Arboriculture Impact Assessment – Kingborough Council

STAGE 2, NORTH WEST BAY MULTI-USE TRAIL

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Contents

Executive Summary

Tasmanian Arboriculture Consultants Pty Ltd was engaged by Kingborough Council to perform an Arboriculture Impact Assessment for trees along the proposed North West Bay River Track (Stage 2), extending from Miandetta Drive to Channel Highway, Tasmania.

Following discussions with trail contractors, it was identified that a lower impact construction method could replace the traditional cut-and-fill approach within the Tree Protection Zone (TPZ) of trees. By opting to increase the grade or build up the trail rather than cutting into the bank, significant impacts on trees can be avoided. When this approach is employed, impacts on trees are highly unlikely, and a simplified set of recommendations is sufficient, negating the need for a full tree protection plan.

By implementing these measures, the trail can be constructed in a manner that minimises impacts to nearby trees and preserves their structural integrity and ongoing viability. The following guidelines replace the need for a full Tree Protection Plan.

The following guidelines should be adhered to when considering rock armour, medium, or heavy benching type construction methodology within the TPZs of trees:

- Avoid the cut-and-fill method within 3 meters of trees, limit excavation depth to 100mm.
- Increase the trail grade by using rocks or fill from outside the TPZ rather than reducing the grade or cutting into the bank.
- Avoid building up soil against tree trunks; instead use rocks or boulders to prevent contact with the trunk.
- For rock armour, limit excavation depth to 200mm or less.
- Preserve all roots greater than 50mm in diameter and avoid cutting or damaging these roots.

Brief

Tasmanian Arboriculture Consultants Pty Ltd had been commissioned by Kingborough Council to conduct an Arboriculture Impact Assessment for trees along the proposed North West Bay River Track (stage 2) from Miandetta Dr to Channel Hwy, Tasmania. Tasmanian Arboriculture Consultants Pty Ltd follows the guidance of the Australian Standard for Protection of Trees on Development Sites (Standards Australia 2009) in all matters relating to the impact assessment. We provide unbiased recommendations based on evidence provided in plans and collected on site with the goal of preserving the arboricultural assets.

Method

Tree and Site Assessment

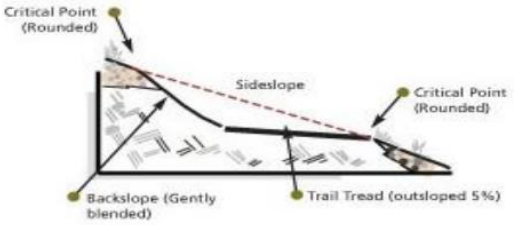
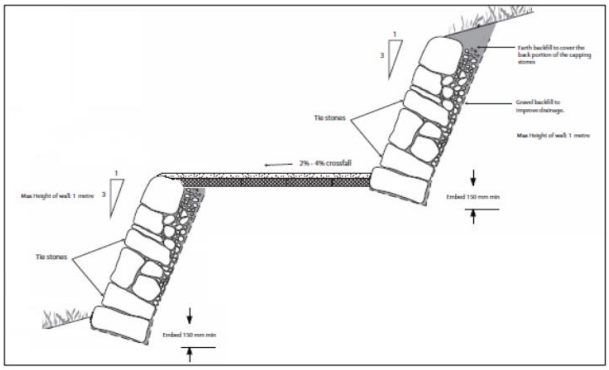
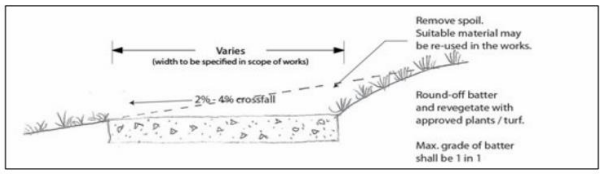
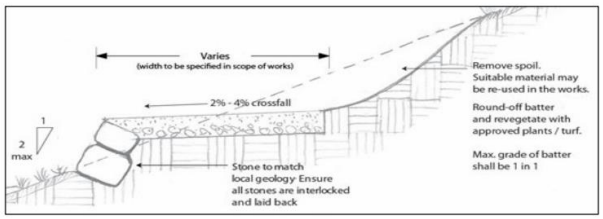
An Arboriculture Impact Assessment was conducted for trees potentially impacted along the proposed track section. On 7th November 2024, the site was assessed by walking the track alignment marked by survey data points along the trail centerline. The assessment involved:

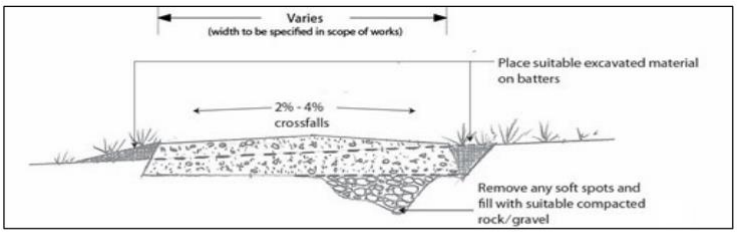
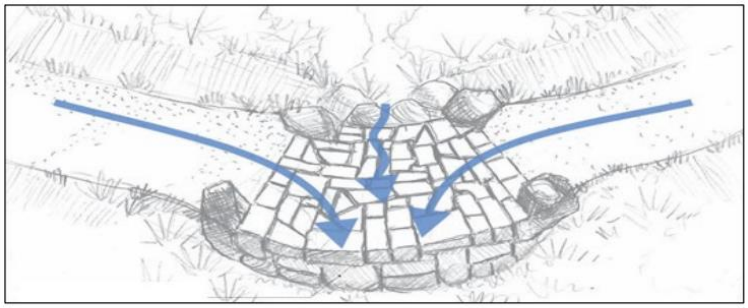
- Collecting data, including photos and measurements, using a custom application on an iPad Pro with Fulcrum (Fulcrum, 2024).
- Identifying trees to species level and visual assessment of tree health, vigour and condition (Mattheck and Breloer,1994).
- On-site measurements of tree dimensions, including DBH (Diameter at Breast Height) and DAB (Diameter Above Buttress), to calculate TPZ and Structural Root Zones (SRZ) in accordance with AS 4970-2009 Protection of Trees on Development Sites(Standards Australia).
- Recording tree positions relative to the proposed trail to calculate encroachment using CAD software or the ProofSafe Encroachment Calculator.
- Discussions with contractors to understand the planned construction methodology and its potential impact on trees.

Potential Impacts

Discussions with council representatives and potential contractors on-site informed the assessment of the trail alignment in relation to the trees and the proposed construction methods. These discussions helped identify potential impacts and categorised the trail construction into four types based on the level of potential impact on the trees (see Table 1).

Table 1. Types of trail construction and possible for impacting trees. Figures taken from North West Bay River Multi-use Trail Feasibility Study, Appendix 3 – Explanation of Track Construction Work Type.

Type of Construction	Construction Detail	Potential for Impacts (Low, Medium High)
Full Bench Construction	 FULL BENCH TRACK CONSTRUCTION (*TRAIL SOLUTIONS*, IMBA 2001)	High
Heavy Bench Construction	 HEAVY BENCHING - PARTIAL BENCH - HB	High
Medium Bench Construction	 MEDIUM BENCHING - FULL BENCH – MBEBT&B (HCC 2011)  MEDIUM BENCHING - PARTIAL BENCH - MBEBT (HCC 2011)	Medium

Low Bench Construction	 LOW BENCHING (HCC 2011)	Low
Rock Armour Construction	 ROCK ARMOURING / PAVING (HCC 2011)	Medium

Encroachment Calculation

Encroachment levels were calculated as a percentage of the total Tree Protection Zone and SRZ impacted by the proposed construction. According to AS 4970-2009, if the encroachment exceeds 10% of the TPZ or occurs within the SRZ, the project arborist must:

- Demonstrate tree viability through detailed assessment, or
- Recommend appropriate mitigation measures or setback distances to ensure that the encroachment does not result in detrimental impacts on the tree

Tree Protection Plan

Typically, a Tree Protection Plan (TPP) is developed based on the Arboriculture Impact Assessment and aligned with the guidelines of AS 4970-2009: Protection of Trees on Development Sites. However, in this case, where impacts are extremely unlikely, it is deemed sufficient to provide simple recommendations in place of a full tree protection plan. These recommendations will guide construction activities to ensure minimal impacts to the trees.

Results

Arboriculture Impact Assessment

Tree and Site Assessment

Three trees, identified as Tree 1, Tree 2, and Tree 3, were assessed for their potential impact during the construction of Stage 2 of the North West Bay River Track. The trees include:

- Tree 1: A mature *Eucalyptus viminalis*
- Trees 2 and 3: Mature *Eucalyptus globulus*

The locations of these trees are shown in Figure 1, and their proximity to the proposed track are illustrated in Figures 2 and 3. The DBH and calculated TPZ for each tree are provided in Table 2.

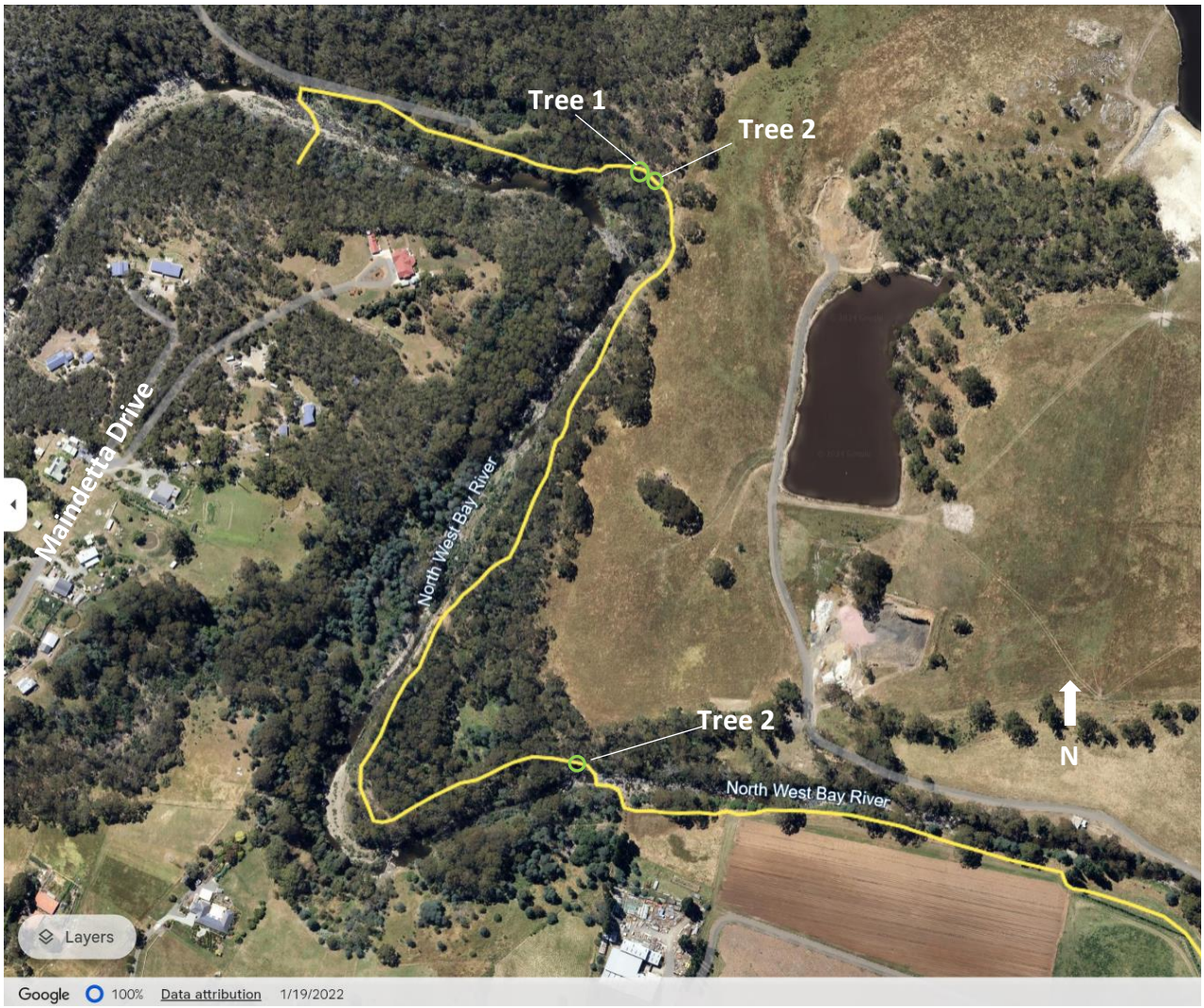


Figure 1. Relative positions of Tree 1, Tree 2, and Tree 3 along the Stage 2 section of the proposed North West Bay River Track. Tree 1 is a Eucalyptus viminalis, and Trees 2 and 3 are Eucalyptus globulus. The circles represent approximate locations and are indicative only, not to scale.

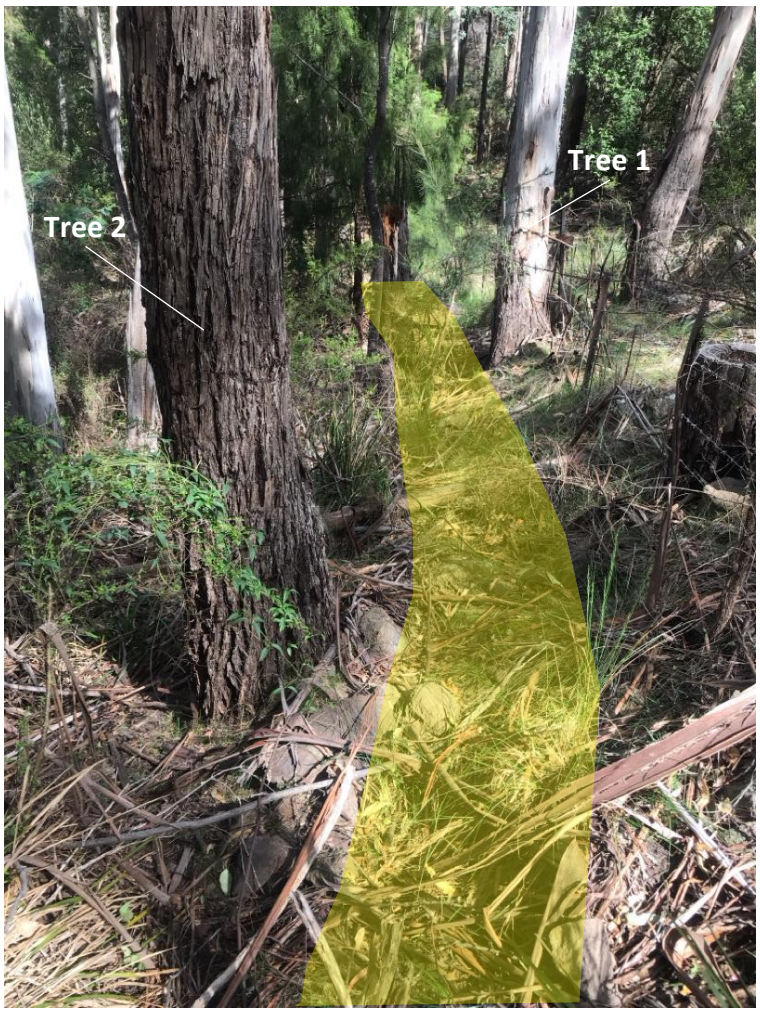


Figure 2. Trees 1 and 2 in relation to the proposed track alignment, which will require medium to heavy benching due to the steep slope of the hill. The yellow shading indicates the approximate track alignment. This positioning is necessary to accommodate constraints such as exclusion zones for threatened fauna and property tenure restrictions.

Figure 3. Tree 3, a Eucalyptus globulus, is visible in the background. The proposed track, indicated by the yellow shading, traverses a steep slope to provide access to the river crossing.

Table 2. Details of the data collected.

Tree no.	Species	DBH	TPZ	DAB	SRZ	Retention	Encroachment
Tree 1	*Eucalyptus viminalis*	.55m	6.6m	.66m	2.7m	Y	35%
Tree 2	*Eucalyptus globulus*	.46m	5.5m	.55m	2.5m	Y	33%
Tree 3	*Eucalyptus globulus*	.52m	6.2m	.6m	2.6m	Y	28%

Potential Impacts

Negative impacts on the trees may result from development activities that disrupt the root system or physically damage the tree. It is essential to identify areas of the track requiring medium or heavy benching (figure 4) and understand all activities within the TPZs (table 3) to be able to mitigate impacts effectively.

Table 3. Potential impacts and mitigation measures to consider for trees at along stage 2 of the North West Bay River Track.

Potential impacts	Reason	Mitigation measures
Excavation for Medium and Heavy Benching	Roots can be severed, affecting the tree's structural stability or ability to uptake nutrients and water.	Minimise excavation depth to remain above natural grade. Use fill to create the trail base instead of excavation. Preserve all roots >50mm diameter.
Excavation for Rock Armour Drainage or Crossings	Roots may be severed, compromising stability and nutrient/water uptake.	Minimise excavation depth to remain above natural grade. Use fill to raise trail grade and reduce excavation. Preserve all roots >50mm diameter.
Building Up Fill Against Trunk	Soil piled against the trunk can cause decay and damage the cambium layer, inhibiting nutrient uptake.	Prevent fill from touching the tree trunk. Use boulders or permeable stone walls for support near the trunk if necessary.
Physical Injury from Excavator Movements	Machinery can damage roots, trunks, or branches, causing structural issus or entry points for pathogens.	Provide a spotter to guide machinery movements within the TPZ. Limit excavator size to a maximum of 3-tonne capacity.

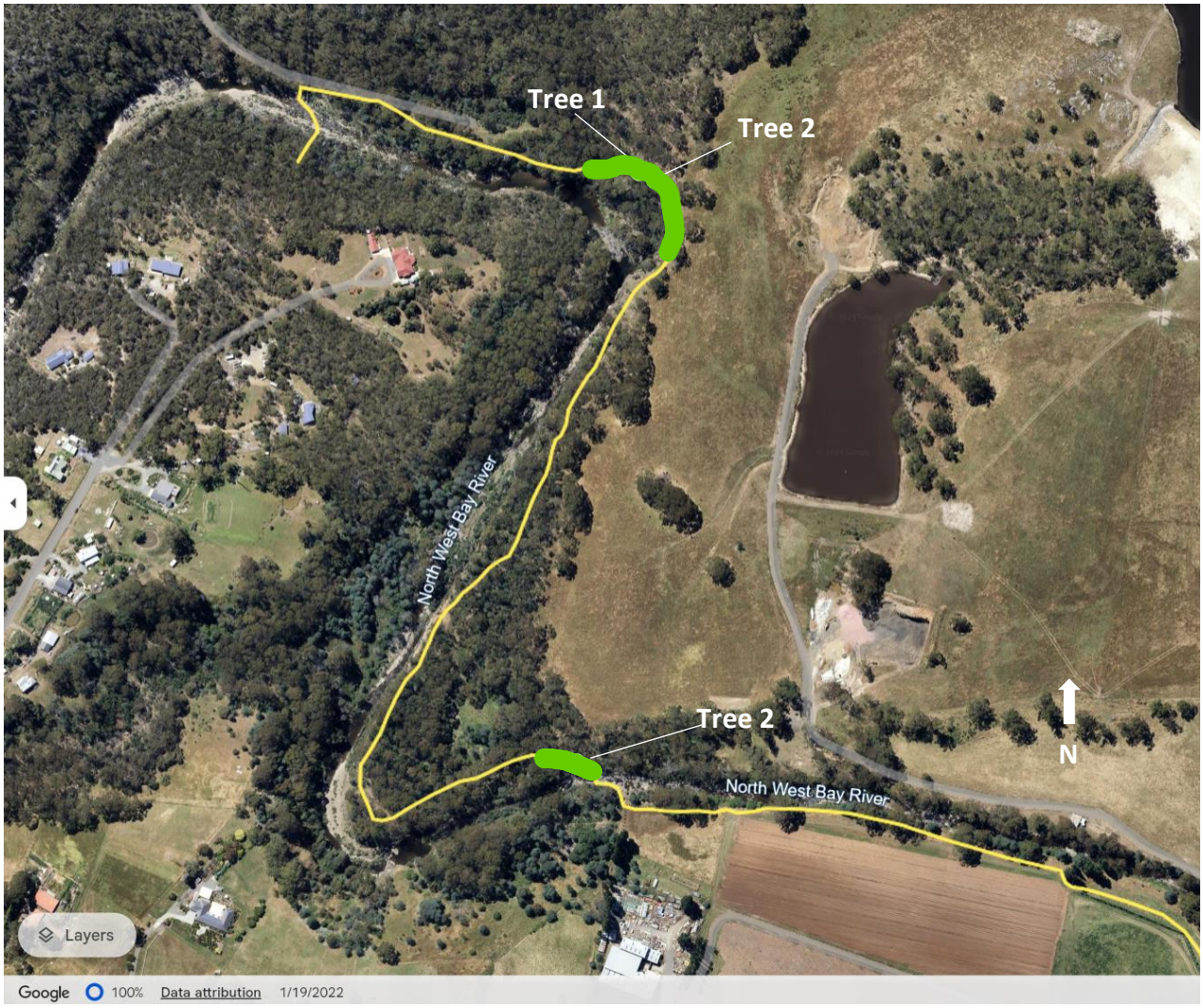


Figure 4. Sections of the North West Bay Track requiring “Medium” or “Heavy Benching” type construction are highlighted in green, as outlined in the North West Bay River Multi-use Trail Feasibility Study. These construction methods have the potential to impact nearby trees.

Encroachment Calculation

Encroachment calculations, derived from on-site discussions and assessed using the ProofSafe online encroachment calculator (Figure 4), indicate an encroachment level of approximately 28–35% for all assessed trees. According to AS 4970-2009 Protection of Trees on Development Sites, this level qualifies as major encroachment. While the trail alignment passes directly beside most of these trees, the potential impacts of encroachment can be effectively mitigated, rendering the encroachment level a less critical concern.

Discussion and Recommendations

The current trail alignment runs close to several large trees intended for retention. The proposed medium or heavy benching construction method could potentially impact trees, as it could sever critical roots necessary for stability and nutrient uptake, potentially rendering the trees non-viable.

Discussions with trail contractors suggest that a lower-impact construction approach could replace the traditional cut-and-fill method within the TPZs. By increasing the trail grade and building up the track rather than cutting into the bank, the need to remove roots or rocks is minimied. Using this method, the likelihood of negative impacts on the trees is significantly reduced.

By implementing these measures, the trail can be constructed in a manner that minimises impacts to nearby trees and preserves their structural integrity and ongoing viability.

The following guidelines should be adhered to during construction near trees, replacing the need for a full Tree Protection Plan:

- Avoid the cut-and-fill method within 3 meters of trees; limit excavation depth to 100mm.
- Increase the trail grade by using rocks or fill from outside the TPZ rather than reducing the grade or cutting into the bank.
- Avoid building up soil against tree trunks; instead, use rocks or boulders to prevent contact with the trunk.
- For rock armour, limit excavation depth to 200mm or less.
- Preserve all roots greater than 50mm in diameter; avoid cutting or damaging these roots.

References

Fulcrum 2024, accessed 7 August 2024, https://web.fulcrumapp.com

Mattheck, C, Breloer, H 1994, *The body language of trees: a handbook for failure analysis: Research for Amenity Trees No.4*, 8th impression, HMSO, London.

Standards Australia 2009, *AS 4970 – 2009: Protection of trees on development sites*, Standards Australia, Australia.

Disclaimer

This report assesses and considers the impacts of the proposed development. The authors do not account for unforeseen circumstances, potential nefarious actions / vandalism or unobserved biological factors which are beyond the scope of the assessment and may contribute to the decline or demise of some trees.

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