Tasmania's tallest trees

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Abstract

The heights of 53 trees in 21 putatively tall eucalypt stands in southern Tasmania were accurately measured. The tallest tree was a 92 m Eucalyptus regnans *at the Big Tree Reserve, Styx Valley. This tree is 9 m shorter than the tallest tree ever recorded in Tasmania. Currently, the ten tallest known trees, including one tree in northern Tasmania, are all at least 85 m tall. Extreme tallness is not confined to* E. regnans*, with a 91 m* E. viminalis *and a 90 m* E. delegatensis *being almost as tall.*

Most of the current tallest trees in Tasmania are around 400 years old and senescing at a rate of about 3 m per decade. This decline will become more rapid once the trees reach their likely maximum life span of 450 years. A stand at Coles Creek, within a large patch of 200-year-old E. regnans *in the World Heritage Area, will probably contain Tasmania's tallest tree as older, taller trees decline elsewhere.*

The 92 m tree in the Big Tree Reserve, Styx Valley, appears to be currently the world's tallest flowering plant in natural forest.

Introduction

The world's tallest tree ever recorded was a fallen *Eucalyptus regnans* tree measured at 133 m at Watts River, Victoria, in 1872 (Carder 1995). The tree, reported by William Ferguson, had a broken top and the entire tree was estimated to have once been over 500 feet (152 m) tall. However, there is some doubt (e.g. Maiden 1904, cited in Carder

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1995) about the veracity of this and other early records, and the tallest eucalypt tree acknowledged by some sources was a 115 m *E. regnans* felled in 1880 at Thorpdale, Victoria, and measured by a certified surveyor, George Cornthwaite (Hardy 1935).

The tallest tree standing in the world today is 112 m and is a conifer, a coast redwood (*Sequoia sempervirens*) in California, USA (Carder 1995). However, the tallest conifer ever recorded was a Douglas fir (*Pseudotsuga menziesii*) of 127 m in the Lynn Valley in British Columbia, Canada (Carder 1995). Hence, it is still a matter of debate about which species grows the tallest. If the Ferguson report is accepted, then *E. regnans* is the tallest. If the more plausible Cornthwaite measurement is taken as the tallest *E. regnans*, then the tallest species would be *Pseudotsuga menziesii*. In any event, it is true to claim that the tallest hardwood species, and hence the tallest flowering species, is *E. regnans*.

Eucalyptus regnans is confined to Tasmania and Victoria, and these States have vied for the title of home of the world's tallest flowering plant. In Victoria, Mace (1996) noted that the tallest existing tree is a 91 m *E. regnans* in the Wallaby Creek catchment. However, an *E. regnans* in the Cumberland Tall Trees Reserve that was previously 92 m (now stands at 84 m) is commonly recognised as the State's tallest living tree.

While Victoria has a published literature on its tallest trees (e.g. Caire 1905; Simpfendorfer 1982; Mace 1996), there is a lack of comprehensive information for Tasmania. Lewin (1906) gives a brief summary of some tall trees but includes no

precise information on measurement methods or locations. Irby (1925) refers to a 97 m blue gum (*E. globulus*) without specifying measurement methods or its location. Helms (1945) describes a single massive *E. regnans* in the Derwent Valley with a height of 78 m to a broken crown. Mount (1960) describes very tall *E. regnans* trees in the Styx Valley and includes measurements of 98 m for one *E. regnans* in Snowy Forest Block (later to become known as the Styx Big Tree stand) and another in Andromeda Forest Block (Photo 1). An 89 m tall *E. viminalis* was reported from the Evercreech Forest Reserve (Anon. 1976). Some unpublished records were contributed by Pryor (1988) at the Commission of Inquiry into the Lemonthyme and Southern Forests (Commonwealth of Australia and State of Tasmania 1997) and included an 87 m tall *E. regnans* at the Andromeda stand, Styx Valley, and an 89 m *E. regnans* at Manning Road, Florentine Valley.

No published current information is available for tall trees in Tasmania despite considerable public interest. Hence, a short study was carried out in April/May 2000 to collate information on tall trees in Tasmania and determine the heights of a number of putatively tall trees. The results of the study, which was confined to southern Tasmania, are reported in Kostoglou (2000).

The purpose of this paper is to formally publish a summary of the results of Kostoglou (2000), examine the findings in the context of tree and stand growth, and report on management for the protection of Tasmania's tallest trees. This paper also includes registers of Tasmania's tallest ever, and existing tallest, trees.

Method

Collation of unpublished data

This initial investigation involved a perusal of internal files and historic notebooks authored by staff of Forestry Tasmania (formerly the Forestry Commission, Tasmania)

Photo 1. A Eucalyptus regnans *measured at 98 m in 1962 at the Andromeda stand. (Photo from Mount 1964; courtesy of A.B. Mount)*

and Australian Newsprint Mills (ANM), in addition to more widely circulated secondary source material held by various public libraries.

The issue of tall eucalypt trees in Tasmania has formed the basis for three previous investigations, which are summarised below.

1. *ANM surveyors (1962)*

ANM formerly held a timber concession over State forest in the Florentine and Styx Valleys. The informal declaration of several tall tree reserves by ANM was prefaced by a tree-heighting program undertaken by at least three surveyors employed by that company. Messrs L.D. Davey, R. Terry and J. Eagle measured approximately 14 extremely tall trees growing in the proposed reservations in the Styx Valley. A greater number of trees may have been assessed but unfortunately the original written records pertaining to this assessment, including all location details, could not be located.

2. *Potter (1987)*

ANM commissioned another registered surveyor to undertake a more expansive measurement program in 1987. Mr D.G. Potter measured the heights of 21 trees located throughout five informal ANM reserves and one wood-production compartment in the Styx and Florentine Valleys. These findings were summarised in a short briefing paper (Potter 1987), which unfortunately did not provide specific location details of the trees measured. The heights were taken to the highest leaf of each tree, which meant that trees with dead tops were not measured to their maximum extent.

3. *Berrigan (1992)*

In 1992, Mr S. Berrigan, then an employee of the Forestry Commission, Tasmania, prepared a list of Tasmania's tallest trees, including individuals from a variety of species in Tasmania. This list included a collation of previous tree heights provided by Potter and Davey but does not appear to have produced any new measurements for tall eucalypts. No location details for any individual trees were provided.

Selection of prospective stands

The unpublished data were used to determine prospective areas for current measurement and were supplemented by discussions with individuals who have worked in tall eucalypt forests. The objective was to locate stands with trees greater than 80 m tall which are defined here as extremely tall trees. In order to maximise the probability of locating the tallest possible trees, attention focussed predominantly on forest dominated by *E. regnans,* although *E. obliqua, E. delegatensis, E. viminalis* and *E. globulus* are known to attain heights over 80 m. Photo-interpreted (PI) maps (Stone 1998) were used to further define the areas. These were of limited use for finding extremely tall trees because the tallest height class commonly used for mapping is E1, which refers to stands with an average height of more than 55 m. A further classification of E1* that refers to stands greater than 76 m is defined but rarely, if ever, used on modern digitised maps. There are large areas of mapped E1 forest but very few are likely to contain trees more than 80 m tall. However, photo-interpreters at Forestry Tasmania examined aerial photographs of prospective areas and identified the most likely tallest stands. The areas were all in southern Tasmania and included 21 patches in the Styx, Florentine, Arve and upper Derwent River Valleys. Only one record (Anon. 1976) of an extremely tall tree has ever been reported elsewhere in Tasmania (at the Evercreech Forest Reserve in north-eastern Tasmania) and a current measurement was obtained for this tree. The sampled stands are listed in Table 1 and their location is shown in Figure 1.

Field work

A patch of E1 was delineated on a PI map for each prospective stand. The total area
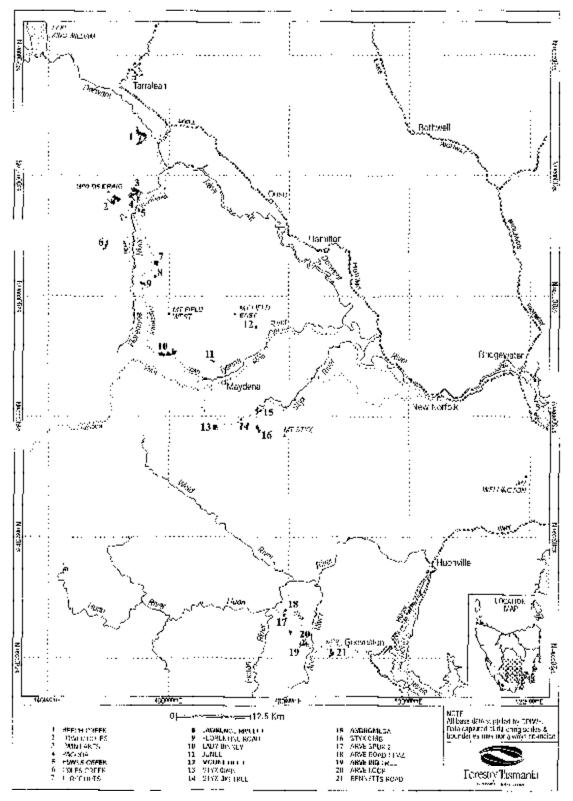
Figure 1. Location of sampled stands in southern Tasmania.

Table 1. Sampled stands.

Styx Valley

Styx Big Tree, Andromeda, Styx 009B and Styx 015B stands.

Florentine Valley

Lady Binney Forest Reserve, Lawrence Rivulet Forest Reserve, Three Huts, Hunns Creek, Pagoda, Twin Lakes, Coles Creek, Lower Coles and Florentine Road stands.

Beech Creek, upper Derwent Valley

A stand south of Beech Creek.

Arve Valley

Arve Big Tree, Bennetts Road, Arve Spur 2, Arve Loop Spur 5, Arve Loop Road and the Arve Road stands.

A stand near the Junee River was also sampled outside these catchments.

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for all the stands was about 700 ha. Accessible areas within the patches were used for field sampling. The objective was to record trees greater than 80 m although details of shorter trees were kept to characterise sampled stands. The height of at least one dominant tree was accurately measured at each stand. If the height was close to, or exceeded 80 m, then up to two additional dominant trees were measured. Field work was carried out over 18 days and some stands were visited more than once to allow further consultation with photo-interpreters on the most prospective parts of a stand.

Measuring tree heights

Several methods were used to measure the trees.

Laser rangefinder. A laser 'Impulse Series 2000' rangefinder manufactured by Laser Technology Inc., was used to estimate heights of most sampled trees. The model used has an effective range of between 200–500 m, allowing the tallest trees to

be measured comfortably. Two distinct advantages with this device are its extreme portability (it fits into a large coat pocket) and the speed at which measurements can be made. Estimates taken with a horizontal distance greater than the tree's height can produce measurements with accuracy comparable to a theodolite.

Theodolite. An Electronic Distance Measurement (EDM) theodolite was used by a licenced surveyor to measure a small selection of exceptionally tall trees for independent verification.

Climber-deployed tape. Two professional arborists climbed a small number of trees, mainly where visibility of the tree top from the ground was obscured by other trees. The tree heights were measured by taking a 50 m tape to the very top of the tree and measuring the distance to the base in two or more stages.

A comparison was made between the heights derived from a single tree by the theodolite, laser rangefinder and climber-deployed tape measure. All three techniques agreed within 0.5 m of each other. It was thus considered appropriate to quote all measurements in this study to the nearest metre.

Laser and theodolite measurements were taken from the top side of the tree. The aim was to measure trees from a horizontal distance equivalent to at least one tree height but this was often not possible due to the presence of other trees. While some minor clearing was done with a slash hook, it would have been inappropriate to undertake major clearing of sight-lines in stands of high aesthetic value. Trees were measured to their highest point which, for older trees, was often a dead branch well above the highest green leaf. An effort was made to choose a point centred over the base of the tree to reduce errors caused by asymmetrical measurements. The base of the tree was estimated as the average elevation of the top and bottom side of the tree. The diameter of each tree was

measured, using a diameter tape, at 1.3 m height from the top side of the tree.

Approximate stand origin

The approximate ages of sampled stands were estimated from the appearance of the trees and with reference to fire histories reported by Gilbert (1959), Mount (1964) and Hickey *et al.* (1999). Gilbert (1959) did a detailed study of forest succession in the Florentine Valley and reported large areas of regeneration after wildfires in 1934, 1837, 1807, 1752, 1642 and pre-1550. These dates were mostly determined from ring counts of eucalypts and *Nothofagus cunninghamii* stumps in felled areas. The highest count was a *Nothofagus* at 450 years in 1957.

Mount (1964) carried out ring counts of eucalypts, averaging three counts per coupe, in over 80 areas on the Florentine and Styx Valleys. He reported that the Styx forests mostly regenerated in the periods 1600–1700 and 1500–1600; that is, they are now 300 to 500 years old. However, no eucalypt was found to be over 450 years old in 1960. The Andromeda stand had two veteran trees estimated to have originated in about 1560. The remainder of the stand, which was similarly tall, was estimated to have originated in about 1710.

Hickey *et al.* (1999) recorded some ring counts of eucalypts from the Warra Long Term Ecological Research site, about 10 km from the tallest trees of the Arve Valley. The oldest eucalypts had severely rotten cores. The earliest age of a eucalypt was inferred from ring counts of an adjacent *Phyllocladus aspleniifolius* at about 460 years and indicates a year of origin in the early 1500s.

Rates of stand senescence

The tallest trees of the Andromeda and Styx Big Tree stands have been accurately measured with theodolites in 1957 (Styx Big Tree stand only), 1962, 1987 and again in 2000. Andromeda was considered the tallest known stand of trees in Tasmania

(Photo 2) and contained 12 trees over 90 m when measured by Davey in 1962 (Berrigan 1992). The measurements over four decades were used to track the rate of senescence of the Andromeda and Styx Big Tree stands. The 1987 measurement was not considered here as heights were taken to the highest green leaf and not necessarily to the top of the tree.

Results

Table 2 shows the location, tenure, species, forest type, tallest tree height, additional tree heights and estimated stand origin for stands sampled in 2000. The stands are ranked in order of the tallest tree. Fifty-three trees were accurately measured over 18 field days, at a rate of nearly three trees per day. They included 23 trees greater than 80 m, of which 15 were *E. regnans* and five were *E. delegatensis.* The tallest tree was a 92 m *E. regnans* at the Styx Big Tree stand (Photo 3) and was located about 100 m south of the 'Big Tree' which was previously recognised as the tallest tree but which now stands at 89 m (cover photo).

Appendix 1 is a register of the ten tallest existing trees in Tasmania. It is based on the results of the April/May 2000 survey plus a current measurement of the *E. viminalis* at the Evercreech Forest Reserve. All the trees are at least 85 m tall and include seven *E. regnans*, two *E. delegatensis* and one *E. viminalis.* The most massive tree is an *E. regnans*, the Arve Big Tree, with a diameter at breast height of 544 cm (Photo 4). Six of the trees have been measured by previous workers but trees at Coles Creek, Three Huts and the 85 m tree at Lower Coles Road were probably measured for the first time in 2000.

Appendix 2 is a register of the ten tallest trees ever recorded in Tasmania. The trees were all at least 94 m tall and included seven *E. regnans* and three *E. globulus.* However, the reliability of the three *E. globulus* trees, including the two putative tallest ever trees,

Table 2. Location, tenure, species, forest type, tallest tree height, additional tree heights and estimated origin of stands sampled in April/May 2000. The stands are ranked in order of the tallest tree measured.

Stand	Grid Reference	Tenure	Species[1]	PI type[2]	Forest type[3]	Tallest tree (m)	Additional trees (m)	Approx. origin
Styx Big Tree	E 471950 N 5259590	SF	*E. reg*	E1c	o/m mixed	92	89, 78	1600
Lower Coles	E 451250 N 5296060	SF	*E. del*	E1b	o/m mixed	90	85, 78	1600
Andromeda	E 475200 N 5260900	SF	*E. reg, E. del*	E1b	o/m wet scl.	88	73, 70	1560/ 1710
Three Huts	E 457800 N 5285500	SF	*E. reg*	E1b+	mature wet scl. & mixed	87	86, 80	1800
Arve Big Tree	E 482820 N 5222080	SF	*E. reg*	E1f	o/m mixed & wet scl.	87	–	1600
Coles Creek	E 449500 N 5288500	WHA	*E. reg*	E1a	mature mixed	86	79, 74	1800
Beech Creek	E 455800 N 5206620	WHA	*E. del E. reg, E. obl*	E1c	o/m mixed	84	83, 83	1600
Lawrence Rivulet	E 457550 N 5283280	SF	*E. reg E. vim*	E1b	o/m wet scl.	84	83, 83	1600
Hunns Creek	E 455020 N 5294280	SF	*E. reg*	E1a	mature wet scl.	83	82, 81	1800
Styx 015B	E 474750 N 5258150	SF	*E. reg*	E1c	o/m mixed & wet scl.	81	77, 76	1600
Junee	E 467300 N 5269200	SF	*E. reg*	E1c	c/o o/m mixed	79	–	1600/ 1934
Pagoda	E 454550 N 5294800	SF	*E. reg*	E1a	mature mixed	79	78, 76	1800
Bennetts Road	E 486900 N 5221200	SF	*E. reg*	E1d	o/m wet scl.	79	–	1600
Lady Binney	E 460250 N 5270250	SF	*E. obl*	E1f	o/m mixed	75	74, 73	1600
Mount Field	E 474700 N 5274850	NP	*E. reg*	E1c	o/m wet scl.	75	71, 70	1600
Twin Lakes	E 454800 N 5295850	SF	*E. reg*	E1c	mature mixed	74	70, 64	1700
Florentine Road	E 455400 N 5282150	SF	*E. reg*	E1b	o/m mixed	71	68, 66	1600
Arve Loop	E 480400 N 5224300	SF	*E. reg*	E1d	o/m wet scl.	71	71, 68	1600
Styx 009B	E 467550 N 5258300	SF	*E. reg*	E1c	o/m mixed	70	–	1600
Arve Spur 2	E 479120 N 5227200	SF	*E. reg*	E1c	o/m wet scl.	70	65, 63	1600
Arve Road	E 480400 N 5224300	SF	*E. reg E. glob*	E1d/ ER4c	o/m and regrowth wet scl.	60	–	1600/ 1934

[1] *E. reg = E. regnans, E. del = E. delegatensis, E. obl = E. obliqua, E. vim = E. viminalis, E. glob = globulus.* Note that measurements pertain to the first listed species for each stand.

[2] E1 average height > 55 m; a = 70–100% crown cover, b = 40–70% crown cover, c = 20–40% crown cover, d = 5–20% crown cover, f < 5% crown cover.

[3] c/o = cutover; o/m = overmature; mixed = rainforest understorey below eucalypts; wet scl. = wet sclerophyll (broad-leaved shrub) understorey.

is considered low as no details of measurement methods are available.

Table 3 compares repeated theodolite measurements of the tallest tree in the Andromeda stand and the previously recognised, but no longer the tallest, 'Big Tree' at the Styx Big Tree stand. The trees have declined in height by 11 m and 9 m respectively over four decades.

Discussion

The location and measurement of extremely tall trees, even within the 700 ha area identified in this study, is a formidable task, let alone amongst thousands of hectares of E1 forest in remote areas. It is quite likely that equally tall, or taller trees, occur even within the sampled area. It is hoped that publication of the findings of this study will promote interest in accurate, opportunistic measurement of tall trees that can be tested for their significance with these findings.

New records should be based on sound procedures. Estimating heights of tall trees in dense forests is affected by poor visibility, sloping trees, irregular tree tops which are not centred over the base, and uncertainty in defining the tree base due to sloping ground or an accumulation of peat and debris over centuries. For these reasons, the authors believe that heights given to a fraction of a metre are highly spurious. The best measurements are those where the observer is at least a tree length from the tree. This was achieved in only two of the ten measurements recorded in Appendix 1. Even so, the 92 m and 89 m trees ranked first and fourth in Appendix 1 have been subsequently verified by an independent surveyor (Bevilacqua 2000) using a theodolite. The 90 m tree ranked third has also been confirmed by a subsequent theodolite measurement (M. Giudici, pers. comm.)

Photo 2. Present-day trees from the Andromeda stand. These trees are thought to have originated in about 1710. (Composite photo)

Photo 3. The 92 m Eucalyptus regnans *at the Styx Big Tree stand. This tree is 100 m south of the commonly recognised Big Tree (now 89 m but measured at 98 m in 1957). The 92 m tree was identified when the arborists climbed the Big Tree and noted a bigger tree nearby.*

The comparison of the tallest existing and tallest ever eucalypt trees is interesting. It shows that the tallest tree standing today is 9 m shorter than that ever recorded in Tasmania, or 7 m if the low reliability

Table 3. Repeated theodolite measurements of tall trees in the Styx Valley.

Year	Andromeda stand	Styx Big Tree stand	Surveyor
1957		98	R. Terry
1962	99	95	L. Davey
2000	88	89	D. Potter

records are discounted. This is in marked contrast to Victoria where the currently tallest tree is at least 24 m and possibly as much as 61 m less than the tallest ever recorded tree in that State. Hence, it might be concluded that Tasmania still has trees that are approximately as tall as those that existed prior to European settlement, although it now has fewer of them.

Most of the current tallest trees in Tasmania are around 400 years old and senescing at a rate of perhaps 3 m in height per decade, and this decline will become more rapid once the trees reach their likely maximum

Photo 4. The Arve Big Tree is the most massive of the tallest existing trees.

life span of 450 years (Photo 5). Their timber is relatively non-durable (Boland *et al.* 1984) so once they die they will probably lose height fairly quickly. This time can be estimated from the observation that fire-killed stags from the 1966/67 fires in southern Tasmania are still prominent in the landscape whereas stags from the 1934 fire are much less evident; many have fallen and those that still stand have lost their limbs and much of their height. Hence, stags will only remain prominent for a period of about 50 years. The Styx Big Tree stand is overmature mixed forest and, if it remains undisturbed, will probably become rainforest within the next century, according to the successsional pathway described by Gilbert (1959). The Andromeda stand
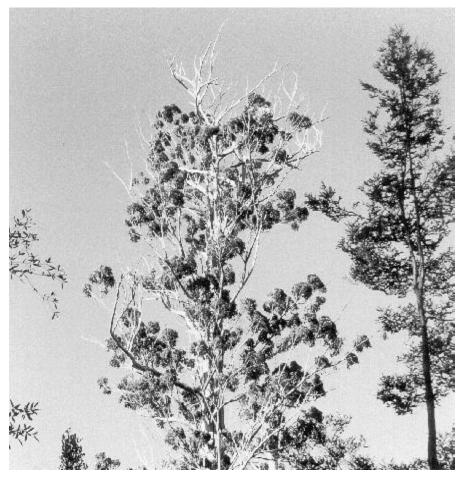
Photo 5. The declining overmature crown of the Arve Big Tree.

(Photo 2) contains 290- and 440-year-old trees; most of the younger trees may still be alive after another century without disturbance.

The Coles Creek, Three Huts and Hunns Creek stands are around 200 years old and, in the absence of fire, disease or disturbance should remain tall for another two centuries. The Coles Creek stand (Photo 6) lies within a large patch of 200-year-old *E. regnans* in the World Heritage Area and will probably contain Tasmania's tallest tree as older, taller trees decline elsewhere.

Beyond 200 years, Tasmania's tallest trees will be found in areas that are currently, or not yet established, regrowth. Ashton (1976) reports that the height growth of *E. regnans*

over a period of four to 200 years can be summarised by the equation*

$$Ht = - 0.37 + 2.78 \, (\ln age)^2.$$

The predicted height growth is shown in Figure 2. Regrowth may arise either from wildfires or after silvicultural regeneration. In order to become extremely tall, the regrowth will need to occur on favourable sites and be undisturbed for perhaps two hundred years, although most of the potential height is achieved in the first century (Ashton 1976).

The protection of the very tallest trees is primarily a natural heritage rather than a

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* Age and height appear to have been mistakenly transposed in Ashton's paper and were reversed in the equation presented here.
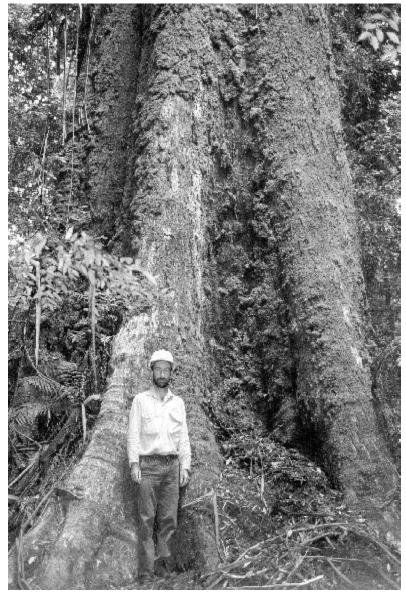
Photo 6. An 86 m mature Eucalyptus regnans *in the Coles Creek catchment. This stand was particularly aesthetic due to the health of the trees, their density and the sparse ground cover under a tall subcanopy of rainforest.*

biodiversity issue. The reservation of tall forests, but not necessarily the tallest trees, has been most recently addressed under the 1997 Tasmanian Regional Forest Agreement. Under the Agreement, 16 230 ha of *E. regnans*, 107 520 ha of tall *E. obliqua* forest and 86 780 ha of tall *E. delegatensis* forest are in a designated Comprehensive, Adequate and Representative reserve system

(Commonwealth of Australia and State of Tasmania 1997). The tallest trees have the aesthetic qualities of majestic stature, grandeur and apparent age (Commonwealth of Australia 1988) and merit protection, but their conservation should be considered separately from biodiversity conservation because they are unlikely to support elements of the biota that are not already
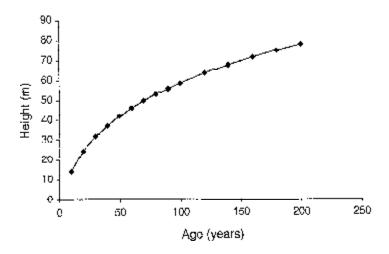
Figure 2. Modelled height growth for Eucalyptus regnans *(after Ashton 1976).*

adequately reserved. The permanent protection of a stand of tallest trees may be inappropriate when the stand senesces and becomes no longer tall or is killed by a wildfire. Aesthetic values would be better met, at least for the next century or two, by protecting younger trees elsewhere with a potential to grow extremely tall. Hence, the natural heritage values of the tallest trees may best be met by a system of rotational reserves as suggested by Ellis (1987), whereas biodiversity needs are usually best met by large permanent reserves. Four of the trees in Appendix 1 are in areas listed for permanent reservation (the Styx Big Tree stand is to become a Forest Reserve); the remainder have protection for the period that they remain extremely tall.

Forestry Tasmania has a policy of protecting the tallest trees, at least while they are 85 m tall (Forestry Tasmania 2000). The policy prescribes surveys for trees at least 85 m tall in coupes planned for harvesting in areas with a likelihood of containing extremely tall trees. Because the notional rotation age for eucalypt forests extensively managed for wood production is about 90 years (Whiteley 1999) and Figure 2 indicates that trees will have attained only 70% of their potential height (at 200 years) at rotation time, very tall trees will rarely occur in future silvicultural regeneration. However,

regrowth stands that are exceptionally tall for their age could be identified in wood production areas as Tall Tree Management Zones. These zones are for longer rotation areas that are designated under a land classification system for State forests (Orr and Gerrand 1998) for appreciation of tall forests. About 15 zones, ranging in size from about 10 to 400 ha have been designated to date.

Conclusion

This study has provided a reliable current estimate of 92 m for the tallest known tree in Tasmania, which exceeds the heights of the tallest hardwoods reliably reported elsewhere, including 91 m for *E. regnans* in Victoria (Mace 1996) and 85 m for *E. diversicolor* in Western Australia (Carder 1995). A planted *E. saligna* in South Africa is reputed to be 96 m tall (www.csir.co.za/environmentek/eucbreed/ records.html) but has not been accurately measured. It appears that the 92 m tree in the Styx Big Tree stand is currently the world's tallest flowering plant, at least in natural forest. This study has also shown that extreme tallness is not confined to *E. regnans,* with individuals of *E. delegatensis* (90 m) and *E. viminalis* (91 m) being virtually as tall.

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Note added in proof

In January 2001, Brett Misfud reported two additional 90+ m trees at the Andromeda stand and a 90+ m tree about 650 m south of the Andromeda stand. These trees were measured subsequently by Michael Giudici, a licensed surveyor, and their details are shown in Table 4. The table can be used to update Appendix 1 and indicates trees that are ranked second, fourth and sixth on the basis of size (height/diameter).

Table 4. Theodolite measurements and location of three trees measured in January 2001.

Ht (m)	DBH (cm)	Species	Grid ref (GPS)	Location	Measurer	Horizontal distance (m)
91	380	*E. regnans*	E 475028 N 5261037	Andromeda stand	M. Giudici	68
90	330	*E. regnans*	E 475022 N 5260960	Andromeda stand	M. Giudici	62
90	291	*E. regnans*	E 475338 N 5260381	Jacques Road	M. Giudici	60

Photo 7. A 91 m Eucalyptus regnans *at the Andromeda stand. This is the tree shown in Photo 1, which was first measured in 1962. Since then, it has lost height and most of its crown.*

Appendix 1. Register of the ten tallest existing trees in Tasmania. (n.a. = not available)

Ht (m)	DBH (cm)	Species	Grid reference	Location	Walking track	Date	Measurers	Instrument	Horizontal distance (m)
92	472	E. regnans	E 471900 N 5259530	Styx Valley Big Tree stand	No	9/5/2000	P. Kostoglou J. Potter[1]	theodolite	50
91	330	E. viminalis	E 581387 N 5415937	Evercreech Forest Reserve	Yes	19/5/2000	E. Tuohy	theodolite	77
90	307	E. delegatensis	E 451250 N 5296060	Lower Coles Road (State forest)	No	13/4/2000	P. Kostoglou J. Hickey	laser	100
89	386	E. regnans	E 471942[2] N 5259618	Styx Valley Big Tree stand	Yes	13/4/2000	P. Kostoglou J. Potter[1]	theodolite[3]	40
88	362	E. regnans	E 475015[2] N 5260962	Andromeda stand	No	8/5/2000	P. Kostoglou J. Potter[1]	theodolite	45
87	163	E. regnans	E 458042 N 5285633	Three Huts stand	No	13/4/2000	P. Kostoglou J. Hickey	laser	45
87	544	E. regnans	E 481994 N 5222118	Arve Big Tree stand	Yes	11/5/2000	P. Kostoglou J. Potter[1]	theodolite[3]	50
86	175	E. regnans	E 458042 N 5285678	Three Huts stand	No	2/5/2000	P. Kostoglou B. Tewson	laser	40
86	166	E. regnans	E 449380 N 5288740	Coles Creek stand (World Heritage Area)	No	4/5/2000	P. Kostoglou J. Hickey	laser	40
85	295	E. delegatensis	E 450900 N 5295800	Lower Coles Road stand	No	12/5/2000	P. Kostoglou J. Hickey	laser	120

[1] Licensed surveyor.
[2] GPS measurement.
[3] Measurement verified by climber-deployed tape by Tom Greenwood and Kim Knight.

Appendix 2. Register of the ten tallest trees ever recorded in Tasmania. (n.a. = not available)

Ht (m)	Tree Name	Species	Location	Date	Source	Measurer	Instrument	Reliability
101	Lady Franklin Tree	E. globulus	Mt Wellington	n.a.	Lewin (1906)	n.a.	n.a.	low
101		E. globulus	Huon River Geeveston	n.a.	Lewin (1906)	n.a.	n.a.	low
99[1]		E. regnans	Andromeda stand	1962	Berrigan (1992)	L. Davey	theodolite	high
98[1]		E. regnans	Andromeda stand	1962	Berrigan (1992)	L. Davey	theodolite	high
98[1]		E. regnans	Andromeda stand	1962	Berrigan (1992)	L. Davey	theodolite	high
98[1]	Big Tree	E. regnans	Styx Valley, Big Tree stand	1957	Berrigan (1992)	R. Terry	theodolite	high
97	Irby Tree	E. globulus	Unknown	n.a.	Irby (1925)	n.a.	n.a.	low
96[1]		E. regnans	Andromeda stand	1962	Berrigan (1992)	L. Davey	theodolite	high
94[1]		E. regnans	Andromeda stand	1962	Berrigan (1992)	L. Davey	theodolite	high
94[1]		E. regnans	Andromeda stand	1962	Berrigan (1992)	L. Davey	theodolite	high

[1] Still standing but with height reduced.