Aboricultural Impact Assessment Report

24 Stewart Street, Lennox Head

Prepared for: ***Ballina Shire Council***
Prepared on: ***19 August 2022***
Prepared by: ***Bronson Branch (Dip Arboriculture)***
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19 August 2022

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Introduction

This report is prepared to assess the arboricultural impacts of two trees on public land recently impacted by lightning strike, assess the implications to the trees future health and the public risk associated and to comply with Ballina Shire Council Policy Urban Vegetation on Public Land Policy requirements for removal of significant trees within the shire.

Methodology

A Visual Tree Assessment was conducted from the ground only and no invasive or diagnostic techniques were used when examining the tree. VTA observes the external indications given by the tree at the time of inspection to determine health and the structural integrity of the tree.

A tangent height gauge was used to measure tree height. Diameter at Breast Height (DBH) and other site measurements were taken using a double sided 10m diameter/measuring tape.

The DBH was measured at 1.4m above the natural ground level.

Distances were measured using geospatial imagery tools.

Images were taken by council arborist Bronson Branch using iPhone 6.

Observations

Tree No.	Species	Common name	DBH	Height	Canopy Spread	Health	Age	SULE
1	Araucaria columnaris	Cook Island Pine	700mm	20m	6m	Poor	Juvenile	4d
2	Araucaria columnaris	Cook Island Pine	700mm	20m	6m	Poor	Juvenile	4a

2 x Araucaria columnaris / Cook Island Pine trees listed on the Ballina Shire Council Significant Tree Register.

Both trees are located road reserve 3m east of the boundary of 24 Stewart Street. The trees are growing in sandy soil with compacted and hard paved surfaces to the east.
A pole supporting electrical service lines is located 1.5m to the north of tree 1 and the line traverses beneath the trees canopy. A second line traversers approx. 5m south of tree 2.

Three houses to the west of the trees are within the fall height of the trees. The front yard of No. 24 is beneath the drip line of both trees. Vehicles are occasionally parked beneath the trees drip line. Traffic on Stewart Street is frequent and passes within the fall height. pedestrian foot traffic is occasional. Overhead powerlines are situated 12m to the east within the fall height.

The trees have previously been observed as being in good health with no defects prior to the storm event / lightening strike. The trees are now declining in health with necrotic foliage from the apical tip down, this would indicate that cellular damage has occurred interrupting water flow between the roots and the crown. Bark discoloration is also evident however there are no signs of bark splits or cracks in the trunks of the trees.

Tree No. 1 the northern tree is showing progressive indications of decline extending 50 % of tree height, dead and dying foliage.

Tree No. 2 the southern tree has die back in the apical tip approximately 10% of total canopy showing signs of decline at this stage. It assumed the lightning has transferred thru the ground water at the time of the strike and impacted both trees.

Discussion

The trees were struck by lightning on Sunday 6th March 2022 and have been frequently monitored since 08 March 2022. In the 5 months since the initial inspection the trees have made an obvious decline in health.
Video footage of the strike was captured and posted on social media. I have viewed the video (see appendix 4) and the strike appears to traverse through the tree and transfer into the power pole 1.5m away where the strike earthed into the ground, this has allowed the energy to dissipate instead of exploding out of the tree. It is assumed that the lightning strike has damaged internal and external tissues of the trees.

A tree struck by lightning has been stressed severely. The intense heat and energy of the strike compromises the trees internal and external physiology both above and below the ground. Water is a better electrical conductor than wood, lightning striking a tree tends to travel just underneath the bark, damaging the phloem and Xylem and the trees ability to transport water and nutrients essential for growth. When the water component is absent from the trees wood it becomes brittle and eventually breaks.

Recommendations

Tree 1: Tree removal is recommended under BSC Policy Urban Vegetation on Public Land part A (tree with unacceptable public risk)

Tree 2: Height reduction pruning to remove apical damage in tip of tree.
Continued monitoring at 3-month interval or less to observe for further decline. This tree is very likely to require removal in the future.

Conclusion

The rate of decline in the trees is becoming more rapid due to the dryer conditions. The decline is expected to continue, and ultimately lead to tree death.

In the probable event of failure, the targets include high value property and possible serious injury.
Based on the results of the ISA Risk Assessment & VTA forms attached, the risk is calculated as high due to an inherent defect and the predominant easterly winds blowing in the direction of permanent targets.

Appendix 1: Location of tree.

Appendix 2. Sule Ratings

TreeAZ

SULE: Its use and status into the New Millennium

Appendix 3
Safe Useful Life Expectancy Categories (Updated 04/01)

This reference sheet should be included as supplementary information with all reports where a SULE assessment is an element. Additionally, it can be copied and covered with a laminated plastic protective sheet and used as a field sheet to help with data collection.

Safe Useful Life Expectancy Categories (Updated 01/04/01)

1: **Long SULE:** Trees that appeared to be retainable at the time of assessment for more than 40 years with an acceptable level of risk.
- **(a)** Structurally sound trees located in positions that can accommodate future growth.
- **(b)** Trees that could be made suitable for retention in the long term by remedial tree care.
- **(c)** Trees of special significance for historical, commemorative or rarity reasons that would warrant extraordinary efforts to secure their long term retention.

2: **Medium SULE:** Trees that appeared to be retainable at the time of assessment for 15–40 years with an acceptable level of risk.
- **(a)** Trees that may only live between 15 and 40 more years.
- **(b)** Trees that could live for more than 40 years but may be removed for safety or nuisance reasons.
- **(c)** Trees that could live for more than 40 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- **(d)** Trees that could be made suitable for retention in the medium term by remedial tree care.

3: **Short SULE:** Trees that appeared to be retainable at the time of assessment for 5–15 years with an acceptable level of risk.
- **(a)** Trees that may only live between 5 and 15 more years.
- **(b)** Trees that could live for more than 15 years but may be removed for safety or nuisance reasons.
- **(c)** Trees that could live for more than 15 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- **(d)** Trees that require substantial remedial tree care and are only suitable for retention in the short term.

4: **Remove:** Trees that should be removed within the next 5 years.
- **(a)** Dead, dying, suppressed or declining trees because of disease or inhospitable conditions.
- **(b)** Dangerous trees because of instability or recent loss of adjacent trees.
- **(c)** Dangerous trees because of structural defects including cavities, decay, included bark, wounds or poor form.
- **(d)** Damaged trees that are clearly not safe to retain.
- **(e)** Trees that could live for more than 5 years but may be removed to prevent interference with more suitable individuals or to provide space for new planting.
- **(f)** Trees that are damaging or may cause damage to existing structures within 5 years.
- **(g)** Trees that will become dangerous after removal of other trees for the reasons given in (a) to (f).
- **(h)** Trees in categories (a) to (g) that have a high wildlife habitat value and, with appropriate treatment, could be retained subject to regular review.

5: **Small, young or regularly pruned:** Trees that can be reliably moved or replaced.
- **(a)** Small trees less than 5m in height.
- **(b)** Young trees less than 15 years old but over 5m in height.
- **(c)** Formal hedges and trees intended for regular pruning to artificially control growth.

www.TreeAZ.com

Appendix 3: Tree Risk Assessment Form Tree 1.

ISA Basic Tree Risk Assessment Form

Client: Ballina Shire Council — Date: 17/08/2022 — Time:

Address/Tree location: 24 Stewart street lennox Head — Tree no. 1 — Sheet ___ of ___

Tree species: Araucaria columnaris — dbh: 700 (est) — Height: 20m — Crown spread dia.: 6m

Assessor(s): Bronson Branch - AQF L5 — Time frame: 3 months — Tools used: Binocculars

Target Assessment

Target number	Target description	Target zone: Target within drip line	Target within 1 x Ht.	Target within 1.5 x Ht.	Occupancy rate (1 – rare, 2 – occasional, 3 – frequent, 4 – constant)	Practical to move target?	Restriction practical?
1	houses Nos.22, 24 & 26		✔		4		
2	road passing traffic	✔			3		
3	pedestrian	✔			2		
4							

Site Factors

History of failures no — **Topography** Flat ■ Slope ☐ ___% — **Aspect** east

Site changes None ☐ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe ___

Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ■ Pavement over roots ■ ___% Describe adjacent to curb

Prevailing wind direction NE-SE — **Common weather** Strong winds ■ Ice ☐ Snow ☐ Heavy rain ■ Describe ___

Tree Health and Species Profile

Vigor Low ■ Normal ☐ High ☐ — **Foliage** None (seasonal) ☐ None (dead) ☐ Normal 50 % Chlorotic 25 % Necrotic 25 %

Pests ___ — **Abiotic** ___

Species failure profile Branches ☐ Trunk ☐ Roots ☐ Describe typicall sound trees

Load Factors

Wind exposure Protected ☐ Partial ☐ Full ■ Wind funneling ☐ ___ — **Relative crown size** Small ☐ Medium ■ Large ☐

Crown density Sparse ☐ Normal ■ Dense ☐ — **Interior branches** Few ☐ Normal ■ Dense ☐ — **Vines/Mistletoe/Moss** ☐ ___

Recent or planned change in load factors no

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown ☐ LCR 80 %

Dead twigs/branches ☐ ___% overall Max. dia. ___

Broken/Hangers Number ___ Max. dia. ___

Over-extended branches ☐

Pruning history

Crown cleaned ☐ Thinned ☐ Raised ☐

Reduced ☐ Topped ☐ Lion-tailed ☐

Flush cuts ☐ Other ___

Cracks ☐ ___ Lightning damage ■

Codominant ☐ ___ Included bark ☐

Weak attachments ☐ ___ Cavity/Nest hole ___% circ.

Previous branch failures ☐ ___ Similar branches present ☐

Dead/Missing bark ☐ Cankers/Galls/Burls ☐ Sapwood damage/decay ☐

Conks ☐ Heartwood decay ☐ ___

Response growth ___

Main concern(s) dead wood detaching above targets

Load on defect N/A ☐ Minor ■ Moderate ■ Significant ☐

Likelihood of failure Improbable ☐ Possible ☐ Probable ■ Imminent ☐

— Trunk —

Dead/Missing bark ☐ Abnormal bark texture/color ■

Codominant stems ☐ Included bark ☐ Cracks ☐

Sapwood damage/decay ■ Cankers/Galls/Burls ☐ Sap ooze ☐

Lightning damage ■ Heartwood decay ☐ Conks/Mushrooms ☐

Cavity/Nest hole ___ % circ. Depth ___ Poor taper ☐

Lean ___° Corrected? ___

Response growth ___

Main concern(s) wind snap from predominent wind in direction of houses

Load on defect N/A ☐ Minor ☐ Moderate ■ Significant ■

Likelihood of failure

Improbable ☐ Possible ☐ Probable ■ Imminent ☐

— Roots and Root Collar —

Collar buried/Not visible ☐ Depth ___ Stem girdling ☐

Dead ☐ Decay ☐ Conks/Mushrooms ☐

Ooze ☐ Cavity ☐ ___% circ.

Cracks ☐ Cut/Damaged roots ☐ Distance from trunk ___

Root plate lifting ☐ Soil weakness ☐

Response growth ___

Main concern(s) up rooting due to weakend or decayed roots effected by lightning

Load on defect N/A ☐ Minor ☐ Moderate ☐ Significant ■

Likelihood of failure

Improbable ☐ Possible ■ Probable ☐ Imminent ☐

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Risk Categorization

Condition number	Tree part	Conditions of concern	Part size	Fall distance	Target number	Target protection	Likelihood: Failure: Improbable	Failure: Possible	Failure: Probable	Failure: Imminent	Impact: Very low	Impact: Low	Impact: Medium	Impact: High	Failure & Impact (from Matrix 1): Unlikely	Somewhat	Likely	Very likely	Consequences: Negligible	Minor	Significant	Severe	Risk rating of part (from Matrix 2)
1	Crown	dead wood detaching above targets	100	22	1				●				●			●				●			Low
					3				●			●			●						●		Low
2	Trunk	wind snap from predominent wind			1				●					●			●					●	High
					2				●				●			●						●	moderate
					3				●			●			●							●	Low
3	Roots	up rooting due to weakend or decayed roots			1			●						●		●						●	moderate
					2			●					●		●							●	Low
					3			●				●			●							●	Low
4																							

Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impacting Target: Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure: Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low

Notes, explanations, descriptions

Mitigation options continued monitoring — **Residual risk** High

tree removal — **Residual risk** Low

Residual risk

Residual risk

Overall tree risk rating Low ☐ Moderate ☐ High ■ Extreme ☐ **Work priority** 1 ■ 2 ■ 3 ☐ 4 ☐

Overall residual risk Low ■ Moderate ☐ High ☐ Extreme ☐ **Recommended inspection interval**

Data ■ Final ☐ Preliminary **Advanced assessment needed** ■ No ☐ Yes-Type/Reason

Inspection limitations ☐ None ■ Visibility ☐ Access ☐ Vines ☐ Root collar buried Describe Inspection from the ground only

This datasheet was produced by the International Society of Arboriculture (ISA) and is intended for use by Tree Risk Assessment Qualified (TRAQ) arborists – 2013

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Appendix 4: Tree Images

Tree 1: Looking southeast

Tree 2: Dieback in apical tip and upper third of crown.

Trees 1 & 2 looking west

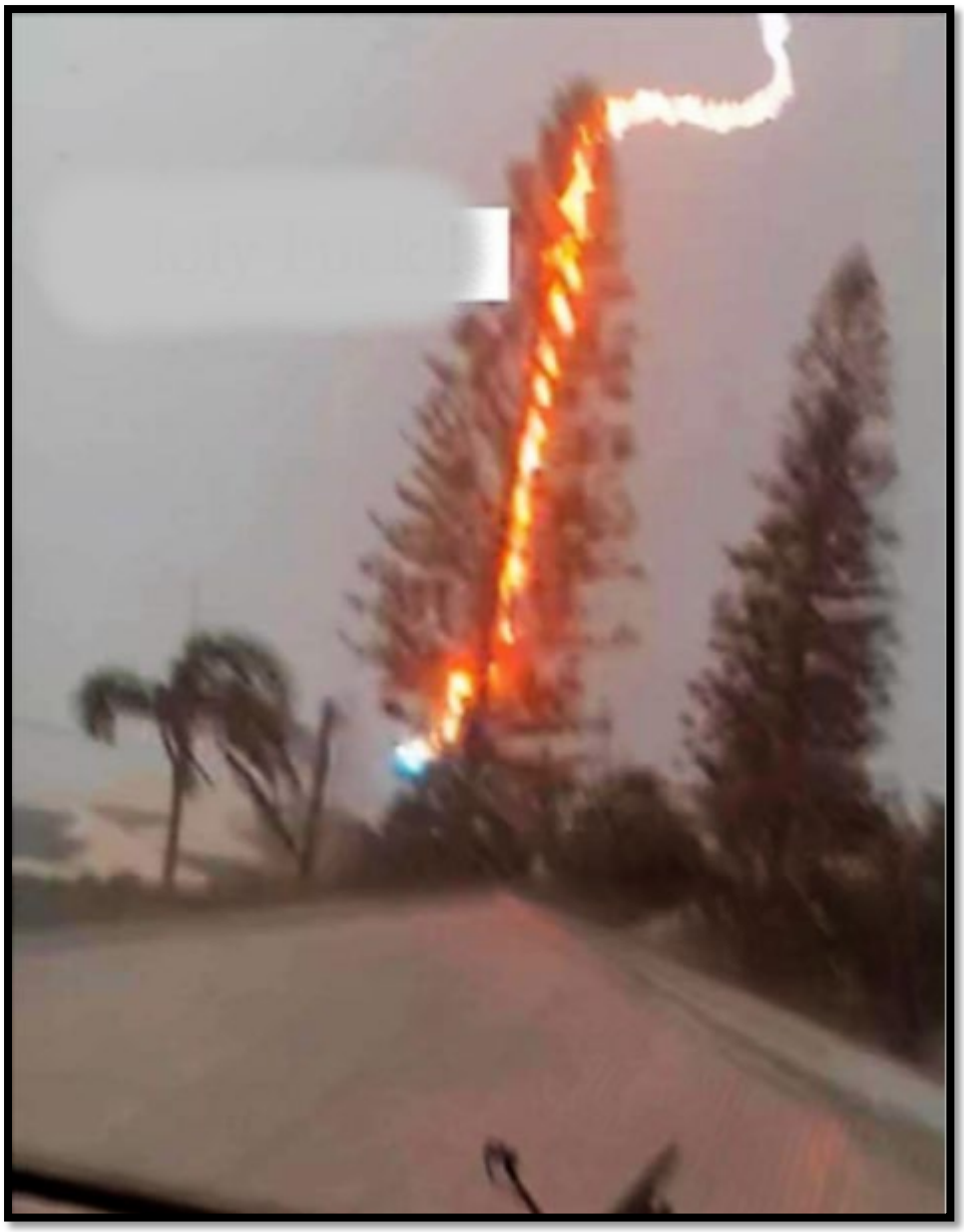

Image taken 6 March 2022 extracted from Facebook.

References:

https://www.rbgsyd.nsw.gov.au/stories/2017/what-happens-when-lightning-strikes-a-tree

Matheck, C, 1994, Field Guide for Visual Tree Assessment