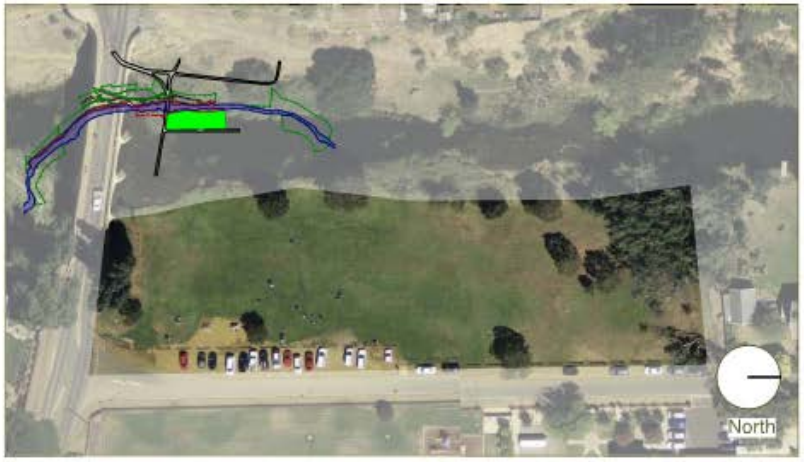
Management Zones Map



MANAGEMENT ZONES

Zone A Priority: High

North West of Bridge



OBJECTIVES

Maintain as 'open parkland' landscape to enable views to Bridge from North Easterly aspects.

CULTURAL VALUES

- Lombardy poplars provide scale and frame many of the key views to the bridge.
- Open lawn has functional and aesthetic value.
- Wide expanses of lawns are enjoyed by visitors and locals alike.

HERITAGE VALUES

- Lombardy poplars beside bridge are noted on Heritage Register.
- CMP 2010 Priority Works/Actions (7.7.11) reference the suckering of poplars and the potential impact on the bridge structure.

KEY VEGETATION MANAGEMENT ISSUES

- Succession of Lombardy Poplars beside the Bridge. Arborist reports that the trees are in good health and have a life-expectancy of another 15-40 years.
- However, suckering of Lombardy poplars adjacent to bridge structure is of concern to Department of State Growth. Therefore, a 5 to 10-year succession process is suggested.
- Succession planning for copse of White poplars to north of this Zone.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Commence planning and consultation for the replacement of Lombardy Poplars within the next 10 years. The recommended action is to fell all of the mature poplars and replace with the same species (*Populus nigra 'Italica'*) but propagated from minimal-suckering root stock (e.g. Flemings Nursery). Felling all of the trees will enable removal of 'old' root stock to prevent future suckering, and enable the installation of a root barrier between the trees and the bridge buttress.
- Gradually replace white poplars along northern boundary with *P. canadensis* or *U. procera*. *Zelkova serrata* is also recommended (see planting palette).
- Removal of selected trees as per the Action Plan (Appendix 2).

Zone B Priority: High

South West of Bridge

OBJECTIVES

Maintain vista to bridge from south-westerly vantages. Maintain an open 'parkland' landscape.

CULTURAL VALUES

- Has a long history as public open space, although subsequent land grants reduced that for a period (1830s to early 1900s).
- Is one of the key areas for photographic opportunities to the bridge.

HERITAGE VALUES

- Medium archaeological potential due to historical record of Buscombe's Mill – the site of which is marked by a mature pine tree (THR#1101)
- Mature pine tree is one of the older planted specimens in the precinct.

KEY VEGETATION MANAGEMENT ISSUES

- Succession of trees, particularly the single *Pinus radiata*. However, arboricultural assessment is that this tree is likely to have a long life ahead of it, if looked after.
- Mowing/grounds maintenance impeded by stumps, uneven ground.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Remove dead wood >50mm dia. from pine tree (Arborists Report ref. 53) in accordance with sound arboricultural practice.
- Remove stumps throughout this zone by grinding. Works are to be undertaken with reference to Heritage Tasmania's guidelines as there is 'medium' archaeological value to this site.
- Pruning of dead wood from pine tree.
- See also specific Actions listed in Action Plan (Appendix 2).

Note: THR = Tasmanian Heritage Register

Zone C Priority: High

Orchard, South West of Bridge

OBJECTIVES

Maintain as an 'orchard'

CULTURAL VALUES

- Locals and visitors enjoy the ability to pick fruit from the orchard.
- Autumn colour.
- Flowering and fruiting provides seasonal colour and interest.

HERITAGE VALUES

- 'Almond orchard' cited in CMP and THR as being of cultural significance (marked a path leading from bridge to Buscombe's Mill).

KEY VEGETATION MANAGEMENT ISSUES

- The older original almond trees have almost all died or been removed. New (last 10 years) plantings of mixed species (including apple, pear, apricot) have been undertaken by Council and the community.
- Stumps of old trees are impeding maintenance/mowing.
- Silver wattle at the 'back' of the orchard has a limited life-span and should be removed.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Form prune (in accordance with sound arboricultural and horticultural practices) all existing trees.
- Remove stumps.
- Remove silver wattle and grind stump.
- Complete orchard by filling gaps in 'grid' structure.
- Replace old almond trees along the path with almonds to replicate historical references to almond orchard.
- See also specific Actions listed in the Action Plan (Appendix 2).

Zone D Priority: High

Steep Bank to East of Village Green

OBJECTIVES

Maintain a visually appealing backdrop to views from the bridge and from the North-East, whilst enabling views from the top of the bank to the SW of the site.

CULTURAL VALUES

- Important photo point/vantage point is located above this bank, to the NE edge of the 'village green'

HERITAGE VALUES

- Forms a backdrop to the bridge so is important as part of the heritage precinct of the bridge.

KEY VEGETATION MANAGEMENT ISSUES

- Bank is too steep to mow and brush-cut.
- Annual grasses and weeds dominate the site, including some suckers of Elm and some boxthorn and hawthorn saplings.
- Will become over-run with woody weeds over time due to difficulties mowing/slashing due to steep slope.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Remove annual grasses, weeds.
- Remove briar roses, pine seedlings, elm suckers and 2-3 dead or dying wattles at base of slope.
- Install hessian mulch/weed mat.
- Plant native grasses - wallaby grass (*Austrodanthonia spp.*) and kangaroo grass (*Themeda triandra*) – across the whole slope.
- Plant *Brusaria spinosa* (native box) in informal 'copses' along the eastern border of this zone to the toe of the bank as shown on the planting plan.
- See also specific Actions listed in the Action Plan (Appendix 2).

Zone E

Priority: Low

Top of Bank between Bridge Street and Stone Steps

OBJECTIVES

Maintain as 'parkland' transition from Bridge Street streetscape to 'orchard'.

CULTURAL VALUES

- 'Transitional landscape' from the Bridge Street streetscape to the 'orchard' area to the South.
- Has a parkland character.

HERITAGE VALUES

- Peppercorn trees are a key species within this cultural landscape.

KEY VEGETATION MANAGEMENT ISSUES

- Existing wattles (*Acacia saligna*) and *Photinia* along footpath are out of character and should be removed to enable views to bridge/river.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- It is recommended to replace wattles and photinia along Bridge Street with ornamental pear (e.g. *Pyrus calleryana x betulaefolia* 'Edgedell').
- Form prune blackwood and peppercorn trees in the middle of this zone to lift the canopy and enable views from Bridge St footpath to the river. Ensure adherence to best practice arboricultural techniques.

Zone F Priority: High

Steep Bank to North East of Bridge

OBJECTIVES

Maintain a visually appealing backdrop with low maintenance requirements.

CULTURAL VALUES

- Important background to photographs taken from the Eastern banks of the Coal River (i.e. Zone A and beyond).
- Neighbouring landholders are undertaking much of the vegetation management on the steep slopes of this zone.

HERITAGE VALUES

- This area was purchased from the adjoining landholders in the 1973.
- Medium archaeological potential due to due to historical record of fords in this area (THR#1101)

KEY VEGETATION MANAGEMENT ISSUES

- The bank along the western section of this Zone is too steep to mow and brush-cut.
- Annual grasses and weeds dominate the site, including marshmallow, fennel, hawthorn, boxthorn and other weeds.
- Vegetation management difficulties have resulted in the perceived need to burn off large parts of the bank, which is not well received by some residents.
- Will become over-run with woody weeds over time due to difficulties mowing/slashing due to steep slope.
- Toe of bank along track needs stabilisation.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Remove annual grasses, weeds. Install hessian mulch/weed mat to all slopes steeper than 1:3 (18°). Plant native grasses - wallaby grass (*Austrodanthonia spp.*) and kangaroo grass (*Themeda triandra*). Plant *Bursaria spinosa* (native box) in informal 'copses' as shown on the planting plan.
- Remove boxthorn, marshmallow, hawthorn, gorse, yucca, blackberry and other weeds as per 'Weed Management Guidelines'.
- See also specific actions listed in the Action Plan (Appendix 2).
- See also Riparian Zone 3 for actions relating to riverbank management.

Zone G Priority: Low

Recreation Reserve

OBJECTIVES

Maintain as a low maintenance, predominantly 'bushland with open grass' landscape as a transition between the Recreation Reserve and the Coal River.

CULTURAL VALUES

- Used for passive recreation by the local community (e.g. dog walking etc.).
- Not seen from the bridge and views to the bridge from this zone are blocked by current vegetation structure.

HERITAGE VALUES

- Not visually significant area from bridge landscape perspective.
- Archaeological values not ascertained.

KEY VEGETATION MANAGEMENT ISSUES

- Ongoing mowing/slashing of grassed areas.
- Ongoing weed management (particularly fennel, thistles and blackberry).
- Broad plantings of largely indigenous trees and shrubs are healthy, well established and appropriate in form.
- Management of riparian vegetation to ensure bank stability and maintain/improve water quality.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Ongoing weed management throughout this management zone, but particularly the riparian zone.
- Annual monitoring and control of gorse, crack willow, fennel, thistles, blackberry, hawthorn and other weeds along the riparian zone. Apply the methods described in the DPIPWE publication 'Guidelines for Safe and Effective Herbicide Use Near Waterways' (see Weed Control Strategy herein).
- Additional weed control required upstream of Recreation Reserve on Crown Land to minimise re-introduction of weeds to the Richmond Bridge precinct.

Zone H

Priority: Low

Picnic Area

OBJECTIVES

Provide a pleasant micro-climate for picnics/BBQs that is not visually intrusive from key vantage points from the bridge or key bridge views.

CULTURAL VALUES

- Widely used by locals and visitors, but this could be enhanced by improving the quality of the landscape setting.

HERITAGE VALUES

- Not visually significant area from bridge landscape perspective.
- Archaeological values not ascertained.

KEY VEGETATION MANAGEMENT ISSUES

- Maintain trees in good condition to ensure public safety and high aesthetic appeal.
- Some grading and top-dressing of lawn areas to improve trafficability for mowing.
- 'Garden bed' area beside the concrete steps to the north west of this zone needs re-designing to ensure a better 'fit' with the locality.

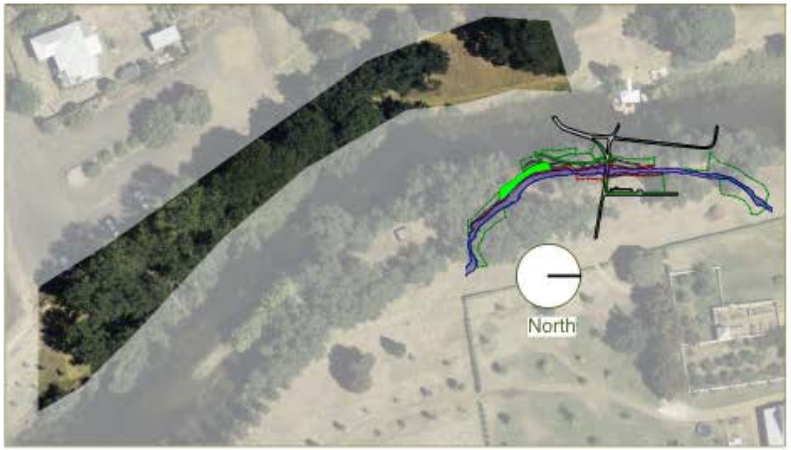
MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Feb 2015 arboricultural assessment identified no general issues with the trees in this area.
- Stump removal and re-grading/topdressing of lawn areas.
- This area would benefit from a re-design of 'hard' landscape elements to rationalise paths and other facilities. This would facilitate better vegetation management, particularly of lawns.
- Remove ivy from central garden bed to carpark area and replace (in the long term, after ivy control has been complete) with *Correa alba* or similar.

Zone I

Priority: High

Woodland of Elms and White Poplars



OBJECTIVES

Maintain 'English woodland' character and seasonal colour backdrop to views from the Bridge.

CULTURAL VALUES

- Enjoyed by visitors and locals (especially children) as a 'wild' place to explore.
- Provides an important backdrop to views from the north of the Bridge.

HERITAGE VALUES

- Elms and White Poplars are 'naturalised' from historical plantings. The original plantings are no longer in existence.
- Forms an important part of the landscape character of the whole precinct.

KEY VEGETATION MANAGEMENT ISSUES

- Arborist recommends removal of specific white poplar specimens which are structurally defective (Tree Ref's: 25, 27, 28, 29, 30, 36, 37, 38).
- The elms are currently in good condition and should be allowed to continue to form 'natural' copses through suckering.
- Over the long-term, the gradual removal of the white poplars and the extension of elms (with some planting of oaks) is recommended. This will preserve the character of this zone whilst minimising maintenance.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Removal of specified trees identified in Arboricultural Assessment (Feb. 2015).
- Every 5 years, remove 3-4 white poplars, working from each of the northern and southern ends of the white poplar copse, and replace with oak and elm trees, as per the Planting Schedule.
- Locals enjoy the informality of the pathways through this area. It is recommended that they are kept informal.
- Specific stump grinding and other actions as per the Action Plan (Appendix 2).

Zone J

Priority: High

Bathurst St to Gatty Dam

OBJECTIVES

Design a 'transitional' landscape between the exotic-dominated landscape of zone J and the more 'natural' riparian zone downstream of Gatty Dam.

CULTURAL VALUES

- Largely open as the result of clearing of willows over the past decade.
- Not seen from the Bridge or from key viewpoints of the bridge.
- Plantation of *Callistemon* shrubs along the upper bank was planted by Richmond Primary School students.

HERITAGE VALUES

- Gatty Dam was constructed in 1935. Construction of the dam ensured standing water in the Coal River through the town.
- Not seen from the Richmond Bridge or from key viewpoints of the bridge.

KEY VEGETATION MANAGEMENT ISSUES

- The recently planted (last 5 years) Turkish oaks are not representative of species found elsewhere in the study area and therefore have no historic reference. However, oaks were commonly planted through the district historically, and their form and colour is complimentary to this setting. They should be retained and this species adopted for other plantings in the precinct as a succession strategy. Relying too heavily on Elms could place the landscape at risk in the future should Dutch Elm Disease or Elm Leaf Beatle take hold in the future.
- Transform the upper track along the western boundary into an 'avenue' by planting a row of blackwood between the track and boundary fence.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Remove dead and dying silver wattles at southern end of this zone.
- Re-vegetate southern areas with blackwood and drooping she-oak (see Planting Schedule).
- Plant an avenue of blackwoods to western boundary. Prune *Callistemon* plantation into an informal hedge, less than 1 m high.

Zone K

Priority: Mod

South Eastern Banks near Gatty Dam

OBJECTIVES

Provide a low-maintenance 'parkland' landscape and a backdrop to views from the western banks of the Coal River.

CULTURAL VALUES

- Mainly used as a pedestrian thoroughfare and for access to neighbouring private land.
- Landscape contribution is mainly as a backdrop to views over the Coal River from westerly vantages.

HERITAGE VALUES

- Gatty Dam was constructed in 1935. Construction of the dam ensured standing water in the Coal River through the town.
- Not seen from the Richmond Bridge or from key viewpoints of the bridge.

KEY VEGETATION MANAGEMENT ISSUES

- Relatively young blackwoods are becoming well established along the banks.
- Is an 'open canvass' in terms of landscape development opportunities, however such redevelopment would require consideration of access requirements and resourcing for both establishment and management.
- Additional planting along the banks and riparian zone would enhance the landscape character of the views from western vantages by screening residences in the background.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Ongoing weed monitoring and management.
- Planting of more indigenous trees and shrubs along bank and riparian zone.
- Planting of indigenous reeds and rushes on lower bank.

Zone R1 Priority: High

Riparian strip, NE Bank

OBJECTIVES

Ensure views to the Bridge from the North-East are maintained and enhanced. Protect bank from erosion.

CULTURAL VALUES

- Forms an important foreground to views of the Bridge from north-eastern vantages.

HERITAGE VALUES

- Important part of views to and from the bridge.
- Some historically planted trees and shrubs have become naturalised but are not considered significant from a heritage perspective.

KEY VEGETATION MANAGEMENT ISSUES

- Environmental weeds including fennel, blackberry, gorse are interspersed with indigenous riparian vegetation and could continue to spread and eventually dominate if not controlled.
- Some hawthorn trees have volunteered, which may form a barrier to views if allowed to grow too big or become too dense.
- *Phragmites australis* (Common Reed) dominates the lower bank and rivers edge. This provides protection from erosion and creates a low-maintenance, attractive edge to the river bank and lawns.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Southern-most bank: re-establish indigenous reeds and rushes (see Species list) to protect bank and maintain 'edge' consistency in the landscape.
- Ongoing weed control: manual removal of hawthorn, boxthorn, gorse and fennel, etc.
- Monitor for introduction of other weed species (willow, cumbungi, etc.) and control as necessary.

Zone R2 Priority: High

Mill Bank

OBJECTIVES

Maintain a high quality landscape that transitions between the gardens of the Mill and the Coal River.

CULTURAL VALUES

- Forms an important foreground to views of the Bridge from south-eastern vantages.
- Is an important component of views from the bridge.

HERITAGE VALUES

- Old boiler tank is 'hidden' under the shallow bank in the centre of this zone.
- Weeping willow is one of the only remaining willows in the area; a relic of older plantings.

KEY VEGETATION MANAGEMENT ISSUES

- Ivy is growing on bridge buttress and must be removed.
- Ongoing control of suckers/seedlings of White Poplar, Lombardy Poplar, peppercorn and various prunus species is required.
- Parts of the banks are eroding due to high volumes of pedestrian access to this area with only an informal, unformed path network.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Remove ivy from Bridge structure. Liaise with adjacent landholder to negotiate an eradication program to minimise future maintenance.
- Remove white poplar suckers/young trees.
- A formed path to define pedestrian access points would assist minimise current bank erosion due to uncontrolled access.

Zone R3 Priority: High

North West Bank

OBJECTIVES

Maintain key views from north-western vantages and provide a pleasant background to views from the eastern bank.

CULTURAL VALUES

- Forms an important foreground to views of the Bridge from northern and eastern vantages.
- Is an important component of views from the bridge.

HERITAGE VALUES

- Old fords across the river that pre-date the bridge.

KEY VEGETATION MANAGEMENT ISSUES

- Crack willow suckers/re-growth from previously controlled trees is occurring through this site.
- Large expanses of *Phragmites* could spread as sedimentation up-stream of the bridge continues.
- Isolated specimens of weed such as boxthorn, gorse, marshmallow, blackberry, fennel.
- Good regeneration of blackwood (*Acacia melanoxylon*) on banks. This may need to be thinned and/or some trees removed if their density increases to the extent that views are blocked.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Some trimming of *Phragmites* is required to 'open up' views to the bridge from the bank near the old Cypress tree (a key vantage point for views to the bridge).
- Weed control required including boxthorn, gorse, marshmallow, blackberry, fennel.
- Thinning of Blackwood seedlings.

Zone R4 Priority: High

South West Bank – Duck Feeding Area

OBJECTIVES

Maintain key views from south-westerly vantages and protect the river banks from erosion.

CULTURAL VALUES

- Forms an important foreground to views of the Bridge from southern and eastern vantages.
- Is an important component of views from the bridge.

HERITAGE VALUES

-

KEY VEGETATION MANAGEMENT ISSUES

- Banks are heavily impacted by pedestrian traffic and duck population and are exposed and prone to erosion.
- Suckering Prunus spp. and other woody weeds in the northern half of this zone will impact on views through and under the bridge arches.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Design and construct 'hardstand' (rock beaching) areas for ducks and waterfowl and plant out banks between these ramps with indigenous reeds and rushes.
- Control weeds and suckering *Prunus spp*. through manual removal.

Zone R5 Priority: Mod

South-Western Riparian Zone

OBJECTIVES

Maintain river and river-bank function and minimise flood impacts of fallen white poplar branches whilst maintaining essentially 'exotic' landscape.

CULTURAL VALUES

- Branches/trunks of white poplars that fall/lean into the river course are of concern to locals because of their impact on recreational users of the river (paddle boats and canoeists) and concerns over flood management.

HERITAGE VALUES

- White poplars are naturalised from historical plantings.
- The landscape of the riparian zone is characterised by the deciduous trees along the banks.

KEY VEGETATION MANAGEMENT ISSUES

- Low overhanging branches of white poplar impede use of the river by paddle boats and canoes.
- Low overhanging branches may cause a build up of debris and exacerbate flooding and flood impacts both upstream and downstream.
- Ducks are impacting on grass cover on some areas of the banks, contributing to erosion.
- Some isolated crack willow suckers are establishing themselves.

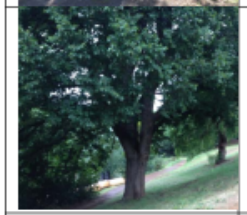
MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Gradual removal of all white poplars from the riparian zone.
- Allow the gradual replacement of white poplars with Elm suckers.
- Adjacent to Zone J, plant new Elm and Oak trees (to continue the 'English woodland' theme of Zone J).
- Adjacent to Zones B and K, establish indigenous reeds and rushes on banks to minimise erosion.
- Control suckers of white poplars.
- Ongoing weed control throughout this Zone, prioritising the control of crack willow, gorse, hawthorn, prunus sp., fennel, blackberry.

Planting Schedule

Photo	Botanical Name	Common Name	Size at maturity (h x w) in m.	Notes
	*Acacia melanoxylon*	Blackwood	20 x 10 *Evergreen*	Indigenous to the locality. Several planted and regenerated specimens occurr across the precinct. Susceptable to damage by brushcutters, mowers etc. and this can negatively impact their health and form. The dark foliage complements the predominantly exotic trees within this precinct.
	*Allocasuarina verticillata*	Drooping She-Oak	12 x 10 *Evergreen*	Indigenous to the site. Useful for screening, suppresses grass/weed growth under the canopy and attracts native birds and insects.
	*Eucalyptus viminalis spp. Viminalis*	Manna Gum, white gum	20 x 12 *Evergreen*	An indigenous tree well suited to the site. Several speciments have been planted (within the last 10-15 years) along the river banks (Zone A in particular) and are thriving. Useful as an evergreen backdrop to screen out the fences etc. of adjacent properties, but should not be planted within 20m of a building or property boundary.
	*Quercus cerris*	Turkish Oak	30 x 20 *Deciduous*	No remnants of historical plantings exist on site. However, Council has planted Turkish Oak in Zone K and it is deemed an appropriate large tree for this area. Oaks of many varieties were commonly planted by settlers in the region. The form, colour and texture of these trees is compliments the character of the precinct. Diversifying the range of large deciduous trees means the landscape is less succeptable to possible drastic change if Elm-leaf Beetle or Dutch Elm Disease impacts the Elm trees in the region in the future.

RECOMMENDED PLANTING PALETTE…

Photo	Botanical Name	Common Name	Size at maturity (h x w) in m.	Notes
	*Schinus molle*	Peppercorn Tree	15 x 12 *Evergreen*	Remnants of historical plantings occur on site. A prolific seeder, this species is volunteering across the site and throughout the town (according to locals). Its continued use as a shade and specimen tree is warranted as it is a hardy specimen tree well suited to the locality and the place.
	*Ulmus procera*	English Elm	18 x 12 *Deciduous*	Remnants of historical plantings occur on site. These old varieties are more prone to suckering than modern nursery-raised stock, which are often grafted onto low-suckering root stock. Formative pruning often required as the tree grows, so a biennial pruning program for new plantings is recommended.
	*Populus nigra 'italica'*	Lombardy Poplar	30 x 10 *Deciduous*	The Lombardy poplars flanking the Eastern approach to the bridge are important historical and cultural plantings that provide a strong vertical element to photographers and artists impressions of the Bridge. Further plantings of this tree at other key points in the landscape, where a strong vertical accent is needed, is appropriate. Within the next 5-10 years the existing Lombardy Poplars adjacent to the bridge will need to be replaced. Any future plantings should be grown from low-suckering root stock.
	*Zelkova serrata* 'Green Vase'	Zelkova	14 x 10 *Deciduous*	From the Ulmnaceae family (Elms), the Zelkova is an excellent substitute for other traditionally planted deciduous parkland trees because of its high resistance to pests and diseases and its non-suckering roots. It does not tolerate waterlogging. Should be considered as a substitute for Elm and white poplars on this site, particularly along pathways, roads and property boundaries where good upright form is required. Does not sucker.

RECOMMENDED PLANTING PALETTE – Shrubs and Grasses

Photo	Botanical Name	Common Name	Size at maturity (h x w) in m.	Notes
	*Austrodanthonia spp.*	Wallaby grass	Grass	Indigenous grasses recommended for revegetating the steep banks of the precinct because they requires no mowing.
	*Bursaria spinosa*	Prickly Box, Sweet Bursaria	2 x 1 Evergreen	This ubiquitous Tasmanian evergreen small tree/shrub would make a useful contribution to the dryer banks and steeper slopes of the precinct, where it will assist in the suppression of exotic grasses and weeds, provide habitat for birds and insects (particularly butterflies) and screens fences and other 'hard' elements in the landscape.
	*Correa alba*	White Correa	1.5 x 1.5 Evergreen	A useful native shrub where structured planting is required to border pathways and/or screen or contain views. Existing plantings of *C. alba* are performing well on site and the form and colour of this native compliments the 'English' landscape character of the site.
	*Themeda triandra*	Kangaroo grass	Grass	An indigenous grass that is recommended for revegetating the steep banks of the precinct because it requires no mowing.

AQUATIC VEGETATION

Whilst an exhaustive survey of aquatic plants has not been undertaken as part of this Vegetation Management Plan, it appears that the majority of aquatic plants within the Coal River are native.

The *Phragmites australis* (common reed) that dominates much of the northern section of the Coal River is valuable in protecting banks from erosion and filtering high nutrient-load runoff from adjacent lawns. It may be spreading through the bed of the river, but this is a result of shallowing of the riverbed due to sedimentation. Whilst 'drowning' by cutting the reeds off below water level may stop its spread and control the reed in the short term, continuing sedimentation will exacerbate this 'problem' in the long term. *Phragmites* does not pose a problem to flooding, unlike the introduced bull-rush (*Cumbungi*), because it lies down under floodwater (and protects banks in doing so).

Rushes (*Juncus spp., Eleocharis gracilis*, etc.) play a similar role in protecting the riverbanks from erosion and withstand much of the impacts of the high duck population in Bridge precinct.

Ribbon weed (*Triglochin procera)* is a dominant aquatic plant within the Coal River that is also likely to be 'spreading' into the main channel of the river due to sedimentation.

A long-term strategy for continued use of the river by boats and canoes would be to reverse the sedimentation process. However, this would most likely require the removal or modification of Gatty Dam and/or mechanical modification of the river bed (i.e. dredging). A major flood may also have the effect of scouring out the riverbed, deepening it in places. These scenarios should be the subject of a separate and detailed hydrological and fluvial geomorphological investigations.

Weed Strategy

INTRODUCTION

As well as the usual array of garden escapees and agricultural weeds common across the region, many of the 'weeds' within the study area are naturalised specimens of historical plantings on or adjacent to the study area.

Some 'weeds' of this site are therefore important elements of the character of this landscape.

It is therefore appropriate that a balance between preserving cultural landscape values whilst minimising environmental and economic impacts of weeds.

Due to the long history of European settlement on this site, the Richmond Bridge and environs is largely a 'European' landscape. Maintaining this character is appropriate given the historical significance of the site.

The 'landscape principles' set out on Page 6 of this report include reference to the management of weed species in the overall landscape context. The overriding principles relating to 'weed' management are that:

- 'Declared weeds' be controlled and eradicated from the site within 5 years.
- Weeds are not to be allowed to spread to adjacent properties.
- Where feasible, exotic species that are profuse suckering varieties be replaced with modern cultivars and/or specimens grafted on to low-suckering root stock.

STRATEGY

The recommended strategic approach to weed management recommended for the site is based on the 'Bradley Method'# of weed control. The basic principles of that method are:

- Work from good to bad areas.
- Disturb the soil as little as possible.
- Allow the rate of regeneration to dictate the rate of clearing.

In the case of the Richmond Bridge precinct, this can be applied by:

1. Bimonthly monitoring each Management Zone for isolated specimens of priority weed species (see next page).
2. On-the-spot (i.e. at inspection time) manual removal of small specimens of priority weeds.
3. Using GPS tagging of larger priority weed specimens and scheduling a follow-up removal works request to be actioned within one month.
4. In the Riparian Management Zones, start weed control works up-stream. Ensure all weed debris is removed from the site to a Council nominated location and treated in accordance with Council's weed management policy.
5. The selected method of eradicating each weed specimen/clump will be site and species specific^. The objective (in line with the Bradley Method) is to minimise disturbance of surrounding vegetation at all times and to 'work in from the edges' of larger infestations.
6. Sow/plant desirable species where larger areas of 'bare ground' have been exposed. This will be site-specific (refer to the Planting Plan).

#Bradley, J. 2002. *Bringing Back the Bush: The Bradley Method of Bush Regeneration*. New Holland.

^Refer to the DPIPWE publication *Guidelines for Safe and Effective Herbicide Use Near Waterways* as a guide to herbicide use within the area defined by this Vegetation Management Plan. available at: http://dpipwe.tas.gov.au/Documents/herbicide_guidelinesFINAL2012.pdf

Definition of Weed

A weed is any plant growing out of place, causing adverse economic, environmental and/or social impacts.

Weeds 'Declared' under the *Weed Management Act* (1999) pose a significant threat to Tasmania's environmental and/or agricultural values. Land owners/managers have a legal responsibility to control declared weeds on their land.

Priority Weed Species

Photo	Botanical Name	Common Name	Notes*
	*Lycium ferocissimum*	African Boxthorn	Declared weed. Prickly and incompatible with public open space.
	*Ulex europaeus*	Gorse	Declared weed. Very invasive and not compatible with the objectives of public open space. 'High threat' weed (TASVEG).
	*Crataegus momgyna*	Hawthorn	Not a declared weed in Tasmania, and has cultural/historic value. However, can be invasive.
	*Malva spp.*	Mallow	Not a declared weed and currently limited to the NW corner of Zone F. However, timely control will prevent long-term infestation.
	*Asparagus officinalis*	Asparagus	Garden escapee. Need to be vigilant for the more invasive declared weed variety *A. scandens*

Photo	Botanical Name	Common Name	Notes*
	*Foeniculum vulgare*	Fennel	Declared weed.
	*Salix alba X fragila*	Crack Willow	The 'Crack' willow is of particular concern. Existing weeping willows have historical/cultural value and are less prone to spread than other species.
	*Rubus fruiticosa* *Image © DPIPWE Tasmania*	Blackberry	Declared weed. 'High threat' weed (TASVEG).

Other Priority 'weed' species

Pine (*Pinus radiata*) seedlings are volunteering in areas (e.g. Zone F). Requires ongoing monitoring and manual removal of seedlings. **Yucca (*Yucca spp.*)** some of which are planted specimens; can be invasive. **Agapanthus (*Agapanthus africanus*)** is useful and traditionally planted in and around the site. However, it can spread in some circumstances so monitoring is required to contain it. **Briar Rose (Rosa spp.)** isolated occurrences along the riparian zones of each Management Zone. Particularly prevalent in Zone H.

NOTE: This is **not** intended to be a comprehensive list of weeds occurring on site. This list represents some of the more prevalent weed species that are having an impact on the visual character of the site and the management of vegetation generally in the study area.

The 'borrowed' landscape

INTRODUCTION

Many of the best views of the Richmond Bridge are framed by vegetation from the 'borrowed landscape' (the broader landscape around the study area).

The mature Blue Gums in front of St Johns Church; the pine and cypress trees on private land to the north of the study area; the silver poplars in the traffic island on Bridge Street to the west of the bridge; and the white poplars along the banks of the Coal River south-east of the bridge are key examples.

The succession of this vegetation is important to maintaining the cultural landscape of the Richmond Bridge and its surrounds.

SUCCESSION PLANTING

It is recommended that Council take a proactive approach to ensuring the smooth transition of the broader landscape so that drastic changes to the skyline, near and middle-distant views are not disrupted when the existing vegetation declines and has to be removed.

In some instances, there is room around the existing vegetation to enable new plantings to occur now and for that vegetation to become established in time for the eventual decline of the existing trees.

In other cases, removal of the existing trees will be required before new plantings can be undertaken.

Regardless of the approach to succession planting, it is important that the community is well informed of the plans for succession of large trees. If the community is assured that the works are part of a long-term replacement program and that the disruption to the landscape will be temporary, they will be more accepting of the need to remove old trees.

The priority areas of the 'borrowed' landscape where succession plantings are particularly required are:

St Johns Church, Blue Gums.

The mature blue gums form an important backdrop and skyline to views of the Bridge, particularly from the south-west. Removal of some of these trees occurred relatively recently. It is important that these are replaced soon, and that additional plantings of the same species be undertaken in the vicinity of the existing trees, but making allowance for the safe removal of the existing trees. Detailed site design is recommended to ensure new trees are located appropriately so as not to impact on the structure of the church or other infrastructure.

Cypress and Pines, 12 Gunning St & 56 & 52 St John Circle.

The old pine and cypress (*Pinus radiata* & *Cupressus macrocarpa*) on private land north of the main Richmond Bridge precinct form an important backdrop to the cultural landscape of the Bridge environs. These trees have not been assessed by an arborist as part of this Vegetation Management Plan, however, due to their age there is a need to commence succession planning for their eventual demise. There are two main options a) negotiate with the current landholders to discuss options for replacing these trees over time; or b) plant pine and/or cypress trees at the northern end of Zone F. A factor in deciding which option is most appropriate is the fact that it is likely that access for removal of the existing trees on 12 Gunning St might have to occur through Crown land (Zone F).

White Poplars, Bridge Street.

The two large white poplars to the western side of the 'traffic island' to Bridge Street/Gunning Street form an important focal point and backdrop to the Bridge as it is approached from the east. Although currently healthy and with a likely long life ahead of them, succession planning for these specimens is important. There is room to the East of these trees to establish new plantings. White poplars should be re-planted.

Poplars on private land, 'The Mill'.

The Lombardy poplars to the south of the eastern buttresses of the Bridge are key landmarks and historically and culturally significant plantings. Negotiations with this landholder are required to start planning for the succession of these trees. The white poplars along the banks of the Coal River south-east of the Bridge are also important determinants of landscape character. Their gradual replacement with elms is recommended (as per the opposite (Zones I, J and 5). Many of the mature trees throughout The Mill property are important in the overall context of the Bridge landscape.

Mature eucalypt, she-oak and peppercorn trees to rear of 62 and 64 Bridge Street.

The mature eucalypt, she-oak and peppercorn trees in the rear yards of these two addresses perform important roles in the landscape by screening buildings. Negotiations with the landowner(s) is required to highlight the role these trees play in the landscape and come to an arrangement for their long-term replacement.

Eucalypts West of St Luke's Cemetery

The mature blue gums to the west of the cemetery form a backdrop to the views from the high vantage point on the edge of the bank of the Coal River to the east of the Village Green. There is space on that site to plant eucalypts of the same species (*E. globulus*) to eventually replace these mature trees. Detailed site planning and negotiations with the landowner are required to ensure future plantings are compatible with surrounding land uses and infrastructure.

Poplars, 51 Bridge Street (Cnr Gunning St).

The Lombardy poplars at 51 Bridge St. form a focal point to views as the Bridge is approached from the east. Negotiations with this landholder should be undertaken to determine their intentions and the likelihood of succession planting being possible in this location. If it is not, an alternative site in the vicinity should be selected for new Lombardy poplars (low-suckering stock) to be planted.

Many of the recommendations of this Vegetation Management Plan relate to routine land management and arboricultural practices.

Effective weed management requires strategic, timely and regular works to be carried out by trained staff. Regular weed management should be included in all programmed maintenance for the whole site.

Tree removal and replacement in historic precincts may be controlled under various State, National and Local legislation. The specific National, State and Local Government legislative frameworks within which the proposed actions are to be guided are discussed below.

National

The National Heritage listing includes the Bridge, and the north west and south west riverbanks that are in public ownership (but not its setting). Commonwealth approval will be required where an action has, will have or is likely to have a significant impact on the National Heritage values of the place. An action is likely to have a significant impact under the impact guidelines (p.20) if there is a real chance or possibility that it will cause:

- one or more of the National Heritage values to be lost
- one or more of the National Heritage values to be degraded or damaged, or
- one or more of the National Heritage values to be notably altered, modified, obscured or diminished.

The recommended vegetation management works are not considered to result in a significant impact on the identified heritage values of the Richmond Bridge.

State

Implementation of Actions suggested within this Vegetation Management Plan are to be guided by the *Heritage Tasmania Practice Notes – Historic plantings and landscapes* (Heritage Tasmania, 2015).

Heritage Tasmania will generally issue a certificate of exemption for general maintenance of landscapes including actions such as:

- General mowing; seeding, top-dressing, aeration/coring of lawns; removal of dead plants; disease control; mulching; spraying etc.
- Removal of dead or dying minor shrubs; herbs, perennials etc. or plants of no significance.
- General weed control, noting that some heritage species are environmental weeds, in which case a works application will be required.

Tree surgery, hedging, pruning and trimming are also generally eligible for a certificate of exemption if the works are carried out by qualified arborist(s) or horticulturalists with an appreciation of the heritage value of the vegetation under treatment.

Therefore, the majority of the works recommended in this Vegetation Management Plan will require a permit from Heritage Tasmania.

Approval will be required for:

- Stump grinding, in areas within moderate and high archaeological interest (as noted in the Management Zones descriptions) if the grinding is deeper than 30cm.
- Tree removal.
- Replacement of trees where the new trees are not of the same species as those removed.
- New plantings (i.e. tree or shrub plantings in areas where no planting has been present historically, but may impact on views to or from historically significant features or landscapes).

Once the consultation on this Draft Vegetation Management Plan has been completed, discussions with Heritage Tasmania will be finalised and a staged process of approvals for the agreed works determined.

An overarching permit for works prescribed in this Vegetation Management Plan may be able to be negotiated. The extent of soil disturbance (e.g. stump grinding and root control barrier installation) will be one of the key issues that Heritage Tasmania will consider in issuing permits for vegetation management.

Local

The Richmond Bridge and Surrounds are identified as a heritage listed place under Table E13.1 of the Historic Heritage Code, Clarence Interim Planning Scheme 2015. The planting, clearing or modification of vegetation for landscaping or management of vegetation purposes within the Richmond recreational area is exempt from the Code.

Succession Planting on Private Land

It is recommended that Clarence City Council investigate the potential for developing partnerships with adjacent landowners to further the vegetation management principles through succession plantings on private land.

Appendices

1. Cemetery Bluff Management Zone
2. Action Plan
3. Plans (A3 SET)
    - Site Analysis Plan
    - Management Zones
    - Planting Plan (North)
    - Planting Plan (South)
    - Borrowed Landscape Notes
4. Vegetation Condition as at February 2015 (Aboricultural Survey Report)

Zone CB Priority: Mod

Cemetery Bluff (Private Land, owned by Catholic Church)

Zone CB (Foreground)

OBJECTIVES8

Maintain vegetation cover to minimise erosion. Minimise the spread of environmental weeds through adjacent properties/downstream.

CULTURAL VALUES

- Largely 'unused' land.
- Forms a visual backdrop to Recreation Reserve and fore-ground to views from the cemetery.
- Not seen from the Richmond Bridge.

HERITAGE VALUES

- Not visually significant area from bridge landscape perspective.
- Archaeological values not ascertained. However, cemetery is being impacted by erosion of the bluff so heritage issues are evident.

KEY VEGETATION MANAGEMENT ISSUES

- Existing vegetation is dominated by naturalised 'historical' species, which are now considered environmental weeds (briar rose, yucca, hawthorn, boxthorn, etc.).
- This vegetation is performing the roles of preventing erosion and providing some habitat values for native fauna.
- The cost and resources required to remove the weeds and replace them with indigenous vegetation may not be acceptable to the community.
- A long-term (10-15 year) program of gradual weed eradication and replacement with indigenous species is recommended.

MAIN VEGETATION MANAGEMENT PRESCRIPTIONS

- Monitor weed spread.
- Target the more invasive weed species (particularly gorse) for priority control.
- Control willows on banks of the Coal River, through an annual program of removal (see Weed Strategy).
- Gradually work 'in' from the extremities of the site towards the centre, replacing exotic species with indigenous species (particularly *Melaleuca ericifolia, Bursaria spinosa*, *Allocasuarina verticillata* – see Species List).

Appendices

ACTION PLAN

The Arboricultural Assessment of February 2015 recommends the following specific remedial actions:

PRIORITY	MANAGEMENT ZONE	ACTION	RESPONSIBILITY
High	Zone A	REMOVAL of trees 95 & 96.	CCC
Mod	Zone A	REMOVAL of trees 104 & 105.	CCC
High	Zone B	Remove *A. melanoxylon* (Tree 75) and replace with a new better-formed specimen.	CCC
High	Zone B	Pruning of pine (tree 53) to remove large diameter dead wood.	CCC
Mod	Zone B	Pruning of peppercorn (tree 61) to remove large diameter dead wood.	CCC
Mod	Zone C	Pruning of almond (tree 68) to remove large diameter dead wood.	CCC
Mod	Zone E	Pruning of peppercorn (tree 69) to remove dead wood.	CCC
High	Zone F	Pruning of pine (tree 79) to remove large diameter dead wood.	CCC
High	Zone I	REMOVAL of trees 25, 27, 28, 29, 30, 36, 37 and 38	CCC
High	Zone I	Minor works to trees 22 & 23; 31-35 inclusive; 39.	CCC
Mod	Zone J	REMOVAL of trees 4, 5 & 6 (dead and dying *Acacia dealbata*).	CCC

NOTES FOR TABLES:

PRIORITY:
HIGH: Within 6 months.
MOD: 6 to 18 months.
LOW: 18 months to 3 years.
Refer to Arboricultural report for GPS Coordinates of above-mentioned trees.

RESPONSIBILITY:
CCC: Clarence City Council
State Growth: Department of State Growth
DPIPWE CLS: Department of Primary Industries, Parks, Water and Environment, Crown Land Services.

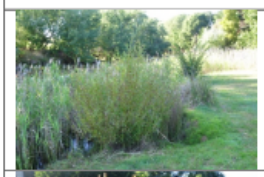
Prioritised Vegetation Management Actions:

Note: These recommendations are in addition to the recommendations of the Arborists Report (Appendix 4)

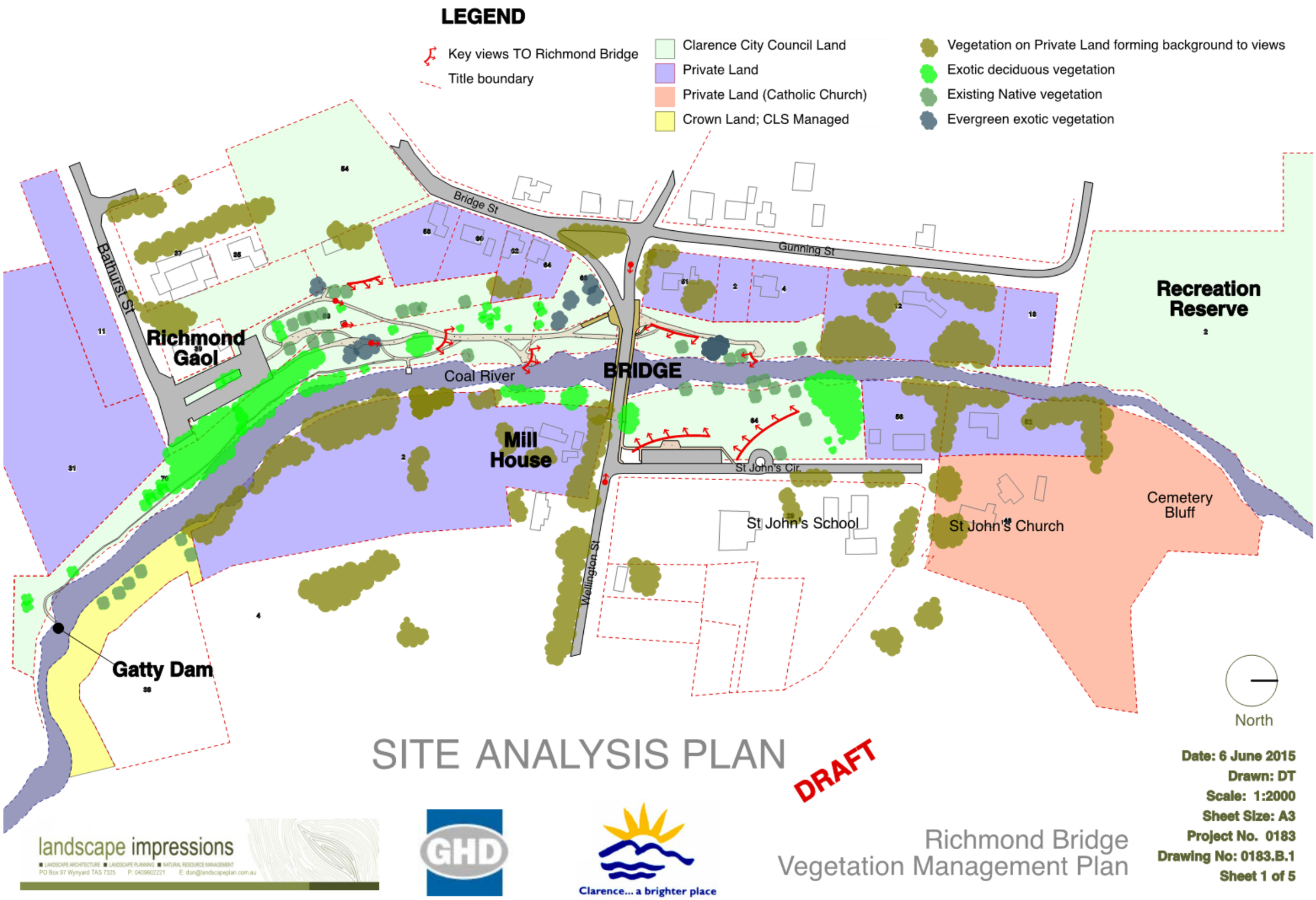
Photo	Priority	Zone	Description of Issue	Notes	Respon-sibility
	High	A	• Remove all Lombardy Poplar suckers within 2m of the bridge structure.	• Arborist recommends not using herbicides on suckers. • Manual removal is recommended. • Avoid damage to bridge structure itself. • Scheduled program of manual removal every 6 months is recommended.	State Growth
	Low	A	• Remove stumps of old white poplars along northern boundary of Zone A.	• Complete removal will facilitate ongoing management of grass and enable replacement trees to be established.	CCC
	Mod	A	• Remove Pinoak	• Is performing poorly (perhaps waterlogged?). • Is not a species found elswhere in the Richmond Bridge precinct. • Replace with Turkish oak or elm.	CCC
	Mod	B	• Remove exotic shrubs and small trees from the garden bed below the concrete steps and mass plant with Correa alba.	• The existing *Correa alba* within this bed are performing well and have an appropriate form and colour for this site. • The taller shrubs are blocking views to the bridge and river and enclose the pathway too heavily.	CCC

Photo	Priority	Zone	Description of Issue	Notes	Respon-sibility
	Mod	C	• Remove stumps throughout the orchard area.	• Stumps are impeding mowing and other maintenance operations. • Area has medium archaelogical value so an observer is to be present to ensure any artefacts disturbed during works are identified and the site protected if significant quantities/qualities of artefacts are discovered.	CCC
	High	D	• Remove elm suckers at toe of bank in Zone D.	• Use 'cut and paint' method or manual remove,ensuring as much of the parent root material is also removed.	CCC
	Low	D	• Revegetate the steep banks of Zone D with indigenous grasses.	• Control existing grass and weed cover using a knock-down, broad-spectrum herbicide. • Leave residue in situ. • Lay hession weed mat downslope to cover the entire slope. • Establish wallaby grass (*Austrodanthonia spp.*) and kangaroo grass (*Themeda triandra*). • Options for establishment include: hydroseeding or planting seedlings. The latter would be more expensive and take longer to establish a thick enough cover to suppress weed incursions. Hydroseeding is therefore the preferred option.	CCC
	Mod	D	• Remove *Acacia dealbata* between concrete steps and the picked fence on top of the embankment of Zone D.	• Will start to decline in health and should be removed to enable the re-planting of this bank.	CCC

Photo	Priority	Zone	Description of Issue	Notes	Respon-sibility
	Mod	D	• Remove wattles. • Retain eucalypt.	• Specimens are 'leggy' and their removal will enable the revegetation of the adjacent bank with indigenous grasses. • Replace with *Bursaria spinosa* as per the planting plan.	CCC
	High	F	• Remove yucca, pine seedlings and boxthorn throughout this zone.	• Manual removal of these plants will be required. • Yucca re-growth will need to be monitored and herbicide treatment may be necessary. Eradication of Yucca is recommended before attempting revegetation of banks with indigenous grasses.	CCC
	Low	F	• Revegetate the steep banks of Zone D with indigenous grasses.	• See prescription for Zone D.	CCC
	Mod	F	• Stump of old cypress tree.	• Grind to fully remove. • Medium archaelogical value site: follow Heritage Tasmania guidelines.	CCC
	Mod	I	• Grind stump of old elm tree and remove suckering re-growth.	• Re-plant Ulmus sp.	CCC
	Mod	I	• Grind stump og old peppercorn tree.	• Low archaeological value site but an observer should be present when grinding to ensure works can cease if any historical/cultural artefacts are uncovered.	CCC

Photo	Priority	Zone	Description of Issue	Notes	Respon-sibility
	High	R2	• Remove ivy from Bridge face.	• Remove ivy from stone work. • Work with landowner to eradicate Ivy from this site to prevent future maintenance burden and ensure integrity of the bridge in the future.	State Growth
	High	R4	• Remove willow suckers/ saplings.	• Follow 'Guidelines for Safe and Effective Herbicide Use Near Waterways'.	CCC
	Mod	R4	• Remove *Prunus sp.* sucker from bank.	• Follow 'Guidelines for Safe and Effective Herbicide Use Near Waterways'.	CCC
	High	R5	• Elm suckers.	• Remove Elm suckers through this area to enable view lines to remain open from this zone and the adjacent areas. • Follow 'Guidelines for Safe and Effective Herbicide Use Near Waterways'.	CCC
	High	R5	• Remove boughs of white poplars 'falling' across th Coal River.	• These branches and stems are causing problems with access to the waterway and could potentially contribute to flooding issues up- and down-stream.	DPIPWE CLS

Attachment


LEGEND
Key views TO Richmond Bridge
Title boundary
Clarence City Council Land
Private Land
Private Land (Catholic Church)
Crown Land; CLS Managed
Vegetation on Private Land forming background to views
Exotic deciduous vegetation
Existing Native vegetation
Evergreen exotic vegetation
Bridge St
Gunning St
Bathurst St
Richmond Gaol
Coal River
BRIDGE
Mill House
St John's Cir.
St John's School
St John's Church
Cemetery Bluff
Recreation Reserve
Wellington St
Gatty Dam
North
SITE ANALYSIS PLAN
DRAFT
Date: 6 June 2015
Drawn: DT
Scale: 1:2000
Sheet Size: A3
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Drawing No: 0183.B.1
Sheet 1 of 5
landscape impressions
GHD
Clarence... a brighter place
Richmond Bridge
Vegetation Management Plan

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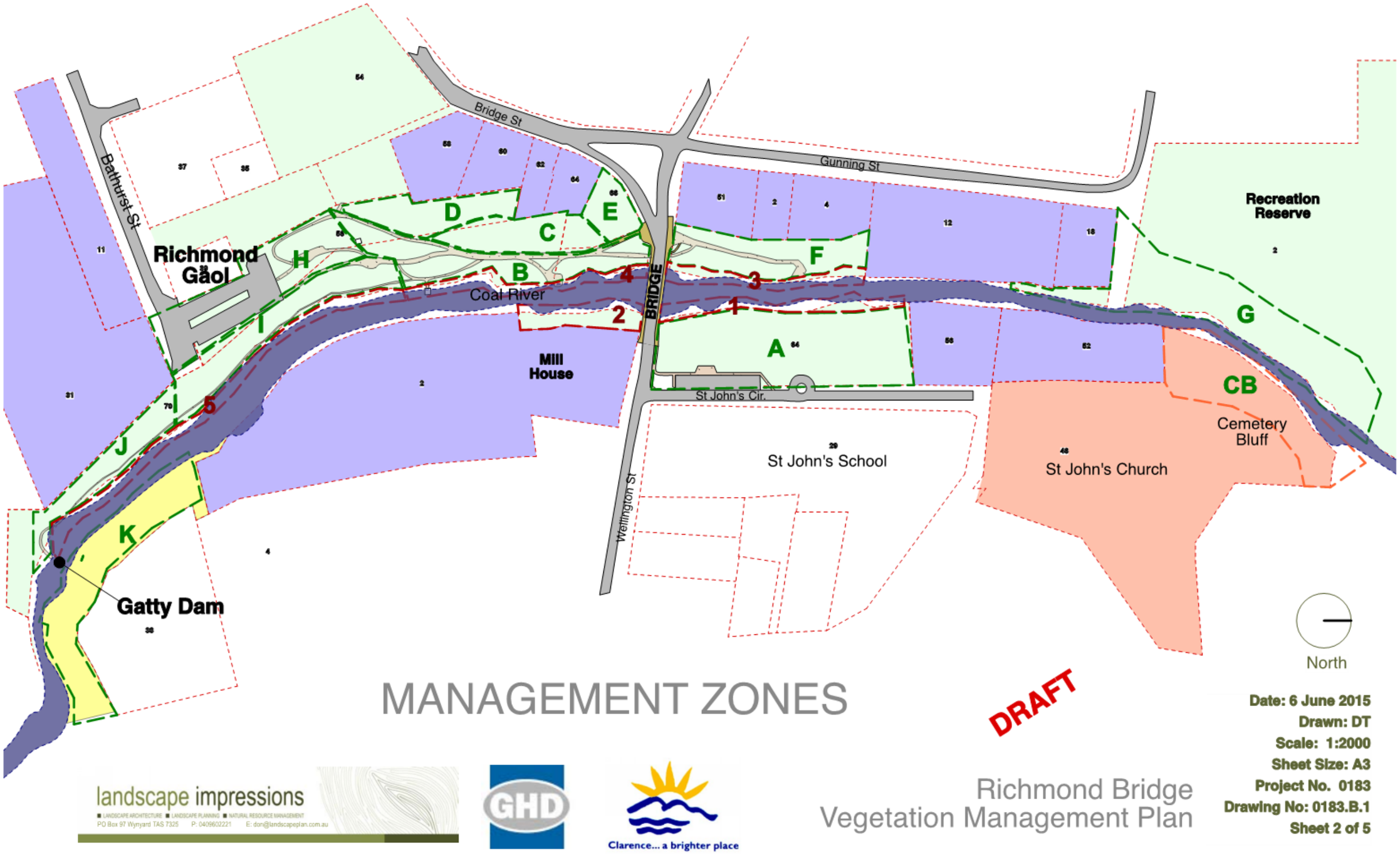
Bridge St
Gunning St
Bathurst St
Richmond Gaol
Coal River
BRIDGE
Mill House
St John's Cir.
St John's School
Wellington St
St John's Church
Cemetery Bluff
Recreation Reserve
Gatty Dam
A
B
C
D
E
F
G
H
I
J
K
CB
1
2
3
4
5
North
MANAGEMENT ZONES
DRAFT
Date: 6 June 2015
Drawn: DT
Scale: 1:2000
Sheet Size: A3
Project No. 0183
Drawing No: 0183.B.1
Sheet 2 of 5
landscape impressions
GHD
Clarence... a brighter place
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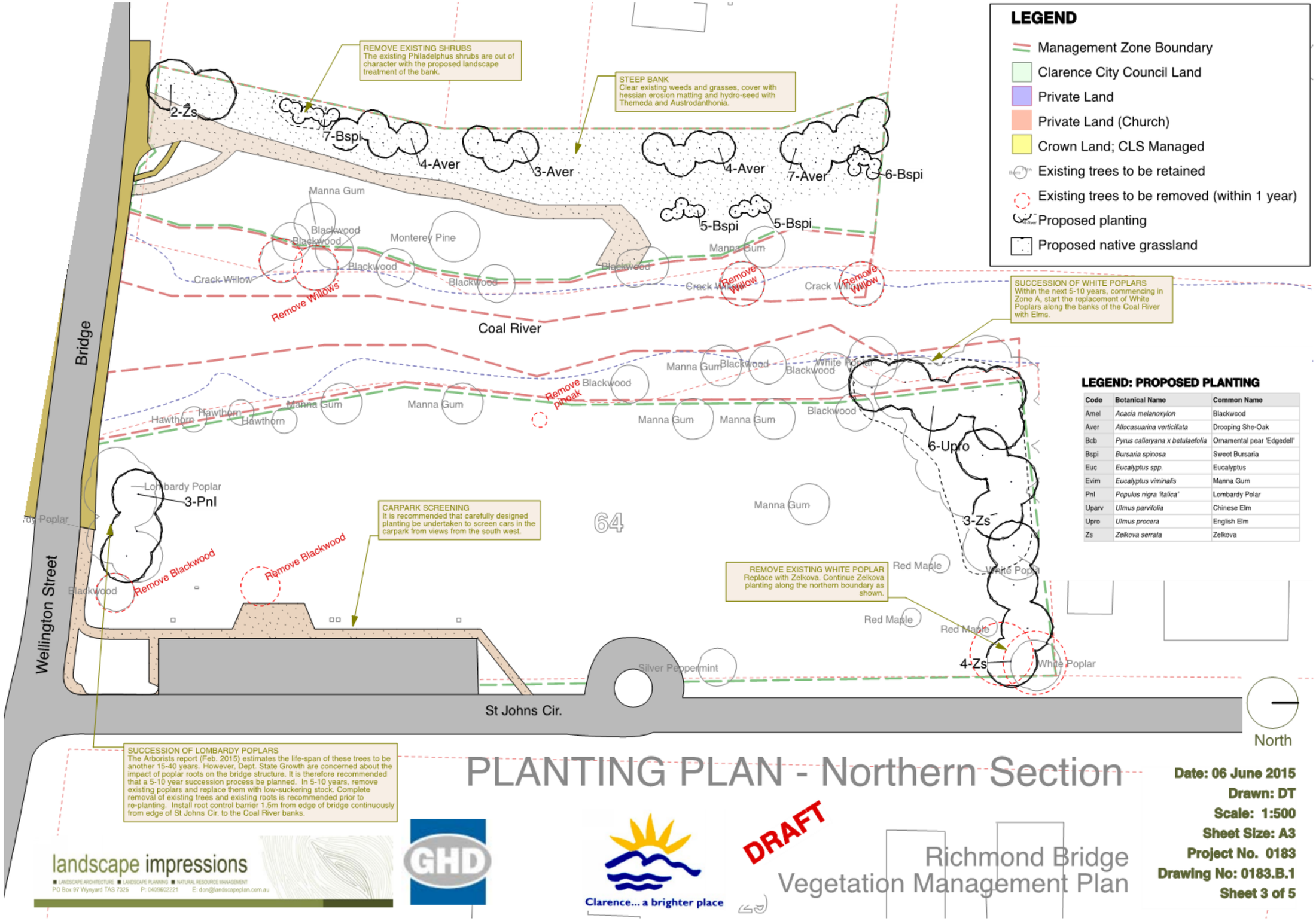
LEGEND
Management Zone Boundary
Clarence City Council Land
Private Land
Private Land (Church)
Crown Land; CLS Managed
Existing trees to be retained
Existing trees to be removed (within 1 year)
Proposed planting
Proposed native grassland
REMOVE EXISTING SHRUBS
The existing Philadelphus shrubs are out of character with the proposed landscape treatment of the bank.
STEEP BANK
Clear existing weeds and grasses, cover with hessian erosion matting and hydro-seed with Themeda and Austrodanthonia.
SUCCESSION OF WHITE POPLARS
Within the next 5-10 years, commencing in Zone A, start the replacement of White Poplars along the banks of the Coal River with Elms.
CARPARK SCREENING
It is recommended that carefully designed planting be undertaken to screen cars in the carpark from views from the south west.
REMOVE EXISTING WHITE POPLAR
Replace with Zelkova. Continue Zelkova planting along the northern boundary as shown.
SUCCESSION OF LOMBARDY POPLARS
The Arborists report (Feb. 2015) estimates the life-span of these trees to be another 15-40 years. However, Dept. State Growth are concerned about the impact of poplar roots on the bridge structure. It is therefore recommended that a 5-10 year succession process be planned. In 5-10 years, remove existing poplars and replace them with low-suckering stock. Complete removal of existing trees and existing roots is recommended prior to re-planting. Install root control barrier 1.5m from edge of bridge continuously from edge of St Johns Cir. to the Coal River banks.
2-Zs
7-Bspi
4-Aver
3-Aver
4-Aver
7-Aver
6-Bspi
5-Bspi
5-Bspi
Manna Gum
Blackwood
Monterey Pine
Crack Willow
Remove Willows
Remove Willow
Coal River
Bridge
Hawthorn
Remove pinoak
6-Upro
3-Zs
Lombardy Poplar
3-Pnl
Remove Blackwood
Red Maple
White Poplar
4-Zs
Silver Peppermint
Wellington Street
St Johns Cir.
North
64
LEGEND: PROPOSED PLANTING
Code | Botanical Name | Common Name
Amel | Acacia melanoxylon | Blackwood
Aver | Allocasuarina verticillata | Drooping She-Oak
Bcb | Pyrus calleryana x betulaefolia | Ornamental pear 'Edgedell'
Bspi | Bursaria spinosa | Sweet Bursaria
Euc | Eucalyptus spp. | Eucalyptus
Evim | Eucalyptus viminalis | Manna Gum
Pnl | Populus nigra 'Italica' | Lombardy Polar
Uparv | Ulmus parvifolia | Chinese Elm
Upro | Ulmus procera | English Elm
Zs | Zelkova serrata | Zelkova
PLANTING PLAN - Northern Section
Date: 06 June 2015
Drawn: DT
Scale: 1:500
Sheet Size: A3
Project No. 0183
Drawing No: 0183.B.1
Sheet 3 of 5
landscape impressions
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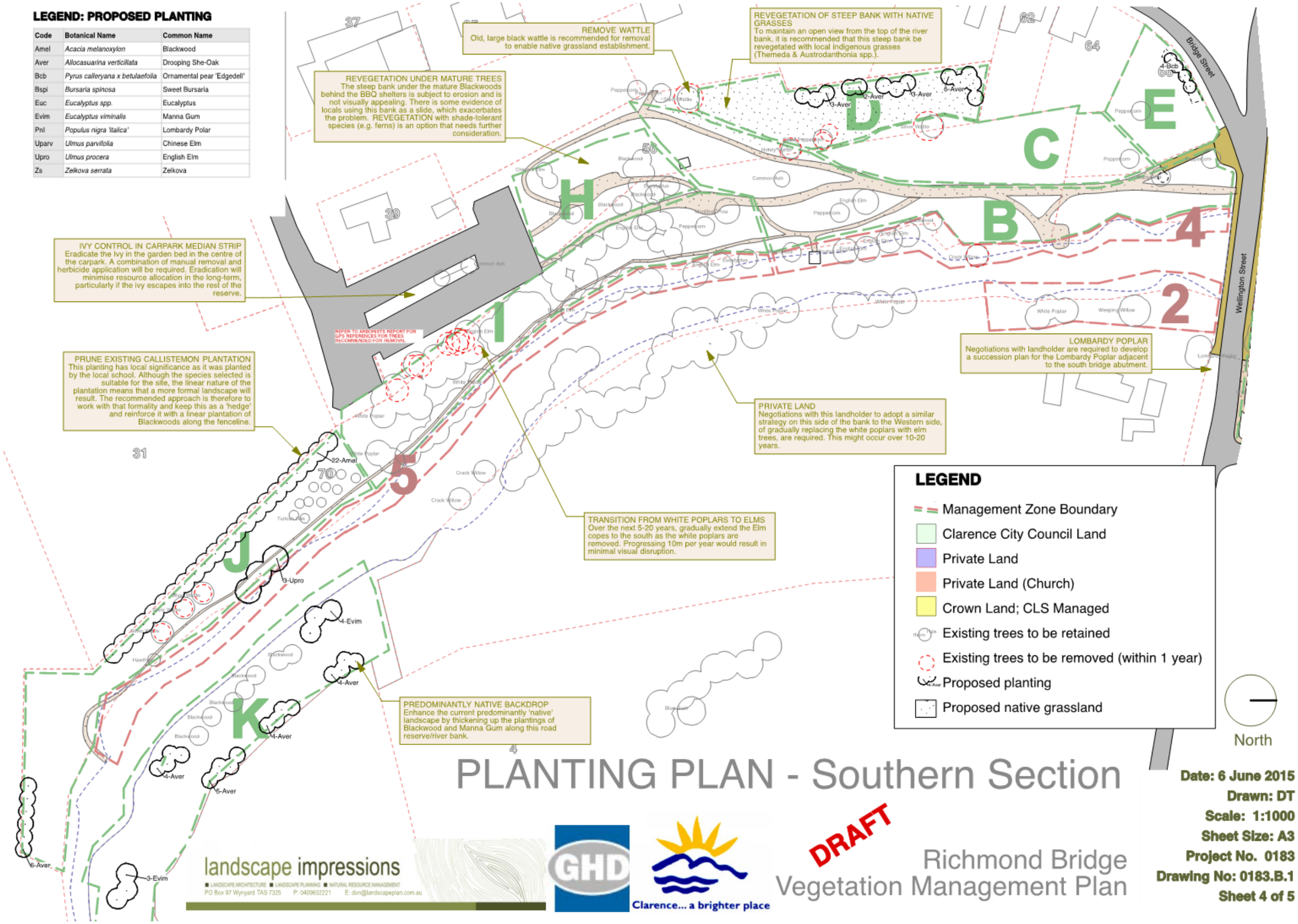
LEGEND: PROPOSED PLANTING
Code | Botanical Name | Common Name
Amel | Acacia melanoxylon | Blackwood
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Pnl | Populus nigra 'Italica' | Lombardy Polar
Uparv | Ulmus parvifolia | Chinese Elm
Upro | Ulmus procera | English Elm
Zs | Zelkova serrata | Zelkova
REMOVE WATTLE
Old, large black wattle is recommended for removal to enable native grassland establishment.
REVEGETATION OF STEEP BANK WITH NATIVE GRASSES
To maintain an open view from the top of the river bank, it is recommended that this steep bank be revegetated with local indigenous grasses (Themeda & Austrodanthonia spp.).
REVEGETATION UNDER MATURE TREES
The steep bank under the mature Blackwoods behind the BBQ shelters is subject to erosion and is not visually appealing. There is some evidence of locals using this bank as a slide, which exacerbates the problem. REVEGETATION with shade-tolerant species (e.g. ferns) is an option that needs further consideration.
IVY CONTROL IN CARPARK MEDIAN STRIP
Eradicate the Ivy in the garden bed in the centre of the carpark. A combination of manual removal and herbicide application will be required. Eradication will minimise resource allocation in the long-term, particularly if the ivy escapes into the rest of the reserve.
PRUNE EXISTING CALLISTEMON PLANTATION
This planting has local significance as it was planted by the local school. Although the species selected is suitable for the site, the linear nature of the plantation means that a more formal landscape will result. The recommended approach is therefore to work with that formality and keep this as a 'hedge' and reinforce it with a linear plantation of Blackwoods along the fenceline.
LOMBARDY POPLAR
Negotiations with landholder are required to develop a succession plan for the Lombardy Poplar adjacent to the south bridge abutment.
PRIVATE LAND
Negotiations with this landholder to adopt a similar strategy on this side of the bank to the Western side, of gradually replacing the white poplars with elm trees, are required. This might occur over 10-20 years.
TRANSITION FROM WHITE POPLARS TO ELMS
Over the next 5-20 years, gradually extend the Elm copes to the south as the white poplars are removed. Progressing 10m per year would result in minimal visual disruption.
PREDOMINANTLY NATIVE BACKDROP
Enhance the current predominantly 'native' landscape by thickening up the plantings of Blackwood and Manna Gum along this road reserve/river bank.
Bridge Street
Wellington Street
LEGEND
Management Zone Boundary
Clarence City Council Land
Private Land
Private Land (Church)
Crown Land; CLS Managed
Existing trees to be retained
Existing trees to be removed (within 1 year)
Proposed planting
Proposed native grassland
North
PLANTING PLAN - Southern Section
Date: 6 June 2015
Drawn: DT
Scale: 1:1000
Sheet Size: A3
Project No. 0183
Drawing No: 0183.B.1
Sheet 4 of 5
landscape impressions
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Vegetation Management Plan

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BORROWED LANDSCAPE

DRAFT

landscape impressions

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Richmond Bridge
Vegetation Management Plan

Date: 6 June 2015
Drawn: DT
Scale: 1:2000
Sheet Size: A3
Project No. 0183
Drawing No: 0183.B.1
Sheet 5 of 5

Attachment

PHILIP JACKSON - Arborist & Environmental Consulting

ARBORICULTURAL SURVEY REPORT

RICHMOND BRIDGE SETTING

RICHMOND

11 February 2015 - DRAFT FOR CLIENT REVIEW

Prepared for: Sarah Fitzgerald
Manager Environment & Planning
GHD, Tasmania

Prepared by: Philip Jackson
B Sc (hons) – Plant Ecology
B Sc – Botany / Env. Studies
Ass. Dip. App. Sci. – Amenity Horticulture
Dip. Hort. (Aboriculture)

Member of the International Society of Arboriculture
Member of the Society of Municipal Arborists

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SUMMARY

An assessment of the health, structural condition and remaining life expectancy of 113 individual trees from 21 species, and three mono-specific copse group features within the survey area of the Richmond Bridge setting was undertaken. From this assessment a prioritized works requirement was determined.

In general the tree population within the survey area is in good health and condition considering the tree age structure and growing conditions. Only five trees were identified as having a high hazard rating with a corresponding high works priority.

36 trees were identified as requiring remedial arboricultural work. The breakdown of these works is:

- Tree Removal – 13
- Deadwood Removal – 11
- Formative Pruning – 12

A schedule of all the required works is presented in **Appendix 4.**
A plan of the location of trees requiring work is included in **Appendix 5.**

Trees are dynamic living organisms that provide a broad, extensive range of benefits. Whilst the most recent industry standards with regards to tree health and risk assessment have been employed, the advice and recommendations in this report are limited to **twelve (12) months,** after which all responsibility regarding the site trees is that of Clarence City Council, which has responsibility for management of the subject trees.

Attachment

TABLE OF CONTENTS

1 INTRODUCTION

1.1 Client Brief

1.1.1 This report was commissioned by Sarah Fitzgerald, Manager Environment & Planning, GHD Pty Ltd, Tasmania. The brief for the report was to assess the current health and remaining life expectancy of the tree population located within the general study area of the "Richmond Bridge and its setting" as prescribed in the *Clarence City Council Invitation for Quotation - Q1019-14*, described in the *Richmond Bridge Conservation Management Plan* (DIER ,2010) and outlined in **Section 2** below.

1.1.2 The purpose of the report is to identify any health and/or structural defects in each tree inspected that may represent a potential hazard to public safety or private property and infrastructure, together with recommendations for remedial action where required to mitigate such risks.

1.2 Scope

1.2.1 This report provides the following information for each tree inspected:

- Identification (botanical & common name)
- Maturity class
- Height Class
- Health
- Structural Condition
- Remaining life expectancy
- Risk rating
- Recommendation and prioritization of works required to mitigate hazardous tree risks identified
- GPS location
- Any relevant comments.

2 THE STUDY SITE

2.1.1 For the purposes of this report, the survey area included the following components:

- The land on the north east river bank owned by the Archdiocese of Hobart and known as 64 St Johns Circle and defined by Certificate of Title 104610/1 (PID 5888635);

- The two parcels of land on the south east river bank owned by the Crown and defined by Certificate of Title 10089/3 (PID 3003450) and Certificate of Title 10089/4 (PID 3003450);

- The area of public land located on the south east river bank adjacent to the Gatty Dam between approximate Australian Map Grip coordinates

Attachment

536030E/5268181N (AGD 66) in the north to approximate Australian Map Grip coordinates 536097E/5268110N (AGD 66) in the south;

- The three parcels of land on the north west bank river bank owned by the Crown and defined by Certificates of Title 66866 folios 1, 2 and 3 (PID 2799418) and;

- The three parcels of land on the south west bank of the river. This includes:
  - The two parcels of land owned by the Crown and defined by Certificate of Title 146275/1 and potential PID 2068367; and
  - The narrow parcel of riverbank land owned by the Clarence City Council and defined by Certificate of Title 17/1777.

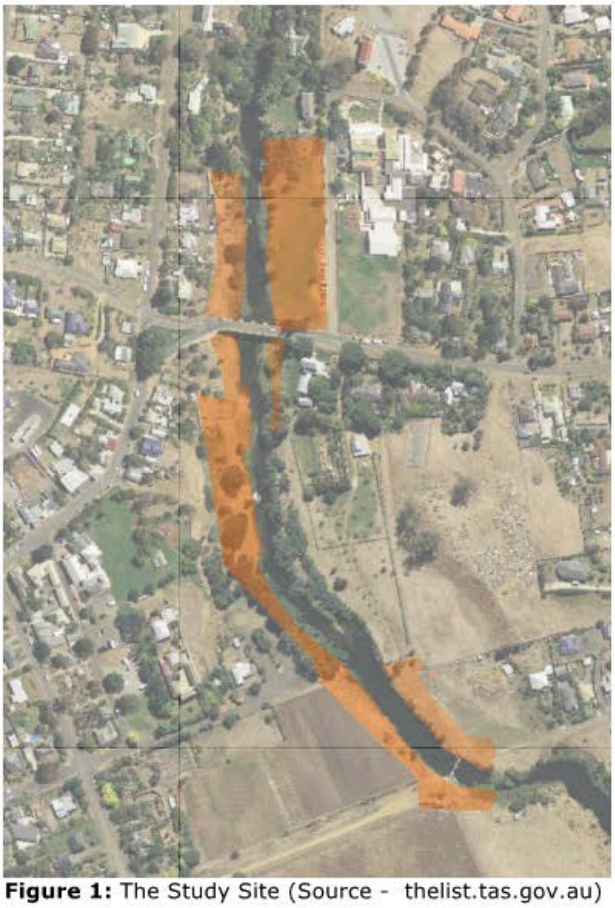

Figure 1: The Study Site (Source - thelist.tas.gov.au)

3 METHODOLOGY

3.1 Field Survey

3.1.1 The subject trees were inspected by Philip Jackson on the 19h January 2015. The comments and recommendations in this report are based on the findings from this site inspection. The trees were visually inspected from the ground. No aerial or climbing inspections, core testing, drilling; ultrasound diagnosis or excavations were undertaken.

3.1.2 The survey was generally limited to trees estimated to be 5 metres in height or greater. However trees less than 5m in height were included where such trees were potentially significant long-term landscape components or constituted a current prominent landscape feature.

3.1.3 Mono-specific copses of trees, especially those including numerous individuals derived from vegetative reproduction (i.e suckering), were assessed as group features. Where trees within these groups had features of particular note they were recorded as individuals.

3.1.4 Individually assessed trees and tree group features were attributed with unique identifying numbers. Tree numbers used in this report and appearing in column 1 of the tree assessment schedules (**Appendix 3 & 4**) correspond with the unique identifying numbers provided in the Tree Location Plans **(Appendix 5)** and the GIS data set **(Appendix 7)** compiled for the survey area.

3.1.5 Photographs of trees to be removed within group features were taken for further reference and are included in (**Appendix 6).**

3.1.6 Spatial data relating to tree locations was recorded on a Garmin eTrex handheld GPS unit and correlated with LISTmap orthorectified site aerial imagery.

3.1.7 Where sufficient identifying characteristics were present trees were identified to species level. Trees were assessed to determine their age class, structure and condition. Tree height class was estimated. Where groups trees were assessed, an estimate of the mean height class was made.

3.2 Field Survey and Reporting Limitations

3.2.1 Assessment exclusion zones applied to the following:

- The Coal River and its immediate banks.
- Inundated riverside land included in the Crown land parcel PID 3003450.

3.2.2 The accuracy of the GPS location unit used is variable depending on limiting conditions at the time of recording. For the purposed of this report the data recorded is assumed to be accurate to 5m. For most of the trees recorded, correlation with the orthorectified aerial imagery increases the

accuracy to within the diameter of the trunk. Where the precise GPS location of closely spaced trees to be removed in groups was unable to be established a photographic detail of the trees is presented in **Appendix 6** to allow positive identification of the subject trees to their unique identification number.

3.2.3 The Tree Location Plans presented are based on LISTmap orthorectified aerial imagery. It should be noted that these images may vary with regards to trees, buildings or structures that may be new or no longer exist due to the date the image was taken. It should also be noted that the Tree Location Plans are not survey accurate.

3.3 Health & Condition Assessment

3.3.1 The inspection method undertaken followed the principles of Visual Tree Assessment (VTA), an internationally recognised systematic method of identifying tree defects and hazard potential, described by Matheck & Breloer (1994). It is also complied with the Limited Visual Assessment: Level 1 process described by the International Society of Arboriculture Best Management Practices handbook *'Tree Risk Assessment"* (ISA, 2011). The biological and mechanical features of the trees were assessed for health, condition and *obvious* defects and an informed opinion of the hazard/failure potential of the trees was reached.

3.3.2 The trees were visually inspected from the ground for external signs of health or disease including; fungal fruiting bodies, insect infestation, epicormic shoots, extent of dieback, mechanical trunk damage and crown foliage condition and density.

3.3.3 The structural condition of the subject trees was assessed by observing the form and growth habit, as modified by their environment (aspect, exposure to prevailing winds, competing vegetation). It was also assessed by inspecting the state of the scaffold (i.e. trunk and major branches) including previous pruning, mechanical wounding, structural defects such as included bark, cavities, cracks, crooked trunk or weak trunk/branch junctions. Any evidence of previous branch failure was also noted. Any visual signs of defects, disturbance or mechanical damage to major woody roots, or within the root zone of the tree were also noted.

3.3.4 The health and structural condition of the tree were rated as follows:

	HEALTH & VIGOUR	STRUCTURAL CONDITION
G	**Good** health and vigour exhibiting no apparent or minor pest/disease, good extension growth, normal foliage size, colour & density.	**Good** structure - stable and free from, or with minor visible defects and damage. Appears stable with no visible evidence of instability
F	**Fair** health and vigour - may exhibit moderate (non-life threatening) pest/disease, fair extension growth, small foliage size,abnormal colouration, thin foliage cover	**Fair** structure - containing defects and/or damage that may me able to be remediated to provide an acceptable level of risk.
P	**Poor** health and vigour - exhibiting extensive or untreatable pest/disease, poor extension growth, significant deadwood and dieback, evidence of rapid decline, sparse foliage cover, abnormal foliage colour or size.	Evidence of instability or contains defects and/or damage which render the tree potentially **hazardous**/ prone to failure or cannot be successfully remediated.
D	Tree is dead	

3.4 Maturity Class

3.4.1 The maturity class of each tree has designated as follows:

OM	**Over Mature (Senescent)**	Greater than 80% of the life expectancy for the species. These trees are senescent, being in a state of gradual decline
M	**Mature**	50-80% of the life expectancy for the species
SM	**Semi-mature**	20-50% of the life expectancy for the species
S	**Sapling (Young or immature)**	less than 20% of the life expectancy for the species

3.5 Safe Useful Life Expectancy (SULE)

3.5.1 The remaining Safe Useful Life Expectancy of a tree (as developed and most recently described by Barrell, 2001) is an estimate of the sustainability of the tree in the landscape, based on an estimate of the average age of the species in its location, less its estimated current age. The life expectancy of the tree has been further modified where necessary in consideration of its current health, vigour and structural condition and suitability to the site. A detailed explanation of SULE is presented in **Appendix 1** and the estimated SULE of each tree is shown n in **Appendix 3.**

3.5.2 The following ranges have been allocated to each tree:-

- Greater than 40 years (**Long)**
- Between 15 and 40 years (**Medium)**
- Between 5 and 15 years (**Short**)
- Dead or immediately hazardous (**Remove**)

3.6 Tree Risk Evaluation

3.6.1 A hazard is a potential risk imposed by a tree or part of a tree which has a structural defect, when combined with the presence of a target, is likely to cause personal injury or property damage. A target may be people, property or other physical assets within the range of the tree. The range is the distance within which the defective tree or part can have a potential impact.

3.6.2 Using the tree risk evaluation method developed by Matheny & Clark (1994) an overall **Tree Risk Rating** was determined. This qualitative numerical risk assessment method is widely used in Australia and is recognised by the International Society of Arboriculture. This method is useful in prioritising required works as part of large-scale tree surveys.

The Tree Risk Rating relates to the tree part(s) most likely to fail and considers the addition of three factors:

1. The nature & severity of the defect & the likelihood of failure, considering site factors such as level of exposure; (Failure Potential).

2. Size of the defective part.

3. The relationship of the tree to existing targets and the type and intensity of usage; and the consequence of failure or extent of potential damage/ severity of harm (Target Rating)

3.6.3 Each factor is given a value from 1-4 and an aggregate rating value is given (max. 12). **A risk rating value of 9 or above is generally regarded as unacceptably high**. Although the Tree Risk Rating arrived at is useful in making a decision on the priority for removal or remediation of a particular tree, it is only a guide and should not be used in isolation of other relevant site and subject factors. This is evidenced by the fact that trees with the same hazard rating can be fundamentally different in character and hazard potential, given the use of three independent factors in the rating scheme as set out below. The *Failure Potential* rating factor below identifies the most likely failure and rates the likelihood of the defect failing ***within a given inspection period of 12 months***. A more detailed example of representative hazard rating parameters is presented in **Appendix 2.**

Table 1: Tree Risk Rating Parameters

Rating Factor	1	2	3	4
Failure Potential	Low	Medium	High	Severe
Size of Part To Fail (cm diameter)	<15	15-45	45-75	>75
Target Rating (use/occupancy)	Occasional	Intermittent	Frequent	Constant

Risk Rating = Failure Potential + Size Of Part + Target Rating

3.6.4 The higher the score (Risk Rating), the more significant the risk, greater potential for damage and the greater the consequence of failure. The aim of the risk rating system is to identify the level of risk and provide a basis for prioritizing treatment.

3.7 Tree Works Priority

3.7.1 A Works Priority rating has also been given for each tree to indicate the relative importance of the identified required works. The rating is shown in **Appendix 4**. The following ratings have been applied:

Table 2: Tree Works Priority

Hazard Rating Score	Works Priority	Description	
9-12	**High**	**Potentially Hazardous**	Remedial work should be undertaken as soon as practicable in order to avoid damage or injury.
6-8	**Moderate**	**Important**	The specified work is not critical, but should be undertaken as soon as practicable
1-5	**Low**	**Not Critical**	The specified work is considered important but not critical. The specified work should be carried out within a reasonable time frame to avoid future problems. This may include work that is desirable from a tree health perspective but essential or critical from a safety perspective.

4 OBSERVATIONS

5.1 Tree Population

115 trees were recorded within The Site comprising 21 different species. These species and their percentages of the tree population in the study area are presented in Table 3.

Table 3: Tree Species Distribution

Species	Number of Trees	% of Population
Acacia dealbata (silver wattle)	5	4
Acacia melanoxylon (blackwood)	28	25
Acacia sp. (wattle)	2	2
Acer negundo (box elder)	3	3
Betula pendula (silver birch)	1	1
Eucalyptus sp. (gum)	3	3
Eucalyptus tenuiramis (silver peppermint)	1	1
Eucalyptus viminalis (white gum)	9	8
Fraxinus angustifolia 'Raywood' (claret ash)	3	3
Malus sp. (crabapple)	1	1
Melaleuca armillaris (honey myrtle)	1	1
Photinia glabra (red leaf photinia)	1	1
Pinus radiata (radiata pine)	2	2
Populus alba (white poplar)	23	20
Populus nigra (lombardy poplar)	1	1
Prunus cerasifera (cherry plum)	1	1
Prunus dulcis (almond)	2	2
Quercus sp. (oak)	12	11
Salix babylonica (weeping willow)	1	1
Schinus molle (pepper tree)	3	3
Ulmus x hollandica (dutch elm)	12	11

- Numerous white poplars located within the group features numbered T23A & T94 were not recorded individually and do not form part of the above species distribution data.
- Due to rounding total percentages equal more than 100.

5.2 Tree Health

In general the trees displayed typical health across the tree population with 92% of the trees displaying Fair or better health, considered to be typical for the species growing in this environment under current conditions and following recent drought years. (refer to Table 4 below) .

Table 4: Tree Health

Health	Number of Trees	% of Population
Good	68	60
Fair	37	32
Poor	6	5
Dead	3	3

5.3 Tree Condition

In general the trees displayed typical structural condition across the tree population with 84% of the trees displaying Fair or better condition, considered to be typical for the species growing in this environment under current conditions. (refer to Table 5 below). Defects and deficiencies were observed as trees that had basal, trunk or limb decay associated with past limb failures or wounding, hollows or cavities, poor form from previous pruning and the presence of fungal fruiting bodies.

Table 5: Tree Condition

Condition	Number of Trees	% of Population
Good	68	60
Fair	27	24
Poor	16	14
Dead	3	3

Due to rounding total percentages equal more than 100.

5.4 Remaining Life Expectancy

The overall remaining life expectancy of the tree population is good with the greater majority of the trees expected to live between 15-40 years (table 6). The reasonably large percentage of trees with a long SULE is due to the contribution of the 12 newly planted oak trees. Those trees with a short remaining life expectancy are predominantly blackwoods. While all of the trees identified for removal are either silver poplar or silver wattle.

Table 6 SULE

SULE	Number of Trees	% of Population
Long: >40 years	23	20
Medium: 15-40 years	71	62
Short: 5-15 years.	7	6
Remove	13	11

Due to rounding total percentages equal less than 100.

5.5 Tree Works Priority

5.5.1 Currently eighty percent of the tree population has been assessed as requiring no works. The large number of trees not requiring work is

indicative of a predominantly healthy tree population with no over-mature or currently senescent trees.

5.5.2 All but three of the low priority works are for formative pruning of the newly planted oak trees. Although low priority in the context of hazard reduction, these works are still important for the maintenance and improvement of the long term structural condition and amenity value of these trees.

5.5.3 Nine of the moderate priority works relate to deadwood removal. The remaining seven moderate priority works are for the removal of trees with relatively low failure potential or are in low target areas.

5.5.4 The five high priority works are for the removal of large white poplars that have an unacceptably high hazard rating due to them having significant structural defects and being located in an area with a relatively high target rating.

5.5.4 Tree condition can change rapidly because of environmental and other influences. It is recommended that regular inspections be undertaken to identify changes to tree condition on or following local severe or damaging weather events.

Table 7: Tree Works Priority

Works Priority (hazard rating)	Number of Trees	% of Population
High (9-12)	5	4
Moderate (5-8)	16	14
Low (1-4)	13	11
No works Required	80	70

Due to rounding total percentages equal less than 100.

6 SPECIFIC MANAGEMENT ISSUES

6.1 Deadwood

6.1.1 A number of trees exhibit deadwood throughout the crown to varying extents. The formation of deadwood is likely to be a maintenance issue from time to time, particularly during extended dry periods and drought. It is difficult to mitigate this given the nature of the site, in particular the soil conditions and the tree locations (which limit the use of mulches or other ground cover that would otherwise improve moisture holding capacity). Removal of deadwood should be undertaken periodically to reduce hazards associated with falling deadwood, particularly overhanging high use areas, as specified in the schedule.

6.2 Replacement of Removed Trees

6.2.1 It is important to factor in the replacement of trees as part of the removal process undertaken within the study area otherwise the net result is an incremental loss of trees to the site. Clearly such incremental losses have a deleterious affect on the amenity of the site and should be avoided.

7 RECOMMENDATIONS FOR REMEDIAL TREATMENT

7.1 General

7.1.2 All pruning work (including deadwooding) should be carried out in accordance with Australian Standard No. 4373: *Pruning of Amenity Trees*. All pruning work should be carried out by a qualified and experienced arborist (Australian Qualification Framework Level 3 or above) or tree surgeon (minimum 5 years industry experience).

7.2 Deadwooding

7.2.1 Where deadwood exists that is significant in length or diameter and is located over high use areas (such as pathways, picnic benches, parking areas etc), this is identified in the schedule (**Appendix 4**). All completely dead branches of greater than 20mm in diameter should be pruned back to the branch junction in accordance with Natural Target Pruning Techniques described in AS 4373: *Pruning of Amenity Trees*.

7.3 Formative Pruning

7.3.1 Young trees often develop growth defects and other problems in the early stages of development that can lead to more significant problems at maturity. If corrected early through an appropriate level of monitoring and treatment, most growth defects can be removed to form structurally sound trees in the long term. Without remedial action, some growth defects can lead to hazards, leading to greater costs, higher risk and potential liabilities.

7.3.2 Formative pruning is the selective pruning of a young tree to promote good form and branching structure typical of the natural growth habit of the species. The main aim of formative pruning is to identify and remove any growth defects or other structural problems that may have long-term implications early in the development of the tree.

7.4.3 There are several types of growth defects that can lead to structural flaws at maturity. Structurally defective portions of the tree are more likely to fail under adverse weather conditions than normal sound growth. Most of the defects that can be corrected by formative pruning relate to the improper development of the trunk or branching structure. Such defects may include:

- Crossing and rubbing branches
- Co-dominant leading stems with included bark
- Dominant lateral branches
- Included bark at branch junctions

7.4.3 Young trees should be periodically checked for growth defects or atypical growth habit and corrected as soon as possible using formative pruning in accordance with Natural Target Pruning Techniques as specified in AS 4373. Trees requiring formative pruning have been identified in the schedule and Tree Works Plan.

7.5 Tree Removal

7.5.1 Trees T25, T27, T28, T30 & T37 are recommended for removal due to potential instability because of structural defects. These trees are all listed as high priority and should be removed as soon as possible.

7.5.2 Any tree removed should be replaced with an appropriate species in an appropriate area of the site.

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Attachment

APPENDIX 1- SULE CATEGORIES

SULE Category	Description
Long	Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.
1a	Structurally sound trees located in positions that can accommodate for future growth
1b	Trees that could be made suitable for retention in the long term by remedial tree care.
1c	Trees of special significance that would warrant extraordinary efforts to secure their long term retention.
Medium	Trees that appeared to be retainable at the time of assessment for 15-40 years with an acceptable level of risk.
2a	Trees that may only live for 15-40 years
2b	Trees that could live for more than 40 years but may be removed for safety or nuisance reasons
2c	Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide for new planting.
2d	Trees that could be made suitable for retention in the medium term by remedial tree care.
Short	Trees that appeared to be retainable at the time of assessment for 5-15 years with an acceptable level of risk.
3a	Trees that may only live for another 5-15 years
3b	Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
3c	Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide for a new planting.
3d	Trees that require substantial remedial tree care and are only suitable for retention in the short term.
Remove	Trees that should be removed within the next five years.
4a	Dead, dying, suppressed or declining trees.
4b	Dangerous trees because of instability or loss of adjacent trees
4c	Dangerous trees because of structural defects
4d	Damaged trees not safe to retain.
4e	Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide for a new planting.
4f	Trees that are damaging or may cause damage to existing structures within 5 years.
Small	Small or young trees that can be reliably moved or replaced.
5a	Small trees less than 5m in height.
5b	Young trees less than 15 years old but over 5m in height.

(after Barrel, 2001)

Attachment

APPENDIX 2: Tree Hazard Rating Table

Score	Failure potential	Size of part (diameter)	Target rating
1 (Low)	-Minor defects -Die back of twigs -Small wounds with good wound wood. -Small crossed branches	<100mm	Occasional use Jogging, Cycling trail, no persons stationary in area.
2 (Medium)	-Cavity covering 10-25% of the circumference of the trunk. -Codominant stems without included bark. Small fruiting bodies. -Long horizontal branches -Small epicormic growth (<6 metres in length).	100-450mm	Picnic area, day use parking,
3 (High)	-Cavity covering 30-50% of the circumference of the trunk. -Codominant stems with included bark. Included bark. -Large fruiting bodies. -Long horizontal branches with large canopy. -Dead canopy with leaves still attached. -Structural woody roots pruned.	450-750mm	Seasonal camping, storage facilities,
4 (Severe)	-Cavity covering >50% of the circumference of the trunk. -Codominant stems with included bark and crack. -Included bark with crack present. -Large fruiting bodies with bulge around area. -Long horizontal branches with large canopy bending down (Heavy reaction wood present). -Dead canopy with wood soft to push. -Structural woody roots pruned. -Ground heaving or cracked around base of tree. -Structural woody roots have evidence of decay.	>750mm	-Year round use for a number of hours each day. -Constant traffic through the day. -Seating or playground below canopy.

Adapted from:-
Matheny N.P. & Clark, J.R. (1994)

Attachment

APPENDIX 3 - TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE

Tree ID	Species	Height (m)	Maturity Class	Health	Condition	Remaining Safe Useful Lie Expectancy (SULE)
1	***Prunus cerasifera 'nigra'* (purple cherry plum)**	6-10m	Mature	Fair	Fair	2a-Medium:15-40 years
2	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Good	Fair	3a-Short:5-15 years
3	***Acacia dealbata* (silver wattle)**	0-5m	Mature	Good	Good	2a-Medium:15-40 years
4	***Acacia dealbata* (silver wattle)**	0-5m	Dead	Dead	Dead	4a-Dead, dying or declining: Remove
5	***Acacia dealbata* (silver wattle)**	6-10m	Dead	Dead	Dead	4a-Dead, dying or declining: Remove
6	***Acacia dealbata* (silver wattle)**	6-10m	Dead	Dead	Dead	4a-Dead, dying or declining: Remove
7	***Quercus* sp. (oak)**	0-5m	Sapling	Fair	Fair	1a-Long: >40 years
8	***Quercus* sp. (oak)**	0-5m	Sapling	Good	Good	1a-Long: >40 years
9	***Quercus* sp. (oak)**	0-5m	Sapling	Good	Good	1a-Long: >40 years
10	***Quercus* sp. (oak)**	0-5m	Sapling	Good	Good	1a-Long: >40 years
11	***Quercus* sp. (oak)**	0-5m	Sapling	Good	Good	1a-Long: >40 years
12	***Quercus* sp. (oak)**	0-5m	Sapling	Good	Good	1a-Long: >40 years
13	***Quercus* sp. (oak)**	0-5m	Sapling	Good	Good	1a-Long: >40 years
14	***Quercus* sp. (oak)**	0-5m	Sapling	Good	Good	1a-Long: >40 years
15	***Quercus* sp. (oak)**	0-5m	Sapling	Good	Good	1a-Long: >40 years
16	***Quercus* sp. (oak)**	0-5m	Sapling	Good	Good	1a-Long: >40 years
17	***Quercus* sp. (oak)**	0-5m	Sapling	Good	Good	1a-Long: >40 years
18	***Quercus* sp. (oak)**	0-5m	Sapling	Good	Good	1a-Long: >40 years
19	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
20	***Populus alba* (white poplar)**	6-10m	Sapling	Good	Good	2a-Medium:15-40 years
21	***Populus alba* (white poplar)**	6-10m	Sapling	Good	Good	2a-Medium:15-40 years
22	***Populus alba* (white poplar)**	16-20m	Mature	Good	Fair	2d-Medium: 15-40, minor works required.
23	***Populus alba* (white poplar)**	16-20m	Mature	Good	Fair	2d-Medium: 15-40, minor works required.

Attachment

Tree ID	Species	Height (m)	Maturity Class	Health	Condition	Remaining Safe Useful Life Expectancy (SULE)
24	***Populus alba* (white poplar)**	16-20m	Mature	Good	Good	2a-Medium:15-40 years
25	***Populus alba* (white poplar)**	16-20m	Mature	Good	Poor	4c-Dangerous / structural defect:Remove
26	***Populus alba* (white poplar)**	16-20m	Mature	Good	Poor	2a-Medium:15-40 years
27	***Populus alba* (white poplar)**	16-20m	Mature	Good	Poor	4c-Dangerous / structural defect:Remove
28	***Populus alba* (white poplar)**	16-20m	Mature	Fair	Poor	4c-Dangerous / structural defect:Remove
29	***Populus alba* (white poplar)**	16-20m	Mature	Fair	Poor	4c-Dangerous / structural defect:Remove
30	***Populus alba* (white poplar)**	16-20m	Mature	Good	Poor	4c-Dangerous / structural defect:Remove
31	***Populus alba* (white poplar)**	11-15m	Mature	Fair	Fair	2d-Medium: 15-40, minor works required.
32	***Populus alba* (white poplar)**	11-15m	Mature	Good	Fair	2d-Medium: 15-40, minor works required.
33	***Populus alba* (white poplar)**	11-15m	Mature	Good	Fair	2d-Medium: 15-40, minor works required.
34	***Populus alba* (white poplar)**	11-15m	Mature	Good	Fair	2d-Medium: 15-40, minor works required.
35	***Populus alba* (white poplar)**	11-15m	Mature	Fair	Fair	2d-Medium: 15-40, minor works required.
36	***Populus alba* (white poplar)**	11-15m	Mature	Fair	Poor	4c-Dangerous / structural defect:Remove
37	***Populus alba* (white poplar)**	16-20m	Mature	Fair	Poor	4c-Dangerous / structural defect:Remove
38	***Populus alba* (white poplar)**	16-20m	Mature	Fair	Poor	4c-Dangerous / structural defect:Remove
39	***Ulmus procera* (english elm)**	16-20m	Mature	Fair	Good	2d-Medium: 15-40, minor works required.
40	***Ulmus procera* (english elm)**	11-15m	Mature	Fair	Good	2a-Medium:15-40 years
41	***Ulmus procera* (english elm)**	21-25m	Mature	Fair	Good	2a-Medium:15-40 years
42	***Ulmus procera* (english elm)**	21-25m	Mature	Fair	Good	2a-Medium:15-40 years
43	***Ulmus procera* (english elm)**	16-20m	Mature	Fair	Good	2a-Medium:15-40 years
44	***Ulmus procera* (english elm)**	11-15m	Mature	Fair	Good	2a-Medium:15-40 years
45	***Ulmus procera* (english elm)**	11-15m	Mature	Fair	Good	2a-Medium:15-40 years
46	***Ulmus procera* (english elm)**	11-15m	Mature	Fair	Good	2a-Medium:15-40 years
47	***Ulmus procera* (english elm)**	16-20m	Mature	Fair	Good	2a-Medium:15-40 years
48	***Acacia melanoxylon* (blackwood)**	11-15m	Mature	Good	Good	2a-Medium:15-40 years
49	***Acacia melanoxylon*(blackwood)**	11-15m	Mature	Good	Fair	2a-Medium:15-40 years
50	***Acacia melanoxylon* (blackwood)**	11-15m	Mature	Good	Good	2a-Medium:15-40 years

Attachment

Tree ID	Species	Height (m)	Maturity Class	Health	Condition	Remaining Safe Useful Life Expectancy (SULE)
51	***Eucalyptus* sp. (gum)**	6-10m	Mature	Fair	Fair	2a-Medium:15-40 years
52	***Eucalyptus* sp. (gum)**	16-20m	Mature	Poor	Fair	3a-Short:5-15 years
53	***Pinus radiata* (radiata pine)**	21-25m	Mature	Good	Good	1a-Long: >40 years
54	***Ulmus procera* (english elm)**	6-10m	Sapling	Good	Good	1a-Long: >40 years
55	***Ulmus procera* (english elm)**	6-10m	Sapling	Good	Good	1a-Long: >40 years
56	***Fraxinus excelsior* (common ash)**	6-10m	Sapling	Good	Good	1a-Long: >40 years
57	***Acacia melanoxylon* (blackwood)**	11-15m	Mature	Fair	Good	2a-Medium:15-40 years
58	***Melaleuca armilaris (honey myrtle)***	0-5m	Mature	Fair	Fair	2a-Medium:15-40 years
59	***Eucalyptus tenuiramis* (silver peppermint)**	11-15m	Mature	Fair	Good	2a-Medium:15-40 years
60	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
61	***Schinus molle* (pepper tree)**	6-10m	Mature	Good	Fair	2a-Medium:15-40 years
62	***Ulmus procera* (english elm)**	21-25m	Mature	Good	Good	2a-Medium:15-40 years
63	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Good	Fair	2a-Medium:15-40 years
64	***Prunus dulcis* (almond tree)**	6-10m	Mature	Fair	Fair	2a-Medium:15-40 years
65	***Malus sp. (crabapple)***	6-10m	Mature	Fair	Fair	2a-Medium:15-40 years
66	***Fraxinus excelsior* (common ash)**	6-10m	Mature	Good	Fair	2a-Medium:15-40 years
67	***Fraxinus excelsior* (common ash)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
68	***Prunus dulcis* (almond tree)**	6-10m	Mature	Fair	Poor	2a-Medium:15-40 years
69	***Schinus molle* (pepper tree)**	11-15m	Mature	Good	Good	2a-Medium:15-40 years
70	***Acacia sp.* (wattle)**	6-10m	Mature	Fair	Fair	2a-Medium:15-40 years
71	***Acacia sp.* (wattle)**	6-10m	Mature	Fair	Fair	2a-Medium:15-40 years
72	***Photonia glabra (red leaf photinia)***	6-10m	Mature	Good	Good	2a-Medium:15-40 years
73	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
74	***Schinus molle* (pepper tree)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
75	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Good	Poor	4e- remove for better specimen
76	***Acacia melanoxylon* (blackwood)**	11-15m	Mature	Good	Good	2a-Medium:15-40 years
77	***Eucalyptus viminalis* (white gum)**	11-15m	Mature	Good	Good	2a-Medium:15-40 years

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Tree ID	Species	Height (m)	Maturity Class	Health	Condition	Remaining Safe Useful Life Expectancy (SULE)
78	***Acacia melanoxylon* (blackwood)**	11-15m	Mature	Good	Good	2a-Medium:15-40 years
79	***Pinus radiata* (radiata pine)**	16-20m	Mature	Good	Good	2a-Medium:15-40 years
80	***Eucalyptus viminalis* (white gum)**	11-15m	Mature	Good	Good	1a-Long: >40 years
81	***Acacia melanoxylon* (blackwood)**	11-15m	Mature	Good	Good	2a-Medium:15-40 years
82	***Acacia melanoxylon* (blackwood)**	11-15m	Mature	Good	Good	2a-Medium:15-40 years
83	***Eucalyptus viminalis* (white gum)**	11-15m	Mature	Good	Good	1a-Long: >40 years
84	***Eucalyptus viminalis* (white gum)**	11-15m	Mature	Good	Good	1a-Long: >40 years
85	***Populus nigra* 'italica' lombardy poplar**	16-20m	Mature	Good	Fair	2a-Medium:15-40 years
86	***Eucalyptus viminalis* (white gum)**	11-15m	Mature	Good	Good	1a-Long: >40 years
87	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
88	***Eucalyptus viminalis* (white gum)**	6-10m	Mature	Poor	Good	3a-Short:5-15 years
89	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
90	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Fair	Good	2a-Medium:15-40 years
91	***Eucalyptus viminalis* (white gum)**	6-10m	Mature	Fair	Good	2a-Medium:15-40 years
92	***Populus alba* (white poplar)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
93	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Poor	Poor	3a-Short:5-15 years
94	***Populus alba* (white poplar)**	11-15m	Mature	Fair	Fair	2a-Medium:15-40 years
95	***Populus alba* (white poplar)**	16-20m	Mature	Poor	Poor	3b-Short:5-15 but removed for safety/ nuisance
96	***Populus alba* (white poplar)**	6-10m	Mature	Poor	Poor	4c-Dangerous / structural defect:Remove
97	***Acer negundo* (box elder)**	0-5m	Mature	Good	Good	1a-Long: >40 years
98	***Acer negundo* (box elder)**	0-5m	Mature	Good	Good	1a-Long: >40 years
99	***Acer negundo* (box elder)**	0-5m	Mature	Good	Good	1a-Long: >40 years
100	***Eucalyptus viminalis* (white gum)**	6-10m	Mature	Fair	Good	2a-Medium:15-40 years
101	***Acacia melanoxylon* (blackwood)**	0-5m	Mature	Good	Good	2a-Medium:15-40 years
102	***Eucalyptus viminalis* (white gum)**	6-10m	Mature	Fair	Good	2a-Medium:15-40 years
103	***Eucalyptus* sp. (gum)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
104	***Acacia melanoxylon* (blackwood)**	0-5m	Mature	Poor	Poor	3b-Short:5-15 but removed for safety/ nuisance

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Tree ID	Species	Height (m)	Maturity Class	Health	Condition	Remaining Safe Useful Life Expectancy (SULE)
105	***Acacia melanoxylon* (blackwood)**	0-5m	Mature	Fair	Poor	3b-Short:5-15 but removed for safety/ nuisance
106	***Salix babylonica* (weeping willow)**	11-15m	Mature	Fair	Fair	2a-Medium:15-40 years
107	***Acacia dealbata* (silver wattle)**	0-5m	Sapling	Good	Good	2a-Medium:15-40 years
108	***Acacia melanoxylon* (blackwood)**	0-5m	Mature	Good	Good	2a-Medium:15-40 years
109	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
110	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Fair	Fair	2a-Medium:15-40 years
111	***Acacia melanoxylon* (blackwood)**	0-5m	Mature	Fair	Fair	2a-Medium:15-40 years
112	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Fair	Fair	2a-Medium:15-40 years
113	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
114	***Acacia melanoxylon* (blackwood)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years
115	***Betula pendula* (birch)**	6-10m	Mature	Good	Good	2a-Medium:15-40 years

APPENDIX 4 - TREE HAZARD ASSESSMENT & RECOMMENDATIONS SCHEDULE

Id. No.	Species	Hazard Rating				Defect	Works Priority	Works Required	Comments
		Size of defective part	Failure Potential	Target rating	Hazard Rating / 12				
1	*Prunus cerasifera 'nigra'* (purple cherry plum)	1	1	1	3	No visual defects	n/a	No works required	
2	*Acacia melanoxylon* (blackwood)	2	2	1	5	Stem wounds	n/a	No works required	
3	*Acacia dealbata* (silver wattle)	1	1	1	3	No visual defects	n/a	No works required	
4	*Acacia dealbata* (silver wattle)	4	1	1	6	No visual defects	M	Remove tree.	
5	*Acacia dealbata* (silver wattle)	4	1	1	6	No visual defects	M	Remove tree.	
6	*Acacia dealbata* (silver wattle)	4	1	1	6	No visual defects	M	Remove tree.	
7	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
8	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
9	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
10	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
11	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
12	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
13	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
14	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
15	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
16	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
17	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
18	*Quercus* sp. (oak)	1	1	1	3	No visual defects	L	Formative prune	
19	*Acacia melanoxylon* (blackwood)	1	1	1	3	No visual defects	n/a	No works required	
20	*Populus alba* (white poplar)	1	1	2	4	No visual defects	n/a	No works required	Copse of three
21	*Populus alba* (white poplar)	1	1	2	4	No visual defects	n/a	No works required	Copse of three
22	*Populus alba* (white poplar)	3	2	2	7	Included codominant stems	n/a	No works required	
23	*Populus alba* (white poplar)	2	2	3	7	Dead wood <50mm	M	Remove large diameter dead wood	Reduce end weight of branches over path
24	*Populus alba* (white poplar)	1	1	3	5	Dead wood <50mm	L	Remove minor dead wood	
25	*Populus alba* (white poplar)	4	3	3	10	Basal decay	H	Remove tree.	
26	*Populus alba* (white poplar)	2	2	3	7	Basal decay	n/a	No works required	Monitor decay
27	*Populus alba* (white poplar)	4	3	3	10	Basal decay	H	Remove tree.	
28	*Populus alba* (white poplar)	4	3	3	10	Basal decay	H	Remove tree.	Leaning tree
29	*Populus alba* (white poplar)	3	2	3	8	Basal decay	M	Remove tree.	
30	*Populus alba* (white poplar)	3	3	3	9	Basal decay	H	Remove tree.	Leaning over path

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31	***Populus alba* (white poplar)**	3	1	3	**7**	Pronounced lean	**M**	Remove large diameter dead wood	Leaning over path
32	***Populus alba* (white poplar)**	2	2	3	**7**	Multiple attached stems	**n/a**	No works required	
33	***Populus alba* (white poplar)**	2	2	3	**7**	Multiple attached stems	**n/a**	No works required	
34	***Populus alba* (white poplar)**	2	2	3	**7**	Multiple attached stems	**n/a**	No works required	
35	***Populus alba* (white poplar)**	2	1	3	**6**	Dead wood <50mm	**M**	Remove minor dead wood	Copse of trees
36	***Populus alba* (white poplar)**	3	2	3	**8**	Basal decay	**M**	Remove tree.	Leaning over path
37	***Populus alba* (white poplar)**	3	3	3	**9**	Fruiting body (large)	**H**	Remove tree.	
38	***Populus alba* (white poplar)**	3	2	3	**8**	Basal decay	**M**	Remove tree.	
39	***Ulmus procera* (english elm)**	3	1	3	**7**	Dead wood >50mm	**M**	Remove large diameter dead wood	
40	***Ulmus procera* (english elm)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
41	***Ulmus procera* (english elm)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
42	***Ulmus procera* (english elm)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
43	***Ulmus procera* (english elm)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
44	***Ulmus procera* (english elm)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
45	***Ulmus procera* (english elm)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
46	***Ulmus procera* (english elm)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
47	***Ulmus procera* (english elm)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
48	***Acacia melanoxylon* (blackwood)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
49	***Acacia melanoxylon*(blackwood)**	2	1	3	**6**	Included codominant stems	**n/a**	No works required	
50	***Acacia melanoxylon* (blackwood)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
51	***Eucalyptus* sp. (gum)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
52	***Eucalyptus* sp. (gum)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
53	***Pinus radiata* (radiata pine)**	3	1	3	**7**	Dead wood >50mm	**M**	Remove large diameter dead wood	
54	***Ulmus procera* (english elm)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
55	***Ulmus procera* (english elm)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
56	***Fraxinus excelsior* (common ash)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
57	***Acacia melanoxylon* (blackwood)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
58	***Melaleuca armilaris (honey myrtle)***	1	1	3	**5**	No visual defects	**n/a**	No works required	
59	***Eucalyptus tenuiramis* (silver peppermint)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
60	***Acacia melanoxylon* (blackwood)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
61	***Schinus molle* (pepper tree)**	2	1	3	**6**	Dead wood >50mm	**M**	Remove large diameter dead wood	
62	***Ulmus procera* (english elm)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
63	***Acacia melanoxylon* (blackwood)**	1	1	3	**5**	Stem wounds	**n/a**	No works required	
64	***Prunus dulcis* (almond tree)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
65	***Malus sp. (crabapple)***	2	1	3	**6**	No visual defects	**n/a**	No works required	
66	***Fraxinus excelsior* (common ash)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
67	***Fraxinus excelsior* (common ash)**	1	1	3	**5**	No visual defects	**n/a**	No works required	

Attachment

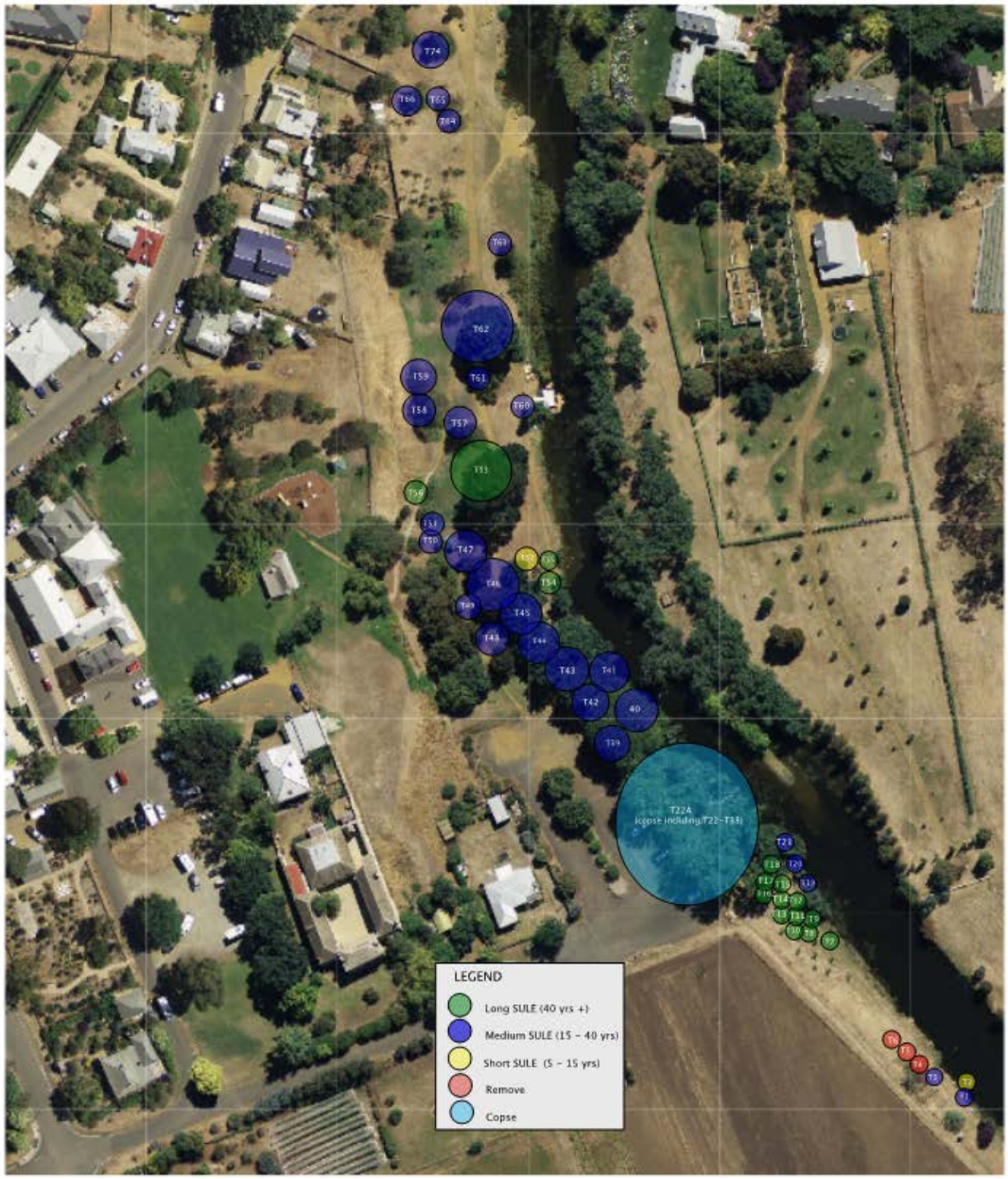
68	***Prunus dulcis* (almond tree)**	3	1	3	**7**	Dead wood >50mm	**M**	Remove large diameter dead wood	
69	***Schinus molle* (pepper tree)**	3	1	3	**7**	Dead wood <50mm	**M**	Remove minor dead wood	
70	***Acacia sp.* (wattle)**	2	1	4	**7**	No visual defects	**n/a**	No works required	
71	***Acacia sp.* (wattle)**	2	1	4	**7**	No visual defects	**n/a**	No works required	
72	***Photonia glabra (red leaf photinia)***	1	1	4	**6**	No visual defects	**n/a**	No works required	
73	***Acacia melanoxylon* (blackwood)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
74	***Schinus molle* (pepper tree)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
75	***Acacia melanoxylon* (blackwood)**	1	1	3	**5**	Stem wounds	**L**	Remove tree.	
76	***Acacia melanoxylon* (blackwood)**	1	1	1	**3**	No visual defects	**n/a**	No works required	
77	***Eucalyptus viminalis* (white gum)**	2	1	1	**4**	No visual defects	**n/a**	No works required	
78	***Acacia melanoxylon* (blackwood)**	1	1	1	**3**	No visual defects	**n/a**	No works required	
79	***Pinus radiata* (radiata pine)**	2	1	1	**4**	Dead wood >50mm	**L**	Remove large diameter dead wood	
80	***Eucalyptus viminalis* (white gum)**	1	1	1	**3**	No visual defects	**n/a**	No works required	
81	***Acacia melanoxylon* (blackwood)**	1	1	1	**3**	No visual defects	**n/a**	No works required	
82	***Acacia melanoxylon* (blackwood)**	1	1	1	**3**	No visual defects	**n/a**	No works required	
83	***Eucalyptus viminalis* (white gum)**	1	1	1	**3**	No visual defects	**n/a**	No works required	
84	***Eucalyptus viminalis* (white gum)**	1	1	1	**3**	No visual defects	**n/a**	No works required	
85	***Populus nigra* 'italica' lombardy poplar**	2	1	3	**6**	No visual defects	**n/a**	No works required	Copse
86	***Eucalyptus viminalis* (white gum)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
87	***Acacia melanoxylon* (blackwood)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
88	***Eucalyptus viminalis* (white gum)**	2	1	3	**6**	Foliar pest	**n/a**	No works required	
89	***Acacia melanoxylon* (blackwood)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
90	***Acacia melanoxylon* (blackwood)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
91	***Eucalyptus viminalis* (white gum)**	2	1	3	**6**	No visual defects	**n/a**	No works required	
92	***Populus alba* (white poplar)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
93	***Acacia melanoxylon* (blackwood)**	3	2	1	**6**	Stem decay	**n/a**	No works required	
94	***Populus alba* (white poplar)**	2	2	2	**6**	No visual defects	**n/a**	No works required	Copse
95	***Populus alba* (white poplar)**	4	1	3	**8**	Crown dieback	**M**	Remove large diameter dead wood	
96	***Populus alba* (white poplar)**	3	2	3	**8**	Stem wounds	**M**	Remove tree.	
97	***Acer negundo* (box elder)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
98	***Acer negundo* (box elder)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
99	***Acer negundo* (box elder)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
100	***Eucalyptus viminalis* (white gum)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
101	***Acacia melanoxylon* (blackwood)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
102	***Eucalyptus viminalis* (white gum)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
103	***Eucalyptus* sp. (gum)**	1	1	3	**5**	No visual defects	**n/a**	No works required	
104	***Acacia melanoxylon* (blackwood)**	3	2	3	**8**	Stem wounds	**n/a**	No works required	
105	***Acacia melanoxylon* (blackwood)**	3	2	3	**8**	Stem wounds	**n/a**	No works required	

Attachment

106	***Salix babylonica* (weeping willow)**	3	2	2	**7**	Stem wounds on upper branches	**n/a**	No works required	
107	***Acacia dealbata* (silver wattle)**	1	2	1	**4**	No visual defects	**n/a**	No works required	Copse
108	***Acacia melanoxylon* (blackwood)**	1	1	1	**3**	No visual defects	**n/a**	No works required	
109	***Acacia melanoxylon* (blackwood)**	1	1	1	**3**	No visual defects	**n/a**	No works required	
110	***Acacia melanoxylon* (blackwood)**	1	1	1	**3**	Stem wounds	**n/a**	No works required	
111	***Acacia melanoxylon* (blackwood)**	1	1	1	**3**	Stem wounds	**n/a**	No works required	
112	***Acacia melanoxylon* (blackwood)**	1	1	1	**3**	Stem wounds	**n/a**	No works required	
113	***Acacia melanoxylon* (blackwood)**	1	1	1	**3**	No visual defects	**n/a**	No works required	
114	***Acacia melanoxylon* (blackwood)**	1	1	1	**3**	No visual defects	**n/a**	No works required	
115	***Betula pendula* (birch)**	1	1	1	**3**	No visual defects	**n/a**	No works required	

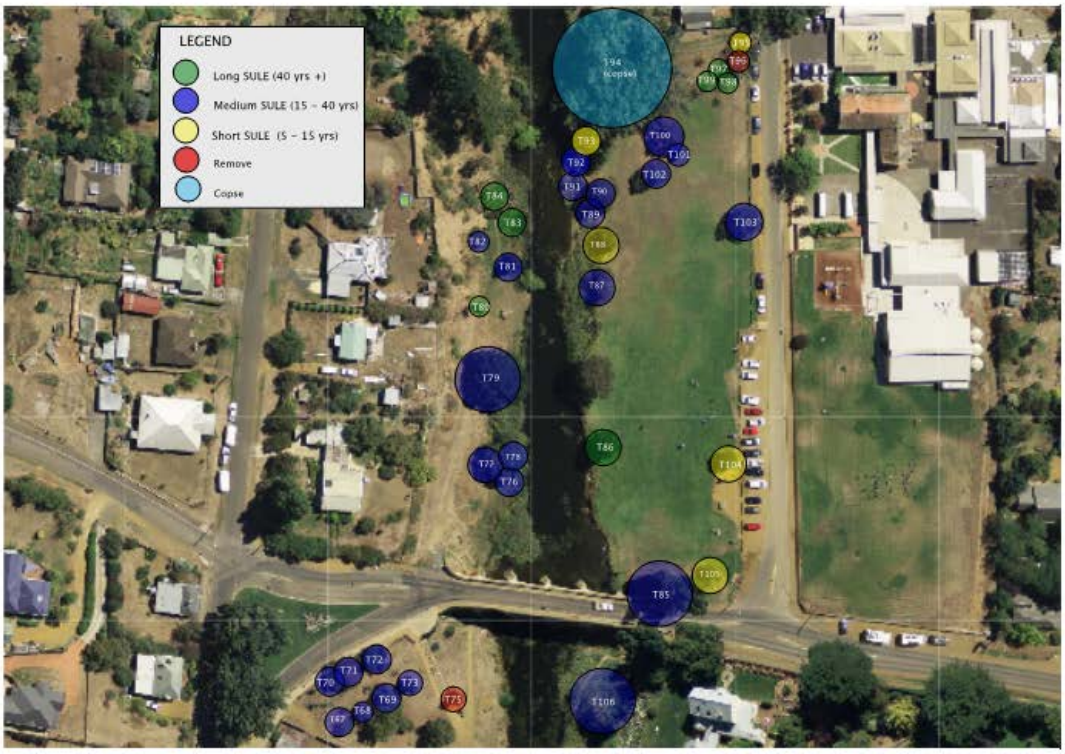
APPENDIX 5: TREE LOCATION PLANS SHOWING SAFE USEFUL LIFE EXPECTANCY (SULE)

PLAN A: Trees T1-T74



Attachment

Plan B: Trees T67- T106



Attachment

Plan C: T107-115

Attachment

APPENDIX 6: PHOTOGRAPHS OF TREES TO BE REMOVED WITHIN COPSE GROUP FEATURES

Photo 1: Trees T22-T28 within group T22A. Trees numbered in red are to be removed

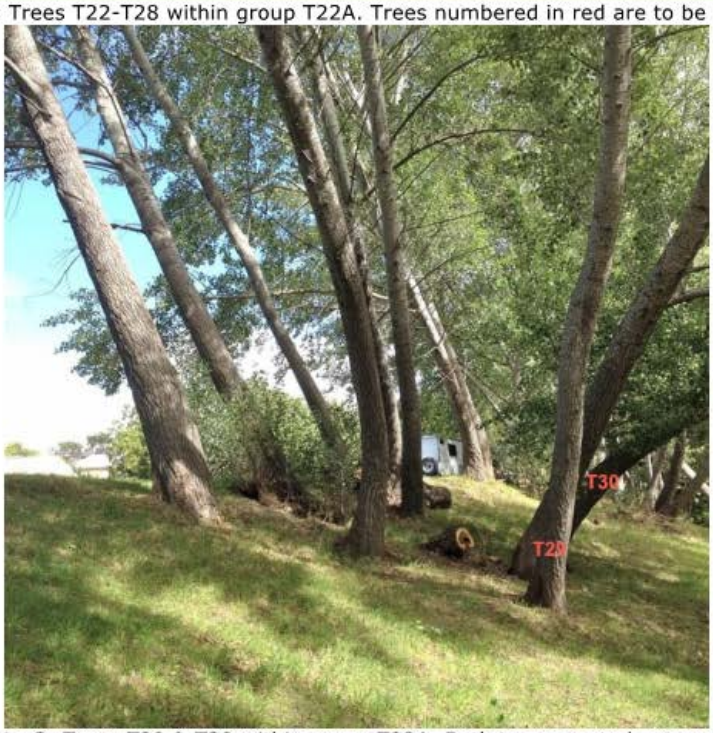


Photo 2: Trees T29 & T30 within group T22A. Both trees are to be removed

Attachment

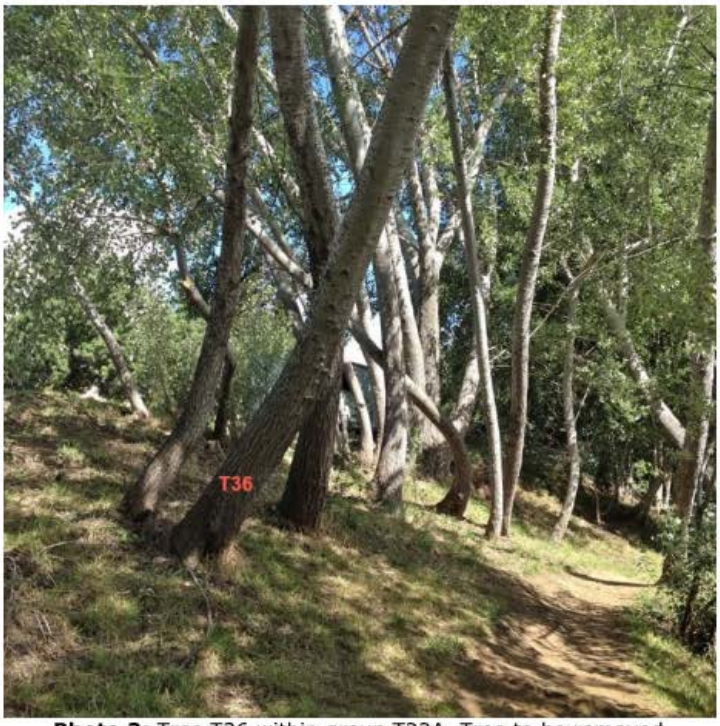


Photo 3: Tree T36 within group T22A. Tree to be removed

Photo 4: Tree T37 within group T22A. Tree to be removed

Attachment

Photo 5: Tree T38 within group T22A. Tree to be removed

Attachment

APPENDIX 7: TREE GPS LOCATION DATA

ID No.	Northing	Easting
T1	5268297	536147
T2	5268299	536148
T3	5268327	536102
T4	5268305	536135
T5	5268308	536132
T6	5268311	536130
T7	5268341	536107
T8	5268343	536101
T9	5268347	536102
T10	5268345	536097
T11	5268348	536097
T12	5268352	536098
T13	5268349	536093
T14	5268353	536093
T15	5268358	536094
T16	5268355	536088
T17	5268359	536088
T18	5268364	536090
T19	5268361	536099
T20	5268365	536096
T21	5268372	536093
T22	5268370	536083
T23	5268380	536058
T24	5268957	535662
T25	5268378	536061
T26	5268560	535878
T27	5268376	536060
T28	5268382	536061
T29	5268382	536063
T30	5268382	536065
T31	5268524	535878
T32	5268524	535878
T33	5268524	535878
T34	5268524	535878
T35	5268395	536054
T36	5268391	536054
T37	5268402	536049
T38	5268402	536048
T39	5268408	536042
T40	5268452	536033
T41	5268463	536086
T42	5268433	536018
T43	5268441	536014
T44	5268441	536012
T45	5268448	536012
T46	5268455	536011
T47	5268458	536010
T48	5268433	536006
T49	5268450	536002
T50	5268459	535999

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T51	5268466	535994
T52	5268559	536016
T53	5268483	536005
T54	5268451	536024
T55	5268456	536023
T56	5268475	535983
T57	5268498	535997
T58	5268500	535985
T59	5268507	535985
T60	5268504	536014
T61	5268510	536002
T62	5268527	536003
T63	5268550	536008
T64	5268587	535994
T65	5268593	535991
T66	5268594	535981
T67	5268611	535964
T68	5268615	535968
T69	5268617	535975
T70	5268624	535960
T71	5268627	535963
T72	5268630	535971
T73	5268623	535981
T74	5268610	535990
T75	5268620	535993
T76	5268681	536007
T77	5268685	536006
T78	5268690	536008
T79	5268707	536006
T80	5268726	536000
T81	5268739	536010
T82	5268746	536001
T83	5268750	536013
T84	5268756	536007
T85	5268649	536053
T86	5268689	536035
T87	5268718	536027
T88	5268731	536035
T89	5268735	536035
T90	5268745	536035
T91	5268758	536035
T92	5268769	536035
T93	5268772	536032
T94	5268790	536038
T95	5268801	536077
T96	5268796	536070
T97	5268794	536062
T98	5268783	536067
T99	5268786	536062
T100	5268772	536052
T101	5268769	536056
T102	5268763	536049
T103	5268749	536073
T104	5268684	536068

Attachment

T105	5268652	536064
T106	5268618	536035
T107	5268363	536131
T108	5268343	536146
T109	5268338	536148
T110	5268330	536152
T111	5268327	536157
T112	5268324	536161
T113	5268318	536164
T114	5268312	536171
T115	5268297	536183

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