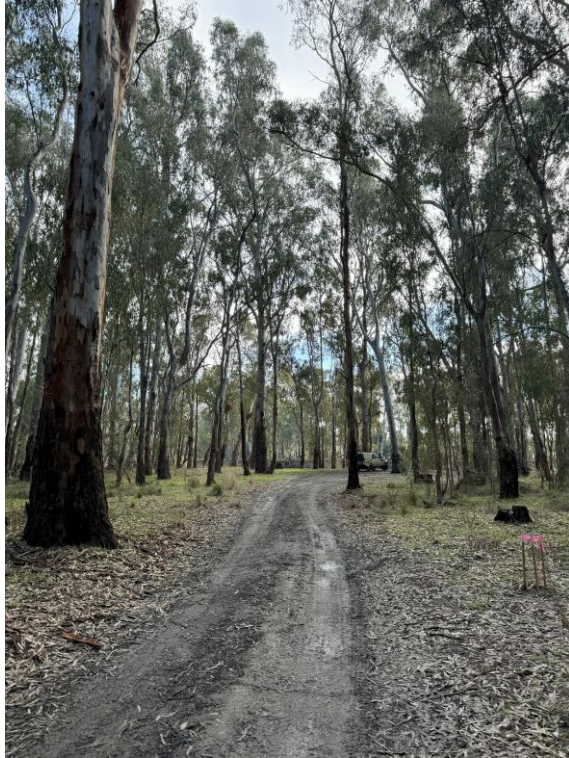




**OLDMEADOW**  
**ARBORICULTURE**  
TREE CARE SPECIALISTS



Murray River Adventure Trail  
Arboricultural impact assessment report

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## 1 Introduction

### 1.1 Purpose

Oldmeadow Arboriculture has been engaged to undertake an objective assessment of the likely impact to adjacent trees from the proposed construction of the Murray River Adventure Trail, as well as provide general comments on potential impacts from eight (8) campground/facilities site upgrades, and two (2) river crossings.

### 1.2 Scope

- Review likely impacts to native trees from the construction proposal for the Murray River Adventure Trail as a general assessment in accordance with assessing impacts to native vegetation where a long and linear action is proposed through an area with lots of trees as per page 3 Native Vegetation Regulations Newsletter Dated November 2019.
- Undertake an assessment of the eight (8) proposed campground/facilities upgrade areas, as well as two (2) bridge sites, and provide recommendations to minimise impacts to native trees.
  - Individual tree data will not be collected for trees within the campgrounds. A general assessment only will be undertaken with consideration of the provided construction documentation.

### 1.3 Method

- A site visit was undertaken by Rhys Oldmeadow on 13-14 July 2024. Much of the Murray River Adventure Trail was driven in a vehicle, all eight (8) campground/ facilities site upgrade areas as well as the two (2) river crossing sites were visited as well as several sections of unmade trail.

#### Documents viewed for the preparation of this report

- Murray river adventure trail section 8 Barmah lakes - kayak launch design. Concept design. Drawing No. – JJR-4211023D-8-ST001. Issue – A. Dated – 29.02.2024. Drafted by – R. Abbasi. JJ Ryan Consulting Pty Ltd.
- Murray river adventure trail section 10 Braund Bend – Stepped Canoe Launch. Concept design. Drawing No. – JJR-4211023D-10-ST001. Issue – A. Dated – 11.03.2024. Drafted by – S. EJLAI. JJ Ryan Consulting Pty Ltd.
- Broken River Bend. Concept Design. Drawing No. – LD-MRAT-04. Rev. – A. Dated – 22/02/2024. Drafted by – NK. McGregor Coxall.
- Murray river adventure trail section 09 Kiln Bend – Stepped Canoe Launch. Concept design. Drawing No. – JJR-4211023D-9-ST001. Issue – A. Dated – 11.03.2024. Drafted by – S. EJLAI. JJ Ryan Consulting Pty Ltd.
- Kiln Bend. Concept Design. Drawing No. – LD-MRAT-12. Rev. – A. Dated – 22/02/2024. Drafted by – NK. McGregor Coxall.
- Master's Landing. Concept Design. Drawing No. – LD-MRAT-05. Rev. – A. Dated – 22/02/2024. Drafted by – NK. McGregor Coxall.
- Murray river adventure trail section 11 Masters Landing – Kayak Launch. Concept design. Drawing No. – JJR-4211023D-11-ST001. Issue – A. Dated – 06.03.2024. Drafted by – R. ABBASI. S. EJLALI. JJ Ryan Consulting Pty Ltd.
- Nursery Bend. Concept Design. Drawing No. – LD-MRAT-03. Rev. – A. Dated – 22/02/2024. Drafted by – NK. McGregor Coxall.
- Murray river adventure trail section 11 Nursery Bend – Stepped Canoe Launch. Concept design. Drawing No. – JJR-4211023D-11-ST001. Issue – B. Dated – 06.03.2024. Drafted by – R. ABBASI. S. EJLALI. JJ Ryan Consulting Pty Ltd.
- The Gulf. Concept Design. Drawing No. – LD-MRAT-15. Rev. – A. Dated – 22/02/2024. Drafted by – NK. McGregor Coxall.
- Yarran Creek. Concept Design. Drawing No. – LD-MRAT-02. Rev. – A. Dated – 22/02/2024. Drafted by – NK. McGregor Coxall.
- Murray river adventure trail section 09 Deep Creek Bridge – Bridge design. Drawing No. – JJR-4211023D-9-BR001. Issue – A. Dated – 03.05.2022. Drafted by – R. ABBASI. JJ Ryan Consulting Pty Ltd.

### 1.4 Limitations

- No individual tree data was collected
- Impacts were assessed based on the proposed construction cross section details, taking into consideration the methodology, existing site impacts as well as vegetation type, health and condition.



## 2 Observations

### 2.1 Proposed campground/ facilities site upgrade areas

#### Yarran Creek

Yarran Creek campground is located next to an existing bridge as well as a concrete boat ramp. The area is already compacted from vehicle traffic. There are several large, mature river red gums within the area, all in fair-good health. The largest tree in the area has an estimated DBH of around 120cm and is located adjacent to the existing boat ramp.

The proposed trailer parking area is quite close to a single tree which is already in fair-poor condition. However, given the already compacted nature of the campground, there is no expected reduction in health or useful life expectancy of this tree. Providing a mulched circle around trees which are close to parking areas will potentially mitigate some of the additional compaction possible with establishing parking.

Some tree removal may be required to facilitate the new vehicle entrance.

The proposed toilet facility appears well removed from larger trees which would be more susceptible to root disturbance.

Proposed campgrounds are situated in areas already utilised for camping. Delineating camping areas will possibly reduce impacts on adjacent trees as it may reduce access for vehicles to designated areas only.



*Plate 1: Panorama of Yarran Campground; bridge to the left of image, proposed trailer parking in the foreground.*

#### Nursery Bend

Nursery Bend comprises a much denser tree canopy cover compared to Yarran Creek, with a gentler slope into the river.

The proposed toilet facility and turn around area is located in a small natural clearing and should have limited impact on adjacent trees.

The proposed camping areas are again located in areas which are already heavily utilised for camping with existing compaction.



*Plate 2: Panorama of Nursery Bend; proposed turn around and toilet facility to the left of image.*



The location for the stepped canoe launch will need to be carefully considered as it will likely require excavation into the bank. However, there should be ample space between some of the larger trees with the possible removal of some small self-seeded trees.



*Plate 3: Stepped canoe launch could be situated where these fallen logs are.*

### **Broken River**

The track leading into Broken River was very boggy in places with evidence of vehicle use off track to avoid the worst sections. The likely entrance into the campground passes beneath a low, leaning tree.

The fallen tree noted on the plans has already been cut up by campers and will likely be used for firewood in the short-mid term.



*Plate 5: Boggy track leading to Broken River.*



*Plate 4: Low leaning tree at entrance.*



There is sufficient space between smaller trees to locate the stepped canoe launch without detrimental impacts to trees.

There is also ample space in a natural clearing to facilitate the vehicle turn around and toilet without impacting trees.

The site is heavily compacted from current camping use, and delineating camping areas may well reduce impacts to surrounding trees.

### **Masters Landing**

Masters Landing is already a well-established campground with existing toilet facilities and a service road loop. Camping areas are already utilised and well compacted. Delineating camp sites will have no further impact on adjacent trees.

The location of the kayak launch was not clear, however there is sufficient space between large trees to minimise impact and ensure no long-term effect on tree health or useful life expectancy.



*Plate 6: Entrance to Masters Landing.*



### Mullers Creek crossing

No designs have been seen for this site, however, it is currently proposed to be a culvert crossing. The banks on either side of Mullers Creek are steep and densely vegetated with river red gums.

Any proposal will need to consider; access with heavy machinery to place culverts, fill material around the culverts, or possible screw piles and above grade track construction.

Excavation should be avoided, especially within the tree protection zone (TPZ) or structural root zone (SRZ) of retained trees.



*Plate 7: Proposed location for Mullers Creek crossing.*

### Braund Bend

The only works proposed at Braund Bend is construction of a stepped canoe launch.

There is ample space between large trees to achieve this without a detrimental impact to tree health or useful life expectancy.



*Plate 8: Braund Bend river access*



### Kiln Bend

The track in to Kiln Bend was very rough and very muddy. Due to this there were dozens of alternate routes and it was difficult to determine which was the primary route. Improving the access track will significantly reduce compaction from vehicles attempting to find alternative routes in.

The campground itself was heavily compacted and appeared to have been impacted by storm events with evidence of many broken limbs and branches in the surrounding trees. Tree health and condition was reduced compared to the previous campgrounds, with a higher percentage of deadwood present in the tree canopies.

The proposed location of the stepped canoe launch appears to be quite close to a large, veteran river red gum with a history of branch and limb failures and multiple habitat hollows. Ensuring that canoe launch is outside of the TPZ will reduce impacts to this tree and may prevent failures from impacting the canoe launch.

Given the compacted condition of this camping area, there are no further impacts to trees expected from the construction of camping and parking areas. Provided that the location of the toilet is outside TPZs and SRZs of large trees to be retained, there will be no further impacts.

The condition of the trees may necessitate pruning be undertaken to reduce the likelihood of failure over higher use areas such as parking, and campsites. All pruning should be undertaken by an AQF 3 qualified arborist and in accordance with natural target pruning as per AS4373 *Pruning amenity trees*, unless internodal pruning allows the retention of habitat hollows.



Plate 10: Kiln Bend compacted campground.



Plate 9: Kiln Bend poor track in and evidence of storm damage to trees.

### Deep Creek bridge site

Deep Creek is densely vegetated on the northern bank, with much sparser vegetation on the southern bank.

The crossing is deep and very wide and will require a substantial bridge to be constructed. Early construction drawings depict substantial concrete footings ~3mx3m by 600mm high, to be excavated into the bank. A further large concrete anchor footing is also required on each end. Given the substantially more vegetated northern bank, some losses are expected, and some trees may require removal to facilitate the construction footprint.

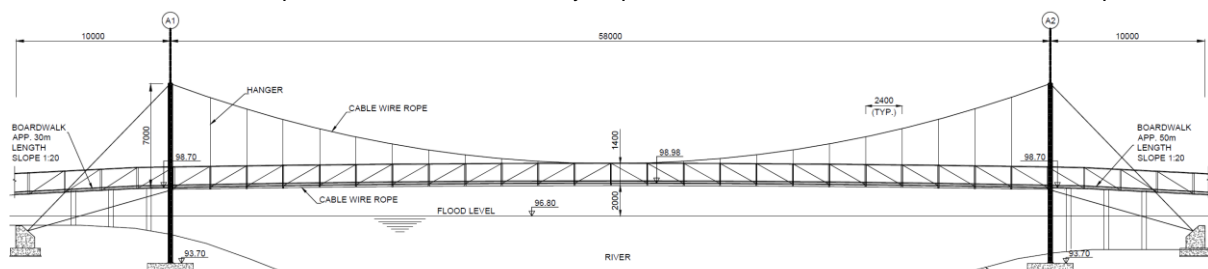


Plate 11: Murray River adventure trail section 09 Deep Creek Bridge – Bridge design. Drawing No. – JJR-4211023D-9-BR001. Issue – A. Dated – 03.05.2022. Drafted by – R. ABBASI. JJ Ryan Consulting Pty Ltd.





*Plate 13: Deep Creek - Looking south.*



*Plate 12: Same location as plate 12 - looking north*

### **Barmah Lakes**

Barmah Lakes is a well-established day visiting area with toilet facilities and undercover tables.

The only proposed works at this location is construction of a canoe launch.

Preliminary designs indicate pile driven piers, which, provided they are outside structural root zones, should not adversely impact the health or useful life expectancy of retained trees.



*Plate 14: Possible proposed location of canoe launch, centrally located between trees.*



### The Gulf camping area

The Gulf camping area is well established with camping to the west of the site, and a day visitor area to the east and adjacent the river.

There is also an established boat ramp to the southeast of the site, close to the sacred Yorta Yorta tree.

The proposed toilet facility should be located outside of the tree protection zone of the large river red gum adjacent. Some impacts to trees are anticipated, mostly small patch trees, given the density of surrounding trees.



*Plate 15: Panorama of the Gulf site, with camping to the right of image, and day visitor area to the left.*



*Plate 16: Possible toilet facility location, with large veteran tree behind.*

One tree is proposed for removal to better align the parking bays.

Given the existing compaction of most of the site, no further detrimental impacts to tree health or useful life expectancy are anticipated from the campground upgrade.



### 3 Discussion

#### 3.1 Encroachment/ impacts on trees

Works such as site cut and fill, re-grading, trenching, installation of underground services, building footings, landscaping or reducing the rain catchment within Tree Protection Zones (TPZ) are considered as encroachment. These activities may damage trees; this may be via direct (physical wounding) or indirect (soil alteration) impacts. Encroachment may result in wounds, decay, increased deadwood, thinning foliage, decreased health, instability, failures and death.

Likely impacts are assessed based on the degree of encroachment, the type of proposed works, the tree, and surrounding conditions.

#### 3.2 Typical construction (new trail – not on existing tracks)

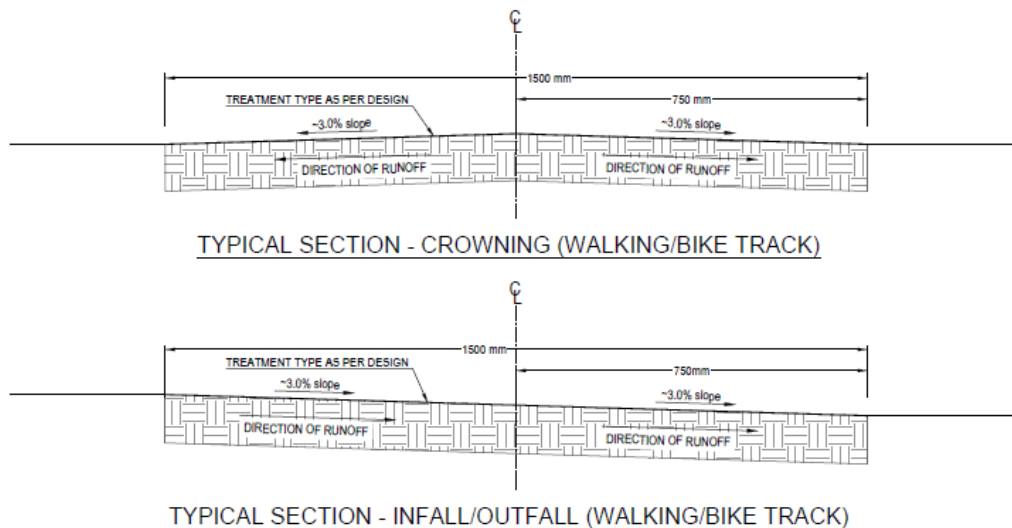
The following construction methods have been provided by Parks Victoria to Oldmeadow Arboriculture (T. McBean, personal communication, July 15 2024).

*Excavate maximum 100mm below current surface level along alignment (This can be reduced to as low as excavate 50mm in areas of good subgrade)*

*Place and compact 150mm of 20mm imported crushed rock (This can be reduced to as low as 75mm in areas of good subgrade)*

*Excavated material to be utilised with construction footprint*

*This will mean the track will sit slightly higher than the surround[ing] area to maintain drainage in one of the below ways.*

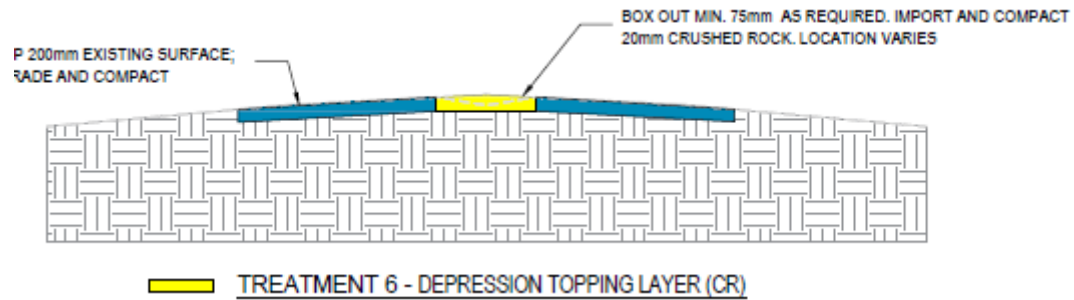


*There are only a few areas where cross track drainage will occur and these will be done with culverts passing underneath the track following the fall of the land with minimal additional excavation required 200-300mm depth.*

*Our most impactful works relate to the rectification of soft spots or repairs of rutting along these sections. Where removal / ripping and recompacting of unsuitable ground would go to a depth of 200mm below existing surface.*

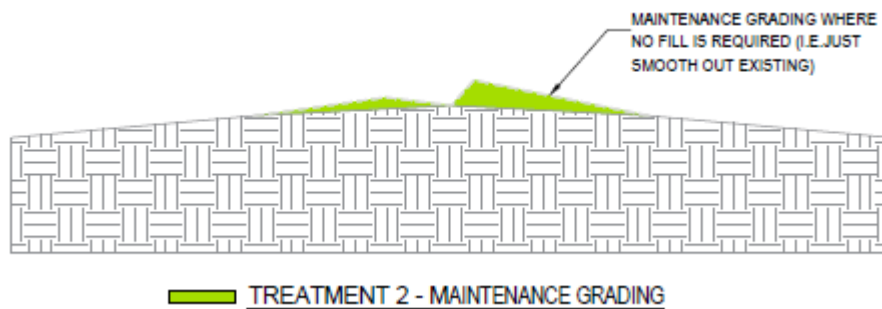
*Then crushed rock would be placed on top.*

*These areas are localised to areas of poor / damaged subgrade.*

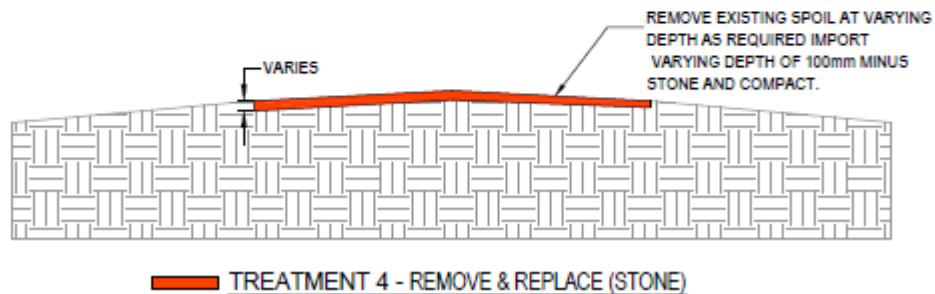
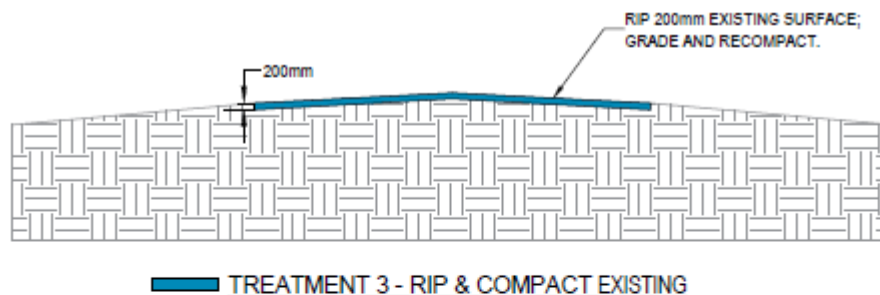


### 3.3 Typical construction (existing tracks)

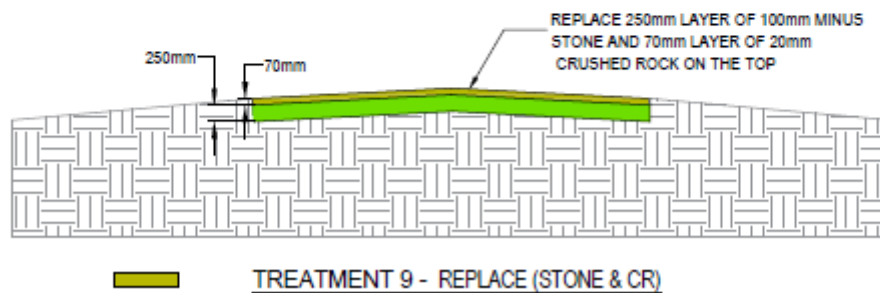
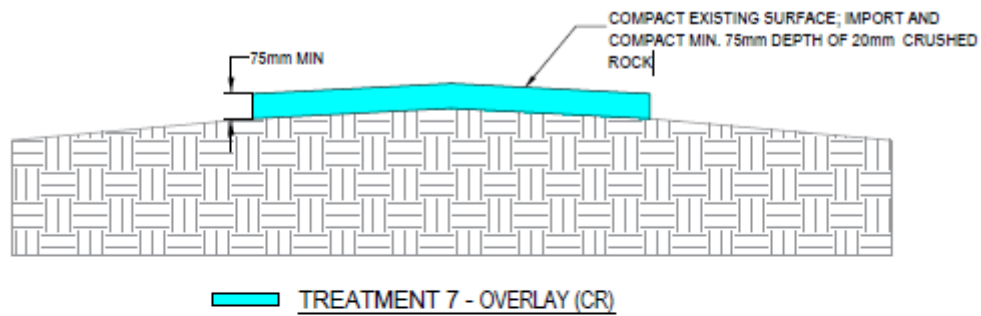
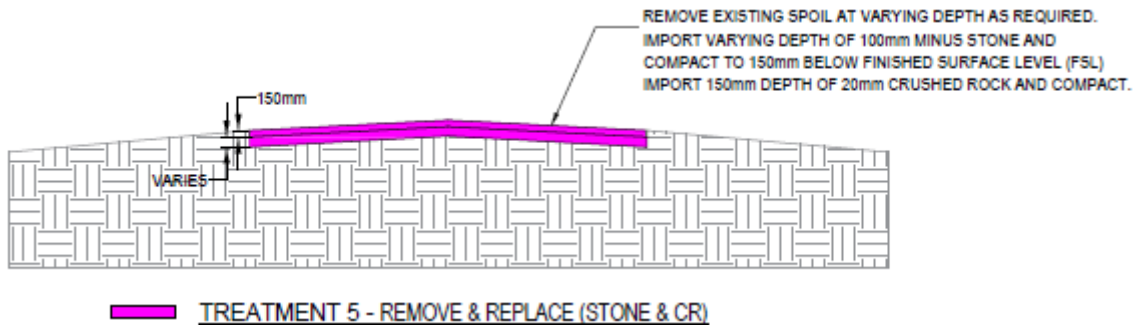
*The majority of the roads treatment is just maintenance grading*



*Where more significant damage has occurred the following are applied as directed by the engineer. The worse the damage the road the larger the intervention.*







*Drainage works to the road works component would be limited to existing drainage crossing and the repair or replacement of these.*

### 3.4 Existing site conditions

Existing site conditions have been taken into consideration when determining the likely impact of proposed works. Much of the Murray River Adventure Trail (MRAT) utilises existing vehicle tracks, and as such, is not anticipated to have a significant impact on adjacent trees.

The most significant intervention required to rehabilitate the track will be in areas which have already been significantly impacted by compaction. Whilst accessing some campgrounds, such as Kiln Bend, it was observed that some wheel ruts were already at depths of up to approx. 500mm below grade. In such cases, the treatment required to rehabilitate the road is unlikely to have a greater impact than that already created by wheel ruts.

Much of the track into, and the existing campground areas, is also heavily compacted from current use. Soil compaction occurs more readily when soil conditions are wet, which is a regular occurrence along the Murray River. Delineating campgrounds with bollards and improving track conditions will reduce vehicle compaction in areas other than those designated for use.

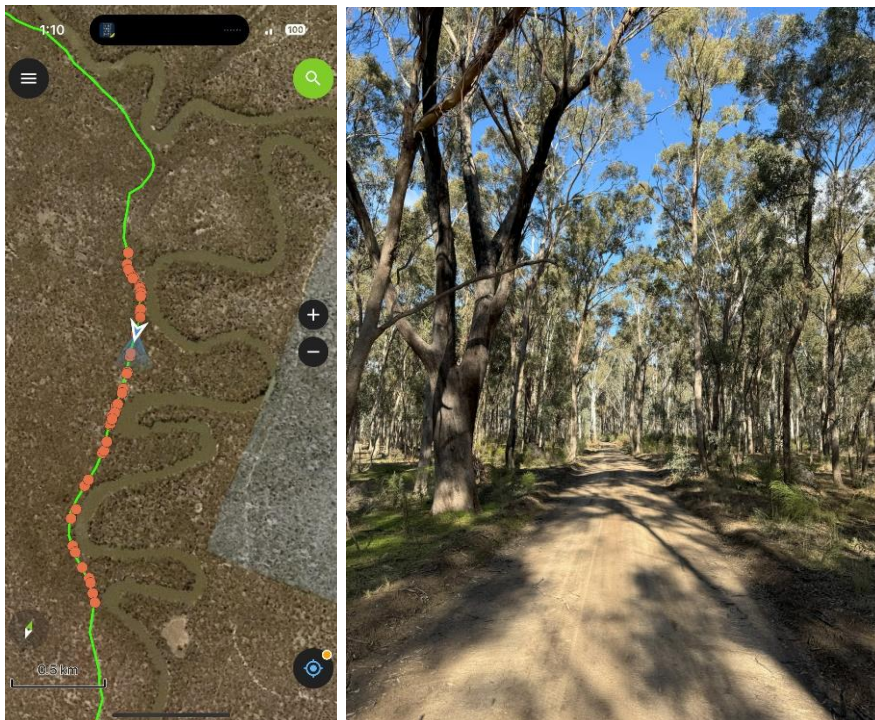


Plate 17: Example of track conditions west of Masters Landing.

## 4 Conclusion

Oldmeadow Arboriculture undertook a site inspection on 13-14 July of the proposed Murray River Adventure Trail (MRAT), including eight (8) campground/facilities site upgrades, as well as two (2) river crossing sites.

The proposed alignment of the MRAT was inspected for both existing road rehabilitation sites as well as for sites proposed for new trail construction.

For existing access roads, even the heaviest proposed rehabilitation methods are unlikely to have a more significant impact than the existing site conditions.

For the new trail areas, the maximum proposed excavation of 100mm will be tolerated by adjacent trees, provided that the alignment is considerate and avoids structural root zones as far as practicable.

The most likely sites to be impacted will be areas where new trail is to be constructed and the current conditions are boggy, with poor subgrade material which will require rehabilitation. Careful alignment choice, locating works requiring excavation of depths greater than 100mm outside of structural roots zones, will minimise impacts to retained trees. It is anticipated that this will be achievable given the density of trees. This will minimise potential impacts to a level which should be tolerated by adjacent trees.



In general, the campground/ facilities site upgrades will have minimal impact on the surrounding trees provided that considerate construction methods are utilised and that works are sensitively located to avoid impacts to larger trees. Areas which have already been significantly compacted or disturbed should be utilised first.

Accurate losses for the two (2) river crossing sites cannot be determined without further detailed design or construction method. The Mullers Creek crossing may have a lesser impact if a culvert is utilised, however, a construction method or detailed construction designs would need to be viewed to interpret this.

The Deep Creek crossing will very likely require some tree removal and will potentially impact other trees due to the substantial footings required to support the bridge. Detailed designs inclusive of tree protection zones of adjacent trees will need to be prepared to determine the actual impact.

Given the scale of this project, only minimal tree losses are anticipated primarily due to:

- The Deep Creek Crossing
- Possible tree removals in campgrounds to facilitate car parking (directly in the footprint of proposed construction)
- Some possible losses due to ground rehabilitation to facilitate trail construction.

However, there will likely be substantial benefits if access roads into campgrounds can be improved, minimising off-road vehicles trying to avoid boggy sections.

There will also be some benefit to delineating parking and campground areas, minimising access to other areas.

## 5 Recommendations

### General recommendations on minimising tree impact

- Where possible, existing soil disturbance is to be utilised for the trail alignment (e.g., contain all works within existing road formations or vehicle tracks as far as practicable)
- Excavation must be minimised. Where possible fill should be used to achieve the required grade, rather than excavation.
- Excavation inside Structural Root Zones should be avoided as far as practicable. Given the difficulty of calculating SRZs for all trees on site, these can nominally be considered as:
  - Trees <150mm diameter: SRZ 1m radius
  - Trees >150mm<250mm diameter: SRZ 1.5m radius
  - Trees >250mm<400mm diameter: SRZ 2.3m radius
  - Trees >400mm<600mm diameter: SRZ 2.7m radius
  - Trees >600mm<800mm diameter: SRZ 3m radius
  - Trees >800mm diameter: SRZ 3.5m radius
- Detailed design or a sensitive construction method should be prepared for the Mullers Creek crossing.
- Detailed design should be prepared for the Deep Creek bridge crossing to clarify likely impacts to adjacent trees.
- If the scope of works changes to include road widening, new culvert installations or any further excavation, then detailed construction plans must be drawn up inclusive of adjacent trees which may be impacted and tree protection zones.
- All pruning works must be undertaken by a minimum certificate III qualified arborist and in accordance with natural target pruning as outlined in Australian Standard 4373 *Pruning of amenity trees*.
  - Trees within the Kiln Bend campsite should be inspected and pruned by a suitably qualified arborist to reduce tree related risk at this location.
- Vehicles used for track construction should remain within the track alignment footprint.
- Stockpiling of materials and equipment set down areas should be cognisant of, and located outside of, tree protection zones which can be calculated as 12x Trunk Diameter (in meters) at Breast height (1.4m).

## 6 References

Standards Australia (2007), AS 4373-2007 Pruning of amenity trees

Standards Australia (2009), AS 4970-2009 Protection of trees on development sites

## 7 Appendix 1. Protection of retained trees

### Pruning standards / Lopping

An Australian standard exists to give guidance on pruning of trees.

It is important that all remedial works are carried out by a competent contractor in accordance with the Australian Standard. (AS. 4373 2007 - Pruning of Amenity Trees).

Lopping; as defined within the Standard, is detrimental to trees, often resulting in decay and poorly attached epicormic shoots. Natural Target Pruning methods should be used wherever possible when removing sections from trees.

### Establishment of Tree Protection Zones

The tree protection zone (TPZ) is the principal means of protecting trees on development sites. Usually fencing will be used to delineate the Tree Protection Zones (TPZ) as defined by AS 4970-2009 Protection of trees on development sites.

Fencing is installed following permitted vegetation removal and pruning but prior to construction site establishment. Fencing should be retained until completion of all construction related activity.

Some works and activities within the TPZ may be authorised by the Responsible Authority. These works should be supervised by the project arborist. Any additional encroachment that becomes necessary as the site works progress should be reviewed by the project arborist and be acceptable to the Responsible Authority before being carried out (AS 4970--2009).

### Activities restricted within the TPZ

A TPZ area may surround a single tree or group or a patch of vegetation, activities that must NOT be carried out within a TPZ include, but are not limited to, the following:

- (a) machine excavation including trenching;
- (b) excavation for silt fencing;
- (c) cultivation;
- (d) storage;
- (e) preparation of chemicals, including preparation of cement products;
- (f) parking of vehicles and plant;
- (g) refuelling;
- (h) dumping of waste;
- (i) wash down and cleaning of equipment;
- (j) placement of fill;
- (k) lighting of fires;
- (l) soil level changes;
- (m) vehicle movement – access ways;
- (n) changes of grade;
- (o) temporary or permanent installation of utilities and signs, and
- (p) damage to the tree.

### Maintaining Tree Protection Zones (TPZ)

If at any time the TPZ must be infringed upon for works such as excavation for the installation of pipes or drainage or the movement of equipment or any other interference that may cause a change in the availability of water or oxygen to the tree, a suitably qualified arborist should be consulted to supervise the works and permission from the responsible authority may be required.

It may be possible to work or construct within a TPZ without significantly impacting a tree however the size and number of roots in the area would need to be determined and the specifics of the tree and its resilience to impacts would need to be reviewed prior to commencement. Design and construction methods may need alteration to minimise adverse tree impact.

### AS 4970-2009 (extract)

#### Variations to the TPZ

##### General

*It may be possible to encroach into or make variations to the standard TPZ. Encroachment includes excavation, compacted fill and machine trenching.*



#### Minor encroachment

*If the proposed encroachment is less than 10% of the area of the TPZ and is outside the SRZ detailed root investigations should not be required. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.*

*Variations must be made by the project arborist considering relevant factors listed in (see standard) ...*

#### Major encroachment

*If the proposed encroachment is greater than 10% of the TPZ or inside the SRZ, the project arborist must demonstrate that the tree(s) would remain viable.*

*The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. This may require root investigation by non-destructive methods and consideration of relevant factors listed in (see standard)*

#### **Physical / mechanical damage to trees**

Physical damage to tree parts, particularly the trunk, provides entry points for pests and diseases such as fungal infections. This may cause long-term decay and can lead to partial or complete tree failure and death.

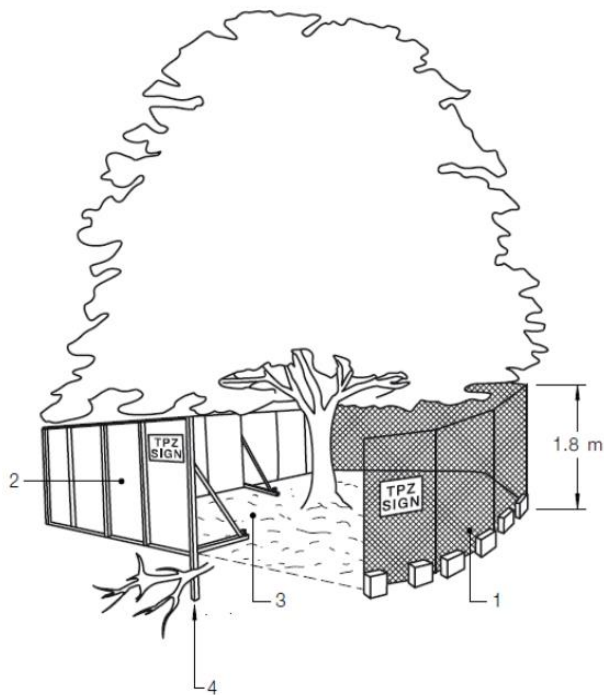
#### **Alteration of soil levels**

Alteration of soil levels around trees will affect the root zone and stability of a tree as well as tree metabolism. This may result in reduced tree health, excessive deadwood, thinning foliage and poor vigour; it can take some years for the impact to become evident at which time it is normally irreversible.

#### **Tree protection zone fencing**

Protective fencing is used to delineate the TPZ. The fence must provide high visibility and act as a physical barrier to construction vehicles. No construction activity is to be undertaken within the fenced TPZ. The fence should be adequately signed, be sturdy and prevent the entry of heavy equipment, vehicles, workers and the public.

Once erected, protective fencing must not be removed or altered without approval by the project arborist or responsible authority. The TPZ should be secured to restrict access. Tree protection fencing will consist of chain wire mesh panels held in place with concrete feet. The tree protection zone shall be clearly signed "Tree Protection Zone – No Access".



TREE PROTECTION ZONE SIGN EXAMPLE  
(Informative)

'PZ sign provides clear and readily accessible information to indicate that a TPZ is established. Figure C1 provides an example of a suitable sign.



Source – AS 4970-2009 Protection of trees on development sites

### Temporary access

(Tree Protection)

### to the TPZ

When tree protection fencing cannot be installed or requires temporary removal, other tree protection measures should be used.

Where necessary, physical protection for the trunk and branches of trees should be installed. The materials and positioning of protection will be specified by the project arborist. A minimum height of 2m is recommended.

If temporary access for machinery is required within the TPZ, ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Measures may include a permeable membrane such as geotextile fabric beneath a layer of mulch or crushed rock below rumble boards. These measures may also be applied to root zones beyond the TPZ (see image).

### Root protection during works within the TPZ

Works that have been approved by the Responsible Authority to occur within the TPZ, such as re-grading, installation of piers or landscaping have the potential to damage roots.

If the grade is to be raised the material should be coarser or more porous than the underlying material.

Depth changes and compaction should be minimized. Manual excavation should be carried out under the supervision of the project arborist to identify roots critical to tree stability and health. Relocation or redesign of works may be required.

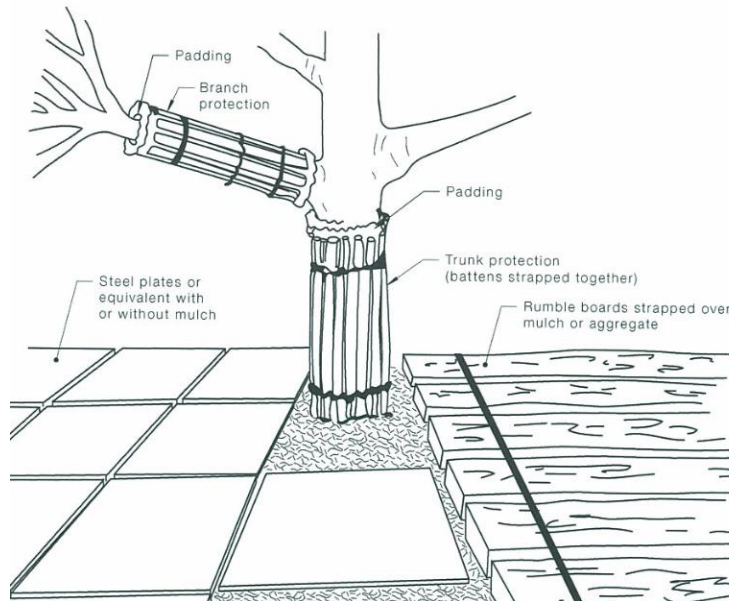
Where the project arborist identifies roots to be pruned within or at the outer edge of the TPZ, they should be pruned with a final cut to undamaged wood. Pruning cuts should be made with sharp tools such as secateurs, pruners, handsaws or chainsaws. Pruning wounds should not be treated with dressings or paints.



It is not acceptable for roots within the TPZ to be 'pruned' with machinery such as backhoes or excavators.

Where roots within the TPZ are exposed by excavation, temporary root protection should be installed to prevent them drying out. This may include jute mesh or hessian sheeting as multiple layers over exposed roots and excavated soil profile, extending to the full depth of the root zone. Root protection sheeting should be pegged in place and kept moist during the period that roots are exposed.

Other excavation works in proximity to trees, including landscape works such as paving, irrigation and planting can adversely affect root systems, seek advice from the project arborist.



Source – AS 4970-2009 Protection of trees on development sites

If temporary access is required within a Tree Protection Zone this may be carried out using sheets of heavy plywood or like protection but should not be considered for long term requirements.

(Ground Protection)

#### Installing underground services within TPZ

All services should be routed outside the TPZ. If underground services must be routed within the TPZ, they should be installed by directional drilling or in manually excavated trenches using non-destructive methods such as Air or hydro excavation.

The directional drilling bore should be at least 600 mm deep. The project arborist should assess the likely impacts of boring and bore pits on retained trees.

#### Driveways and paving within TPZ's

Works should not encroach into a TPZ. If encroachment is unavoidable any hard surfaces such as paving or driveways should:

1. not require any scraping or excavation – most roots, particularly small absorbing roots, are shallow; within the upper 100mm of soil.
2. be constructed of a permeable material and laid on a base and subbase specifically designed to allow the movement of water through and into the soil below.

If construction is permitted within a TPZ it should be suspended on piers leaving the ground undisturbed other than the careful placement of pier holes. The bottom of supporting beams should be above existing ground level or, if this is not possible beams should run radially away from the tree trunk. There should be NO excavation of any description, including piers, within a Structural Root Zone (SRZ)

## 8 Arboricultural consultancy: Assumptions

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