THE UNIVERSITY of ADELAIDE

Future Trees Project

Trees recommended for inclusion on the list of Permitted species for planting under powerlines in non-bushfire areas

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make history.

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Table of Contents

1. Executive Summary

The challenge of maintaining an extensive and high-quality urban forest has been documented in other reports.

One of the primary limitations to growing and building a more extensive urban forest is rules around powerlines, which limit new trees planted under powerlines to those published on the Permitted Species List which has not been updated since the 1980s.

Here, we present evidence for a number of taxa to be added to the Permitted Species List. We also provide a standard for the assessment of other taxa to facilitate ongoing updates to the list.

After exposure to a series of criteria, 67 taxa were selected for detailed review, with 4,893 trees available for on-ground assessment. This was subsequently reduced to 47 taxa (due to incorrect identification of council trees) with 870 trees inspected (15-28 per taxon).

We recommend 18 taxa as suitable for inclusion on the Permitted Species List for planting below above ground powerlines in non-bushfire areas and that the subsequent list be reviewed for taxonomic currency. A further 15 taxa may be suitable, subject to further analysis following sufficient time to allow for their development to a mature height.

This report is a summary of the research led by Shane Selway to fulfil the requirements of a master's dissertation from Myerscough College. Full details of the research approach and discussion will be available in the dissertation.

2. Background

The urban forest of Adelaide is a vital part of our vibrant, healthy city, but is under increasing pressure from numerous factors, including climate suitability, public safety/liability, and the community expectation of tree provided amenity values versus tree disservices. The diversity of Adelaide's urban forest includes both strengths and weaknesses with a high proportion of taxa within the Myrtaceae family as well as more recent plantings being dominated by exotic species from cooler, higher rainfall climates (Caddy-Retalic, et al., 2023). This means it is vulnerable to the impacts of a warming and drying climate as well as novel pest and disease incursions. Increasing diversity, across species, genera and family, dilutes the populus of individual taxon within the urban forest and limits the affect that taxon specific biotic and abiotic stressors may have across the whole (Raupp, et al., 2006). Thoughtful taxa selection and planting arrangement of the diverse palette will provide us with a cooling, green and biodiverse canopy into the future.

Tree taxa diversity not only results in increased ecological services, but also tree size and form. The risk posed by falling branches and trees to electrical infrastructure is real, with several examples of tree-related damage causing widespread power outages and bushfires (Most & Weissman, 2012; Mitchell, 2013; Lowe, *et al*., 2022). In South Australia, the *Electricity (Principles of Vegetation Clearance) Regulations 2021* (the Regulations) provides SA Power Networks, as the monopoly electricity distributor, with extensive powers to ensure vegetation is kept clear from power infrastructure. The Australian Electricity Regulator can leverage substantial fines in the case of electricity outages, so there are strong legal obligations and financial incentives for SA Power Networks to ensure vegetation is clear of powerlines.

The Regulations state that a list of Permitted vegetation, suitable for planting under powerlines in non-bushfire areas will be published on a website maintained by the Office of the Technical Regulator (SA OTR) [https://www.sa.gov.au/topics/energy-and-environment/safe-energy-use/powerline-safety/vegetation-clearance-near-powerlines/list-of-trees-that-can-be-planted-near-powerlines]. Permitted vegetation is expected to have a mature height of less than six metres, allowing clearance to be maintained for low voltage powerlines (Office of the Technical Regulator, 2016). An analogous list of Approved vegetation (expected to have a mature height of three metres or less) is also maintained for bushfire areas. The Permitted List and Approved List were compiled based on available texts and the professional judgement of the drafting officer and his expectations of the mature height trees would reach in South Australia, and reviewed by a committee comprised of representatives from relevant agencies before being published in October 1988 as part of the Regulations (P. Dean, pers. comm. 8/11/2023). The 2021 revision of the Regulations removed the lists from within the Regulations, giving the SA OTR the power to update the lists at its discretion, without requiring parliamentary approval.

There have been minimal updates to the lists for the last several years, and many of the taxa listed have undergone taxonomic revisions, are no longer commercially available, been assessed as weeds, or have typographical errors. The lists contain limited diversity and many of the listed species are not suitable for planting in streets due to their structure or undesirable traits (e.g. short lifespan, production of excessive litter, etc). Additionally, several new species and cultivars have become available that have not been considered for inclusion on either list. The South Australian Government has not stipulated a process to update the list since its removal from the Regulations.

3. Project scope

The Future Trees project is aimed at identifying vulnerabilities of Adelaide's trees and developing approaches to improve the resilience and extent of our urban forest. A benchmarking study of the diversity of Adelaide's urban forest (Caddy-Retalic *et al*. 2023) provided the opportunity to identify tree species and cultivars planted by councils that may be suitable for inclusion on the Permitted Species List for planting under powerlines.

We present a list of taxa initially selected by the project team as suitable for assessment, the results of field assessment of those taxa and recommendations for the inclusion of 18 on the Permitted Species List for planting under powerlines in non-bushfire areas. A more diverse planting palette, made up of species known to fit structurally beneath overhead powerlines, that are climate resilient, and from a broad range of families and genera, will increase the future viability of our urban forest while constraining costs for the electricity distributor.

We envisage the methodology and process we have undertaken in this project will be used to regularly update the Permitted and Approved lists to ensure they present as many options as possible for municipal arborists and private landowners who host electricity infrastructure on their land.

4. Methodology

4.1. Tree taxa selection for on-ground review

The Future Trees project team compiled tree inventories from 20 local governments to create a combined database of council trees across greater Adelaide, comprising a total of 629,292 georeferenced, taxonomically valid trees from 867 taxa, including >700 species (Caddy-Retalic *et al*., 2023). This list of taxa was used by the project team to identify tree species and cultivars that satisfy council requirements for planting on verges and are unlikely to reach powerline height, making them suitable for inclusion on the Permitted Species List for planting in non-bushfire areas.

We assessed the list of taxa to identify taxa that might be suitable for planting under above ground powerlines, on the basis of expected mature tree height. We prioritised taxa based on tree form, suitability for roadside planting environments, and predicted performance under projected climate change (Table 1). In order to promote diversity within Adelaide's urban forest, we also prioritised taxa that were not closely related to those already on the Permitted list.

This process resulted in a list of 67 potentially suitable taxa. A minimum of 15 trees of each taxon were inspected on-ground to record taxon-specific traits (e.g. structural form and environmental suitability) and performance (e.g. tree height, crown spread, etc). We used SA Power Networks' tree management reference guide *Powerline Friendly Trees* (Seed Consulting Services, 2018) as a guide.

Table 1: Characteristics of tree taxa selected to be assessed for inclusion on the Permitted Species List

Priority	Rationale
Nomenclature currency	Taxonomic naming convention were current under the World Flora database and synonyms combined into the latest classification.
Representative population	At least 15 trees of each taxon were present within the database population.
Permitted Species list absence	Taxon already listed within the Permitted Species List were omitted from the assessment.
Prohibition from planting/sale	Some taxa were excluded on the basis of being declared weeds, however, a comprehensive review of factors that may limit the suitability for planting outside of those listed on this table was beyond the scope of this project.
Tree height	Mature height consistent with recommendations for planting under above ground electrical infrastructure, generally 8m above the ground.
Tree form	Trees with a generally consistent, upright form that does not sprawl were prioritised for assessment.
Relatedness to abundant taxa	Species or cultivars closely related to the most abundant tree taxa in Adelaide (as detailed in the Future Trees benchmarking report) were deprioritised for assessment.
Suitability for planting on verges	Trees without a propensity for structural defects and failures and lacking characteristics that would make them unsuitable for pedestrian footpaths (e.g. excessive litter, dangerous spikes, poisonous fruit) were prioritised for assessment.
Suitability for projected climate change	Trees thought to be more resilient to future (i.e. hotter and drier) climates were prioritised for assessment.

4.2. Field assessments

Field assessment of a minimum of 15 individuals per taxon across multiple locations were undertaken during May and June of 2023. Several trees were identified as being of different taxa to those recorded in the council database and were excluded from analysis. In some cases, this removed the total number of individuals to <15, excluding that taxon from further assessment.

Each tree was assessed against eight attributes of interest (Table 2) and on-ground data, including photographs, were entered at the time of tree assessment into the TreePlotter® data platform. Extracted data from the platform was saved as a CSV file format for further analysis.

Taxa were attributed to a climate zone based on the map in Figure 1. These climate zones correspond to those defined within *Powerline Friendly Trees* (Seed Consulting Services, 2018).

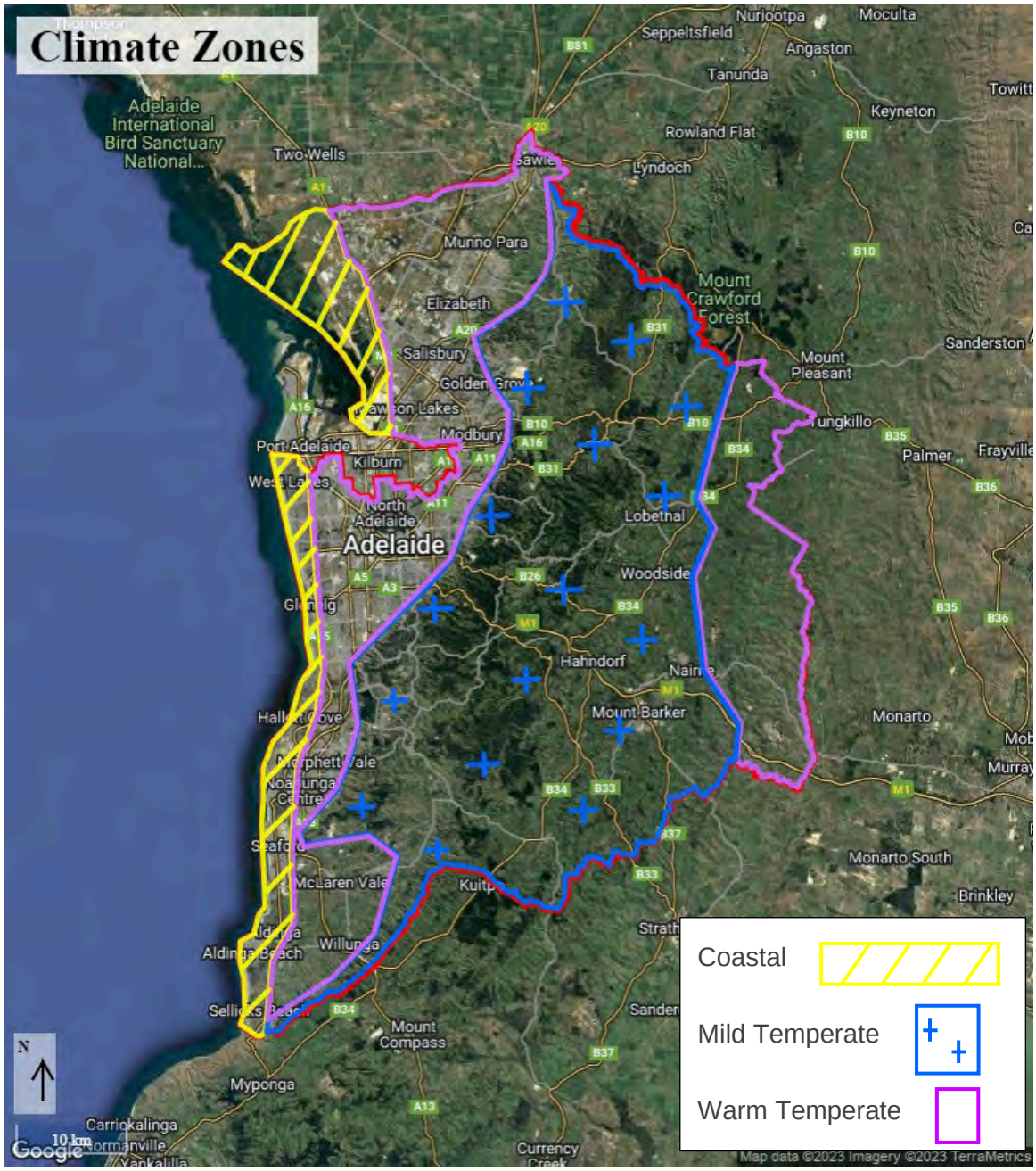

Figure 1 Climate zones, as defined within *Powerline Friendly Trees*.

Table 2: Attributes measured in field assessments

Attribute	Measurement protocol	Rationale
Taxon identification	Taxonomic identification was confirmed against the council record using diagnostic traits: leaf shape, size and colour, bark texture, flower and fruit form, size and colour (where present) and tree form. Current taxonomy was checked with *Global Flora online*, and cultivars with the *Horticultural Flora of South Eastern Australia*.	Confirmation of correct identification ensured our recommendations were for known taxa.
Diameter at breast height	The circumference measurement of the trunk at 1.4m above ground level divided by π, measured in centimetres. In cases where multiple trunks were observed, each trunk is then measured, and the following equation used to combine the stems measurements: $\sqrt{(\text{Stem } 1^2 + \text{Stem } 2^2)}$	Diameter at breast height (consistent with Australian Standard AS4970-2009: Protection of Trees on Development Sites (Standards Australia, 2009)); indicative of maturity and growth performance.
Tree height	Tree height was measured in metres using a Nikon Forestry Pro II Laser Rangefinder to 0.1m.	Height indicative of maturity and growth performance.
Tree health	A visual assessment of the tree's health was determined by comparing the foliage density and colour compared to typical attributes of the species, the presence of any pests or disease and the proportion of deadwood within areas of the crown. These attributes were aligned to the Visual Vitality Index model (Callow *et al*. 2018).	As tree health impacts growth (diameter at breast height and tree height), health provides an indication as to whether its growth is as expected in similar conditions.
Tree age	Tree age relates to physiological maturity rather than actual years since planting. Age was determined by assessing trunk diameter at breast height, tree height, branch and twig extension, and making a comparison to compare to examples of the taxa in the same or similar environments (if available). Categories were "Young", "Immature", "Mature", "Over-Mature" or "Senescent/Dead".	Taxa mature at different rates and therefore years after planting. Furthermore, different environmental factors will cause examples of the same taxon to display maturity attributes at different rates. For this study, determining mature height was critical for making recommendations.
Tree structure	A visual assessment of the primary and secondary structure to identify structural flaws. It is noted that structure can be manipulated with pruning. Rated as "Good", "Fair" or "Poor".	Taxa with consistent structural concerns, not resulting from extrinsic factors, may be of low benefit for further planting. While this was not a major focus of this project, the data was recorded to inform arborists considering our recommendations in the future.
Crown spread	Crown spread was measured in metres using a Nikon Forestry Pro II Laser Rangefinder.	Crown spread is a representative of maturity; this attribute provides an indication of the individual compared to general knowledge of the taxa performance in similar conditions.
Geographical location	Four climate zones are listed within *Powerline Friendly Tree* (Seed Consulting Services, 2018): • **Mild Temperate –** Areas with distinctly dry and warm summers. • **Warm Temperate –** Areas with distinctly dry and hot summers.	The average annual rainfall within the climate zones of greater Adelaide vary and growth potential may likewise vary as a result. For example, a tree assessed only within the Arid climate zone may be

	• **Coastal** – Any area along the Adelaide coastline, generally experiencing sea winds and sandy soils. • **Arid** – Areas of warm to hot, with summer droughts and persistently dry periods.	represented as a smaller taxon in comparison to the same taxon assessed within the Mild Temperate climate zone.
Tree image	Digital photograph(s) of each tree was taken using the camera within the assessment device (smartphone).	Visual record for illustration and future reference.

4.3. Assessment data analysis

Following field data collection, the data were reviewed and tree height for each taxon were plotted to assess propensity to grow to powerline height. Tree age, tree health and structure, crown spread, and geographic location were then considered. The complete CSV file formatted data was then reviewed by grouping individual tree assessment into their relative taxon and using various spreadsheet filters for the noted categories to review their suitability for inclusion on the Permitted Species List for planting below above ground powerlines in non-bushfire areas. The influence of each attribute on tree performance and their recommendation for inclusion, is defined in Table 3.

Table 3: Attributes used to assess tree suitability for addition to the Permitted Species List

Attribute	Influence
Taxon identification	Incorrectly identified trees were removed from the assessment pool; occurred during in-field assessments as some trees were recognised as being mis-identified upon observation of morphology.
Tree height	All trees were plotted using box and whisker plots and height outliers identified. Taxa where the average height of >20% specimens inspected was greater than 8m were considered unsuitable for recommendation.
Diameter at breast height (DBH)	Guided the maturity assessment but no impact on selection; no taxa were omitted as a result of this attribute alone.
Tree age	Only taxa where at least 80% of individuals assessed (minimum 12 individuals) were recorded as “Mature” were retained in the recommendation process. If the minimum 80% was not met, the taxa moved to the “Further investigation required” category.
Tree health	Where taxa were identified as being poor performers across all climatic zones, health attributes and indicators of performance were noted.
Tree structure	No taxa were omitted from the recommendation process on account of structural deficiencies.
Crown spread	No taxa were omitted from the recommendation process on account of crown spread factors.
Geographical location	No taxa were omitted from the recommendation process on account of poor performance in one climatic zone.
Tree image	Digital photograph(s) of each tree at point in time for record keeping but had no influence on selection.

5. Recommendations

5.1. Taxa suitability for addition to the Permitted Species List

From the selected list of 47 taxa, we propose 18 taxa be added to the Permitted Species List for planting under above ground powerlines in non-bushfire areas maintained by the Office of the Technical Regulator pursuant to the *Electricity (Principles of Vegetation Clearance) Regulations 2021*.

Due to changes in taxonomy and the currency of cultivars changes, it is important that the Permitted Species List be regularly updated. Our review of the list revealed several errors and obsolete taxa. We recommend a review of the Permitted Species List and Allowed Species List (for bushfire areas) be undertaken.

We have assessed a further 15 taxa as being potentially suitable for inclusion, subject to further assessment. These taxa met the suitability criteria of remaining consistently below powerline height, but we were unable to assess sufficient individuals to be confident in making a recommendation. This was due to trees being misidentified in council databases, or because trees had not yet reached maturity.

Trees recommended for inclusion on the Permitted List

We found 18 tree taxa (Table 4, Figure 2) to be suitable for planting under above ground powerlines and recommend the Office of the Technical Regulator add these to the Permitted Species List in non-bushfire risk areas.

These taxa were consistently 8m or less in height across at least 80% of the minimum 15 trees assessed. Tree health was sustainable with these attributes considered for individual climatic zones. Taxa may have been found suitable for planting in these environments in one zone however not within another; for example, *Stenocarpus sinuatus* is suitable for planting in Coastal and Warm Temperate climate zones but has potential to be too tall in Mild Temperate climate zone, where average annual rainfall is greater.

Table 4 Taxa recommended for inclusion on the Permitted List for planting below powerlines in non-bushfire areas.

Taxon	Family	# assessed	Av height	Max height	Compliance (%)*	Climate zones^
Acacia floribunda	Fabaceae	19	5.2m	9.4m	97%	MT, WT
Acacia victoriae	Fabaceae	21	4.9m	8.0m	100%	WT
Acer campestre 'Queen Elizabeth'	Sapindaceae	20	4.5m	5.7m	100%	WT
Acer negundo 'Sensation'	Sapindaceae	20	5.1m	7.5m	100%	WT
Cercis canadensis	Fabaceae	23	5.2m	8.1m	97%	WT
Eriobotrya japonica	Rosaceae	21	4.5m	5.7m	100%	MT, WT
Eucalyptus erythrocorys	Myrtaceae	21	6.2m	9.2m	91%	WT, C

Fraxinus excelsior 'Aurea'	Oleaceae	20	6.4m	8.8m	90%	MT, WT
Malus ioensis 'Plena'	Rosaceae	28	2.9m	4.2m	100%	MT, WT
Melaleuca lanceolata	Myrtaceae	20	5.9m	9.8m	95%	MT, WT, C
Melaleuca linearis	Myrtaceae	20	2.9m	4.6m	100%	MT, WT
Melaleuca pallida	Myrtaceae	18	3.2m	4.4m	100%	MT, WT
Metrosideros excelsa	Myrtaceae	21	5.3m	14.4m	95%	MT, WT, C
Platycladus orientalis	Cupressaceae	22	2.7m	4.7m	100%	MT, WT
Prunus armeniaca	Rosaceae	21	4.2m	5.2m	100%	MT
Prunus dulcis	Rosaceae	20	6.3m	8.4m	90%	MT, WT
Stenocarpus sinuatus	Proteaceae	20	5.7m	14.9m	85%	MT, WT
Triadica sebifera	Euphorbiaceae	20	6.5m	8.2m	95%	WT

*Compliance: Percentage of trees assessed that were measured to be less than 8m in height.

^Climate Zones: MT – Mild Temperate, WT – Warm Temperate, C – Coastal.

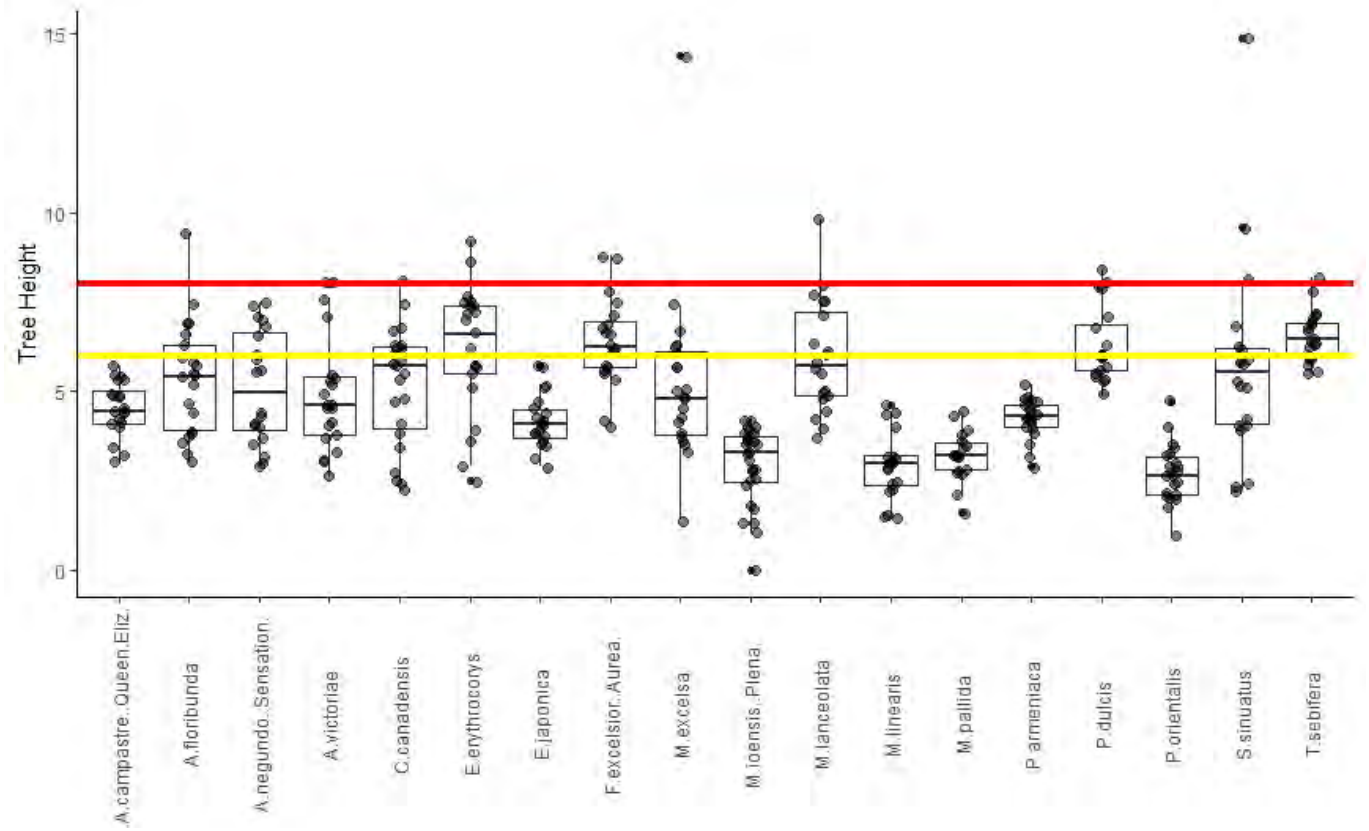

Figure 2: Recorded heights of taxa recommended as suitable for planting under powerlines. Boxes represent lower quartile Q1 to upper quartile Q3, with all data displayed. Red line represents typical powerline height at 8m, yellow line represents 2m clearance from this height.

Trees requiring further investigation

15 taxa assessed displayed characteristics that indicated they are likely to be suitable for planting below powerlines (Table 5, Figure 3). These taxa were consistently less than 8m in height across at least 77% of the individuals assessed however most did not display sufficient maturity attributes for a reliable recommendation. In all cases, more than 15 examples exist within greater Adelaide to allow for further assessment to be conducted as they mature.

The following 15 taxa (Table 5) are recommended to be researched further to determine if they are suitable for inclusion on the Permitted Species List in non-bushfire risk areas.

Table 5 Taxa requiring further investigation prior to consideration for inclusion on the Permitted List for planting below powerlines in non-bushfire areas.

Name	Family	# assessed	Av height	Max height	Compliance (%)*	Climate zones^
Acacia baileyana	Fabaceae	15	5.5m	7.9	100%	MT
Acer campestre 'Evelyn'	Sapindaceae	20	4.5m	6.8m	100%	WT
Acer platanoides 'Crimson Sentry'	Sapindaceae	18	3.7	4.7	100%	MT, WT
Acer platanoides 'Globosum'	Sapindaceae	16	3.8m	4.5m	100%	MT
Auranticarpa rhombifolia	Pittosporaceae	7	3.8	5.8m	100%	MT, WT
Brachychiton bidwillii 'Beau Bells'	Sterculiaceae	20	3.8	5.8m	100%	WT
Cercis siliquastrum	Fabaceae	16	5.3m	7.2m	100%	MT, WT
Corymbia ficifolia 'Summer Red'	Myrtaceae	16	4.4m	6.6m	100%	WT, C
Corymbia ficifolia 'Wildfire'	Myrtaceae	15	2.4m	5.2m	100%	MT, WT
Eucalyptus cneorifolia	Myrtaceae	15	6.6m	9.0m	80%	MT, C
Eucalyptus conferruminata	Myrtaceae	13	6.9m	11.3m	77%	MT, WT
Eucalyptus victrix 'Little Ghost Gum'	Myrtaceae	10	2.9m	4.6m	100%	MT, WT
Libidibia ferrea	Fabaceae	15	6.0m	9.6m	93%	WT
Malus spectibilis	Rosaceae	16	3.3m	5.0m	100%	WT
Melaleuca bracteata 'Revolution Gold'	Myrtaceae	14	4.8m	7.3m	100%	MT, WT

*Compliance: Percentage of trees assessed that were measured to be less than 8m in height.

^Climate Zones: MT – Mild Temperate, WT – Warm Temperate, C – Coastal.

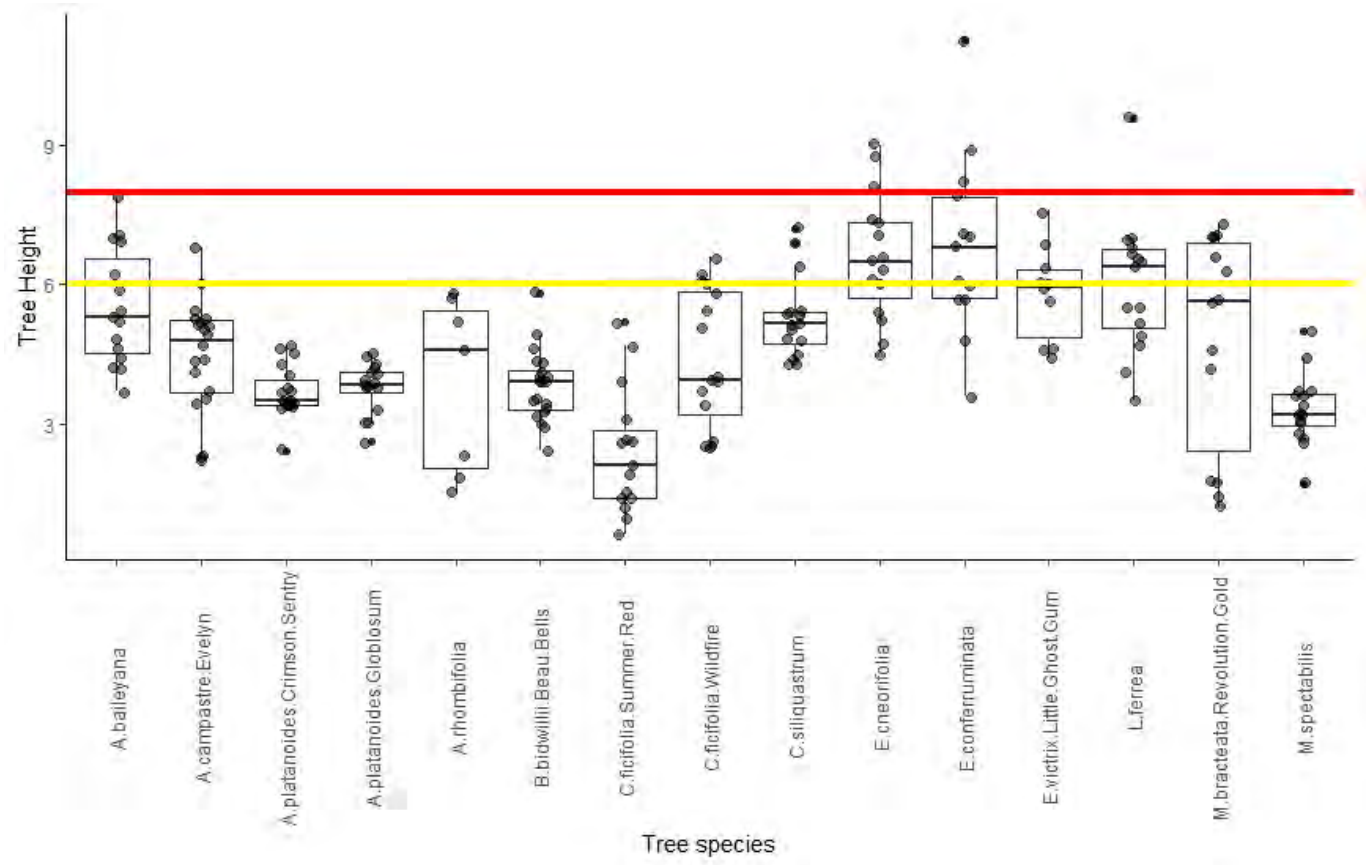

Figure 3: Recorded heights of taxa requiring further investigation before making a recommendation as to suitability for planting under powerlines. Boxes represent lower quartile Q1 to upper quartile Q3, with all data displayed. Red line represents typical powerline height at 8m, yellow line represents 2m clearance from this height.

Trees not recommended for inclusion on the Permitted List

Taxa that consistently exceeded 8m are not recommended as suitable for cultivation below powerlines (Table 6, Figure 4). These 14 taxa have high percentages of individuals that exceeded 8m (typical powerline height). These taxa may be able to be reviewed in future if climate makes growing conditions less optimal.

Table 6 Taxa not recommended for inclusion on the Permitted List for planting below powerlines in non-bushfire areas.

Name	Family	# assessed	Av height	Max height	Compliance (%)*	Climate zones^
Acacia pendula	Fabaceae	19	10.7m	15.3m	11%	MT, WT
Acacia salicina	Fabaceae	20	8.1m	10.3m	40%	MT, WT, C
Betula pendula	Betulaceae	19	8.6m	14.8m	60%	MT, WT
Calodendrum capense	Rutaceae	20	6.0m	11.1m	75%	MT, WT, C
Eucalyptus campaspe	Myrtaceae	16	8.2m	11.3m	38%	WT
Eucalyptus diptera	Myrtaceae	22	8.4m	12.2m	41%	MT
Eucalyptus eremophila	Myrtaceae	13	7.3m	12.7m	62%	WT
Eucalyptus leptophylla	Myrtaceae	21	10.6m	15.0m	24%	MT, WT
Eucalyptus leucoxylon 'Goolwa Gem'	Myrtaceae	25	9.9m	16.6m	32%	MT, C
Exocarpos cupressiformis	Santalaceae	14	7.5m	11.8m	64%	WT, C
Pistacia chinensis	Anacardiaceae	20	6.9m	10.8m	80%	MT, WT
Syzygium smithii	Myrtaceae	20	9.3m	14.0m	30%	MT, WT
Toona ciliata	Meliaceae	20	9.2m	11.8m	25%	WT
Ulmus parvifolia	Ulmaceae	20	8.7m	11.,7m	35%	MT, WT, C

*Compliance: Percentage of tree assessed that were measured to be less than 8m in height.

^Climate Zones: MT – Mild Temperate, WT – Warm Temperate, C – Coastal.

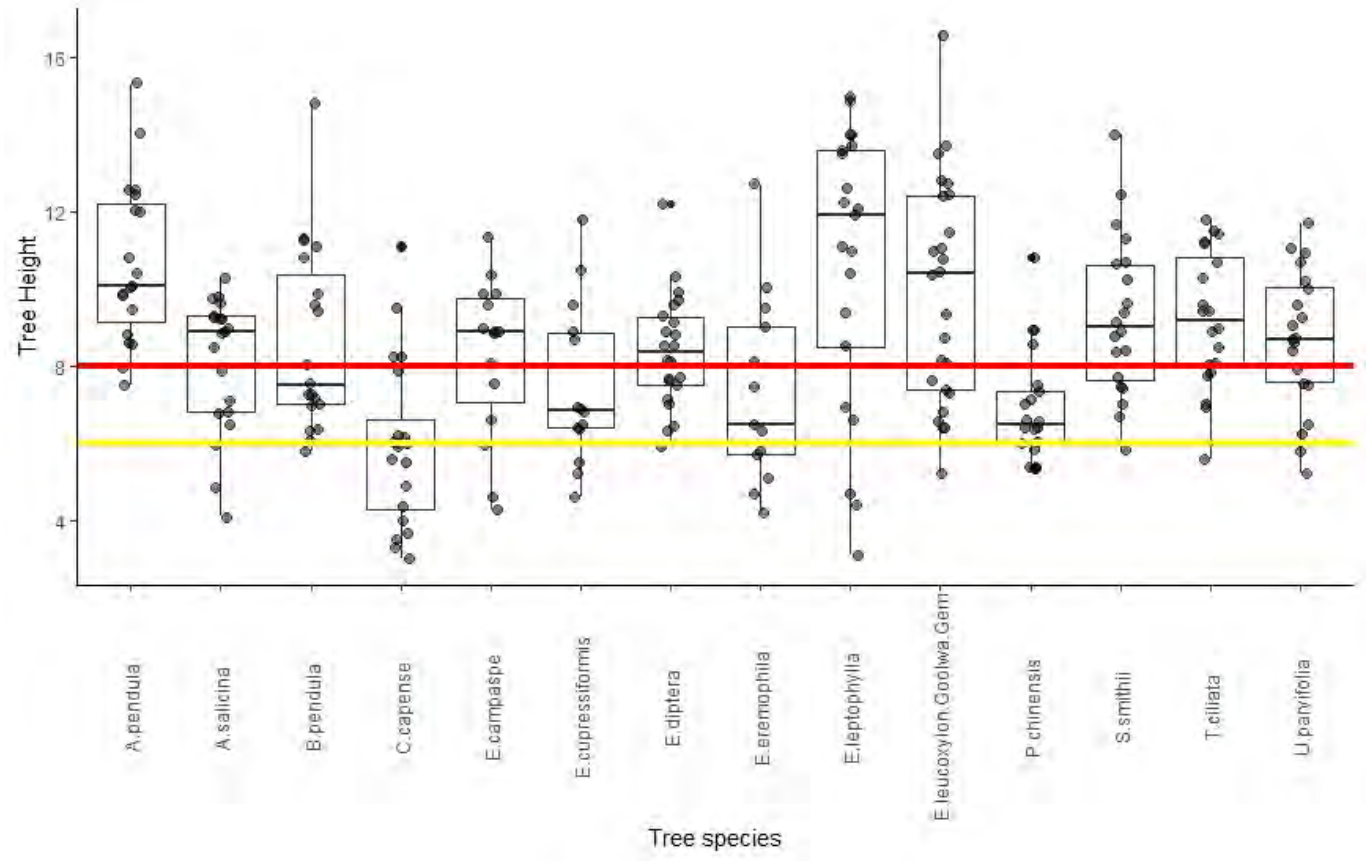

Figure 4: Recorded heights of taxa not recommended as suitable for planting under powerlines. Boxes represent lower quartile Q1 to upper quartile Q3, with all data displayed. Red line represents typical powerline height at 8m, yellow line represents 2m clearance from this height.

5.2. Summary recommendations

We make the following recommendations:

1. Taxa in Table 4 be added to the Permitted Species List of suitable taxa for planting under powerlines pursuant to the *Electricity (Principles of Vegetation Clearance) Regulations 2021.*
2. The Office of the Technical Regulator provide support for an independent party to undertake regular further assessment of the tree taxa in Table 5 for their potential future addition to the Permitted List.
3. The Office of the Technical Regulator provide support for an independent party to undertake regular further assessment of trees and shrubs suitable for addition to the Permitted and Allowed species lists on a regular and ongoing basis (i.e. annually or more regularly).
4. The Office of the Technical Regulator commission a review of the current Permitted and Approved Lists to correct errors and obsolete entries.

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7. Appendices

7.1. Species-specific results – Trees recommended for addition to the Permitted list of trees able to be planted under powerlines in non-bushfire areas

Family: *Fabaceae* **- Genus:** *Acacia* **- Species:** *floribunda* **- Origin:** Aus. Native

Acacia floribunda (gossamer wattle) is typically a dense shrub to small tree native to the east coast of Australia and extending along water course. The species has successfully been cultivated in areas of Greater Adelaide and is naturalised with higher annual rainfall and typically remains sustainable for periods exceeding 25 years following establishment.

We assessed trees in the Adelaide hills and foothills regions, along water courses and in areas of above average rainfall to greater Adelaide.

Trees assessed: 19

Regions assessed: Mild and Warm Temperate.

Average height: 5.2m **Maximum height:** 9.4m

Compliance percentage: 97%

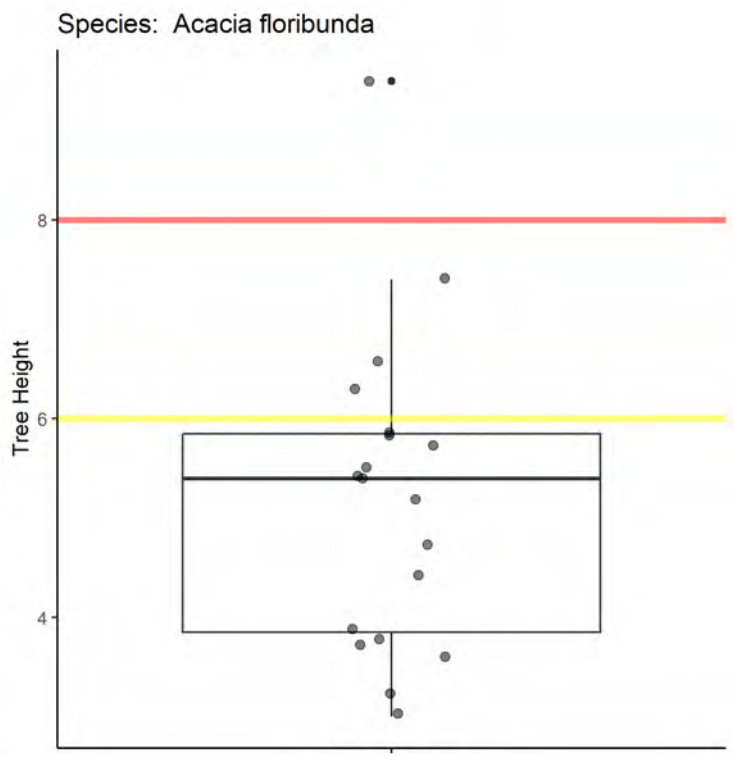

Figure 7.1 Height distribution of 19 *A. floribunda* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on the x axis to enable clear differentiation. 97% of individuals surveyed were shorter than 8m.

Figure 7.2 *Acacia floribunda* growing in Hahndorf.

Figure 7.3 The geographic distribution of assessed *A. floribunda*. These trees are located within the Warm Temperate and Mild Temperate zones.

Recommendation: Based on the compliance of 19 of 20 assessed individuals (97%), *Acacia floribunda* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Fabaceae* **- Genus:** *Acacia* **- Species:** *victoriae* **- Origin:** Indigenous

Acacia victoriae (bramble wattle) is typically a dense shrub to small tree with widespread distribution throughout Australia including South Australia. Assessment of trees within the group occurred within the northeastern region, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 21

Regions assessed: Warm Temperate.

Average height: 4.9m

Maximum height: 8.0m

Compliance percentage: 100%

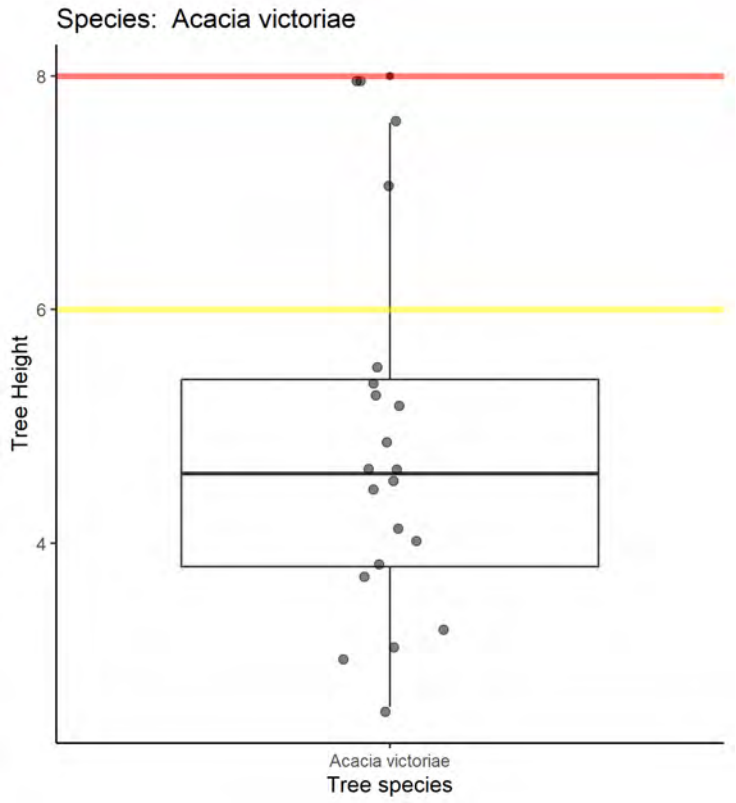

Figure 7.4 Height distribution of 21 *A. victoriae* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.5 A representative image of *A. victoriae.*

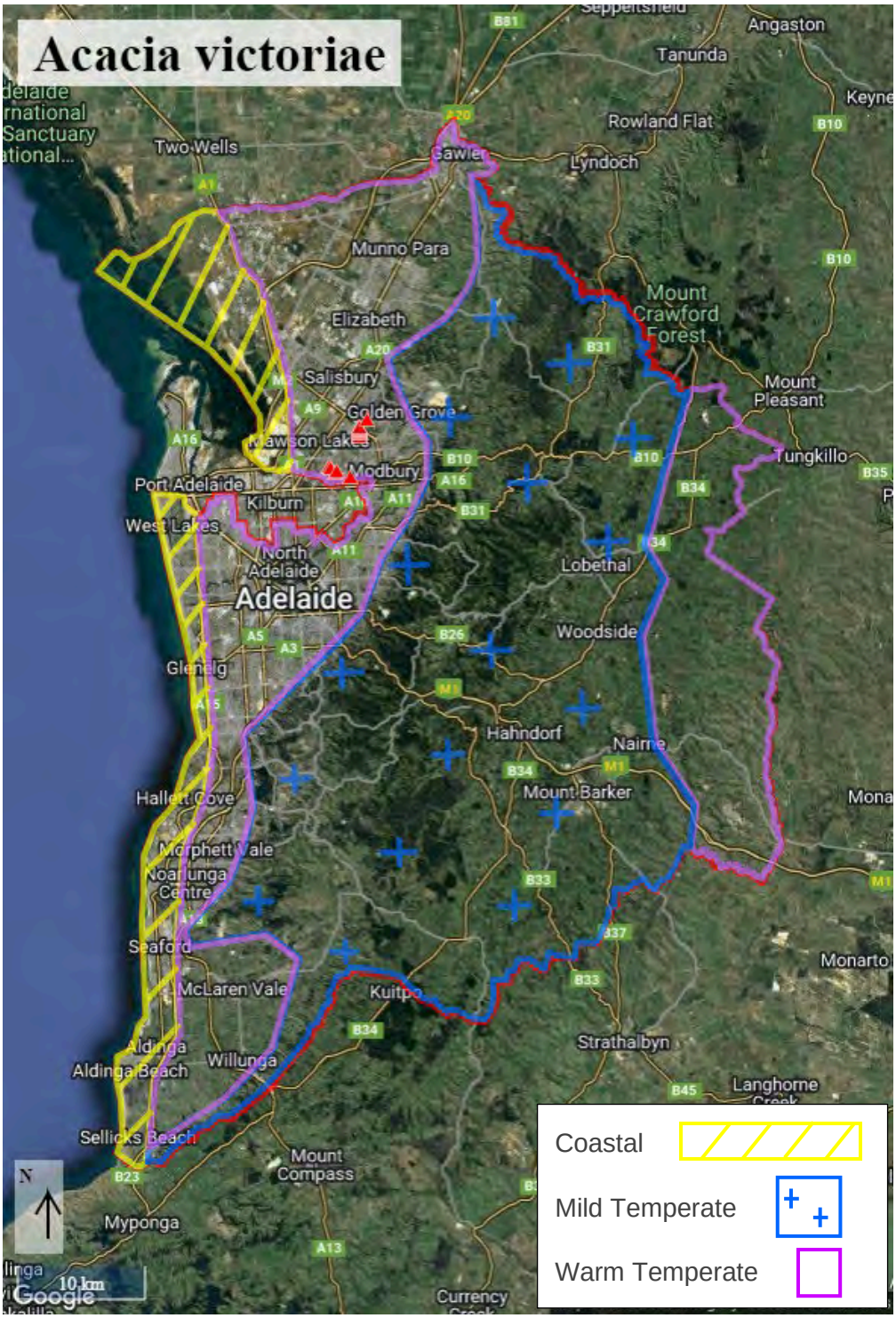

Figure 7.6 - The geographic distribution of field assessed *A. victoriae*. These trees are located within the Warm Temperate zones.

Recommendation: Based on the compliance of all assessed individuals (100%), *Acacia victoriae* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Sapindaceae* **- Genus:** *Acer* **- Species:** *campestre* ‘Queen Elizabeth’ - **Origin:** Exotic

Acer campestre ‘Queen Elizabeth’ (Queen Elizabeth maple) is typically a medium sized tree with an erect form. The parent species is indigenous to Europe and Asia Minor, however this cultivar has been planted in various streets throughout central Adelaide and the surrounding suburbs.

Assessment of trees within the group occurred within the warm temperate areas surrounding the Adelaide CBD, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Warm Temperate.

Average height: 4.5m **Maximum height:** 5.7m

Compliance percentage: 100%

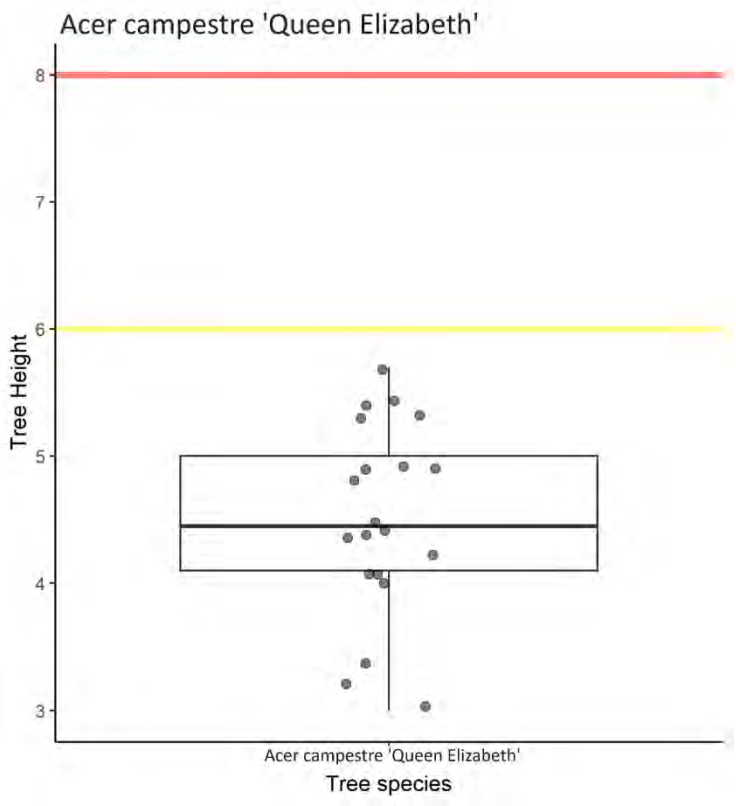

Figure 7.4 Height distribution of 20 *A. campestre* ‘Queen Elizabeth’ trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.5 - A representative of *A. campestre* ‘Queen Elizabeth’.

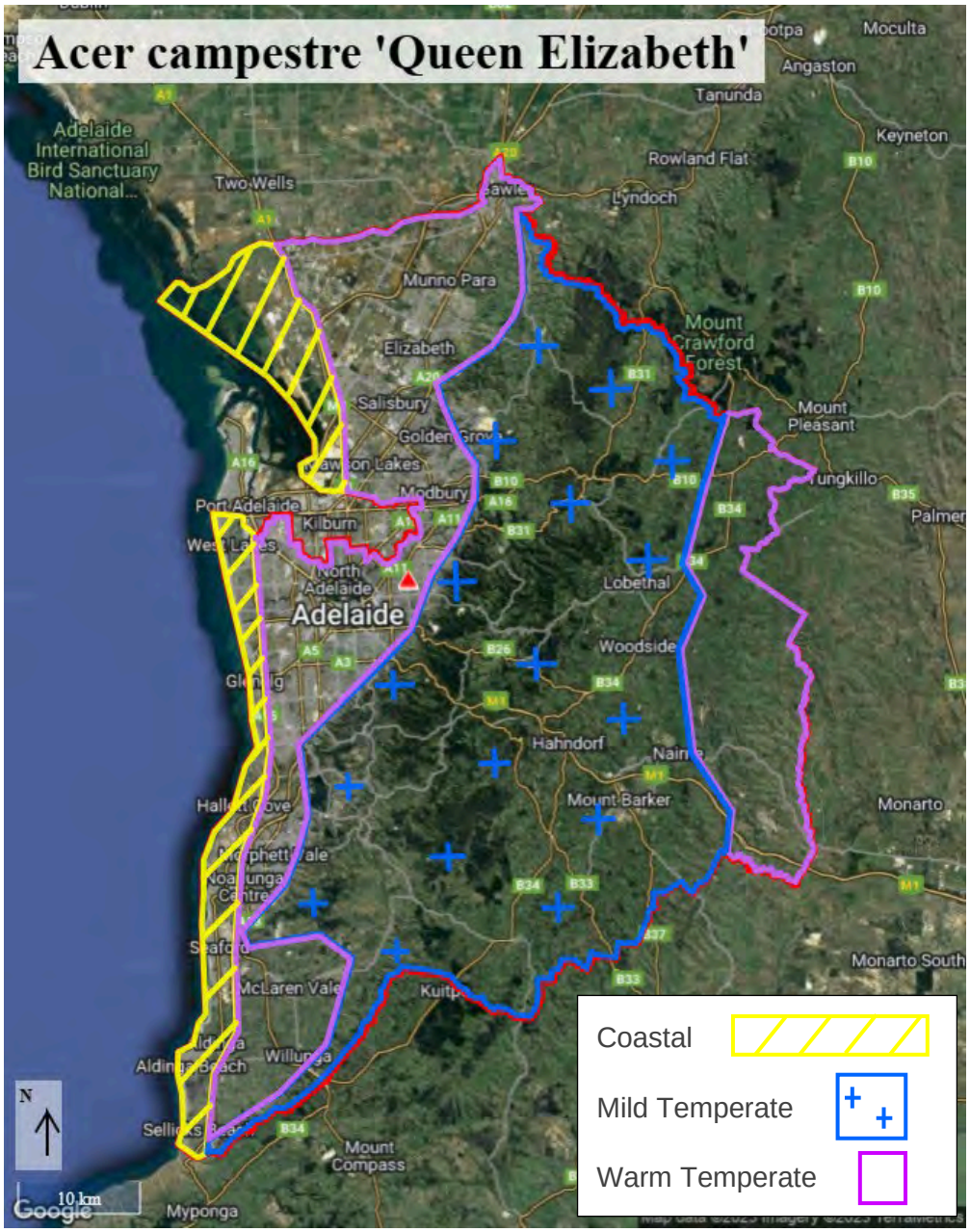

Figure 7.6 - The geographic distribution of assessed *Acer campestre* 'Queen Elizabeth'. These trees are located within the Warm Temperate zone.

Recommendation: 100% of trees assessed were less than 8m in height. On account of the 20 trees assessed, *Acer campestre* 'Queen Elizabeth' is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Sapindaceae* **- Genus:** *Acer* **- Species:** *negundo* ‘Sensation’ - **Origin:** Exotic

Acer negundo ‘Sensation’ (Sensation box elder) is a deciduous tree with a single trunk and medium-broad often irregular crown. The parent species has been successfully planted in Adelade, both on the plains and in the hills. The assessed *A. negundo* ‘Sensation’ is sterile and presents as useful for planting environments where weed concerns are noted.

Assessment of trees within the group occurred within warm temperate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Warm Temperate.

Average height: 5.1m **Maximum height:** 7.5m

Compliance percentage: 100%

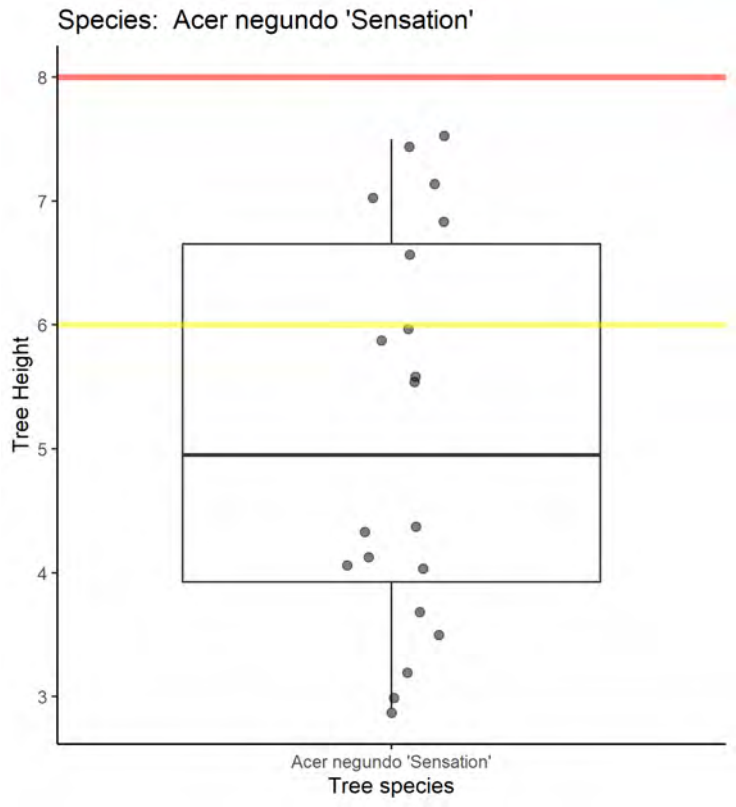

Figure 7.8 Height distribution of 20 *A. negundo* ‘Sensation’ trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.7 - A representative image of Acer *negundo* ‘Sensation’.

Figure 7.9 - The geographic distribution of assessed *A. negundo* 'Sensation'. These trees are located within the Warm Temperate Zones.

Recommendation: 100% of trees assessed were less than 8m in height. On account of the 20 trees assessed, *Acer negundo* 'Sensation' is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Fabaceae* **- Genus:** *Cercis* **- Species:** *canadensis* **- Origin:** Exotic

Cercis canadensis (eastern redbud) is a small flowering tree with rounded and spreading form. The species is native to central North America and has been grown in temperate climates globally.

Assessment of trees within the group occurred within the inner-city suburbs and warm temperate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 23

Regions assessed: Warm Temperate.

Average height: 5.2m **Maximum height:** 8.1m

Compliance percentage: 100%

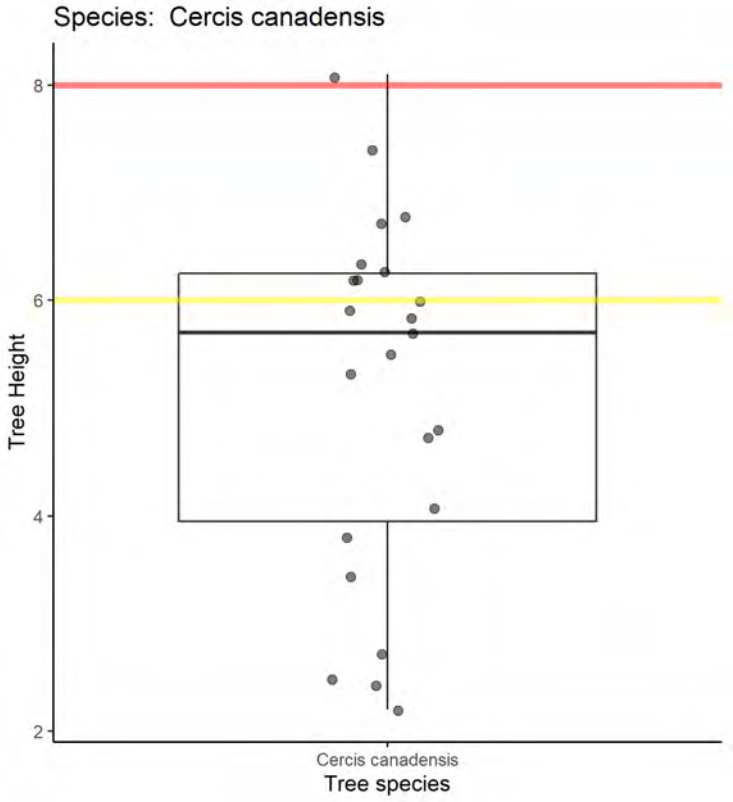

Figure 7.10 Height distribution of 23 *C. canadensis* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 95.7% of trees of this species were shorter than 8m.

Figure 7.11 - A representative image of *Cercis canadensis*.

Figure 7.12 - The geographic distribution of assessed *C. canadensis*. These trees are located within the Warm Temperate zone.

Recommendation: 95.7% of trees assessed were less than 8m in height. On account of the 23 trees assessed, *Cercis canadensis* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Rosaceae* **- Genus:** *Eriobotrya* **- Species:** *japonica* **- Origin:** Exotic

Eriobotrya japonica (loquat) typically develops a pyramidal crown from of evergreen foliage. A large shrub to small tree that is suitable for planting in acid to neutral pH soils.

Assessment of trees within the group occurred within the mild and warm temperate climatic zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 21

Regions assessed: Mild and Warm Temperate.

Average height: 4.2m **Maximum height:** 5.7m

Compliance percentage: 100%

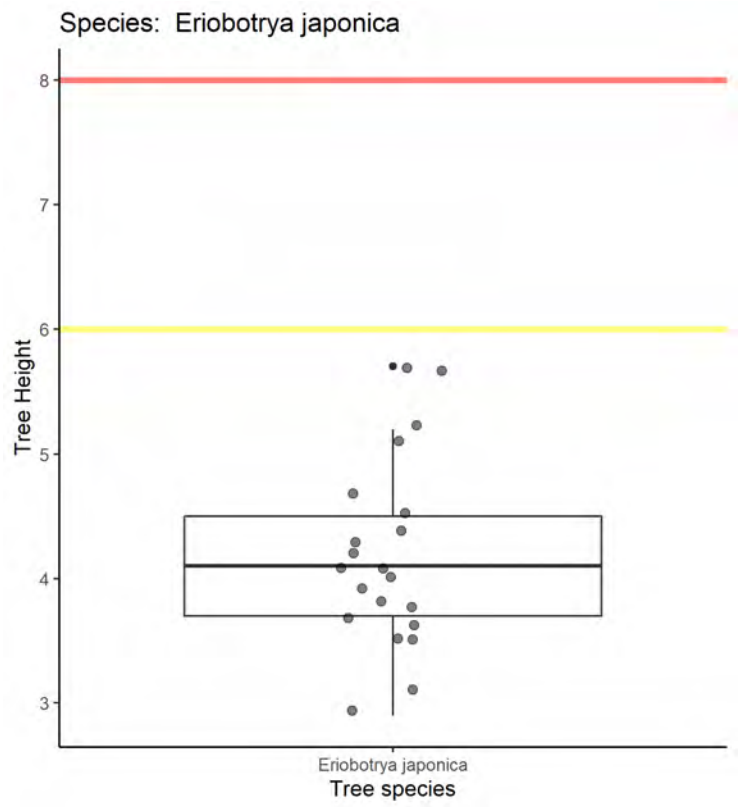

Figure 7.13 Height distribution of 21 *E. japonica* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.14 A representative image of *E. japonica*.

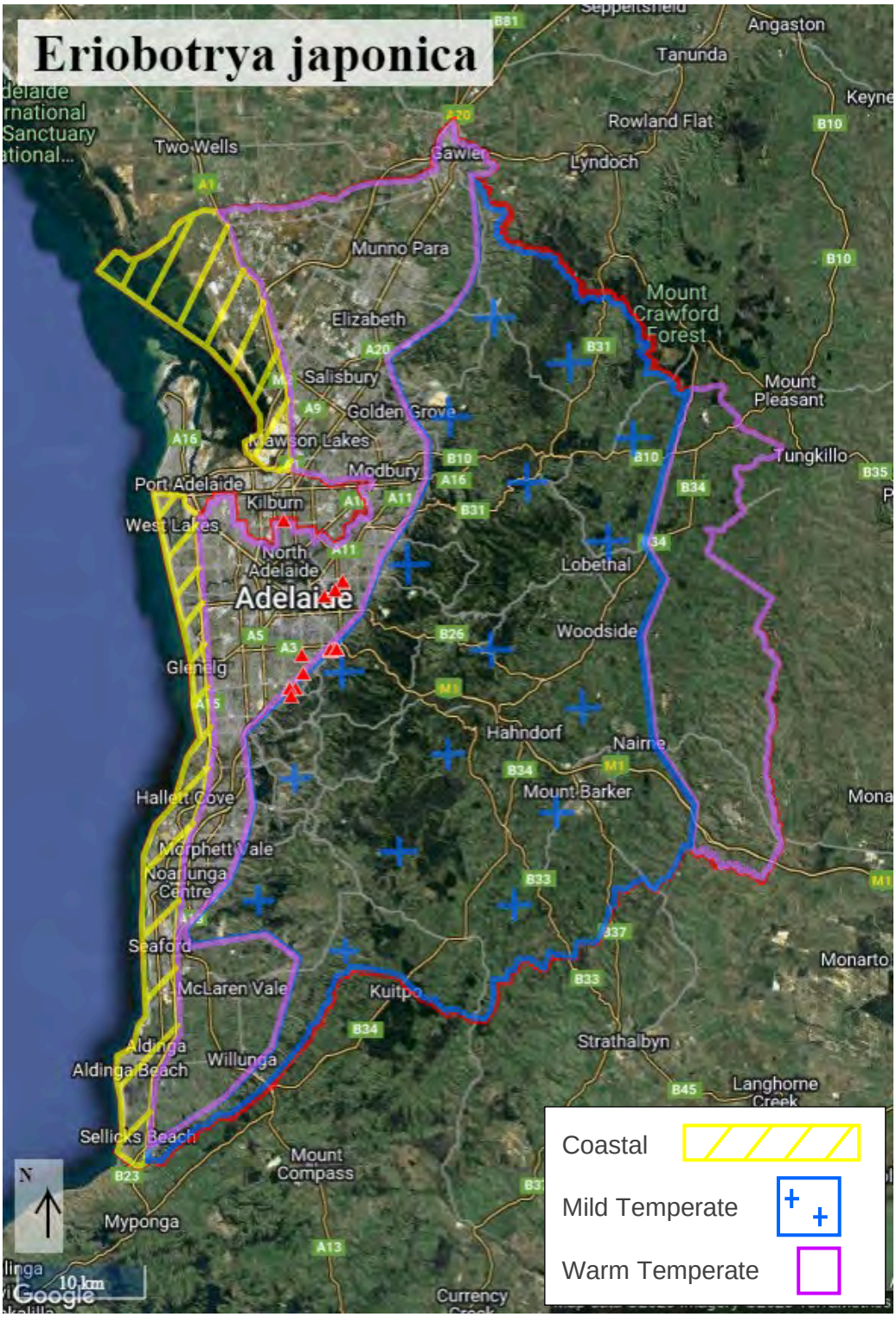

Figure 7.15 - The geographic distribution of assessed *Eriobotrya japonica*. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 100% of trees assessed were shorter than 8m in height. On account of the 21 trees assessed *E. japonica* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Myrtaceae* **– Genus:** *Eucalyptus* **- Species:** *erythrocorys* - **Origin:** Introduced Native

Eucalyptus erythrocorys (red-capped gum) is a small tree occurring in subcoastal limestone areas north of Perth. This species has widespread distribution throughout Australia, including South Australia.

Assessment of trees within the group occurred within the warm temperate and coastal zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 21

Regions assessed: Warm Temperate and Coastal.

Average height: 6.2m **Maximum height:** 9.2m

Compliance percentage: 90.5%

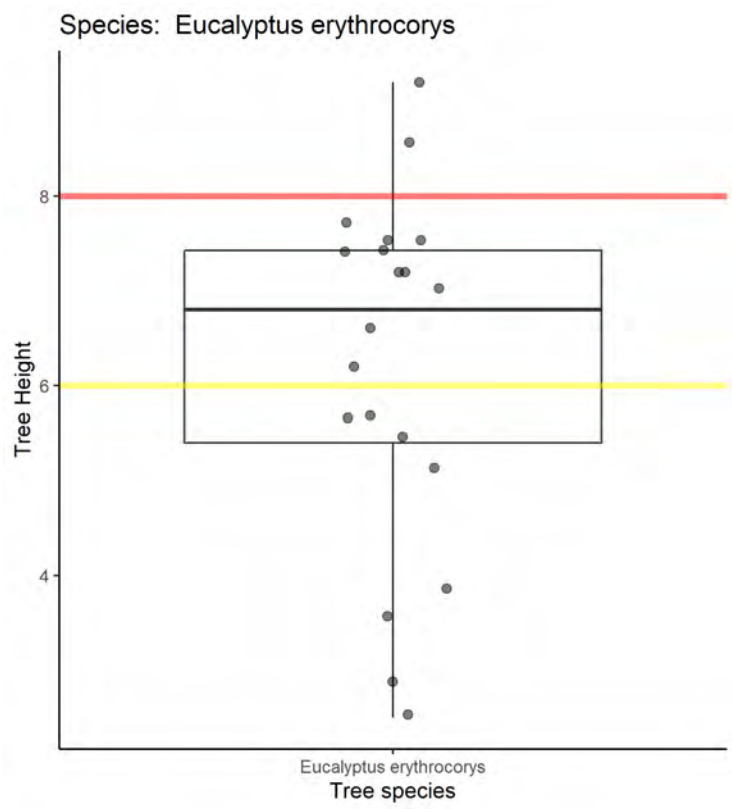

Figure 7.16 Height distribution of 21 *E. erythrocorys* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 91% of trees of this species were shorter than 8m.

Figure 7.17 - A representative image of *E. erythrocorys*.

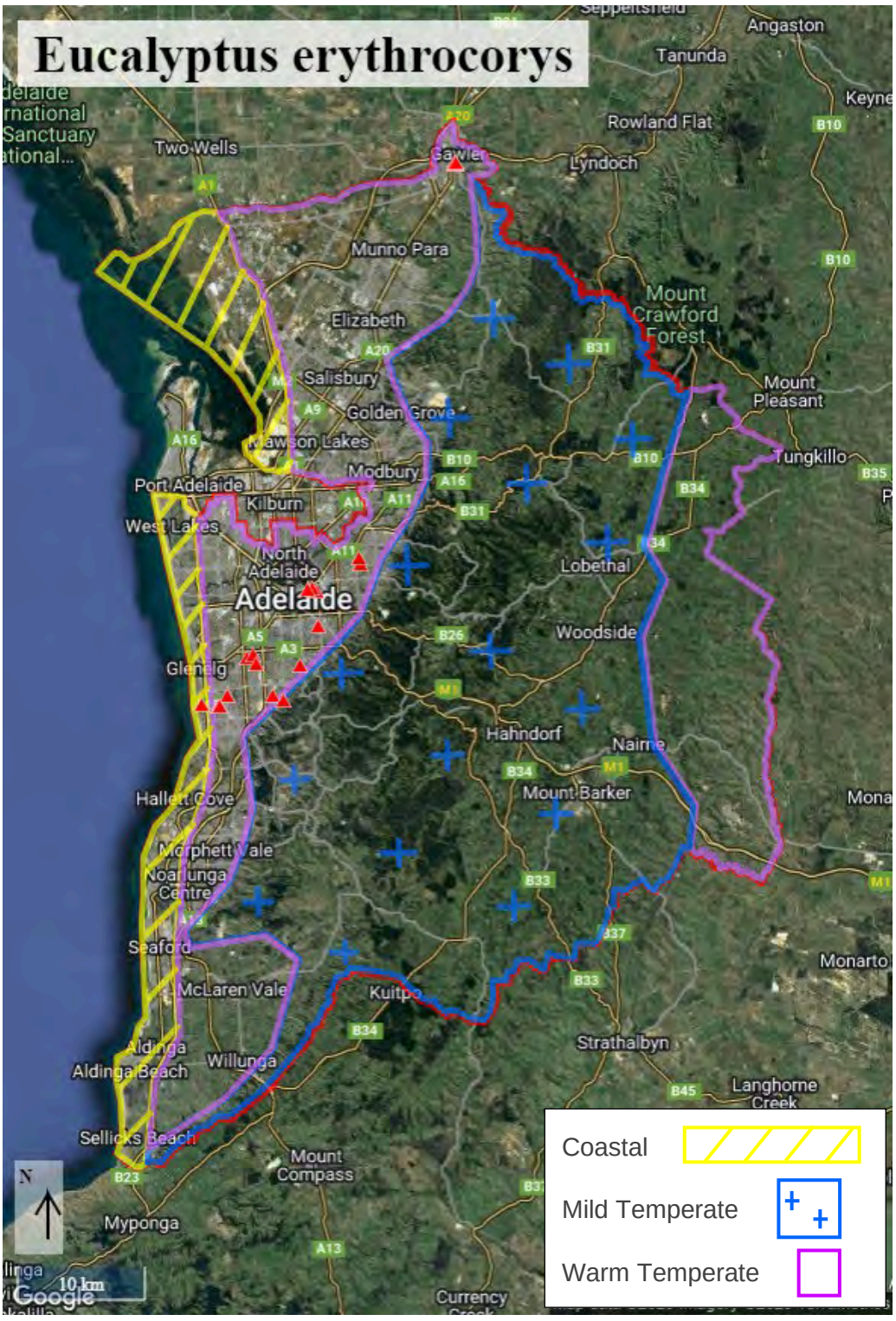

Figure 7.18 - The geographic distribution of assessed *Eucalyptus erythrocorys*. These trees are located within the Warm Temperate and Coastal zones.

Recommendation: 91% of trees assessed were less than 8m in height. On account of the 21 trees assessed, *Eucalyptus erythrocorys* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Oleaceae* **- Genus:** *Fraxinus* **- Species:** *excelsior* ‘Aurea’ - **Origin:** Exotic

Fraxinus excelsior ‘Aurea’ (golden ash) is a small to medium tree with conical to spherical form. The tree is somewhat smaller than the parent species and displays yellow branchlets and twigs with black buds contrasting the yellow bark. The parent species has a wide native distribution extending from Great Britain, central, southern and western Europe and Turkey.

Assessment of trees within the group occurred within the mild and warm temperate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Mild and Warm Temperate.

Average height: 6.4m **Maximum height:** 8.8m

Compliance percentage: 90%

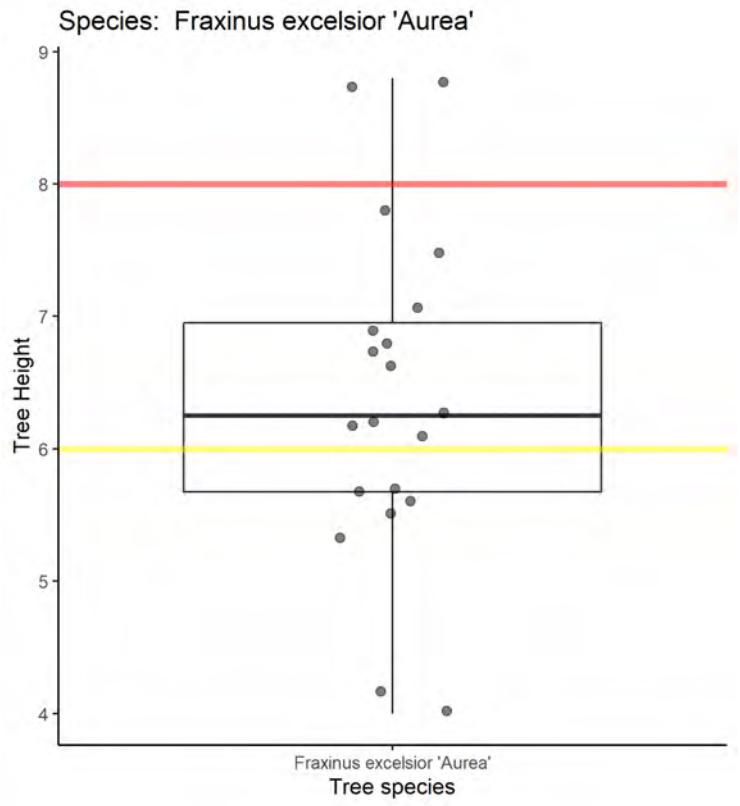

Figure 7.19 Height distribution of 20 *F. excelsior* ‘Aurea’ trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 90% of trees of this species were shorter than 8m.

Figure 7.20 - A representative image of *F. excelsior* ‘Aurea’.

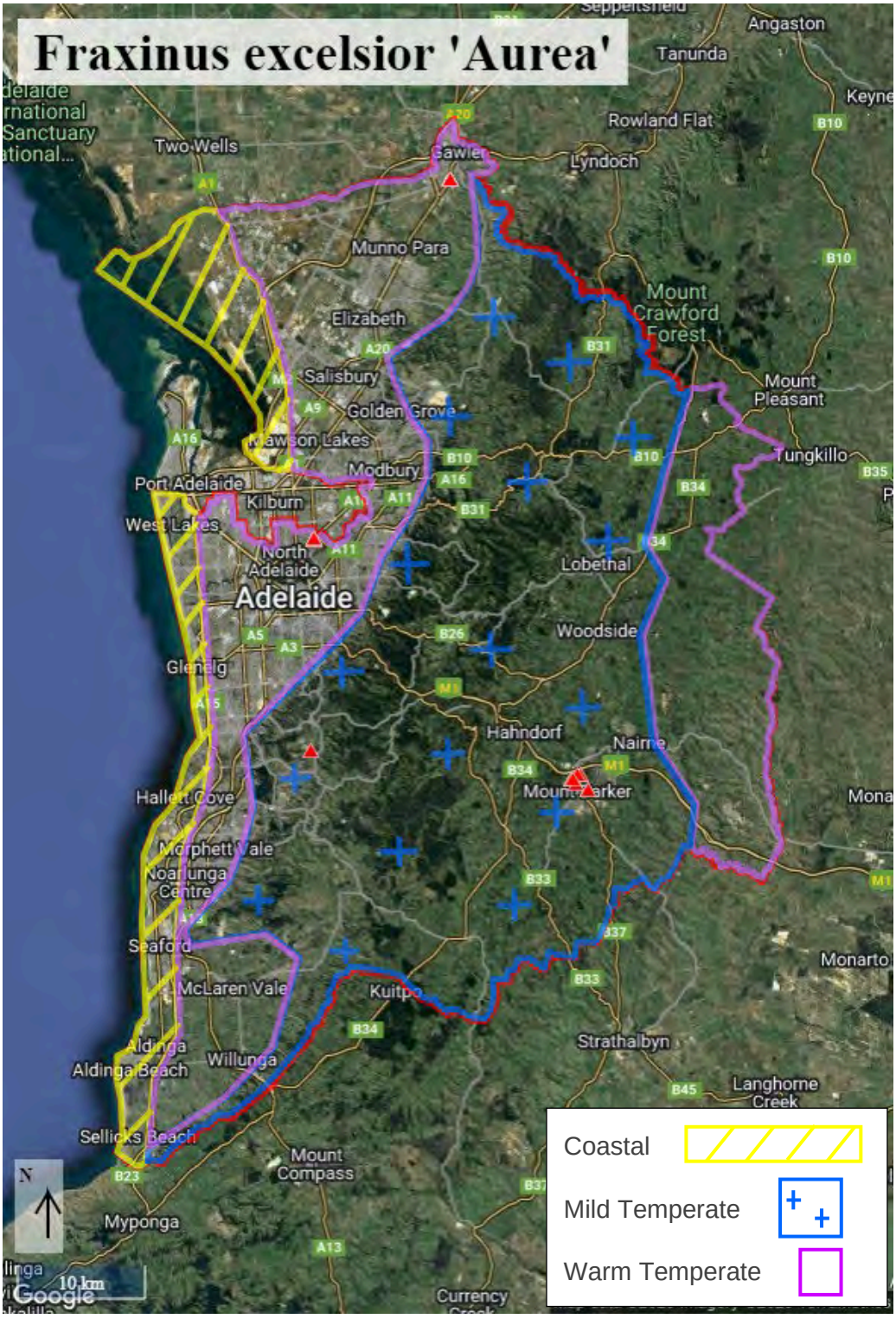

Figure 7.21 - The geographic distribution of assessed *Fraxinus excelsior* 'Aurea'. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 90% of trees assessed were less than 8m in height. On account of the 20 trees assessed, *Fraxinus excelsior* 'Aurea' is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Rosaceae* **- Genus:** *Malus* **- Species:** *ioensis* 'Plena' **- Origin:** Exotic

Malus ioensis 'Plena' (crab apple) is a double-flowered small tree with ascending branches supporting pendulous branchlets. This species is common planted throughout the southern states of Australia and does not produce fruit however does present a late and attractive floral bloom.

Assessment of trees within the group occurred within the Mild and Warm Temperate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 28

Regions assessed: Mild and Warm Temperate.

Average height: 2.9m **Maximum height:** 4.2m

Compliance percentage: 100%

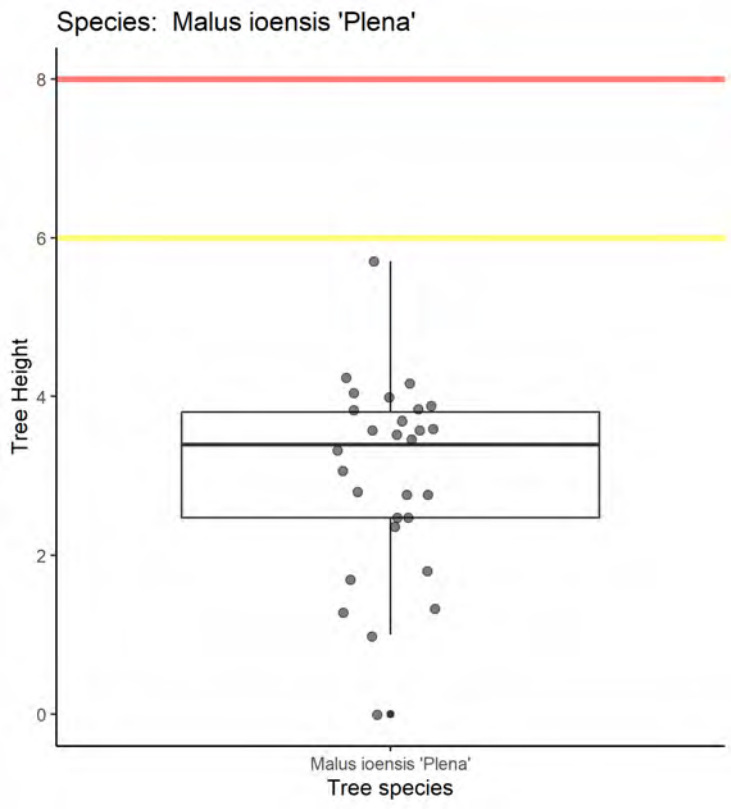

Figure 7.22 Height distribution of 28 *M. ioensis* 'Plena' trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.23 A representative image of *M. ioensis* 'Plena'.

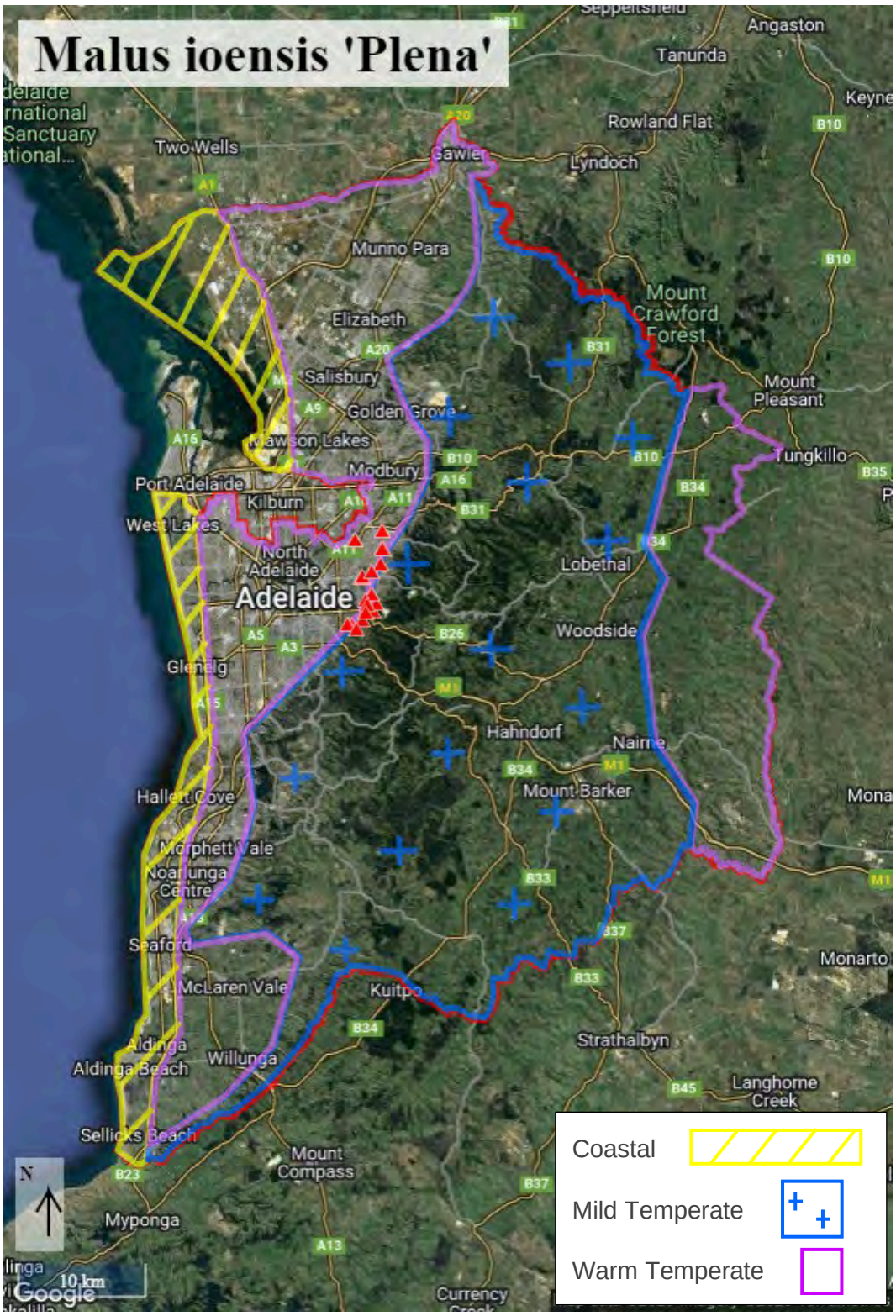

Figure 7.24 - The geographic distribution of assessed *Malus ioensis* 'Plena'. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 100% of trees assessed were less than 8m in height. On account of the 28 trees assessed, *Malus ioensis* 'Plena' is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Myrtaceae* **- Genus:** *Melaleuca* **- Species:** *lanceolata* - **Origin:** Indigenous

Melaleuca lanceolata (black paperbark) is bushy shrub or low branching small tree. This species is native to the Adelaide region.

Assessment of trees within the group occurred within the coastal, mild and warm temperate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Coastal, Mild and Warm Temperate.

Average height: 5.9m **Maximum height:** 9.8m

Compliance percentage: 95%

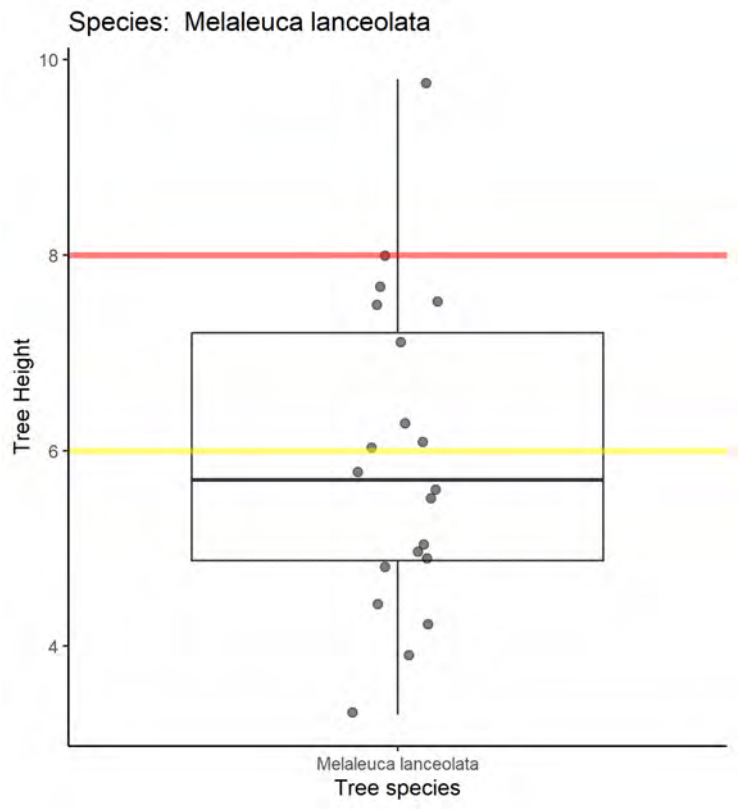

Figure 7.25 Height distribution of 20 *M. lanceolata* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 95% of trees of this species were below 8m in height.

Figure 7.26 A representative image of *M lanceolata*.

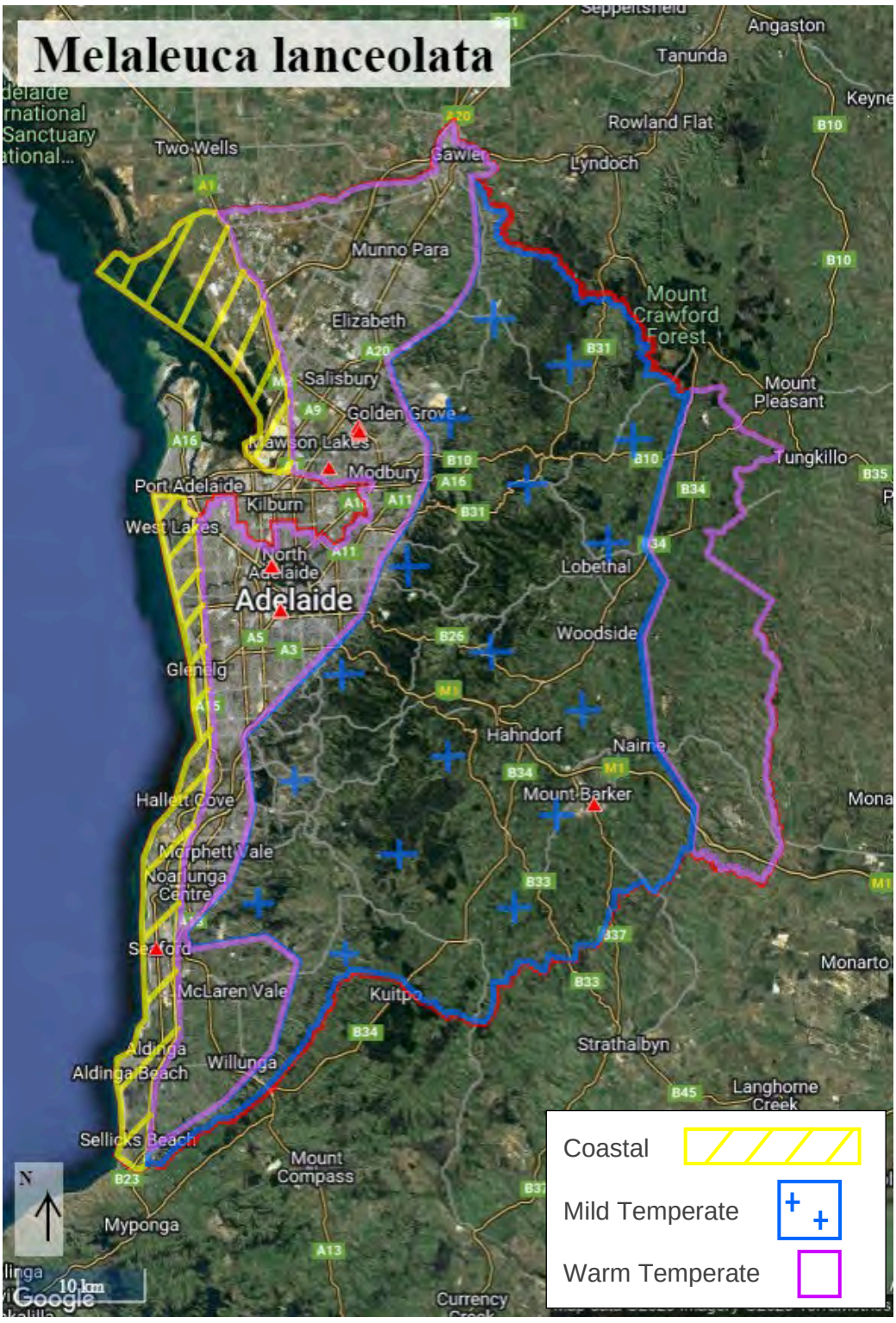

Figure 7.27 - The geographic distribution of assessed *Melaleuca lanceolata*. These trees are located within the Mild and Warm Temperate zones and Coastal zone.

Recommendation: 95% of trees assessed were below 8m in height. On account of the 20 trees assessed, *Melaleuca lanceolata* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Myrtaceae* **- Genus:** *Melaleuca* **- Species:** *linearis* **Origin:** Introduced Native

Melaleuca linearis (narrow-leaved bottlebrush) is typically a small to medium shrub with a native distribution extending throughout forests and woodland from central New South Wales to southeast Queensland, including coastal regions.

Assessment of trees within the group occurred within the inner-city suburbs and Adelaide Hills regions, within the mild and warm temperate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Mild and Warm Temperate.

Average height: 2.9m **Maximum height:** 4.6m

Compliance percentage: 100%

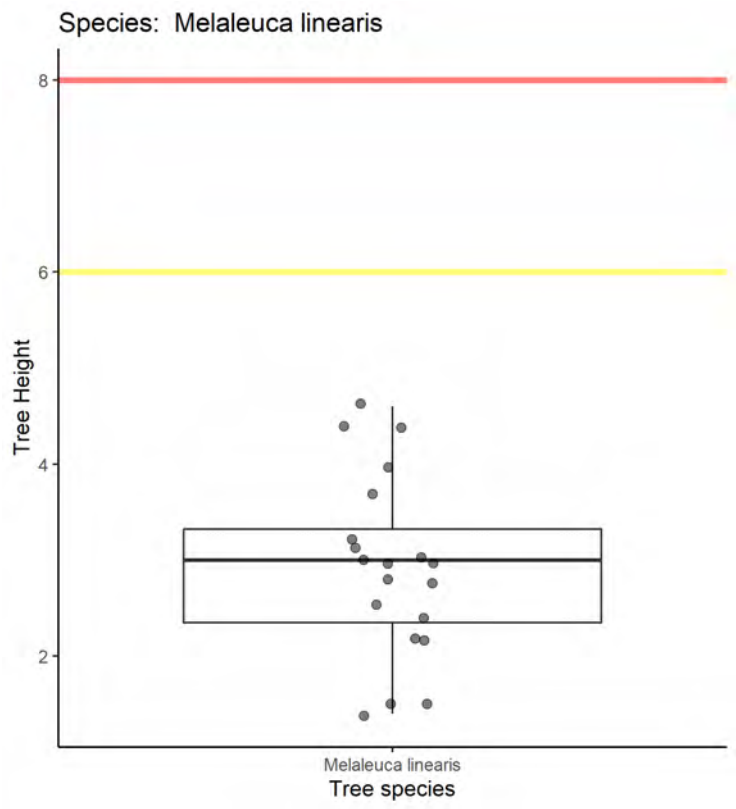

Figure 7.28 Height distribution of 20 *M. linearis* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.38 A representative image of *M. linearis*.

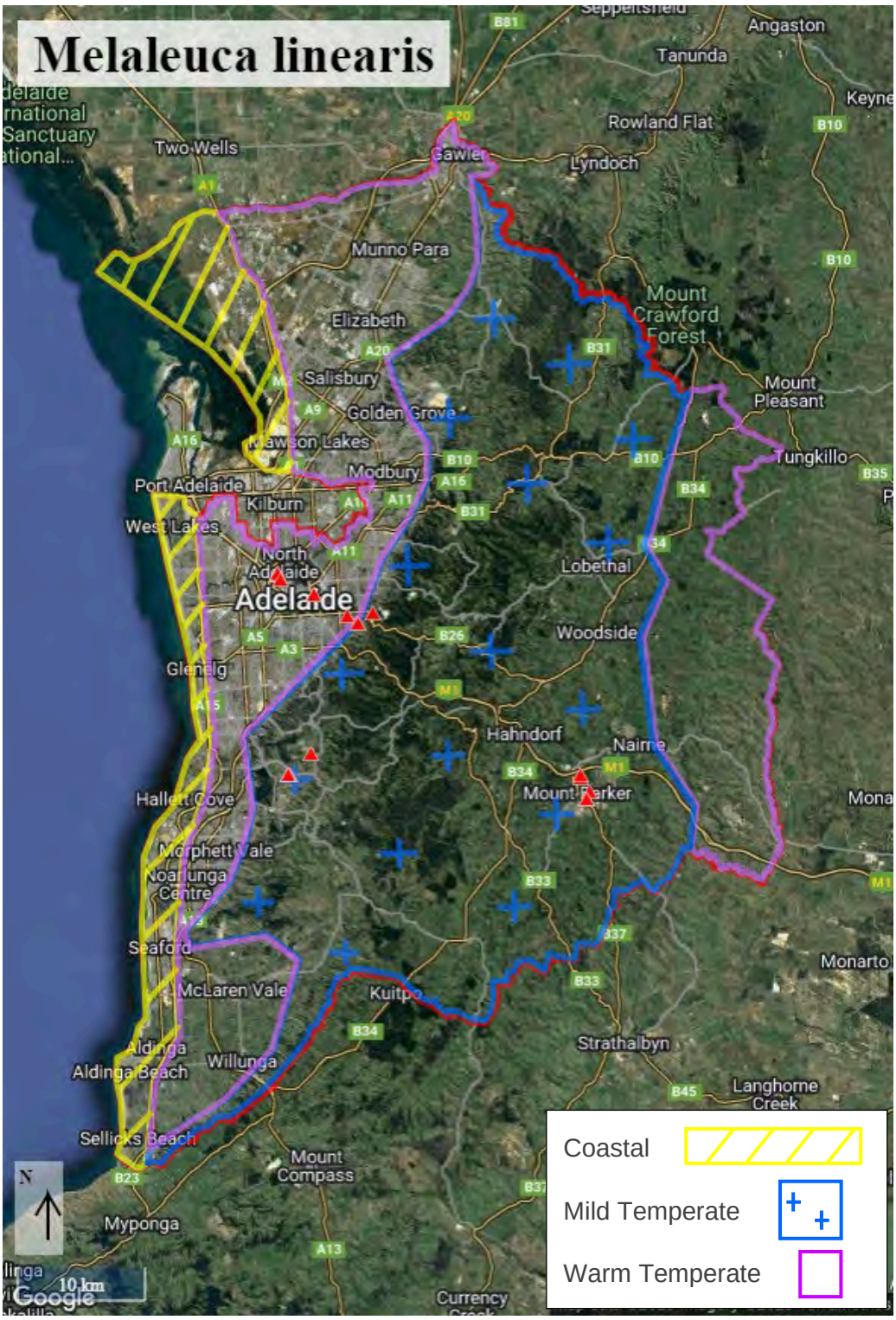

Figure 7.29 - The geographic distribution of assessed *M. linearis*. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 100% of trees assessed were less than 8m in height. On account of the 20 trees assessed, *Melaleuca linearis* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Myrtaceae* **- Genus:** *Melaleuca* **- Species:** *pallida* **Origin:** Introduced Native

Melaleuca pallida (lemon bottlebrush) is typically a small and erect shrub with a native distribution occurring on rocky sites of eastern mountainous ranges through Tasmania, Victoria and New South Wales.

Assessment of trees within the group occurred within the inner-city parklands and Adelaide Hills regions, within the mild and warm temperate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 18

Regions assessed: Mild and Warm Temperate.

Average height: 3.2m **Maximum height:** 4.4m

Compliance percentage: 100%

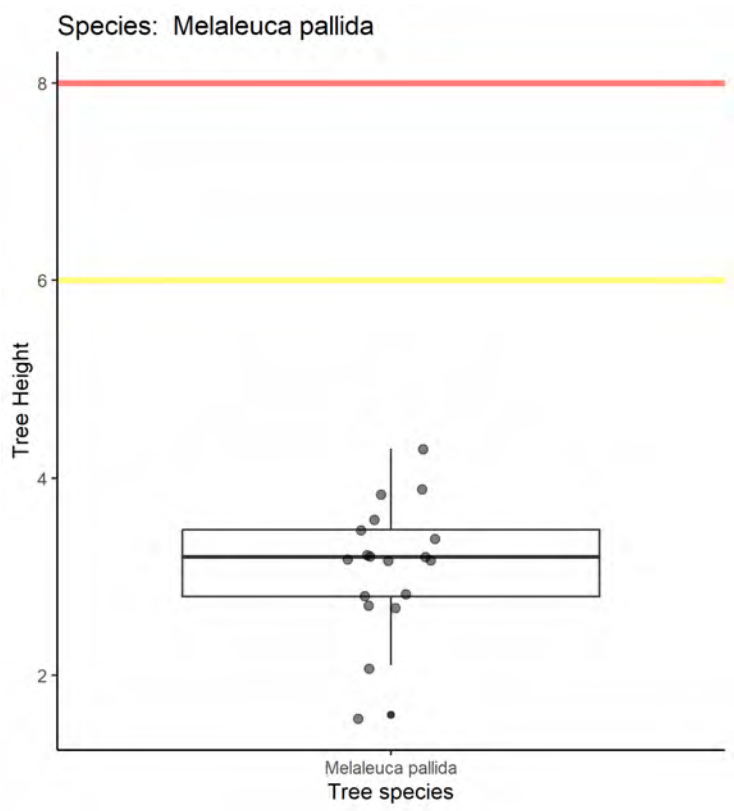

Figure 7.30 Height distribution of 18 *M. pallida* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.31 A representative image of *M. pallida*.

Figure 7.32 - The geographic distribution of assessed *Melaleuca pallida*. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 100% of trees assessed were less than 8m in height. On account of the 18 trees assessed, *Melaleuca pallida* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Myrtaceae* **- Genus:** *Metrosideros* **- Species:** *excelsa* - **Origin:** Exotic

Metrosideros excelsa (New Zealand Christmas tree) is an evergreen small to medium tree with a stout trunk supporting spreading branches to create an umbrella like form. This species is indigenous to the north island of New Zealand.

Assessment of trees within the group occurred within the coastal, mild and warm temperate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 21

Regions assessed: Coastal, Mild and Warm Temperate.

Average height: 5.3m **Maximum height:** 14.4m

Compliance percentage: 95%

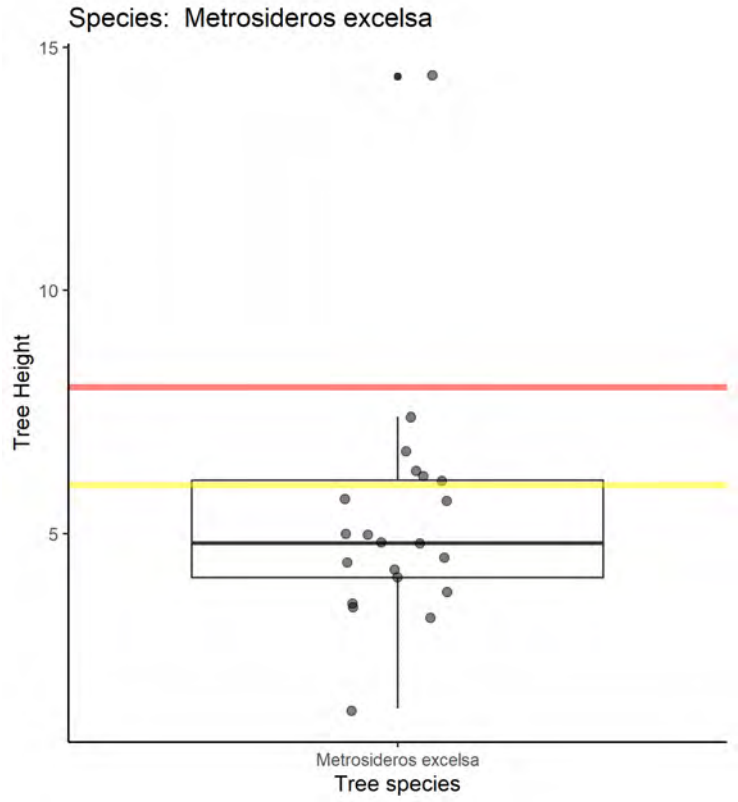

Figure 7.34 Height distribution of 21 *M. excelsa* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 95% of trees of this species were shorter than 8m.

Figure 7.33 A representative image of *M. excelsa M. excelsa.*

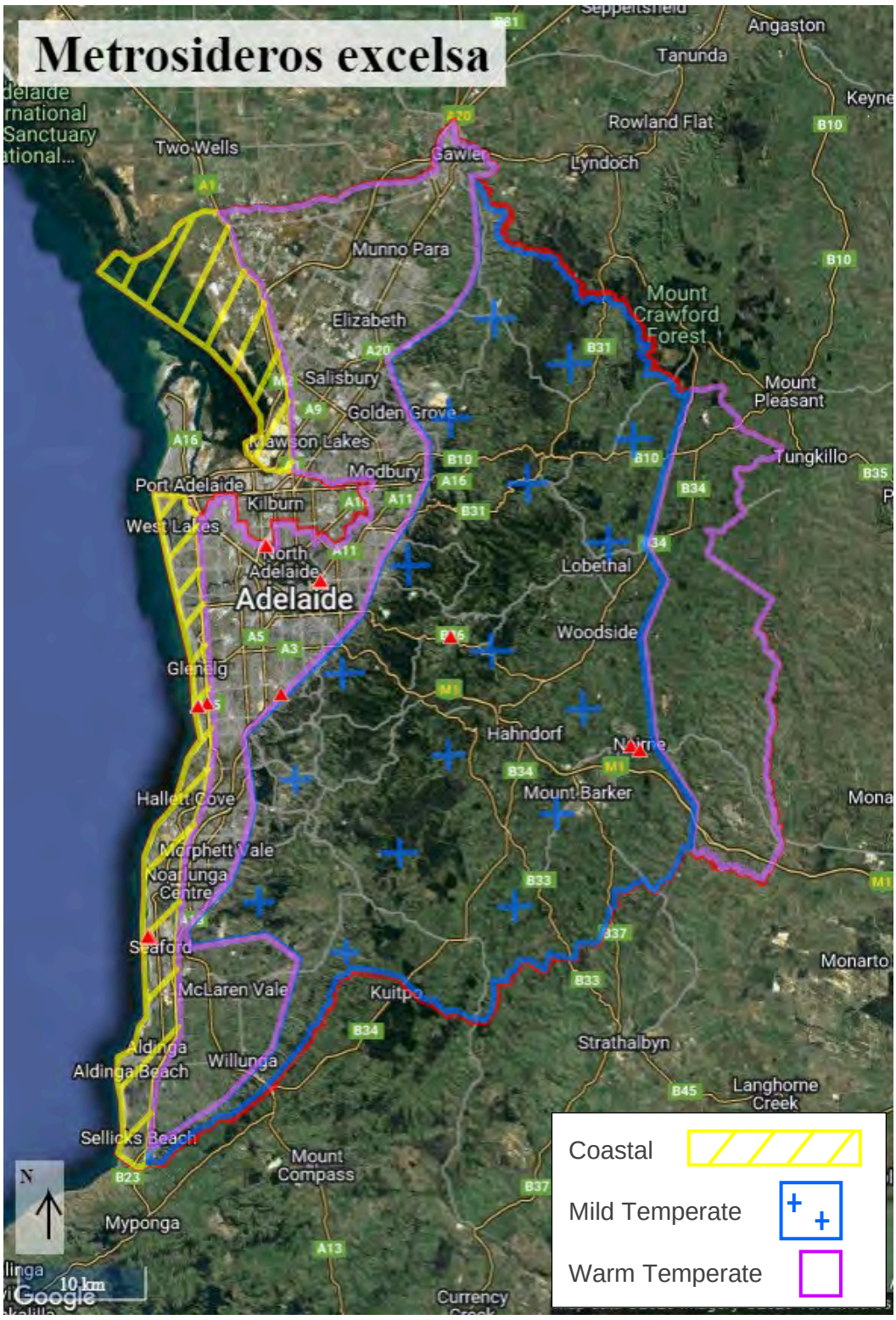

Figure 7.35 - The geographic distribution of assessed *Metrosideros excelsa* These trees are located within the Mild and Warm Temperate zones and Coastal Zone.

Recommendation: 95% of trees assessed were less than 8m in height. On account of the 21 trees assessed, *Metrosideros excelsa* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Cupressaceae* **- Genus:** *Platycladus* **- Species:** *orientalis* **Origin:** Exotic

Platycladus orientalis (oriental arbor-vitae) is a slow growing ovoid shrub to small tree indigenous to China and Japan. The preferred climate zone for the taxon is tropical, subtropical and monsoonal, however the species also performs well in temperate climates.

Trees assessed: 22

Regions assessed: Mild and Warm Temperate.

Average height: 2.7m **Maximum height:** 4.7m

Compliance percentage: 100%

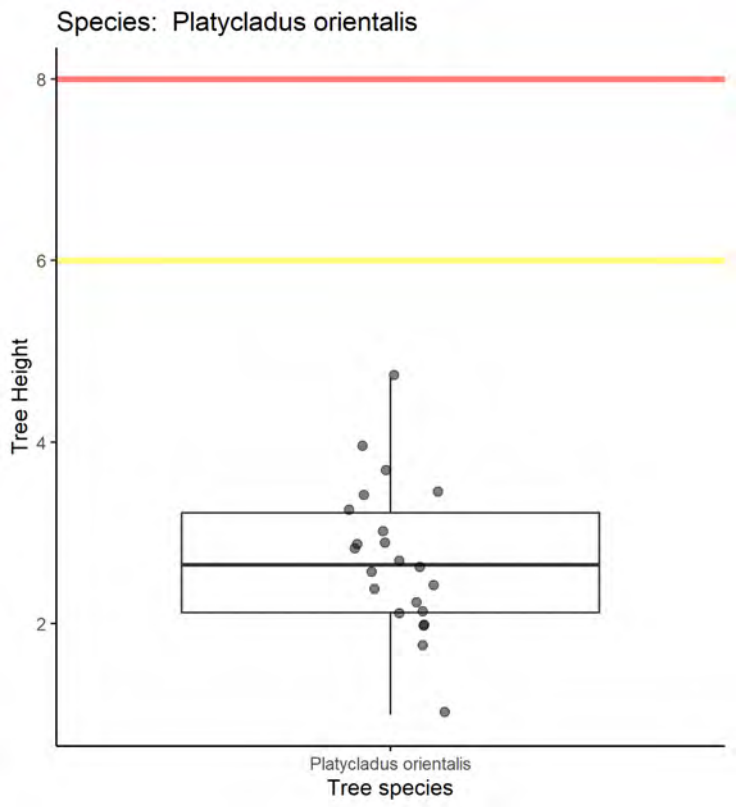

Figure 7.36 Height distribution of 22 *P. orientalis* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.37 A representative image of *P. orientalis*.

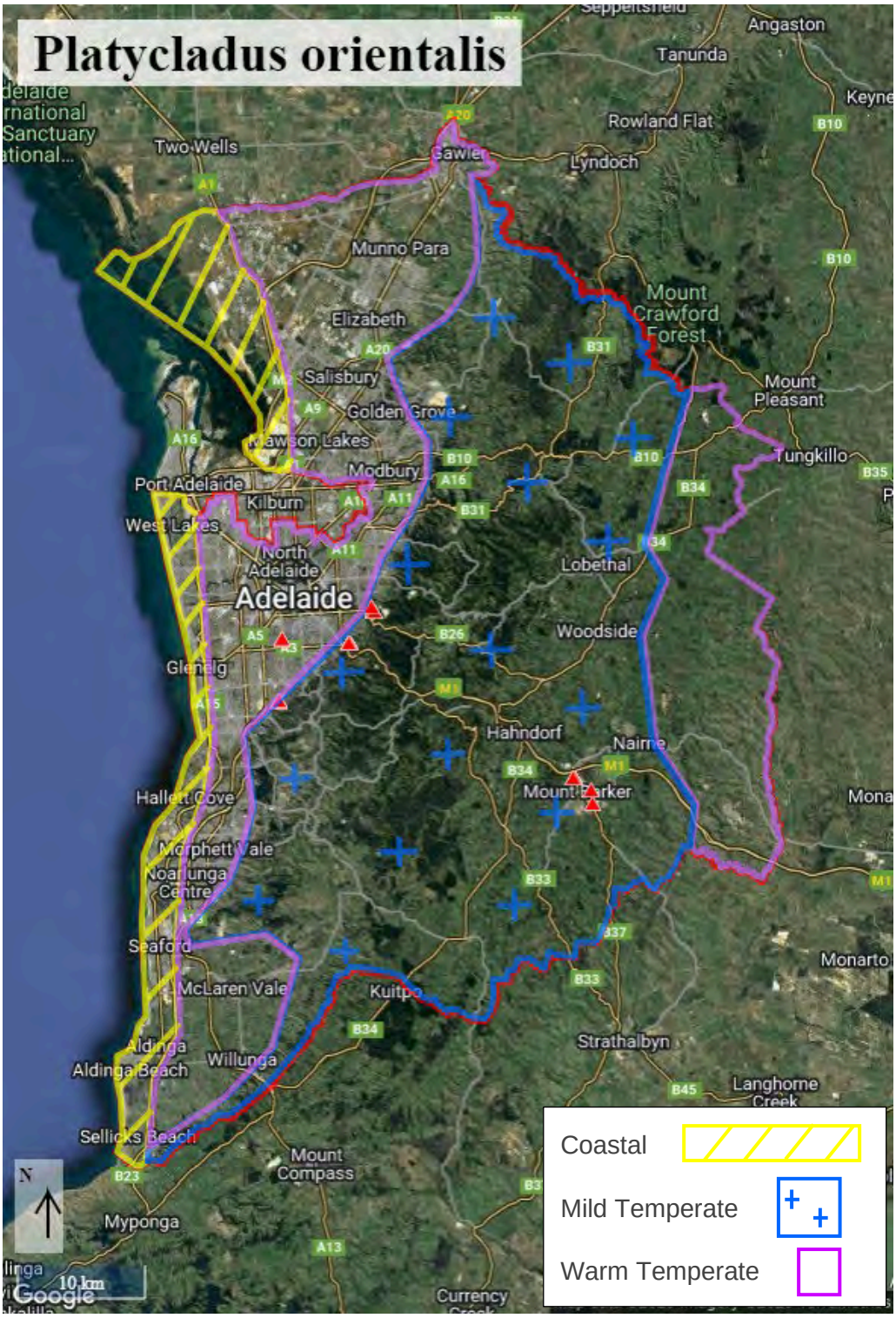

Figure 7.38 - The geographic distribution of assessed *Platycladus orientalis*. These trees are located within the Mild and Warm Temperate climatic zones.

Recommendation: 100% of trees assessed were less than 8m in height. On account of the 22 trees assessed, *Platycladus orientalis* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Rosaceae* **- Genus:** *Prunus* **- Species:** *armeniaca* - **Origin:** Exotic

Prunus armeniaca (apricot) is the most commonly cultivated apricot species. It is a deciduous tree that is native to eastern Europe and west Asia. The form typically consists of a single trunk supporting spreading branches to create a dome shaped crown.

Assessment of trees within the group occurred within the mild temperate zone, in urbanised areas with typical environmental conditions of reserve plantings.

Trees assessed: 21

Regions assessed: Mild Temperate.

Average height: 4.2m **Maximum height:** 5.2m

Compliance percentage: 100%

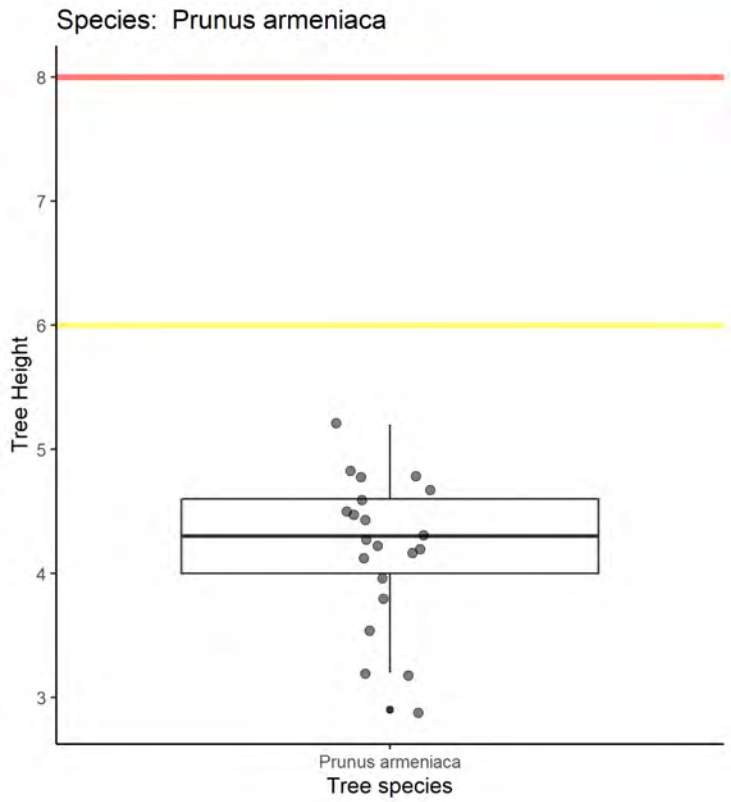

Figure 7.49 Height distribution of 21 *P. armeniaca* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.50 A representative image of *P. armeniaca*.

Figure 7.39 - The geographic distribution of assessed *P. armeniaca.* These trees are located within the Mild Temperate climatic zones.

Recommendation: 100% of trees assessed were less than 8m in height. On account of the 21 trees assessed, *Prunus armeniaca* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Rosaceae* **- Genus:** *Prunus* **- Species:** *dulcis* **- Origin:** Exotic

Prunus dulcis (almond) is an upright deciduous tree generally growing to 4-6m with a spread of 2-3m. This species generates full blooms in late winter and has dense foliage providing generous canopy cover. Many examples of this taxon are present throughout greater Adelaide.

Assessment of trees within the group occurred within the Mild and Warm Temperate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Mild and Warm Temperate.

Average height: 6.3m **Maximum height:** 8.4m

Compliance percentage: 90%

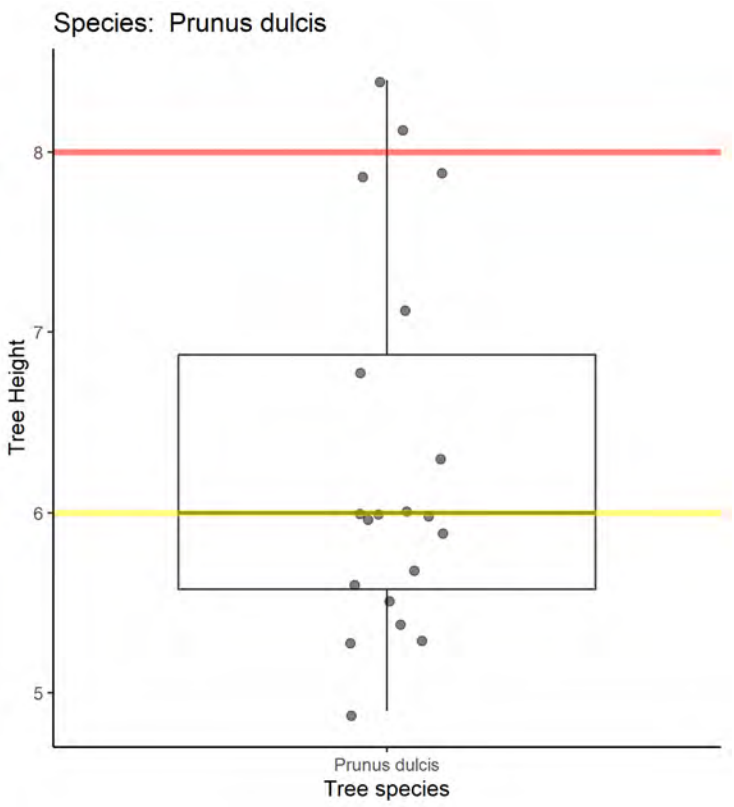

Figure 7.52 Height distribution of 20 *P. dulcis* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 90% of trees of this species were shorter than 8m.

Figure 7.53 A representative image of *P. dulcis*.

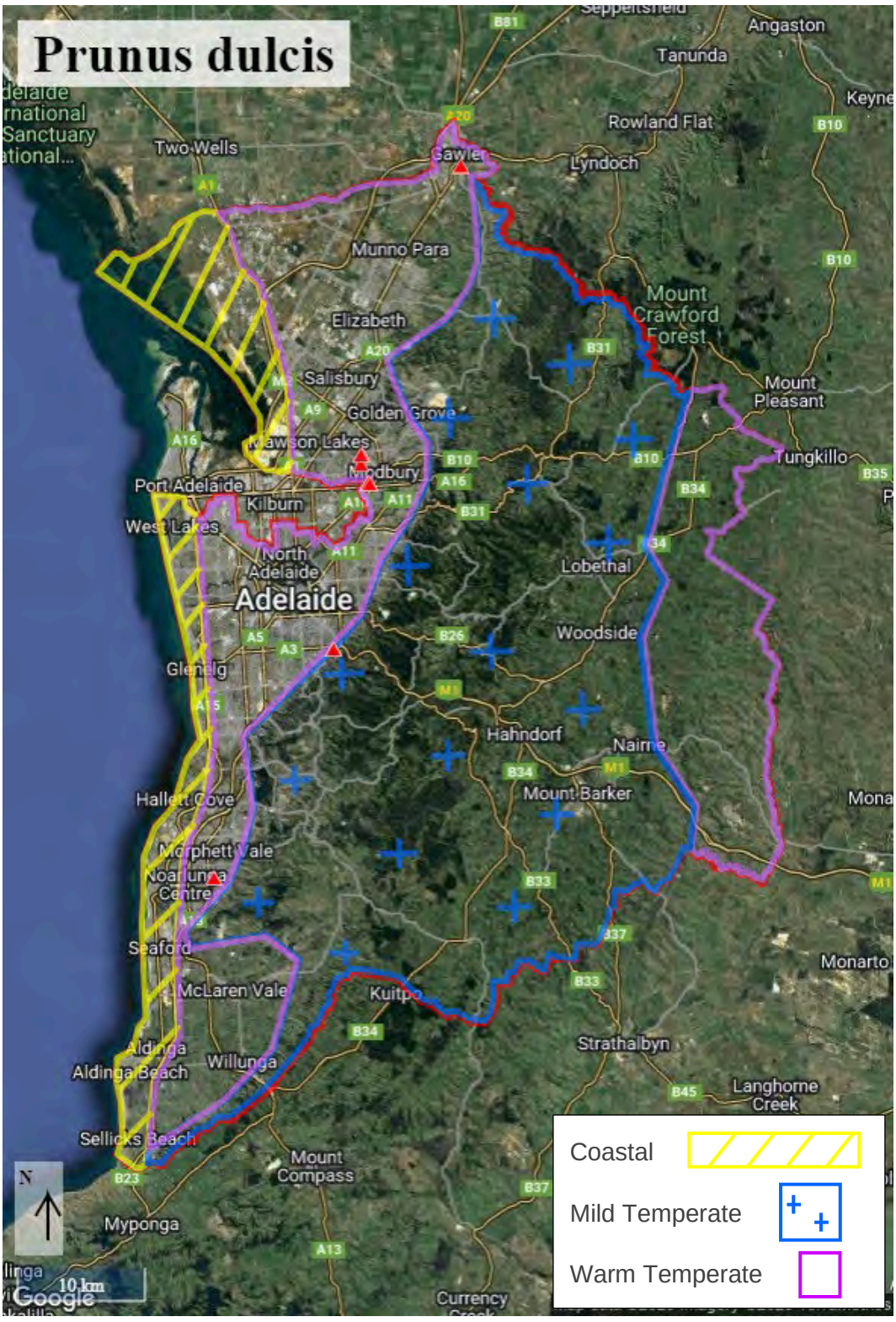

Figure 7.40 The geographic distribution of assessed *Prunus dulcis*. These trees are located within the Mild and Warm Temperate climatic zones.

Recommendation: 90% of trees assessed were less than 8m in height. On account of the 20 trees assessed, *Prunus dulcis* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Proteaceae* **- Genus:** *Stenocarpus* **- Species:** *sinuatus* - **Origin:** Introduced Native

Stenocarpus sinuatus (firewheel tree) develops an upright form of evergreen foliage. This species is indigenous to open forest environments between the New South Wales/Queensland border and the Atherton Tablelands in Far North Queensland. The tree can grow to 20m in its native distribution with higher annual rainfall however is severely limited in drier environments.

Assessment of trees within the group occurred within the mild and warm temperate climatic zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Mild and Warm Temperate.

Average height: 5.7m **Maximum height:** 14.9m

Compliance percentage: 85%

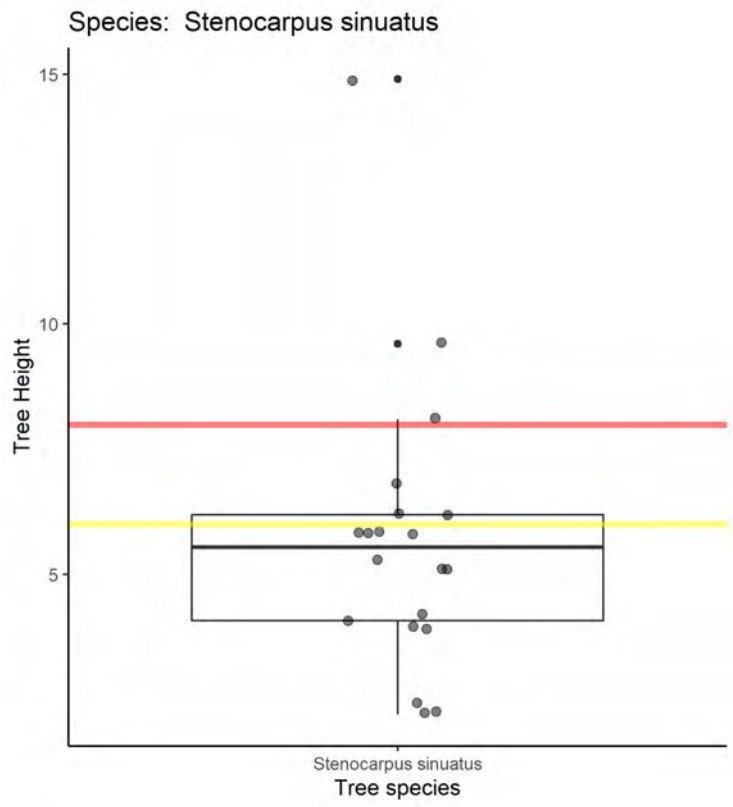

Figure 7.41 Height distribution of 20 *S. sinuatus* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 85% of trees of this species were shorter than 8m.

Figure 7.42 A representative image of *S. sinuatus*.

Figure 7.43 - The geographic distribution of assessed *S. sinuatus.* These trees are located within the Mild and Warm Temperate climatic zones.

Recommendation: 85% of trees assessed were shorter than 8m in height. On account of the 20 trees assessed, *Stenocarpus sinuatus* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas. This species does have the potential to grow above 8m in wetter areas (e.g. the Adelaide Hills and Foothills), but these would represent bushfire areas and therefore outside the scope of the Permitted List.

Family: *Euphorbiaceae* **- Genus:** *Triadica* **- Species:** *sebifera* - **Origin:** Exotic

Triadica sebifera (Chinese tallow) is a deciduous medium sized tree of single trunk supporting radiating branches.

Assessment of trees within the group occurred within the southwestern inner suburbs (warm temperate climate zone), in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Warm Temperate.

Average height: 6.5m **Maximum height:** 8.2m

Compliance percentage: 95%

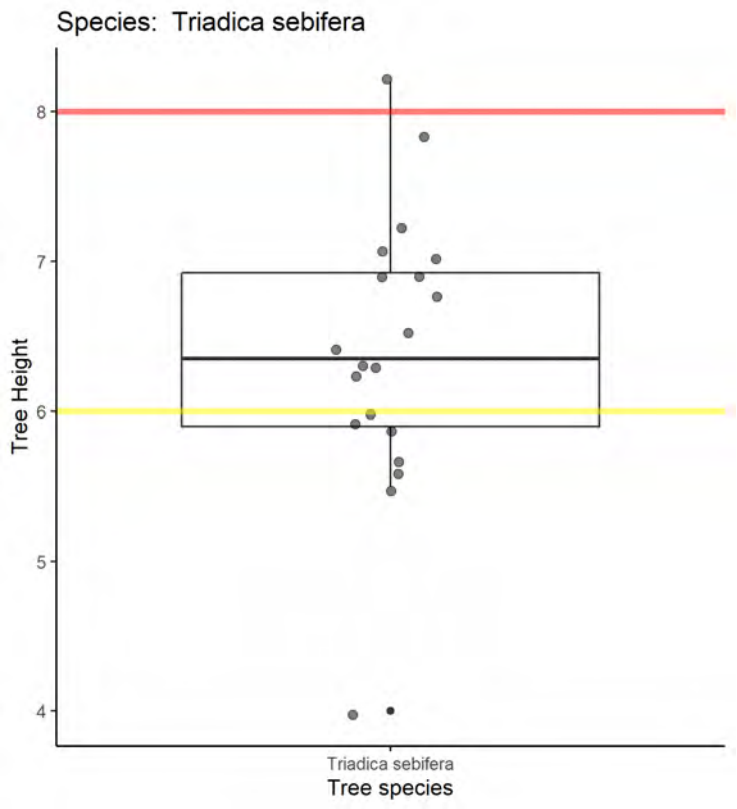

Figure 7.44 Height distribution of 20 *T. sebifera* trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 95% of trees of this species were shorter than 8m.

Figure 7.45 A representative image of *T. sebifera*.

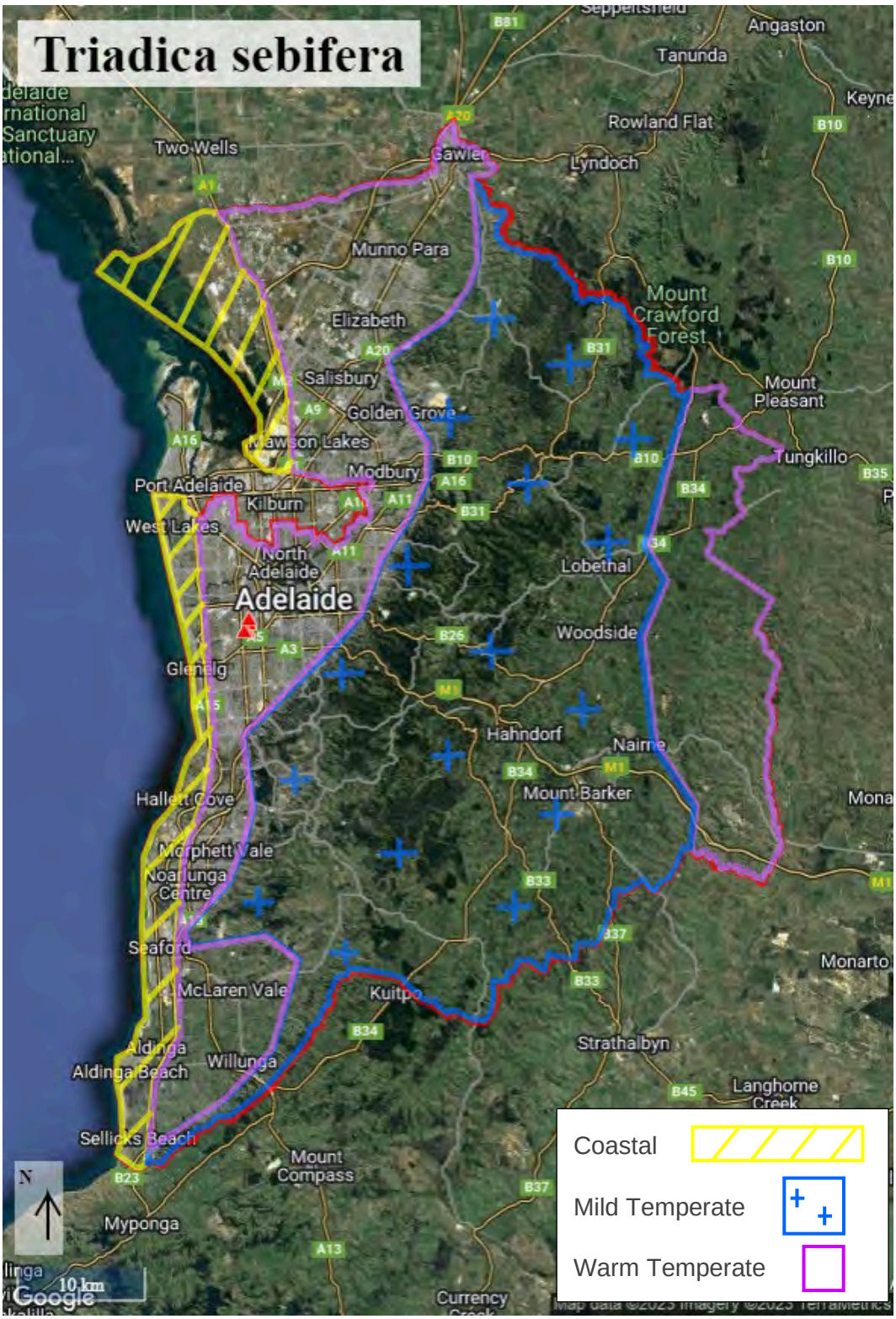

Figure 7.46 - The geographic distribution of assessed *T. sebifera*. These trees are located within the Warm Temperate climatic zone.

Recommendation: 95% of trees assessed were less than 8m in height. On account of the 20 trees assessed, *Triadica sebifera* is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

7.2. Species specific results – Trees requiring further assessment

Family: *Fabaceae* **- Genus:** *Acacia* - **Species:** *baileyana* - **Origin:** Aus. Native

Acacia baileyana (Cootamundra wattle) is typically a medium spreading shrub to small tree with widespread distribution throughout Australia including South Australia. This species has naturalised through many states including southeastern South Australia and Kangaroo Island.

Assessment of trees within the group occurred within the Adelaide Foothills and Mount Barker regions (Mild Temperate Zone), in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 15

Regions assessed: Mild Temperate.

Average height: 5.5m. **Maximum height:** 7.9m

Compliance percentage: 100**%**

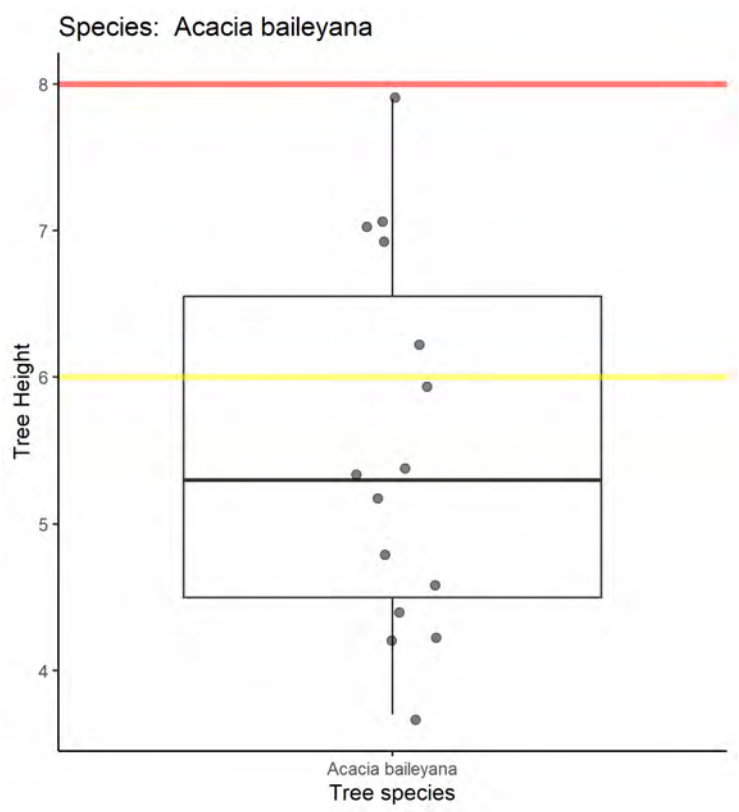

Figure 7.47 Height distribution of 15 *A. baileyana* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.48 A representative image of *A. baileyana*.

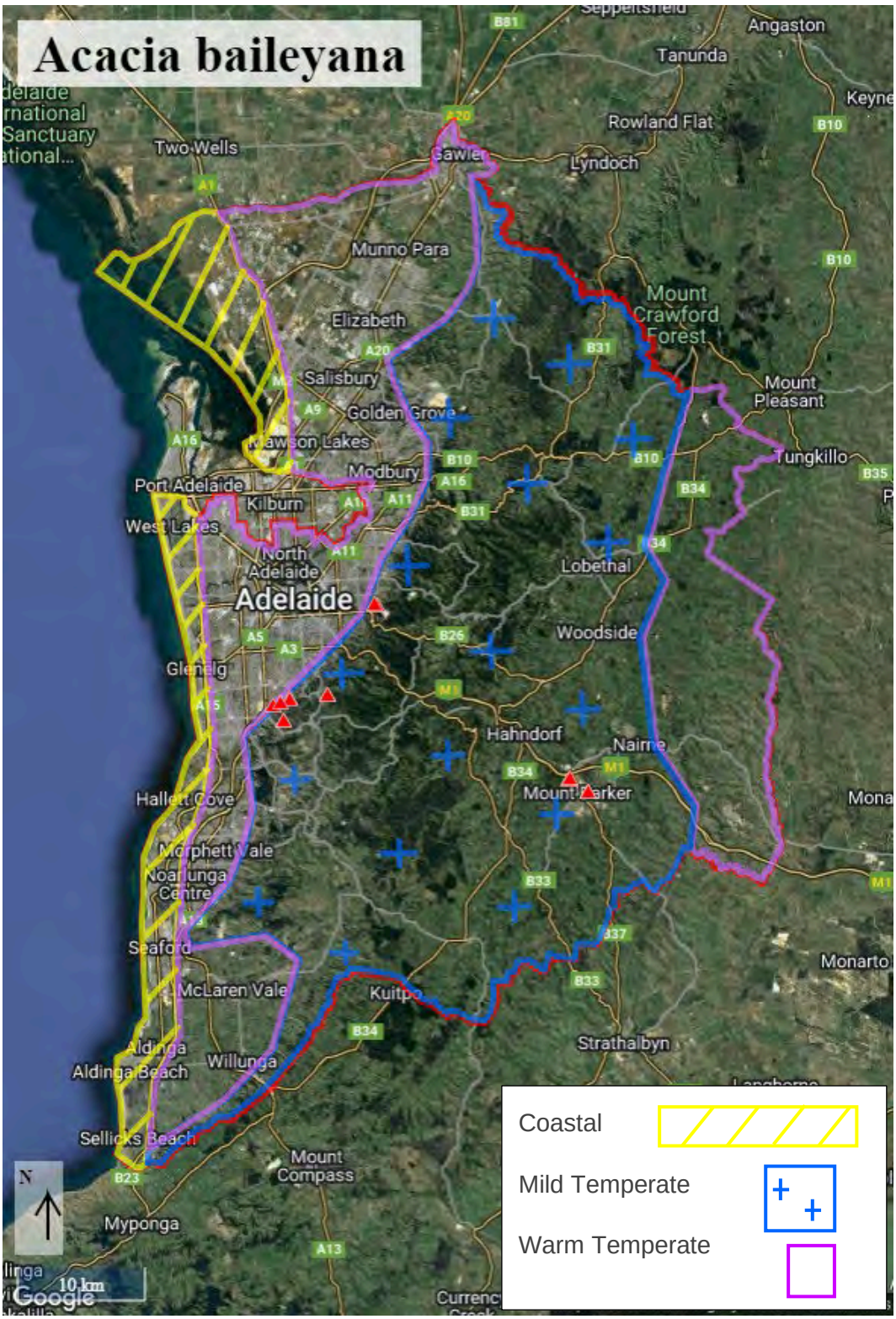

Figure 7.49 The geographic distribution of assessed *A. baileyana*. These trees are located within the Mild Temperate zone.

Recommendation: 100% of trees assessed were shorter than 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Acacia baileyana* for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this species be investigated further.

Family: *Sapindaceae* **- Genus:** *Acer* **- Species:** *campestre* ‘Evelyn’ **Origin:** Exotic

Acer campestre ‘Evelyn’ (Evelyn maple) is typically a medium sized tree with a dense round crown. The parent species is indigenous to Europe and Asia Minor, but this cultivar has been planted extensively throughout Adelaide.

Trees were sampled in the warm temperate areas surrounding the Adelaide CBD, in urbanised areas with typical roadside conditions.

Trees assessed: 20

Regions assessed: Warm Temperate.

Average height: 4.5m. **Maximum height:** 6.8m

Compliance percentage: 100%

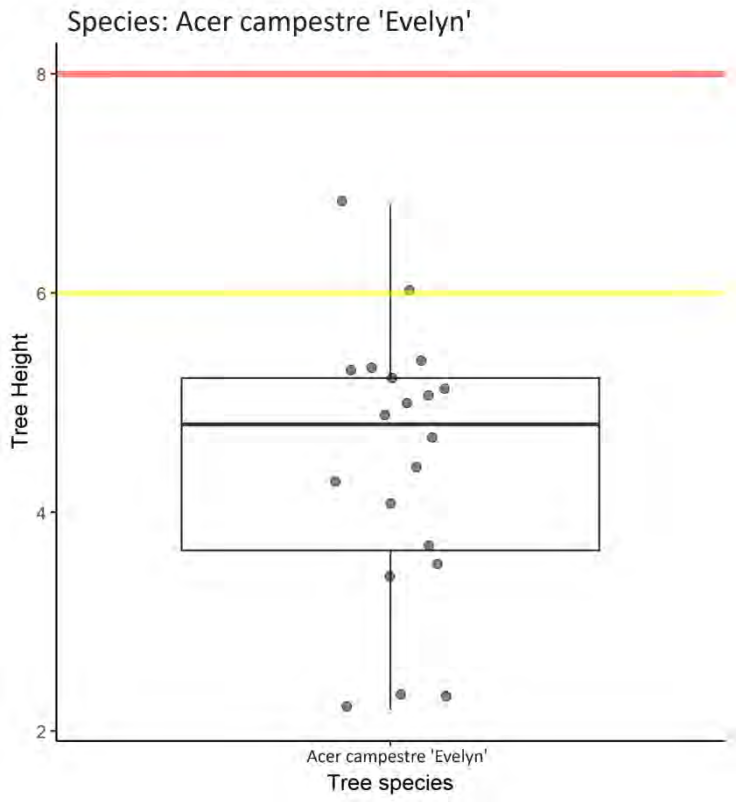

Figure 7.50 Height distribution of 20 *A. campestre* ‘Evelyn’ trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. All trees were shorter than 8m.

Figure 7.51 - A representative image of *A. campestre* ‘Evelyn’.

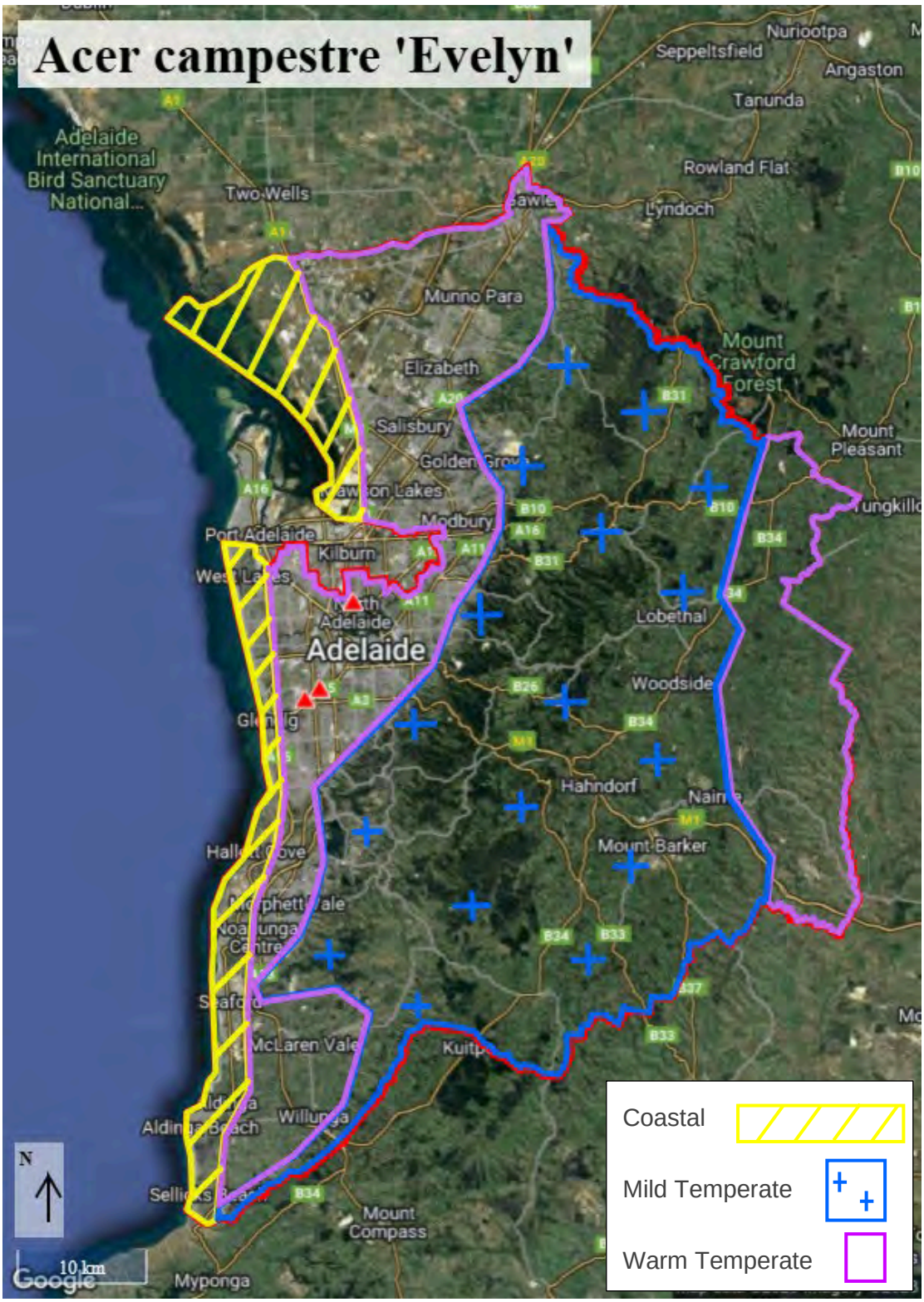

Figure 7.52 - The geographic distribution of assessed *Acer campestre* 'Evelyn'. These trees are located within the Warm Temperate zones.

Recommendation: Based on the compliance of all assessed individuals (100%), *Acer campestre* 'Evelyn' is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Sapindaceae* **– Genus:** *Acer* **– Species:** *platanoides* ‘Crimson Sentry’ - **Origin:** Exotic

Acer platanoides ‘Crimson Sentry’ is a broadleaf and deciduous cultivar that grows with an upright and columnar form through semi-mature years and later spread to create a more domed form with dense foliage.

Assessment of this taxa occurred in both Mild and Temperate Zones.

Trees assessed: 18

Regions assessed: Mild and Warm Temperate.

Average height: 3.7m. **Maximum height:** 4.7m

Compliance percentage: 100%

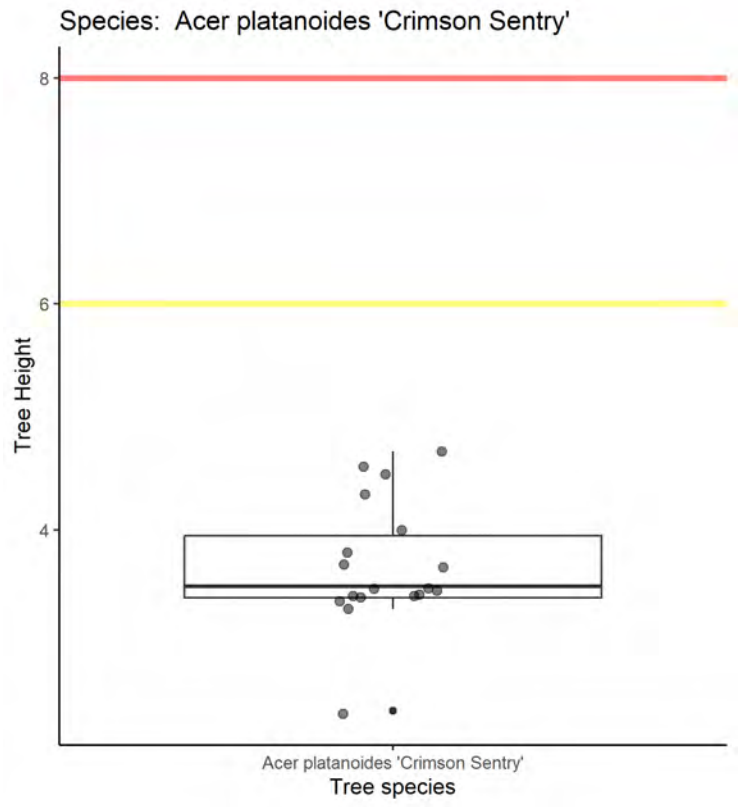

Figure 7.64 Height distribution of 18 *A. platanoides* ‘Crimson Sentry’ trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.65 A representative image of *Acer platanoides* ‘Crimson Sentry’.

Figure 7.53 The geographic distribution of assessed *Acer platanoides* 'Crimson Sentry'. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 100% of trees assessed were shorter than 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Acer platanoides* 'Crimson Sentry' for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this cultivar be investigated further.

Family: *Sapindaceae* **- Genus:** *Acer* **- Species:** *platanoides* ‘Globosum’ - **Origin:** Exotic

Acer platanoides ‘Globosum’ (standard maple) is a dense and symmetrical small tree with a rounded form with slow to moderate growth rate. This tree has an expected height of 5m at maturity.

Assessment of trees within the group occurred within the mild temperate zone, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 16

Regions assessed: Mild Temperate.

Average height: 3.8m **Maximum height:**4.5m

Compliance percentage: 100%

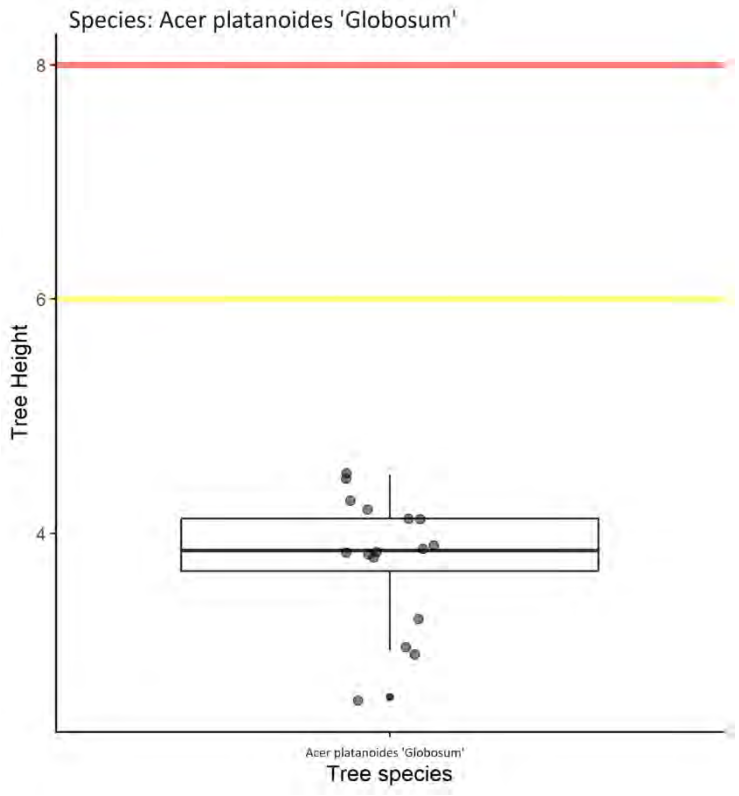

Figure 7.54 Height distribution of 16 *A. platanoides* ‘Globosum’ trees measured. The red line is indicative of the standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.55 A representative image of *Acer platanoides* ‘Globosum’.

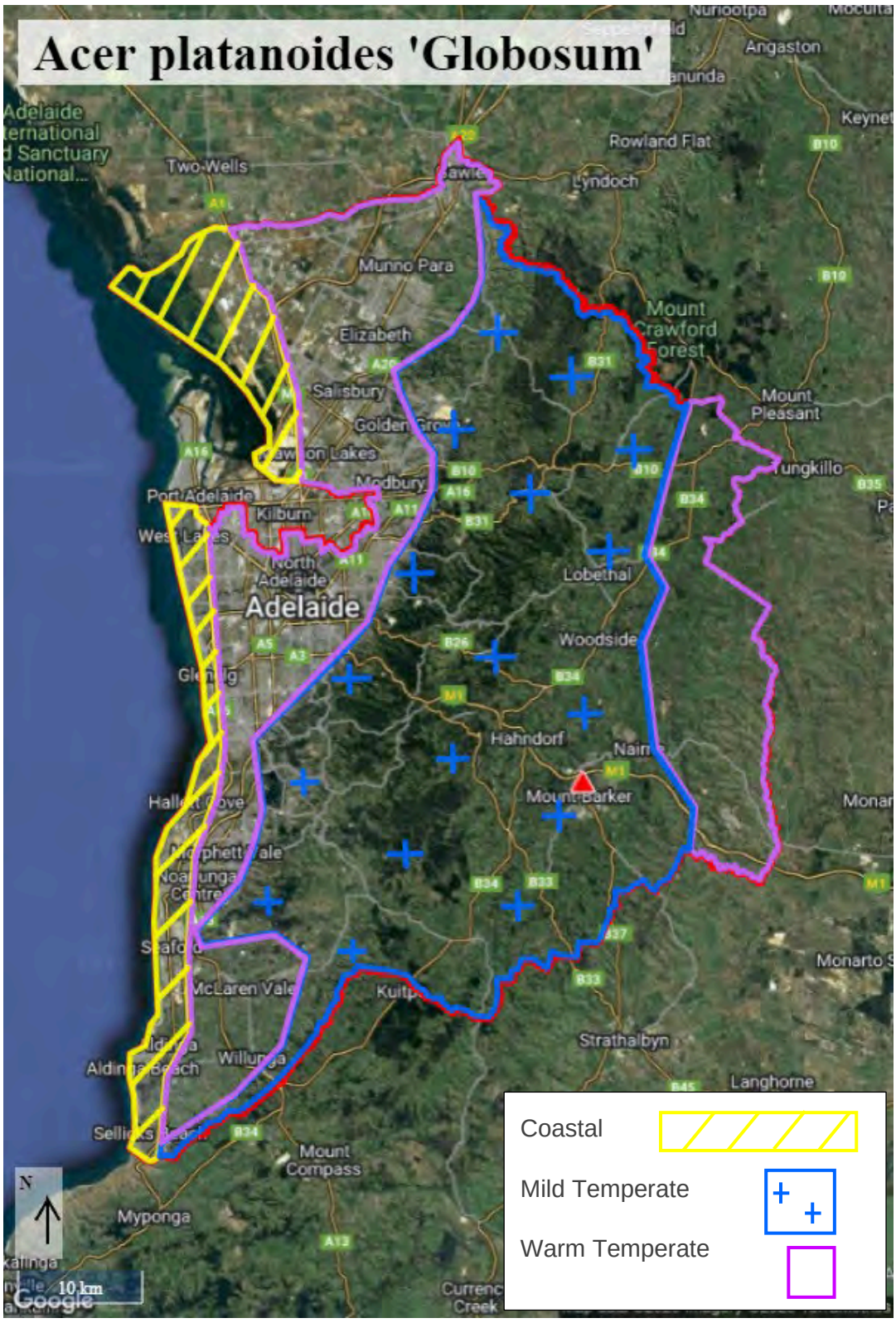

Figure 7.56 - The geographic distribution of assessed *Acer platanoides* 'Globosum'. These trees are located within the Mild Temperate zone.

Recommendation: 100% of trees assessed were less than 8m in height. On account of the 16 trees assessed, *Acer platanoides* 'Globosum' is recommended as suitable for inclusion on the Permitted List of species able to be planted under power infrastructure in non-bushfire areas.

Family: *Pittosporaceae* **- Genus:** *Auranticarpa* **- Species:** *rhombifolia* **- Origin:** Introduced Native

Auranticarpa rhombifolia (diamond leaf pittosporum) is a tall upright tree which can reach 20 metres in height in its natural range but grows far smaller when cultivated outside of this range. This species is indigenous to forest lands between the coast and tablelands of southern Queensland and extending south to the Clarence River in New South Wales. The erect trunk generally supports radiating branches with dense foliage to create a domed crown form.

Assessment of trees within the group occurred within the southern plains and hills region (Mild and Warm Temperate Zones), in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 7

Regions assessed: Mild and Warm Temperate.

Average height: 3.8m. **Maximum height:** 5.8m

Compliance percentage: 100%

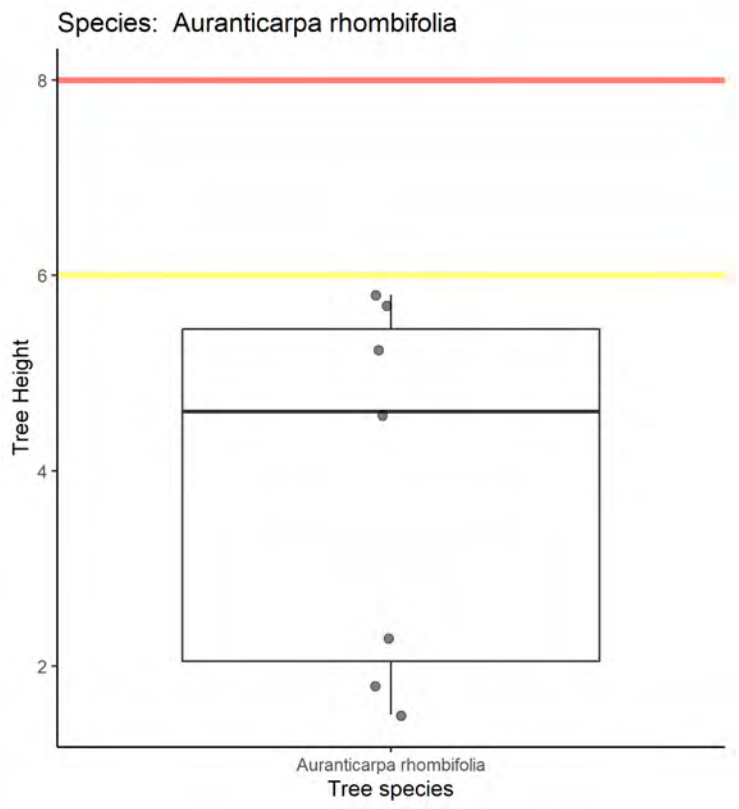

Figure 7.58 Height distribution of seven *A. rhombifolia* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.57 A representative image of *A. rhombifolia*.

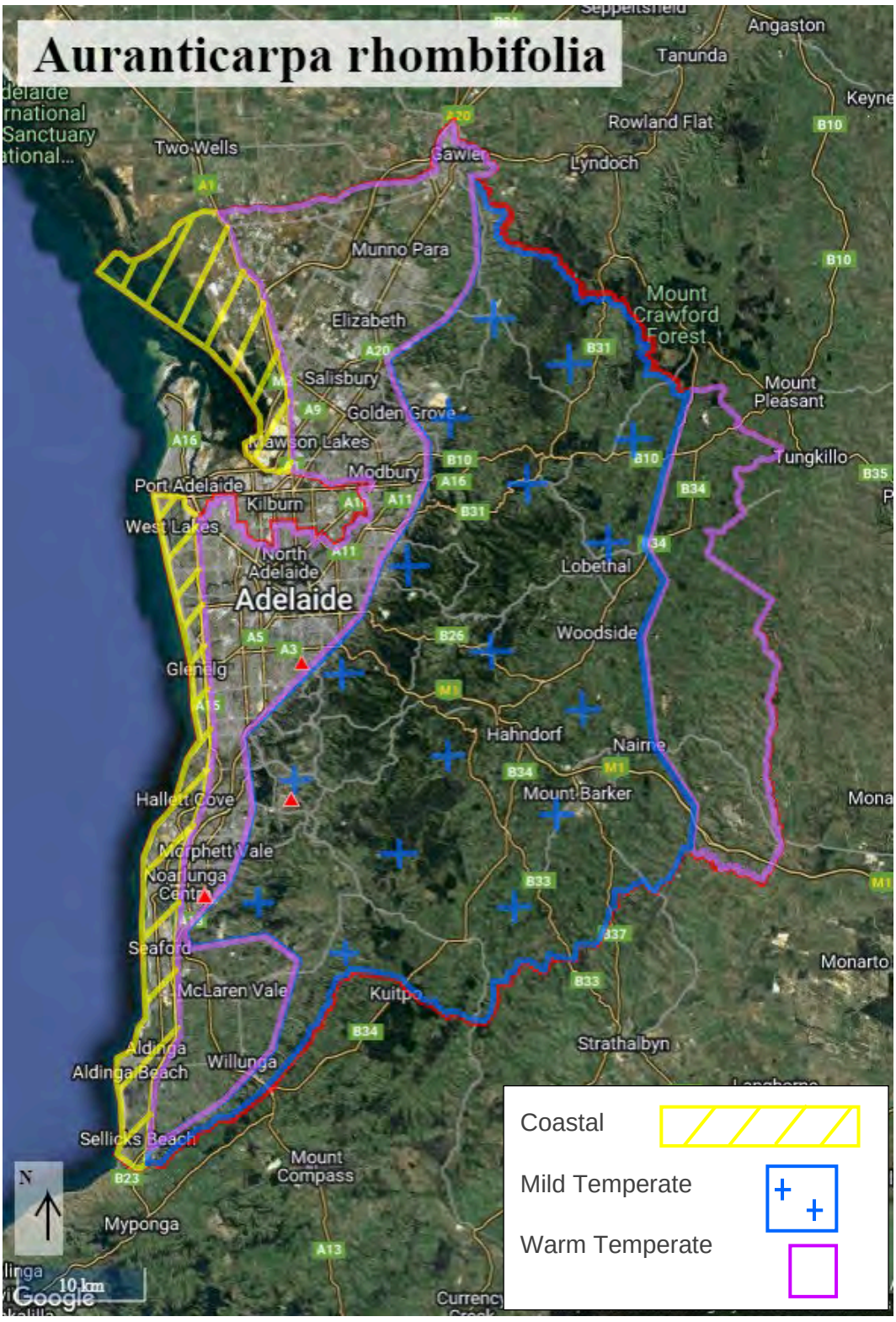

Figure 7.59 The geographic distribution of assessed *A. rhombifolia*. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 100% of trees assessed were shorter than 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Auranticarpa rhombifolia* for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this species be investigated further.

Family: *Sterculiaceae* **- Genus:** *Brachychiton* **- Species:** *bidwillii* 'Beau Bells' **- Origin:** Indigenous

Brachychiton bidwillii 'Beau Bells' is a cloned variety of the parent species that develops with variability however is usually restricted to a maximum height of 4.5m through its natural distribution range.

Assessment of trees within the group occurred within the northern region (Warm Temperate Zone), in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Warm Temperate.

Average height: 3.8m. **Maximum height:** 5.8m

Compliance percentage: 100%

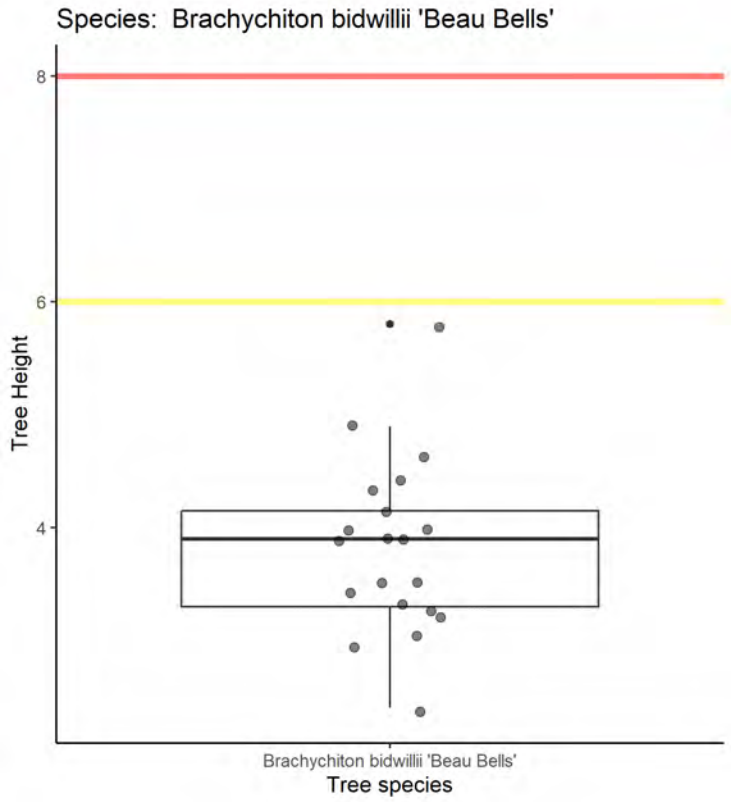

Figure 7.60 Height distribution of 20 *B. bidwillii* 'Beau Bells' trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.61 A representative image of *B. bidwillii* 'Beau Bells'.

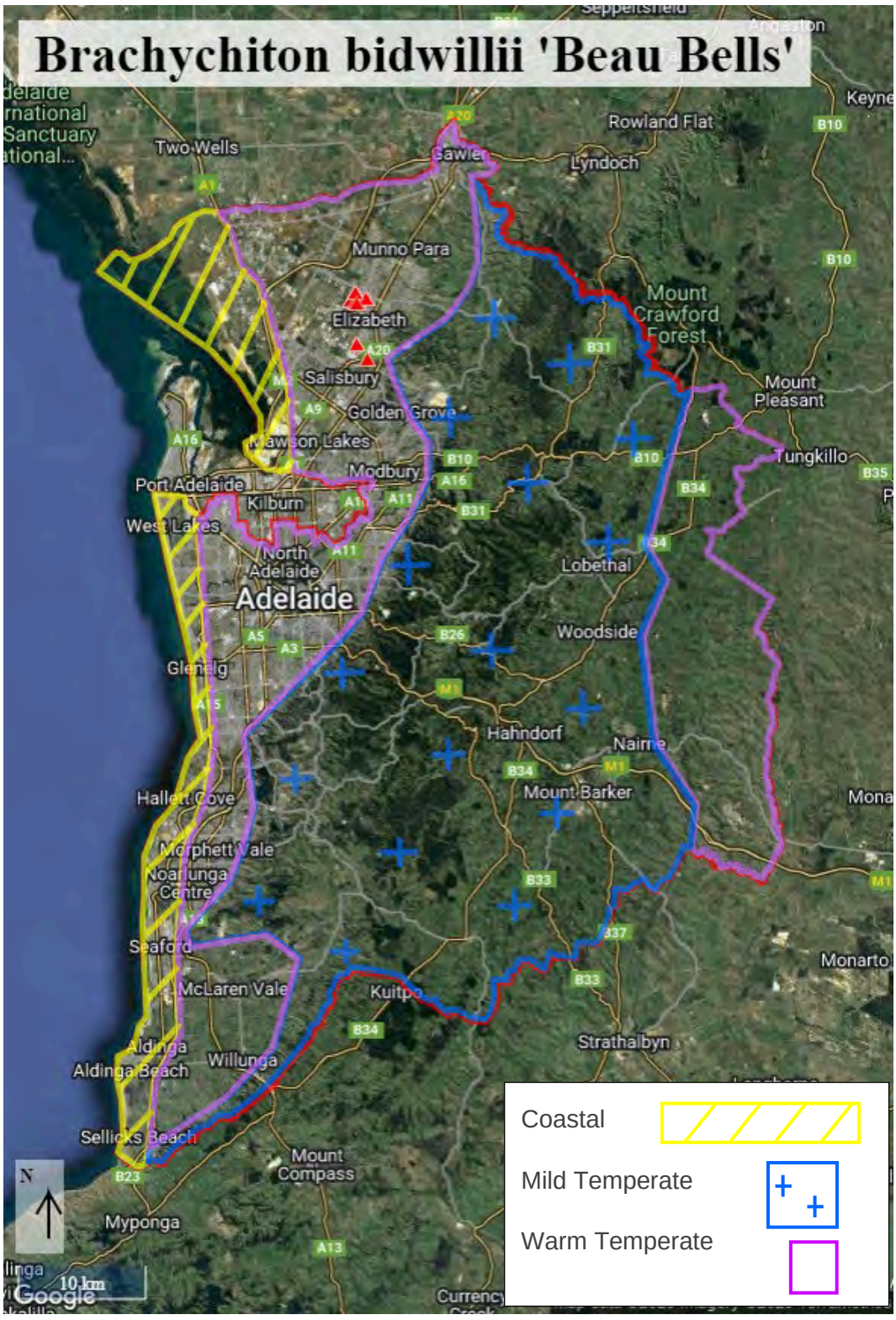

Figure 7.62 The geographic distribution of assessed *B. bidwillii* 'Beau Bells'. These trees are located within the Warm Temperate zone.

Recommendation: 100% of trees assessed were shorter than 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Brachychiton bidwillii* 'Beau Bells' for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this cultivar be investigated further.

Family: *Fabaceae* **- Genus:** *Cercis* **- Species:** *siliquastrum* **Origin:** Exotic

Cercis siliquastrum (Judas tree) is typically a slow growing small tree of rounded form. The distribution of this species throughout public lands of Greater Adelaide is limited however it is noted to be drought, fire tolerant, and suitable for planting in the Mild and Warm Temperate Zones, as well as Coastal areas with a minor setback from the sea.

Assessment of trees within the group occurred within the northeastern and southern foothills, Adelaide Hills and northern plains regions (Mild and Warm Temperate Zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 16

Regions assessed: Mild and Warm Temperate.

Average height: 5.3m. **Maximum height:** 7.2m

Compliance percentage: 100%

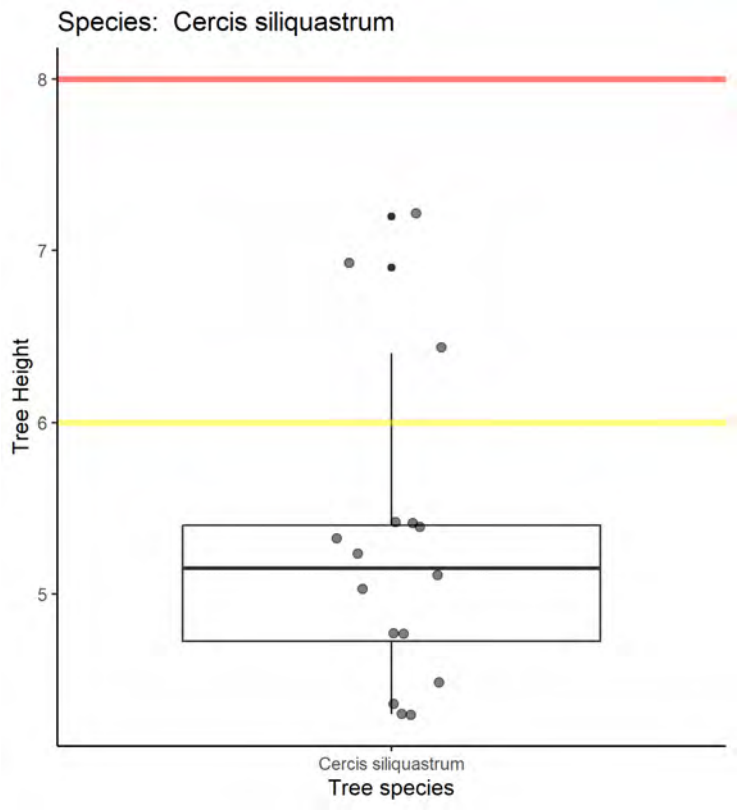

Figure 7.633 Height distribution of 16 *C. siliquatrum* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m however the species population was limited, and more examples of this species are required to determine a true indication of consistent mature tree heights.

Figure 7.74 A representative image of *C. siliquastrum*.

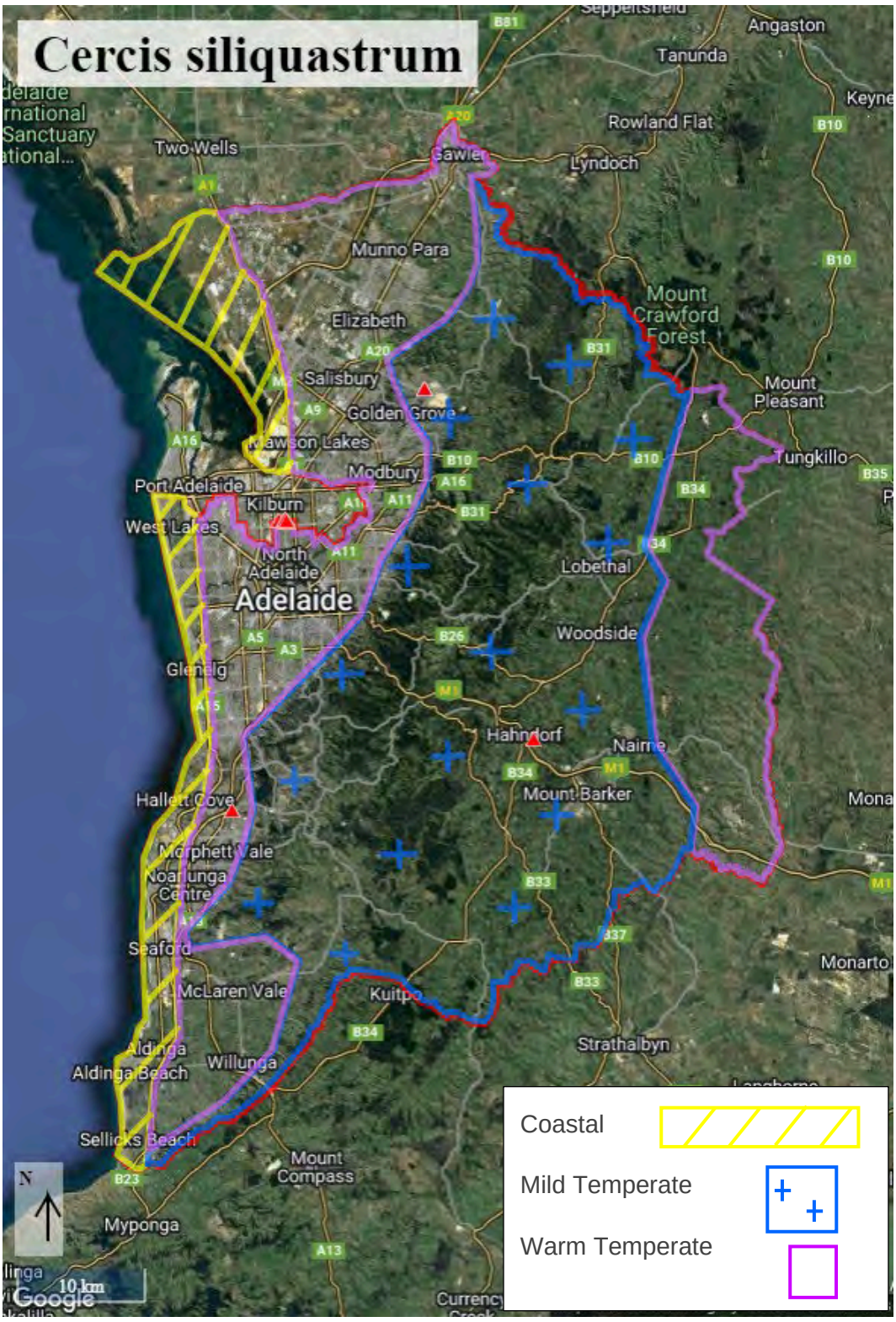

Figure 7.64 The geographic distribution of assessed *Cercis siliquastrum*. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 100% of trees assessed were shorter than 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Cercis siliquastrum* for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this species be investigated further.

Family: *Myrtaceae* **- Genus:** *Corymbia* **- Species:** *ficifolia* ‘Summer Red’

Origin: Introduced Native

Corymbia ficifolia ‘Summer Red’ is typically a small tree to 5m consisting of a grafted cultivar of *Corymbia ficifolia* x *C. calophylla*, grafted onto rootstock of *C. maculata.* This taxon is predicted to be a slow growing ornamental that is suitable for planting in small gardens and streetscape environs however was developed relatively recently more information may be required to understand its growth pattern.

Assessment of trees within the group occurred within the southwestern coastal and northeastern suburbs, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 15

Regions assessed: Warm Temperate and Coastal.

Average height: 2.4m. **Maximum height:** 6.6m

Compliance percentage: 100%

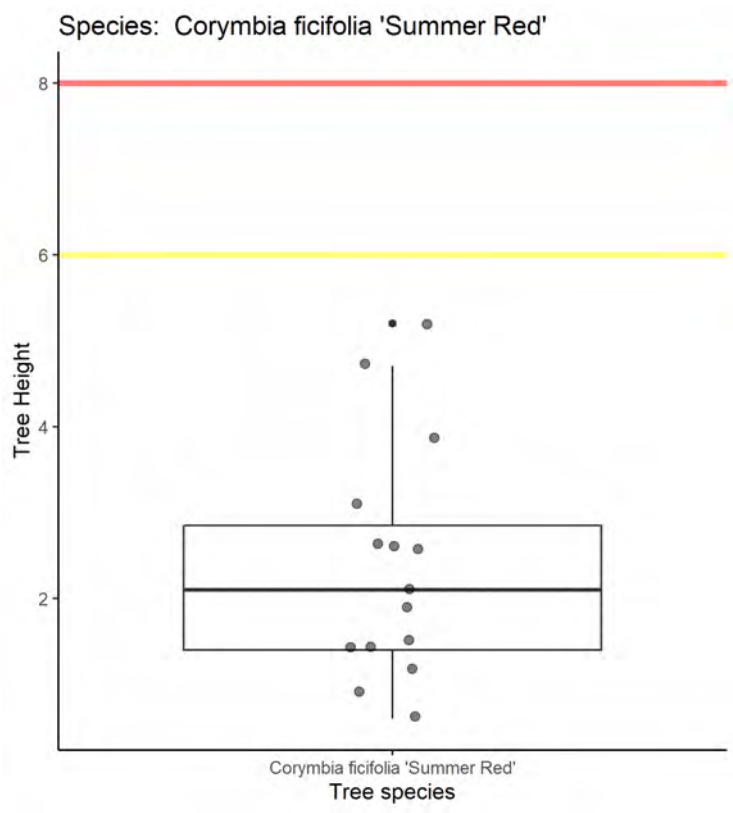

Figure 7.65 Height distribution of 14 *C. ficifolia* ‘Summer Red’ trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. All individuals were shorter than 8m.

Figure 7.66 A representative image of *C. ficifolia* ‘Summer Red’.

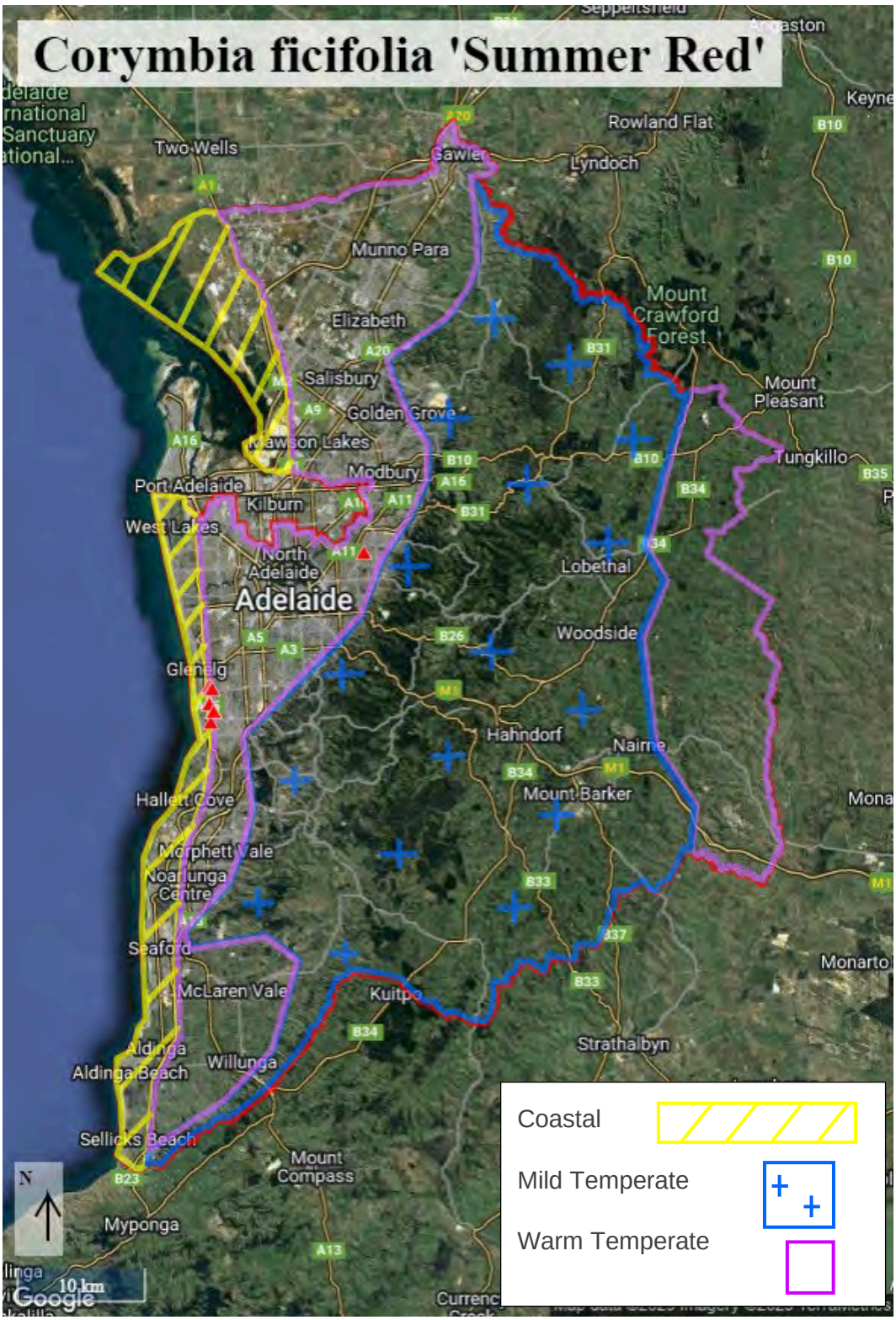

Figure 7.67 The geographic distribution of assessed *C. ficifolia* 'Summer Red'. These trees are located within the Warm Temperate and Coastal zones.

Recommendation: 100% of trees assessed were shorter than 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Corymbia ficifolia* 'Summer Red' for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this cultivar be investigated further.

Family: *Myrtaceae* **- Genus:** *Corymbia* **- Species:** *ficifolia* 'Wildfire'

Origin: Introduced Native

Corymbia ficifolia 'Wildfire' is similar to *C. ficifolia* 'Summer Red'. This tree forms a small crown to 5m consisting of a grafted cultivar of *C. ficifolia* onto rootstock of *C. maculata.* This taxon is predicted to be a slow growing ornamental that is suitable for planting in small gardens and streetscape environs however was developed relatively recently more information may be required to understand its growth pattern.

Assessment of trees within the group occurred within the northeastern and southern regions of warm and mild temperate climate ranges. All trees assessed occurred within urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 16

Regions assessed: Mild and Warm Temperate.

Average height: 4.4m. **Maximum height:** 5.2m

Compliance percentage: 100%

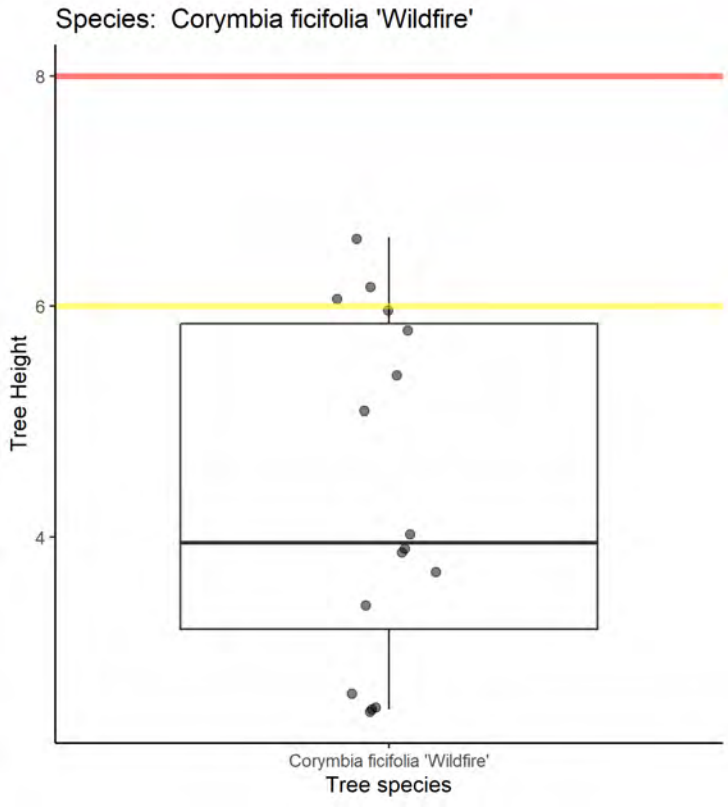

Figure 7.69 Height distribution of 16 *C. ficifolia* 'Wildfire' trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.68 A representative image of *C. ficifolia* 'Wildfire'.

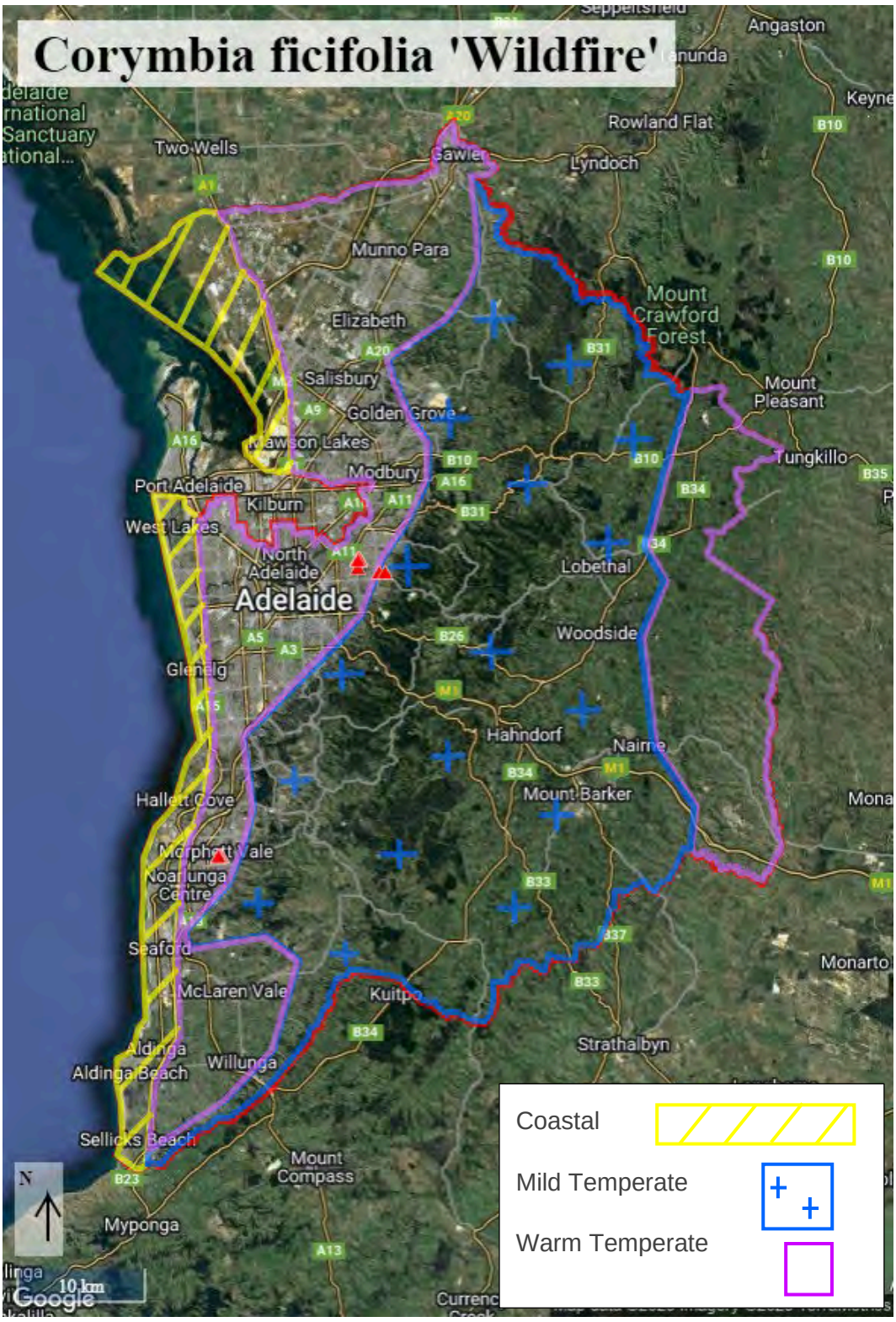

Figure 7.70 The geographic distribution of assessed *C. ficifolia*'. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 100% of trees assessed were shorter than 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Corymbia ficifolia* 'Wildfire' for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this cultivar be investigated further.

Family: *Myrtaceae* **- Genus:** *Eucalyptus* **- Species:** *cneorifolia*

Origin: Introduced Native

Eucalyptus cneorifolia (Kangaroo Island narrow-leaf mallee) is typically a mallee or small tree with a native range of Kangaroo Island and the southern tip of the Fleurieu Peninsula but has been planted widely throughout urbanised areas of South Australia and Victoria.

Assessment of trees within the group occurred within the inner southern suburban areas of Adelaide, coastal areas near Glenelg and the foothills areas surrounding Mount Osmond, forming Coastal, Mild and Warm Temperate climates.

Trees assessed: 15

Regions assessed: Warm Temperate and Coastal.

Average height: 6.6m. **Maximum height:** 9.0m

Compliance percentage: 80%

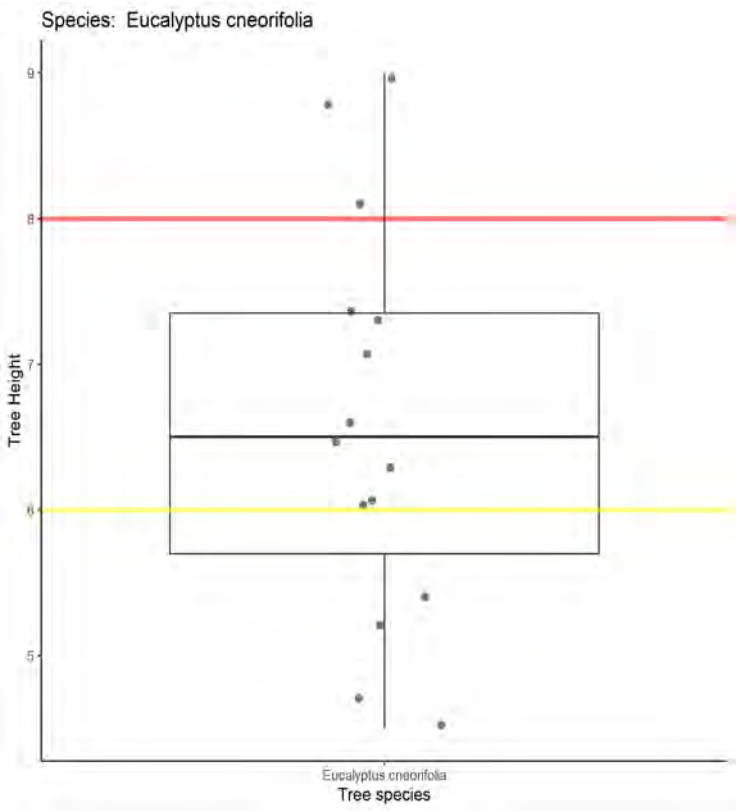

Figure 7.72 Height distribution of 15 *E. cneorifolia* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 80% of trees of this species were shorter than 8m.

Figure 7.71 A representative image of *E. cneorifolia*.

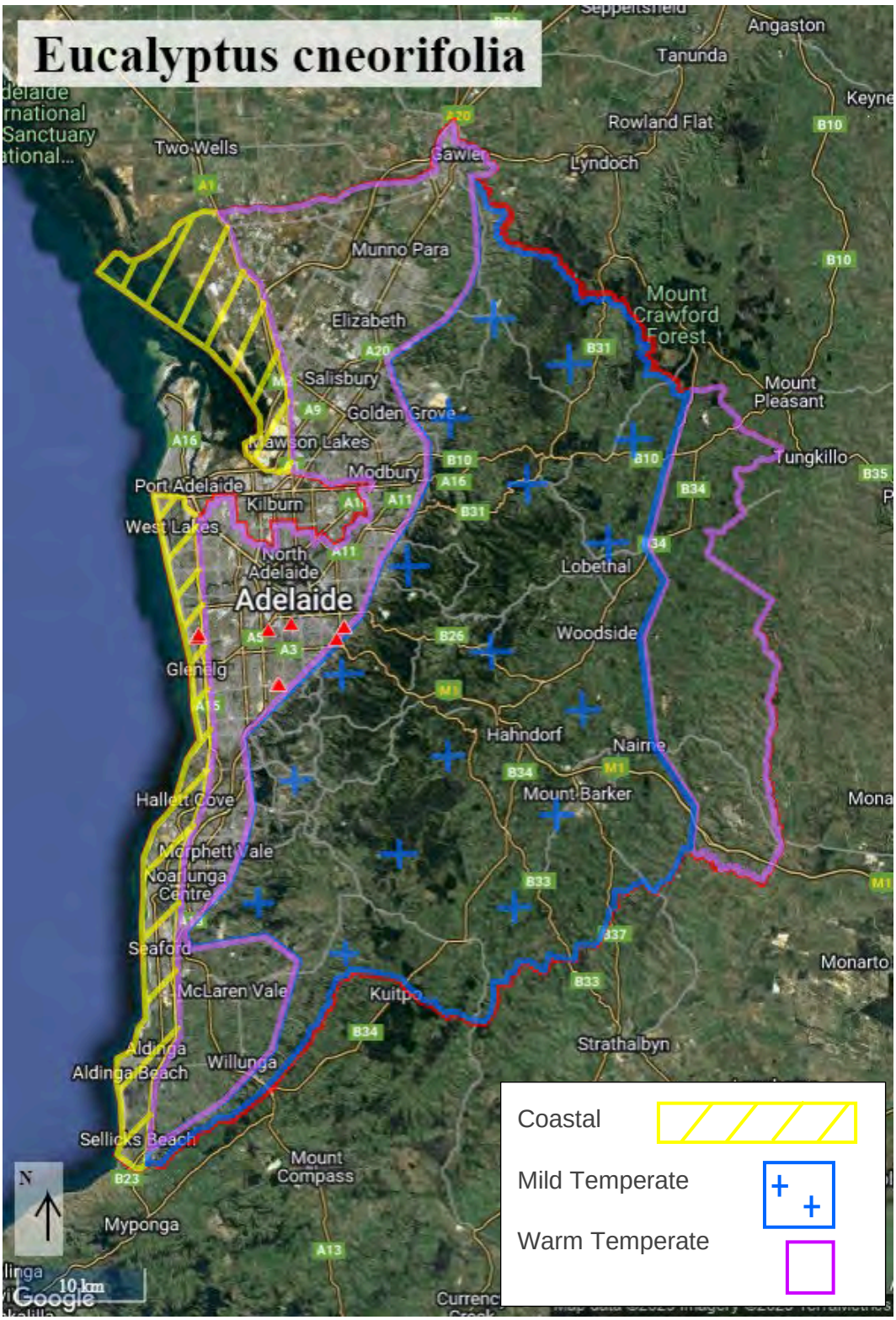

Figure 7.73 The geographic distribution of assessed *E. cneorifolia*. These trees are located within the Warm Temperate and Coastal zones.

Recommendation: 80% of trees assessed were shorter than 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Eucalyptus cneorifolia* for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this species be investigated further.

Family: *Myrtaceae* **- Genus:** *Eucalyptus* **- Species:** *conferruminata*

Origin: Introduced Native

Eucalyptus conferruminata (bushy yate) is a dense shrub to small tree and has a natural distribution ranging though southern coastal Western Australia where is succeeds on sandy soils and salt wind exposure.

Assessment of trees within the group occurred within the Adelaide City parklands and foothills near Stonyfell, in urbanised Warm and Mild Temperate climate zones of developed areas with moderately typical environmental conditions of roadside plantings.

Trees assessed: 13

Regions assessed: Maild and Warm Temperate.

Average height: 6.9m. **Maximum height:** 11.3m

Compliance percentage: 77%

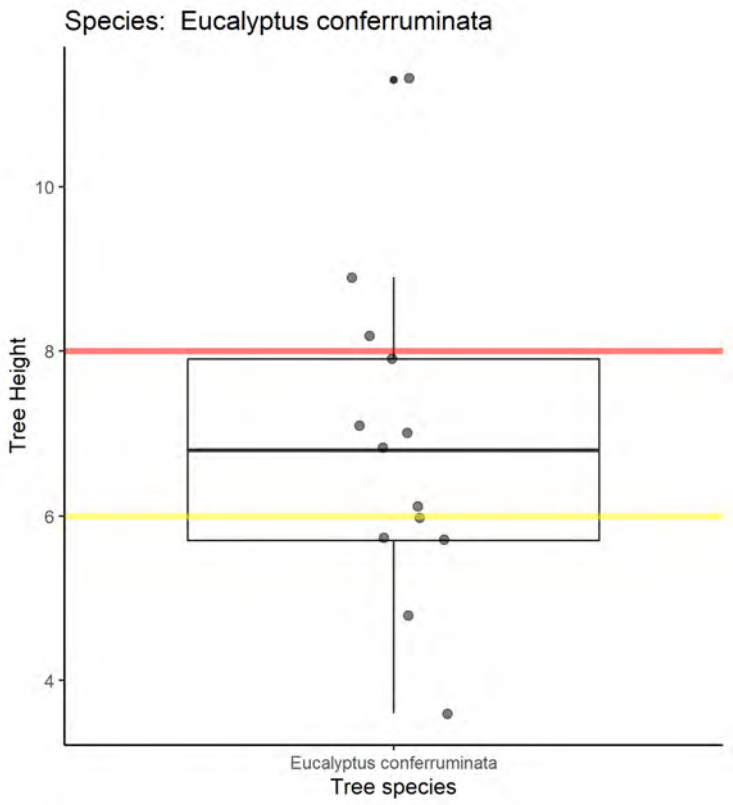

Figure 7.75 Height distribution of 19 *E. conferruminata* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 23% of trees of this species were taller than 8m.

Figure 7.74 A representative image of *E. conferruminata*.

Figure 7.76 The geographic distribution of assessed *E. conferruminata*. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 77% of trees assessed were below 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Eucalyptus conferruminata* for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this species be investigated further.

Family: *Myrtaceae* **- Genus:** *Eucalyptus* **- Species:** *victrix* 'Little Ghost Gum'

Origin: Indigenous

Eucalyptus victrix 'Little Ghost Gum' is indigenous to northern Western Australia and central Australia where it succeeds in dry lakes receiving infrequent inundation. A small population has been planted in Adelaide, which are still young to semimature in age however developing with good form and health.

Assessment of trees within the group occurred within the Coastal climate zone, in a single planting. The environment at this location consisted of an urbanised and developed area with typical environmental conditions of roadside plantings.

Trees assessed: 10

Regions assessed: Warm Temperate and Coastal.

Average height: 5.8m. **Maximum height:** 7.6m

Compliance percentage: 100%

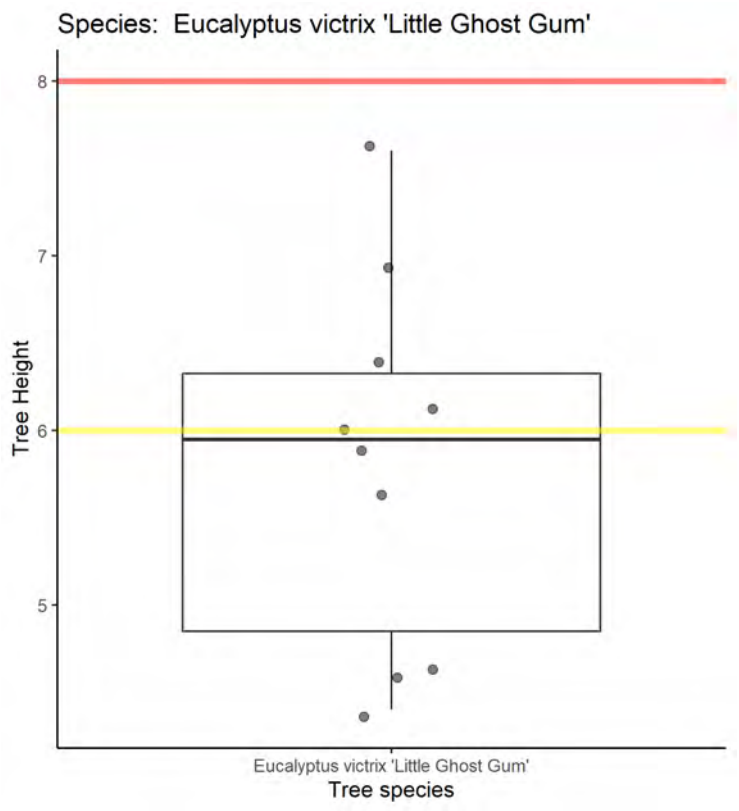

Figure 7.77 Height distribution of 10 *E. victrix* 'Little Ghost Gum' trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.78 A representative image of *E. victrix* 'Little Ghost Gum'.

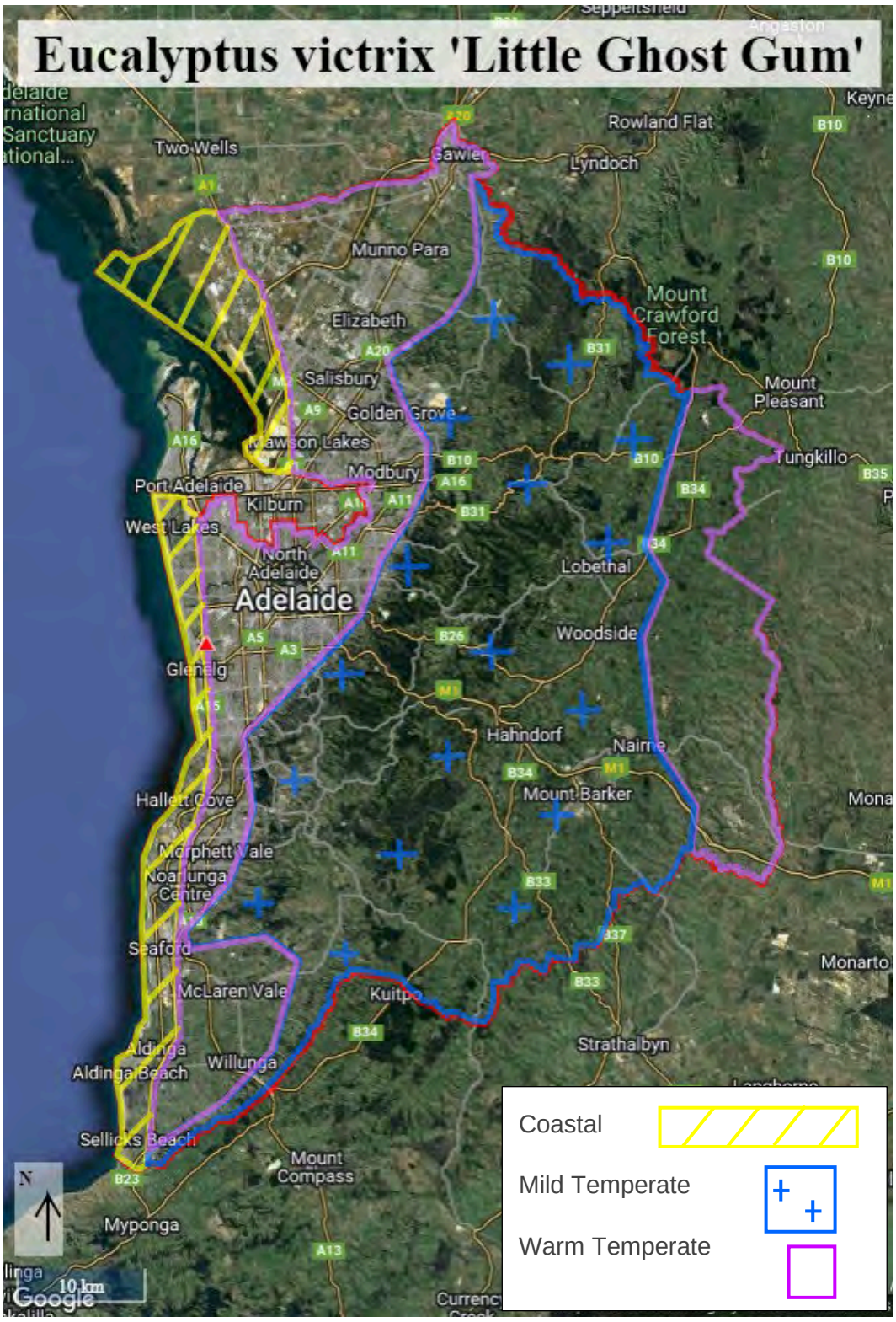

Figure 7.79 The geographic distribution of assessed *E. victrix* 'Little Ghost Gum'. These trees are located within the Warm Temperate and Coastal zones.

Recommendation: 100% of trees assessed were shorter than 8m, however we were unable to survey sufficient mature specimens in the field to recommend *Eucalyptus victrix* 'Little Ghost Gum' for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this cultivar be investigated further.

Family: *Fabaceae* **- Genus:** *Libidibia* **- Species:** *ferrea* **– Origin:** Exotic

Libidibia ferrea (leopard tree) is indigenous to Eastern Brazil, but a small population has been planted in the western suburbs of Adelaide. This taxon is suitable for roadside plantings, drought tolerant and performs well on dry soils with full sun exposure.

Assessment of trees within the group occurred within the western suburban areas within the Warm Temperate climatic zone, in areas with typical environmental conditions of roadside plantings.

Trees assessed: 15

Regions assessed: Warm Temperate.

Average height: 6.0m. **Maximum height:** 9.6m

Compliance percentage: 93%

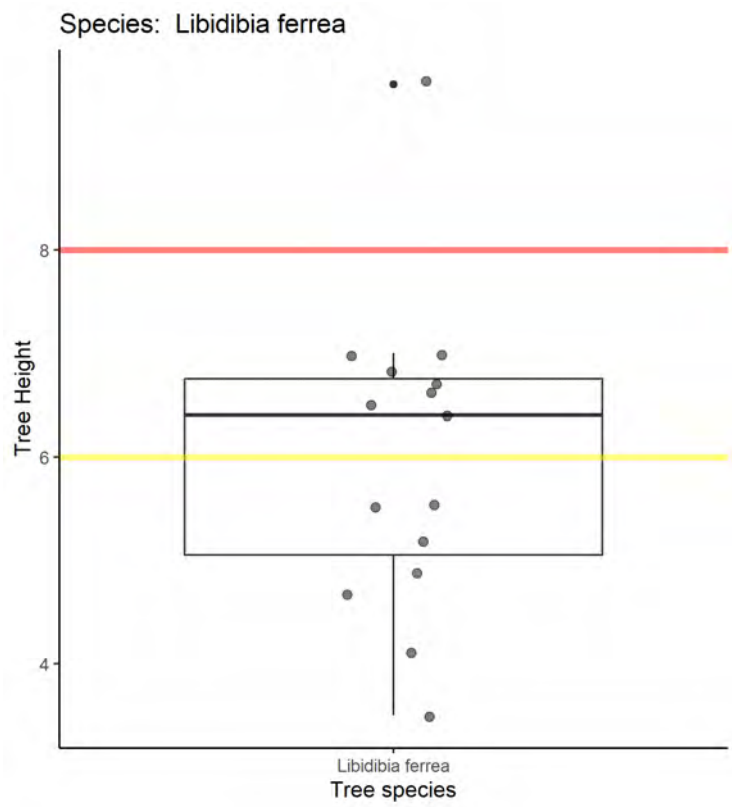

Figure 7.80 Height distribution of 15 *L. ferrea* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 93% of trees of this species were shorter than 8m.

Figure 7.81 A representative image of *L. ferrea*.

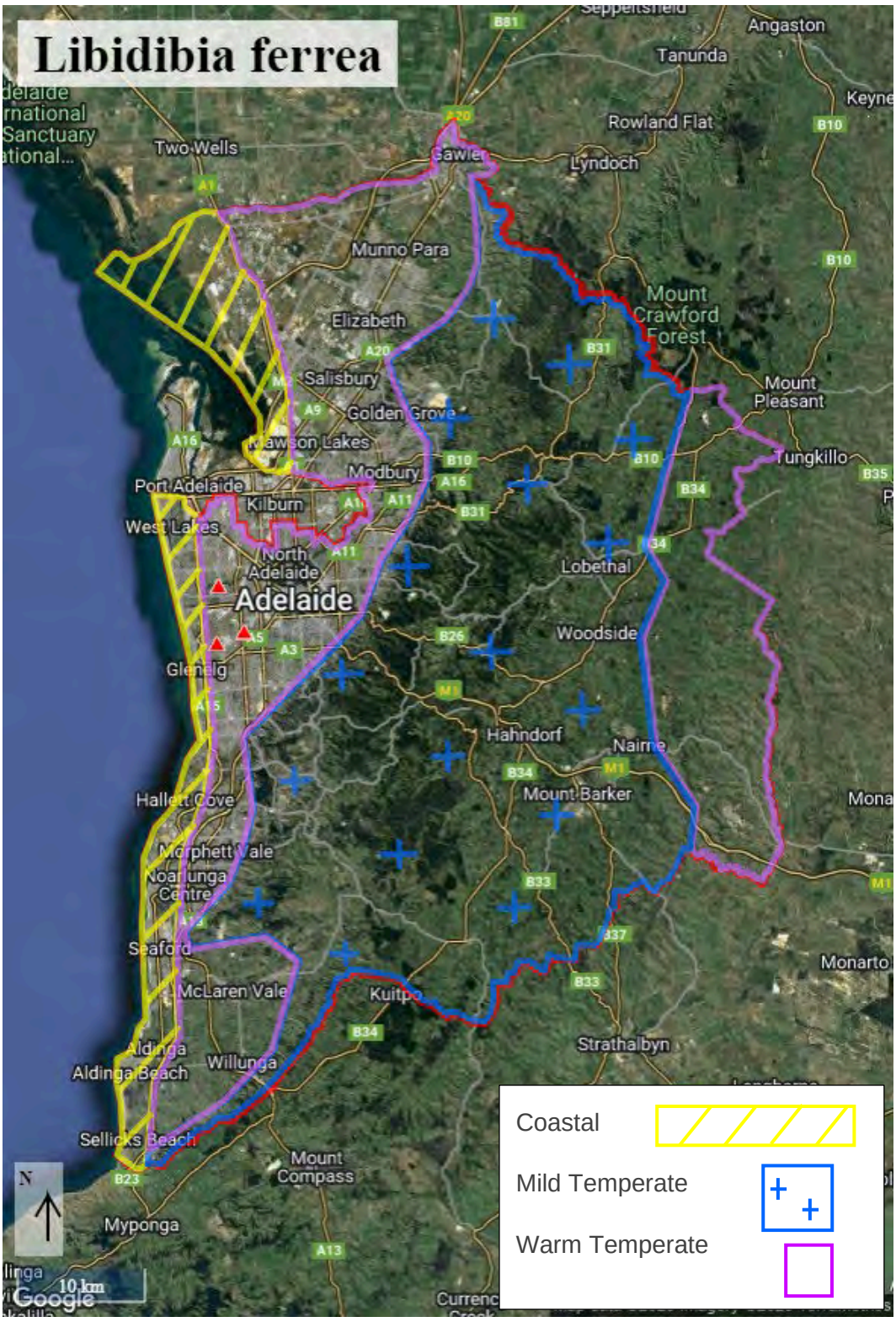

Figure 7.82 The geographic distribution of assessed *L. ferrea*. These trees are located within the Warm Temperate zone.

Recommendation: 93% of trees assessed were shorter than 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Libidibia ferrea* for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this species be investigated further.

Family: *Rosaceae* **- Genus:** *Malus* **- Species:** *spectabilis* **- Origin:** Exotic

Malus spectabilis (Asiatic apple) is typically a small tree to 6m, thought to be of East Asian and Chinese origins. The form of this taxon is vase shaped and dense with double flowering inflorescence. The species is tolerant of all soil textures and pH ranges and will succeed with minimal supplementary irrigation.

Assessment of trees within the group occurred within the southern plains between the inner suburbs of Unley to Oaklands Park. These areas all fall within the Warm Temperate climate zone.

Trees assessed: 16

Regions assessed: Warm Temperate.

Average height: 3.3m. **Maximum height:** 5.0m

Compliance percentage: 100%

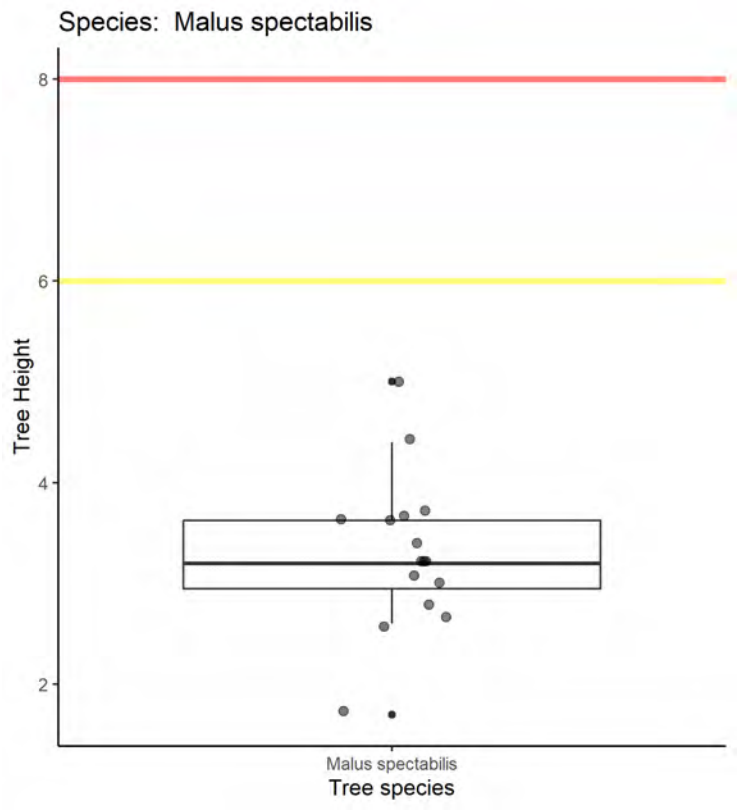

Figure 7.83 Height distribution of 16 *M. spectabilis* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.84 representative image of *M. spectabilis*.

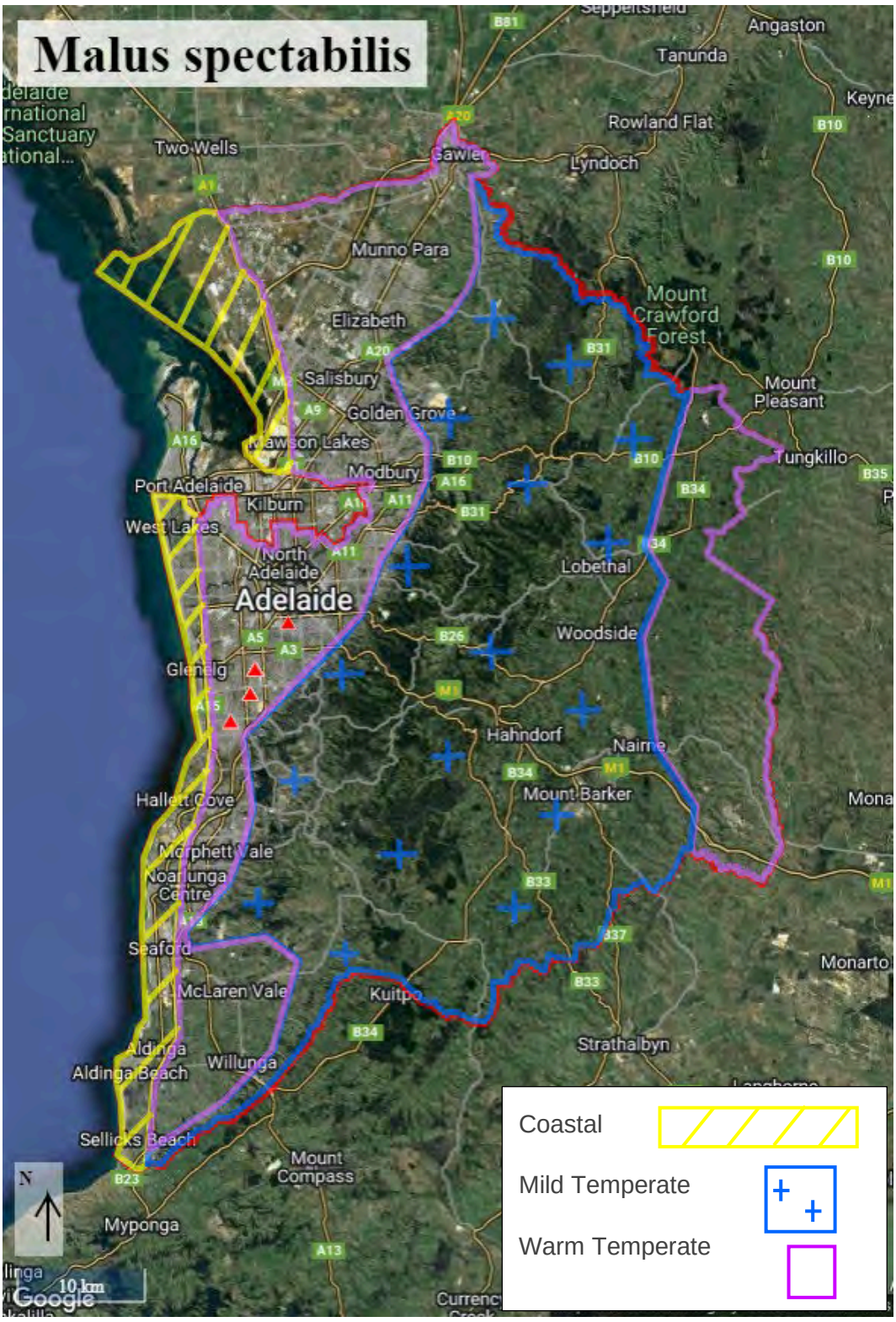

Figure 7.85 The geographic distribution of assessed *M. spectabilis*. These trees are located within the Mild Temperate zone.

Recommendation: 100% of trees assessed were shorter than 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Malus spectabilis* for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this species be investigated further.

Family: *Myrtaceae* **- Genus:** *Melaleuca* **- Species:** *bracteata* 'Revolution Gold'

Origin: Introduced Native

Melaleuca bracteata 'Revolution Gold' typically grows as a dense shrub to small tree of up to 6m in height. This cultivar is often used in screen plantings however minor pruning would enable it to be successfully used in street tree planting environs including under powerlines. It has high wind exposure, drought and waterlogging tolerance and moderately tolerant to coastal salt spray.

Assessment of trees within the group occurred within the inner western suburbs and foothills around Skye, in Warm and Mild Temperate climate zones, of urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 14

Regions assessed: Mild and Warm Temperate.

Average height: 4.8m. **Maximum height:** 7.3m

Compliance percentage: 100%

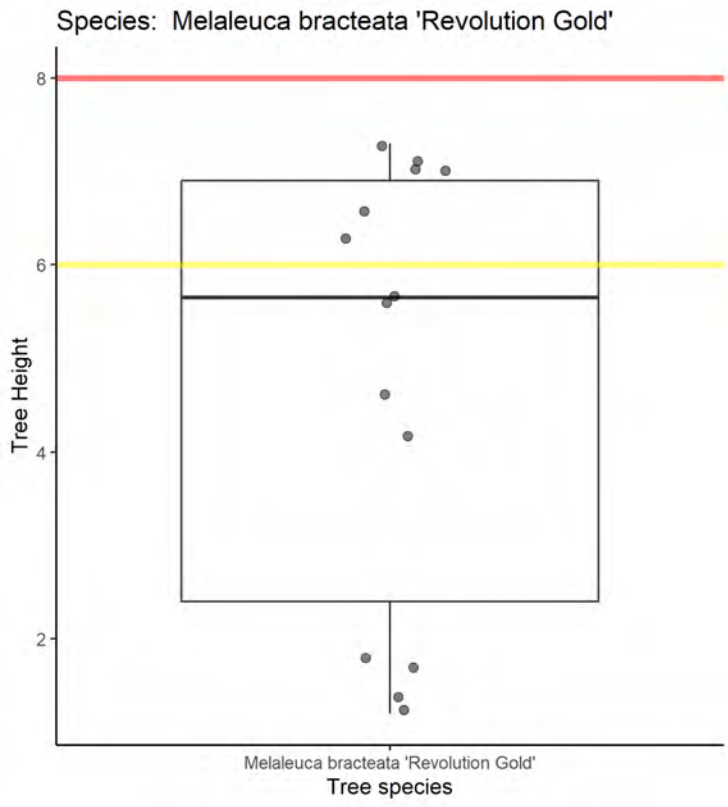

Figure 7.87 Height distribution of 14 *M. bracteata* 'Revolution Gold' trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 100% of trees of this species were shorter than 8m.

Figure 7.86 A representative of *Melaleuca bracteata* 'Revolution Gold'.

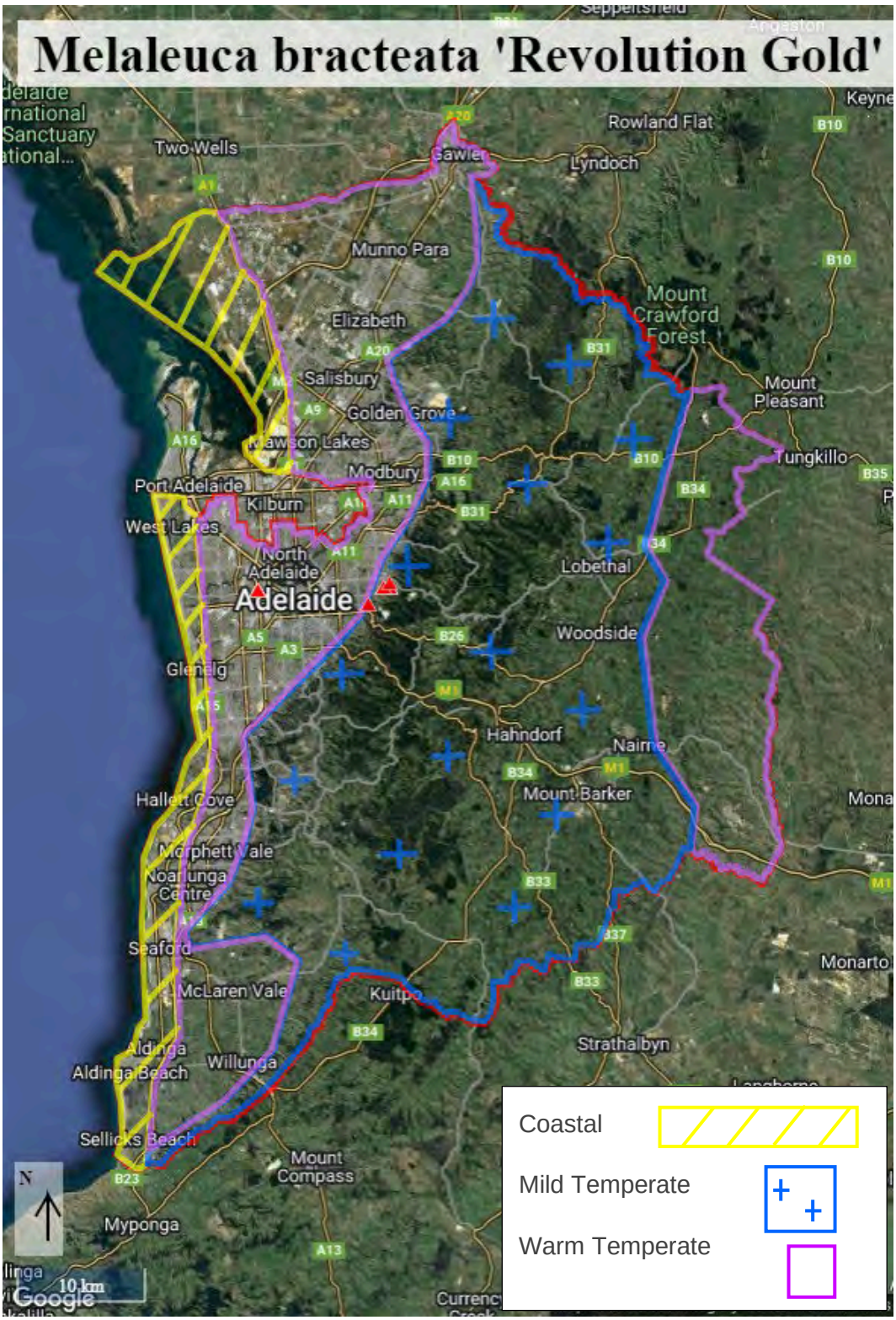

Figure 7.88 The geographic distribution of assessed *M. bracteata* 'Revolution Gold'. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 100% of trees assessed were shorter than 8m in height, however we were unable to survey sufficient mature specimens in the field to recommend *Melaleuca bracteata* for inclusion on the Permitted List for planting under powerlines in non-bushfire areas. We recommend the suitability of this cultivar be investigated further.

7.3. Species specific results – Trees not recommended for planting underneath powerlines

Family: *Fabaceae* **- Genus:** *Acacia* **- Species:** *pendula*

Origin: Introduced Native

Acacia pendula (weeping myall) is an upright tree with pendulous branchlets supporting silvery foliage. This species has a widespread distribution throughout Australia including South Australia and has been planted in public streets and private gardens throughout the Adelaide plains and hills. It is tolerant of low rainfall environments with clay soils indicating it is a suitable tree for planting in greater Adelaide.

Assessment of trees within the group occurred within the Mild and Warm Temperate climate zones to the north, east and south of the city CBD, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 19

Regions assessed: Mild and Warm Temperate.

Average height: 10.7m. **Maximum height:** 15.3m

Compliance percentage: 11%

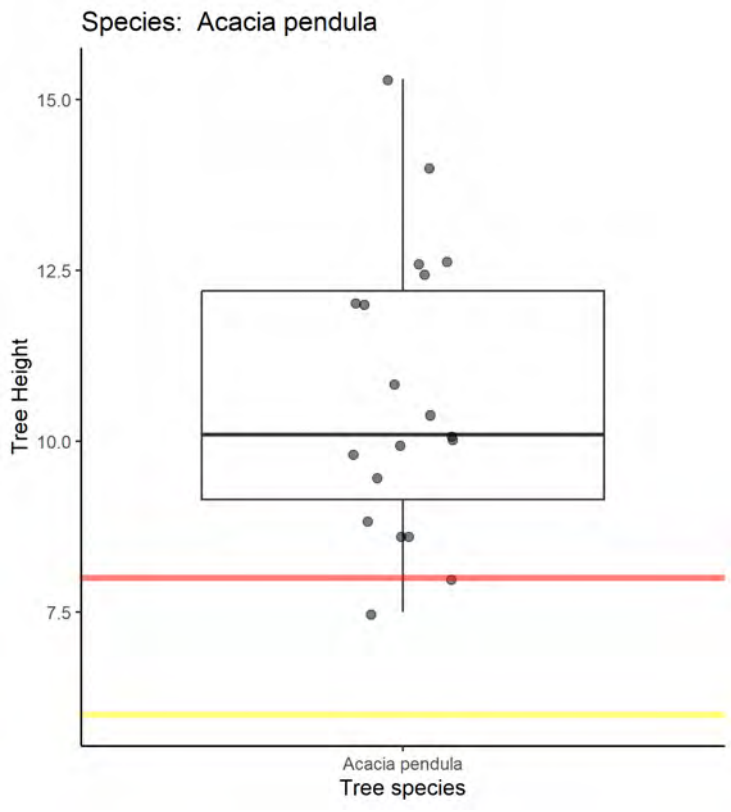

Figure 7.89 Height distribution of 19 *A. pendula* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 89% of trees of this species were taller than 8m.

Figure 7.90 A representative image of *A. pendula*.

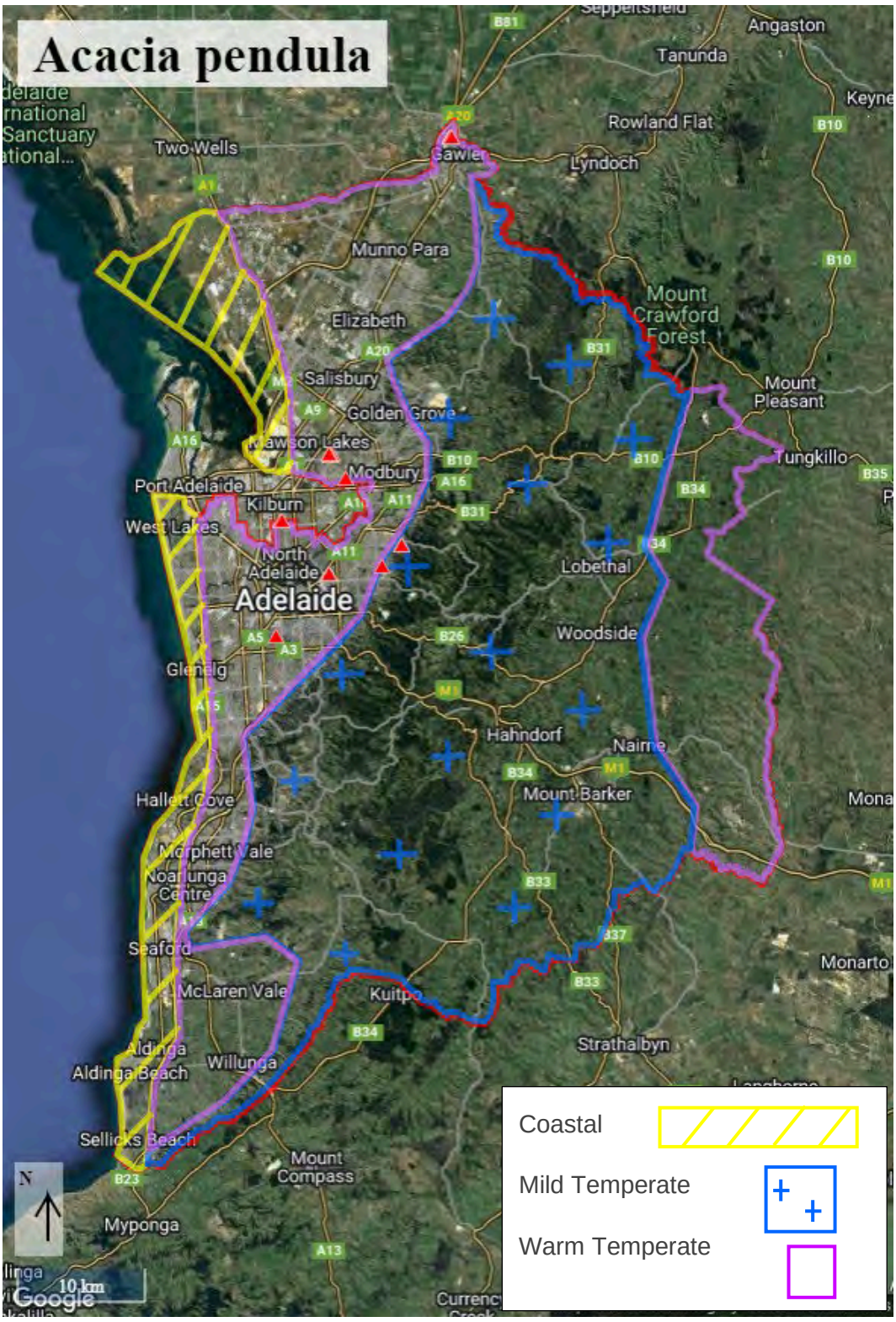

Figure 7.91 The geographic distribution of assessed *A. pendula*. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 89% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Acacia pendula* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Fabaceae* **- Genus:** *Acacia* **- Species:** *salicina* **– Origin:** Indigenous

Acacia salicina (Broughton willow) is a rough-barked small tree with widespread distribution throughout Australia including South Australia extending from the Adelaide Plains northward to Central Australia. This species is well distributed throughout the eastern states and central Australia, where it grows to heights ranging between 3-13m.

Assessment of trees within the group occurred within the Coastal, Mild and Warm Temperate climate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Coastal, Mild and Warm Temperate.

Average height: 8.1m. **Maximum height:** 10.3m

Compliance percentage: 40%

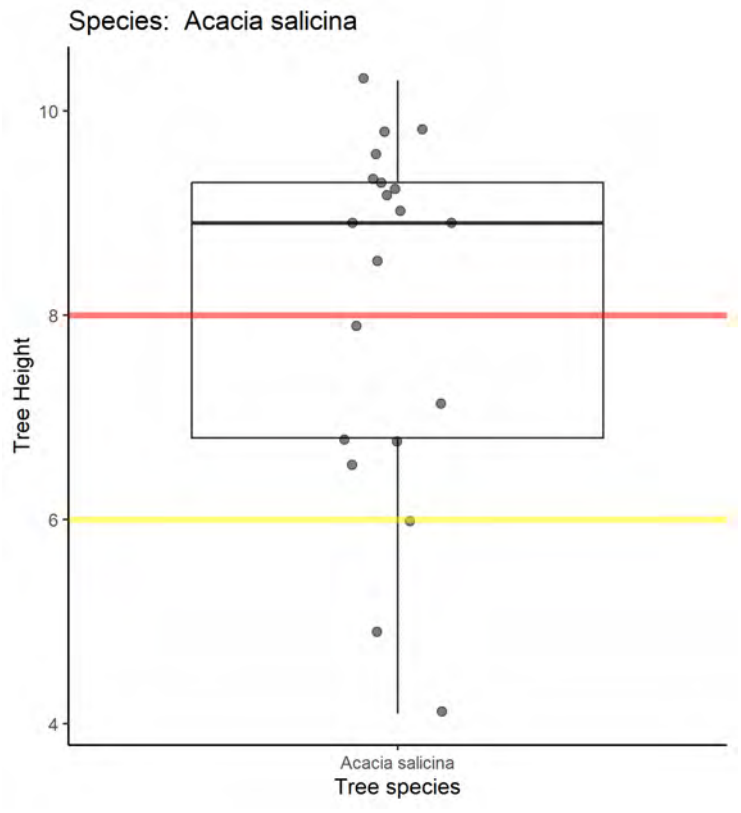

Figure 7.92 Height distribution of 20 *A. salicina* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 60% of trees of this species were taller than 8m.

Figure 7.93 A representative image of *A. salicina*.

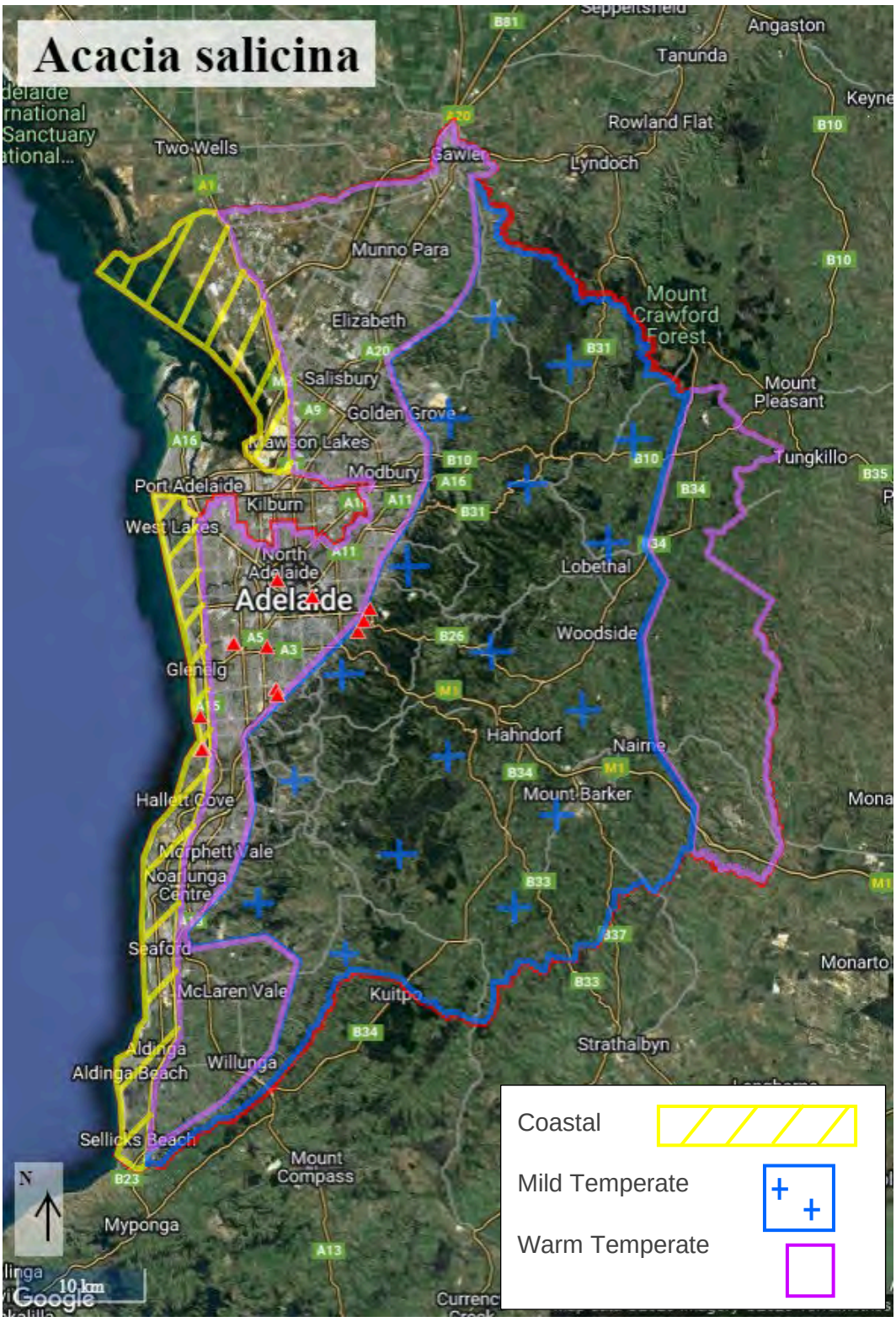

Figure 7.94 The geographic distribution of assessed *A. salicina*. These trees are located within the Mild and Warm Temperate zones and Coastal zone.

Recommendation: 60% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Acacia salicina* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Betulaceae* **- Genus:** *Betula* **- Species:** *pendula* **– Origin:** Exotic

Betula pendula (silver birch) typically consists of a single trunk form with showy silver bark ranging and pendulous branches.

Assessment of trees within the group occurred within the Mild and Warm Temperate climate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 19

Regions assessed: Maild and Warm Temperate.

Average height: 8.6m. **Maximum height:** 14.8m

Compliance percentage: 60%

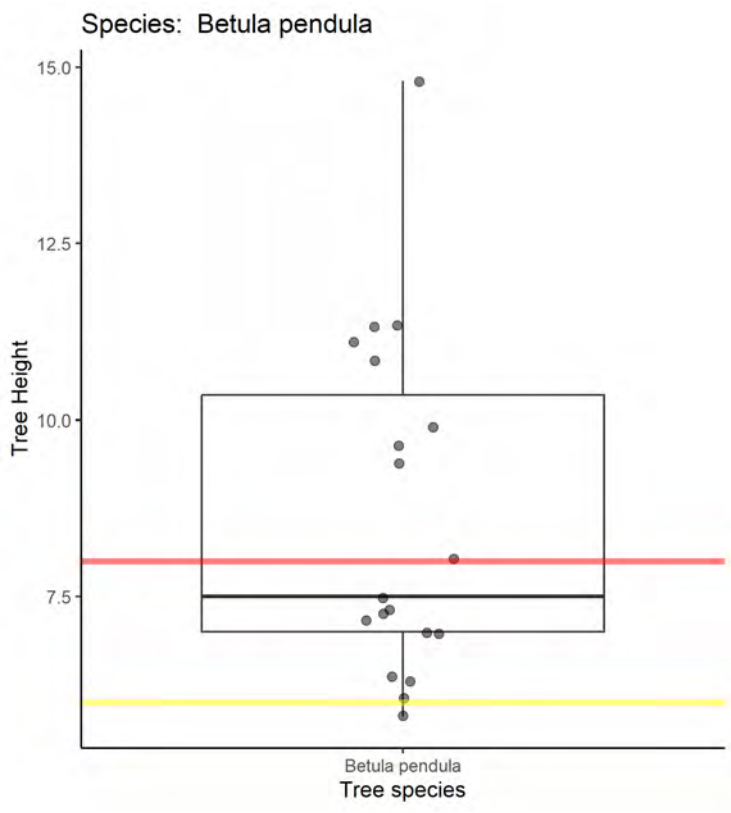

Figure 7.95 Height distribution of 19 *B. pendula* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 42% of trees of this species were taller than 8m.

Figure 7.96 A representative image of *B. pendula*.

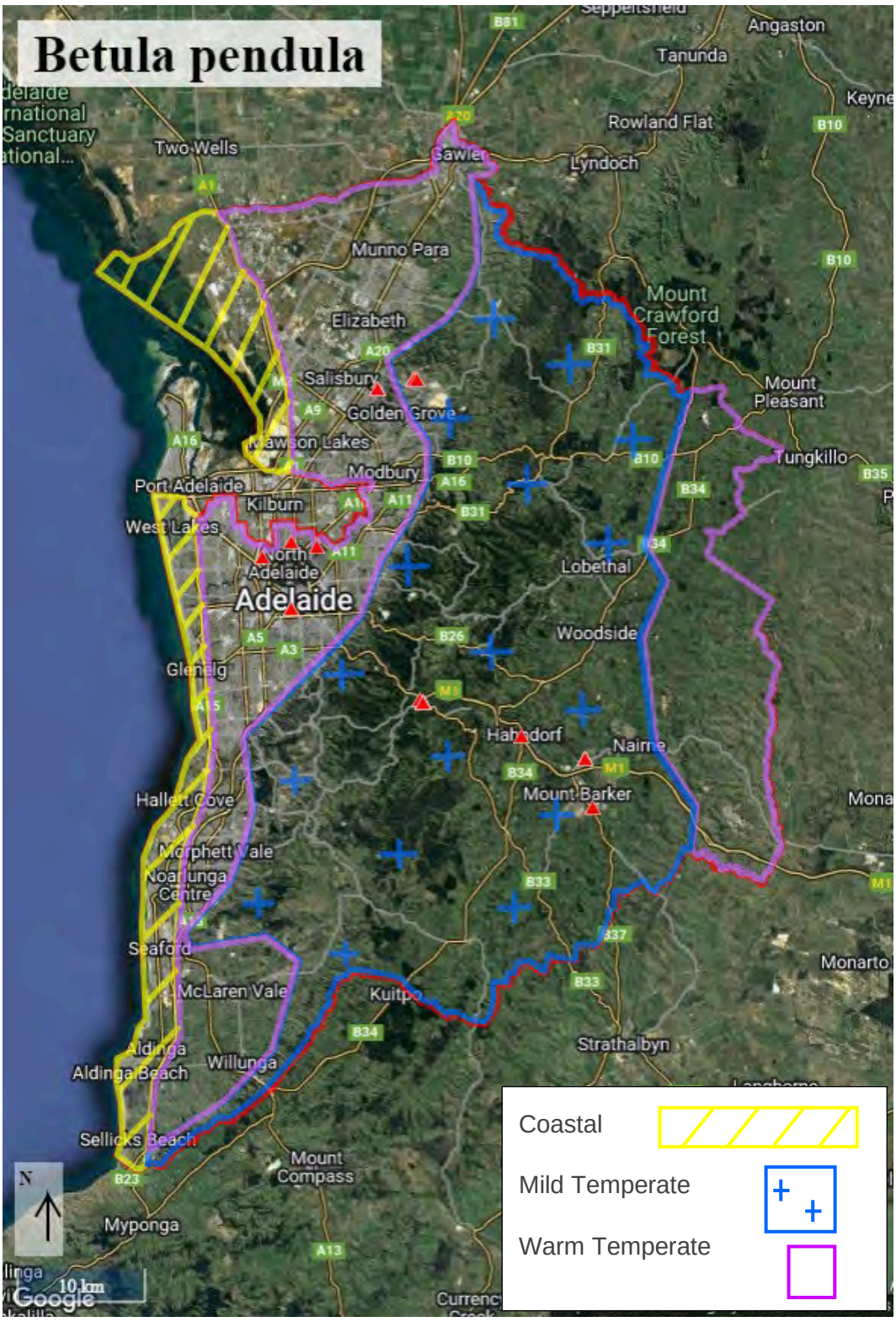

Figure 7.97 The geographic distribution of assessed *Betula pendula*. Surveyed trees were located within the Mild and Warm Temperate zones.

Recommendation: 42% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Betula pendula* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Rutaceae* **– Genus:** *Calodendrum* **– Species:** *capense*

Origin: Exotic

Calodendrum capense (cape chestnut) is typically a densely domed, small to medium sized tree known for its drought tolerance.

Assessment of trees within the group occurred within the Mild and Warm Temperate climate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Mild and Warm Temperate.

Average height: 6.0m. **Maximum height:** 11.1m

Compliance percentage: 75%

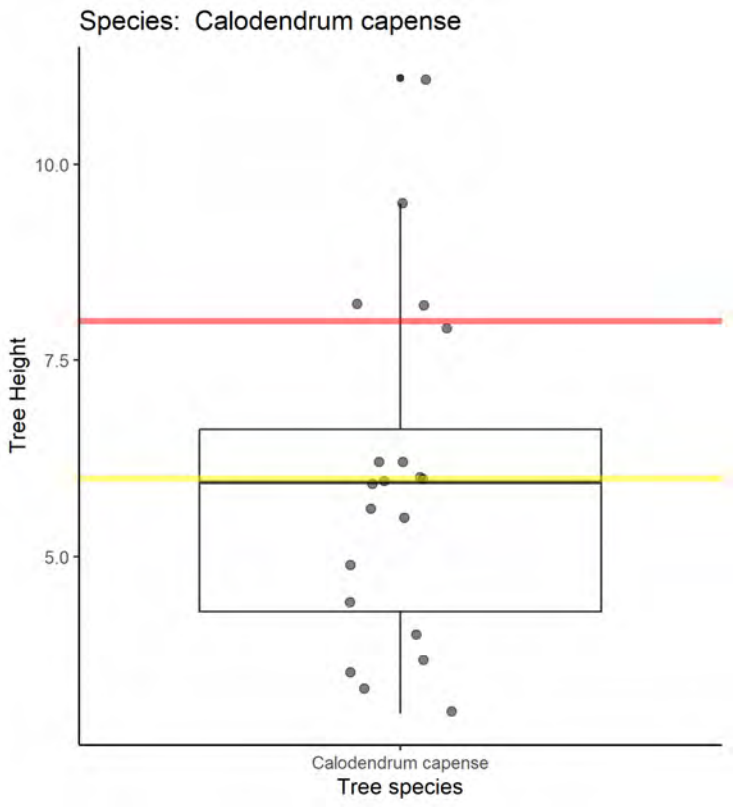

Figure 7.98 Height distribution of 20 *C. capense* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 20% of trees of this species were taller than 8m.

Figure 7.99 A representative image of *C. capense*.

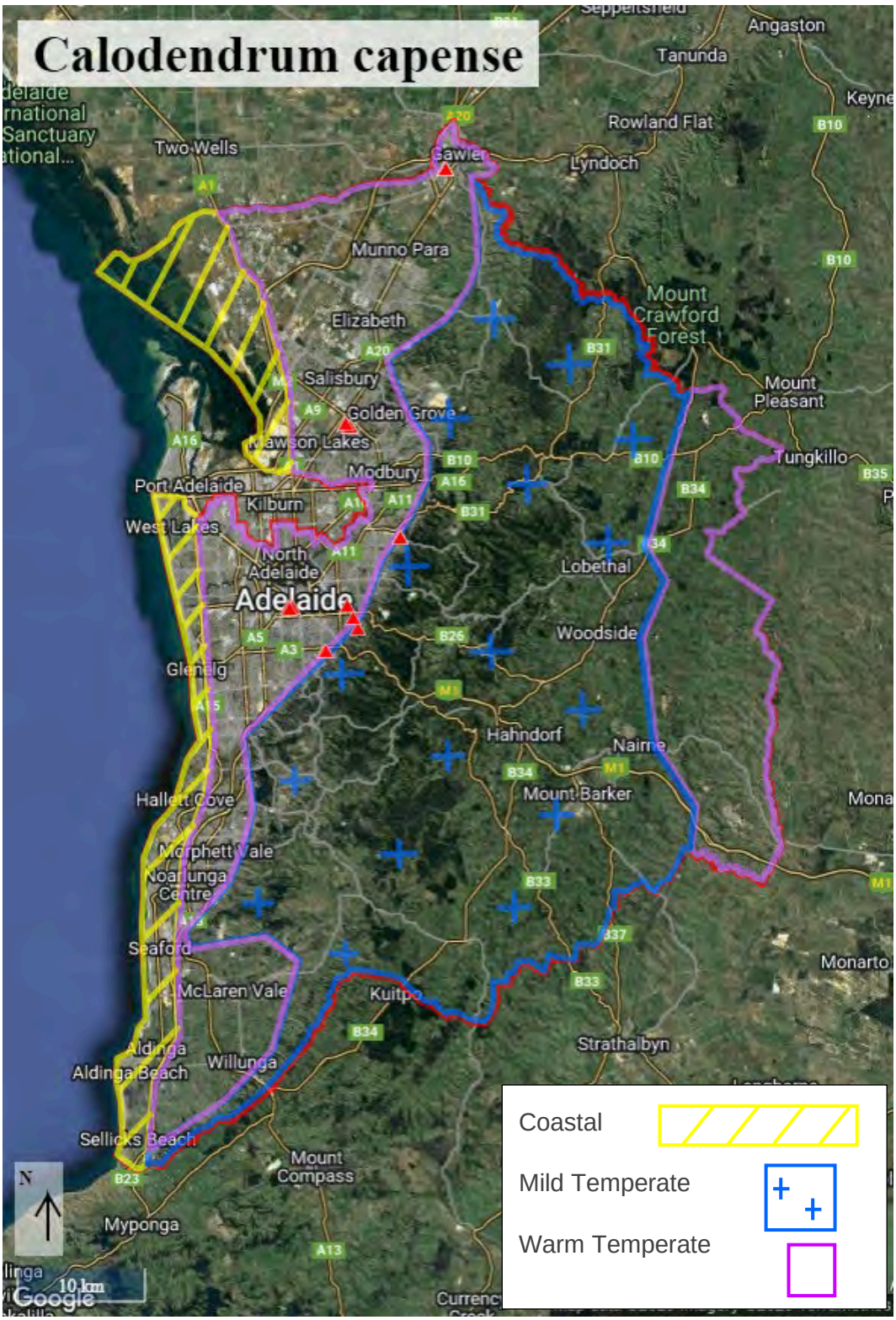

Figure 7.100 The geographic distribution of assessed *C. capense*. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 20% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Calodendrum capense* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Myrtaceae* **- Genus:** *Eucalyptus* **- Species:** *campaspe*

Origin: Introduced Native

Eucalyptus campaspe (silver gimlet) is a small tree that typically develops a rounded crown. This species is indigenous to a small area surrounding Kalgoorlie, Western Australia however has a common planted distribution throughout southeastern and central South Australia, Victoria and New South Wales.

Assessment of trees within the group occurred within the Coastal, Mild and Warm Temperate climate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 16

Regions assessed: Coastal, Mild and Warm Temperate.

Average height: 8.2m. **Maximum height:** 11.3m

Compliance percentage: 37.5%

Tree Height distribution: Assessed of trees *E. campaspe* were predominantly greater then 8m at maturity.

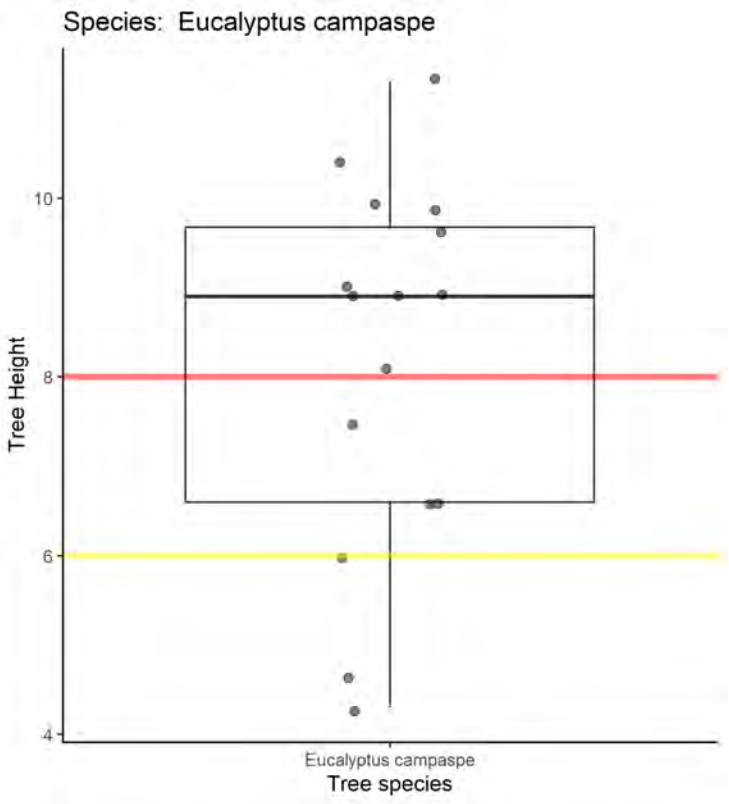

Figure 7.101 Height distribution of 16 *E. campaspe* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 62.5% of trees of this species were taller than 8m.

Figure 7.102 A representative image of *E. campaspe*.

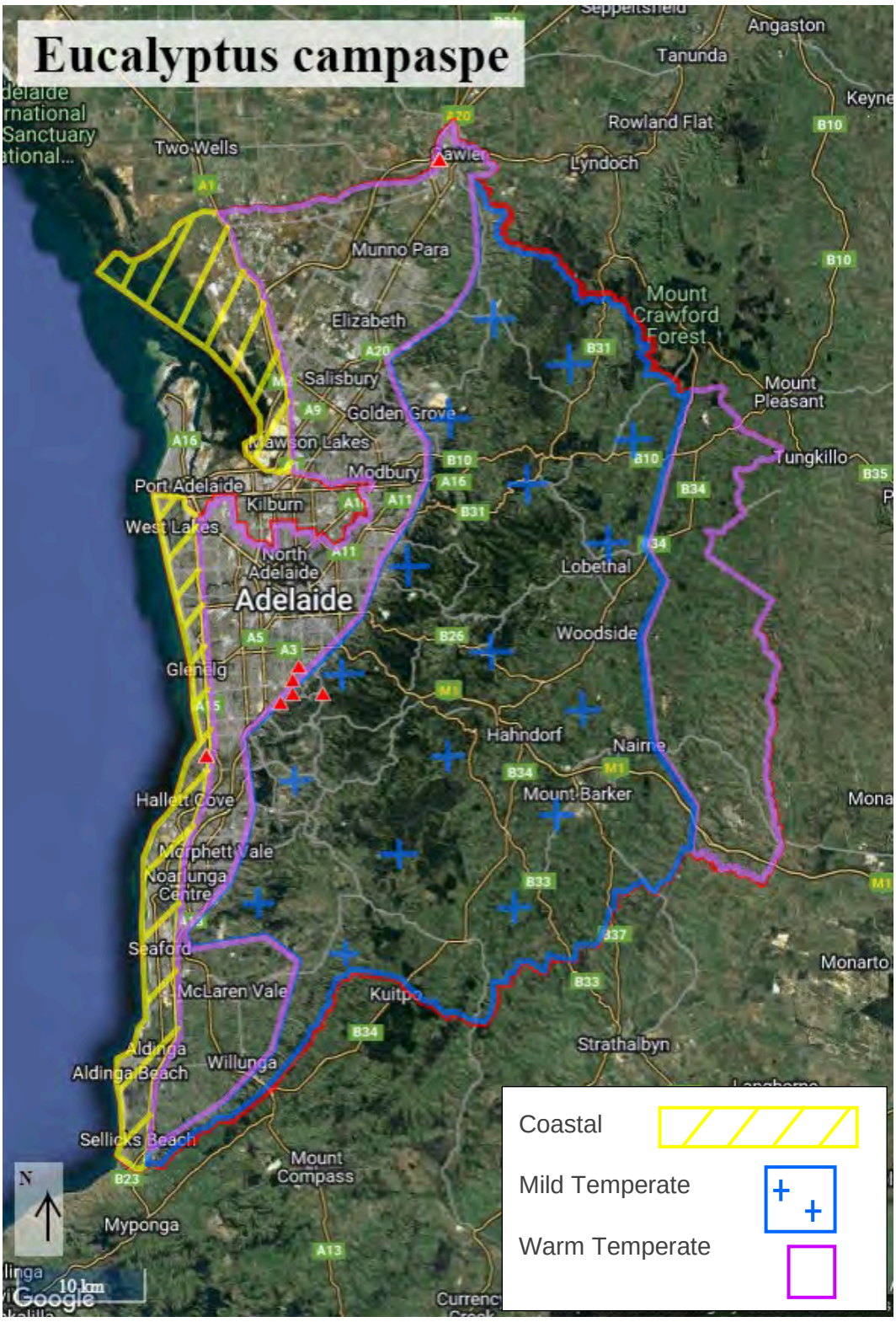

Figure 7.103 The geographic distribution of assessed *E. campaspe*. These trees are located within the Mild and Warm Temperate zones and Coastal zone.

Recommendation: 62.5% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Eucalyptus campaspe* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Myrtaceae* **- Genus:** *Eucalyptus* **- Species:** *diptera*

Origin: Introduced Native

Eucalyptus diptera (two-winged gimlet) is a small to medium-sized tree native to a small area north of Esperance in Western Australia and typically develops an obconical crown. *E. diptera* has a planted distribution throughout the southeastern and mid-north of South Australia, extending to western Victoria and New South Wales.

Assessment of trees within the group occurred within the Coastal and Warm Temperate climate zones to the southwest of the Adelaide CBD, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 22

Regions assessed: Warm Temperate and Coastal.

Average height: 8.4m. **Maximum height:** 12.2m

Compliance percentage: 41%

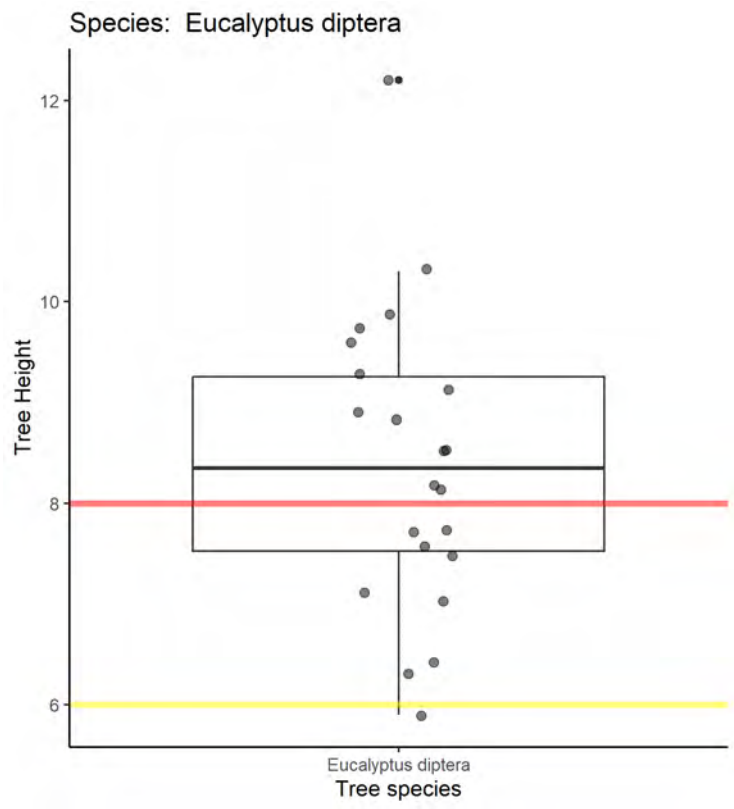

Figure 7.104 Height distribution of 22 *E. diptera* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 59% of trees of this species were taller than 8m.

Figure 7.105 A representative image of *E. diptera*.

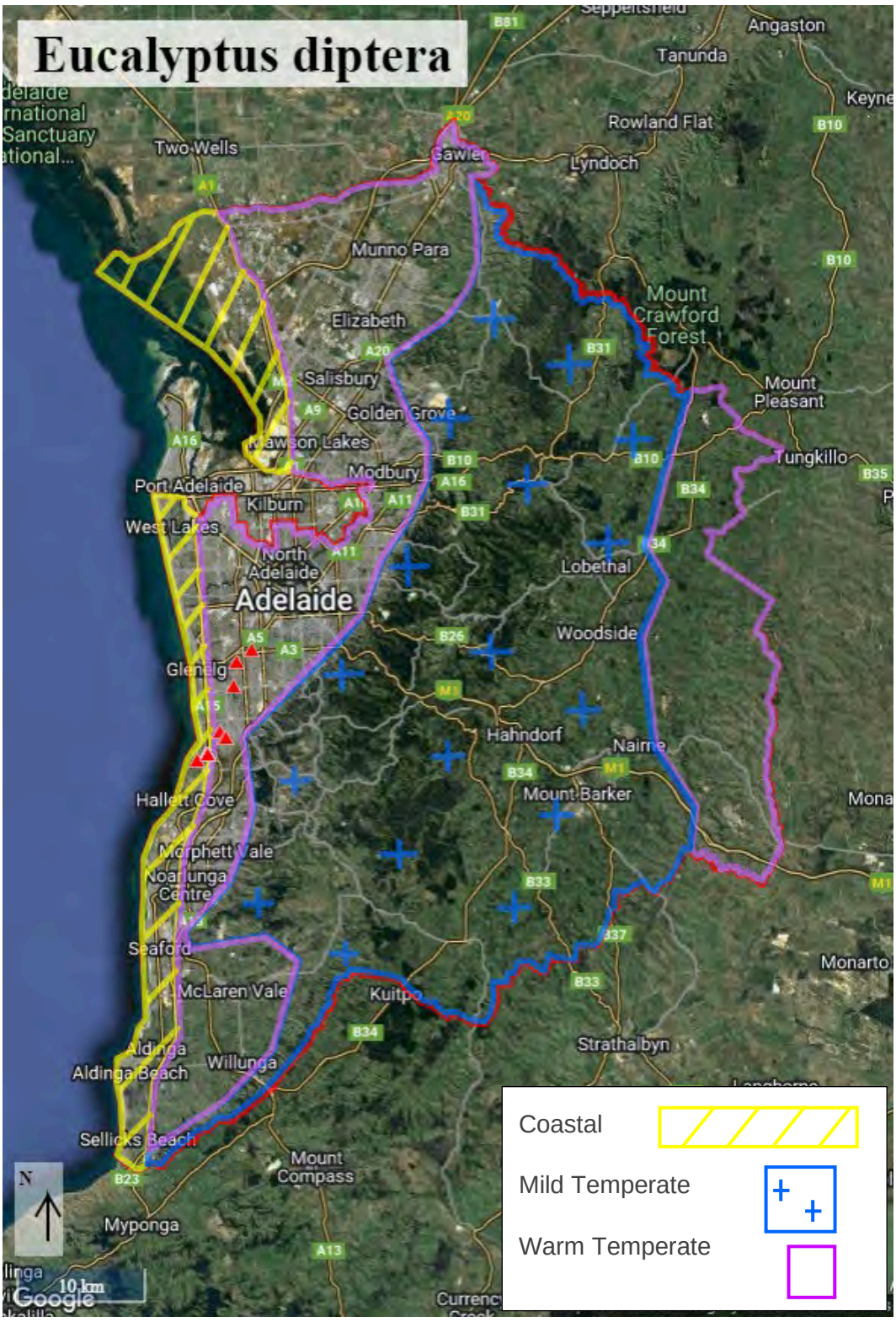

Figure 7.106 The geographic distribution of assessed *E. diptera*. These trees are located within the Warm Temperate and Coastal zones.

Recommendation: 59% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Eucalyptus diptera* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Myrtaceae* **- Genus:** *Eucalyptus* **- Species:** *eremophila*

Origin: Introduced native

Eucalyptus eremophila (sand mallet) is a hardy species with a dense, upright form. *E. eremophila* is native to the Esperance Plains between Esperance and Kalgoorlie, Western Australia, but has been widely planted throughout the southeastern and mid-north of South Australia, extending to western to mid Victoria and New South Wales.

Assessment of trees within this group occurred within the southwestern inner suburbs south of Glenelg, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 13

Regions assessed: Warm Temperate.

Average height: 7.3m. **Maximum height:** 12.7m

Compliance percentage: 62%

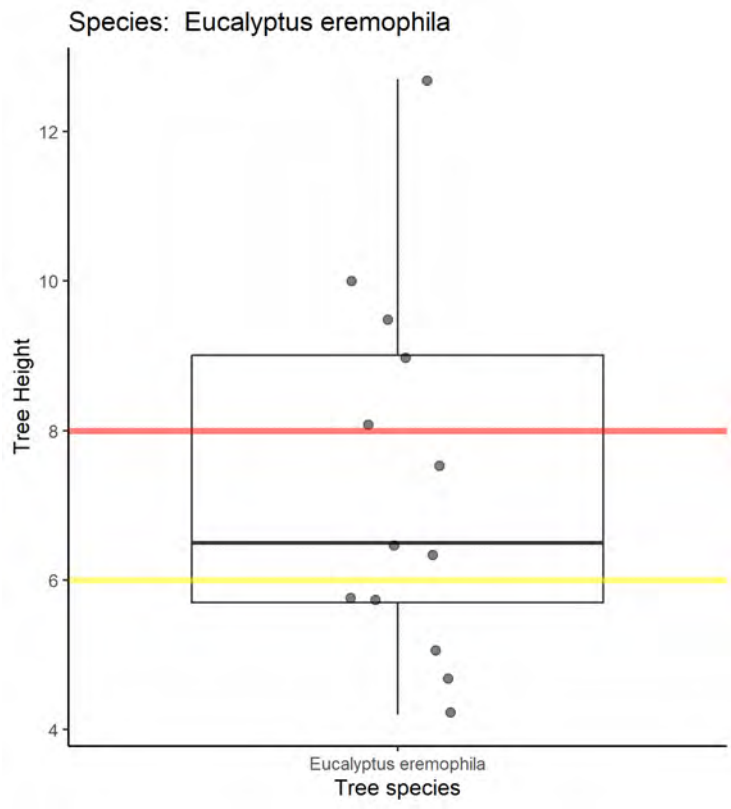

Figure 7.107 Height distribution of 13 *E. eremophila* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 38% of trees of this species were taller

Figure 7.108 A representative image of *E. eremophila*.

Figure 7.109 The geographic distribution of assessed *E. eremophila*. These trees are located within the Warm Temperate zone.

Recommendation: 38% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Eucalyptus eremophila* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Myrtaceae* **- Genus:** *Eucalyptus* **- Species:** *leptophylla*

Origin: Indigenous

Eucalyptus leptophylla (march mallee) typically develops an upright form and medium tree. The species is indigenous to large areas of South Australia and is therefore well suited for planting throughout Greater Adelaide.

Assessment of trees within the group occurred within the Mild and Warm Temperate climate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 21

Regions assessed: Mild and Warm Temperate.

Average height: 10.6m. **Maximum height:** 15.0m

Compliance percentage: 24%

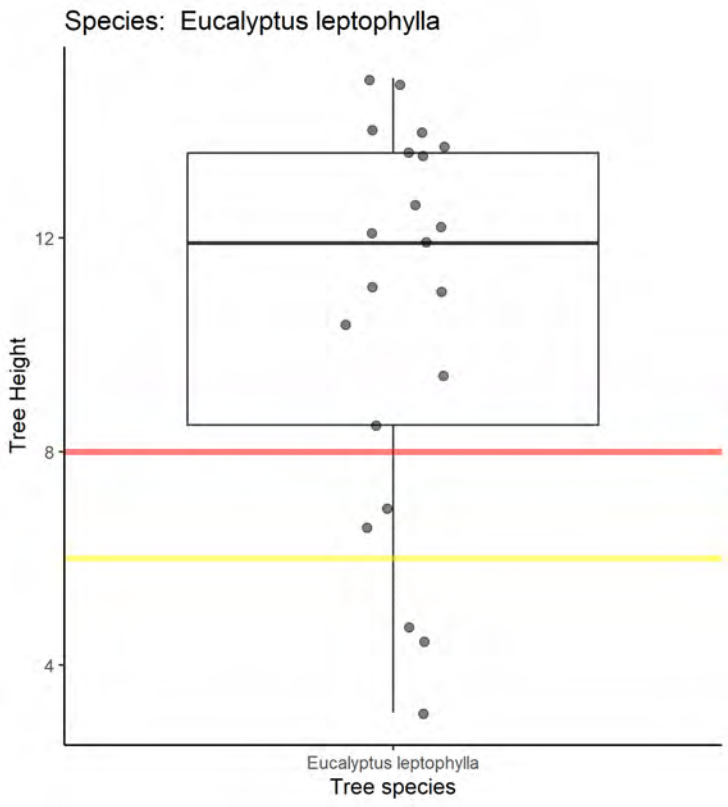

Figure 7.121 Height distribution of 21 *E. leptophylla* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 76% of trees of this species were taller than 8m.

Figure 7.122 A representative image of *E. leptophylla*.

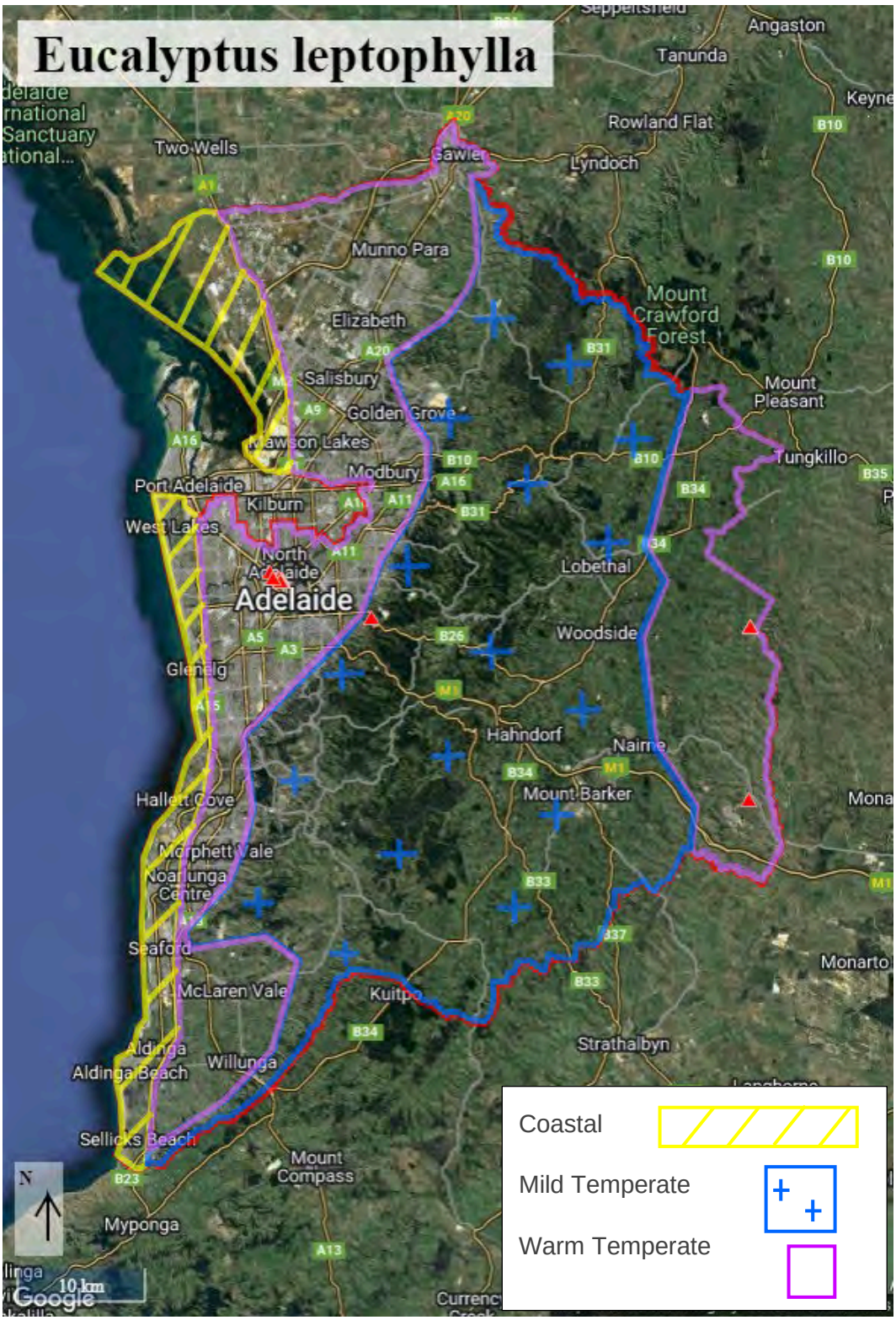

Figure 7.110 The geographic distribution of assessed *E. leptophylla*. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 76% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Eucalyptus leptophylla* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Myrtaceae* **- Genus:** *Eucalyptus* **- Species:** *leucoxylon* 'Goolwa Gem'

Origin: Introduced Native

Little information was available regarding the form and characteristics of *Eucalyptus leucoxylon* 'Goolwa Gem'. The parent species, *Eucalyptus leucoxylon,* has a wide range in tree height, depending on subspecies, between 10-30m. *E. leucoxylon* is indigenous to South Australia and succeeds best in hilly environments of sandy loam to loam soils.

Assessment of trees within the group occurred within the Coastal and Warm Temperate climate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 25

Regions assessed: Warm Temperate and Coastal.

Average height: 9.9m. **Maximum height:** 16.6m

Compliance percentage: 32%

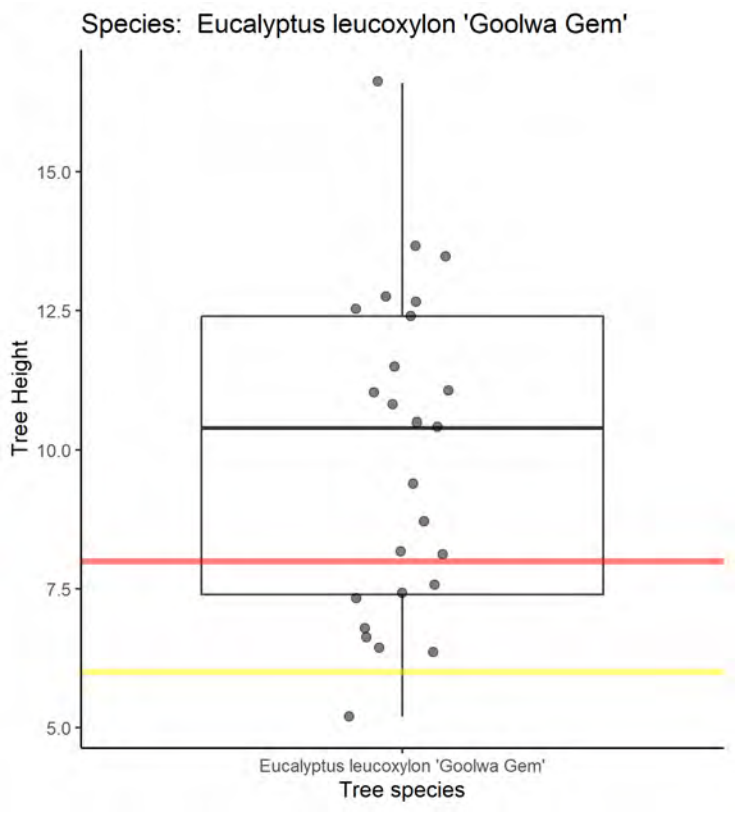

Figure 7.111 Height distribution of 25 *E. leucoxylon* 'Goolwa Gem' trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 68% of trees of this species were taller than 8m.

Figure 7.112 A representative image of *E. leucoxylon* 'Goolwa Gem'.

Figure 7.113 The geographic distribution of assessed *E. leucoxylon* 'Goolwa Gem'. These trees are located within the Mild Temperate and Coastal zones.

Recommendation: 68% of trees assessed were taller than 8m in height. On the basis of the cultivar regularly exceeding powerline height, we do not recommend *Eucalyptus leucoxylon* 'Goolwa Gem' as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Santalaceae* **- Genus:** *Exocarpos* **- Species:** *cupressiformis*

Origin: Indigenous

Exocarpos cupressiformis (native cherry) is typically a dense shrub to small tree with widespread distribution throughout southeastern Australia. The species can be difficult to cultivate but has been planted widely.

Assessment of trees within the group occurred within the Mild Temperate climate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 14

Regions assessed: Mild Temperate.

Average height: 7.5m. **Maximum height:** 11.8m

Compliance percentage: 64%

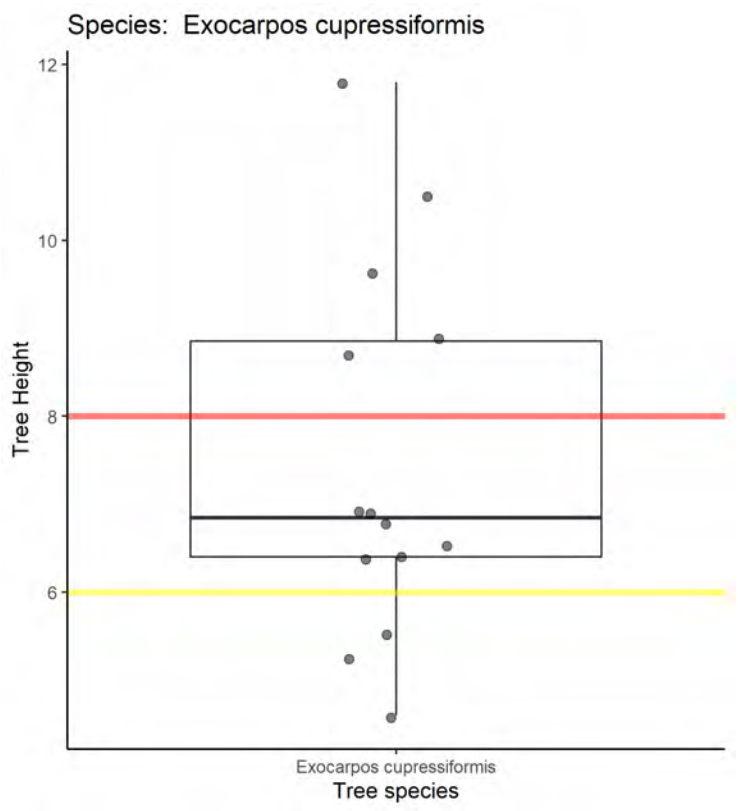

Figure 7.114 Height distribution of 13 *E. cupressiformis* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 36% of trees of this species were taller than 8m.

Figure 7.115 A representative image of *E. cupressiformis*.

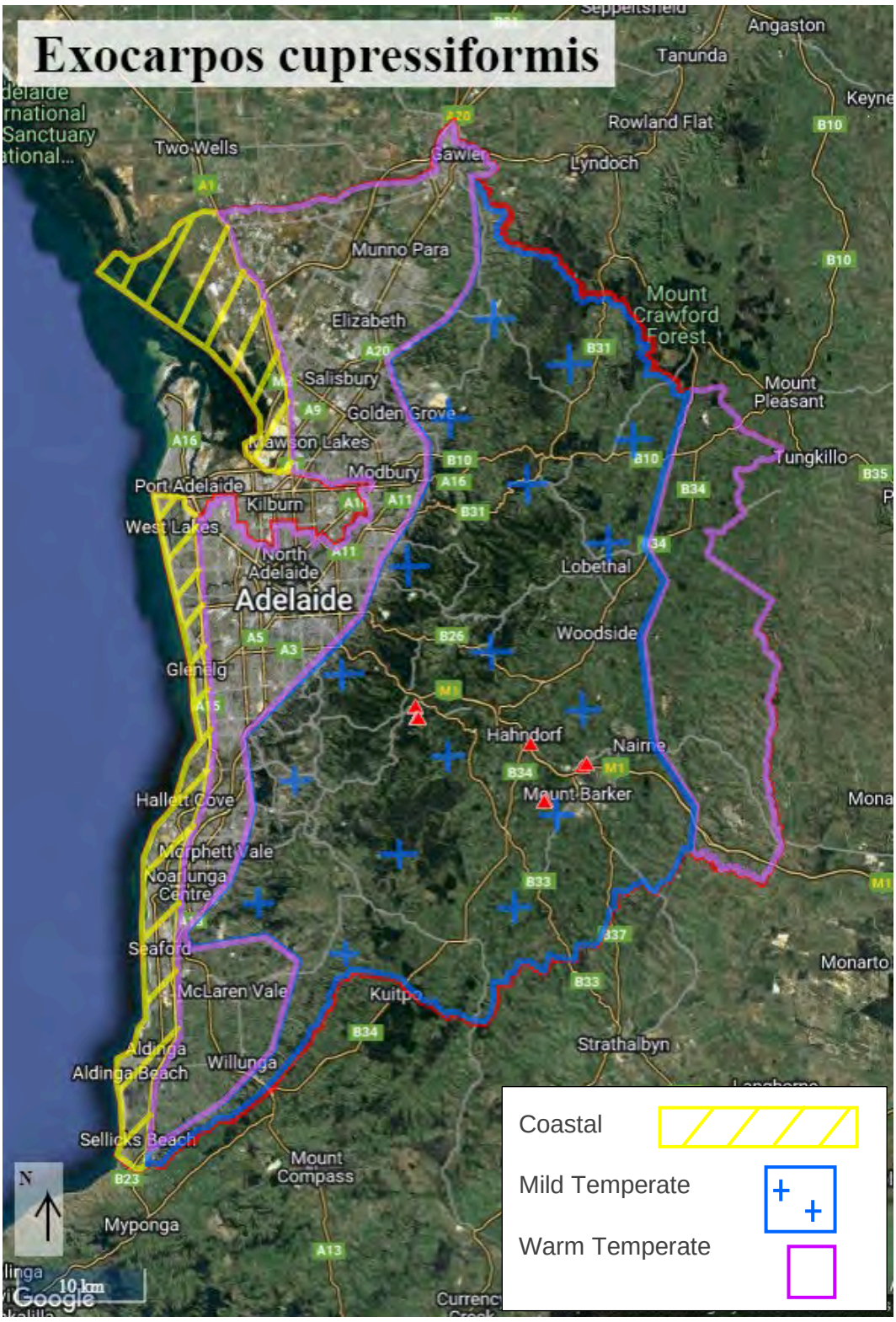

Figure 7.116 The geographic distribution of assessed *E. cupressiformis*. These trees are located within the Mild Temperate zone.

Recommendation: 36% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Exocarpos cupressiformis* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Anacardiaceae* **- Genus:** *Pistacia* **- Species:** *chinensis*

Origin: Exotic

Pistacia chinensis (Chinese pistachio) is a rounded, deciduous tree. This species is indigenous to China and Taiwan and has widely been planted and maintained within streetscapes of the Adelaide Hills and Plains due to its high drought tolerance.

Assessment of trees was mostly within the Warm Temperate climate zone, but some trees were assessed in the Mild Temperate climate zone in Mount Barker, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Mild and Warm Temperate.

Average height: 6.9m. **Maximum height:** 10.8m

Compliance percentage: 80%

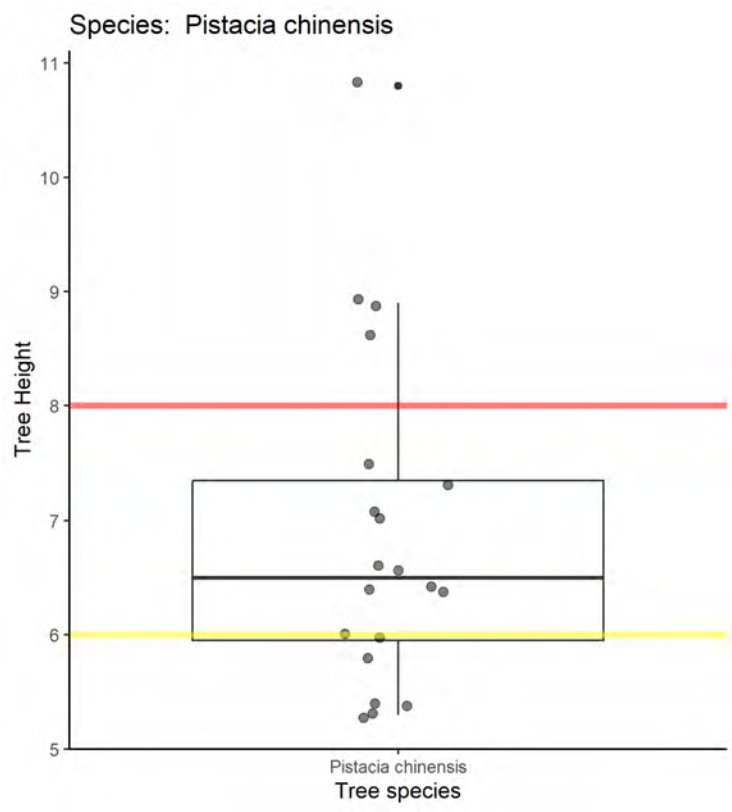

Figure 7.117 Height distribution of 20 *P. chinensis* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 20% of trees of this species were taller than 8m.

Figure 7.118 A representative image of *P. chinensis*.

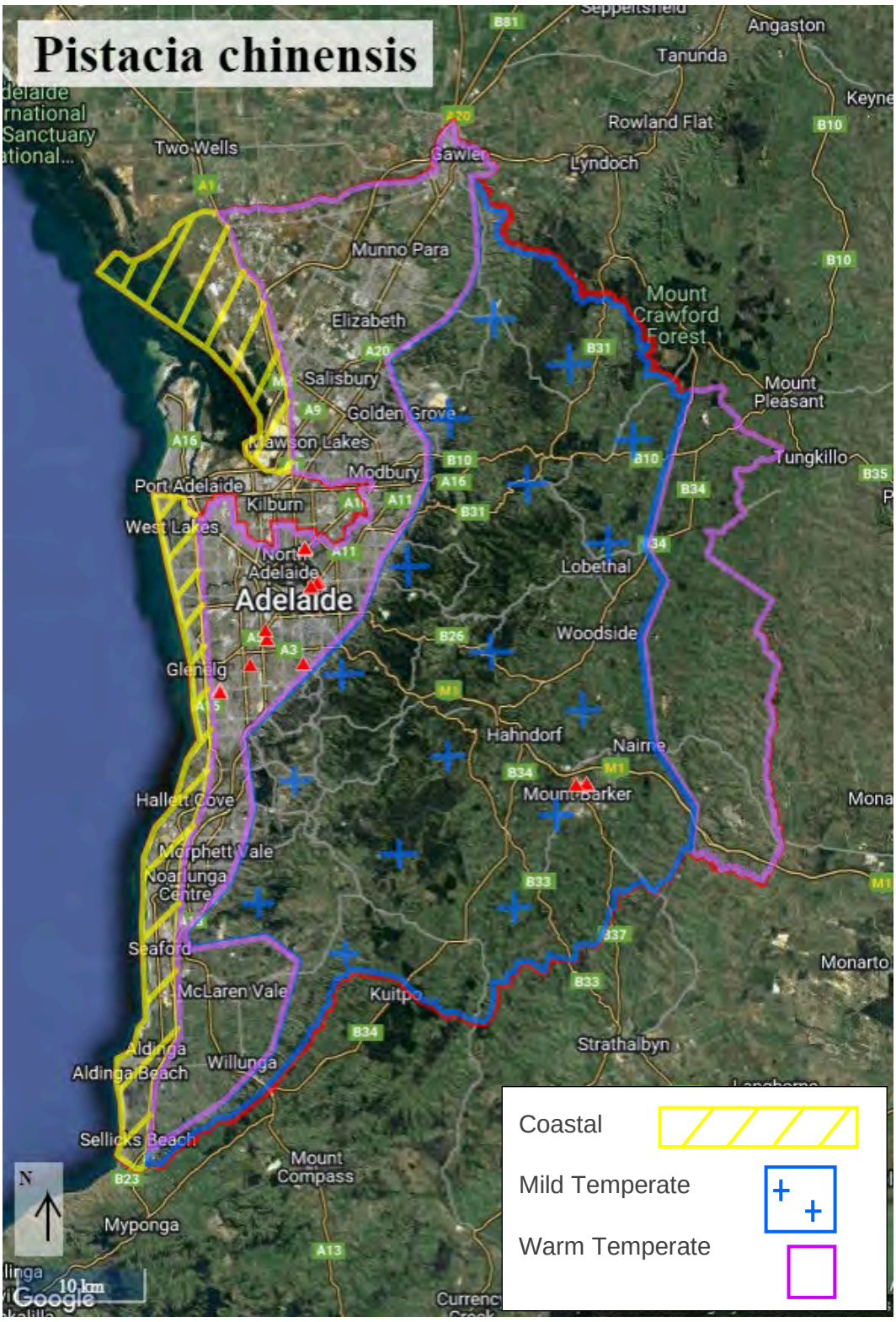

Figure 7.119 The geographic distribution of assessed *P. chinensis*. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 20% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Pistacia chinensis* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Myrtaceae* **- Genus:** *Syzygium* **- Species:** *smithii*

Origin: Introduced Native

Syzygium smithii (lilly pilly) is typically a medium sized tree native to eastern Australia. This species is drought, fire and frost tolerant and will succeed on all soil textures.

Assessment of trees within the group occurred within the Mild and Warm Temperate climate zones, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Mild and Warm Temperate.

Average height: 9.3m. **Maximum height:** 14.0m

Compliance percentage: 30%

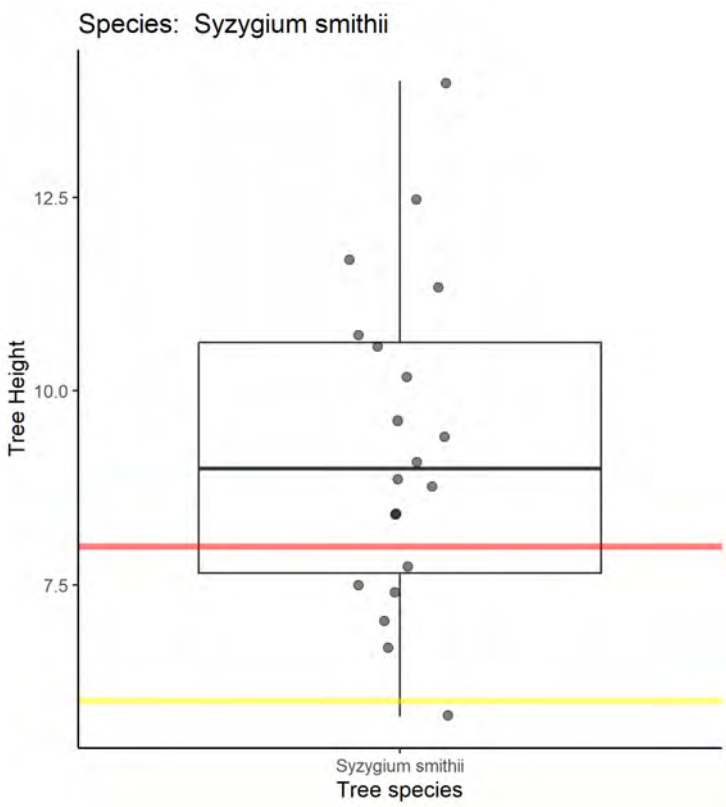

Figure 7.120 Height distribution of 20 *S. smithii* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 70% of trees of this species were taller than 8m.

Figure 7.121 A representative image of *S. smithii*.

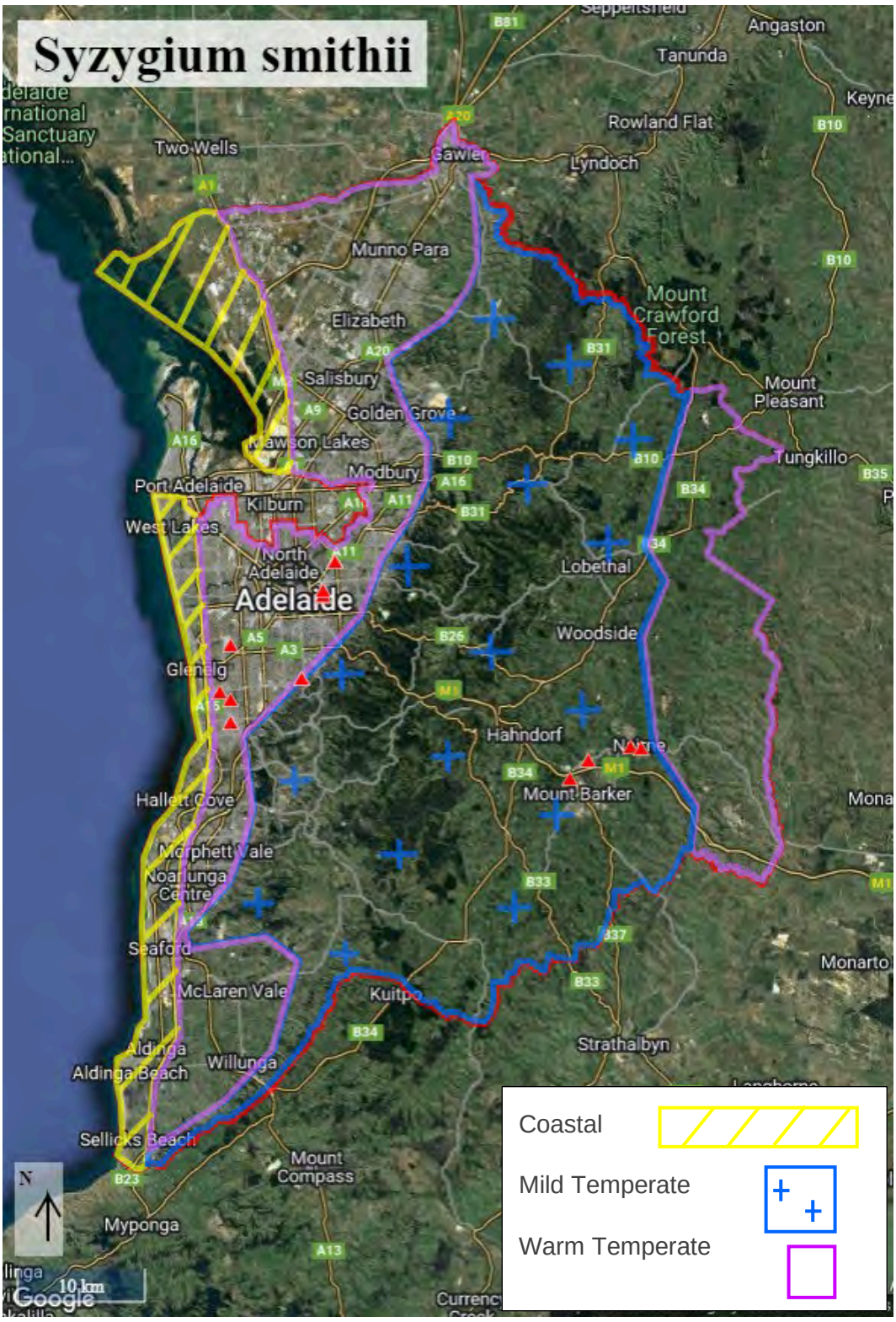

Figure 7.122 The geographic distribution of assessed *S. smithii*. These trees are located within the Mild and Warm Temperate zones.

Recommendation: 70% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *S. smithii* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Meliaceae* **- Genus:** *Toona* **- Species:** *ciliata*

Origin: Introduced Native

Toona ciliata (Australian cedar) is a medium to large deciduous tree native to Queensland and northern New South Wales.

Assessment of trees within the group occurred within the inner northeastern Adelaide suburbs, in urbanised and developed areas of the Warm Temperate climate zone with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Warm Temperate.

Average height: 9.2m. **Maximum height:** 11.8m

Compliance percentage: 25%

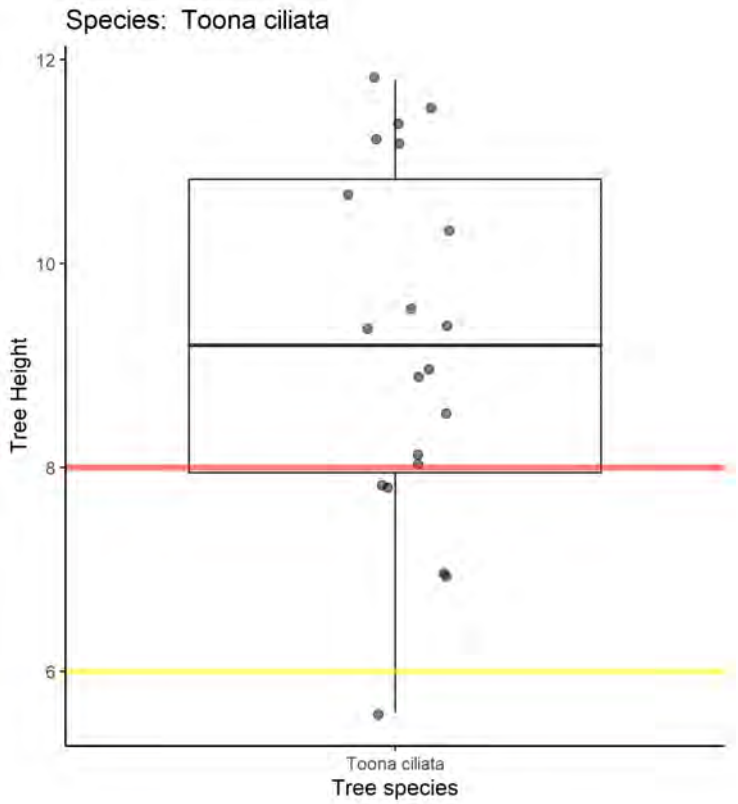

Figure 7.123 Height distribution of 20 *T. ciliata* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 70% of trees of this species were taller than 8m.

Figure 7.124 A representative image of *T. ciliata*.

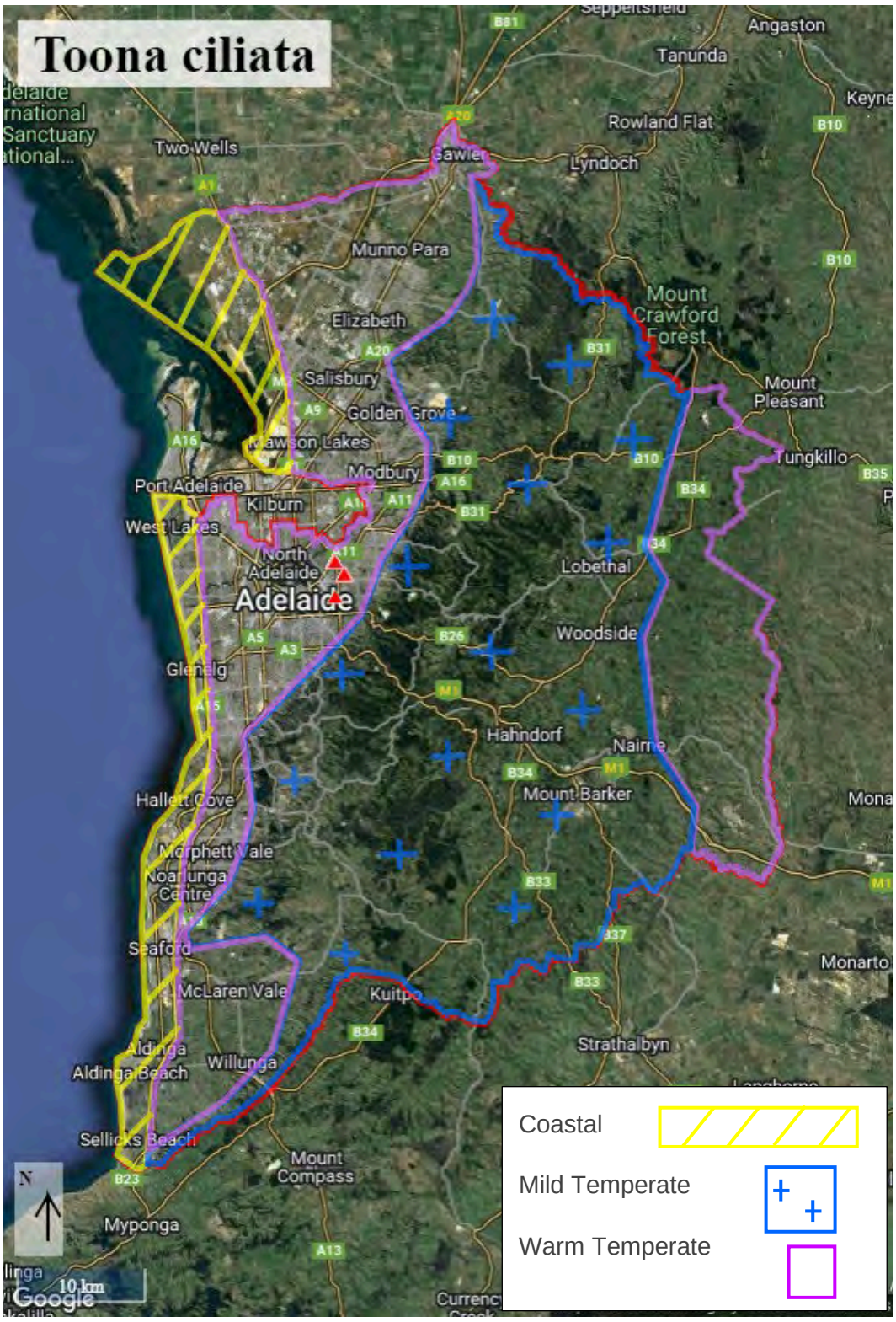

Figure 7.125 The geographic distribution of assessed *T. ciliata*. These trees are located within the Warm Temperate zone.

Recommendation: 70% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Toona ciliata* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.

Family: *Ulmaceae* **- Genus:** *Ulmus* **- Species:** *parvifolia*

Origin: Exotic

Ulmus parvifolia (Chinese elm) is an evergreen or partly deciduous, domed tree of medium size. This species is indigenous to central China, Korea, Japan and Taiwan and has been widely planted throughout greater Adelaide.

Assessment of trees within the group occurred mostly within the Warm Temperate climate zone with a small number of trees assessed within the Mild Temperate climate zone of Mount Barker, in urbanised and developed areas with typical environmental conditions of roadside plantings.

Trees assessed: 20

Regions assessed: Coastal, Mild and Warm Temperate.

Average height: 8.7m. **Maximum height:** 11.7m

Compliance percentage: 35%

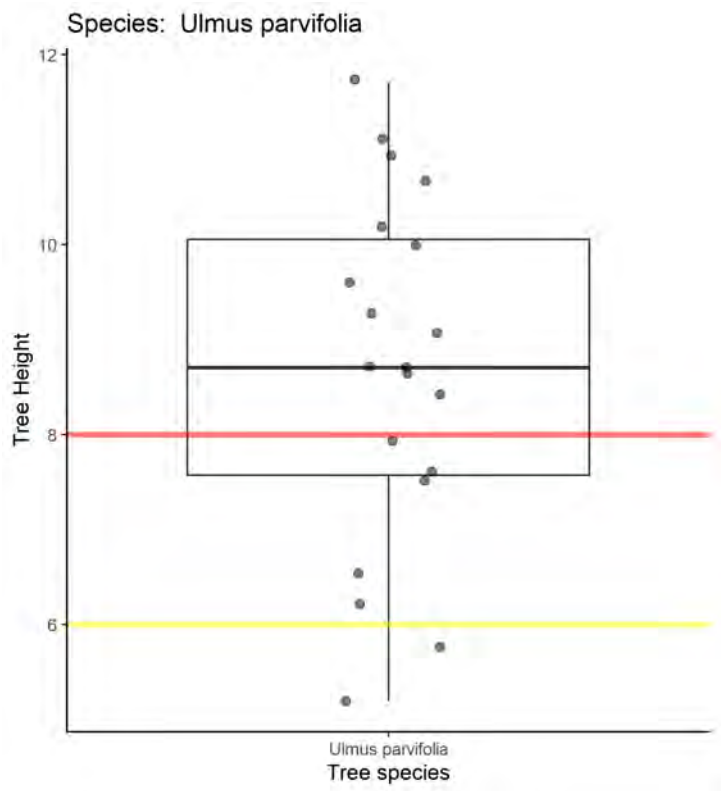

Figure 7.127 Height distribution of 20 *Ulmus parvifolia* trees measured. The red line indicates standard low voltage powerline height of 8m above ground level and yellow line represents a 2m clearance envelope. Height data has been jittered on x axis to enable clear differentiation. 65% of trees of this species were taller than 8m.

Figure 7.126 A representative image of *U. parvifolia*.

Figure 7.128 The geographic distribution of assessed *U. parvifolia*. These trees are located within the Mild and Warm Temperate zone and Coastal zone.

Recommendation: 65% of trees assessed were taller than 8m in height. On the basis of the species regularly exceeding powerline height, we do not recommend *Ulmus parvifolia* as suitable for inclusion on the Permitted List for planting under powerlines in non-bushfire areas.