

1 Ecosphere

2 Seedling growth responses to species, neighborhood and landscape scale effects during
3 tropical forest restoration

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8 Appendix S1

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10 **Table S1** List of species (grouped by family in alphabetical order) with respective traits and
11 successional stage status used in diversity treatments in the rainforest restoration project.

12 Diversity treatments included: monoculture (1), six species (6) and twenty-four species (24).

13 *Values obtained by Chave et al. (2009) and Zanne et al. (2009). **Information obtained

14 from Kooyman (1996), Warboys (2006) and Goosem and Tucker (2013). ***Information

15 obtained from (Cooper and Cooper 2004). ****Information obtained from (Royal Botanic

16 Gardens Kew 2017). ^Φ Seed mass for *Melicope jonesii* was obtained via direct measurements

17 of voucher specimens. ^Ψ *Syzygium kuranda* was substituted for *Syzygium cormiflorum* when

18 *S. cormiflorum* was not available.

Species	Family	Wood density (g/cm ³)*	Successional Stage **	Maximum tree height (m) ***	Seed mass (mg) ****	Diversity treatment
<i>Cryptocarya oblata</i>	Lauraceae	0.474	Mature	35	7650	24
<i>Endiandra sankeyana</i>	Lauraceae	0.680	Mature	30	5600	24
<i>Litsea leefeana</i>	Lauraceae	0.421	Late secondary	30	600	24
<i>Neolitsea dealbata</i>	Lauraceae	0.498	Early	15	146	6, 24
<i>Ficus congesta</i>	Moraceae	0.381	Early	6	0.32	24
<i>Ficus destruens</i>	Moraceae	0.420	Mature	40	0.40	24
<i>Ficus obliqua</i>	Moraceae	0.521	Mature	50	0.44	24
<i>Ficus septica</i>	Moraceae	0.421	Early	15	0.21	6, 24
<i>Acmena resa</i>	Myrtaceae	0.676	Mature	40	551.3	24

<i>Rhodamnia sessiliflora</i>	Myrtaceae	0.839	Early	10	30	24
<i>Syzygium cormiflorum</i>	Myrtaceae	0.672	Mature	30	11307	6
<i>Syzygium kuranda</i> ^w	Myrtaceae	0.581	Mature	35	5321.3	24
<i>Syzygium luehmannii</i>	Myrtaceae	0.607	Mature	35	54	24
<i>Cardwellia sublimis</i>	Proteaceae	0.464	Late secondary	35	582	6, 24
<i>Darlingia ferruginea</i>	Proteaceae	0.517	Early	30	385	24
<i>Lomatia fraxinifolia</i>	Proteaceae	0.839	Late secondary	25	25	24
<i>Stenocarpus sinuatus</i>	Proteaceae	0.646	Mature	40	20.2	24
<i>Acronychia acidula</i>	Rutaceae	0.551	Late secondary	27	89	24
<i>Flindersia brayleyana</i>	Rutaceae	0.481	Late secondary	35	35	1, 6, 24
<i>Melicope elleryana</i>	Rutaceae	0.524	Early	35	1.61	24
<i>Melicope jonesii</i>	Rutaceae	0.516	Early	35	7.7 ^Φ	24
<i>Castanospora alphandii</i>	Sapindaceae	0.607	Late secondary	45	2765	6, 24
<i>Guioa acutifolia</i>	Sapindaceae	0.607	Early	20	33	24
<i>Guioa lasioneura</i>	Sapindaceae	0.536	Early	15	49	24
<i>Mischocarpus lacnocarpus</i>	Sapindaceae	0.697	Late secondary	20	59	24

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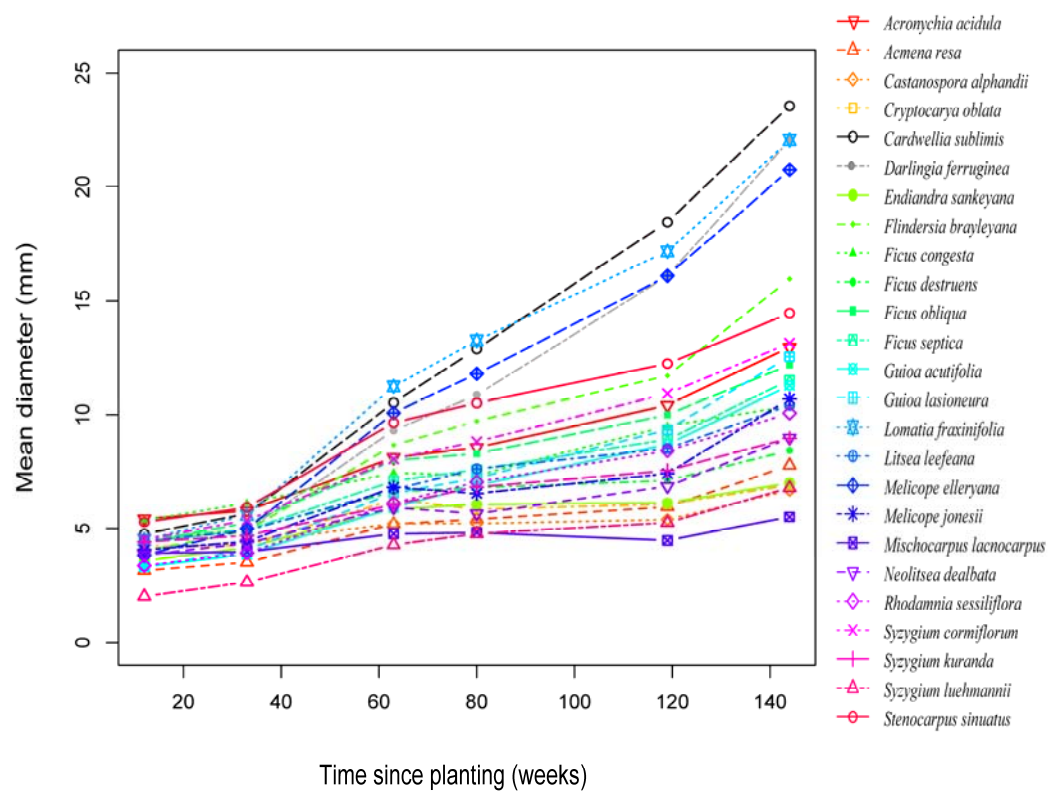
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34 **Figure S1** Changes in mean diameter (mm) over time (weeks) for 25 tropical tree species,
 35 planted in pastures on the Thiaki Creek Nature Reserve, Queensland, Australia.

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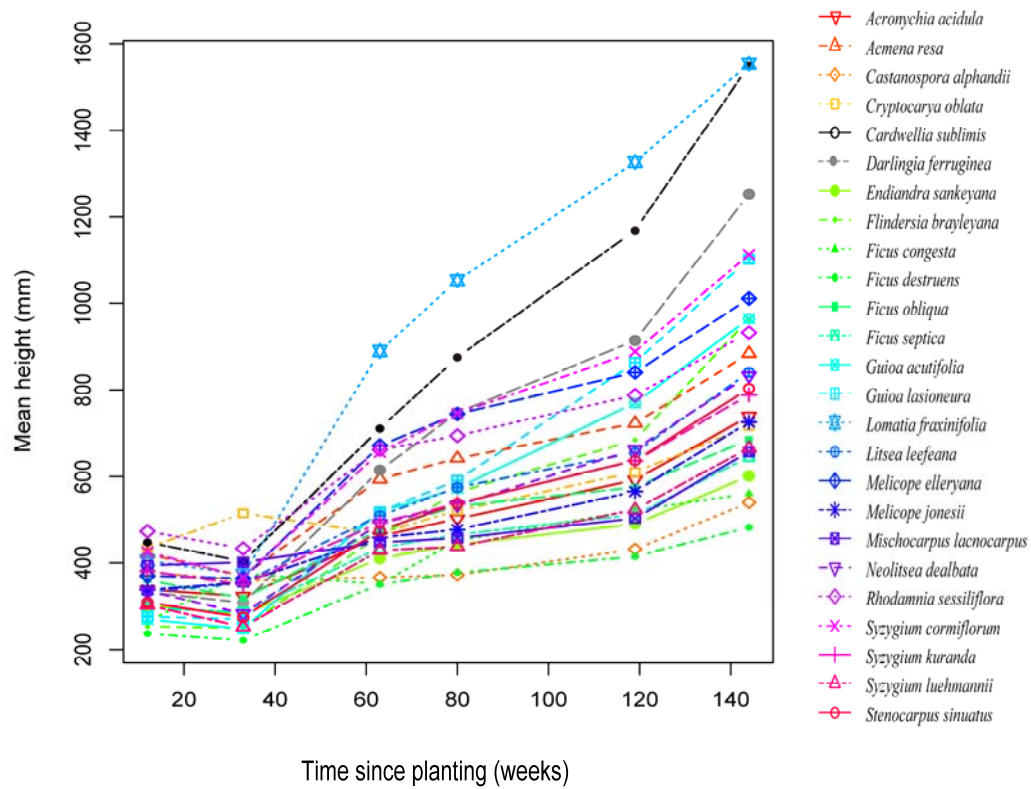
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48 **Figure S2** Changes in mean height (mm) over time (weeks) for 25 tropical tree species,
 49 planted in pastures on the Thiaki Creek Nature Reserve, Queensland, Australia.

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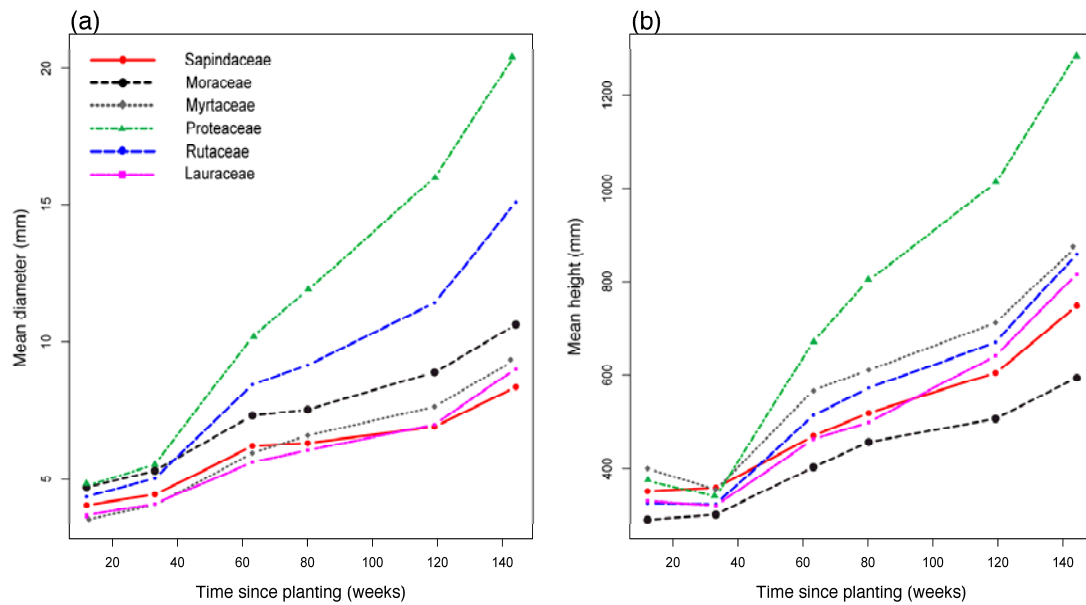
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61 **Figure S3** Changes in mean a) diameter (mm) and b) height (mm) over time (weeks) for six
62 seedling families planted in pastures on the Thiaki Creek Nature Reserve, Queensland,
63 Australia.

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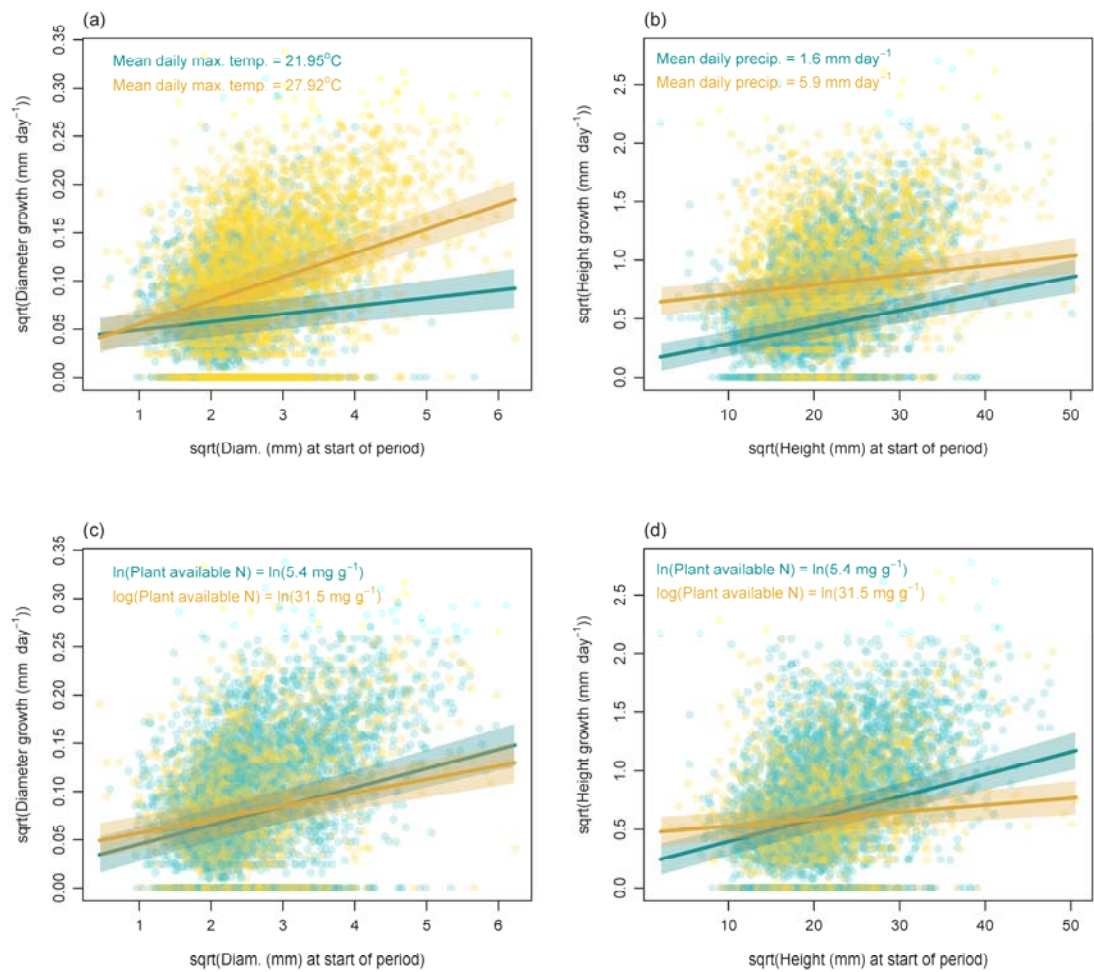
Table S2 Relative mean diameter and height growth rates (mm day^{-1}) \pm Standard deviation (SD) during 27 months post planting for 25 tropical tree species, planted in pastures on the Thiaki Creek Nature Reserve, Queensland, Australia. Species are ordered by family.

Species	Family	Mean diameter growth rate ($\text{mm day}^{-1} \pm \text{SD}$)	Mean height growth rate ($\text{mm day}^{-1} \pm \text{SD}$)
<i>Cryptocarya oblata</i>	Lauraceae	0.0021 ± 0.011	0.2013 ± 1.04
<i>Endiandra sankeyana</i>	Lauraceae	0.0061 ± 0.012	0.5206 ± 0.95
<i>Litsea leefeana</i>	Lauraceae	0.0085 ± 0.015	0.5858 ± 1.16
<i>Neolitsea dealbata</i>	Lauraceae	0.0064 ± 0.013	0.656 ± 1.190
<i>Ficus congesta</i>	Moraceae	0.0086 ± 0.015	0.0529 ± 1.27
<i>Ficus destruens</i>	Moraceae	0.0072 ± 0.01	0.4862 ± 0.53
<i>Ficus obliqua</i>	Moraceae	0.0122 ± 0.016	0.543 ± 0.870
<i>Ficus septica</i>	Moraceae	0.0107 ± 0.024	0.5771 ± 1.36
<i>Acmena resa</i>	Myrtaceae	0.0087 ± 0.011	0.8916 ± 1.17
<i>Rhodamnia sessiliflora</i>	Myrtaceae	0.0112 ± 0.015	0.8041 ± 1.27
<i>Syzygium cormiflorum</i>	Myrtaceae	0.0141 ± 0.017	1.1688 ± 1.39
<i>Syzygium kuranda</i>	Myrtaceae	0.0064 ± 0.011	0.6805 ± 0.81
<i>Syzygium luehmanna</i>	Myrtaceae	0.0085 ± 0.010	0.6303 ± 0.68
<i>Cardwellia sublimis</i>	Proteaceae	0.0295 ± 0.027	1.5303 ± 1.57
<i>Darlingia ferruginea</i>	Proteaceae	0.0327 ± 0.034	2.1139 ± 2.31
<i>Lomatia fraxinifolia</i>	Proteaceae	0.0278 ± 0.032	1.9182 ± 2.41
<i>Stenocarpus sinuatus</i>	Proteaceae	0.0156 ± 0.018	0.8191 ± 1.04
<i>Acronychia acidula</i>	Rutaceae	0.0114 ± 0.018	0.6026 ± 1.16
<i>Flindersia brayleyana</i>	Rutaceae	0.0183 ± 0.023	1.0719 ± 1.67
<i>Melicope elleryana</i>	Rutaceae	0.0313 ± 0.030	1.3312 ± 1.64
<i>Melicope jonesii</i>	Rutaceae	0.0027 ± 0.005	0.2371 ± 0.73
<i>Castanospora alphandii</i>	Sapindaceae	0.0023 ± 0.010	0.0178 ± 0.83
<i>Guioa acutifolia</i>	Sapindaceae	0.0133 ± 0.014	1.3294 ± 1.74
<i>Guioa lasioneura</i>	Sapindaceae	0.0150 ± 0.018	1.4741 ± 2.12
<i>Mischocarpus lacnocarpus</i>	Sapindaceae	0.0026 ± 0.007	0.2475 ± 0.81

Table S3 Pairwise comparisons of species diameter and height growth between diversity treatments for seedlings 31 months post planting.

Pairwise comparisons	Estimate	SE	z-value	P
Seedling diameter				
Twenty four species - six species	0.072	0.068	1.06	0.539
Seedling height				
Twenty four species - six species	3.671	4.785	0.767	0.723

Figure S4 Relationship between seedling growth rates (mm day^{-1}) and initial stem size with climatic and edaphic factors: a) diameter growth for species under low and high mean daily maximum temperatures ($^{\circ}\text{C}$), b) height growth for species under low and high mean daily precipitation (mm), c) diameter growth for species in plots with low and high concentrations of inorganic Nitrogen (mg g^{-1}), and d) height growth for species in plots with low and high concentrations of inorganic Nitrogen (mg g^{-1}). Coloured points represent the values below (green) and above (gold) the mean of the climatic and edaphic variables included in the interaction with initial stem size. The fitted lines show relationships for the 10th and 90th percentile of temperature, precipitation and Nitrogen values. Other explanatory variables not included in the plotted interactions were held at their means during line fitting. Shaded bands represent 95% confidence intervals.



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123 **References for supporting information**

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