



BOROUGH OF QUEENSCLIFFE
Quantified Tree Risk Assessment

Selected Trees in Princess, Citizens and
Victoria Parks, Queenscliff

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BRIEF

To produce a comprehensive risk assessment using the QTRA Risk Assessment model on the following trees recommended for immediate removal (and other specified trees) in the August 2009 report prepared by John Patrick P/L.

Princess Park	Citizens Park	Victoria Park		
10	72	4	41	71
11	155	6	43	73
29	156	13	45	76
30	161	14	46	77
39	165	15	47	80
41	166	16	49	81
42		17	51	82
43		18	52	85
44		19	53	93
45		20	54	94
46		21	61	95
47		23	62	102
48		30	63	107
55		31	64	109
61		32	65	113
68		33	66	115
69		35	67	117
70		37	69	120
71		39	70	121
Total 19	Total 6	Total 57		

OBJECTIVES

- Review August 2009 John Patrick P/L report related to the management, removal and replacement of trees in the subject parks;
- Undertake a field assessment of trees recommended for removal to confirm the findings of the John Patrick report to be used as a basis for the quantitative risk assessment.
- Conduct a quantified risk assessment using the QTRA Risk assessment model on nominated trees recommended for immediate removal (and other specified trees) in the August 2009 John Patrick report (the attached schedule identifies the trees to be assessed in each park).
- Advise on measures required (for example notices, signage, infrastructure changes, fencing, exclusion zones, etc) needed to be undertaken to mitigate the public risk in order to retain the recommended trees for removal.

METHOD

Visual Tree Assessment

All specified trees were identified and a Visual Tree Assessment carried out. Tree heights were measured using a TruPulse 360B laser rangefinder and diameters and canopy spreads measured with a diameter tape measure and standard tape measure respectively.

No aerial inspections were carried out, no samples were collected and no exploratory excavation to determine root extent was considered necessary at this stage.

Quantified Tree Risk Assessment

Target Potential

Park usage data was provided by the Borough of Queenscliffe based on Winter vs Summer usage and Weekday vs Weekend usage. This was further divided into Day vs Night and into Normal, Road/Table/Bin, Camping/Playground, Car Parking and Caravan zones.

From the above data an average usage per square metre can be calculated based on the assumption that the users of a park have an equal chance of being in each square metre of a zone at any given time.

Using the canopy spread data and the area of each zone within the target zone of the tree the Target Potential is calculated.

It must be noted that as the park usage data are estimates and averages rather than measured values it was necessary to ensure that the figures were overestimates and as such the final Risk of Harm will be an overestimate of the risk presented by the tree.

Impact Potential

During the Visual Tree Assessment the diameter of the limb or stem most likely to fail into the target zone is recorded. Using a biometric formula for stem weights and the assumption that once the diameter of a limb or stem reaches $\geq 600\text{mm}$ maximum damage to a target is certain, a probability based on the ratio of the size of the limb or stem compared to a 600mm limb or stem is produced.

It must be noted that the size of the limb or stem most likely to fail is used and while larger limbs or stems may have the potential to fail, when considered along with the Probability of Failure, the overall risk presented by this scenario is lower.

Probability of Failure

Of all the component calculations that make up a tree risk assessment the most uncertainty relates to the Probability of Failure. This probability assesses the likelihood of the limb or stem used in the calculation of Impact Potential failing over the next 12 months.

It must be noted that, as with any component of a risk assessment where there is insufficient data to provide accurate calculations, it is ensured that the figure used is an overestimate and as such the final Risk of Harm will be an overestimate of the risk presented by the tree.

Risk of Harm

The final Risk of Harm calculation is the multiplication of the three above probabilities to produce an overall probability of harm to people or property.

As this method was developed in the United Kingdom where the Health and Safety Executive (equivalent of WorkSafe Victoria) specifies that *“for members of the public who have a risk imposed on them ‘in the wider interest’ HSE (Health and Safety Executive) would set this limit at 1/10,000 per annum”* (Health and Safety Executive, 1996) the limit used to define the upper limit of a High risk tree has been set at this level. The remaining thresholds (Medium, Low and Very Low) have been developed to give some context to the probability values.

It must be noted that the 1/10,000 threshold is an upper limit for Risk of Harm and in an Australian risk management context Risk of Harm values approaching this upper limit would be required to be managed accordingly. It would also be expected that all risks associated with those trees determined to have a Medium Risk of Harm would be managed as far as opportunity and resources allow with priority given to those at the upper end of the Medium range.

DISCUSSION

Review of Previous Report

This report continues on from that prepared by John Patrick Pty Ltd (John Patrick Pty Ltd, 2009) and in general supports the recommendations of that report.

In particular this report confirms the proposed management of the mature *Cupressus macrocarpa* (Monterey Cypress). The main difference is in the timing of the removals of these trees as, for the most part, the trees assessed were recommended for immediate removal (John Patrick Pty Ltd, 2009) whereas the risk assessment suggests it might be possible to retain these trees in the short term. This will be discussed in more detail later, but the majority of these trees are at the high end of the Medium risk category and it would be reasonable to decide not to accept the risk presented by these trees and schedule their immediate removal. It must also be noted that this report only considers the risk presented by the tree and not the many other reasons for routine tree removals (eg. tree health, amenity, long term planning etc.) considered in the John Patrick Pty Ltd (2009) report.

While in general this report does not support the removal of the *Melaleuca lanceolata* (Moonah) in Victoria Park on the basis of risk, from an ecological and environmental protection perspective the creation of the 'Moonah Reserves' (John Patrick Pty Ltd, 2009) is considered of great importance. The implications of this report are therefore related to the installation design of the reserves rather than the question of whether they should be created. For example, as these trees present a low risk to people and property, fencing of the reserve need only be sufficient to allow understorey establishment rather than completely exclude pedestrians (ie. a single, less visibly intrusive fence through the centre of the reserve to discourage pedestrian access through the reserve rather than an intrusive perimeter fence).

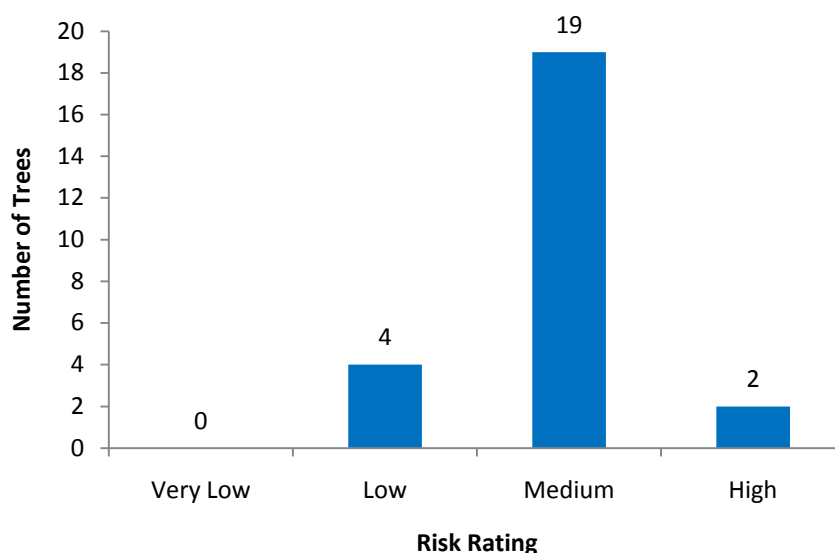
Tree & Risk Assessments

For the details of each Tree & Risk Assessment see Appendix One.

Princess & Citizens Park

The majority of trees in Princess & Citizens Park would be considered of Medium risk (see Chart 1) and while this level of risk could be broadly considered acceptable, it needs to be recognised that in a public space it is the community that determines an acceptable level of risk. In this situation where several trees are considered of Medium risk but are close to the threshold with High risk it would be a reasonable response to schedule removal of these trees rather than accept the risk over the period where the Target Potential is at its peak (ie. summer).

Chart 1: Princess & Citizens Park Risk Ratings



Cupressus macrocarpa (Monterey Cypress)

While only one of these trees would be considered a High risk and requiring immediate action, the remaining trees are generally in poor condition and are close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where these trees could become a High risk.

Given that the risk of these trees will only increase with time and beyond 12 months they are likely to represent a High risk to people and property, their removal in the short term to facilitate long term tree population management would be considered appropriate.

Other Species

The other species present in the reserve generally present the lowest risk (with the exception of Tree 165) and, from a risk management perspective these trees can be managed through works to improve the health of the trees and modification of the Target Potential rather than removal of the tree.

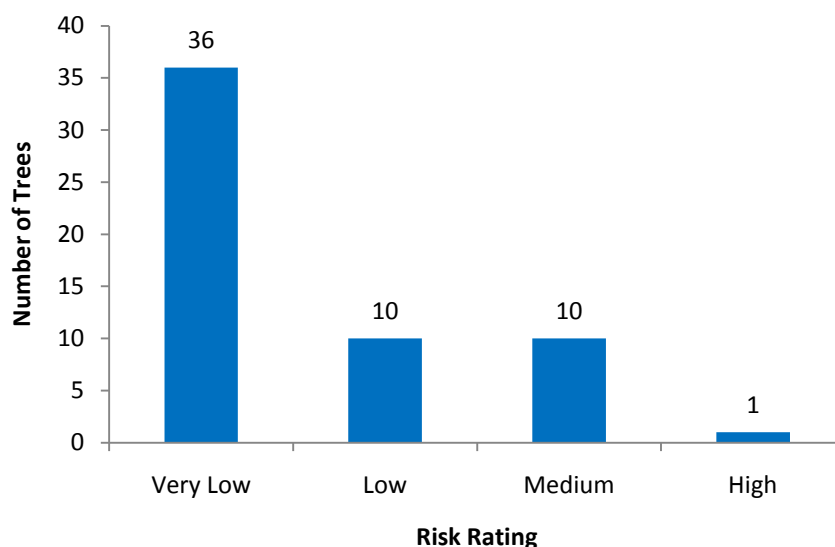
To improve the trees health (tree health can contribute to the tree's risk by increasing the Probability of Failure) it is recommended that establishment of a mulched garden bed be completed and investigation into the viability of supplying additional water to the trees be conducted.

The establishment of the mulched garden bed will also have an impact on the Target Potential resulting in a decreased Risk of Harm. This impact can be increased by moving park furniture out from underneath the canopy of the trees further reducing the Risk of Harm.

Victoria Park

The majority of trees in Victoria Park would be considered of Very Low or Low risk (see Chart 2). While this level of risk does not require any immediate works, it must be noted that this recommendation does not consider the many other reasons for routine tree removals (eg. tree health, amenity, long term planning etc.) particularly in a situation like Victoria Park where there is limited space for tree establishment to ensure long term continuity of the tree population.

Chart 2: Victoria Park Risk Ratings



There are a number of trees that would be considered to present a Medium risk to people and property and while this level of risk could be broadly considered acceptable, it needs to be

recognised that in a public space it is the community that determines an acceptable level of risk. In this situation where several trees are considered of Medium risk but are close to the threshold with High risk it would be a reasonable response to schedule removal of these trees rather than accept the risk over the period where the Target Potential is at its peak (ie. summer). The high Target Potential of camping in the target zone of these trees over summer would also suggest that, assuming that these trees will require removal within 5 years, it would be reasonable to schedule their immediate removal rather than accept the risk over the coming summer.

Melaleuca lanceolata (Moonah)

The majority of these trees would be considered of Low or Very Low risk to people and property and in the short term there are generally no recommended actions (with the notable exception of Tree 107). This should not be taken as a reason for inaction however, as there is very little recruitment occurring in the population and a significant indigenous stand of trees should not be permitted to decline without recruitment when there appears to be ample opportunity to reconfigure the park to allow the recruitment process to begin without a significant impact on camping spaces in the park.

Of particular relevance to the *Melaleuca lanceolata* (Moonah) in Victoria Park are previous comments regarding the scope of this report. This report has only considered risk when preparing recommendations, whereas there are a variety of other factors (eg. tree health, amenity, long term planning etc.) that need to be considered when managing the continuity of a large tree population.

Cupressus macrocarpa (Monterey Cypress)

While none of these trees would be considered a High risk and requiring immediate action, the trees are generally in poor condition and are close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where these trees could become a High risk.

Given that the risk of these trees will only increase with time and beyond 12 months they are likely to represent a High risk to people and property, their removal in the short term to facilitate long term tree population management would be considered appropriate. In Victoria Park the high Target Potential represented by camping in the target zone of the tree

Other Species

The other species present on site are generally in poor health and while this has not resulted in an unacceptable risk these trees can be managed through works to improve the health of the trees and modification of the Target Potential rather than removal of the tree.


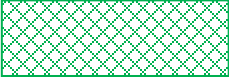








To improve the trees health (tree health can contribute to the tree's risk by increasing the Probability of Failure) it is recommended that establishment of a mulched garden bed be completed and investigation into the viability of supplying additional water to the trees be conducted.

The establishment of the mulched garden bed will also have an impact on the Target Potential resulting in a decreased Risk of Harm. This impact can be increased by moving park furniture out from underneath the canopy of the trees further reducing the Risk of Harm.

APPENDIX ONE

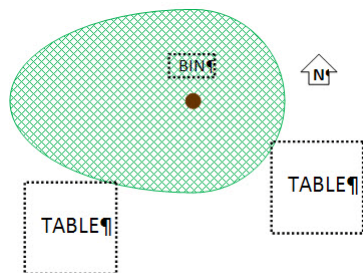
Tree & Risk Assessments

Tree Diagrams

Symbol	Description
	Trunk of the tree
	Target Zone of the tree represented by the extent of the canopy
	Table and Seats
	BBQ
	Bin Station
	Seat
	Road/Access Track/Path
	Car Parking
	Camping/Caravans/Caravans
	Building/Private Property

Princess Park

Tree 10



Species	<i>Pinus pinea</i> (Stone Pine)	
DBH (cm)	66	
Height (m)	13.2	
Canopy Spread (m)	N	4
	S	4
	E	4
	W	8
Target Potential	1/20	
Impact Potential	1/8	
Probability of Failure	1/1,000	
Risk of Harm	1/174,397	
Risk Rating	Low	

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

To prevent further decline in tree health that can contribute to the tree's risk by increasing the Probability of Failure it is recommended that establishment of a mulched garden bed be completed and investigation into the viability of supplying additional water to the trees be conducted.

Whilst not an immediate recommendation, the establishment of the mulched garden bed will also have an impact on the Target Potential resulting in a decreased Risk of Harm. This impact can be increased by moving park furniture out from underneath the canopy of the tree further reducing the Risk of Harm.

Immediate Risk Management Recommendation

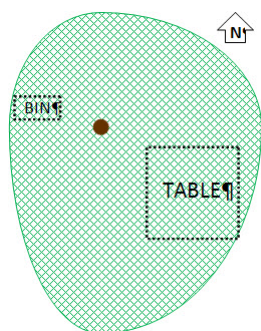
Required

- There are no required actions

Optional

- Move park infrastructure outside target zone
- Establish mulch beds to drip-line of the tree
- Minor remedial pruning (deadwood)

Tree 11



Species	<i>Pinus pinea</i> (Stone Pine)	
DBH (cm)	57	
Height (m)	12.5	
Canopy Spread (m)	N	5
	S	9
	E	7
	W	4
Target Potential	1/13	
Impact Potential	1/81	
Probability of Failure	1/1,000	
Risk of Harm	1/460,810	
Risk Rating	Low	

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

To prevent further decline in tree health that can contribute to the tree's risk by increasing the Probability of Failure it is recommended that establishment of a mulched garden bed be completed and investigation into the viability of supplying additional water to the trees be conducted.

Whilst not an immediate recommendation, the establishment of the mulched garden bed will also have an impact on the Target Potential resulting in a decreased Risk of Harm. This impact can be increased by moving park furniture out from underneath the canopy of the tree further reducing the Risk of Harm.

Immediate Risk Management Recommendation

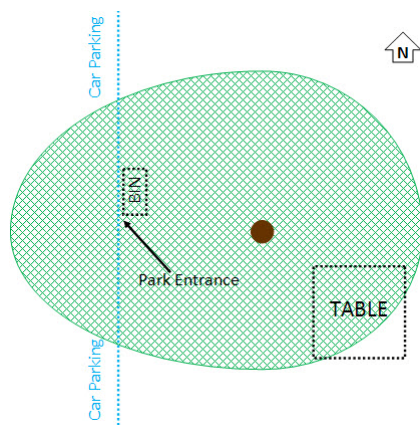
Required

- There are no required actions

Optional

- Move park infrastructure outside target zone
- Establish mulch beds to drip-line of the tree
- Minor remedial pruning (deadwood)

Tree 29



Species		<i>Pinus pinea</i> (Stone Pine)
DBH (cm)		98
Height (m)		16.1
Canopy Spread (m)	N	7
	S	6
	E	7
	W	11
Target Potential		1/6
Impact Potential		1/81
Probability of Failure		1/1,000
Risk of Harm		1/446,457
Risk Rating		Low

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

To prevent further decline in tree health that can contribute to the tree's risk by increasing the Probability of Failure it is recommended that establishment of a mulched garden bed be completed and investigation into the viability of supplying additional water to the trees be conducted.

Whilst not an immediate recommendation, the establishment of the mulched garden bed will also have an impact on the Target Potential resulting in a decreased Risk of Harm. This impact can be increased by moving park furniture out from underneath the canopy of the tree further reducing the Risk of Harm.

Immediate Risk Management Recommendation

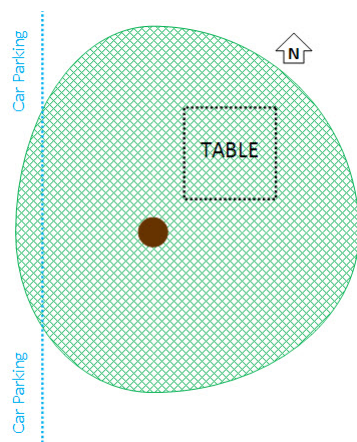
Required

- Minor remedial pruning (deadwood)

Optional

- Move park infrastructure outside target zone
- Close park entrance and move to alternate location outside target zone
- Establish mulch beds to drip-line of the tree

Tree 30



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	128	
Height (m)	16.5	
Canopy Spread (m)	N	9
	S	7
	E	9
	W	6
Target Potential	1/6	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/24,506	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

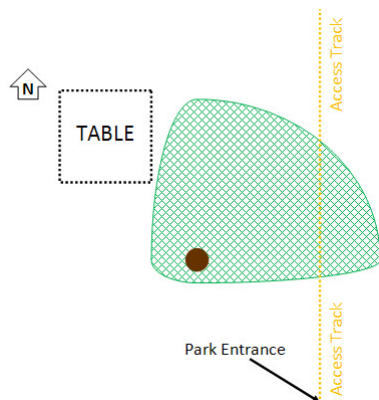
Required

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree
- Restrict car parking in target zone

Tree 39



Species

Cupressus macrocarpa
(Monterey Cypress)

DBH (cm)

99

Height (m)

16.9

Canopy

N

7

Spread (m)

S

1

E

8

W

2

Target Potential

1/16

Impact Potential

1/81

Probability of Failure

1/50

Risk of Harm

1/64,075

Risk Rating

Medium

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

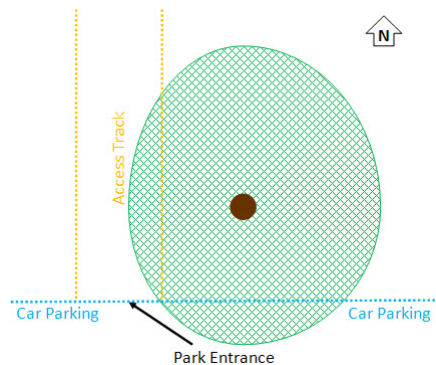
Required

- Minor remedial pruning (deadwood)
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Move park infrastructure outside target zone
- Establish mulch beds to drip-line of the tree

Tree 41



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	112	
Height (m)	16.5	
Canopy Spread (m)	N	7
	S	6
	E	6
	W	5
Target Potential	1/13	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/54,553	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

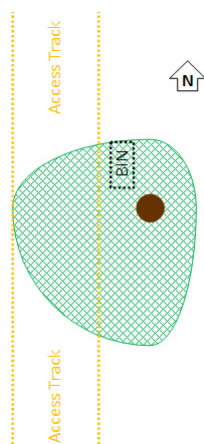
Required

- Minor remedial pruning (deadwood)
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree
- Restrict car parking in target zone

Tree 42



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	120	
Height (m)	18.3	
Canopy Spread (m)	N	3
	S	6
	E	2
	W	6
Target Potential	1/4	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/16,658	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

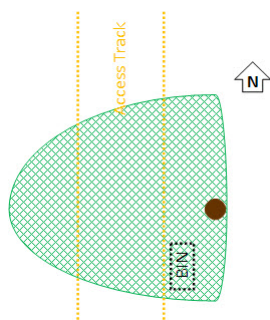
Required

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 43



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	89	
Height (m)	15.7	
Canopy Spread (m)	N	5
	S	4
	E	0
	W	9
Target Potential	1/4	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/14,858	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

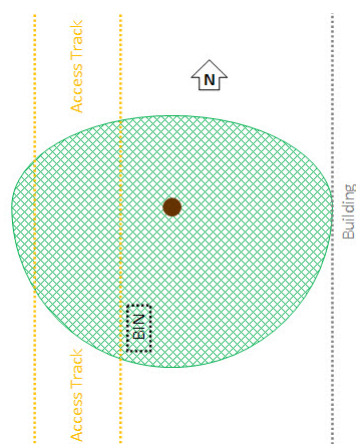
Required

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 44



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	78	
Height (m)	16.7	
Canopy Spread (m)	N	4
	S	7
	E	7
	W	7
Target Potential	1/3	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/13,436	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

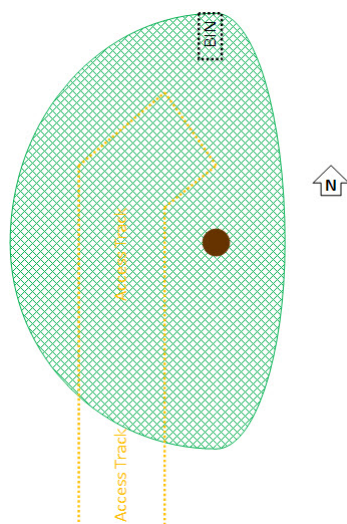
Required

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 45



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	117	
Height (m)	14.1	
Canopy Spread (m)	N	10
	S	9
	E	3
	W	9
Target Potential	1/3	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/12,443	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

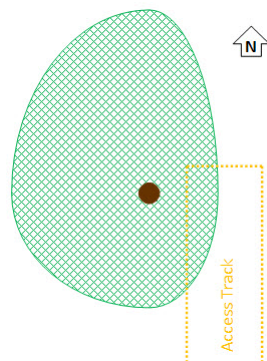
Required

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 46



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	90	
Height (m)	13.2	
Canopy Spread (m)	N	8
	S	5
	E	3
	W	6
Target Potential	1/17	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/67,875	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

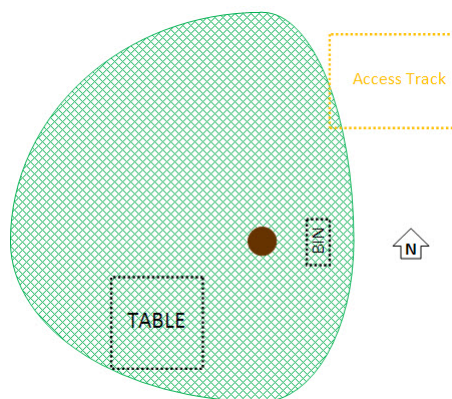
Required

- Minor remedial pruning (deadwood)
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 47



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	124	
Height (m)	19.1	
Canopy Spread (m)	N	10
	S	7
	E	4
	W	11
Target Potential	1/5	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/20,274	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

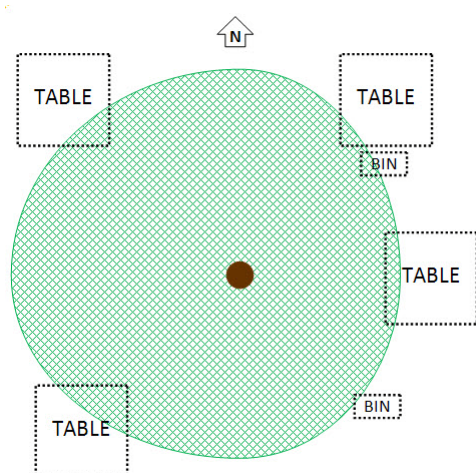
Required

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 48



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	117	
Height (m)	18.7	
Canopy Spread (m)	N	9
	S	8
	E	7
	W	10
Target Potential	1/4	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/17,959	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

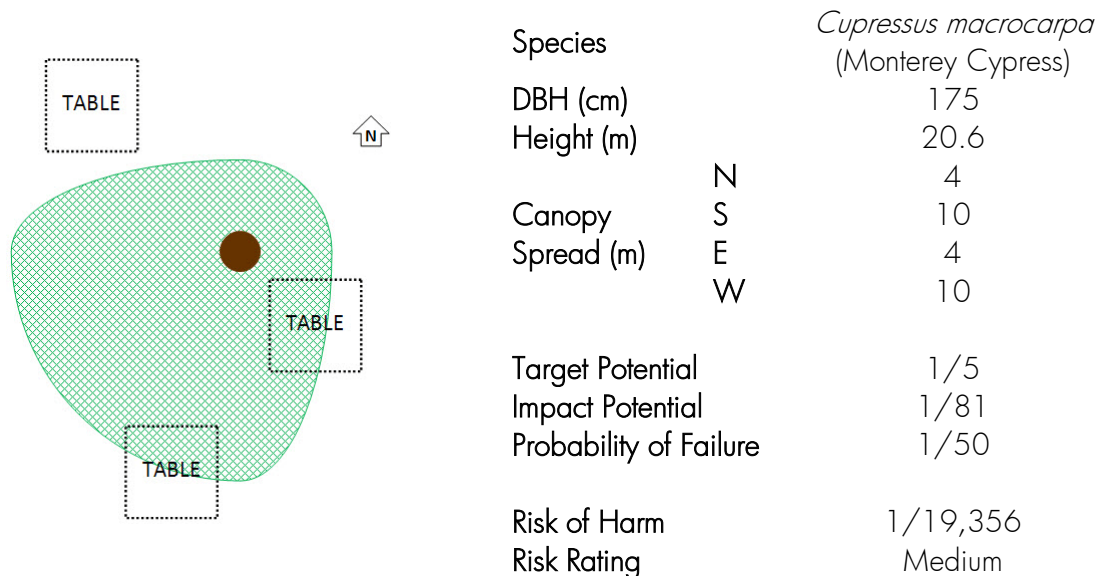
Required

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 55



Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

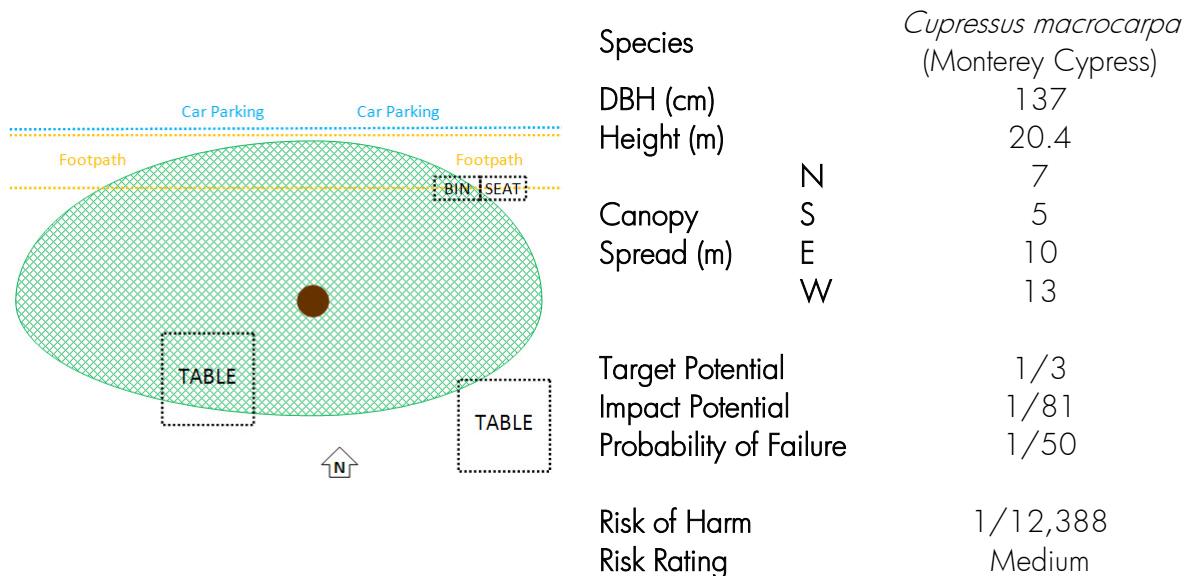
Required

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 61



Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

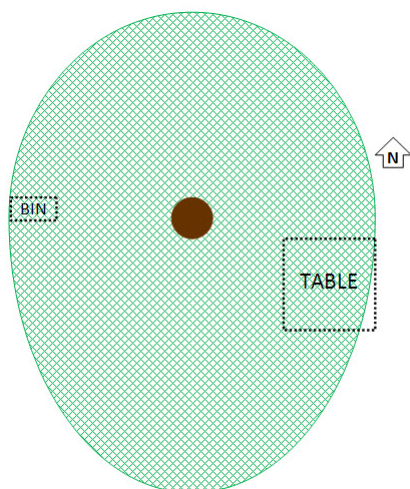
Required

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 68



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	180	
Height (m)	20.7	
Canopy Spread (m)	N	9
	S	12
	E	8
	W	8
Target Potential	1/4	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/17,783	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

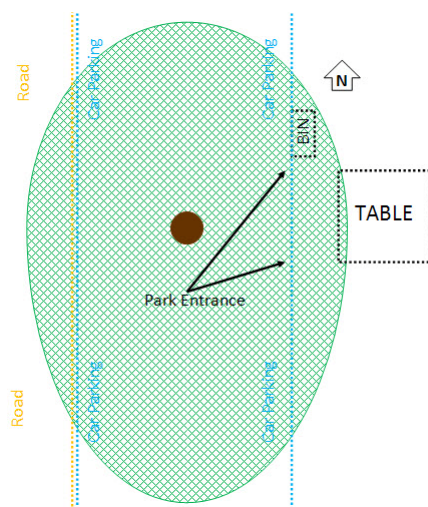
Required

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- During events install temporary fencing to limit pedestrian access to target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 69



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	141	
Height (m)	17.0	
Canopy Spread (m)	N	9
	S	12
	E	7
	W	7
Target Potential	1/3	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/11,475	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

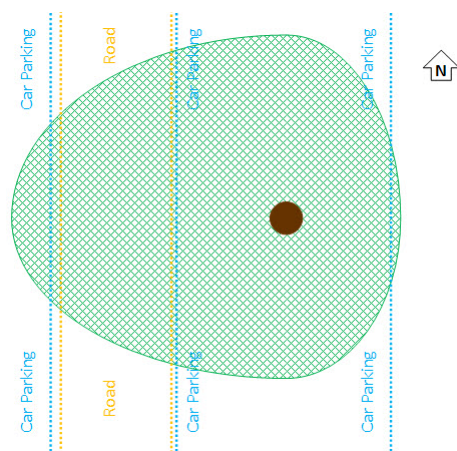
Required

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- Remove car parking within target zone
- Close park entrance and move to alternate location outside target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 70



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	142	
Height (m)	19.7	
Canopy Spread (m)	N	8
	S	7
	E	5
	W	12
Target Potential	1/2	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/7,855	
Risk Rating	High	

Discussion

This tree currently presents a High risk to people and property over the next 12 months.

There is little that can be done to reduce the risk presented by this tree by means other than the tree's removal as even if car parking were removed from the target zone it would not be possible and/or practical to close the public road that significantly contributes to the Target Potential.

Immediate Risk Management Recommendation

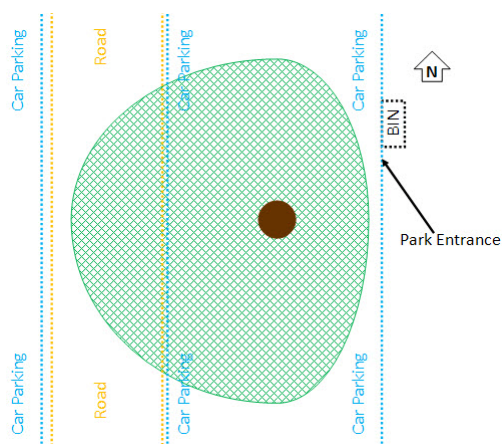
Required

- Remove Tree

Optional

- Minor remedial pruning (deadwood)
- Remove car parking within target zone
- Establish mulch beds to drip-line of the tree

Tree 71



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	163	
Height (m)	20.7	
Canopy Spread (m)	N	7
	S	8
	E	4
	W	9
Target Potential	1/3	
Impact Potential	1/81	
Probability of Failure	1/50	
Risk of Harm	1/11,924	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

Required

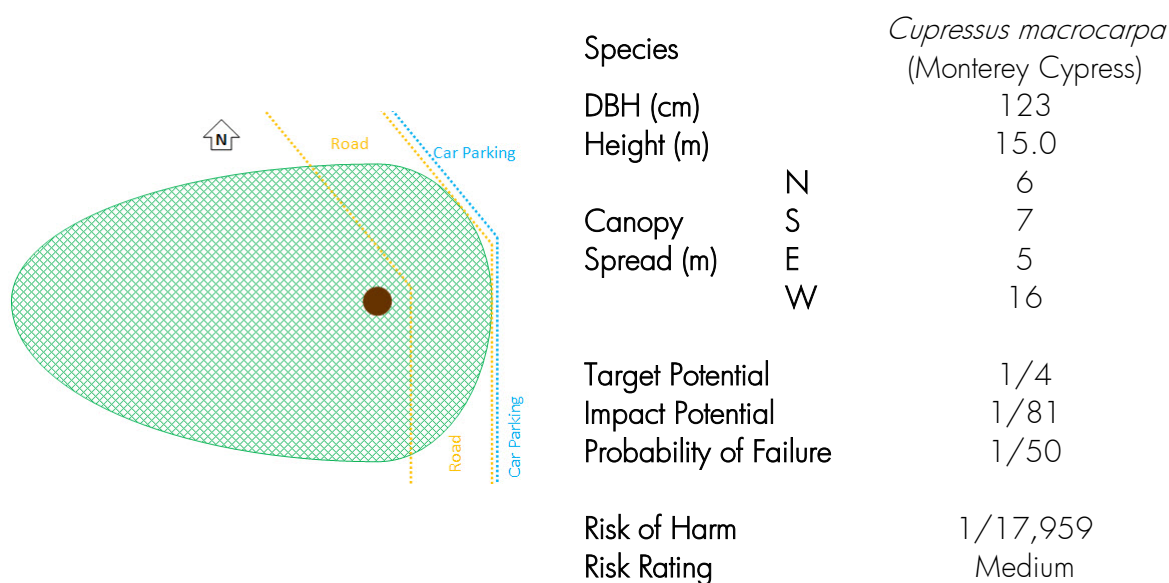
- Minor remedial pruning (deadwood)
- Remove car parking within target zone
- Close park entrance and move to alternate location outside target zone

Optional

- Establish mulch beds to drip-line of the tree

Citizens Park

Tree 72

**Discussion**

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

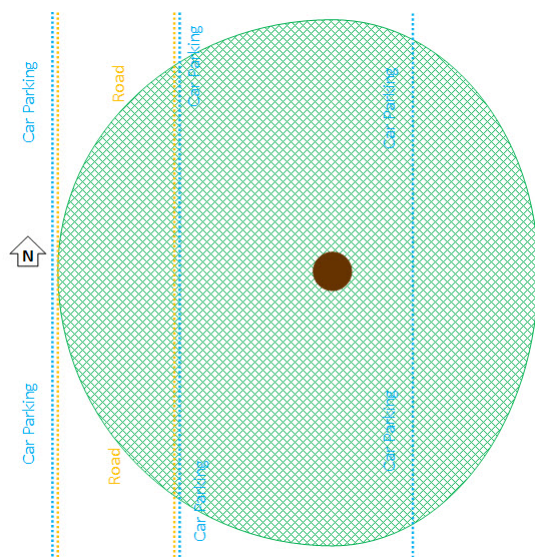
Immediate Risk Management RecommendationRequired

- Minor remedial pruning (deadwood)

Optional

- Establish mulch beds to drip-line of the tree

Tree 155



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	168	
Height (m)	17.4	
Canopy Spread (m)	N	11
	S	12
	E	9
	W	12
Target Potential	1/2	
Impact Potential	1/81	
Probability of Failure	1/100	
Risk of Harm	1/19,342	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

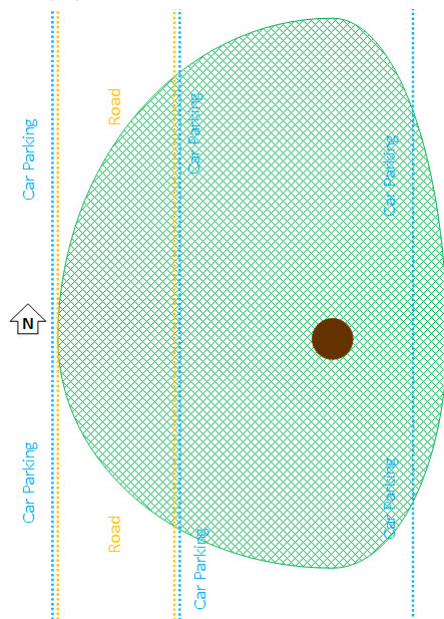
Required

- Minor remedial pruning (deadwood)
- Remove car parking within target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 156



Species		<i>Cupressus macrocarpa</i> (Monterey Cypress)
DBH (cm)		178
Height (m)		14.3
Canopy Spread (m)	N	14
	S	10
	E	5
	W	12
Target Potential		1/3
Impact Potential		1/81
Probability of Failure		1/100
Risk of Harm		1/21,970
Risk Rating		Medium

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

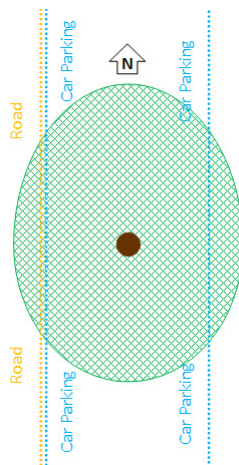
Required

- Minor remedial pruning (deadwood)
- Remove car parking within target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 161



Species	<i>Allocasuarina verticillata</i> (Drooping She-oak)	
DBH (cm)	102	
Height (m)	10	
Canopy Spread (m)	N	7
	S	6
	E	5
	W	5
Target Potential	1/13	
Impact Potential	1/5	
Probability of Failure	1/10	
Risk of Harm	1/628	
Risk Rating	High	

Discussion

This tree currently presents a High risk to people and property over the next 12 months.

The main factor affecting the risk presented by this tree is the large split between the co-dominant stems in the lower metre of the trunk. Cables have been installed to try to prevent limb failure but these must be recognised as temporary measures. Despite the reduction in the Target Potential due to the mass of Boobialla this tree remains a High risk with very low potential for risk reduction.

Immediate Risk Management Recommendation

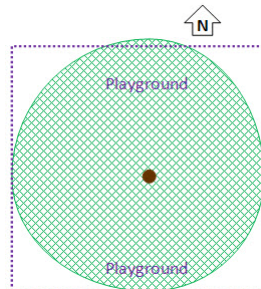
Required

- Remove Tree

Optional

- Minor remedial pruning (deadwood)
- Remove car parking within target zone
- Establish mulch beds to drip-line of the tree

Tree 165



Species		<i>Pinus halepensis</i> (Aleppo Pine)
DBH (cm)		57
Height (m)		11.1
Canopy Spread (m)	N	6
	S	5
	E	5
	W	6
Target Potential		1/1.4
Impact Potential		1/450
Probability of Failure		1/1,000
Risk of Harm		1/625,045
Risk Rating		Low

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

This tree is in poor health and without application of supplementary water is likely to decline further. Continuing decline will result in an increase over time of the Risk of Harm presented by the tree. Whilst its removal is premature, consideration of replacement trees, in preparation for a medium term removal of this tree, would be of benefit to the playground.

Immediate Risk Management Recommendation

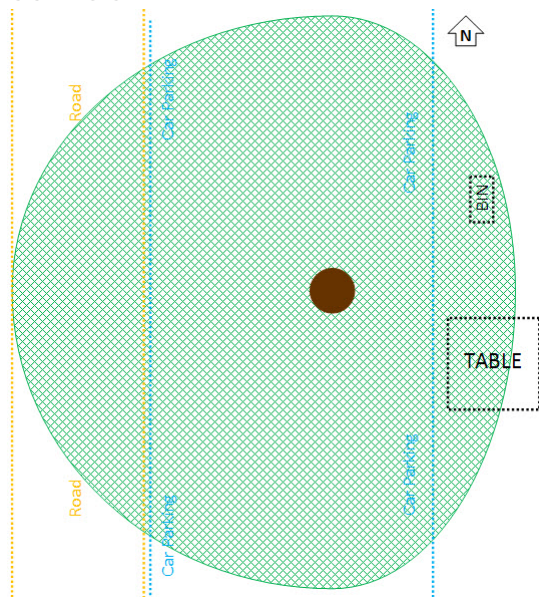
Required

- Minor remedial pruning (deadwood)

Optional

- Move park infrastructure outside target zone

Tree 166



Species

Cupressus macrocarpa
(Monterey Cypress)

DBH (cm)

195

Height (m)

20.2

Canopy

N

12

Spread (m)

S

13

E

8

W

14

Target Potential

1/1.3

Impact Potential

1/81

Probability of Failure

1/200

Risk of Harm

1/20,376

Risk Rating

Medium

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

Required

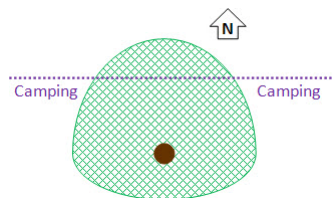
- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- Remove car parking within target zone

Optional

- Establish mulch beds to drip-line of the tree

Victoria Park

Tree 4



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	88	
Height (m)	15.6	
Canopy Spread (m)	N	5
	S	2
	E	4
	W	4
Target Potential	1/18	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/7,987,610	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

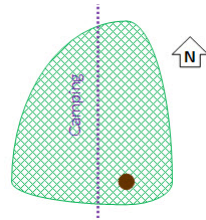
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 6



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	68	
Height (m)	14.3	
Canopy Spread (m)	N	7
	S	1
	E	2
	W	5
Target Potential	1/10	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/4,640,689	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

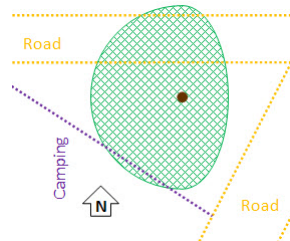
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 13



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	43	
Height (m)	8.0	
Canopy Spread (m)	N	4
	S	4
	E	2
	W	4
Target Potential	1/6	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/2,857,047	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

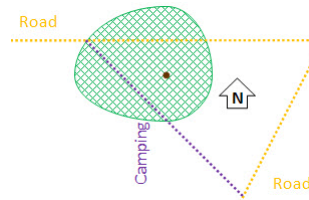
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 14



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	26	
Height (m)	8.0	
Canopy Spread (m)	N	3
	S	2
	E	2
	W	4
Target Potential	1/11	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/4,840,920	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

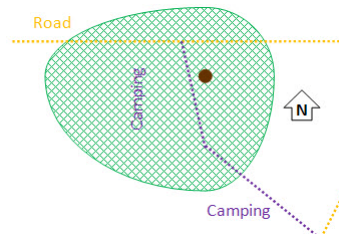
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 15



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	57	
Height (m)	8.0	
Canopy Spread (m)	N	3
	S	5
	E	3
	W	7
Target Potential	1/6	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/2,753,836	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

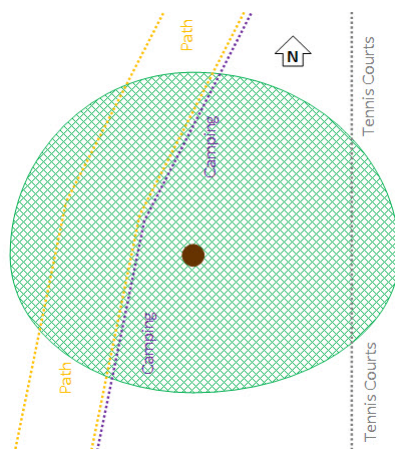
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 16



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	95	
Height (m)	17.3	
Canopy Spread (m)	N	8
	S	6
	E	9
	W	8
Target Potential	1/2	
Impact Potential	1/81	
Probability of Failure	1/100	
Risk of Harm	1/14,557	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

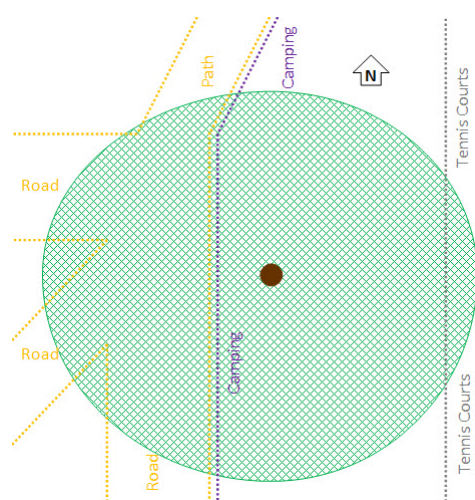
Required

- Minor remedial pruning (deadwood)
- Remove camping within target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 17



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	96	
Height (m)	16.3	
Canopy Spread (m)	N	8
	S	9
	E	9
	W	10
Target Potential	1/1.3	
Impact Potential	1/81	
Probability of Failure	1/100	
Risk of Harm	1/10,723	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

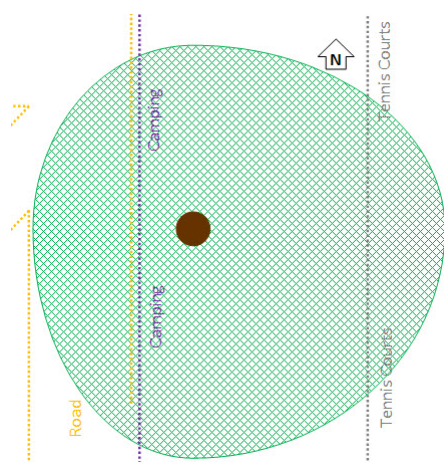
Required

- Minor remedial pruning (deadwood)
- Remove camping within target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 18



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	148	
Height (m)	15.3	
Canopy Spread (m)	N	8
	S	10
	E	11
	W	7
Target Potential	1/1.2	
Impact Potential	1/81	
Probability of Failure	1/100	
Risk of Harm	1/10,093	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

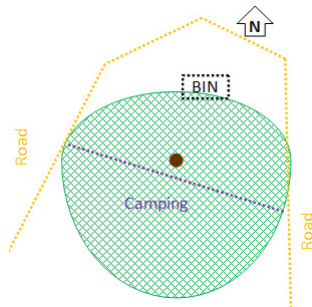
Required

- Minor remedial pruning (deadwood)
- Remove camping within target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 19



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	57	
Height (m)	11.8	
Canopy Spread (m)	N	3
	S	6
	E	5
	W	5
Target Potential	1/6	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/2,892,396	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

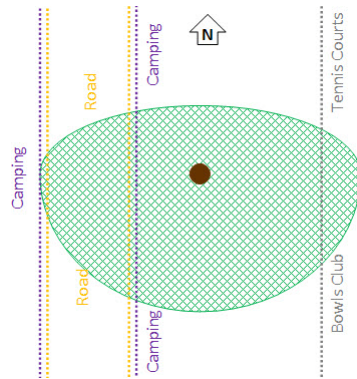
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 20



Species		<i>Melaleuca lanceolata</i> (Moonah)
DBH (cm)		88
Height (m)		15.6
Canopy Spread (m)	N	3
	S	6
	E	7
	W	7
Target Potential		1/3
Impact Potential		1/450
Probability of Failure		1/1,000
Risk of Harm		1/1,373,743
Risk Rating		Very Low

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

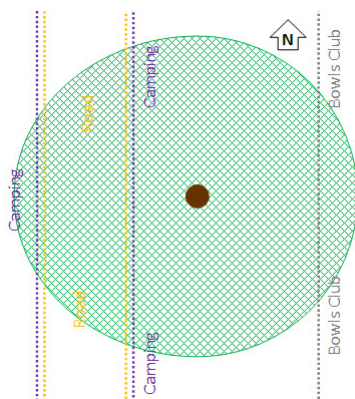
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 21



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	100	
Height (m)	16.3	
Canopy Spread (m)	N	7
	S	7
	E	7
	W	8
Target Potential	1/2	
Impact Potential	1/81	
Probability of Failure	1/100	
Risk of Harm	1/15,554	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

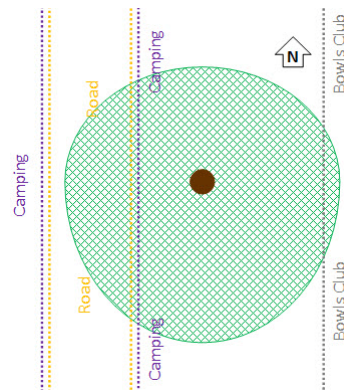
Required

- Minor remedial pruning (deadwood)
- Remove camping within target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 23



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	106	
Height (m)	10.4	
Canopy Spread (m)	N	5
	S	7
	E	6
	W	6
Target Potential	1/3	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/1,394,034	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

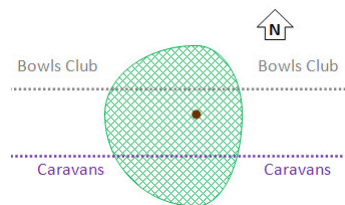
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 30



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	36	
Height (m)	7.9	
Canopy Spread (m)	N	3
	S	4
	E	2
	W	4
Target Potential	1/29	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/12,883,075	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 31



Species	<i>Leptospermum laevigatum</i> (Coastal Ti-tree)	
DBH (cm)	36	
Height (m)	8.4	
Canopy Spread (m)	N	3
	S	3
	E	3
	W	3
Target Potential	1/20	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/9,071,832	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

The tree is pretty much dead and while it does not pose a risk to people or property, its removal would be in line with good public space management.

Immediate Risk Management Recommendation

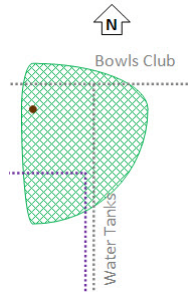
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 32



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	30	
Height (m)	5.1	
Canopy Spread (m)	N	2
	S	5
	E	5
	W	0
Target Potential	1/34	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/15,119,720	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

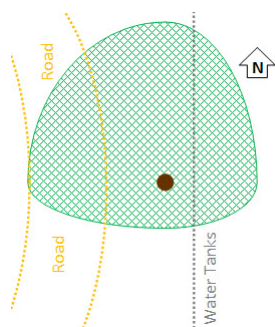
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 33



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	71	
Height (m)	9.6	
Canopy Spread (m)	N	7
	S	2
	E	4
	W	6
Target Potential	1/4	
Impact Potential	1/5	
Probability of Failure	1/1,000	
Risk of Harm	1/21,110	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

The main concern regarding this tree is the significant lean over the roadway and while propping can be used in the short term to reduce the Probability of Failure, in the long term the tree is unlikely to remain viable.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) which will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

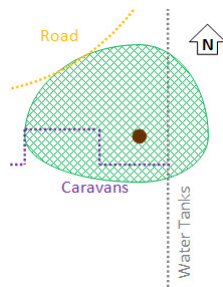
Required

- Minor remedial pruning (deadwood)
- Close park entrance

Optional

- Establish mulch beds to drip-line of the tree

Tree 35



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	60	
Height (m)	8.9	
Canopy Spread (m)	N	4
	S	2
	E	3
	W	5
Target Potential	1/10	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/4,443,346	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

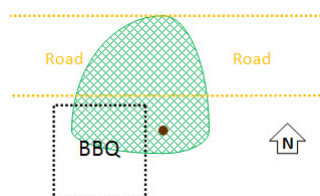
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 37



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	39	
Height (m)	8.2	
Canopy Spread (m)	N	5
	S	1
	E	2
	W	4
Target Potential	1/5	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/2,378,590	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

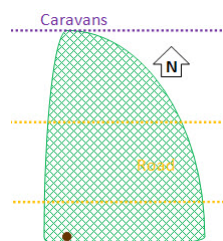
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Move park infrastructure outside target zone
- Establish mulch beds to drip-line of the tree

Tree 39



Species		<i>Melaleuca lanceolata</i> (Moonah)
DBH (cm)		37
Height (m)		9.1
Canopy Spread (m)	N	9
	S	0
	E	6
	W	1
Target Potential		1/4
Impact Potential		1/450
Probability of Failure		1/1,000
Risk of Harm		1/1,652,296
Risk Rating		Very Low

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

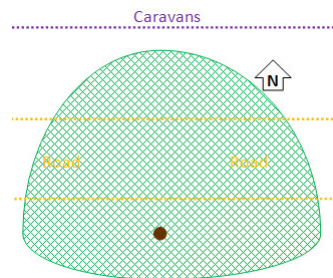
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 41



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	55	
Height (m)	8.4	
Canopy Spread (m)	N	8
	S	2
	E	7
	W	6
Target Potential	1/2	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/799,599	
Risk Rating	Low	

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

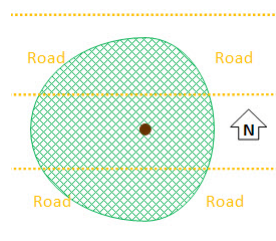
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 43



Species	<i>Allocasuarina verticillata</i> (Drooping She-oak)		
DBH (cm)	48		
Height (m)	11.5		
	N	4	
Canopy	S	4	
Spread (m)	E	3	
	W	5	
Target Potential	1/4		
Impact Potential	1/81		
Probability of Failure	1/1,000		
Risk of Harm	1/286,206		
Risk Rating	Low		

Discussion

This tree currently presents a low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

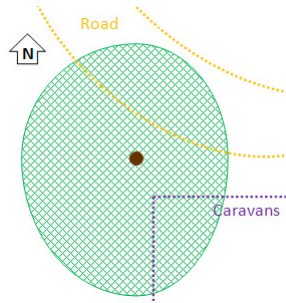
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 45



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	58	
Height (m)	10.1	
Canopy Spread (m)	N	5
	S	6
	E	4
	W	5
Target Potential	1/3	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/1,404,320	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

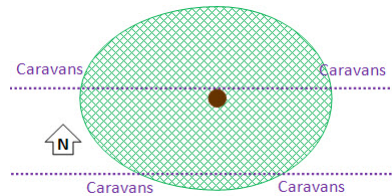
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 46



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	77	
Height (m)	7.3	
Canopy Spread (m)	N	4
	S	4
	E	5
	W	6
Target Potential	1/8	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/3,618,681	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

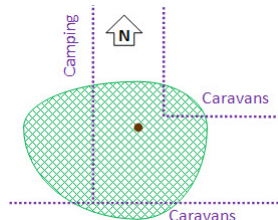
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 47



Species	<i>Leptospermum laevigatum</i> (Coastal Ti-tree)	
DBH (cm)	34	
Height (m)	5.4	
Canopy Spread (m)	N	2
	S	4
	E	3
	W	5
Target Potential	1/12	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/5,554,183	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

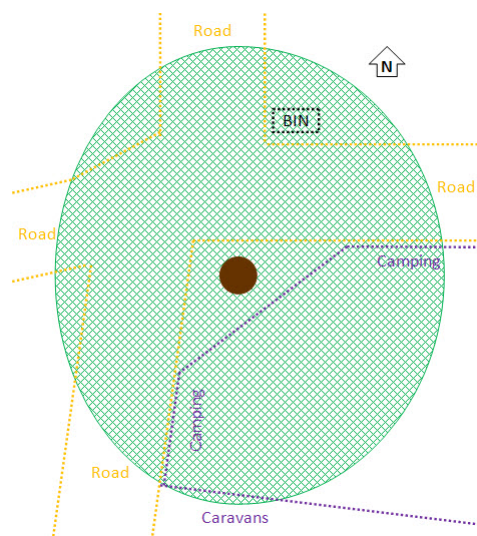
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 49



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	162	
Height (m)	20.0	
Canopy Spread (m)	N	10
	S	10
	E	9
	W	8
Target Potential	1/1.4	
Impact Potential	1/81	
Probability of Failure	1/100	
Risk of Harm	1/11,165	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

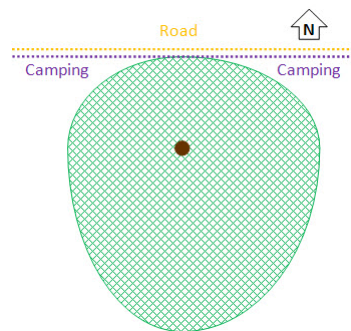
Required

- Minor remedial pruning (deadwood)
- Remove camping within target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 51



Species		<i>Melaleuca lanceolata</i> (Moonah)
DBH (cm)		63
Height (m)		12.8
Canopy Spread (m)	N	4
	S	8
	E	6
	W	5
Target Potential		1/11
Impact Potential		1/450
Probability of Failure		1/1,000
Risk of Harm		1/4,917,256
Risk Rating		Very Low

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

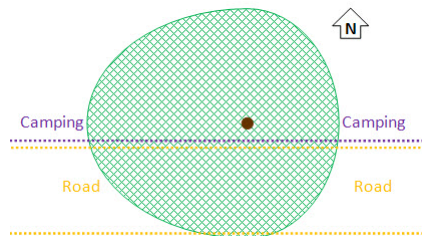
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 52



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	60	
Height (m)	9.8	
Canopy Spread (m)	N	5
	S	5
	E	4
	W	7
Target Potential	1/3	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/1,203,961	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

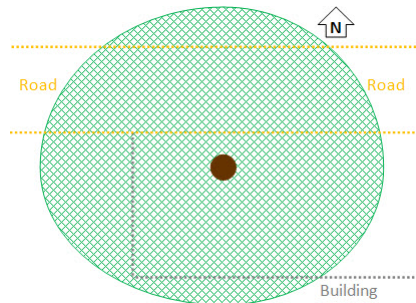
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 53



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	110	
Height (m)	12.4	
Canopy Spread (m)	N	7
	S	6
	E	7
	W	8
Target Potential	1/1.3	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/599,774	
Risk Rating	Low	

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

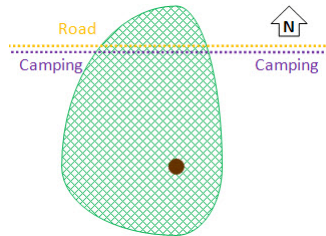
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 54



Species	<i>Eucalyptus gomphocephala</i> (Tuart)	
DBH (cm)	66	
Height (m)	10.0	
Canopy Spread (m)	N	7
	S	3
	E	2
	W	5
Target Potential	1/20	
Impact Potential	1/8.6	
Probability of Failure	1/1,000	
Risk of Harm	1/172,015	
Risk Rating	Low	

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

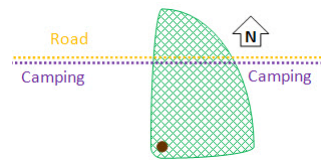
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 61



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	45	
Height (m)	9.3	
Canopy Spread (m)	N	6
	S	0
	E	4
	W	0
Target Potential	1/20	
Impact Potential	1/81	
Probability of Failure	1/1,000	
Risk of Harm	1/1,587,399	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

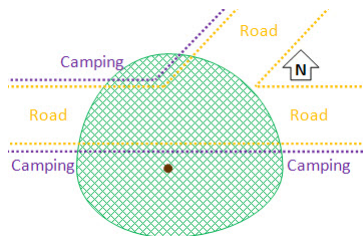
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 62



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	35	
Height (m)	11.0	
Canopy Spread (m)	N	5
	S	3
	E	5
	W	4
Target Potential	1/4	
Impact Potential	1/81	
Probability of Failure	1/1,000	
Risk of Harm	1/330,694	
Risk Rating	Low	

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

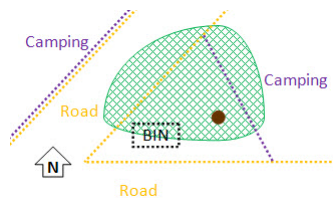
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 63



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	57	
Height (m)	6.4	
Canopy Spread (m)	N	4
	S	1
	E	2
	W	5
Target Potential	1/10	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/4,396,905	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

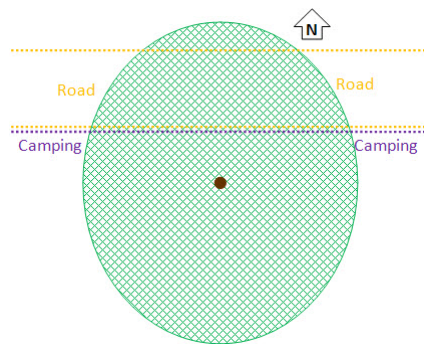
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 64



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	Multi-Stem	
Height (m)	7.0	
Canopy Spread (m)	N	7
	S	7
	E	6
	W	6
Target Potential	1/2	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/1,079,833	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

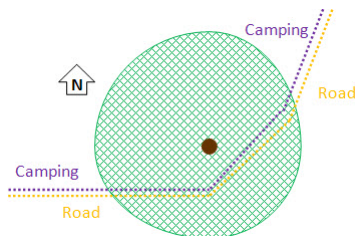
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 65



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	66	
Height (m)	8.6	
Canopy Spread (m)	N	5
	S	4
	E	4
	W	5
Target Potential	1/5	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/2,252,984	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

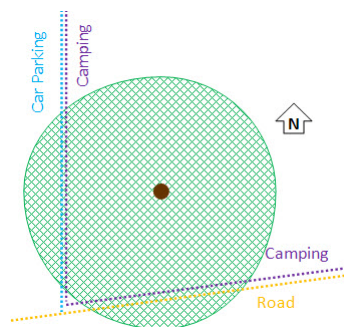
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 66



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	60	
Height (m)	8.3	
Canopy Spread (m)	N	5
	S	6
	E	5
	W	6
Target Potential	1/7	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/3,111,762	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

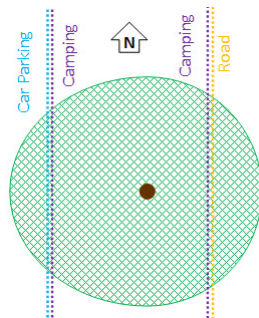
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 67



Species		<i>Melaleuca lanceolata</i> (Moonah)
DBH (cm)		Multi-Stem
Height (m)		9.5
Canopy Spread (m)	N	5
	S	5
	E	5
	W	6
Target Potential		1/6
Impact Potential		1/450
Probability of Failure		1/1,000
Risk of Harm		1/2,821,286
Risk Rating		Very Low

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

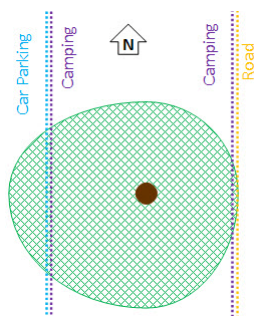
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 69



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	92	
Height (m)	10.2	
Canopy Spread (m)	N	4
	S	5
	E	4
	W	6
Target Potential	1/17	
Impact Potential	1/81	
Probability of Failure	1/1,000	
Risk of Harm	1/1,408,360	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

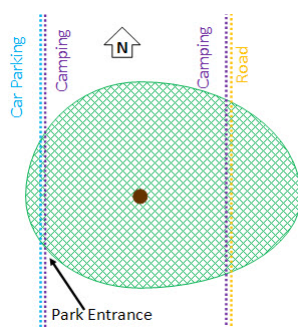
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 70



Species		<i>Melaleuca lanceolata</i> (Moonah)
DBH (cm)		62
Height (m)		9.1
Canopy Spread (m)	N	5
	S	4
	E	7
	W	5
Target Potential		1/6
Impact Potential		1/450
Probability of Failure		1/1,000
Risk of Harm		1/2,751,908
Risk Rating		Very Low

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

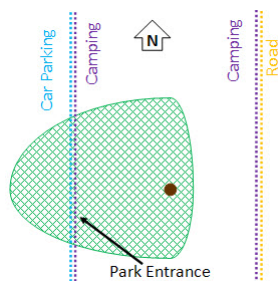
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree
- Close park entrance

Tree 71



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	52	
Height (m)	9.0	
Canopy Spread (m)	N	4
	S	3
	E	1
	W	7
Target Potential	1/31	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/13,732,460	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

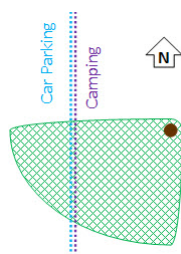
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 73



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	56	
Height (m)	4.7	
Canopy Spread (m)	N	0
	S	5
	E	0
	W	7
Target Potential	1/48	
Impact Potential	1/450	
Probability of Failure	1/100	
Risk of Harm	1/2,145,697	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

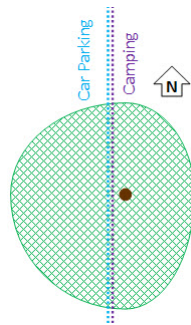
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 76



Species	<i>Pinus pinea</i> (Stone Pine)	
DBH (cm)	52	
Height (m)	8.1	
Canopy Spread (m)	N	4
	S	5
	E	3
	W	5
Target Potential	1/27	
Impact Potential	1/81	
Probability of Failure	1/100	
Risk of Harm	1/219,991	
Risk Rating	Low	

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

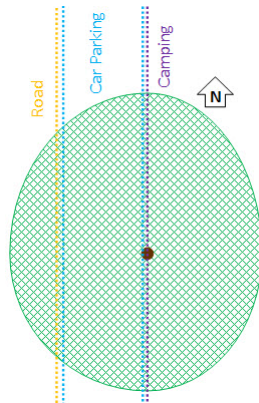
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 77



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	Multi-Stem	
Height (m)	9.8	
Canopy Spread (m)	N	7
	S	6
	E	5
	W	6
Target Potential	1/5	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/2,305,346	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

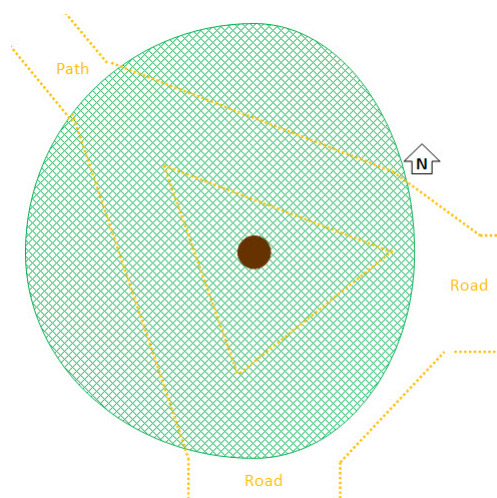
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 80



Species

Cupressus macrocarpa
(Monterey Cypress)

DBH (cm)

143

Height (m)

19.0

Canopy

N

10

Spread (m)

S

9

E

7

W

10

Target Potential

1/1.4

Impact Potential

1/81

Probability of Failure

1/100

Risk of Harm

1/11,307

Risk Rating

Medium

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

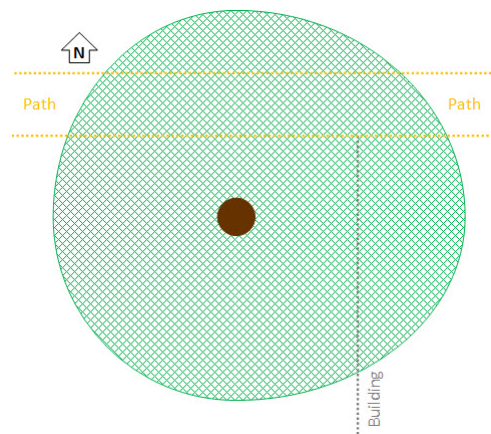
Required

- Minor remedial pruning (deadwood)
- Remove paths & roads within target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 81



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	164	
Height (m)	17.1	
Canopy Spread (m)	N	9
	S	8
	E	10
	W	8
Target Potential	1/2	
Impact Potential	1/81	
Probability of Failure	1/100	
Risk of Harm	1/17,413	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

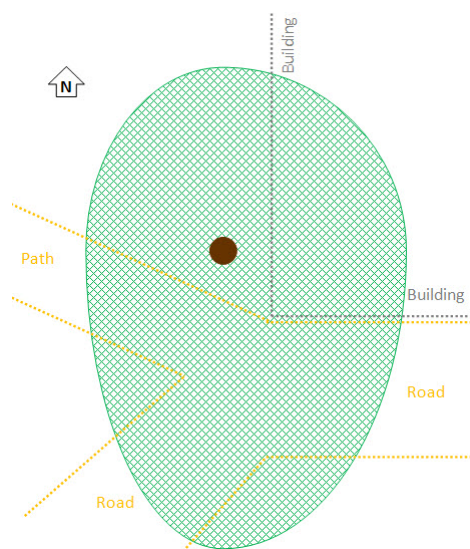
Required

- Minor remedial pruning (deadwood)
- Remove paths & roads within target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 82



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	118	
Height (m)	17.9	
Canopy Spread (m)	N	8
	S	13
	E	8
	W	6
Target Potential	1/2	
Impact Potential	1/81	
Probability of Failure	1/100	
Risk of Harm	1/17,250	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

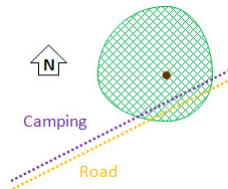
Required

- Minor remedial pruning (deadwood)
- Remove paths & roads within target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 85



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	32	
Height (m)	8.0	
Canopy Spread (m)	N	3
	S	2
	E	2
	W	3
Target Potential	1/16	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/7,299,669	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

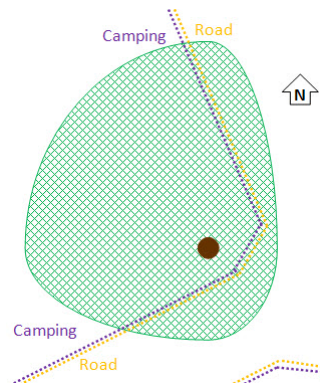
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 93



Species		<i>Melaleuca lanceolata</i> (Moonah)
DBH (cm)		91
Height (m)		12.6
Canopy Spread (m)	N	9
	S	4
	E	3
	W	8
Target Potential		1/3
Impact Potential		1/450
Probability of Failure		1/1,000
Risk of Harm		1/1,531,056
Risk Rating		Very Low

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

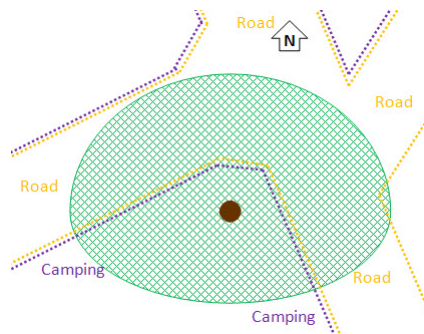
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 94



Species		<i>Melaleuca lanceolata</i> (Moonah)
DBH (cm)		Multi-Stem
Height (m)		14.0
Canopy Spread (m)	N	6
	S	4
	E	7
	W	7
Target Potential		1/2
Impact Potential		1/450
Probability of Failure		1/1,000
Risk of Harm		1/921,783
Risk Rating		Low

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

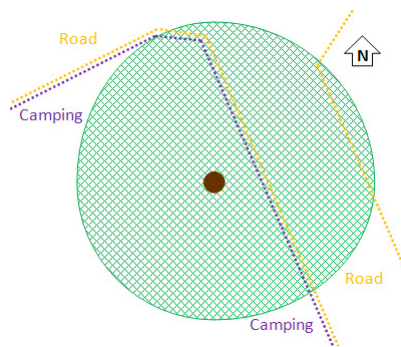
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 95



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	Multi-Stem	
Height (m)	14.4	
Canopy Spread (m)	N	7
	S	6
	E	7
	W	6
Target Potential	1/2	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/934,114	
Risk Rating	Low	

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

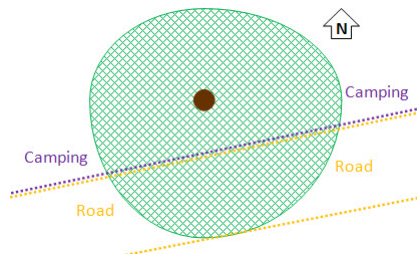
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 102



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	Multi-Stem	
Height (m)	10.4	
Canopy Spread (m)	N	4
	S	6
	E	6
	W	5
Target Potential	1/3	
Impact Potential	1/81	
Probability of Failure	1/1,000	
Risk of Harm	1/257,739	
Risk Rating	Low	

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

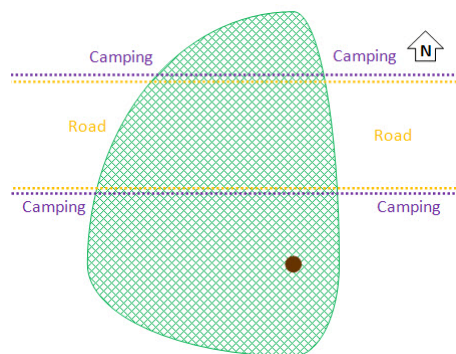
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 107



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	69	
Height (m)	16.5	
Canopy Spread (m)	N	11
	S	4
	E	2
	W	9
Target Potential	1/2	
Impact Potential	1/5	
Probability of Failure	1/10	
Risk of Harm	1/105	
Risk Rating	High	

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

The High risk represented by this tree relates to a fresh crack that has developed in a large upper co-dominance. The risk can be minimised by the immediate creation of a fenced 'Moonah Reserve' (John Patrick Pty Ltd, 2009), however this will have an impact on this summer's camping.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) which will allow the natural process of tree decline to occur in this indigenous population without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

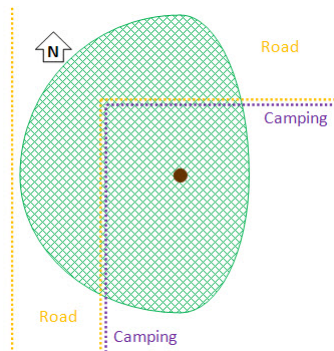
Required

- Construct exclusion fencing around target zone of the tree
- Consider removal if not possible

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 109



Species	<i>Eucalyptus gomphocephala</i> (Tuart)	
DBH (cm)	58	
Height (m)	12.4	
Canopy Spread (m)	N	7
	S	6
	E	3
	W	7
Target Potential	1/3	
Impact Potential	1/450	
Probability of Failure	1/100	
Risk of Harm	1/137,990	
Risk Rating	Low	

Discussion

This tree currently presents a Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

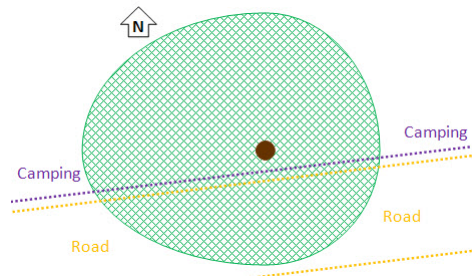
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 113



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	82	
Height (m)	11.3	
Canopy Spread (m)	N	6
	S	5
	E	5
	W	8
Target Potential	1/2	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/1,001,490	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

This tree is being considered for inclusion in a 'Moonah Reserve' (John Patrick Pty Ltd, 2009) and while this is not currently required based solely on risk management, the reserves will allow the natural process of tree decline to occur without the escalation of risk that usually accompanies this process.

Immediate Risk Management Recommendation

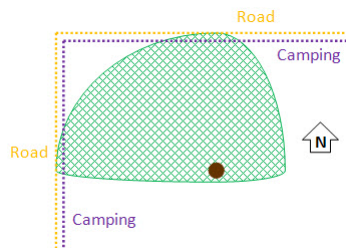
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 115



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	67	
Height (m)	10.7	
Canopy Spread (m)	N	6
	S	0
	E	3
	W	7
Target Potential	1/23	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/10,161,048	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

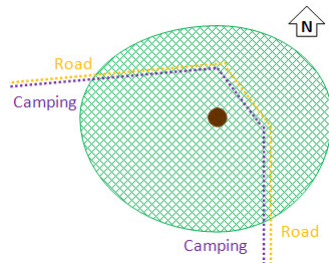
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 117



Species	<i>Melaleuca lanceolata</i> (Moonah)	
DBH (cm)	80	
Height (m)	8.5	
Canopy Spread (m)	N	4
	S	5
	E	5
	W	6
Target Potential	1/4	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/1,824,917	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

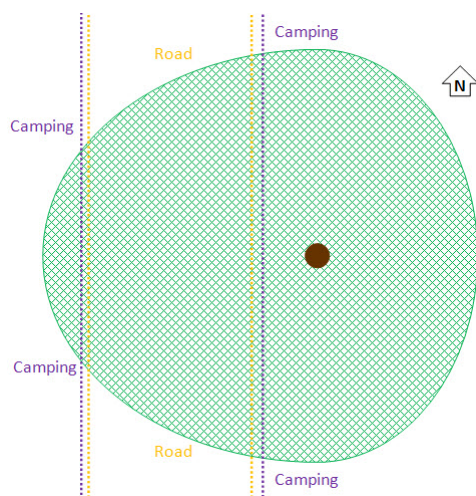
Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

Tree 120



Species	<i>Cupressus macrocarpa</i> (Monterey Cypress)	
DBH (cm)	105	
Height (m)	16.7	
Canopy Spread (m)	N	9
	S	9
	E	7
	W	12
Target Potential	1/2	
Impact Potential	1/81	
Probability of Failure	1/100	
Risk of Harm	1/16,605	
Risk Rating	Medium	

Discussion

This tree currently presents a Medium risk to people and property over the next 12 months.

While not currently considered a High risk, it is close enough to the threshold where minor changes in weather patterns and/or tree health can affect the Probability of Failure to an extent where this tree could become a High risk.

Given that the risk of this tree will only increase with time and beyond 12 months it is likely to represent a High risk to people and property, its removal in the short term to facilitate long term tree population management would be considered appropriate.

Immediate Risk Management Recommendation

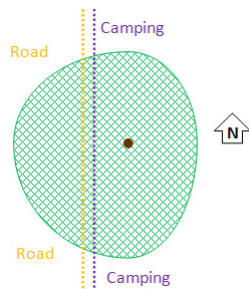
Required

- Minor remedial pruning (deadwood)
- Remove camping within target zone

Optional

- Establish mulch beds to drip-line of the tree

Tree 121



Species	<i>Allocasuarina verticillata</i> (Drooping She-oak)	
DBH (cm)	39	
Height (m)	13.7	
Canopy Spread (m)	N	4
	S	5
	E	3
	W	5
Target Potential	1/4	
Impact Potential	1/450	
Probability of Failure	1/1,000	
Risk of Harm	1/1,996,049	
Risk Rating	Very Low	

Discussion

This tree currently presents a Very Low risk to people and property over the next 12 months.

Immediate Risk Management Recommendation

Required

- There are no required actions

Optional

- Minor remedial pruning (deadwood)
- Establish mulch beds to drip-line of the tree

APPENDIX TWO

Explanation of Terms

Tree Assessment

Botanical Name

Is the Latin or Linnaean name of the tree. This will be recorded to varying degrees of accuracy depending on the scope of the report. As a minimum an identification based on field recognition of the plant will be undertaken.

Common Name

Is the name by which the tree species is colloquially known. It is important to realise that often one species can be known by many different common names or one common name can refer to many different species. Due to this plants will always be referred to by their accepted Scientific Name to avoid confusion.

Diameter and Circumference

The diameter of the tree can be measured at either 1.4m above the ground (known as diameter at breast height or DBH) or at the base of the tree depending on the requirements of local governments or the client. In the case of multi stemmed trees either individual values for each stem will be recorded or the diameter/circumference will be measured only at the base of the tree.

Canopy Spread

The canopy spread is the distance measured in four directions from the trunk of the tree to the furthest extent of the foliage.

Origin

The origin of a plant is defined as follows:

Indigenous	occurs naturally in the area directly surrounding the subject site
Local Native	occurs naturally in the state where the subject site is located but is not Indigenous
Native	occurs naturally in mainland Australia but is not Indigenous or Local Native
Exotic	occurs naturally outside mainland Australia

Tree Health

Tree health is defined as follows:

Good	Plant has strong evidence of recent or current growth, none or minimal signs of
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	decline (ie. deadwood), better than average foliage density and quality and none or minimal signs of pest or disease infestation.
Fair	Plant show signs of recent or current growth, minimal or normal signs of decline (ie. deadwood), typical foliage density and quality and minimal or within acceptable limits signs of pest or disease infestation.
Poor	Plant does not show signs of recent or current growth, more than normal signs of decline (ie. deadwood), less than typical foliage density and quality and high levels of signs of pest or disease infestation.
Dead	No sign of growth and plant is beyond rejuvenation through remedial works.

Tree Structure

Tree structure is defined as follows:

Good	None or minimal signs of inherent structural weakness.
Fair	Minimal or within acceptable limits signs of inherent structural weakness.
Poor	Many or substantial signs of inherent structural weakness.

ULE

ULE stands for the Useful Life Expectancy of the tree. This is an estimate of how long the assessor believes the tree will remain of acceptable risk to people and property, in reasonable health and/or suitable in the site. Please note that this is a very rough estimate of tree longevity and does not take into account changes in environment that may occur and is intended as a guide for planning the future management of the site.

Age

Determining the precise age of a tree, particularly in climates where the difference between seasons is less pronounced, is extremely difficult. It is more appropriate, therefore, to consider the age of the tree relative to the expected lifespan of that tree. This can be defined as follows:

Juvenile	Exhibits juvenile characteristics of the species. Generally <10% of the expected lifespan.
Semi Mature	No longer exhibits juvenile characteristics but is not yet fully grown. Generally between 10% and 30% of the expected lifespan.
Mature	Fully grown with no (or minor) signs of decline. Generally between 30% and 80% of the expected lifespan.
Over Mature	Signs of decline evident and often associated with large scale failures in some species. Generally >80% of the expected lifespan.

QTRA Risk Assessment

QTRA Risk Assessment

QTRA stands for Quantified Tree Risk Assessment. It is a method of calculating the risk of harm to people and property from trees developed in the United Kingdom by Mike Ellison (2005, 2007). The risk is calculated as the probability of a hazard being realised (ie. a branch falling) and resulting in injury or damage over the next 12 months.

This method is used, rather than other methods, as the result is a consistent and probabilistic calculation of risk that can be compared across sites and species and measured against published acceptable limits of risk. It also allows the majority of inputs into the risk assessment to be objectively calculated and other experts in arboriculture to review the assessment and justification for each input calculation.

Target Potential

There are three types of targets considered: pedestrian, vehicular and property.

The calculation of the target potential for people and moving vehicles relates to the relative occupancy (ie. how much time relative to a given time period) of a position in which a given hazard could cause injury or damage to a target. For example, if a person were to stand under a tree for two hours every day of the year, the site occupancy would be 2 out of 24 hours, or $1/12$ of the time. This calculation can also involve the site area, where visitors to a site are assumed to have an equal chance of being in any given place during a given time period. For example, if 200 people were to visit a $10,000\text{m}^2$ site, then there is a 1 in 50 chance of a person being in any given square metre during the given time period.

When calculating the target potential for stationary vehicles or property that is in a fixed position, the replacement value or cost to repair is used. To relate this back to the pedestrian calculation however, the dollar value must be converted to a probability. To do this the 'Value of Statistical Life' (which in very rough terms is the cost to reduce the average number of deaths by one) is used. Currently the value used is \$2.3 million which is based on a currency conversion from a standard value in the UK (Ellison, 2007). For example, if the cost to repair a house from a tree failure was \$10,000, then the probability is calculated as 10,000 divided by 2.3 million or $1/230$.

To combine these values in the case of multiple targets the calculated value for all targets are added together to make the total target probability. For example, using the examples above, $1/12$ plus $1/230$ equals $1/11$.

Impact Potential

The consequence of failure relates to the size of part that is considered most likely to fail. This is based on the mass of the branch or stem which is calculated by a pre-developed relationship between the diameter of the part and the mass (Ellison, 2007). To simplify these calculations is has

been assumed that a part > 450mm in diameter will cause maximum damage and that a part < 10mm in diameter will cause negligible damage. For example, if the assessor is of the opinion that a branch of 50mm in diameter is the most likely part of the tree to fail, then the value used is 1/450. The following table illustrates a simplified range of values:

Size of Part Likely to Impact Target	Impact Potential
> 450mm diameter	1/1
250 - 450mm diameter	1/2
100 - 250mm diameter	1/8.6
50 - 100mm diameter	1/82
25 - 50mm diameter	1/450
< 25mm diameter	1/2500

From Ellison 2007

Probability of Failure

Unfortunately there is no completely objective method by which to predict probability of failure and this is calculated using the training and experience of the assessing arborist. The method by which it is calculated is to visualise multiple individual trees identical to the one being assessed and estimate how many would be expected to fail over the next year. For example, if there were 1,000 trees identical to the one being assessed and over the next year it is the assessor's opinion that 2 would be likely to fail, then the value used is 1/500.

Risk of Harm

The risk of harm is then calculated by multiplying the result of the previous calculations. For example, using the previous examples, the result would be $1/11 \times 1/450 \times 1/500$ which equals 1/2,475,000.

To get an idea of what this means, the following can be used as a guide:

Risk of Harm	Risk Rating
1/1 to 1/10,000	High
1/10,000 to 1/100,000	Medium
1/100,000 to 1/1,000,000	Low
> 1/1,000,000	Very Low

It is important to recognise that the above is a guide and that it is up to the individual to determine what level of risk they are prepared to accept. It also needs to be recognised that in an Australian context risk must be managed according to the hierarchy of controls for hazard control (ie. elimination, substitution, separation, administrative control, PPE).

APPENDIX THREE

References

- ELLISON, M. J. (2005) Quantified tree risk assessment used in the management of amenity trees, *Journal of Arboriculture*, **31** (2).
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- HEALTH AND SAFETY EXECUTIVE (1996) *Use of Risk Assessment within Government Departments*, HSE Books, Suffolk, UK.
- JOHN PATRICK PTY LTD (2009) 'Draft Tree Management, Removal and Replacement Strategy: for Princess, Citizens and Victoria Parks', Borough of Queenscliff.

APPENDIX FOUR

Assumptions and Limiting Conditions

Any legal description provided to ArbEcology Pty Ltd is assumed to be correct. Any titles and ownerships to any property are assumed to be correct. No responsibility is taken for matters outside the control of ArbEcology Pty Ltd.

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