

Arboricultural Assessment Report

Papakura STEM Evaluation

Prepared For

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Prepared By

Andre Le Claire & Karl Burgisser
of
Arborlab Consultancy Services Limited

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1. Executive Summary

Arborlab Limited has been engaged to evaluate nominated and other suitable trees for Auckland Councils Plan Change to the Auckland Council District Plan: Papakura Section, using the Standard Tree Evaluation Method.

Arborlab have reviewed these evaluations in comparison with a random sample of the existing schedule and recommend the threshold for inclusion should be set at 126 points.

This threshold has been determined as capturing the most significant trees within the Papakura District and is supported by existing policies and robust rationale.

2. Introduction

Arborlab Ltd has been engaged by Auckland Council to evaluate trees nominated for inclusion in the Auckland Council District Plan: Papakura Section Schedule 3B-Trees and Areas of Landscape to be Protected. This engagement also included capturing trees suitable for evaluation as part of the proposed plan change.

Following the Resource Management (Simplifying and Streamlining) Amendment Act 2009 and the amalgamation of Auckland Council in 2010, Auckland Council has initiated plan changes to capture trees suitable for inclusion in the schedules of notable trees for each of the District Plans within the Auckland Region.

Arborlab Ltd has undertaken evaluations of all nominated trees in the urban environment and recommended and evaluated additional trees.

It is noted that this evaluation process was undertaken without the knowledge of a predetermined threshold, nor were scores calculated at the time of evaluation. For this reason, there is greater security these trees have been evaluated on merit rather than any conscious or unconscious manipulation of scores for any tree(s) to achieve or fail a predetermined threshold.

3. Methodology

The original and basic version of the Standard Tree Evaluation Method (STEM) by Ron Flook (1996) has been applied with all assessments including both the new trees and the field study of the existing scheduled trees. This is the preferred methodology used by the New Zealand Institute of Horticulture (RNZIH) and it is generally considered the most robust and widely accepted throughout the industry.

The STEM methodology requires an assessment of each tree or group of trees against criteria, each criterion is awarded a point's score out of 30, these can be represented as a percentage of the optimal score 30 points equalling 100%. The applicable scoring and associated percentages are shown below and relate to the description in each criterion.

Points	3	9	15	21	27	30
Percentage	10%	30%	50%	70%	90%	100%

The criteria is broken up and calculated into the following groups, Condition Evaluation, Amenity Evaluation and Notable Evaluation. The Notable Evaluation required researched and documented confirmation from a Historian on the age, association and commemoration components to support a claim in these categories. e.g. Historian to prove association with an historic person or event.

Condition Evaluation

- Form
- Occurrence
- Vigour/Vitality
- Function
- Age

Amenity Evaluation

- Stature
- Visibility
- Proximity
- Role
- Climate

Notable Evaluation

- Stature
 - Feature
 - Form
- Historic
 - Age
 - Association
 - Commemoration
 - Remnant
 - Relict
- Scientific
 - Source
 - Rarity
 - Endangered

While it has previously been stated that the STEM method is generally considered the most robust and widely accepted, it should also be acknowledged these evaluations have a level of subjectivity and therefore an advice note explaining how the STEM method has been applied is provided in Appendix 1.

4. Notable Tree Field Study

To assist in determining the threshold, a field study of Schedule 3B- Trees and Areas of Landscape to be Protected was undertaken. This study surveyed 11 existing scheduled trees/groups of trees.

Findings of the field study are listed below;

Minimum:	120
25 th Percentile:	132
Mean:	140
Median:	132
75 th Percentile:	147
Range:	48
Maximum:	168

5. Threshold Discussion

Considering the field study of existing scheduled trees, it is considered appropriate to set the threshold for the plan change at 126. This would trigger all trees, achieving a score of 126 or greater, immediate inclusion as proposed protected trees for the plan change. This threshold is considered appropriate to be applied across the district.

The rationale supporting the threshold being set at 126 includes;

- The majority of the trees meeting this threshold have attained dimensions where their visual catchment is increased and their amenity can be enjoyed by surrounding properties and the general public.
- All of the scheduled trees scored over 126, with the exception of one tree which scored lower due to poor health and condition.
- 126 is considered a low enough threshold to include prominent, well-formed younger trees that not have reached their optimal dimensions. These trees are not as large or old enough to have the same level of cultural or historic association as some other existing and proposed listings. However, capturing these is considered essential to provide a schedule of significant trees with a range of useful life expectancy and avoid only protecting the oldest tree stock with a limited life expectancy in comparison.

Special consideration on a case by case basis should be provided for any tree which scores within the Notable Evaluation criteria which does not meet the threshold applied. Such a provision would allow for any tree having significance within the Notable Evaluation criteria to be included. This is considered important due to the scoring and threshold process, a valued notably significant tree could be excluded due to other characteristics for which it is not valued.

6. Recommendations

Considering the rationale provided, the threshold is recommended to be set at 126. This is recommended as a suitable threshold as this captures the trees that are potentially perceived as significant by the general public, but low enough to capture additional trees with high amenity values. As earlier mentioned it is important to capture these for their preservation for the future considering many of these are likely to have a superior life expectancy.

The provision for inclusion in the schedule of notable trees on a case by case basis is recommended for any tree which does not meet the threshold, however scores within the Notable Evaluation criteria.

With regard to pest plants, it has been resolved through general consensus, to exclude any formally identified pest on the basis that the negative characteristics of the species prevail over any positive contribution. This identifies particularly with visual amenity and Phoenix Palms (*Phoenix canariensis*).

It is noted for a species to be considered a formal pest plant, these species must be identified as a pest plant (surveillance pest plant or greater) in the operative Auckland Regional Pest Management Strategy (ARPMS) or included in the National Pest Plant Accord (NPPA).

Finally through mutual consensus the exclusion of any tree(s), which in the opinion of the assessing arborist is currently or foreseeably creating any undue damage, destruction or major interference to persons and/or property.

Upon reflection of the evaluations, a list of trees that are considered appropriate to be scheduled in the Auckland Council District Plan: Papakura Section has been forwarded to the Auckland Council Planner for their consideration.

7. Summary

Specifics of the evaluations are as follows;

77 trees or sites were assessed for inclusion in the plan change in total;
11 randomly selected scheduled trees/sites were evaluated to determine the proposed threshold;

63 trees achieved equal to or greater than 126 and are proposed to be included in the plan change; (Appendix 2)

9 trees/sites which failed to attain the proposed threshold; (Appendix 3)

5 trees/sites that scored above the threshold which have been excluded on the grounds they are a pest plant or creating undue interference; (Appendix 4)

Scheduled trees evaluated and scores (Appendix 5)

8. Conclusion

Considering the desire to include only trees valued and significant within the Papakura District, the determination of a threshold of 126 is recommended as appropriate to apply.

The inclusion of all trees meeting this threshold and the inclusion of trees scoring in the Notable Evaluation criterion (as well as the exclusion of formal pest plants and trees which are currently or foreseeably creating any undue damage, destruction or major interference) are all supported by Arborlab Ltd.

Appendix 1 – STEM Advice Notes

Condition Evaluation

- Form

This includes shape and symmetry being typical, good, poor etc. for the species as well as including branching structure within this category which is generally separate. The score has been applied as a medium of these two separate characteristics.

- Occurrence

This has been evaluated considering the local tree stock in the Papakura area, with the obviously most common vegetation type scored as predominant. In this region there was a mixed range of species and therefore native species such as Totara has been evaluated as predominant, scoring 3.

Due to the timing of the assessments, many trees were devoid of flowers, fruit and foliage, creating uncertainty in distinguishing between species. Considering this, the default position of the genus has been applied. An example of this is Oak being determined as common, however it is acknowledge differing species of Oak are less frequent and even rare within the district. The application of this default is considered conservative and consistent with the intention STEM is to be applied.

- Vigour/Vitality

Due to the timing of the assessments, many of the exotic trees were devoid of foliage due to seasonal leaf abscission. This absence limits the accuracy of the evaluation, where size, density, discoloration and distortion of leaf could not be assessed for the determination of vitality. For this reason other indications were utilised, including the hue of the canopy, density of buds, fruit set, absence/presence of lichens on small diameter branches etc.

Specific to vigour, previous and current growth increments were observed when easily identified from ground level.

- Function

Considering the great majority of trees were of reasonably significant age and dimensions, a default position was created, which considers all trees as having a useful function and having a positive environmental benefit, therefore scoring 9.

When a tree had an obviously higher contribution in an aspect of function, this was then scored accordingly. Groups of trees are noted as generally being of greater value in this criterion than singular trees.

- Age

This is a particularly difficult area of the STEM evaluation due to the changing scale as well as the general subjective nature of this estimation. No prior identification had been undertaken to view trees known to be of x years in age in comparison to another of x years in age prior to gain a greater understanding of species typical development in the region.

Generally exotic trees were scored conservatively, while native trees given their known slower growth rates in general were considered older.

Amenity Evaluation

- Stature

These were scored in metres and consider the subject trees greatest dimension whether that was height or crown spread. These were almost always estimated and conservatively applied.

- Visibility

This was applied considering the distance a person would be able to view and distinguish the tree or group of trees being assessed. This score related to proximity and stature of the tree as well as the geographical topography.

- Proximity

Large statured trees which were growing in association with other smaller shrubs or trees could be determined as solitary if this tree dominated the others into insignificance in comparison and was considered appropriate by the assessing arborist.

Due to the gap between a solitary tree and 3+ in the STEM evaluation, two trees of the same species growing together were also considered solitary for this purpose, where two trees of differing species were considered in the group 3+.

- Role

This is a subjective criterion when the assessor determines the trees contribution to the local landscape in purely aesthetical terms. In this criterion the location, prominence and visual catchment are key factors to consider when attributing a score to the positive visual influence of this tree(s) in this location.

Timing is also a factor as people will often associate an increased level of amenity with autumn colour, flowering or fruiting as being more highly valued. Considering this is species dependant, a tree's score would vary depending on the time of assessment.

- Climate

This criterion had a direct relationship with the associated land use in close proximity to the tree(s) being assessed. Factors considered were dwellings, car parks, seating or recreation areas, as well as stock shelter. In this instance minor (3) is the default and it was a requirement for the subject tree to have a direct benefit on something adjacent to provide shelter from the various elements. Groups of trees were also generally more valued in this criterion.

Notable Evaluation

All scores in the notable section were scored very conservatively and only where it was considered that the tree was an exceptional example. The age, association and commemoration components were left blank given that historical expertise will be required to determine whether these categories should be scored.

- Stature

- Feature

In the Papakura study area no trees were scored in this section. Trees score in this criterion for being of very high prominence or being easily recognisable as valued in their growing environment.

- Form

In the Papakura study area no trees were scored in this section. Trees only score in this criterion if they are impressive examples of their species as determined by the assessing arborist.

- Historic

- Age

To be scored only when supported by written research evidence from a historian.

- Association

To be scored only when supported by written research evidence from a historian.

- Commemoration

To be scored only when supported by written research evidence from a historian.

- Remnant

In the Papakura study area no trees were scored in this section. Scores are given in this section for trees which existed as part of a previous land use or activity and remain; and only where written evidence is provided.

- Relict

In the Papakura study area no trees were scored in this section. This section applies to trees considered to be part of an original forest which has now been modified from their original growing environment (forest trees now growing in urban subdivision). Trees were only scored here when supported by written evidence.

- Scientific

- Source

In the Papakura study area no trees were scored in this section. No evidence was found that would indicate that any of the trees had exceptional history in relation to their seed source or any distinctive variation of the species.

- Rarity

This would only be triggered if the species being assessed was the only known example of the species, subspecies, variety or cultivar in the area and applied accordingly to various level of significance e.g. local, district, region etc.

STEM acknowledges that the New Zealand Botanical Society should also be utilised to confirm rarity.

- Endangered

This was applied when a species is being predated to a point where this threatens the survival of this genus or species etc. This has been applied across the region with the Elm and Zelkova geneses due to the risk of greater Auckland's known Dutch Elm Disease concerns.

Appendix 2 – Trees Achieving the Threshold and Recommended for Scheduling (Total of 63 Sites)

Assessment #	Property No	Address	Common Name	Botanical Name	TOTAL
1	56	Great South Rd	3 x Totara	<i>Podocarpus totara</i>	126
3	48	Road Reserve outside 48 Great South Road	Totara	<i>Podocarpus totara</i>	138
4	48	Great South Rd	Totara	<i>Podocarpus totara</i>	126
6	27a	Great South Rd	Italian Cyprus	<i>Cupressus sempervirens</i>	126
10	30	Great South Rd	Oak	<i>Quercus sp</i>	174
11	1/2	Taonui St	Pohutakawa	<i>Metrosideros excelsa</i>	162
12	414	Great South Rd	Oak	<i>Quercus sp</i>	150
14	360-368	Great South Rd	Native group containing Kahikatea, Rimu, Miro, Titoki, Kauri & Totara	<i>Dacrydium dacrydioides / Dacrydium cupressinum / Prumnopitys ferruginea / Alectryon excelsus / Agathis australis / Podocarpus totara</i>	150
15	365-367	Great South Rd	7 x Totara	<i>Podocarpus totara</i>	138
16	1/2	Prictor St	Rimu	<i>Dacrydium cupressinum</i>	132
17	22	Marne Rd	Oak	<i>Quercus sp</i>	144
19	1/40	Clevedon Rd	Juniper	<i>Juniperus sp</i>	132
21	184	Clevedon Road	Norfolk Island Pine	<i>Araucaria heterophylla</i>	156
22	16	Onslow Rd	Kauri	<i>Agathis australis</i>	144
24	7 & 5	Butterworth Ave	Rewarewa, Rimu, 2x Totara	<i>Knightia excelsa / Dacrydium cupressinum / Podocarpus totara</i>	162
25	7 & 5	Butterworth Ave	3x Kauri	<i>Agathis australis</i>	144
26	6	Butterworth Ave	Rimu	<i>Dacrydium cupressinum</i>	138
27	31	Butterworth Ave	Kauri	<i>Agathis australis</i>	162
28	31	Butterworth Ave	3 x Miro 1 x Titoki	<i>Prumnopitys ferruginea / Alectryon excelsus</i>	144
29	110	Settlement Road	2 x Beech	<i>Fagus sylvatica</i>	162
30	18	Smiths Ave	3 x Totara	<i>Podocarpus totara</i>	138
31	39	Marne Rd	Kauri	<i>Agathis australis</i>	144
32	7a	Butterworth Ave	1 x Rimu 1 x Puriri	<i>Dacrydium cupressinum / Vitex lucens</i>	162

33	13a	Butterworth Ave	7 x Rimu 1 x Taraire 1 x Puriri	<i>Dacrydium cupressinum / Beilschmiedia tarairi / Vitex lucens</i>	174
34	15	Butterworth Ave	Native Grove- containing Rimu & Rewarewa	<i>Dacrydium cupressinum, Knightia excelsa</i>	168
35	17b	Butterworth Ave	Native Grove- containing Rimu & Rewarewa	<i>Dacrydium cupressinum, Knightia excelsa</i>	168
36	17a	Butterworth Ave	1 x Totara 2 x Rimu 2 x Totara	<i>Podocarpus totara / Dacrydium cupressinum</i>	144
37	19	Butterworth Ave	2 x Rimu	<i>Dacrydium cupressinum</i>	180
38	23	Butterworth Ave	Miro	<i>Prumnopitys ferruginea</i>	168
39	25	Butterworth Ave	Rimu, 2 x Miro	<i>Dacrydium cupressinum / Prumnopitys ferruginea</i>	168
40	1/14	Great South Rd	Rimu	<i>Dacrydium cupressinum</i>	144
41	10	Great South Rd	Totara	<i>Podocarpus totara</i>	138
42	6	Youngs Rd	Liquidambar (Sweet Gum)	<i>Liquidambar styraciflua</i>	132
43	6	Youngs Rd	Tulip	<i>Liriodendron tulipifera</i>	144
44	8	Youngs Rd	Magnolia & Totara	<i>Magnolia sp / Podocarpus totara</i>	132
45	24	Youngs Rd	Kahikatea & Kauri	<i>Dacrycarpus dacrydioides / Agathis australis</i>	126
46	40	Youngs Rd	2 x Oaks	<i>Quercus sp</i>	132
47	43	Youngs Rd	Norfolk Is Pine	<i>Araucaria heterophylla</i>	138
48	43	Takanini Rd	Totara	<i>Podocarpus totara</i>	132
49	45	Takanini Rd	2 x Totara	<i>Podocarpus totara</i>	138
50	4	Beach Rd	Totara	<i>Podocarpus totara</i>	126
52	2	Coles Cres	Oak	<i>Quercus sp</i>	132
55	15	Manuroa Rd	2 x Oaks	<i>Quercus sp</i>	156
57	154	Great South Rd	Totara	<i>Podocarpus totara</i>	156
58	16	Marne Rd	Totara & Rimu	<i>Podocarpus totara / Dacrydium cupressinum</i>	138
59	13	Orion St	Elm	<i>Ulmus sp</i>	147
61	38	Park Haven Drive	Oak	<i>Quercus sp</i>	150
64	38	Creek St Drury	Oak	<i>Quercus sp</i>	168

65	29	Butterworth Ave	Matai	<i>Prumnopitys taxifolia</i>	156
66	27	Butterworth Ave	Native grove containing Karaka and Miro	<i>Corynocarpus laevigatus</i> , <i>Prumnopitys ferruginea</i>	144
67	27a	Butterworth Ave	Totara, Puriri, Miro	<i>Podocarpus totara</i> , <i>Vitex lucens</i> , <i>Prumnopitys ferruginea</i>	162
68	1	Butterworth Ave	Rimu	<i>Dacrydium cupressinum</i>	132
69	1	Butterworth Ave	Miro	<i>Prumnopitys ferruginea</i>	144
70	4	McCall Place	Totara	<i>Podocarpus totara</i>	144
71	4	McCall Place	Rimu	<i>Dacrydium cupressinum</i>	144
72	346	Great South Rd	Native group containing Taraire, Nikau, Rimu, Karaka, Rewarewa, Totara	<i>Beilschmiedia tarairi</i>	150
73	350a	Great South Rd	Native grove- numerous species		150
74	350b	Great South Rd	Native grove- numerous species		162
75	13	Sunnypark Ave	Totara Group	<i>Podocarpus totara</i>	138
76	23	Liverpool Street	Kahikatea	<i>Dacrycarpus dacrydioides</i>	138
77	9	Bushlands Place	Native Grove- Rimu, Kahikatea, Karaka		162
78	4	Arthur Place	Native grove- numerous species		150
79	9	Butterworth Ave	Native grove- numerous species		126

Appendix 3 – Trees Failing To Achieve The Threshold (Total of 9 Sites)

Assessment #	Property No	Address	Common Name	Botanical Name	TOTAL
51	8	Coles Cres	Totara	<i>Podocarpus totara</i>	120
56	152	Great South Rd	Totara	<i>Podocarpus totara</i>	120
2	52	Great South Rd	Totara	<i>Podocarpus totara</i>	120
7	41	Walters Rd	Japanese Cedar	<i>Cryptomeria japonica</i>	114
9	112	Great South Rd	2 x Atlas Cedar	<i>Cedrus atlantica</i>	102
13	414	Great South Rd	Japanese Cedar	<i>Cryptomeria japonica</i>	114
20	16	Sutton Cres	2 x Cedar	<i>Cedrus sp</i>	114
54	7 & 5	Coles Cres	Rimu & Rewarewa	<i>Dacrydium cupressinum / Knightia excelsa</i>	102
60	64	Dominion Rd	Rimu & Kauri	<i>Dacrydium cupressinum / Agathis australis</i>	108

Appendix 4 – Trees Excluded From the Plan Change

All Phoenix Palm (*Phoenix canariensis*) have been excluded due to their formal pest plant status. The pest plant status is attributed to their ability to disperse a prolific number of viable seed, invading natural as well as disturbed habitats and competing with native flora. Additional to this the fronds spikes are a potential health hazard.

Tree 5 – Rimu (138)

Tree is outside the urban area definition (road reserve tree) and therefore tree protection remains.

Tree 62 – 3 x Totara (138)

Tree is outside the urban area definition and therefore tree protection remains.

Tree 63 – Oak (162)

Tree is outside the urban area definition and therefore tree protection remains.

Tree 18 – American Sweet Gum – 1 Clevedon Road (138)

This tree is excluded as it has major defects.

Tree 63 – Totara (144)

Tree is outside the urban area definition and therefore tree protection remains.

40 Great South Road – Oak (Not Scored)

Not assessed due to problems with access.

24 Great South Road – Liquidambar (Not Scored)

This site is a commercial property; the tree is outside the urban area definition. Tree form was poor. No formal assessment was undertaken.

10 Don St – Oak Tree (Not Scored)

Could not undertake assessment, tree is conflicting with properties and is likely to cause significant nuisance and potential damage.

Appendix 5 – Sample Review of Current Scheduled Trees

Assessment #	Item Ref No	Property No	Address	Common Name	Botanical Name	TOTAL
1	4	19	19 Great South Rd (Item Ref 4)	Oak	<i>Quercus sp</i>	144
2	5	138-144	138-144 Great South Rd (Item Ref 5)	Sycamore	<i>Acer pseudoplatanus</i>	132
3	6	2-4	2-4 Queen Street (Item Ref 6)	2 x Totara	<i>Podocarpus totara</i>	126
4	6		Papakura Village Green (Item Ref 6)	2 x Camphor	<i>Cinnamomum camphora</i>	120
5	20	254	254 Great South Road (Item Ref 20)	2 x Phoenix Palm	<i>Phoenix canariensis</i>	132
6	2	Cnr	Cnr Liverpool & Great South Road (Item Ref 2)	Gum	<i>Eucalyptus sp</i>	156
7	7		Papakura Intermediate School (Item Ref 7)	Oak	<i>Quercus sp</i>	132
8	3		Butterworth Ave Road Reserve (Item Ref 3)	1 x Miro & 1 x Pine	<i>Prumnopitys ferruginea / Pinus sp</i>	132
9	18		Kirks Bush Scenic Reserve (Item Ref 18)	Native Bush		168
10	11	2-4	2-4 Clevedon Road (Item Ref 11)	Olive	<i>Olea sp</i>	150
11	22		Memorial Reserve	2 x Phoenix Palm	<i>Phoenix canariensis</i>	144