The City of Melbourne's

FUTURE URBAN FOREST

Identifying vulnerability to future temperatures

THE UNIVERSITY OF MELBOURNE

CITY OF MELBOURNE

Authors: Dave Kendal, Jess Baumann

Burnley Campus
School of Ecosystem and Forest Sciences
The University of Melbourne
500 Yarra Boulevard
VIC 3010 AUSTRALIA
T: +61 3 8344 0267

Contact: dkendal@unimelb.edu.au

Expert advice from Stephen Frank, Steve Livesley, Peter Symes, Anna Foley, David Reid, Peter May, Ian Shears and David Callow.

First printed June 2016.

Published online November 2016 by the Clean Air and Urban Landscapes Hub: http://www.nespurban.edu.au/publications-resources/research-reports/CAULRR02_CoMFutureUrbanForest_Nov2016.pdf

The Clean Air and Urban Landscapes Hub is funded under the Australian Government's National Environmental Science Programme with a mission to take a comprehensive view of the sustainability and liveability of urban environments.

Executive Summary

Climate change is likely to have a significant effect on many trees in the City of Melbourne. Some species will perform better, while some will perform worse. The report describes the results of a project exploring the vulnerability of tree species currently planted in the City of Melbourne, and identifies some potential new species that may be more suitable for the City's climate futures.

A list of species combining those currently in the City of Melbourne's urban forest with those being newly planted in the City of Melbourne was created. The global locations where species occur naturally and are in cultivation (and abundance where available) were compiled from existing datasets, such as 'open data' tree inventories and extracted from other published data, from approximately 200 cities around the world. Temperature (both mean annual temperature and extreme minimum/maximum temperatures) was identified as the main parameter limiting the distribution of trees in cities. Temperatures where species occurred was compiled from global databases. These temperature 'envelopes' for each species were compared with projected climates under current temperatures, and moderate and extreme climate change scenarios for the City of Melbourne to identify the vulnerability of a list of existing and new species to City of Melbourne's future climates.

A total of 2104 tree species currently or potentially being planted in the City of Melbourne were assessed. Of the 375 species currently planted in Melbourne, 39% of species and 19% of currently planted trees were found to be moderately or extremely vulnerable to the existing temperatures occurring in the City of Melbourne (which has already increased by 1.9 °C since the 1950s due to increased urbanisation and climate change). Under a moderate climate change scenario, where mean annual temperatures increase a further 0.8 °C by 2040 (a 25 year timeframe), 48% of species and 35% of currently planted trees were found to be moderately or extremely vulnerable. Under an extreme climate change scenario of a further 3 °C increase in mean annual temperature by 2090, 78% of species and 62% of currently planted trees were found to be moderately or extremely vulnerable. Two groups of trees were particularly vulnerable to increasing temperatures. Species from colder climates, such as northern Europe and the north-Eastern United States and species with narrow climate envelopes, such as many locally indigenous and other native trees (e.g. *Eucalyptus* spp. and *Acacia* spp.). Both these groups of trees are very important in Melbourne for cultural and ecological reasons. Engagement with relevant stakeholders will be crucial if this identified vulnerability leads to changes in the way the City uses these species (e.g. reduced planting in unirrigated streetcapes).

Some caveats must be used when interpreting this data. The methods used in this research allow a large number of species to be assessed using very large datasets. However, there are likely to be some particular species that respond to future climates differently than predicted using this approach, and the data presented here should be combined with physiological data where available to better understand how particular species are responding to temperature and water stress. Also, not all individuals of a particular species will be equally vulnerable. Individual trees that have access to favourable conditions will be less vulnerable than those in difficult sites. Improving soil conditions and water availability may help reduce the vulnerability of existing trees. Suitable site selection, preparation and maintenance may allow individuals of vulnerable species to continue to be planted into the future.

An additional 976 tree species planted in other cities around the world were also assessed. 273 species were found to be within the City of Melbourne's temperature envelope under the moderate climate change scenario, and 241 species within the City of Melbourne's temperature envelope under the extreme climate change scenario. A further 753 species of Australian trees not currently planted in Melbourne were also assessed. Of these, 401 species were within the City of Melbourne's temperature envelope under the moderate climate change scenario, and 148 species within the City of Melbourne's temperature envelope under the extreme climate change scenario. These new species provide a real opportunity to shape the City of Melbourne's future urban forest that is well adapted to environmental conditions and contribute to the cultural fabric and ecological functioning of the city. A better understanding of these species, their horticultural performance, and what they mean for heritage, culture and biodiversity is needed to be able to make informed selections for the future.

Table of Contents

Project Background

The City of Melbourne has successfully launched their Urban Forest strategy, and completed an initial round of planning for all precincts within the City. A key driver of the strategy is to help the City of Melbourne adapt to a changing climate by increasing the cooling provided by the urban forest – primarily by having an increased canopy cover target. However, climate change is also likely to have a significant effect on many trees in the city (Kendal et al., 2012). Some species will perform better, while some will perform worse. Projecting climate change into the future life expectancy of trees (e.g. 100 years), it is possible, even likely, that many species currently being planted in the City are unlikely to survive, let alone thrive. Conversely, there will be many species well suited to the City's future climate that are rarely planted or absent from the City's current urban forest. Work is required to identify both existing and new species that are likely to survive and grow well in the City of Melbourne's future climates.

Urban forests provide many important ecosystem service benefits to humans, such as climate regulation, improved health outcomes, and psychological well-being (Bolund and Hunhammar 1999; Frumkin 2013). They are also critical to the functioning of urban ecosystems, provision of food and habitat for fauna, and regulation of the environment for plant communities. These benefits are driven by the structure and composition of the urban forest, which in turn is shaped by the climate of the city (Kendal et al. 2012; Ramage et al. 2012).

It is now clear that human-induced climate change is leading to environmental change across the globe. While there has been much scientific effort applied to understanding the drivers of climate and mitigating of these drivers, we must now also begin to focus on adapting our cities to climate change (IPCC 2013). This is a particularly important topic for urban landscape managers, who will be among the first to have to deal with the effects of climate change, but who also have a unique capacity to contribute to the adaptation of cities through careful tree selection and management.

Project Aims

The aims of this project were to:

- Identify key limiting factors to the global distribution of tree species cultivated in cities e.g. maximum temperatures, length of dry spells, minimum rainfall, extreme temperatures
- Identify the City of Melbourne's likely future climate for these limiting factors
- Identify:
    1. The vulnerability of current taxa to these environmental changes, and
    2. a palette of plants that are likely to be less vulnerable to Melbourne's future climate

Detailed Methodology

Melbourne's current urban forest

The current tree species list planted and surviving by the City of Melbourne was downloaded from their open data platform in February 2016. This was used to determine the taxa, abundance, health, etc. of different taxa in the city's urban forest (e.g. Table 1). A list of new plantings within the city and within other LGAs in Melbourne was provided by the City of Melbourne, and these species were also included in the analysis. Taxonomy was standardised using the Plant List (http://www.theplantlist.org/), an online database that contains a working list of all known plant species that was created by RBG Kew and the Missouri Botanic Gardens. Where the City of Melbourne's trees were only known to the genus level, likely species were selected to use in vulnerability analysis (e.g. *Ulmus* x *hollandica* was used in place of *Ulmus* spp.)

Table 1 – the 25 most common species in the City of Melbourne

Taxa	Count	Proportional abundance
Eucalyptus camaldulensis	7797	12.0%
Platanus x acerifolia	5478	8.4%
Corymbia maculata	3089	4.7%
Ulmus sp.	2668	4.1%
Eucalyptus melliodora	2647	4.1%
Allocasuarina verticillata	2464	3.8%
Ulmus minor	1931	3.0%
Eucalyptus leucoxylon	1627	2.5%
Corymbia citriodora	1514	2.3%
Acacia mearnsii	1236	1.9%
Angophora costata	1232	1.9%
Acacia implexa	992	1.5%
Acacia melanoxylon	931	1.4%
Lophostemon confertus	885	1.4%
Eucalyptus sp.	765	1.2%
Melia azedarach	752	1.2%
Quercus palustris Ficus	738	1.1%
macrophylla	718	1.1%
Casuarina cunninghamiana	682	1.0%
Zelkova serrata	626	1.0%
Tristaniopsis laurina	624	1.0%
Eucalyptus sideroxylon	612	0.9%
Schinus molle	605	0.9%
Acer x freemannii 'Jeffersred'	590	0.9%

The City of Melbourne's climate

The weather in the City of Melbourne has been recorded at the Melbourne Regional Office weather station in La Trobe street from 1850 to 2014, and at Olympic Park since 2015. The mean annual temperature in City of Melbourne has varied from 13.9 °C to 17.2 °C, and rainfall from 332 to 968 mm. The City of Melbourne's historic mean annual temperature before 1950 was approximately 14.7 °C (Fig.1). Since 1950, this has steadily increased and the average in the last 20 years (1996-2015) has been 16.4 °C. This increase has been more pronounced in minimum (i.e. overnight) temperatures, although increases in daytime temperatures have also been observed. There are some indications that extreme maximum temperatures are also increasing. The mean annual rainfall is 650 mm and while there is much more uncertainty in trends (visible in the large scatter of points on the graph), rainfall over the last 20 years has averaged 564 mm/yr, and during the drought of 2002-2009 rainfall averaged 488 mm/yr. While some of these changes are very likely due to human induced global warming (via CO2 emissions), the magnitude of these changes have been exacerbated by other factors such as the Urban Heat Island effect.

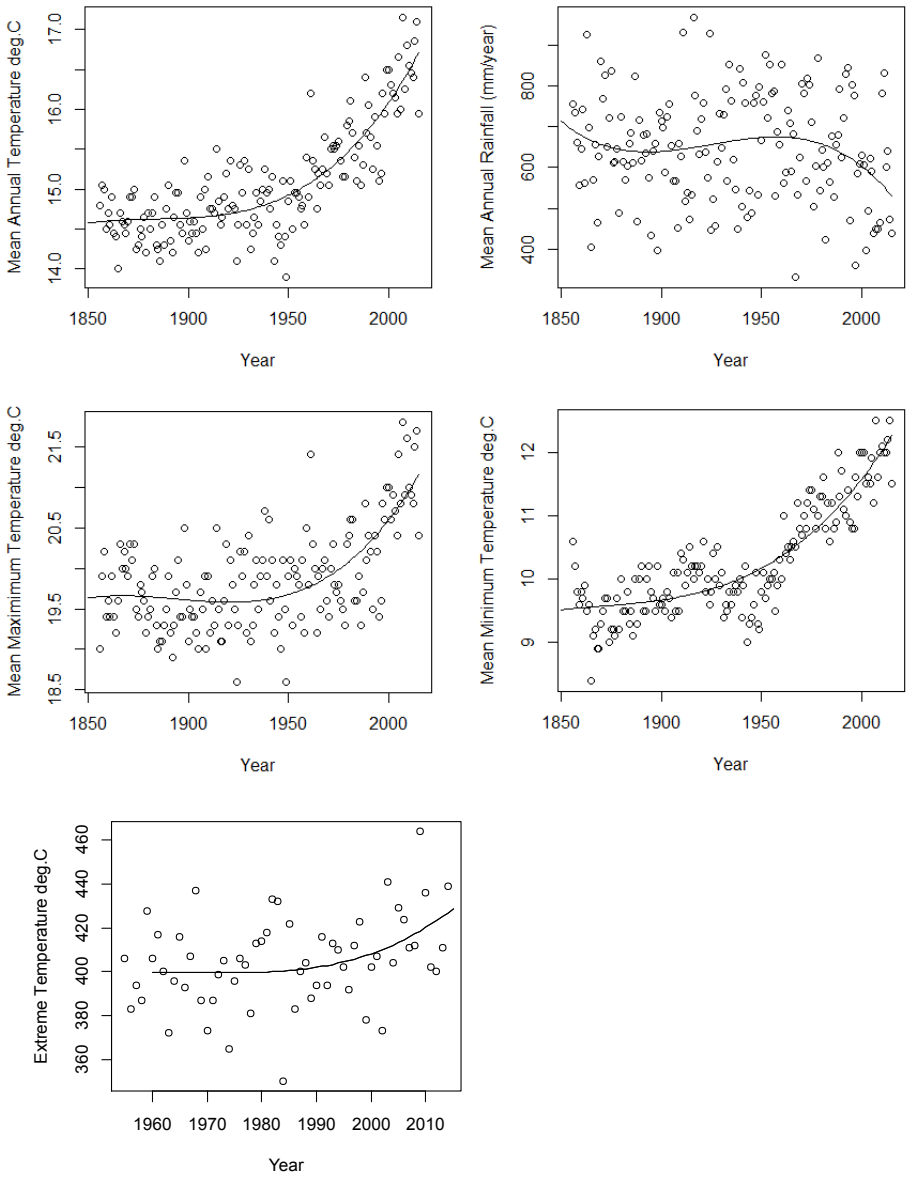

Figure 1 – change in temperature and rainfall in the City of Melbourne over time. Polynomial regression lines of best fit (including quadratic and cubic terms) have been shown.

Climate change projections for Melbourne

A range of different climate change models have been developed to predict future climatic variables from scientific organisations around the world. Best practice combines data from many different models to determine the probability of the direction and size of change in particular climate variables. Different emission scenarios are modelled based on assumptions about whether we will be able to limit global emissions (RCP 4.5 scenario) or allow emissions to continue to increase (RCP 8.5 scenario). Both the RCP 4.5 (Fig.2) and RCP 8.5 (Fig.3) multi-model averages suggest that about 0.5 °C of the temperature increases observed in the City of Melbourne by 2015 can be attributed to climate change. These models predict *additional* temperature increases of between 0.75 °C (for RCP 4.5 by 2040) and and 3 °C (RCP 8.5 by 2090, lifting Melbourne's mean annual temperature to between 17.2 °C and 19.4 °C using mean (50th) percentile model predictions. Rainfall projections from these climate models are uncertain although the extreme climate change model predicts a slight (less than 10%) decline by 2090.

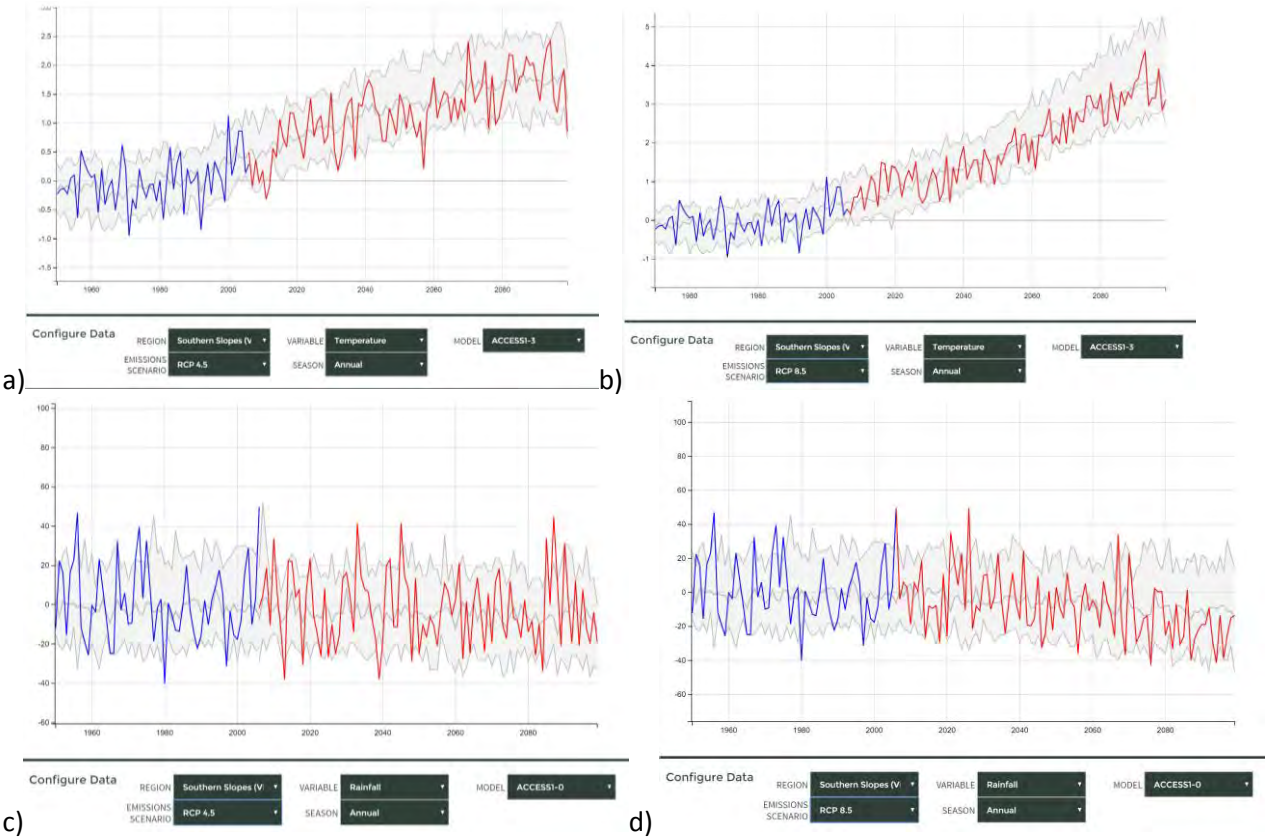

Figure 2 – Change in mean annual temperature (a & b) and rainfall (c & d) for the Southern Slopes region, including Melbourne, projected to 2090 under a & c) the RCP 4.5 moderate emissions scenario and the b & d) business as usual RCP 8.5 emissions scenario. The average, 10th percentile and 90th percentile of climate change models are shown, overlaid by the single ACCESS1-3 model by CSIRO/BOM. Generated using the Time Series Explorer tool provided by climatechangeinaustralia.gov.au

Identifying climate parameters limiting global tree distributions

BIOCLIM is a set of 19 climate envelope variables (Appendix A) that have been shown to be related to the distribution of plant species in natural systems (Booth et al., 2014) and is a well established method for understanding the response of trees to climate change (McKenney et al., 2007). Only one BIOCLIM variable was included in the final analysis: BIOCLIM1 (mean annual temperature). Mean annual temperature has been shown to be a good predictor the distribution of urban tree taxa globally (Kendal et al., 2012). BIOCLIM12 (mean annual preciptiation) was excluded from the final analysis as rainfall has been shown to be a poor predictor of the global distribution of trees (Kendal et al., 2012). Also, rainfall patterns within a species natural range are not always good predictors of irrigation needs, as habitat (e.g. riparian) can strongly influence drought tolerance, and human behaviour such as irrigation can overcome rainfall deficit. Rainfall projections for future climates are uncertain and it is unclear that total annual precipitation in the City of Melbourne will change under future climates. Other BIOCLIM variables (e.g. average maximum temperature, rainfall in the hottest months) were explored but were found to have very moderate values in the City of Melbourne (meaning they would not be good discriminators of species suitability). Examination of raw bioclim data confirms the City of Melbourne's historic climate, with point data for the City of Melbourne's location (long=144.9631,lat=-37.8136) having a BIOCLIM1 (mean annual temperature) value of 146 (14.6 °C) and a BIOCLIM12 (mean annual rainfall) value of 627.

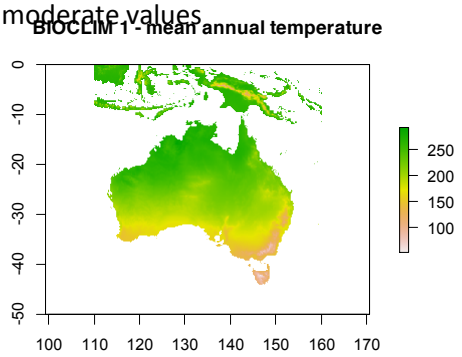

Figure 3 – BIOCLIM 1 (mean annual temperature in ° C multiplied by 10) values across Australia

Additional climate data was obtained from the HadEX2 dataset, which extrapolates historic data from weather stations to measure climate extremes (Donat et al., 2013). Areas with a high concentration of weatherstations, such as urban areas, are well-covered by the dataset. The data is fairly coarse, with each pixel measuring 3.75° x 2.5° longitude-latitude (i.e. tens of thousands of square kilometres). Two variables were used in the final analysis: TXx (highest temperature of the hottest day) and TNn (lowest temperature of the coldest night). Other variables tested but excluded from the final analysis included CDD (Consecutive Dry Days), WSDI (Warm Spell Duration Index) and FD (Frost Days) as Melbourne had low values for these variables.

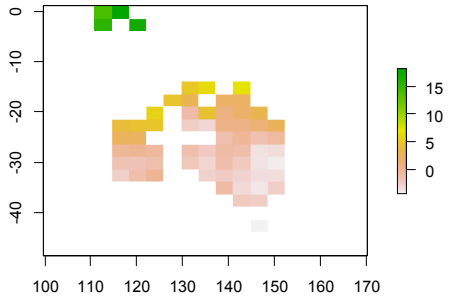

Figure 4 – HadEX2 TNn (extreme minimum night-time temperatures from 1950-2010 °C) values across Australia

Benchmarks for City of Melbourne's future temperature

Benchmarks were derived from current climate averages in 2016, combined with climate change projections. As the BIOCLIM model deliberately excludes non-climate change related influences such as urban heat, current mean and extreme annual temperature values were calculated based on averages of Bureau of Meterology records over the last 20 years (1996-2015) at the Melbourne Regional Office weather station (Table 2). These current values, combined with climate change predictions, were then used to predict temperature values for the City of Melbourne's moderate climate future in 2040 under the RCP 4.5 emissions scenario (0.8 °C further increase in temperature) and extreme climate future climate in 2090 under the RCP 8.5 emission scenario (3 °C increase in temperature). HadEX2 parameters used (extreme maximum and extreme minimum temperatures) were calculated for Melbourne as the highest extreme maximum (44.0 °C) and lowest extreme minimum (-2.4 °C) on record. As the data was very coarse and no climate modelling of extreme temperatures was available, conservative estimates of increases of 0.5 °C for the moderate scenario and 2 °C for the extreme climate scenario were used.

Table 2 – Climate variable thresholds for the City of Melbourne area for historic, current, and projected values for moderate and extreme climate scenarios.

Variable	BIOCLIM1 (mean annual temp)	HADex2 TXx* (extreme hottest day)	HADex2 TNn* (extreme coldest day)
Historic values (pre 1950)	14.6		
Current values (1996-2015)	16.4	44	-2.4
Moderate climate future (RCP4.5 at 2040)	17.2 (+0.8°C)	44.5	-1.9
Extreme climate future (RCP8.5 at 2090)	19.4 (+3°C)	46	-0.4

* These values are less extreme than recorded values due to the coarseness of the dataset

The global distribution of tree species

The global distribution of trees was determined using data from The Global Biodiversity Information Facility (www.gbif.org) which has 650 million occurrence records from over 1.5 million species globally. Occurences have been recorded in GBIF for all tree species currently in the City of Melbourne database. Occurrence records include natural distributions, weed records and some urban floras. A total of 4 million observations of the species of interest were used in the analysis.

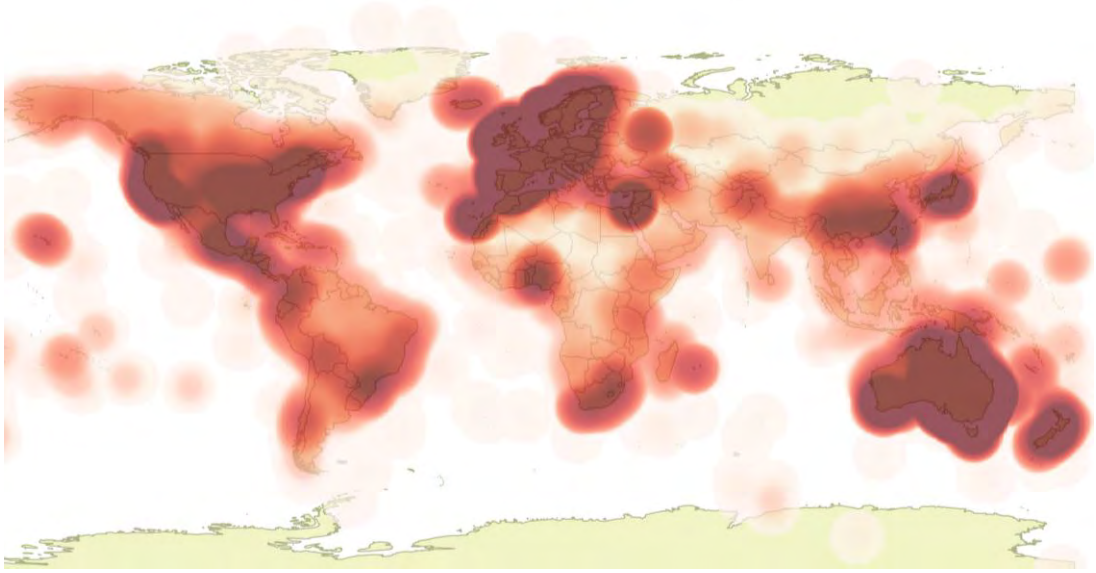

Fig 5 – Heatmap showing the global distribution of occurrence data from Melbourne's species

A second dataset, urban tree inventories, was manually collected from over 400 urban tree inventories published in academic papers and government reports (Fig 5). The location of the city was used to determine the temperature of occurrence of these urban trees. Over 25000 records were included in this dataset.

Note for the purposes of this research, cultivars were included as species only. Cultivars and selections are an important response to this research, but little data exists on the provenance and climatic suitability of the (e.g. they are not represented in the GBIF database).

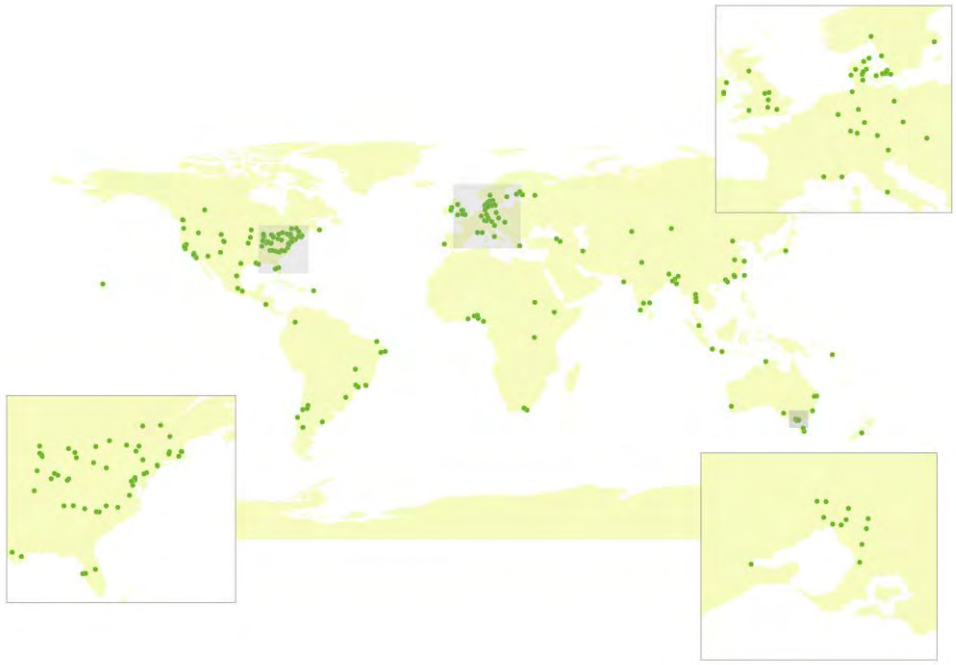

Fig 6 – Map showing the location of global tree inventories

Tree species not currently planted in the City of Melbourne

Species not currently planted in the City of Melbourne were identified from 1) the global urban tree inventories dataset and 2) a public list of approximately 1000 Australian trees.

Analyses

The temperature envelopes for each species was identified by searching for species point locations in the GBIF database, and in the urban tree inventory records, then finding the matching BIOCLIM and HadEX2 variables for the GPS location where the species had been recorded. The distribution of each of the temperature variables was then examined (see Figures 7 & 8 for temperature envelopes of some common species), and the location of the City of Melbourne's current temperature, temperature in a moderate climate change future (in 2040 using the RCP4.5 scenario) and extreme climate change future (in 2090 using the RCP8.5 scenario). The temperature envelopes generated from GBIF data (mostly natural occurances) and the urban tree inventories (mostly planted occurances) were analysed separately to see if trees were being planted in cities outside their natural temperature ranges.

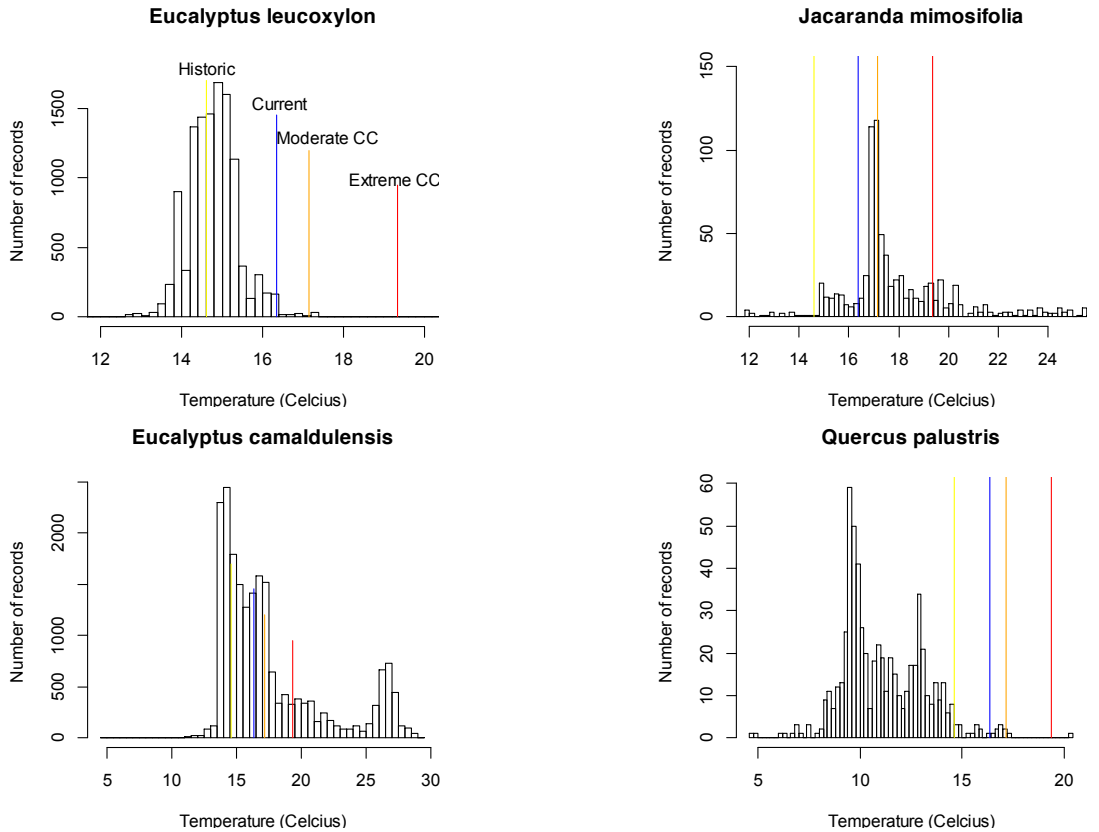

Figure 7. Mean annual temperature of places with point records for *Eucalyptus leucoxylon, Jacaranda mimosifolia, Eucalyptus camaldulensis and Quercus palustris*. Melbourne's historic mean annual temperature (yellow), current mean annual temperature (blue), predicted mean annual temperature with moderate climate change (orange) and extreme climate change (red) are shown as vertical lines.

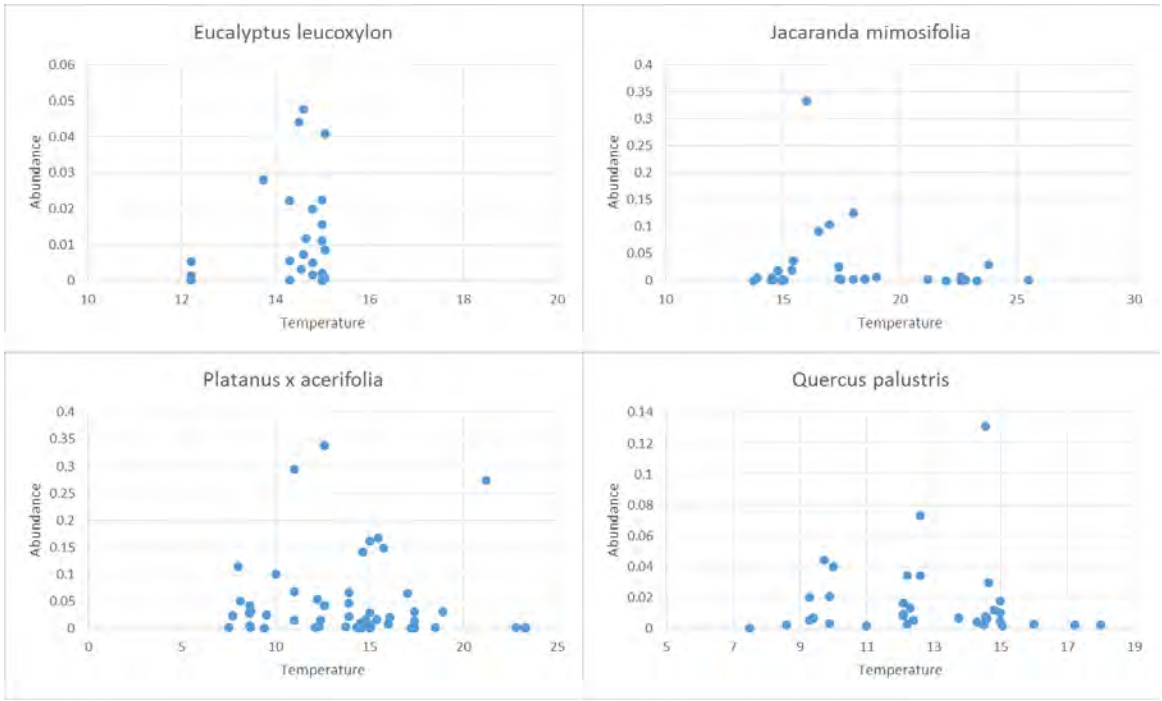

Figure 8 – Abundance of trees in cities with different mean annual temperatures from urban tree inventories.

Determining a traffic light guidance system for identifying vulnerability to temperature increases

The location of the City of Melbourne within the temperature envelope for each species was then coded into traffic light indicators of vulnerability for each climate change scenario:

- Current climate:
  - mean annual temp 16.4 °C
  - extreme maximum temperature 44 °C
  - extreme minimum temperature of -2.4 °C
- Moderate climate future by 2040 (25 year timeframe) assuming:
  - a 0.8 °C increase in mean annual temperature to 17.2 °C
  - a 0.5 °C increase in extreme maximum temperatures 44.5 °C
  - a 0.5 °C increase in extreme minimum temperatures to -1.9 °C
- Extreme climate by 2090 (a 75 year timeframe) assuming:
  - a 3 °C increase in mean annual temperature to 19.4°C
  - a 2 °C increase in extreme maximum temperature to 46 °C
  - a 2 °C increase in extreme minimum temperature to -0.4 °C

Vulnerability was determined by examining the edges of the temperature distribution for each species (Fig 9). Where the City of Melbourne's current or future temperatutre was below the bottom 2.5th percentile of the distribution, the City of Melbourne is considered likely to be too cold for that species. Where the City of Melbourne's temperature was above the 97.5th percentile, then the City of Melbourne is considered likely to be too hot for that species. Where the City of Melbourne's temperature is between the 2.5th and 10th percentile, then the City of Melbourne is considered at risk of being too cold, and similarly where the City of Melbourne's temperature is between the 90th and 97.5th percentile, the City of Melbourne is considered at risk of being too hot. Where the City of Melbourne's temperature falls between the 10th and 90th percentile, the species is unlikely to be vulnerable due to temperature.

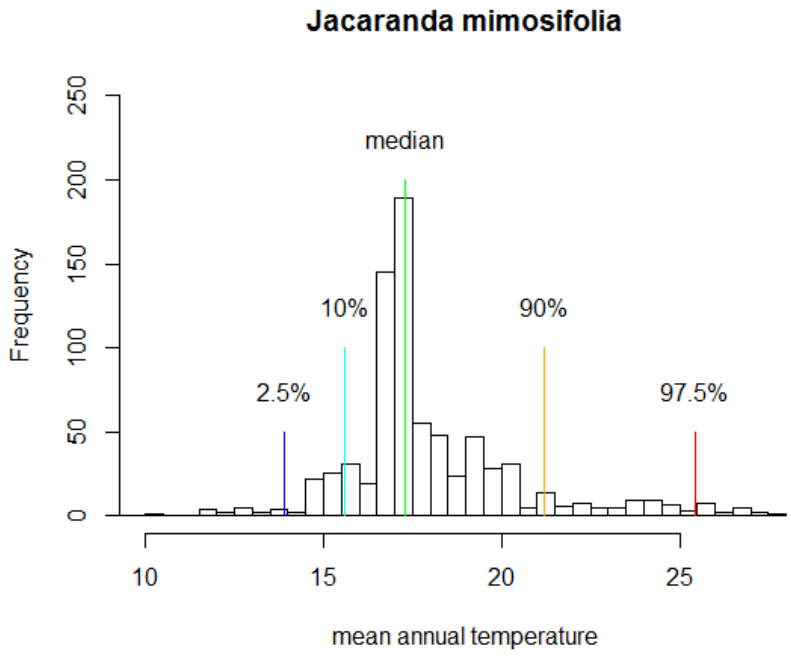

Fig 9 – the key temperature parameters used in determing vulnerability. Coloured lines indicate temperature thresholds.

One issue noted with this temperature dataset was some species naturally have relatively narrow temperature envelopes and are not widely planted globally. For example, there are many hundreds of species of *Eucalyptus* that naturally occur across a range of only 2-3 °C. It is likely that these species could be planted wore widely in cities, as cultivation overcomes some of the limiting factors (particularly barriers to germination). For species with narrow temperature envelopes, this envelope was widened to the 25th percentile mean annual temperature envelope for all species (6.4 °C based on the middle 95% of all records, and 3.8 °C based on the middle 80% of all records) (Fig 10).

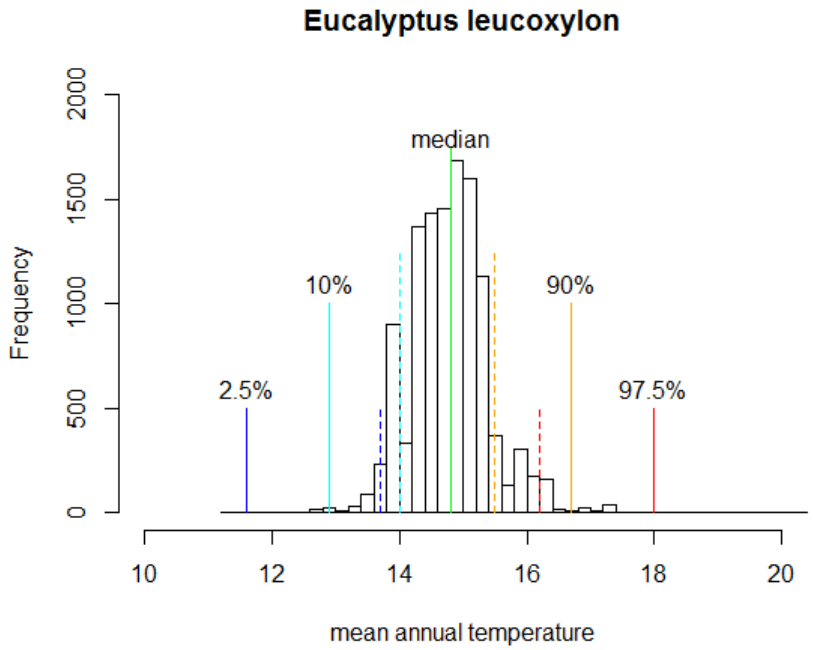

Fig 10 – the key temperature parameters used in determing vulnerability. The dashed lines indicate the calculated temperature thresholds based on occurrence data, and the solid lines indicate the threshold being recalculated to widen the temperature envelope.

For each scenario, every species was assigned a temperature vulnerability traffic light (Table 3). Vulnerability was calculated separately using both GBIF and city tree inventory data to obtain the broadest possible picture of each species potential climate envelope, and the lowest vulnerability catgeory used (i.e. if a species was red-flagged using gbif data, but green flagged using the inventory data, then a green flag would be assigned to that species).

Table 3 – temperature vulnerability traffic light system

Rating	Metric	Example	Description
Green light	The City of Melbourne's temperature is within the middle 90% of all the climates at all locations where the species occurs. (i.e. the City of Melbourne's temperature is between the 10th percentile and the 90th percentile)	Jacaranda mimosifolia, Lophostemon confertus	Species is not considered vulnerable in this temperature scenario
Amber light	The City of Melbourne is warmer than most locations where the species occurs. (i.e. City of Melbourne>90th percentile)	*Acacia mearnsii* (moderate scenario)	The species is moderately vulnerable in this temperature scenario

Amber light (max temp)	The City of Melbourne's hottest summer days are hotter (>2 °C) than 90% of the locations where the species occurs (i.e. City of Melbourne's temperature extreme is >90th percentile plus 2 °C)	Chamaerops humilis (moderate scenario)	The species is moderately vulnerable in this temperature scenario
Aqua light	The City of Melbourne is colder the most locations where this species is found. (i.e. City of Melbourne<10th percentile)	Macadamia tetraphylla (moderate scenario)	The species is moderately vulnerable in this temperature scenario
Aqua light (min temperatures)	The City of Melbourne's coldest winter nights are colder (>2 °C) than 90% of the locations where the species occurs. (i.e. City of Melbourne's temperature extreme is <10th percentile plus 2 °C)	Syzygium hodgkinsoniae	The species is moderately vulnerable in this temperature scenario
Red light	The City of Melbourne is warmer than 97.5% of the locations where this species is found (i.e. City of Melbourne>97.5th percentile)	Ulmus minor	The species is very vulnerable in this temperature scenario
Red light (max temperatures)	The City of Melbourne's hottest summer days are much hotter (>4 °C) than 97.5% of the locations where the species occurs (i.e. City of Melbourne's temperature extreme is >97.5th percentile plus 4 °C)	Trachycarpus fortunei (extreme scenario)	The species is very vulnerable in this temperature scenario
Blue light	The City of Melbourne's climate is colder (than 97.5% of the locations where this species is found (i.e. City of Melbourne's <2.5th percentile)	*Bombax ceiba* (all scenarios)	The species is very vulnerable in this temperature scenario
Blue light (min temperatures)	The City of Melbourne's coldest winter nights are colder than 97.5% of the locations where the species occurs (i.e. Melbourne's temperature extreme is <97.5th percentile)		The species is very vulnerable in this temperature scenario

Results

List A – Trees currently planted in the City of Melbourne:

Out of the approximately 375 species and 63000 trees currently planted in the City of Melbourne, a large proportion are vulnerable to climate change (Table 4). Of the current urban forest, 42% of species and 29% of trees largely occur outside the City of Melbourne's moderate future climate, and 73% of species and 55% of trees are outside the City of Melbourne's extreme future climate.

Table 4 – Proportion of the City of Melbourne's current trees and tree species vulnerable in future temperatures.

	Current		Moderate CC		Extreme CC	
	%species	%trees	%species	%trees	%species	%trees
GREEN	61%	81%	53%	65%	22%	38%
AMBER/AQUA	18%	8%	25%	24%	28%	28%
RED/BLUE	21%	11%	23%	11%	50%	35%

See Appendix A for a full list of vulnerability ratings for 786 species currently planted or proposed to be planted in Melbourne.

List B – Species currently absent from the City of Melbourne but planted in other cities around the globe

See Appendix B for a full list of vulnerability ratings for 976 species currently planted in other cities around the globe, but not currently planted in Melbourne (Table 5). There are hundreds of new species potentially suitable for Melbourne's future temperature from around the globe.

Table 5 – number of species from other cities vulnerable in future temperatures

	Vulnerability rating				
Scenario	green	amber	aqua	blue	red
Moderate	273	163	66	239	235
Extreme	241	159	58	129	389

List C - Australian native tree species not currently planted in the City of Melbourne

See Appendix C for a full list of vulnerability ratings for 753 Australian species not currently planted in Melbourne (Table 6). There are hundreds of new Australian species potentially suitable for Melbourne's future climates.

Table 6 – number of Australian species vulnerable in future temperatures

	Vulnerability rating				
Scenario	green	amber	aqua	blue	red
Moderate	401	204	5	20	156
Extreme	148	278	2	14	344

Implications for Council

The current urban forest is vulnerable to continued environmental change

The temperature in the City of Melbourne has changed dramatically in response to increasing urbanisation and will continue to change in response to climate change. This research clearly demonstrates that many of the current trees, and species of tree that continue to be planted in the City of Melbourne are likely to be vulnerable to further environmental change.

There are two groups of tree species particularly vulnerable:

1) Species from colder climates, such as northern Europe and the north-eastern United States.
2) Species with narrow climate envelopes, such as many locally indigenous and other native trees (e.g. *Eucalyptus* spp. and *Acacia* spp.)

Both these groups of trees make very important contibutions to the City of Melbourne's cultural identity, liveability and biodiversity. While these species may become less reliable (e.g. becoming more susceptible to pests and diseases) with increasing temperatures, they may still be suitable in some places with appropriate management e.g. irrigation, improved soil conditions, etc. There will also likely be a need for increased tree removal, pruning, and planting in response to damage, decline, and mortality.

Caveats on the interpretation of species vulnerability

The methods used in this research allow a large number of species to be assessed using very large datasets. This allows trends and patterns of vulnerability to be predicted. However, there are likely to be some particular species that respond to future climates differently than predicted using this approach. The information presented here should be combined with detailed information on the physiological response of particular species and cultivars of interest to future climates, using methods such as dendrochronology or other measures of physiological response of trees to temperature and water stress.

Another important caveat is that not all individuals within species will be equally vulnerable. Individual trees that have access to protection from hot northerly winds, adequate irrigation through summer and favourable soil volume and structure will be much less vulnerable than individual trees that are in exposed sites, without irrigation, growing in a small volume of compacted soil. Improving soil conditions and water availability may help reduce the vulnerability of existing trees to temperature increases. Suitable site selection, preparation and maintenance may allow individuals of vulnerable species to continue to be planted into the future.

Tree species selection of future tree species

While the vulnerability of current species to future environments seems dramatic, there are hundreds of possible new species that are potentially suitable for planting in Melbourne. The City of Melbourne has a unique opportunity to shape the city's adaptation and resilience to climate change through sensible plant selection of a diverse range of trees that are likely to perform well and maintain or improve ecosystem services and ecological functioning in response to increasing temperatures. However, as there will be greater uncertainty about the outcomes of management actions, processes will need to be developed to select and test these species in order to determine their suitability. Formal street tree trials limited to small areas will enable new tree species to be tested and minimise the risk of unsuccessful plantings within larger streetscapes.

Liaison with the nursery industry in purchasing plants for the future is essential. As nurseries generally stock plants 0-5 years of age, unsuitable plants may need to be phased out of stock over time. There has also been a great increase in the use of clonal plant material due to recent advances in nursery production techniques. While the extensive use

of clonal material may provide uniform form and function in present climates, it may lead to uniform decline and failure in future climates.

Another important criterion for selecting future species is weediness. A weed assessment has not been undertaken as part of this project, but any new species proposed should be assessed fior weediness under current and future climates.

Diversity is a critical component of the resilience of the urban forest (Kendal et al., 2014). Maintaining or enhancing diversity is vital to maintain a healthy urban forest that continues to provide ecosystem services in the face of global environmental change. Genetic diversity (e.g. using seed grown material) and careful provenance selection for better adapted selections of the same species should be taken into account to provide additional protection from the effects of climate change (Aitken et al. 2008; Lohr 2013). There are also risks with new species selection leading to reduced diversity at larger scales. For example, if locally indigenous trees are replaced with cosmopolitan species, diversity at regional and global scales may decline even while diversity at local scales is maintained or increased.

A particular concern within the City of Melbourne is lack of diversity at the family level (particularly in the Myrtaceae). It is likely that many species suitable for Melbourne's future climate are in this family, and a nuanced response is required to reduce risks while allowing the use of climatically suitable plant material. For example, a high proportion of Myrtaceae could be maintained if there is much greater diversity at the species level, or the greater use of genetically diverse (i.e. seed grown) plant material within the family.

Managers will also need to be aware of maladaptation and feedback loops. Some obvious adaptation strategies, such as the use of more heat and drought-tolerant species, can in fact exacerbate the local effects of climate change. For example, where replacement tree species have much sparser canopies than those they are replacing, there could be an increase in the urban heat island effect. More trees may be required to ensure no net-loss in canopy cover. Moreover, policy responses to drought in south-eastern Australia have included restricting the availability of irrigation water for the urban forest (Hatton MacDonald et al. 2010). If this policy response continues, the negative effects of climate change on vulnerable species are likely to be hastened as even less water is available to trees through these stressful periods.

Understanding changes in urban ecosystems

Trees are a keystone of urban ecosystems (Stagoll et al. 2012) and changes in species composition will have flow-on effects for management, urban ecosystems, and the urban public. The effect of species composition and 'trait' shifts (e.g. in canopy density, colour, leaf width) on the provision of ecosystem services, biodiversity and sense of place is also potentially very important.

In Melbourne, it is likely that a shift to smaller-leaved evergreen species will result in less pollution and rainfall interception, and reduced passive solar performance through sparser canopies providing less shade in summer and more shade in winter (Kendal 2011). There may also be health implications as some evergreen species that are likely to become more dominant (for example, *Eucalyptus* spp.) emit higher levels of Volatile Organic Compounds (VOCs) (that can lead to respiratory problems) than broad-leaved deciduous trees (Bernard et al. 2001).

There will also be changes to urban biodiversity with the change in tree species composition of the urban forest. In natural forests, there will be range shifts in flora and fauna in response to climate change, but it is less clear how these processes will operate in more managed urban systems, and whether urban forest managers should facilitate these range shifts. Urban ecological research is urgently required to guide these decisions, taking into account both moderate and more extreme long-term projected climate change.

Perhaps the most important flow-on effect of trait shifts will involve people's perceptions and experience of the urban forest. Trees are an important component of the sense of place of cities; Plane trees contribute to the identity of Paris, while Palm trees shape people's image of Miami. Many cities in South-eastern Australia have a strong

European colonial heritage expressed in their many broad- leaved deciduous trees that is likely to change under future climates. Conversely, the local native trees planted in a city help to create a unique identity that distinguishes one city from another, and provides an important connection to an areas natural heritage and traditional owenership by indigenous people. Changes to the composition and the traits of the urban forest will lead to changes in the sense of place and identity of cities. Recognizing the importance of trait shifts as a result of this adaptation will allow managers to plan for a healthy urban forest that satisfies cultural and natural heritage needs.

Community Engagement

In addition to careful species selection and the ongoing maintenance of trees, sustaining the quality and quantity of the urban forest in the City of Melbourne will require ongoing community involvement.
Community outreach is needed to maximize public and stakeholder awareness around threats to urban forests and the required changes in urban forest management in response to projected climate change. Education material detailing why changes in tree species plantings are needed, best urban forest management practices for tree conservation and associated ecosystem services, and when and how this will be implemented could be included as supplementary material in the City of Melbourne's Urban Forest Strategy.
Consultation and cooperation with stakeholder groups such as local indigenous groups, conservation groups, and friends groups (e.g. Friends of the Elms Heritage group) will be important in encouraging community partners to embrace changes to management of the urban forest. Moreover, collaborations with the nursery industry on initiatives such as planting incentive programs (where trees on the green list are discounted at local nurseries for instance) may foster urban forest stewardship by engaging residents and business owners to plant suitable trees on private land.

Future Research Needs

Two important research needs have been identified at the conclusion of this research:

1. How will these changes in species affect people and biodiversity?

It is likely that different people and different animals will be affected in different ways by changes in the composition of the urban forest. A better understanding of the ecosystem services, habitat and cultural values of the current and potential urban forest is needed to ensure a great urban forest into the future that meets the diverse needs of both humans and non-human animals. A trait-based approach to exploring these questions will allow understanding the benefits provided by forest while the species composition is changing.
Action: Further research (component 2 as outlined in the original research plan)

2. How do we choose which new species to use in Melbourne's urban forest?

This research identifies hundreds of new tree species that may be suitable for planting in the City of Melbourne. Yet we have little knowledge to guide selection within this large group of species, or understand how the public and stakeholder groups may response to these new species. Engagement with all relevant parties is needed to be able to make informed choices from this large pool of species. In particular, the two groups species identified as being particularly vulnerable to climate change – indigenous species, and cold-climate deciduous trees – have strong interest by stakeholders and the general public.
Action: A workshop could be held involving traditional owners, heritage groups, conservation organisations, urban foresters and other relevant parties should be held to the key question of what will the natural and cultural heritage of Melbourne's urban forest of the future be?

References

Aitken, S.N., Yeaman, S., Holliday, J.A., Wang, T. & Curtis- McLane, S. 2008. Adaptation, migration or extirpation: climate change outcomes for tree populations, *Evolutionary Applications, 1,* 95–111.

Bernard, S.M., Samet, J.M., Grambsch, A., Ebi, K.L. & Romieu, I. 2001. The potential impacts of climate variability and change on air pollution-related health effects in the United States. *Environmental Health Perspectives, 109*(2), 199–209.

Bolund, P., & Hunhammar, S. 1999. Ecosystem services in urban areas. *Ecological Economics 29*, 293–301.

Booth, T. H., Nix, H. A., Busby, J. R., Hutchinson, M. F., & Michael, F. (2014). Bioclim: The first species distribution modelling package, its early applications and relevance to most current MaxEnt studies. *Diversity and Distributions*, *20*(1), 1–9.

Donat, M. G., Alexander, L. V., Yang, H., Durre, I., Vose, R., Dunn, R. J. H., Willett, K. M., Aguilar, E., Brunet, M., Caesar, J., Hewitson, B., Jack, C., Klein Tank, A. M. G., … Kitching, S. (2013). Updated analyses of temperature and precipitation extreme indices since the beginning of the twentieth century: The HadEX2 dataset. *Journal of Geophysical Research Atmospheres*, *118*(5), 2098–2118.

Kendal, D., Dobbs, C., & Lohr, V. I. (2014). Global patterns of diversity in the urban forest: is there evidence to support the 10/20/30 rule? *Urban Forestry & Urban Greening*, *13*(3), 411–417.

Kendal, D., Williams, N. S. G., & Williams, K. J. H. (2012). A cultivated environment: exploring the global distribution of plants in gardens, parks and streetscapes. *Urban Ecosystems*, *15*, 637–652.

May, P. B., Livesley, S. J., & Shears, I. (2013). Managing and monitoring tree health and soil water status during extreme drought in Melbourne, Victoria. *Arboriculture and Urban Forestry*, *39*(3), 136–145.

McKenney, D. W., P., Pedlar, J. H., Lawrence, K., Campbell, K., & Hutchinson, M. F. (2007). Potential impacts of climate change on the distribution of North American trees. *Bioscience*, *57*(11), 939–948.

Stagoll, K., Lindenmayer, D.B., Knight, E., Fischer, J. & Manning, A.D. 2012. Large trees are keystone structures in urban parks. *Conservation Letters, 5,* 115–122.

Appendix A

Species List A: The temperature vulnerability of the City of Melbourne's tree species to future temperatures

Note that this list is not designed to be applied to greater Melbourne, which has a broader temperature profile the City of Melbourne, or other cities with different temperature profiles.

Key to reading the species list:

Vulnerability rating	Green	Melbourne has a similar temperature to other places where the species is found and the species is not considered vulnerable in this temperature scenario
	Amber	Melbourne is hotter than most (90%) other places where the species is found and the species is considered moderately vulnerable in this temperature scenario.
	Aqua	Melbourne is colder than most (90%) other places where the species is found and the species is considered moderately vulnerable in this temperature scenario.
	Red	Melbourne is hotter than nearly all (97.5%) other places where the species is found and the species is considered very vulnerable in this temperature scenario.
	Blue	Melbourne is colder than nearly all (97.5%) other places where the species is found and the species is considered very vulnerable in this temperature scenario.
	Max/min	The max/min suffix indicates that the rating is due to extreme maximum and minimum rather than mean annual temperatures.
Temperature scenario	Current	Melbourne with a mean annual temperature of 16.4 °C and extreme maximum temperatures are 44 °C.
	Moderate	Melbourne with moderate climate change by 2040 increasing temperatures 0.8 °C and extreme maximum temperatures increase by 0.5 °C.
	Extreme	Melbourne with extreme climate change by 2090 increasing temperatures 3 °C and extreme maximum temperatures increase by 2 °C.

Limited data indicates that fewer than 20 records were found in the GBIF database and the species was found in fewer than 5 global city inventories – interpret results with caution.

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Abelia grandiflora	green	green	amber		
Abies nordmanniana	red	red	red		
Abutilon hybridum	amber-max	amber-max	red-max	yes	
Acacia acinacea	green	amber	red		
Acacia baileyana	green	green	red		
Acacia binervia	green	green	amber		
Acacia boormanii	green	amber	red		
Acacia caerulescens	amber	amber	red		
Acacia calamifolia	green	green	amber		
Acacia cardiophylla	green	green	amber		
Acacia cognata	amber	amber	red		
Acacia cultriformis	green	green	amber		
Acacia dealbata	green	amber	red		
Acacia deanei	green	green	amber		
Acacia decurrens	green	green	amber		
Acacia elata	green	green	red		
Acacia fimbriata	green	green	green		
Acacia floribunda	green	green	amber		
Acacia hakeoides	green	green	amber		
Acacia howittii	green	amber	red		
Acacia imbricata	green	green	red		
Acacia implexa	green	green	amber		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Acacia iteaphylla	green	green	amber		
Acacia kettlewelliae	red	red	red		
Acacia linearifolia	green	green	red		
Acacia longifolia	green	green	red		
Acacia maidenii	green	green	amber		
Acacia mearnsii	green	amber	red		
Acacia melanoxylon	green	green	amber		
Acacia paradoxa	green	amber	red		
Acacia pendula	green	green	green		
Acacia podalyriifolia	green	green	green		
Acacia pravissima	green	amber	red		
Acacia prominens	green	green	amber		
Acacia pycnantha	green	amber	red		
Acacia retinodes	amber	amber	red		
Acacia rubida	amber	red	red		
Acacia salicina	green	green	green		
Acacia saligna	green	green	amber		
Acacia verniciflua	amber	amber	red		
Acacia verticillata	amber	red	red		
Acacia vestita	green	amber	red		
Acca sellowiana	green	green	green		
Acer buergerianum	green	amber-max	amber-max		
Acer campestre	red	red	red		
Acer cappadocicum	red	red	red		
Acer davidii	amber-max	red-max	red-max		
Acer fabri	amber-max	amber-max	red-max		
Acer freemanii	red	red	red	yes	Acer x freemanii
Acer japonicum	amber	amber	red		
Acer macrophyllum	amber	red	red		
Acer negundo	amber	amber	red		
Acer palmatum	amber	amber	red		
Acer platanoides	red	red	red		
Acer pseudoplatanus	red	red	red		
Acer rubrum	green	amber	amber		
Acer saccharinum	amber	red	red		
Acer sieboldianum	red	red	red		
Acer sp	red	red	red		
Acer truncatum x platanoides	green	amber-max	amber		
Acmena ingens	amber-max	amber-max	red-max		
Acmena smithii	green	green	amber		
Aesculus californica	amber	amber	red		
Aesculus flava	red	red	red		
Aesculus hippocastanum	red	red	red		
Aesculus indica	green	green	red		
Afrocarpus falcatus	green	green	green		
Afrocarpus gracilior	green	green	green		
Agathis atropurpurea	blue	blue	green		
Agathis australis	amber	amber	red		
Agathis corbassonii	blue	blue	blue	yes	
Agathis robusta	aqua	aqua	green		
Agathis vitiensis	blue	blue	blue	yes	
Agonis flexuosa	green	green	amber		
Agonis juniperina	green	green	red		
Agonis marginata	aqua	green	red		
Ailanthus altissima	amber	amber	red		
Albizia julibrissin	green	green	amber		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Albizia lophantha	green	green	amber		
Alectryon subcinereus	blue	blue	blue	yes	
Allocasuarina littoralis	green	green	amber		
Allocasuarina luehmannii	green	green	amber		
Allocasuarina torulosa	green	green	amber		
Allocasuarina verticillata	green	green	amber		
Alnus acuminata	green	green	green		
Alnus acuminata subsp. glabrata	green	green	amber		
Alnus cordata	red-max	red-max	red		
Alnus glutinosa	red	red	red		
Alnus jorullensis	green	green	amber		
Angophora costata	green	green	amber		
Angophora floribunda	green	green	red		
Angophora hispida	green	green	amber		
Anneslea fragrans	aqua	green	amber-max		
Araucaria angustifolia	amber-max	red-max	red-max		
Araucaria araucana	red-max	red-max	red-max		
Araucaria bidwillii	green	green	green		
Araucaria columnaris	aqua	amber-max	amber-max		
Araucaria cunninghamii	green	green	green		
Araucaria heterophylla	green	green	amber-max		
Arbutus canariensis	red-max	red-max	red-max		
Arbutus unedo	amber-max	amber	red		
Arbutus x andrachnoides	red-max	red	red	yes	
Archontophoenix alexandrae	aqua	green	green		
Archontophoenix cunninghamiana	green	green	amber-max		
Argyrodendron actinophyllum	aqua	green	amber		
Austrocedrus chilensis	red	red	red		
Babingtonia virgata	aqua	aqua	red-max		
Backhousia citriodora	blue	aqua	green		
Banksia ericifolia	green	green	amber		
Banksia integrifolia	green	green	green		
Banksia marginata	green	amber	red		
Banksia serrata	green	green	amber		
Banksia spinulosa	green	green	amber		
Bauhinia variegata	green	green	green		
Betula alba	red	red	red		
Betula papyrifera	red	red	red		
Betula pendula	red-max	red	red		
Betula pubescens	red	red	red		
Brachychiton acerifolius	green	green	amber-max		
Brachychiton bidwillii	blue	blue	amber-max		
Brachychiton discolor	green	green	green		
Brachychiton populneus	green	green	amber		
Brachychiton rupestris	green	green	green		
Brahea armata	green	green	green	yes	
Buckinghamia celsissima	green	green	green		
Buddleja davidii	red-max	red-max	red		
Buddleja salviifolia	green	green	amber		
Bursaria spinosa	green	green	red		
Butia capitata	green	green	green		
Buxus sempervirens	red	red	red		
Callistemon citrinus	green	green	green		
Callistemon glaucus	green	green	amber		
Callistemon linearis	green	green	amber-max		
Callistemon macropunctatus	green	green	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Callistemon pachyphyllus	aqua	green	amber-max		
Callistemon pallidus	green	amber	red		
Callistemon phoeniceus	green	green	green		
Callistemon rigidus	green	green	amber-max		
Callistemon salignus	green	green	amber-max		
Callistemon speciosus	green	green	amber		
Callistemon subulatus	amber	red	red		
Callistemon viminalis	green	green	green		
Callitris columellaris	green	green	green		
Callitris glaucophylla	green	green	green		
Callitris preissii	green	green	red		
Callitris rhomboidea	green	green	amber		
Callitris verrucosa	green	green	amber		
Calodendrum capense	green	green	amber-max		
Camellia japonica	green	green	amber-max		
Carpinus betulus	red	red	red		
Carya illinoinensis	green	green	green		
Cassia javanica	blue	blue	aqua		
Castanea mollissima	green	green	amber		
Castanea sativa	red	red	red		
Castanopsis sclerophylla	amber-max	amber-max	red-max		
Casuarina cunninghamiana	green	green	green		
Casuarina glauca	green	green	green		
Casuarina littoralis	amber-max	amber-max	red-max		
Casuarina obesa	green	green	green		
Catalpa bignonioides	amber	amber	red		
Catalpa fargesii	amber-max	red-max	red		
Ceanothus papillosus	amber	red	red		
Cedrela sinensis	red	red	red	yes	
Cedrus atlantica	red	red	red		
Cedrus atlantica f. glauca	red	red	red	yes	
Cedrus deodara	green	green	amber		
Cedrus libani	amber	red	red		
Ceiba speciosa	aqua	green	amber-max		
Celtis australis	green	amber	red		
Celtis occidentalis	amber	red	red		
Ceratonia siliqua	green	green	green		
Ceratopetalum gummiferum	green	green	amber		
Cercis siliquastrum	green	amber-max	amber-max		
Cestrum nocturnum	green	green	green		
Chamaecyparis funebris	amber	red	red	yes	
Chamaecyparis lawsoniana	red	red	red		
Chamaecyparis obtusa	amber-max	red-max	red		
Chamaecyparis pisifera	amber	amber	red-max		
Chamaerops humilis	amber-max	amber-max	red-max		
Chiranthodendron pentadactylon	green	green	green		
Choisya ternata	green	green	amber		
Choricarpia leptopetala	green	green	amber-max		
Chrysanthemoides monilifera	green	green	amber		
Cinnamomum camphora	green	green	amber-max		
Citrus aurantifolia	green	green	amber-max		
Citrus japonica	green	green	amber-max	yes	
Citrus limon	green	green	green		Citrus x limon
Citrus paradisi	green	green	amber-max		Citrus x paradisi
Citrus reticulata	green	green	amber-max		
Clethra arborea	red-max	red-max	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Coleonema pulchellum	green	green	red		
Colutea arborescens	red	red	red		
Combretum caffrum	aqua	green	green		
Coprosma repens	green	amber	red		
Cordyline australis	amber-max	amber	red-max		
Cordyline fruticosa	green	green	amber-max		
Cordyline terminalis	amber-max	amber-max	red-max		
Cornus capitata	green	green	amber		
Correa alba	green	green	red		
Corylopsis spicata	red	red	red		
Corylus avellana	red	red	red		
Corylus colurna	red	red	red		
Corymbia calophylla	green	green	red		
Corymbia citriodora	green	green	green		
Corymbia eximia	green	green	amber		
Corymbia ficifolia	green	green	amber		
Corymbia gummifera	green	green	amber		
Corymbia maculata	green	green	amber		
Corynocarpus laevigatus	red	red	red		
Cotinus coggygria	amber	amber	amber		
Cotoneaster glaucophyllus	green	green	red		
Cotoneaster pannosus	green	green	red		
Crataegus laevigata	red	red	red		
Crataegus lavallei	red	red	red		
Crataegus monogyna	red	red	red		
Crataegus phaenopyrum	red	red	red		
Cryptomeria japonica	amber-max	amber-max	red-max		
Cunninghamia lanceolata	amber-max	amber-max	red-max		
Cunonia capensis	green	green	amber		
Cupaniopsis anacardioides	green	green	green		
Cupressus arizonica	green	green	green		
Cupressus cashmeriana	amber-max	amber-max	red-max		
Cupressus funebris	green	green	amber-max		
Cupressus glauca	red	red	red	yes	
Cupressus lusitanica	green	green	green		
Cupressus macnabiana	amber	red	red		
Cupressus macrocarpa	green	amber	amber		
Cupressus sargentii	amber	red	red		
Cupressus sempervirens	green	green	green		
Cupressus torulosa	green	green	green		
Cupressus x leylandii	green	amber	red		×Cupressocyparis leylandii
Cydonia oblonga	green	amber	red		
Cytisus proliferus	green	green	red		
Cytisus scoparius	red	red	red		
Dais cotinifolia	green	green	amber		
Diospyros kaki	green	amber-max	amber-max		
Dodonaea viscosa	green	green	green		
Dracaena draco	green	green	green		
Duranta erecta	aqua	aqua	green		
Duranta repens	aqua	aqua	red-max		
Echium candicans	green	amber	red		
Elaeagnus angustifolia	amber	amber	red		
Elaeagnus submacrophylla	red	red	red		
Elaeagnus x ebbingei	red	red	red		
Elaeocarpus reticulatus	green	green	amber		
Elaeodendron croceum	blue	blue	blue		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Eriobotrya japonica	green	green	green		
Erythrina caffra	green	green	green		
Erythrina crista-galli	green	green	amber-max		
Erythrina indica	blue	aqua	green		
Erythrina sykesii	green	green	amber		
Erythrina variegata	blue	blue	red-max		
Erythrophleum africanum	blue	blue	blue		
Escallonia bifida	green	green	amber-max		
Escallonia macrantha	red	red	red		
Escallonia rubra var. macrantha	amber	amber	red		
Eucalyptus albens	green	green	red		
Eucalyptus albopurpurea	aqua	green	red		
Eucalyptus angophoroides	red	red	red		
Eucalyptus annulata	green	green	red		
Eucalyptus astringens	green	green	red		
Eucalyptus bancroftii	aqua	green	amber-max		
Eucalyptus baueriana	green	amber	red		
Eucalyptus baxteri	amber	amber	red		
Eucalyptus behriana	green	amber	red		
Eucalyptus beyeri	green	green	red		
Eucalyptus bicostata	red	red	red		
Eucalyptus blakelyi	green	amber	red		
Eucalyptus bosistoana	green	amber	red		
Eucalyptus botryoides	green	green	red		
Eucalyptus bridgesiana	red	red	red		
Eucalyptus brookeriana	red	red	red		
Eucalyptus caesia	green	green	amber		
Eucalyptus caesia subsp. caesia	green	green	amber		
Eucalyptus camaldulensis	green	green	green		
Eucalyptus campaspe	green	green	green		
Eucalyptus cephalocarpa	aqua	amber	red		
Eucalyptus chapmaniana	red	red	red		
Eucalyptus cinerea	amber	amber	red		
Eucalyptus cladocalyx	green	green	red		
Eucalyptus clivicola	aqua	green	amber		
Eucalyptus cneorifolia	aqua	green	red		
Eucalyptus conferruminata	green	green	amber		
Eucalyptus cornuta	green	green	red		
Eucalyptus cosmophylla	aqua	amber	red		
Eucalyptus crenulata	green	amber	red		
Eucalyptus cypellocarpa	red	red	red		
Eucalyptus diptera	aqua	green	amber		
Eucalyptus diversicolor	green	green	red		
Eucalyptus diversifolia	green	green	red		
Eucalyptus dives	green	amber	red		
Eucalyptus dumosa	green	green	amber		
Eucalyptus elata	green	amber	red		
Eucalyptus eremophila	green	green	amber		
Eucalyptus erythrocorys	green	green	green		
Eucalyptus erythronema	green	green	green		
Eucalyptus fibrosa	green	green	amber		
Eucalyptus flavida	aqua	green	green		
Eucalyptus forrestiana	aqua	green	amber		
Eucalyptus froggattii	green	amber	red		
Eucalyptus gardneri	green	green	amber		
Eucalyptus globoidea	green	green	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Eucalyptus globulus	green	green	amber		
Eucalyptus globulus subsp. bicostata	red	red	red		
Eucalyptus globulus subsp. maidenii	amber	red	red		
Eucalyptus globulus subsp. pseudoglobulus	amber	red	red		
Eucalyptus gomphocephala	green	green	green		
Eucalyptus goniocalyx	amber	amber	red		
Eucalyptus grandis	green	green	green		
Eucalyptus gregsoniana	red	red	red		
Eucalyptus grossa	green	green	amber		
Eucalyptus gunnii	red-max	red-max	red		
Eucalyptus kitsoniana	green	amber	red		
Eucalyptus kruseana	green	green	green		
Eucalyptus lansdowneana	green	green	amber		
Eucalyptus largiflorens	green	green	green		
Eucalyptus lehmannii	green	green	amber		
Eucalyptus leucoxylon	green	amber	red		
Eucalyptus leucoxylon subsp. connata	amber	red	red		
Eucalyptus leucoxylon subsp. megalocarpa	amber	amber	red		
Eucalyptus leucoxylon var. rosea	green	amber	red		
Eucalyptus longifolia	green	green	red		
Eucalyptus luehmanniana	green	green	amber		
Eucalyptus macrandra	green	green	red		
Eucalyptus macrorhyncha	amber	amber	red		
Eucalyptus maidenii	amber	red	red		
Eucalyptus mannifera	green	amber	red		
Eucalyptus mannifera subsp. maculosa	red	red	red		
Eucalyptus megacornuta	green	green	amber		
Eucalyptus melliodora	green	amber	red		
Eucalyptus michaeliana	green	amber	red		
Eucalyptus microcarpa	green	green	red		
Eucalyptus microcorys	green	green	amber-max		
Eucalyptus misella	green	green	amber		
Eucalyptus moluccana	green	green	amber-max		
Eucalyptus muelleriana	amber	amber	red		
Eucalyptus newbeyi	amber-max	amber-max	red		
Eucalyptus nicholii	green	amber	red		
Eucalyptus nortonii	red	red	red		
Eucalyptus nutans	green	green	red		yes
Eucalyptus obliqua	amber	amber	red		
Eucalyptus occidentalis	green	green	amber		
Eucalyptus odorata	green	green	red		
Eucalyptus oleosa	green	green	amber		
Eucalyptus orbifolia	blue	aqua	green		
Eucalyptus ovata	green	amber	red		
Eucalyptus pauciflora	green	amber	red		
Eucalyptus pauciflora subsp. parvifructa	red	red	red		yes
Eucalyptus pauciflora subsp. pauciflora	aqua	green	green		yes
Eucalyptus perriniana	red	red	red		
Eucalyptus platypus	green	green	red		
Eucalyptus polyanthemos	green	green	red		
Eucalyptus populnea	green	green	green		
Eucalyptus prava	green	amber	red		
Eucalyptus preissiana	green	green	red		
Eucalyptus propinqua	green	green	amber-max		
Eucalyptus pryoriana	amber	amber	red		
Eucalyptus pseudoglobulus	amber	red	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Eucalyptus pulchella	amber-max	amber	red		
Eucalyptus pulverulenta	amber	amber	red		
Eucalyptus punctata	green	green	amber		
Eucalyptus radiata	green	amber	red		
Eucalyptus resinifera	green	green	amber-max		
Eucalyptus robusta	green	green	amber-max		
Eucalyptus rossii	amber	red	red		
Eucalyptus rubida	red	red	red		
Eucalyptus rudis	green	green	green		
Eucalyptus rugosa	green	green	red		
Eucalyptus saligna	green	green	amber-max		
Eucalyptus salmonophloia	green	green	green		
Eucalyptus salubris	green	green	green		
Eucalyptus sargentii	green	green	green		
Eucalyptus scias	green	green	red		
Eucalyptus scoparia	green	amber	red		
Eucalyptus serraensis	red	red	red		
Eucalyptus siderophloia	green	green	amber-max		
Eucalyptus sideroxylon	green	green	amber		
Eucalyptus sieberi	green	amber	red		
Eucalyptus spathulata	green	green	red		
Eucalyptus steedmanii	aqua	green	green		
Eucalyptus stoatei	green	green	amber		
Eucalyptus stricklandii	green	green	green		
Eucalyptus talyuberlup	green	amber	red		
Eucalyptus tereticornis	green	green	green		
Eucalyptus tetraptera	green	green	amber		
Eucalyptus torquata	green	green	green		
Eucalyptus tricarpa	green	amber	red		
Eucalyptus vegrandis	green	green	red		
Eucalyptus verrucata	red	red	red		
Eucalyptus victoriana	red	red	red		
Eucalyptus viminalis	green	amber	red		
Eucalyptus viminalis subsp. pryoriana	amber	amber	red		
Eucalyptus viridis	green	green	amber		
Eucalyptus wandoo	green	green	amber		
Eucalyptus woodwardii	green	green	green		
Eucalyptus yarraensis	amber	red	red		
Euonymus japonicus	amber-max	amber	red-max		
Exocarpos cupressiformis	green	green	red		
Fagus sylvatica	red	red	red		
Ficus benjamina	green	green	green		
Ficus carica	green	green	green		
Ficus coronata	green	green	amber		
Ficus elastica	green	green	green		
Ficus macrophylla	green	green	green		
Ficus microcarpa	aqua	aqua	green		
Ficus microcarpa var. hillii	green	green	green		
Ficus obliqua	green	green	green		
Ficus platypoda	blue	blue	blue		
Ficus rubiginosa	green	green	green		
Firmiana simplex	amber-max	amber-max	red-max		
Flindersia australis	aqua	green	amber-max		
Fortunella japonica	green	green	amber-max	yes	
Fraxinus americana	green	amber	amber		
Fraxinus angustifolia	green	amber	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Fraxinus angustifolia subsp. angustifolia	green	amber	red		
Fraxinus angustifolia subsp. oxycarpa	amber	red	red		
Fraxinus chinensis	amber-max	amber-max	red-max		
Fraxinus excelsior	red	red	red		
Fraxinus griffithii	green	green	amber-max		
Fraxinus ornus	amber	amber	red		
Fraxinus pennsylvanica	amber	amber	red		
Fraxinus velutina	green	green	green		
Garrya elliptica	red	red	red		
Garrya flavescens	amber	amber	red		
Geijera parviflora	green	green	green		
Genista aetnensis	red	red	red		
Genista monspessulana	amber	amber	red		
Genista spachiana	green	green	red	yes	
Ginkgo biloba	green	amber-max	amber		
Gleditsia triacanthos	green	green	amber		
Glochidion ferdinandii	blue	blue	blue	yes	
Grevillea barklyana	green	red	red		
Grevillea crithmifolia	aqua	green	green		
Grevillea hilliana	blue	aqua	green		
Grevillea hookeriana	green	green	amber		
Grevillea longistyla	blue	aqua	green		
Grevillea robusta	green	green	green		
Grevillea rosmarinifolia	green	amber	red		
Grevillea victoriae	red	red	red		
Hakea dactyloides	green	green	red		
Hakea drupacea	green	green	amber		
Hakea francisiana	green	green	green		
Hakea laurina	green	green	red		
Hakea leucoptera	aqua	green	green		
Hakea multilineata	green	green	amber		
Hakea nodosa	amber	amber	red		
Hakea petiolaris	green	green	amber		
Hakea salicifolia	green	green	amber		
Hakea saligna	blue	blue	blue	yes	
Hakea sericea	green	green	amber		
Hakea suaveolens	aqua	green	red		
Hakea undulata	green	green	amber		
Harpephyllum caffrum	green	green	green		
Harpullia pendula	blue	aqua	green		
Hebe diosmifolia	blue	blue	red	yes	
Hibiscus rosa-sinensis	green	green	green		
Hibiscus syriacus	green	green	green		
Homalanthus nutans	aqua	green	green		
Howea forsteriana	aqua	green	green		
Hymenosporum flavum	green	green	amber-max		
Ilex aquifolium	red-max	red-max	red		
Ilex centrochinensis	amber-max	red-max	red	yes	
Indigofera australis	green	green	amber		
Jacaranda mimosifolia	green	green	amber-max		
Jasminum officinale	amber-max	amber-max	red-max		
Jubaea chilensis	green	amber	red	yes	
Juglans nigra	amber	amber	red		
Juglans regia	red	red	red		
Juniperus chinensis	amber-max	amber-max	red-max		
Juniperus chinensis var. sargentii	amber-max	amber-max	red-max		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Juniperus communis	red	red	red		
Juniperus scopulorum	amber	amber	red		
Juniperus squamata	red	red	red		
Juniperus virginiana	green	green	amber		
Koelreuteria paniculata	green	green	green		
Kunzea baxteri	green	green	amber		
Kunzea ericoides	amber	red	red		
Laburnum anagyroides	red	red	red		
Laburnum watereri	red	red	red		
Lagerstroemia indica	green	green	green		
Lagunaria patersonia	green	green	amber		
Larix decidua	red	red	red		
Laurelia sempervirens	red	red	red		
Laurus nobilis	amber-max	amber-max	red-max		
Leptospermum brevipes	green	green	red		
Leptospermum continentale	green	amber	red		
Leptospermum laevigatum	green	green	amber		
Leptospermum lanigerum	amber	red	red		
Leptospermum obovatum	red	red	red		
Leptospermum petersonii	green	green	green		
Leptospermum scoparium	amber	red	red		
Leptospermum trinervium	green	green	amber		
Leucadendron gandogeri	green	green	red	yes	
Leucadendron salignum	green	green	red		
Leucospermum cordifolium	green	green	red		
Ligustrum lucidum	green	green	amber-max		
Ligustrum ovalifolium	red-max	red-max	red		
Ligustrum sinense	green	green	amber		
Ligustrum vulgare	red-max	red-max	red		
Liquidambar formosana	amber-max	amber-max	red-max		
Liquidambar styraciflua	green	green	green		
Liriodendron tulipifera	amber	amber	red		
Lithocarpus edulis	red-max	red-max	red		
Livistona australis	green	green	amber		
Livistona chinensis	aqua	green	green		
Lophostemon confertus	green	green	green		
Luma apiculata	red-max	red-max	red-max		
Macadamia integrifolia	aqua	aqua	green		
Macadamia tetraphylla	aqua	aqua	amber-max		
Maclura pomifera	green	green	amber		
Magnolia doltsopa	green	green	amber		
Magnolia figo	green	green	amber-max		
Magnolia grandiflora	green	green	amber-max		
Magnolia soulangeana	amber	amber	red		Magnolia x soulangeana
Magnolia wilsonii	red-max	red-max	red	yes	
Malus asiatica	red-max	red	red		
Malus floribunda	red	red	red		
Malus ioensis	green	amber	red		
Malus pumila	amber	amber	red		
Malus purpurea	red	red	red		
Malus sargentii	red	red	red	yes	
Malus spectabilis	red-max	red	red		
Malus yunnanensis	red-max	red-max	red		
Melaleuca alternifolia	green	green	amber-max		
Melaleuca armillaris	green	green	red		
Melaleuca bracteata	green	green	green		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Melaleuca brevifolia	green	amber	red		
Melaleuca decussata	green	amber	red		
Melaleuca diosmatifolia	green	green	green		
Melaleuca diosmifolia	green	green	amber		
Melaleuca elliptica	green	green	amber		
Melaleuca ericifolia	green	green	red		
Melaleuca fulgens	green	green	green		
Melaleuca halmaturorum	green	green	red		
Melaleuca huegelii	green	green	green		
Melaleuca hypericifolia	green	green	red		
Melaleuca incana	green	green	amber		
Melaleuca lanceolata	green	green	amber		
Melaleuca leucadendra	blue	blue	blue		
Melaleuca linariifolia	green	green	amber-max		
Melaleuca nesophila	green	green	amber		
Melaleuca parvistaminea	red	red	red		
Melaleuca pulchella	aqua	green	amber		
Melaleuca quinquenervia	green	green	amber-max		
Melaleuca squamea	amber	amber	red		
Melaleuca squarrosa	amber	red	red		
Melaleuca styphelioides	green	green	amber-max		
Melia azedarach	green	green	green		
Meryta denhamii	blue	aqua	aqua		
Mespilus germanica	red	red	red		
Metasequoia glyptostroboides	green	green	amber-max		
Metrosideros excelsa	green	green	red		
Morus alba	green	green	green		
Morus alba Pendula	green	green	amber		
Morus nigra	green	green	amber-max		
Myoporum insulare	green	green	red		
Myrsine howittiana	green	green	amber		
Myrtus communis	amber-max	amber-max	red-max		
Nandina domestica	green	green	amber-max		
Nerium oleander	green	green	green		
Nothofagus cunninghamii	red	red	red		
Nyssa sylvatica	green	green	amber		
Olea europaea	green	green	amber		
Olea europaea subsp europaea	green	green	red		
Olea europaea subsp. africana	green	green	green		
Olea europaea subsp. cuspidata	green	green	amber		
Omalanthus nutans	green	green	amber-max		
Opuntia ficus-indica	green	green	green		
Pachira insignis	blue	blue	blue		
Paraserianthes lophantha	green	green	amber		
Paulownia tomentosa	amber	amber	red		
Persea americana	green	green	green		
Phellodendron amurense	red	red	red		
Phoenix canariensis	green	green	green		
Phoenix dactylifera	green	green	green		
Phoenix reclinata	aqua	green	amber-max		
Phoenix roebelenii	red-max	red-max	red-max		
Phoenix sylvestris	blue	blue	blue	yes	
Photinia bodinieri	red-max	red-max	red-max		
Photinia glabra	amber-max	amber-max	red-max		
Photinia serratifolia	green	green	amber-max		
Photinia x fraseri	green	green	green		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Phyllostachys nigra	green	green	amber		
Picconia excelsa	amber-max	amber-max	red-max		
Picea abies	red	red	red		
Picea glauca	red	red	red		
Picea omorika	red	red	red		
Picea pungens	red	red	red		
Picea pungens f. glauca	red	red	red	yes	
Picea sitchensis	red	red	red		
Pilgerodendron uviferum	red	red	red		
Pinus brutia	green	green	red		
Pinus canariensis	green	green	green		
Pinus halepensis	green	green	green		
Pinus mugo	red	red	red		
Pinus nigra	red	red	red		
Pinus patula	green	green	green		
Pinus pinaster	amber	red	red		
Pinus pinea	amber-max	amber-max	red-max		
Pinus ponderosa	red	red	red		
Pinus radiata	green	amber	red		
Pinus roxburghii	green	green	green		
Pinus sylvestris	red	red	red		
Pinus tabuliformis	amber	red	red		
Pinus wallichiana	amber	amber	red		
Pistacia chinensis	green	green	amber-max		
Pittosporum angustifolium	green	green	green		
Pittosporum bicolor	red	red	red		
Pittosporum crassifolium	green	amber	red		
Pittosporum eugenioides	green	amber	red		
Pittosporum phillyraeoides	green	green	green		
Pittosporum tenuifolium	amber	amber	red		
Pittosporum tobira	green	green	green		
Pittosporum undulatum	green	green	amber		
Platanus hybrida	green	green	green		Platanus x acerifolia
Platanus occidentalis	green	green	amber		
Platanus orientalis	green	green	green		
Platycladus orientalis	green	amber-max	amber-max		
Podocarpus elatus	green	green	amber-max		
Podocarpus henkelii	green	green	green		
Podocarpus salignus	red	red	red		
Polygala myrtifolia	green	green	red		
Pomaderris aspera	amber	red	red		
Populus alba	amber	amber	red		
Populus balsamifera	red	red	red		
Populus canadensis	red	red	red		Populus x canadensis
Populus canescens	red	red	red		
Populus deltoides	green	green	amber		
Populus deltoides subsp. monilifera	red	red	red		
Populus nigra	amber-max	amber	red-max		
Populus simonii	amber	amber	red		
Populus yunnanensis	green	amber	red		
Portulacaria afra	green	green	green		
Protea compacta	blue	blue	blue		
Protea cynaroides	blue	blue	red		
Protea neriifolia	green	green	red		
Prunus amygdalo-persica	amber-max	amber-max	red-max	yes	
Prunus amygdalus	amber-max	amber-max	red-max	yes	

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Prunus armeniaca	green	green	amber		
Prunus avium	red	red	red		
Prunus cerasifera	amber	amber	red		
Prunus domestica	red-max	red-max	red-max		
Prunus dulcis	green	amber	red		
Prunus incisa	red	red	red		
Prunus laurocerasus	red-max	red-max	red		
Prunus lusitanica	amber	red	red		
Prunus mume	amber-max	amber-max	red-max		
Prunus nigra	red	red	red		
Prunus persica	green	green	green		
Prunus sargentii	red	red	red		
Prunus serrula	red-max	red-max	red-max		
Prunus serrulata	amber	amber	red-max		
Prunus serrulata var. lannesiana	red-max	red	red	yes	
Prunus speciosa	blue	blue	red		
Prunus subhirtella	red	red	red		
Prunus velutina	red	red	red	yes	
Pseudotsuga menziesii	red	red	red		
Psoralea pinnata	green	green	green		
Punica granatum	green	green	green		
Pyracantha crenulata	green	green	red		
Pyrus betulifolia	red	red	red	yes	
Pyrus calleryana	green	green	amber		
Pyrus communis	amber-max	amber-max	red-max		
Pyrus nivalis	red	red	red		
Pyrus pashia	amber-max	amber-max	red-max		
Pyrus pyrifolia	green	amber-max	amber		
Pyrus salicifolia	red	red	red		
Pyrus ussuriensis	amber-max	amber	red		
Quercus acutissima	green	green	amber		
Quercus agrifolia	green	green	red		
Quercus bicolor	red	red	red		
Quercus buckleyi	aqua	green	amber-max	yes	
Quercus calliprinos	aqua	aqua	amber-max		
Quercus canariensis	amber-max	amber-max	red		
Quercus canbyi	green	green	green		
Quercus castaneifolia	red	red	red	yes	
Quercus cerris	red-max	red-max	red-max		
Quercus coccifera	amber-max	amber-max	red-max		
Quercus coccinea	red	red	red		
Quercus dentata	amber-max	red-max	red-max		
Quercus douglasii	amber	amber	red		
Quercus frainetto	red	red	red		
Quercus gambellii	red	red	red	yes	
Quercus hispanica	red	red	red	yes	
Quercus ilex	amber-max	amber-max	red		
Quercus libani	red-max	red-max	red	yes	
Quercus lobata	green	amber	red		
Quercus lusitanica	amber-max	amber	red		
Quercus macrocarpa	amber	amber	amber		
Quercus michauxii	green	amber-max	amber-max		
Quercus palustris	red	red	red		
Quercus petraea	red	red	red		
Quercus phellos	green	green	amber		
Quercus prinus	red	red	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Quercus robur	red	red	red		
Quercus rubra	red-max	red-max	red		
Quercus rugosa	green	green	amber		
Quercus suber	amber-max	amber-max	red-max		
Quercus virginiana	green	green	amber-max		
Quercus x hispanica	red	red	red	yes	
Radermachera sinica	aqua	green	green		
Rapanea howittiana	green	green	amber		
Ravenea rivularis	blue	blue	blue		
Rhaphiolepis delacourii	amber-max	amber-max	red-max	yes	
Rhaphiolepis Xdelacourii	amber-max	amber-max	red-max	yes	
Rhododendron arboreum	green	green	amber-max		
Ricinus communis	green	green	green		
Robinia pseudoacacia	amber	amber	red		
Sabal minor	aqua	green	amber-max		
Salix babylonica	green	green	green		
Salix caprea	red	red	red		
Salix chilensis	amber-max	amber-max	red-max		
Salix cinerea	red	red	red		
Salix discolor	amber	amber	red		
Salix fragilis	red	red	red		
Salix humboldtiana	green	green	green		
Salix reichardtii	red	red	red		
Salix sepulcralis	amber	red	red		
Salix x salamonii	red	red	red	yes	
Sambucus nigra	red-max	red-max	red-max		
Sannantha virgata	green	green	green		
Schefflera actinophylla	green	green	green		
Schinus areira	green	green	amber		
Schinus molle	green	green	amber		
Schinus terebinthifolius	green	green	green		
Senna artemisioides	green	green	green		
Senna multiglandulosa	green	green	amber		
Senna pendula	aqua	green	amber-max		
Sequoia sempervirens	green	green	amber		
Sequoiadendron giganteum	red	red	red		
Solanum aviculare	green	green	amber		
Solanum mauritianum	green	green	green		
Sophora howinsula	aqua	green	green		
Sophora microphylla	red-max	red-max	red		
Sophora tetraptera	red-max	red-max	red		
Sorbus aucuparia	red	red	red		
Sorbus domestica	red	red	red		
Stenocarpus sinuatus	green	green	green		
Strelitzia nicolai	aqua	green	green		
Styphnolobium japonicum	green	amber-max	amber		
Syagrus romanzoffiana	green	green	amber-max		
Syncarpia glomulifera	green	green	amber		
Syringa vulgaris	red	red	red		
Syzygium australe	green	green	green		
Syzygium floribundum	aqua	aqua	green		
Syzygium ingens	green	green	green		
Syzygium luehmannii	blue	aqua	green		
Syzygium paniculatum	green	green	amber		
Syzygium smithii	green	green	amber		
Tamarix aphylla	green	green	green		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Tamarix parviflora	green	green	amber		
Taxandria juniperina	green	green	red		
Taxandria marginata	aqua	green	red		
Taxodium distichum	green	green	amber-max		
Taxus baccata	red	red	red		
Tecoma capensis	green	green	green		
Tecoma smithii	amber-max	amber-max	red-max	yes	
Tecomaria capensis	green	green	green		
Thryptomene saxicola	green	green	amber		
Thuja occidentalis	red-max	red-max	red-max		
Thuja plicata	red	red	red		
Tilia cordata	red	red	red		
Tilia europaea	red	red	red		Tilia x europaea
Tilia platyphyllos	red	red	red		
Tilia tomentosa	amber	red	red		
Tipuana tipu	green	green	green		
Toona ciliata	green	green	amber-max		
Toona sinensis	amber-max	amber-max	red-max		
Toxicodendron succedaneum	green	green	amber-max		
Trachycarpus fortunei	amber-max	amber-max	red-max		
Triadica sebifera	green	green	amber-max		
Tristaniopsis laurina	green	green	amber		
Ulmus glabra	red	red	red		
Ulmus hollandica	red	red	red		Ulmus x hollandica
Ulmus minor	amber-max	amber	red		
Ulmus parvifolia	green	green	green		
Ulmus procera	red-max	red-max	red		
Umbellularia californica	amber	red	red		
Viburnum macrocephalum	green	amber-max	amber		
Viburnum opulus	red	red	red		
Viburnum plicatum	amber	amber	red		
Viburnum tinus	amber-max	amber	red		
Viminaria juncea	green	green	amber		
Virgilia divaricata	green	green	red		
Virgilia oroboides	green	green	red		
Virgilia oroboides subsp. oroboides	blue	blue	red		
Vitex lucens	green	amber	red		
Washingtonia filifera	green	green	green		
Washingtonia robusta	green	green	green		
Waterhousea floribunda	green	green	amber-max		
Westringia fruticosa	green	green	amber		
Widdringtonia schwarzii	blue	blue	red		
Wisteria floribunda	amber	amber	red		
Wisteria sinensis	green	green	amber		
Wollemia noblilis	green	green	green	yes	
Yucca elephantipes	green	green	green		
Yucca gigantea	green	green	green		
Zelkova serrata	green	green	amber-max		

Appendix B

Species List B: The temperature vulnerability of trees not currently planted in the City of Melbourne

Note that thist lis is not designed to be applied to greater Melbourne, which has a broader temperature profile the City of Melbourne, or other cities with different temperature profiles.

Key to reading the species list:

Vulnerability rating	Green	Melbourne has a similar temperature to other places where the species is found and the species is not considered vulnerable in this temperature scenario
	Amber	Melbourne is hotter than most (90%) other places where the species is found and the species is considered moderately vulnerable in this temperature scenario.
	Aqua	Melbourne is colder than most (90%) other places where the species is found and the species is considered moderately vulnerable in this temperature scenario.
	Red	Melbourne is hotter than nearly all (97.5%) other places where the species is found and the species is considered very vulnerable in this temperature scenario.
	Blue	Melbourne is colder than nearly all (97.5%) other places where the species is found and the species is considered very vulnerable in this temperature scenario.
	Max/min	The max/min suffix indicates that the rating is due to extreme maximum and minimum rather than mean annual temperatures.
Temperature scenario	Current	Melbourne with a mean annual temperature of 16.4 °C and extreme maximum temperatures are 44 °C.
	Moderate	Melbourne with moderate climate change by 2040 increasing temperatures 0.8 °C and extreme maximum temperatures increase by 0.5 °C.
	Extreme	Melbourne with extreme climate change by 2090 increasing temperatures 3 °C and extreme maximum temperatures increase by 2 °C.

Limited data indicates that fewer than 20 records were found in the GBIF database and the species was found in fewer than 5 global city inventories – interpret results with caution.

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Abies alba	red	red	red		
Abies balsamea	red	red	red		
Abies concolor	red	red	red		
Abies fraseri	red	red	red		
Abies grandis	red	red	red		
Abies homolepis	red	red	red		
Abies procera	red	red	red		
Abies religiosa	red-max	red-max	red-max		
Abies sibirica	red	red	red		
Acacia aneura	blue	aqua	green		
Acacia aroma	green	green	green		
Acacia atramentaria	green	green	green		
Acacia auriculiformis	blue	blue	aqua		
Acacia caven	red-max	red-max	red-max		
Acacia confusa	aqua	red-max	red-max		
Acacia cyanophylla	aqua	green	green		
Acacia karoo	amber-max	amber-max	red-max	yes	
Acacia leprosa	amber	amber	red		
Acacia mangium	blue	blue	green		
Acacia minuta	blue	blue	amber-max	yes	
Acacia nilotica	blue	aqua	aqua		
Acacia pennata	red-max	red-max	red-max		
Acacia provincialis	amber	amber	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Acacia sophorae	green	green	green		
Acacia stenophylla	aqua	green	green		
Acacia subporosa	green	amber	red		
Acacia visco	green	green	amber		
Acalypha australis	green	green	amber-max		
Acer circinatum	red	red	red		
Acer ginnala	red	red	red		
Acer grandidentatum	green	green	amber		
Acer griseum	red	red	red		
Acer miyabei	red	red	red	yes	
Acer mono	amber	amber	red		
Acer nigrum	red	red	red		
Acer pensylvanicum	red	red	red		
Acer saccharum	amber	amber	red		
Acer tataricum	red	red	red		
Acer triflorum	red	red	red	yes	
Acer truncatum	green	amber-max	amber		
Acrocarpus fraxinifolius	aqua	green	green	yes	
Adansonia digitata	blue	blue	aqua		
Adenanthera pavonina	blue	blue	aqua		
Adina cordifolia	blue	blue	blue		
Aegle marmelos	blue	blue	blue		
Aesculus carnea	red	red	red		Aesculus x carnea
Aesculus glabra	amber	amber	red		
Aesculus parviflora	green	amber-max	red		
Aesculus pavia	green	green	amber-max		
Afrocarpus usambarensis	blue	blue	blue	yes	
Agathis macrophylla	blue	blue	blue		
Aglaia odorata	green	green	green		
Ailanthus fordii	blue	red-max	red-max	yes	
Ailanthus triphysa	blue	aqua	green		
Albizia distachya	green	green	amber	yes	
Albizia falcataria	blue	blue	blue	yes	
Albizia inundata	blue	blue	aqua		
Albizia lebbeck	blue	blue	aqua		
Albizia odoratissima	aqua	green	amber-max		
Albizia procera	blue	blue	aqua		
Albizia saman	blue	blue	aqua		
Aleurites moluccana	aqua	aqua	green		
Allophylus edulis	aqua	green	green		
Alnus formosana	red-max	red-max	red-max		
Alnus incana	red	red	red		
Alnus rhombifolia	green	green	red		
Alnus serrulata	green	green	red		
Alstonia angustiloba	blue	blue	blue	yes	
Alstonia scholaris	blue	blue	aqua		
Amburana cearensis	blue	blue	blue		
Amelanchier alnifolia	red	red	red		
Amelanchier arborea	amber	amber	red		
Amelanchier canadensis	red	red	red		
Amelanchier laevis	red	red	red		
Amherstia nobilis	blue	blue	blue	yes	
Anacardium occidentale	blue	blue	blue		
Anadenanthera colubrina	blue	aqua	green		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Anarthrophyllum rigidum	red	red	red		
Andira inermis	blue	blue	blue		
Annona crassiflora	blue	blue	aqua		
Annona montana	blue	blue	blue		
Annona muricata	blue	blue	red-max		
Annona reticulata	blue	blue	aqua		
Annona squamosa	blue	blue	aqua		
Apeiba tibourbou	blue	blue	blue		
Aphanamixis polystachya	blue	blue	aqua		
Aquilaria malaccensis	blue	blue	blue	yes	
Aralia elata	amber	amber	red		
Aralia hispida	red	red	red		
Aralia nudicaulis	red	red	red		
Aralia racemosa	red	red	red		
Aralia spinosa	green	amber-max	amber		
Arbutus andrachne	aqua	amber-max	amber-max		
Arbutus tessellata	green	green	amber		
Arbutus xalapensis	green	green	green		
Artocarpus altilis	blue	aqua	aqua		
Artocarpus camansi	blue	blue	blue	yes	
Artocarpus communis	blue	blue	green		
Artocarpus gomezianus	blue	blue	blue	yes	
Artocarpus heterophyllus	blue	aqua	red-max		
Artocarpus integrifolia	red-max	red-max	red-max	yes	
Artocarpus lakoocha	blue	blue	amber-max	yes	
Asimina triloba	amber	amber	red		
Aspidosperma polyneuron	blue	blue	green		
Aspidosperma pyrifolium	blue	blue	blue		
Astronium fraxinifolium	blue	blue	aqua		
Austroplenckia populnea	blue	blue	aqua		
Averrhoa bilimbi	blue	blue	blue		
Averrhoa carambola	blue	aqua	aqua		
Azadirachta indica	blue	blue	aqua		
Azara microphylla	red	red	red		
Azara serrata	red-max	red-max	red-max		
Baccaurea ramiflora	blue	blue	amber-max		
Balanites aegyptiaca	blue	blue	blue		
Barringtonia acutangula	blue	blue	blue		
Bauhinia blakeana	aqua	green	green		
Bauhinia cheilantha	blue	blue	blue		
Bauhinia forficata	green	green	green		
Bauhinia hookeri	blue	blue	aqua		
Bauhinia monandra	blue	blue	blue		
Bauhinia purpurea	aqua	green	green		
Betula alleghaniensis	red	red	red		
Betula lenta	red	red	red		
Betula nigra	green	green	amber		
Betula platyphylla	red-max	red-max	red		
Betula populifolia	red	red	red		
Betula utilis	amber	amber	red		
Bischofia javanica	aqua	aqua	amber-max		
Bischofia polycarpa	amber-max	red-max	red-max		
Bixa orellana	blue	blue	aqua		
Blepharocalyx salicifolius	green	green	green		
Bolusanthus speciosus	blue	aqua	green		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Bombax ceiba	blue	blue	red-max		
Bouea macrophylla	blue	blue	blue	yes	
Bowdichia virgilioides	blue	blue	aqua		
Bridelia monoica	blue	red-max	red-max		
Bridelia retusa	aqua	amber-max	amber-max		
Broussonetia papyrifera	green	green	amber-max		
Buchenavia tomentosa	blue	blue	blue		
Bursera serrata	red-max	red-max	red-max	yes	
Bursera simaruba	blue	blue	red-max		
Butea monosperma	aqua	aqua	aqua	yes	
Cabralea canjerana	aqua	green	green		
Caesalpinia crista	blue	aqua	aqua		
Caesalpinia echinata	blue	blue	aqua		
Caesalpinia ferrea	aqua	green	green		
Caesalpinia mexicana	blue	aqua	green		
Caesalpinia peltophoroides	green	green	amber-max		
Caesalpinia pluviosa	blue	blue	aqua		
Caesalpinia pulcherrima	blue	aqua	green		
Caesalpinia pyramidalis	blue	blue	blue		
Callitris endlicheri	green	green	red		
Calocedrus decurrens	red	red	red		
Calophyllum brasiliense	blue	aqua	aqua		
Calophyllum inophyllum	blue	blue	blue		
Calotropis gigantea	aqua	aqua	aqua		
Calpurnia aurea	aqua	green	green		
Calycophyllum candidissimum	blue	blue	blue		
Camellia sinensis	amber-max	amber-max	red-max		
Campomanesia xanthocarpa	aqua	green	green		
Camptotheca acuminata	amber-max	amber-max	red-max		
Cananga odorata	blue	blue	red-max		
Carallia brachiata	blue	blue	blue		
Carapa guianensis	blue	blue	aqua		
Careya arborea	blue	blue	blue		
Carica papaya	aqua	aqua	aqua		
Cariniana estrellensis	blue	blue	green		
Cariniana legalis	blue	blue	green		
Carpinus caroliniana	green	green	green		
Carya aquatica	green	amber-max	amber-max		
Carya cordiformis	amber	red	red		
Carya glabra	green	green	green		
Carya laciniosa	red	red	red		
Carya ovalis	amber	red	red		
Carya ovata	green	amber	amber		
Carya tomentosa	green	green	amber		
Caryocar brasiliense	blue	blue	aqua		
Casimiroa greggii	aqua	aqua	green		
Cassia bicapsularis	aqua	aqua	red-max		
Cassia ferruginea	blue	blue	green		
Cassia fistula	blue	blue	aqua		
Cassia grandis	blue	blue	red-max		
Cassia leiandra	blue	blue	blue		
Cassia nodosa	blue	red-max	red-max		
Cassia renigera	blue	aqua	aqua	yes	
Castanea dentata	amber	red	red		
Castanea pumila	green	green	green		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Castanopsis fissa	blue	red-max	red-max		
Castanospermum australe	aqua	green	green		
Casuarina junghuhniana	blue	blue	blue	yes	
Catalpa bungei	amber-max	red-max	red		
Catalpa longissima	blue	blue	blue		
Catalpa ovata	green	amber-max	red		
Catalpa speciosa	amber	amber	red		
Cecropia glaziovii	aqua	aqua	green		
Cecropia hololeuca	blue	blue	aqua		
Cecropia pachystachya	blue	blue	aqua		
Cecropia palmata	blue	blue	blue		
Cecropia schreberiana	blue	blue	blue		
Cedrela fissilis	aqua	aqua	green		
Ceiba glaziovii	blue	blue	blue		
Ceiba insignis	aqua	aqua	green		
Ceiba pentandra	blue	blue	blue		
Celtis africana	green	green	green		
Celtis bungeana	amber-max	red-max	red-max		
Celtis laevigata	green	green	green		
Celtis pallida	aqua	green	green		
Celtis sinensis	green	green	green		
Centrolobium robustum	blue	blue	green		
Centrolobium tomentosum	aqua	aqua	green		
Cerbera manghas	blue	blue	blue		
Cercidiphyllum japonicum	red	red	red		
Cercis canadensis	green	green	amber		
Cercis chinensis	green	amber-max	amber		
Cercis occidentalis	green	green	red		
Chamaecyparis nootkatensis	red	red	red		
Chamaecytisus palmensis	amber	amber	red		
Chilopsis linearis	green	green	green		
Choerospondias axillaris	amber-max	amber-max	red-max		
Chrysophyllum cainito	blue	blue	aqua		
Chrysophyllum oliviforme	blue	aqua	red-max		
Chukrasia tabularis	blue	aqua	amber-max		
Cinnamomum iners	blue	aqua	aqua		
Cinnamomum parthenoxylon	amber-max	amber-max	red-max		
Cinnamomum tamala	amber-max	amber-max	red-max		
Cinnamomum verum	aqua	aqua	amber-max		
Citharexylum myrianthum	aqua	aqua	green		
Citharexylum quadrangulare	green	green	green	yes	
Citharexylum spinosum	blue	blue	blue		
Citrus hystrix	amber-max	amber-max	red-max		
Citrus maxima	green	amber-max	amber-max		
Citrus medica	green	amber-max	amber-max		
Citrus mitis	blue	blue	blue	yes	
Citrus x aurantium	green	green	amber-max		
Citrus x microcarpa	blue	blue	blue	yes	
Citrus x tangelo	blue	blue	blue	yes	
Cladrastis kentukea	amber	red	red		
Cladrastis lutea	red	red	red		
Clausena lansium	blue	aqua	green		
Clitoria fairchildiana	blue	blue	blue		
Clitoria racemosa	blue	blue	aqua	yes	
Clusia major	blue	blue	blue	yes	

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Cnidoscolus chayamansa	blue	blue	blue		
Coccoloba mollis	blue	blue	aqua		
Coccoloba uvifera	blue	blue	aqua		
Cocculus laurifolius	green	green	amber-max		
Cochlospermum vitifolium	blue	blue	blue		
Coffea arabica	aqua	green	amber-max		
Colvillea racemosa	blue	blue	blue		
Cordia sebestena	blue	blue	blue		
Cordia subcordata	blue	blue	blue		
Cordia trichotoma	blue	aqua	green		
Cornus alba	red	red	red		
Cornus alternifolia	green	amber	red		
Cornus florida	green	green	amber		
Cornus kousa	amber	amber	red		
Cornus mas	red	red	red		
Cornus racemosa	red	red	red		
Cornus sanguinea	red	red	red		
Corylus americana	red	red	red		
Corylus cornuta	red	red	red		
Corymbia terminalis	blue	blue	blue		
Corynocarpus laevigata	green	green	red	yes	
Couroupita guianensis	blue	blue	blue		
Crataegus calpodendron	red	red	red		
Crataegus chrysocarpa	red	red	red		
Crataegus coccinea	red	red	red		
Crataegus crus-galli	amber	amber	red		
Crataegus mollis	red	red	red		
Crataegus orientalis	red	red	red		
Crataegus pinnatifida	red	red	red		
Crataegus sanguinea	red	red	red		
Crataegus submollis	red	red	red		
Crataegus tanacetifolia	red	red	red	yes	
Crataegus viridis	green	green	green		
Crateva nurvala	blue	blue	red-max	yes	
Crateva religiosa	blue	blue	blue		
Cratoxylum ligustrinum	blue	blue	red-max	yes	
Crescentia cujete	blue	blue	aqua		
Crinodendron patagua	green	red	red	yes	
Croton urucurana	blue	blue	green		
Cupressus guadalupensis	green	green	amber		
Cupressus lindleyi	green	green	amber-max		
Cyathea arborea	blue	blue	blue		
Cybistax antisyphilitica	blue	blue	green		
Dalbergia balansae	amber-max	amber-max	red-max		
Dalbergia latifolia	blue	blue	aqua	yes	
Dalbergia miscolobium	blue	blue	green		
Dalbergia nigra	blue	blue	aqua		
Dalbergia sissoo	aqua	aqua	green		
Davidia involucrata	red-max	red	red		
Delonix regia	blue	blue	green		
Derris robusta	blue	blue	red-max	yes	
Dicksonia antarctica	green	amber	red		
Dillenia indica	blue	aqua	amber-max		
Dimocarpus longan	aqua	aqua	amber-max		
Dimorphandra mollis	blue	blue	blue		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Diospyros burchellii	blue	blue	blue		
Diospyros dichrophylla	blue	blue	blue		
Diospyros ebenum	aqua	aqua	amber-max		
Diospyros embryopteris	green	amber-max	amber-max	yes	
Diospyros lotus	amber-max	amber-max	red		
Diospyros virginiana	green	green	amber		
Dombeya cacuminum	blue	aqua	green	yes	
Dombeya tiliacea	green	green	amber-max		
Dombeya wallichii	green	green	green		
Dracaena sanderiana	red-max	red-max	red-max	yes	
Dracontomelon dao	blue	blue	blue		
Drypetes roxburghii	blue	blue	blue	yes	
Durio zibethinus	green	green	amber-max		
Ehretia acuminata	green	green	amber-max		
Ehretia anacua	blue	blue	green		
Elaeagnus argentea	red	red	red	yes	
Elaeagnus umbellata	amber	amber	red		
Elaeocarpus decipiens	amber-max	red-max	red-max		
Elaeocarpus floribundus	blue	blue	blue		
Elaeocarpus hainanensis	blue	blue	blue	yes	
Elaeocarpus hygrophilus	blue	blue	blue	yes	
Elaeocarpus obovatus	green	green	amber-max		
Elaeocarpus robustus	blue	blue	blue	yes	
Elaeocarpus serratus	red-max	red-max	red-max		
Elaeocarpus sphaericus	aqua	aqua	red-max		
Elaeodendron orientale	aqua	aqua	red-max	yes	
Enterolobium contortisiliquum	blue	blue	red-max		
Enterolobium cyclocarpum	blue	blue	red-max		
Enterolobium ellipticum	blue	blue	aqua		
Enterolobium timbouva	blue	blue	aqua		
Eriobotrya deflexa	amber-max	red-max	red-max		
Eriotheca pubescens	blue	blue	blue		
Erythrina corallodendron	amber-max	red-max	red-max	yes	
Erythrina coralloides	green	green	green		
Erythrina falcata	green	green	amber-max		
Erythrina herbacea	green	green	green		
Erythrina sandwicensis	blue	blue	blue	yes	
Erythrina speciosa	blue	aqua	green		
Erythrina subumbrans	blue	blue	blue	yes	
Erythrina velutina	blue	blue	aqua		
Erythroxylum deciduum	aqua	green	green		
Eucalyptus amygdalina	red	red	red		
Eucalyptus aromaphloia	red	red	red		
Eucalyptus burdettiana	green	amber	red		
Eucalyptus deglupta	green	green	green		
Eucalyptus formanii	aqua	green	green		
Eucalyptus haemastoma	green	green	amber		
Eucalyptus macrocarpa	green	green	green		
Eucalyptus maculata	green	green	amber-max		
Eucalyptus microtheca	blue	blue	blue		
Eucalyptus neglecta	red	red	red		
Eucalyptus pleurocarpa	green	green	amber		
Eucalyptus risdonii	red	red	red		
Eucalyptus torelliana	blue	blue	aqua		
Eucommia ulmoides	green	amber-max	amber		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Eucryphia lucida	red	red	red		
Eugenia luschnathiana	blue	blue	blue	yes	
Eugenia uniflora	blue	aqua	amber-max		
Eugenia uvalha	blue	aqua	green	yes	
Euodia hupehensis	red	red	red	yes	
Euonymus bungeanus	green	amber-max	amber		
Euphorbia cotinifolia	amber-max	amber-max	red-max		
Euphorbia pulcherrima	green	green	green		
Fagraea berteroana	blue	blue	blue		
Fagus grandifolia	amber	amber	red		
Fagus orientalis	amber	amber	red		
Falcataria moluccana	blue	blue	red-max		
Feronia limonia	blue	blue	blue	yes	
Ficus benghalensis	aqua	aqua	green		
Ficus burtt-davyi	blue	blue	blue		
Ficus callosa	blue	blue	blue	yes	
Ficus calyptroceras	blue	blue	aqua		
Ficus catappifolia	blue	blue	blue		
Ficus citrifolia	aqua	red-max	red-max		
Ficus cotinifolia	blue	blue	red-max		
Ficus edulis	blue	blue	blue	yes	
Ficus enormis	aqua	aqua	green		
Ficus exasperata	blue	blue	blue		
Ficus hispida	blue	blue	aqua		
Ficus lyrata	green	green	green		
Ficus racemosa	blue	blue	aqua		
Ficus religiosa	aqua	aqua	amber-max		
Ficus retusa	aqua	aqua	amber-max		
Ficus rumphii	blue	blue	aqua	yes	
Ficus septica	blue	blue	aqua		
Ficus superba	green	green	green		
Ficus virens	blue	blue	aqua		
Filicium decipiens	blue	blue	blue		
Firmiana platanifolia	amber-max	amber-max	red-max		
Flacourtia inermis	blue	blue	blue		
Frangula alnus	red	red	red		
Fraxinus berlandieriana	green	green	green		
Fraxinus caroliniana	green	amber-max	amber-max		
Fraxinus latifolia	amber	red	red		
Fraxinus nigra	red	red	red		
Fraxinus quadrangulata	red	red	red		
Fraxinus uhdei	green	green	green		
Garcinia gummi-gutta	blue	blue	blue	yes	
Garcinia spicata	blue	blue	blue	yes	
Gardenia thunbergia	amber-max	amber-max	red-max		
Garuga pinnata	aqua	aqua	red-max		
Genipa americana	blue	blue	aqua		
Geoffroea decorticans	green	green	green		
Gleditsia sinensis	amber-max	amber-max	red-max		
Gliricidia sepium	blue	blue	aqua		
Glycosmis pentaphylla	blue	blue	aqua		
Glyptostrobus pensilis	amber-max	amber-max	red-max		
Gmelina arborea	blue	blue	blue		
Gnetum gnemon	blue	blue	red-max		
Gordonia axillaris	green	green	amber-max		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Gordonia lasianthus	amber-max	red-max	red-max		
Grevillea banksii	aqua	green	green		
Grevillea bipinnatifida	green	green	amber		
Grewia microcos	blue	blue	blue	yes	
Grewia tenax	aqua	aqua	aqua		
Grewia tiliifolia	red-max	red-max	red-max		
Griselinia littoralis	red	red	red		
Guaiacum officinale	blue	blue	blue		
Guarea guidonia	blue	blue	aqua		
Guarea macrophylla	blue	aqua	green		
Guazuma ulmifolia	blue	blue	red-max		
Gymnocladus dioicus	red	red	red		
Hakea acicularis	blue	blue	red	yes	
Hakea baxteri	green	green	red		
Hakea ulicina	amber	amber	red		
Halesia carolina	green	amber-max	amber		
Hamamelis virginiana	green	amber	red		
Heliotropium foertherianum	blue	blue	blue		
Heritiera littoralis	blue	blue	blue		
Heteromeles arbutifolia	green	green	red		
Heteropanax fragrans	blue	aqua	amber-max		
Hevea brasiliensis	blue	blue	blue		
Hibiscus mutabilis	amber-max	amber-max	red-max		
Hibiscus pernambucensis	blue	blue	blue		
Hibiscus tiliaceus	blue	blue	aqua		
Hoheria populnea	red-max	red-max	red		
Holarrhena pubescens	blue	blue	blue		
Holocalyx balansae	blue	blue	green		
Hopea odorata	blue	blue	blue	yes	
Hovenia dulcis	green	green	amber-max		
Humulus scandens	amber-max	red-max	red-max		
Hura crepitans	blue	blue	red-max		
Hydnocarpus alpina	blue	blue	blue	yes	
Hymenaea courbaril	blue	blue	amber-max		
Hymenaea stigonocarpa	blue	blue	blue		
Ilex attenuata	green	amber-max	amber-max	yes	
Ilex cassine	aqua	red-max	red-max		
Ilex cornuta	green	green	amber-max		
Ilex crenata	amber	amber	amber		
Ilex glabra	amber-max	amber-max	red-max		
Ilex mucronata	red	red	red		
Ilex opaca	green	green	amber		
Ilex paraguariensis	amber-max	amber-max	red-max		
Ilex rotunda	amber-max	amber-max	red-max		
Ilex verticillata	red	red	red		
Ilex vomitoria	aqua	green	amber-max		
Inga alba	blue	blue	aqua		
Inga edulis	blue	aqua	aqua		
Inga laurina	blue	blue	red-max		
Inocarpus fagifer	blue	blue	blue		
Jacaranda cuspidifolia	blue	blue	aqua		
Juglans californica	green	green	amber		
Juglans cinerea	red	red	red		
Juglans mollis	green	green	green		
Juniperus conferta	amber	red	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Juniperus drupacea	amber	amber	red		
Juniperus formosana	amber-max	red-max	red		
Kageneckia oblonga	red	red	red	yes	
Kalopanax pictus	red-max	red-max	red		
Khaya senegalensis	blue	blue	blue		
Kielmeyera coriacea	blue	blue	green		
Kigelia pinnata	blue	blue	red-max		
Kiggelaria africana	blue	blue	blue		
Kleinhovia hospita	blue	blue	aqua		
Koelreuteria elegans	aqua	aqua	green		
Laburnum vulgare	green	green	red	yes	
Lafoensia glyptocarpa	blue	blue	aqua		
Lafoensia pacari	blue	aqua	green		
Lagerstroemia floribunda	blue	blue	blue		
Lagerstroemia loudonii	blue	blue	blue	yes	
Lagerstroemia macrocarpa	blue	blue	blue		
Lagerstroemia parviflora	aqua	green	green	yes	
Lagerstroemia reginae	blue	blue	blue	yes	
Lagerstroemia speciosa	blue	aqua	aqua		
Lagerstroemia subcostata	aqua	red-max	red-max		
Lagunaria patersonii	green	green	green		
Lannea coromandelica	aqua	aqua	red-max		
Lansium domesticum	blue	blue	blue		
Larix kaempferi	red-max	red-max	red		
Larix laricina	red	red	red		
Larix leptolepis	red-max	red	red		
Larix sibirica	red	red	red		
Lavatera assurgentiflora	green	green	amber		
Lawsonia inermis	blue	blue	red-max		
Lecythis pisonis	blue	blue	blue		
Leucaena esculenta	aqua	amber-max	red-max		
Leucaena glauca	aqua	aqua	green		
Leucaena leucocephala	blue	aqua	green		
Licania tomentosa	blue	blue	green		
Ligustrum japonicum	green	green	green		
Ligustrum obtusifolium	amber	red	red		
Ligustrum sempervirens	red-max	red	red	yes	
Lindera benzoin	amber	amber	red		
Liriodendron chinense	amber-max	amber-max	red-max		
Litchi chinensis	aqua	green	amber-max		
Lithraea ternifolia	green	green	green	yes	
Lithrea caustica	red	red	red	yes	
Litsea glutinosa	blue	blue	blue		
Litsea monopetala	amber-max	amber-max	red-max		
Litsea salicifolia	aqua	aqua	red-max	yes	
Lonicera maackii	amber	amber	red		
Lonicera mexicana	green	green	red		
Lophanthera lactescens	blue	blue	blue		
Luehea divaricata	aqua	aqua	green		
Lyonothamnus floribundus	green	amber	red		
Lysiloma microphyllum	aqua	aqua	red-max		
Maackia amurensis	red	red	red		
Macaranga tanarius	blue	blue	green		
Machaerium opacum	blue	blue	blue		
Machilus kusanoi	blue	blue	blue		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Madhuca indica	blue	blue	blue	yes	
Magnolia acuminata	green	amber	red		
Magnolia biondii	red	red	red	yes	
Magnolia denudata	amber-max	amber-max	red-max		
Magnolia macrophylla	green	green	amber-max		
Magnolia stellata	green	amber	amber		
Magnolia tripetala	green	amber	red		
Magnolia virginiana	green	amber-max	amber-max		
Magnolia x loebneri	red	red	red	yes	
Magonia pubescens	blue	blue	blue		
Mallotus paniculatus	aqua	aqua	green		
Malpighia glabra	blue	blue	green		
Malus angustifolia	green	amber-max	amber-max		
Malus baccata	amber	amber	red		
Malus coronaria	red	red	red		
Malus hupehensis	amber-max	amber-max	red		
Malus micromalus	red-max	red-max	red	yes	
Malus prunifolia	amber	amber	red		
Malus sylvestris	red-max	red-max	red		
Malus toringoides	red	red	red		
Malus trilobata	red-max	red	red	yes	
Malus tschonoskii	red	red	red		
Mammea americana	blue	blue	aqua		
Mangifera indica	aqua	aqua	green		
Manihot esculenta	blue	blue	red-max		
Manihot glaziovii	blue	blue	aqua		
Manilkara achras	blue	blue	blue		
Manilkara bahamensis	blue	blue	blue	yes	
Manilkara zapota	blue	blue	aqua		
Markhamia lutea	blue	blue	blue		
Matayba elaeagnoides	red-max	red-max	red-max		
Maytenus boaria	amber	amber	amber		
Medicago arborea	green	green	red		
Melaleuca cucullata	aqua	green	amber		
Melanoxylon brauna	blue	blue	aqua		
Melicoccus bijugatus	blue	blue	red-max		
Melicytus dentatus	amber	amber	red		
Metrosideros polymorpha	blue	blue	blue		
Meyna spinosa	blue	blue	blue	yes	
Michelia champaca	aqua	green	amber-max		
Michelia doltsopa	green	green	amber		
Michelia figo	green	green	amber-max		
Michelia x alba	aqua	green	green		
Miliusa tomentosa	blue	blue	blue	yes	
Millingtonia hortensis	aqua	aqua	aqua		
Mimosa caesalpiniifolia	blue	blue	blue		
Mimosa tenuiflora	blue	blue	blue		
Mimusops caffra	blue	blue	blue		
Mimusops elengi	blue	blue	blue		
Morinda angustifolia	blue	blue	blue	yes	
Morinda citrifolia	blue	blue	blue		
Morinda coreia	blue	blue	blue	yes	
Moringa oleifera	blue	blue	blue		
Morus kagayamae	red-max	red-max	red		
Morus rubra	green	green	green		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Muntingia calabura	blue	blue	aqua		
Murraya koenigii	green	green	green		
Murraya paniculata	aqua	aqua	green		
Myoporum laetum	green	green	red		
Myracrodruon urundeuva	blue	blue	aqua		
Myrcia tomentosa	blue	blue	aqua		
Myrcianthes pungens	aqua	green	green		
Myrciaria trunciflora	aqua	aqua	green	yes	
Myrica cerifera	amber-max	amber-max	red-max		
Myrica pensylvanica	red	red	red		
Myrica rubra	amber-max	amber-max	red-max		
Myristica fragrans	aqua	aqua	aqua		
Myroxylon peruiferum	aqua	aqua	green		
Myrsine guianensis	aqua	green	green		
Nectandra megapotamica	aqua	green	green		
Nephelium lappaceum	blue	blue	blue		
Noronhia emarginata	blue	blue	blue		
Nothofagus dombeyi	red	red	red		
Nothofagus obliqua	red	red	red		
Notholithocarpus densiflorus	red	red	red		
Ochroma pyramidale	red-max	red-max	red-max		
Ochrosia elliptica	blue	blue	aqua		
Ocotea velutina	blue	blue	aqua		
Olneya tesota	blue	blue	aqua		
Omalanthus populifolius	green	green	green		
Ormosia stipularis	blue	blue	blue	yes	
Oroxylum indicum	aqua	aqua	amber-max		
Osmanthus delavayi	red-max	red-max	red		
Osmanthus fragrans	amber-max	amber-max	red-max		
Osmanthus heterophyllus	red-max	red-max	red-max		
Ostrya virginiana	green	green	green		
Ouratea hexasperma	blue	blue	blue		
Oxydendrum arboreum	green	amber-max	amber		
Pachira aquatica	blue	blue	red-max		
Pachira glabra	blue	blue	green		
Palaquium formosanum	blue	blue	blue		
Pandanus kaida	blue	blue	red-max	yes	
Pandanus tectorius	blue	blue	aqua		
Parapiptadenia rigida	red-max	red-max	red-max		
Parkia speciosa	blue	blue	blue		
Parkia timoriana	blue	blue	blue	yes	
Parkinsonia aculeata	green	green	green		
Parkinsonia florida	green	green	green		
Parkinsonia microphylla	aqua	aqua	green		
Parkinsonia praecox	green	green	green		
Parmentiera cereifera	blue	blue	aqua		
Parrotia persica	red	red	red		
Paulownia fortunei	amber-max	red-max	red-max		
Peltophorum dubium	blue	blue	aqua		
Peltophorum pterocarpum	blue	blue	blue		
Persea borbonia	aqua	green	green		
Petitia domingensis	blue	blue	blue		
Peumus boldus	amber	amber	red		
Philodendron pinnatifidum	amber-max	amber-max	red-max	yes	
Photinia davidiana	red-max	red-max	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Photinia davidsoniae	amber-max	amber-max	red-max		
Photinia villosa	amber-max	amber	red-max		
Phyllanthus acidus	blue	blue	red-max		
Phyllanthus emblica	green	green	amber-max		
Physocalymma scaberrimum	blue	blue	blue		
Phytolacca dioica	green	green	green		
Picea asperata	red	red	red		
Picea engelmannii	red	red	red		
Picea koraiensis	red	red	red	yes	
Picea likiangensis	red	red	red		
Picea mariana	red	red	red		
Picea meyeri	red	red	red	yes	
Picea orientalis	red	red	red		
Picea rubens	red	red	red		
Picea wilsonii	red	red	red		
Pimenta dioica	blue	aqua	aqua		
Pimenta racemosa	blue	blue	red-max		
Pinus attenuata	red	red	red		
Pinus ayacahuite	green	green	green		
Pinus banksiana	red	red	red		
Pinus bungeana	red	red	red		
Pinus cembra	red	red	red		
Pinus clausa	blue	blue	red-max		
Pinus contorta	red	red	red		
Pinus coulteri	amber	red	red		
Pinus echinata	green	green	green		
Pinus edulis	red	red	red		
Pinus elliottii	aqua	green	amber-max		
Pinus flexilis	red	red	red		
Pinus glabra	aqua	amber-max	red-max		
Pinus hartwegii	green	green	amber		
Pinus maritima	red-max	red	red	yes	
Pinus massoniana	amber-max	amber-max	red-max		
Pinus merkusii	blue	blue	red-max		
Pinus montezumae	green	green	green		
Pinus monticola	red	red	red		
Pinus palustris	amber-max	amber-max	red-max		
Pinus peuce	red	red	red		
Pinus pseudostrobus	green	green	green		
Pinus resinosa	red	red	red		
Pinus rigida	red	red	red		
Pinus serotina	amber-max	amber-max	red-max		
Pinus sibirica	red	red	red		
Pinus strobiformis	green	green	amber		
Pinus strobus	red	red	red		
Pinus taeda	green	green	amber-max		
Pinus thunbergii	amber-max	amber-max	red-max		
Pinus virginiana	amber	amber	red		
Piptadenia gonoacantha	aqua	aqua	green		
Piptadenia stipulacea	blue	blue	blue		
Pithecellobium dulce	blue	blue	aqua		
Pithecellobium flexicaule	blue	blue	aqua	yes	
Pittosporum arborescens	blue	blue	blue	yes	
Pittosporum ferrugineum	blue	aqua	aqua		
Pittosporum napaliense	green	green	amber-max	yes	

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Pittosporum pentandrum	blue	blue	red-max		
Pittosporum rhombifolium	green	green	green		
Platanus racemosa	green	green	amber		
Platanus wrightii	green	green	green		
Plathymenia reticulata	blue	blue	aqua		
Platymiscium floribundum	blue	aqua	green		
Platymiscium pinnatum	blue	blue	aqua		
Platypodium elegans	blue	blue	aqua		
Plinia edulis	blue	blue	green		
Plinia glomerata	blue	blue	green	yes	
Plumeria obtusa	blue	blue	blue		
Plumeria rubra	aqua	aqua	green		
Podocarpus gracilior	green	green	green		
Podocarpus latifolius	red-max	red-max	red-max		
Podocarpus neriifolius	aqua	amber-max	red-max		
Poitea punicea	blue	blue	blue		
Polyalthia longifolia	blue	blue	blue		
Polyscias balfouriana	blue	blue	blue	yes	
Polyscias guilfoylei	blue	blue	aqua		
Pomaderris apetala	red	red	red		
Pometia pinnata	blue	blue	blue		
Poncirus trifoliata	green	green	amber-max		
Pongamia glabra	blue	blue	blue	yes	
Pongamia pinnata	blue	blue	blue		
Populus angustifolia	red	red	red		
Populus grandidentata	red-max	red	red		
Populus heterophylla	green	amber-max	red		
Populus hopeiensis	amber	red	red	yes	
Populus tomentosa	amber-max	amber-max	red-max		
Populus tremula	red	red	red		
Populus tremuloides	red	red	red		
Populus x berolinensis	red	red	red		
Pouteria campechiana	blue	blue	red-max		
Pouteria ramiflora	blue	blue	aqua		
Pouteria torta	blue	blue	aqua		
Prosopis alba	green	green	green		
Prosopis chilensis	green	green	green		
Prosopis flexuosa	green	green	green		
Prosopis juliflora	blue	blue	aqua		
Prosopis laevigata	green	green	green		
Prosopis nigra	aqua	green	green		
Prosopis pallida	blue	blue	aqua		
Prosopis pubescens	green	green	green		
Prosopis velutina	green	green	green		
Prumnopitys andina	red	red	red		
Prunus americana	amber	amber	red		
Prunus angustifolia	green	green	amber		
Prunus campanulata	green	green	amber-max		
Prunus caroliniana	green	green	amber-max		
Prunus cerasus	red	red	red		
Prunus davidiana	amber-max	red-max	red-max	yes	
Prunus glandulosa	amber	red	red	yes	
Prunus lyonii	green	green	red		
Prunus maackii	red	red	red		
Prunus maritima	red	red	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Prunus padus	red	red	red		
Prunus pensylvanica	red	red	red		
Prunus pissardii	red	red	red		
Prunus pseudocerasus	amber	amber	red	yes	
Prunus salicina	green	green	amber		
Prunus serotina	red-max	red-max	red		
Prunus spinosa	red-max	red-max	red		
Prunus tomentosa	red	red	red		
Prunus triloba	red	red	red		
Prunus virginiana	red	red	red		
Prunus x cistena	red	red	red	yes	
Prunus yedoensis	amber	red	red		
Pseudobombax ellipticum	aqua	aqua	amber-max		
Pseudolarix amabilis	green	amber-max	red		
Psidium araca	blue	blue	aqua	yes	
Psidium cattleianum	aqua	green	green		
Psidium guajava	aqua	aqua	green		
Ptelea trifoliata	green	green	green		
Pterocarpus marsupium	blue	blue	blue	yes	
Pterocarpus rohrii	blue	blue	aqua		
Pterocarya stenoptera	amber-max	amber-max	red-max		
Pterodon emarginatus	blue	blue	aqua		
Pterogyne nitens	blue	blue	aqua		
Pterospermum acerifolium	blue	blue	aqua	yes	
Pterospermum heterophyllum	aqua	red-max	red-max		
Pterygota brasiliensis	blue	blue	blue		
Pyrus coronaria	amber-max	red-max	red	yes	
Pyrus fauriei	red	red	red	yes	
Pyrus kawakamii	green	green	green		
Pyrus malus	amber-max	red-max	red-max		
Qualea grandiflora	blue	blue	aqua		
Qualea parviflora	blue	blue	blue		
Quercus alba	amber	amber	red		
Quercus aliena	amber-max	amber-max	red-max		
Quercus berberidifolia	green	amber	red		
Quercus chrysolepis	amber	amber	red		
Quercus ellipsoidalis	red	red	red		
Quercus falcata	green	green	amber		
Quercus fusiformis	aqua	green	green		
Quercus geminata	blue	blue	red-max		
Quercus glandulifera	amber-max	amber-max	red		
Quercus hartwissiana	red-max	red-max	red	yes	
Quercus hemisphaerica	aqua	amber-max	red-max		
Quercus ilicifolia	red	red	red		
Quercus imbricaria	red	red	red		
Quercus kelloggii	red	red	red		
Quercus laurifolia	green	amber-max	amber-max		
Quercus liaotungensis	red	red	red	yes	
Quercus lyrata	green	green	amber-max		
Quercus macrolepis	amber-max	amber-max	red	yes	
Quercus marilandica	green	green	amber		
Quercus mexicana	green	green	green		
Quercus muehlenbergii	green	green	green		
Quercus nigra	green	green	amber-max		
Quercus polymorpha	green	green	green		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Quercus pontica	red	red	red	yes	
Quercus robusta	amber	amber	red	yes	
Quercus shumardii	green	green	green		
Quercus stellata	green	green	green		
Quercus variabilis	amber-max	red-max	red-max		
Quercus velutina	amber	red	red		
Quercus x bebbiana	red	red	red	yes	
Quercus x heterophylla	red	red	red		
Quillaja saponaria	red	red	red		
Reevesia thyrsoidea	red-max	red-max	red-max		
Rhamnus alaternus	green	green	red		
Rhamnus cathartica	red	red	red		
Rhamnus frangula	red	red	red		
Rhamnus ilicifolia	green	green	red		
Rhamnus parvifolia	red-max	red-max	red-max		
Rhizophora mucronata	blue	blue	blue		
Rhododendron canadense	red	red	red		
Rhododendron catawbiense	red	red	red		
Rhododendron maximum	red	red	red		
Rhododendron obtusum	red-max	red	red	yes	
Rhododendron periclymenoides	red	red	red		
Rhododendron ponticum	red	red	red		
Rhododendron simsii	amber-max	amber-max	red-max		
Rhododendron viscosum	amber-max	amber-max	red-max		
Rhodoleia championii	amber-max	amber-max	red-max		
Rhus copallinum	green	green	green		
Rhus glabra	amber	amber	red		
Rhus typhina	red	red	red		
Robinia viscosa	amber	red-max	red		
Rothmannia globosa	aqua	green	green		
Ruprechtia laxiflora	green	green	green		
Salix caroliniana	green	green	green		
Salix daphnoides	red	red	red		
Salix eriocephala	red	red	red		
Salix exigua	green	green	amber		
Salix gooddingii	green	green	green		
Salix gracilistyla	red-max	red	red		
Salix laevigata	green	green	red		
Salix lasiolepis	green	amber	red		
Salix lucida	amber	red	red		
Salix magnifica	red	red	red	yes	
Salix matsudana	green	green	red		
Salix nigra	green	green	amber		
Salix paradoxa	green	green	amber		
Salix pentandra	red	red	red		
Salix phylicifolia	red	red	red		
Salix purpurea	red	red	red		
Salix sericea	red	red	red		
Salvadora persica	blue	blue	aqua		
Sambucus canadensis	green	green	green		
Sambucus mexicana	green	green	green		
Sambucus neomexicana	amber	red	red		
Sambucus racemosa	red	red	red		
Sandoricum koetjape	blue	blue	blue		
Santalum album	blue	blue	blue		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Sapindus mukorossi	amber-max	amber-max	red-max		
Sapindus saponaria	aqua	aqua	green		
Sapium glandulatum	aqua	aqua	green		
Saraca asoca	blue	blue	blue	yes	
Saraca indica	green	green	green		
Sassafras albidum	amber	amber	red		
Schefflera arboricola	green	green	green		
Schefflera macrocarpa	blue	blue	red-max		
Schefflera octophylla	red-max	red-max	red-max		
Schefflera pueckleri	aqua	green	green	yes	
Schima superba	amber-max	amber-max	red-max		
Schinopsis brasiliensis	blue	blue	blue		
Schizolobium parahyba	aqua	aqua	green		
Schleichera oleosa	blue	blue	blue		
Sciadopitys verticillata	red	red	red		
Sclerolobium paniculatum	blue	blue	blue		
Scolopia chinensis	blue	blue	red-max		
Semecarpus anacardium	aqua	aqua	aqua	yes	
Senna candolleana	amber	amber	red	yes	
Senna macranthera	blue	blue	aqua		
Senna siamea	blue	red-max	red-max		
Senna spectabilis	blue	aqua	green		
Senna surattensis	blue	blue	aqua		
Sesbania punicea	green	green	green		
Sesbania sesban	blue	blue	green		
Sideroxylon inerme	blue	blue	blue		
Sideroxylon palmeri	blue	aqua	red-max		
Simarouba amara	blue	blue	red-max		
Simarouba glauca	blue	blue	blue		
Sophora japonica	green	amber-max	amber-max		
Sophora secundiflora	green	green	green		
Sorbus alnifolia	red	red	red		
Sorbus americana	red	red	red		
Sorbus aria	red	red	red		
Sorbus decora	red	red	red		
Sorbus latifolia	red	red	red		
Sorbus mougeotii	red	red	red		
Spartium junceum	green	green	green		
Spathodea campanulata	aqua	aqua	green		
Spathodea nilotica	blue	blue	blue	yes	
Spondias dulcis	blue	blue	blue		
Spondias mombin	blue	blue	red-max		
Spondias Pinnata	blue	blue	aqua		
Spondias purpurea	blue	aqua	aqua		
Spondias tuberosa	blue	blue	blue		
Staphylea trifolia	red	red	red		
Sterculia foetida	blue	blue	blue		
Sterculia guttata	blue	blue	blue	yes	
Sterculia lanceolata	blue	aqua	amber-max		
Sterculia villosa	blue	blue	red-max	yes	
Stereospermum chelonoides	green	amber-max	amber-max	yes	
Streblus asper	blue	blue	blue		
Strychnos nux-vomica	blue	blue	blue		
Stryphnodendron adstringens	blue	blue	green		
Styrax ferrugineus	blue	blue	aqua		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Swietenia macrophylla	blue	blue	aqua		
Syringa josikaea	red	red	red		
Syringa komarowii	red-max	red	red		
Syringa reticulata	red	red	red		
Syringa villosa	red	red	red		
Syringa X chinensis	red	red	red	yes	
Syringa X persica	red	red	red		
Syzygium aqueum	aqua	aqua	green		
Syzygium aromaticum	green	amber-max	amber-max		
Syzygium cordatum	blue	blue	blue		
Syzygium cumini	blue	aqua	green		
Syzygium grande	blue	blue	blue		
Syzygium grijsii	amber-max	red-max	red-max	yes	
Syzygium jambos	aqua	aqua	amber-max		
Syzygium malaccense	blue	aqua	aqua		
Syzygium nervosum	blue	blue	blue		
Syzygium polyanthum	blue	blue	blue		
Syzygium samarangense	blue	blue	blue		
Tabebuia alba	aqua	green	green		
Tabebuia argentea	blue	blue	blue	yes	
Tabebuia aurea	blue	blue	blue		
Tabebuia avellanedae	blue	aqua	green		
Tabebuia bahamensis	blue	blue	blue	yes	
Tabebuia capitata	blue	blue	blue		
Tabebuia chrysotricha	blue	blue	amber-max		
Tabebuia donnell-smithii	blue	blue	aqua		
Tabebuia heterophylla	blue	aqua	aqua		
Tabebuia impetiginosa	aqua	aqua	green		
Tabebuia ochracea	blue	blue	aqua		
Tabebuia rosea	blue	blue	aqua		
Tabebuia serratifolia	blue	blue	aqua		
Taiwania cryptomerioides	green	green	amber		
Talisia esculenta	blue	blue	blue		
Tamarindus indica	blue	blue	aqua		
Tapirira guianensis	blue	blue	aqua		
Taxodium ascendens	amber-max	amber-max	red-max		
Taxodium mucronatum	green	green	green		
Taxus canadensis	red-max	red-max	red-max		
Taxus cuspidata	red	red	red		
Tecoma stans	green	green	green		
Tecomella undulata	green	green	green	yes	
Tectona grandis	blue	blue	blue		
Terminalia arjuna	blue	blue	blue	yes	
Terminalia bellirica	blue	blue	blue		
Terminalia catappa	aqua	aqua	green		
Terminalia chebula	green	green	amber-max		
Terminalia paniculata	blue	blue	blue	yes	
Ternstroemia gymnanthera	green	amber-max	amber-max		
Tetradium daniellii	red	red	red		
Tetrameles nudiflora	blue	blue	blue		
Theobroma cacao	blue	aqua	aqua		
Thespesia grandiflora	blue	blue	blue		
Thespesia populnea	blue	blue	blue		
Thevetia peruviana	blue	aqua	amber-max		
Thujopsis dolabrata	red	red	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Tibouchina candolleana	blue	blue	green		
Tibouchina granulosa	red-max	red-max	red-max		
Tibouchina mutabilis	aqua	amber-max	red-max		
Tibouchina pulchra	aqua	green	green		
Tibouchina semidecandra	green	amber-max	amber-max		
Tilia americana	amber	red	red		
Tilia mongolica	red	red	red	yes	
Tilia rubra	amber	red	red	yes	
Tilia x euchlora	red	red	red		
Tilia x petiolaris	red	red	red	yes	
Tilia x vulgaris	red	red	red		
Toona sureni	blue	red-max	red-max		
Torreya taxifolia	aqua	aqua	red-max	yes	
Trema orientalis	aqua	aqua	green		
Trichilia dregeana	blue	blue	blue		
Triplaris americana	blue	aqua	aqua		
Triplaris gardneriana	blue	blue	blue		
Triplaris surinamensis	blue	blue	blue	yes	
Tsuga canadensis	red	red	red		
Tsuga caroliniana	red	red	red		
Ulmus alata	green	green	green		
Ulmus americana	green	amber	amber		
Ulmus carpinifolia	amber	red	red		
Ulmus laevis	red	red	red		
Ulmus pumila	green	green	amber		
Ulmus rubra	green	amber	amber		
Ulmus serotina	green	green	amber	yes	
Ulmus thomasii	red	red	red		
Viburnum odoratissimum	amber-max	amber-max	red-max		
Viburnum rhytidophyllum	red	red	red		
Vitex agnus-castus	green	green	green		
Vitex altissima	blue	blue	blue	yes	
Vitex parviflora	blue	blue	blue		
Wrightia pubescens	green	green	green		
Wrightia tinctoria	blue	blue	blue	yes	
Xylia xylocarpa	blue	blue	blue	yes	
Zelkova carpinifolia	red-max	red	red		
Zelkova schneideriana	amber-max	red-max	red-max		
Ziziphus amole	blue	aqua	aqua		
Ziziphus joazeiro	blue	blue	blue		
Ziziphus mauritiana	blue	blue	aqua		
Ziziphus spina-christi	blue	aqua	green		
Ziziphus zizyphus	green	green	green		
Zuccagnia punctata	green	amber	red		

Appendix C

Species List C: The temperature vulnerability of Australian trees not currently planted in the City of Melbourne

Note that thist lis is not designed to be applied to greater Melbourne, which has a broader temperature profile the City of Melbourne, or other cities with different temperature profiles.

Key to reading the species list:

Vulnerability rating	Green	Melbourne has a similar temperature to other places where the species is found and the species is not considered vulnerable in this temperature scenario
	Amber	Melbourne is hotter than most (90%) other places where the species is found and the species is considered moderately vulnerable in this temperature scenario.
	Aqua	Melbourne is colder than most (90%) other places where the species is found and the species is considered moderately vulnerable in this temperature scenario.
	Red	Melbourne is hotter than nearly all (97.5%) other places where the species is found and the species is considered very vulnerable in this temperature scenario.
	Blue	Melbourne is colder than nearly all (97.5%) other places where the species is found and the species is considered very vulnerable in this temperature scenario.
	Max/min	The max/min suffix indicates that the rating is due to extreme maximum and minimum rather than mean annual temperatures.
Temperature scenario	Current	Melbourne with a mean annual temperature of 16.4 °C and extreme maximum temperatures are 44 °C.
	Moderate	Melbourne with moderate climate change by 2040 increasing temperatures 0.8 °C and extreme maximum temperatures increase by 0.5 °C.
	Extreme	Melbourne with extreme climate change by 2090 increasing temperatures 3 °C and extreme maximum temperatures increase by 2 °C.

Limited data indicates that fewer than 20 records were found in the GBIF database and the species was found in fewer than 5 global city inventories – interpret results with caution.

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Acacia aneura var. aneura	blue	aqua	green		
Acacia aneura var. argentea	blue	blue	green	yes	
Acacia aneura var. fuliginea	blue	blue	aqua	yes	
Acacia aneura var. intermedia	blue	blue	green		
Acacia aneura var. major	blue	blue	green		
Acacia aneura var. microcarpa	blue	blue	green		
Acacia aneura var. tenuis	blue	blue	green		
Acacia aulacocarpa	blue	blue	green		
Acacia bakeri	blue	aqua	red-max		
Acacia beauverdiana	green	green	amber		
Acacia binervata	green	green	red		
Acacia bivenosa	blue	blue	blue		
Acacia blayana	red	red	red		
Acacia burkittii	green	green	green		
Acacia cambagei	blue	blue	aqua		
Acacia colei	blue	blue	blue		
Acacia complanata	aqua	aqua	amber-max		
Acacia coriacea	blue	blue	blue		
Acacia coriacea subsp. coriacea	blue	blue	blue		
Acacia coriacea subsp. pendens	blue	blue	blue		
Acacia coriacea subsp. sericophylla	blue	blue	blue		
Acacia cuthbertsonii	blue	blue	blue		
Acacia delibrata	blue	blue	blue		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Acacia drummondii	green	green	red		
Acacia falcate	green	green	amber		
Acacia georginae	blue	blue	blue		
Acacia harpophylla	aqua	aqua	green		
Acacia holosericea	blue	blue	blue		
Acacia homalophylla	green	green	green		
Acacia maitlandii	blue	blue	aqua		
Acacia mucronata	red	red	red		
Acacia obtusifolia	amber	amber	red		
Acacia penninervis	green	green	green		
Acacia peuce	blue	blue	blue		
Acacia phlebophylla	red	red	red		
Acacia pruinocarpa	blue	blue	aqua		
Acacia riceana	red	red	red		
Acacia trachyphloia	amber-max	amber	red		
Acacia victoriae	green	green	green		
Acmena hemilampra	blue	blue	blue		
Acradenia euodiiformis	green	green	amber		
Acronychia acidula	blue	blue	blue		
Acronychia baeuerlenii	aqua	green	green		
Acronychia laevis	blue	aqua	green		
Acronychia littoralis	blue	aqua	amber-max		
Acronychia oblongifolia	green	green	amber		
Acronychia octandra	blue	blue	blue		
Acronychia pubescens	green	green	amber-max		
Acronychia suberosa	blue	blue	blue		
Acronychia wilcoxiana	aqua	green	amber-max		
Adansonia gregorii	blue	blue	green		
Alangium villosum subsp. polyosmoides	green	green	green		
Alchornea ilicifolia	green	green	green		
Allocasuarina crassa	red	red	red		
Allocasuarina decaisneana	blue	blue	green		
Allocasuarina decussata	green	amber	red		
Allocasuarina defungens	blue	aqua	amber-max		
Allocasuarina fraseriana	green	green	amber		
Allocasuarina inophloia	green	green	green		
Allocasuarina portuensis	green	amber-max	amber-max	yes	
Allocasuarina simulans	blue	blue	blue		
Alloxylon flammeum	blue	aqua	amber-max		
Alloxylon pinnatum	green	amber-max	amber		
Alloxylon wickhamii	blue	blue	red-max		
Alphitonia excelsa	aqua	green	green		
Alstonia constricta	aqua	green	green		
Angophora bakeri	green	green	amber		
Angophora crassifolia	green	green	amber		
Angophora leiocarpa	green	green	amber-max		
Angophora subvelutina	green	green	amber		
Angophora woodsiana	aqua	green	amber-max		
Anopterus glandulosus	red	red	red		
Anopterus macleayanus	blue	blue	blue		
Aphananthe philippinensis	aqua	green	green		
Archidendron hendersonii	blue	blue	blue		
Archidendron muellerianum	blue	blue	blue		
Archirhodomyrtus beckleri	green	green	green		
Argyrodendron trifoliolatum	blue	aqua	green		
Arytera distylis	blue	blue	blue		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Arytera divaricata	aqua	green	green		
Atalaya multiflora	aqua	aqua	green		
Atherosperma moschatum subsp. integrifolium	amber	red	red		
Athertonia diversifolia	blue	blue	amber-max		
Athrotaxis cupressoides	red	red	red		
Athrotaxis selaginoides	red	red	red		
Atractocarpus benthamianus	green	green	amber-max		
Atractocarpus chartaceus	aqua	aqua	amber-max		
Atractocarpus fitzalanii	blue	blue	aqua		
Auranticarpa rhombifolia	aqua	green	green		
Austrobuxus swainii	blue	blue	blue		
Avicennia marina	green	green	green		
Backhousia sciadophora	green	green	amber		
Baloghia inophylla	green	green	green		
Baloghia marmorata	blue	blue	blue		
Banksia dentata	blue	blue	blue		
Banksia grandis	green	green	amber		
Banksia littoralis	green	green	red		
Banksia menziesii	aqua	green	green		
Banksia prionotes	green	green	green		
Banksia seminuda	green	green	red		
Banksia sessilis	green	green	green		
Banksia speciosa	aqua	green	amber		
Bedfordia arborescens	red	red	red		
Beilschmiedia elliptica	amber-max	amber-max	red-max		
Beilschmiedia obtusifolia	aqua	aqua	green		
Bleasdalea bleasdalei	blue	blue	blue		
Bosistoa floydii	green	green	amber		
Bosistoa pentacocca	aqua	aqua	green		
Bosistoa transversa	aqua	green	amber-max		
Brachychiton australis	blue	blue	aqua		
Brachychiton collinus	blue	blue	blue		
Brachychiton compactus	blue	blue	blue		
Brachychiton diversifolius	blue	blue	aqua		
Brachychiton garrawayae	blue	blue	blue		
Brachychiton gregorii	blue	blue	green		
Brachychiton megaphyllus	blue	blue	blue		
Brachychiton multicaulis	blue	blue	blue		
Brachychiton paradoxus	blue	blue	blue		
Brachychiton spectabilis	blue	blue	blue		
Bridelia exaltata	aqua	amber-max	amber-max		
Bruguiera parviflora	blue	blue	blue		
Caldcluvia paniculosa	green	green	amber		
Callistachys lanceolata	green	green	red		
Callitris baileyi	green	green	amber-max		
Callitris macleayana	green	green	amber-max		
Capparis arborea	green	green	green		
Cassia marksiana	aqua	aqua	amber-max		
Casuarina cristata	aqua	green	green		
Casuarina equisetifolia	aqua	aqua	green		
Casuarina pauper	green	green	green		
Celtis paniculata	blue	aqua	green		
Ceratopetalum apetalum	green	green	amber		
Ceriops tagal	blue	blue	blue		
Chrysophyllum roxburghii	blue	blue	blue		
Cinnamomum oliveri	green	green	green		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Cinnamomum virens	green	green	amber		
Citronella moorei	green	green	green		
Citrus glauca	aqua	green	green		
Claoxylon australe	green	green	amber		
Clerodendrum floribundum	blue	aqua	green		
Clerodendrum tomentosum	green	green	amber-max		
Cordyline obtecta	blue	blue	red	yes	
Corymbia aparrerinja	blue	blue	green		
Corymbia dallachiana	blue	blue	blue		
Corymbia dolichocarpa	aqua	aqua	green		
Corymbia henryi	aqua	green	green		
Corymbia papuana	blue	blue	blue		
Corymbia tessellaris	blue	blue	green		
Corymbia variegata	green	amber-max	amber-max		
Corypha utan	blue	blue	blue		
Croton verreauxii	green	green	amber		
Cryptocarya bidwillii	aqua	aqua	green		
Cryptocarya erythroxylon	green	green	amber		
Cryptocarya floydii	green	amber-max	red		
Cryptocarya foetida	blue	blue	blue		
Cryptocarya foveolata	green	green	red		
Cryptocarya glaucescens	green	green	amber		
Cryptocarya laevigata	blue	aqua	amber-max		
Cryptocarya microneura	green	green	amber		
Cryptocarya nova-anglica	green	amber	red		
Cryptocarya obovata	green	green	amber-max		
Cryptocarya onoprienkoana	blue	blue	green		
Cryptocarya rigida	green	green	amber		
Cryptocarya triplinervis	blue	aqua	green		
Cryptocarya williwilliana	blue	blue	blue		
Cupaniopsis baileyana	green	green	red		
Cupaniopsis newmanii	blue	blue	blue		
Cupaniopsis wadsworthii	blue	blue	aqua		
Cyathea australis	green	green	red		
Cyathea cooperi	green	green	green		
Cyathodes glauca	red	red	red		
Cyclophyllum coprosmoides	blue	aqua	green		
Cyclophyllum longipetalum	green	green	amber-max		
Daphnandra apatela	green	green	amber		
Daphnandra johnsonii	amber-max	amber-max	red		
Daphnandra melasmena	green	green	amber-max		
Daphnandra micrantha	green	green	amber		
Daphnandra tenuipes	blue	blue	blue		
Davidsonia johnsonii	aqua	aqua	amber-max		
Decaspermum humile	aqua	green	green		
Dendrocnide excelsa	green	green	amber		
Dendrocnide photinophylla	green	green	amber-max		
Diospyros australis	green	green	amber		
Diospyros fasciculosa	blue	blue	amber-max		
Diospyros mabacea	blue	blue	blue		
Diospyros pentamera	green	green	green		
Diploglottis australis	green	green	amber		
Diploglottis campbellii	aqua	amber-max	red-max		
Doryphora sassafras	green	green	red		
Drypetes deplanchei	aqua	aqua	green		
Duboisia hopwoodii	aqua	aqua	green		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Duboisia myoporoides	green	green	green		
Dysoxylum alliaceum	blue	blue	blue		
Dysoxylum arborescens	blue	blue	blue		
Dysoxylum fraserianum	green	green	amber		
Dysoxylum gaudichaudianum	blue	blue	blue		
Dysoxylum mollissimum	aqua	aqua	amber-max		
Dysoxylum mollissimum subsp. molle	blue	aqua	green		
Dysoxylum oppositifolium	blue	blue	blue		
Dysoxylum pachyphyllum	aqua	green	amber-max		
Dysoxylum parasiticum	blue	blue	blue		
Dysoxylum pettigrewianum	blue	blue	blue		
Dysoxylum rufum	green	green	green		
Ehretia saligna	blue	blue	green		
Eidothea hardeniana	blue	blue	blue	yes	
Eidothea zoexylocarya	blue	blue	green		
Elaeocarpus bancroftii	blue	blue	blue		
Elaeocarpus eumundi	blue	blue	green		
Elaeocarpus holopetalus	red	red	red		
Elaeocarpus kirtonii	green	green	amber-max		
Elaeocarpus sedentarius	aqua	amber-max	amber-max		
Elaeocarpus williamsianus	blue	blue	blue		
Elaeodendron australe	green	green	amber-max		
Elaeodendron melanocarpum	blue	blue	blue		
Elattostachys microcarpa	blue	blue	blue		
Elattostachys nervosa	green	green	amber-max		
Elattostachys xylocarpa	aqua	aqua	green		
Emmenosperma alphitonioides	green	green	amber-max		
Endiandra compressa	blue	blue	blue		
Endiandra discolor	aqua	green	green		
Endiandra floydii	blue	blue	blue		
Endiandra globosa	blue	blue	blue		
Endiandra hayesii	blue	blue	blue		
Endiandra introrsa	aqua	green	green		
Endiandra muelleri	green	green	green		
Endiandra muelleri subsp. bracteata	blue	aqua	aqua		
Endiandra pubens	aqua	green	green		
Endiandra sieberi	green	green	amber-max		
Endiandra virens	amber-max	amber-max	red-max		
Eremophila bignoniiflora	blue	blue	green		
Eremophila oppositifolia	green	green	green		
Eremophila youngii	blue	blue	aqua		
Erythrina vespertilio	blue	blue	aqua		
Erythrophleum chlorostachys	blue	blue	blue		
Erythroxylum australe	blue	blue	aqua		
Eucalyptus abdita	green	green	green		
Eucalyptus absita	aqua	green	green	yes	
Eucalyptus acaciiformis	amber	red	red		
Eucalyptus accedens	green	green	green		
Eucalyptus acies	blue	blue	red		
Eucalyptus aenea	green	green	amber		
Eucalyptus agglomerata	green	amber	red		
Eucalyptus aggregata	red	red	red		
Eucalyptus alba	blue	blue	blue		
Eucalyptus albida	green	green	amber		
Eucalyptus alligatrix	red	red	red		
Eucalyptus amplifolia	green	green	amber		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Eucalyptus ancophila	blue	blue	blue		
Eucalyptus andrewsii	amber	amber	red		
Eucalyptus angularis	aqua	green	green	yes	
Eucalyptus angustissima	aqua	green	amber		
Eucalyptus annuliformis	aqua	green	green	yes	
Eucalyptus apodophylla	blue	blue	blue		
Eucalyptus apothalassica	aqua	green	amber-max		
Eucalyptus approximans	blue	blue	red		
Eucalyptus aquatica	red	red	red		
Eucalyptus aquilina	aqua	green	amber		
Eucalyptus arachnaea	aqua	green	green		
Eucalyptus arborella	green	green	amber		
Eucalyptus archeri	red	red	red		
Eucalyptus argillacea	blue	blue	blue		
Eucalyptus argutifolia	aqua	green	green		
Eucalyptus articulata	aqua	green	green	yes	
Eucalyptus aspersa	green	green	red		
Eucalyptus aspratilis	aqua	green	amber		
Eucalyptus baeuerlenii	amber	amber	amber		
Eucalyptus baileyana	aqua	green	amber-max		
Eucalyptus balanites	green	green	green	yes	
Eucalyptus balladoniensis	aqua	green	amber		
Eucalyptus banksii	amber	amber	red		
Eucalyptus baudiniana	aqua	aqua	green		
Eucalyptus beardiana	blue	blue	green		
Eucalyptus bensonii	amber	red	red		
Eucalyptus benthamii	green	amber	red		
Eucalyptus beyeriana	green	green	amber		
Eucalyptus bigalerita	blue	blue	blue		
Eucalyptus biturbinata	green	green	red		
Eucalyptus blaxellii	aqua	aqua	green		
Eucalyptus boliviana	amber	red	red	yes	
Eucalyptus brachyandra	green	green	green		
Eucalyptus brachycalyx	green	green	amber		
Eucalyptus brachycorys	aqua	green	green		
Eucalyptus brevifolia	blue	blue	blue		
Eucalyptus brevipes	aqua	green	green		
Eucalyptus brevistylis	blue	blue	red		
Eucalyptus brockwayi	green	green	amber		
Eucalyptus burgessiana	green	green	red		
Eucalyptus burracoppinensis	green	green	green		
Eucalyptus cadens	green	amber	red		
Eucalyptus calcicola	green	green	amber		
Eucalyptus caleyi	green	green	red		
Eucalyptus caliginosa	amber	red	red		
Eucalyptus calycogona	green	green	red		
Eucalyptus calyerup	green	green	red	yes	
Eucalyptus cameronii	amber	amber	red		
Eucalyptus campanulata	green	amber	red		
Eucalyptus camphora	red	red	red		
Eucalyptus canaliculata	green	green	amber		
Eucalyptus cannonii	red	red	red		
Eucalyptus canobolensis	red	red	red		
Eucalyptus capillosa	green	green	green		
Eucalyptus capitellata	green	green	amber-max		
Eucalyptus castrensis	green	green	amber		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Eucalyptus chloroclada	green	green	green		
Eucalyptus cloeziana	blue	aqua	green		
Eucalyptus conica	green	green	amber		
Eucalyptus conjuncta	green	amber	red		
Eucalyptus consideniana	amber	amber	red		
Eucalyptus conspicua	amber	red	red		
Eucalyptus coolabah	blue	blue	green		
Eucalyptus cooperiana	aqua	green	amber		
Eucalyptus copulans	amber	red	red		yes
Eucalyptus cordata	red	red	red		
Eucalyptus corticosa	amber	red	red		
Eucalyptus crebra	green	green	green		
Eucalyptus cretata	green	green	amber		
Eucalyptus crispata	aqua	aqua	green		
Eucalyptus croajingolensis	red	red	red		
Eucalyptus curtisii	aqua	aqua	green		
Eucalyptus dalrympleana	red	red	red		
Eucalyptus dawsonii	green	green	amber		
Eucalyptus dealbata	green	green	red		
Eucalyptus deflexa	aqua	green	amber		
Eucalyptus dendromorpha	amber	red	red		
Eucalyptus denticulata	red	red	red		
Eucalyptus drummondii	green	green	green		
Eucalyptus dunnii	aqua	green	amber		
Eucalyptus dura	aqua	green	green		
Eucalyptus dwyeri	green	green	amber		
Eucalyptus ebbanoensis	aqua	aqua	green		
Eucalyptus effusa	aqua	green	green		
Eucalyptus elaeophloia	red	red	red		
Eucalyptus elliptica	amber	red	red		
Eucalyptus erectifolia	blue	blue	red		
Eucalyptus eremicola	aqua	aqua	green		
Eucalyptus eugenioides	green	green	amber		
Eucalyptus ewartiana	blue	aqua	green		
Eucalyptus exigua	aqua	green	amber		
Eucalyptus exilis	green	green	green		
Eucalyptus exserta	green	green	green		
Eucalyptus falcata	green	green	amber		
Eucalyptus famelica	aqua	green	amber		
Eucalyptus fasciculosa	aqua	amber	red		
Eucalyptus fastigata	red	red	red		
Eucalyptus fergusonii	green	green	amber		
Eucalyptus fitzgeraldii	blue	blue	blue		
Eucalyptus fracta	green	green	amber		
Eucalyptus fraseri	aqua	green	amber		
Eucalyptus fruticosa	blue	blue	aqua		
Eucalyptus fusiformis	green	green	amber-max		
Eucalyptus gamophylla	blue	blue	aqua		
Eucalyptus georgei	aqua	green	amber		
Eucalyptus gillenii	aqua	aqua	green		
Eucalyptus gillii	green	green	green		
Eucalyptus gittinsii	aqua	aqua	green		
Eucalyptus glaucina	green	green	amber-max		
Eucalyptus glomerosa	blue	aqua	green		
Eucalyptus gongylocarpa	blue	aqua	green		
Eucalyptus goniantha	green	green	red		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Eucalyptus goniocarpa	aqua	green	amber		
Eucalyptus gracilis	green	green	amber		
Eucalyptus griffithsii	aqua	green	green		
Eucalyptus guilfoylei	green	green	red		
Eucalyptus gypsophila	aqua	aqua	green		
Eucalyptus hebetifolia	green	green	red		
Eucalyptus herbertiana	blue	blue	blue		
Eucalyptus histophylla	aqua	green	amber		
Eucalyptus houseana	blue	green	green		
Eucalyptus hypostomatica	green	green	red		
Eucalyptus ignorabilis	red	red	red		
Eucalyptus incerata	aqua	green	amber		
Eucalyptus incrassata	green	green	red		
Eucalyptus indurata	aqua	green	amber		
Eucalyptus insularis	green	green	amber		
Eucalyptus interstans	green	green	amber-max		
Eucalyptus intertexta	aqua	green	green		
Eucalyptus jacksonii	blue	blue	red		
Eucalyptus jensenii	blue	blue	blue		
Eucalyptus jimberlanica	green	green	amber		
Eucalyptus johnsoniana	aqua	green	green		
Eucalyptus johnstonii	red	red	red		
Eucalyptus jucunda	blue	aqua	green		
Eucalyptus jutsonii	aqua	aqua	green		
Eucalyptus kartzoffiana	red	red	red		
Eucalyptus kenneallyi	blue	blue	blue	yes	
Eucalyptus kessellii	aqua	green	amber		
Eucalyptus kingsmillii	blue	blue	aqua		
Eucalyptus kondininensis	green	green	amber		
Eucalyptus kumarlensis	aqua	green	amber		
Eucalyptus kybeanensis	red	red	red		
Eucalyptus lacrimans	red	red	red		
Eucalyptus laeliae	green	green	amber		
Eucalyptus laevis	aqua	green	amber		
Eucalyptus largeana	green	green	amber		
Eucalyptus latens	green	green	red		
Eucalyptus lateritica	aqua	green	green		
Eucalyptus leprophloia	aqua	green	green	yes	
Eucalyptus leptocalyx	aqua	green	amber		
Eucalyptus leptophylla	green	green	red		
Eucalyptus lesouefii	aqua	green	green		
Eucalyptus leucophloia	blue	blue	blue		
Eucalyptus leucophylla	blue	blue	blue		
Eucalyptus leucoxylon subsp. bellarinensis	amber	red	red		
Eucalyptus ligulata	amber-max	amber-max	red		
Eucalyptus ligustrina	green	amber	red		
Eucalyptus limitaris	blue	blue	blue		
Eucalyptus lirata	blue	blue	blue		
Eucalyptus litorea	aqua	green	amber		
Eucalyptus livida	aqua	green	amber		
Eucalyptus longicornis	green	green	amber		
Eucalyptus loxophleba	green	green	green		
Eucalyptus lucasii	blue	blue	green		
Eucalyptus lucens	green	green	green		
Eucalyptus luculenta	aqua	amber-max	red-max		
Eucalyptus luteola	aqua	green	amber		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Eucalyptus magnificata	amber	red	red		
Eucalyptus major	aqua	aqua	amber-max		
Eucalyptus malacoxylon	amber	red	red		
Eucalyptus mannensis	blue	blue	green		
Eucalyptus marginata	green	green	red		
Eucalyptus mckieana	amber	amber	red		
Eucalyptus medialis	blue	blue	red		
Eucalyptus megacarpa	green	green	red		
Eucalyptus melanophitra	amber-max	amber-max	red		
Eucalyptus melanophloia	green	green	green		
Eucalyptus melanoxylon	aqua	green	amber		
Eucalyptus merrickiae	aqua	green	amber		
Eucalyptus micranthera	aqua	green	amber		
Eucalyptus microschema	aqua	green	amber		
Eucalyptus mimica	aqua	green	amber		
Eucalyptus miniata	blue	blue	blue		
Eucalyptus mooreana	blue	blue	blue		
Eucalyptus morrisii	aqua	green	green		
Eucalyptus myriadena	green	green	amber		
Eucalyptus nandewarica	green	green	amber		
Eucalyptus neutra	green	green	amber		
Eucalyptus nigrifunda	aqua	aqua	green		
Eucalyptus nitens	red	red	red		
Eucalyptus nitida	red	red	red		
Eucalyptus nobilis	amber	red	red		
Eucalyptus nova-anglica	red	red	red		
Eucalyptus obconica	blue	blue	blue		
Eucalyptus obesa	aqua	green	amber		
Eucalyptus obstans	green	green	amber-max		
Eucalyptus obtusiflora	blue	aqua	green		
Eucalyptus odontocarpa	blue	blue	blue		
Eucalyptus oldfieldii	blue	aqua	green		
Eucalyptus olida	red-max	red-max	red		
Eucalyptus oligantha	blue	blue	blue		
Eucalyptus olivina	green	green	amber		
Eucalyptus olsenii	amber	amber	red		
Eucalyptus ophitica	aqua	green	amber-max		
Eucalyptus optima	aqua	green	amber		
Eucalyptus oraria	blue	aqua	green		
Eucalyptus ordiana	blue	blue	blue		
Eucalyptus oreades	green	green	red		
Eucalyptus ornata	green	green	amber		
Eucalyptus ovularis	aqua	green	amber		
Eucalyptus oxymitra	blue	blue	green		
Eucalyptus pachycalyx	blue	aqua	red-max		
Eucalyptus pachyloma	green	green	red		
Eucalyptus pachyphylla	blue	blue	blue		
Eucalyptus paliformis	red	red	red		
Eucalyptus panda	aqua	green	amber-max		
Eucalyptus pantoleuca	blue	blue	blue		
Eucalyptus parramattensis	green	green	amber-max		
Eucalyptus parvula	red	red	red		
Eucalyptus patens	green	green	red		
Eucalyptus pellita	blue	blue	aqua		
Eucalyptus pendens	aqua	green	green		
Eucalyptus perangusta	green	green	amber		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Eucalyptus petraea	aqua	green	green		
Eucalyptus petrensis	aqua	green	green		
Eucalyptus phaenophylla	green	green	red		
Eucalyptus phenax	green	green	amber		
Eucalyptus phoenicea	blue	blue	blue		
Eucalyptus phylacis	green	green	amber	yes	
Eucalyptus pilbarensis	blue	blue	blue		
Eucalyptus pileata	green	green	amber		
Eucalyptus pilularis	green	green	amber		
Eucalyptus pimpiniana	aqua	amber-max	red-max		
Eucalyptus piperita	green	green	red		
Eucalyptus placita	green	green	amber		
Eucalyptus planchoniana	aqua	green	amber-max		
Eucalyptus planipes	aqua	green	green		
Eucalyptus platycorys	aqua	green	amber		
Eucalyptus pleurocarpa	green	green	amber		
Eucalyptus pluricaulis	green	green	amber		
Eucalyptus polita	green	green	amber		
Eucalyptus praecox	red	red	red		
Eucalyptus praetermissa	amber-max	amber-max	red	yes	
Eucalyptus prolixa	aqua	green	amber		
Eucalyptus prominens	blue	blue	blue		
Eucalyptus protensa	aqua	green	amber		
Eucalyptus pruiniramis	aqua	green	green		
Eucalyptus pruinosa	blue	blue	blue		
Eucalyptus psammitica	aqua	amber-max	red-max		
Eucalyptus pterocarpa	green	green	amber		
Eucalyptus pyriformis	aqua	green	green		
Eucalyptus pyrocarpa	green	green	amber-max		
Eucalyptus quadrangulata	green	green	red		
Eucalyptus quadrans	aqua	green	amber		
Eucalyptus quaerenda	aqua	green	red		
Eucalyptus quinniorum	amber	amber	red		
Eucalyptus rameliana	blue	blue	blue		
Eucalyptus ravida	green	green	green		
Eucalyptus recta	aqua	green	green		
Eucalyptus regnans	red	red	red		
Eucalyptus relicta	green	green	red	yes	
Eucalyptus repullulans	blue	blue	blue		
Eucalyptus retinens	amber	red	red		
Eucalyptus rhodantha	aqua	green	green		
Eucalyptus rigens	aqua	green	amber		
Eucalyptus rigidula	green	green	green		
Eucalyptus rosacea	aqua	green	green		
Eucalyptus roycei	aqua	aqua	aqua		
Eucalyptus rudderi	green	green	amber-max		
Eucalyptus rummeryi	amber-max	amber-max	red-max		
Eucalyptus rupestris	blue	blue	blue		
Eucalyptus salicola	green	green	green		
Eucalyptus saxatilis	red	red	red		
Eucalyptus scias subsp. apoda	aqua	green	amber		
Eucalyptus scyphocalyx	aqua	green	amber		
Eucalyptus seeana	aqua	green	amber-max		
Eucalyptus selachiana	blue	blue	aqua		
Eucalyptus semota	blue	blue	red-max		
Eucalyptus sepulcralis	green	green	amber		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Eucalyptus sessilis	blue	blue	red-max		
Eucalyptus sheathiana	green	green	amber		
Eucalyptus singularis	aqua	green	red		
Eucalyptus smithii	amber	red	red		
Eucalyptus socialis	green	green	amber		
Eucalyptus sparsa	blue	aqua	green		
Eucalyptus sporadica	green	green	amber		
Eucalyptus spreta	aqua	green	amber		
Eucalyptus squamosa	green	green	amber		
Eucalyptus staigeriana	blue	blue	blue		
Eucalyptus stenostoma	red	red	red		
Eucalyptus stowardii	aqua	green	green		
Eucalyptus striaticalyx	blue	blue	green		
Eucalyptus sturgissiana	amber-max	amber-max	red		
Eucalyptus subangusta	green	green	green		
Eucalyptus subcrenulata	red	red	red		
Eucalyptus suberea	aqua	green	green		
Eucalyptus sublucida	blue	blue	aqua		
Eucalyptus subtilis	green	green	amber		
Eucalyptus suggrandis	aqua	green	amber		
Eucalyptus surgens	aqua	amber-max	red-max	yes	
Eucalyptus synandra	aqua	aqua	green		
Eucalyptus tectifica	blue	blue	blue		
Eucalyptus tenella	amber	amber	red		
Eucalyptus tenera	green	green	amber		
Eucalyptus tenuiramis	red	red	red		
Eucalyptus tenuis	aqua	green	amber		
Eucalyptus tephroclada	green	green	amber		
Eucalyptus tetrapleura	aqua	green	green		
Eucalyptus tetrodonta	blue	blue	blue		
Eucalyptus thamnoides	green	green	red		
Eucalyptus thozetiana	blue	blue	green		
Eucalyptus todtiana	aqua	green	green		
Eucalyptus tortilis	aqua	green	amber		
Eucalyptus transcontinentalis	aqua	green	green		
Eucalyptus triflora	amber	red	red		
Eucalyptus trivalva	blue	blue	green		
Eucalyptus tumida	aqua	green	amber		
Eucalyptus ultima	blue	blue	blue		
Eucalyptus umbra	green	green	amber-max		
Eucalyptus uncinata	green	green	amber		
Eucalyptus urna	aqua	green	amber		
Eucalyptus utilis	green	green	amber		
Eucalyptus valens	aqua	green	amber		
Eucalyptus varia	aqua	green	green		
Eucalyptus vernicosa	red	red	red		
Eucalyptus vesiculosa	amber-max	amber-max	red		
Eucalyptus vicina	green	green	green		
Eucalyptus victrix	blue	blue	blue		
Eucalyptus virginea	green	green	red	yes	
Eucalyptus volcanica	green	green	red		
Eucalyptus walshii	amber	amber	red	yes	
Eucalyptus websteriana	aqua	green	green		
Eucalyptus wilcoxii	amber	amber	red		
Eucalyptus williamsiana	amber	amber	red		
Eucalyptus wubinensis	aqua	green	green		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Eucalyptus xanthonema	green	green	red		
Eucalyptus xerothermica	blue	blue	blue		
Eucalyptus yalatensis	green	green	amber		
Eucalyptus yilgarnensis	green	green	green		
Eucalyptus youmanii	amber	red	red		
Eucryphia jinksii	blue	blue	blue	yes	
Eucryphia milliganii	red	red	red		
Eucryphia moorei	amber	red	red		
Eucryphia wilkiei	aqua	aqua	red-max	yes	
Eupomatia laurina	green	green	amber-max		
Euroschinus falcatus	green	green	green		
Excoecaria dallachyana	aqua	aqua	amber-max		
Ficus atricha	blue	blue	blue		
Ficus brachypoda	blue	blue	blue		
Ficus coronulata	blue	blue	blue		
Ficus crassipes	blue	blue	green		
Ficus destruens	blue	blue	blue		
Ficus fraseri	aqua	aqua	green		
Ficus lilliputiana	blue	blue	blue		
Ficus macrophylla f. columnaris	blue	blue	blue		
Ficus opposita	blue	blue	blue		
Ficus pantoniana	blue	blue	blue		
Ficus pleurocarpa	blue	blue	blue		
Ficus scobina	blue	blue	blue		
Ficus subpuberula	blue	blue	blue		
Ficus superba var. henneana	green	green	green		
Ficus triradiata	blue	blue	aqua		
Ficus virens var. sublanceolata	aqua	aqua	green		
Ficus watkinsiana	aqua	green	green		
Flindersia bennettii	aqua	aqua	amber-max		
Flindersia brayleyana	blue	blue	green		
Flindersia collina	aqua	green	green		
Flindersia maculosa	aqua	aqua	green		
Flindersia schottiana	aqua	aqua	red-max		
Flindersia xanthoxyla	aqua	green	amber-max		
Fontainea australis	blue	blue	blue		
Fontainea oraria	blue	blue	blue	yes	
Fontainea rostrata	blue	blue	blue		
Galbulimima baccata	blue	blue	green		
Ganophyllum falcatum	blue	blue	blue		
Gmelina fasciculiflora	blue	blue	blue		
Gmelina leichhardtii	green	green	green		
Gossia acmenoides	green	green	amber-max		
Gossia bidwillii	aqua	green	green		
Gossia fragrantissima	blue	blue	blue		
Grevillea glossadenia	blue	blue	blue		
Grevillea striata	blue	blue	green		
Guioa acutifolia	blue	blue	aqua		
Guioa semiglauca	green	green	amber-max		
Hedycarya angustifolia	green	amber	red		
Helicia glabriflora	green	green	green		
Hibiscus heterophyllus	aqua	green	green		
Hibiscus splendens	aqua	green	green		
Hicksbeachia pilosa	blue	blue	blue		
Hicksbeachia pinnatifolia	blue	blue	blue		
Homalanthus populifolius	green	green	amber		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Intsia bijuga	blue	blue	blue		
Jagera pseudorhus	aqua	aqua	green		
Karrabina benthamiana	green	green	amber-max		
Karrabina biagiana	blue	blue	blue		
Kopsia arborea	blue	blue	blue		
Leptospermum polygalifolium subsp. montanum	green	green	red		
Licuala ramsayi	blue	blue	blue		
Litsea bindoniana	blue	blue	blue		
Litsea leefeana	blue	blue	green		
Litsea reticulata	green	green	amber		
Livistona humilis	blue	blue	blue		
Lomatia arborescens	green	green	red		
Macropiper excelsum	red-max	red-max	red		
Mallotus claoxyloides	blue	aqua	amber-max		
Mallotus discolor	aqua	aqua	amber-max		
Mallotus philippensis	green	green	green		
Maniltoa lenticellata	blue	blue	blue		
Maytenus disperma	blue	blue	green		
Maytenus silvestris	green	green	amber		
Medicosma cunninghamii	blue	aqua	amber-max		
Melaleuca clarksonii	blue	blue	blue		
Melaleuca cuticularis	green	green	amber		
Melaleuca decora	green	green	amber		
Melaleuca dissitiflora	blue	aqua	green		
Melaleuca preissiana	green	green	amber		
Melaleuca trichostachya	blue	blue	aqua		
Melicope bonwickii	blue	blue	blue		
Melicope elleryana	blue	blue	blue		
Melicope micrococca	green	green	amber		
Meryta latifolia	blue	blue	blue	yes	
Mischocarpus pyriformis	aqua	aqua	amber-max		
Monotoca elliptica	green	green	amber		
Monotoca scoparia	green	green	amber		
Myoporum acuminatum	green	green	green		
Myoporum montanum	green	green	green		
Neolitsea australiensis	green	green	amber-max		
Nestegis apetala	red-max	red-max	red	yes	
Niemeyera whitei	green	green	amber-max		
Notelaea ligustrina	red	red	red		
Notelaea longifolia	green	green	amber		
Notelaea microcarpa	green	green	amber		
Notelaea venosa	green	amber	red		
Nypa fruticans	blue	blue	blue		
Ochrosia moorei	blue	blue	blue		
Orites excelsus	green	green	amber		
Owenia acidula	blue	blue	green		
Owenia cepiodora	blue	blue	blue		
Pandanus spiralis	blue	blue	blue		
Pararchidendron pruinosum	green	green	amber-max		
Pennantia cunninghamii	green	green	amber		
Pentaceras australis	aqua	aqua	green	yes	
Persoonia longifolia	green	green	red		
Petalostigma triloculare	blue	aqua	green		
Phyllocladus aspleniifolius	red	red	red		
Pisonia brunoniana	amber-max	amber-max	red-max		
Pittosporum erioloma	aqua	amber-max	red-max		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Pittosporum spinescens	blue	aqua	green		
Planchonella queenslandica	blue	blue	blue		
Pleiogynium timoriense	blue	blue	blue		
Podocarpus lawrencei	red	red	red		
Polyosma cunninghamii	green	green	red		
Polyscias elegans	green	green	green		
Polyscias murrayi	green	green	green		
Polyscias sambucifolia	green	green	amber		
Pouteria cotinifolia	aqua	aqua	amber-max		
Pouteria myrsinoides	blue	blue	green		
Pouteria obovata	blue	blue	blue		
Prostanthera lasianthos	amber	red	red		
Pseudoweinmannia lachnocarpa	blue	blue	blue		
Psychotria loniceroides	green	green	amber-max		
Pullea stutzeri	blue	blue	green		
Quintinia sieberi	green	green	red		
Rapanea variabilis	green	green	amber-max		
Rhizophora stylosa	blue	blue	blue		
Rhodamnia argentea	green	green	amber-max		
Rhodamnia rubescens	green	green	amber		
Rhodosphaera rhodanthema	green	green	amber-max		
Santalum acuminatum	green	green	green		
Santalum lanceolatum	aqua	aqua	green		
Santalum spicatum	green	green	green		
Sarcomelicope simplicifolia	green	green	green		
Sarcopteryx montana	blue	blue	blue		
Sarcopteryx stipata	green	green	amber		
Schizomeria ovata	green	green	amber		
Scolopia braunii	green	green	green		
Seringia arborescens	green	green	amber-max		
Sloanea australis	green	green	amber-max		
Sloanea woollsii	green	green	amber		
Sonneratia alba	blue	blue	blue		
Sonneratia ovata	blue	blue	blue	yes	
Stenocarpus salignus	green	green	amber		
Sterculia quadrifida	blue	blue	aqua		
Streblus pendulinus	aqua	green	green		
Symplocos stawellii	aqua	green	green		
Symplocos thwaitesii	green	green	amber-max		
Syncarpia hillii	blue	blue	blue		
Syzygium alliiligneum	blue	blue	blue		
Syzygium anisatum	green	amber-max	amber-max		
Syzygium cormiflorum	blue	blue	blue		
Syzygium corynanthum	blue	blue	blue		
Syzygium crebrinerve	aqua	amber-max	red-max		
Syzygium eucalyptoides	blue	blue	blue		
Syzygium francisii	aqua	green	amber-max		
Syzygium fullagarii	blue	blue	blue		
Syzygium hodgkinsoniae	blue	blue	blue		
Syzygium moorei	aqua	aqua	red-max		
Syzygium oleosum	aqua	green	green		
Syzygium papyraceum	blue	blue	blue		
Syzygium pseudofastigiatum	blue	blue	blue		
Syzygium xerampelinum	blue	blue	blue		
Terminalia carpentariae	blue	blue	blue		
Terminalia ferdinandiana	blue	blue	blue		

taxa	status-current	status-moderate	status-extreme	limited data	synonym
Terminalia littoralis	blue	blue	blue	yes	
Terminalia petiolaris	blue	blue	blue		
Toechima daemelianum	blue	blue	blue		
Trema tomentosa var. viridis	green	green	green		
Triflorensia cameronii	aqua	green	amber-max		
Tristaniopsis collina	green	green	red		
Trochocarpa laurina	green	green	amber		
Trochocarpa montana	red	red	red		
Uromyrtus australis	aqua	amber-max	amber-max		
Uromyrtus lamingtonensis	blue	blue	blue		
Ventilago viminalis	blue	blue	green		
Vesselowskya rubifolia	amber	amber	red		
Vesselowskya venusta	green	green	red		
Vitex lignum-vitae	blue	aqua	amber-max		
Wilkiea huegeliana	green	green	amber		
Xylocarpus moluccensis	blue	blue	blue		
Xylomelum angustifolium	green	green	green		
Xylomelum benthamii	blue	blue	blue		
Xylomelum cunninghamianum	aqua	green	amber-max		
Xylomelum occidentale	green	green	amber		
Xylomelum pyriforme	green	green	amber		
Xylomelum scottianum	blue	blue	blue		
Xylosma terrae-reginae	blue	aqua	amber-max		
Zanthoxylum brachyacanthum	aqua	green	green		
Zieria arborescens	green	amber	red		