Supplementary information (Nyirambangutse et al.)**:**

Table S1. Biomass and tree turnover properties of all plots. Breast height diameter (D) are measured or calculated from diameter measurements above any stem irregularities. Height (H) was measured on 930 trees to obtain coefficients to calculate H (presented here) from D of all trees. No of stems, basal area (BA), mean D, mean height (H), stem biomass and production (prod) were based on data from all trees > 5 cm D_{BH}. Big trees are > 40 cm D. Stem biomass was calculated from eq. 3 based on four different combinations of species specific (Spec.) and generic (Gen.) H vs D relationships and wood densities (ρ). Mortality and recruitment rate were calculated from eq. 10 and 11 respectively. Successional index was calculated from eq. 9.

Plot no	No of stems (ha⁻¹)	BA (m² ha⁻¹)	D (cm) Mean	D (cm) Max	H (m) Mean	H (m) Max	H of 100 highest trees ha⁻¹ (m)	# big trees, D > 40 cm	Above ground biomass (Mg ha⁻¹) Spec. H, ρ	Gen. H, spec. ρ	Spec. H, gen ρ	Gen. H, ρ	Stem prod. Biomass (Mg ha⁻¹ yr⁻¹)	RGR (% yr⁻¹)	ρ (g cm⁻³)	Mortality rate	Recruitment rate	Successional index$_{BA}$	Successional index$_\#$
1	732	20.3	14.8	81.0	13.7	31.2	21.7	26	142	148	165	161	7.3	6.7	0.53	1.7	4.8	0.050	0.084
2	850	28.4	17.5	81.3	15.7	29.8	22.2	28	182	190	226	233	9.3	4.9	0.47	1.0	4.3	0.012	0.0093
3	678	20.2	15.4	78.4	14.5	34.5	22.0	40	148	152	172	162	6.7	9.7	0.49	1.0	14.1	0.057	0.0086
4	1220	33.2	15.6	98.8	14.8	31.2	22.9	30	248	251	271	272	4.5	2.3	0.51	0.5	1.5	0.178	0.103
5	530	22.3	19.1	78.7	16.1	31.7	22.4	40	153	159	190	198	4.0	6.0	0.46	0.7	3.1	0.021	0.019
6	338	21.2	21.7	86.9	15.1	31.8	22.8	62	157	170	193	199	3.4	5.6	0.51	1.2	5.2	0.002	0.011
7	466	30.4	18.9	131.4	13.5	30.8	24.3	58	300	322	301	316	4.2	6.9	0.51	2.7	5.6	0.549	0.071
8	484	36.9	23.0	126.1	16.7	38.0	26.3	70	342	346	379	376	7.5	5.3	0.49	1.4	4.3	0.209	0.079
9	336	27.1	22.0	105.9	15.6	33.3	23.6	46	279	298	273	287	4.3	5.9	0.52	1.7	5.3	0.349	0.092
10	1798	45.1	14.2	69.0	13.4	33.6	25.9	68	392	393	370	371	7.9	2.1	0.62	0.8	0.4	0.598	0.518
11	536	60.9	28.3	102.2	18.7	37.7	33.0	172	793	743	699	650	8.1	2.9	0.59	1.3	0.7	0.888	0.398
12	446	17.5	16.3	79.6	13.0	29.0	21.7	28	159	170	156	165	3.3	5.6	0.56	1.7	2.6	0.575	0.217
13	1080	26.4	13.9	65.3	14.2	29.6	26.1	32	229	217	231	213	7.0	4.2	0.58	1.6	1.7	0.383	0.234
14	596	31.2	19.0	106.2	15.7	38.8	28.7	66	343	319	326	298	4.4	4.2	0.62	1.6	2.2	0.559	0.294
15	812	26.0	15.3	85.5	13.7	35.5	25.0	46	245	245	232	225	4.2	3.8	0.62	1.6	1.3	0.617	0.246
Mean	727	29.8	18.3	91.8	15.0	33.1	24.6	54	274	275	279	275	5.7	5.1	0.5	1.4	3.8	0.336	0.159

Table S2. Properties of all species identified within the 15 plots at census I (2011/2012) and II (2014/2015). Wood density (ρ) was obtained from measurements of the most common species, indicated by # for number of sampled trees and standard deviation (SD) of the mean. Wood density from other species are from the global wood density databases (Chave et al 2009, Zanne et al 2009). Breast height diameter (*D*) were measured or calculated from diameter measurements above any stem irregularities. Height (*H*) was measured on 930 trees among the most common species (see Table S3) to obtain coefficients to calculate *H* (presented here) from *D* of all trees. No of living, new and dead represents the classification in census II (2015). Rank represents the most abundant species based on no of stems, basal area (BA) and relative growth rates (RGR). The BAs are based on all 15 plots (7.5 ha).

Species	ρ (g cm^{-3}) #	Mean	SD	*D* (cm) Mean	Max	*H* (m) Mean	Max	Stem biomass (kg) Mean	Max	Number of trees Living	New	Dead	Rank # stems	BA	RGR	BA (m^2 ha^{-1})	No of big trees, *D* > 40 cm	RGR (% yr^{-1})
Afrocrania volkensii	2	0.53	± 0.00	17.3	58.6	19.0	29.6	276	2812	119	1	3	11	13	33	0.504	3	4.6
Agauria salicifolia	2	0.53	± 0.02	20.8	62.0	14.3	24.3	347	2555	82		2	13	11	81	0.559	10	0.3
Alangium chinense		0.40		8.7	12.5	10.7	13.6	27	49	2	1		70	75	8	0.002		9.5
Albizia gummifera		0.53		6.7	6.7	9.4	9.4	13	13	1			76	80	64	0.0005		2.1
Alchornea hirtella		0.53		5.7	8.9	8.6	11.2	9	27	138	22	13	10	39	42	0.053		4.2
Anthocleista grandiflora		0.58		22.7	57.4	17.0	27.9	607	2754	6			55	41	68	0.051	1	1.9
Antidesma venenosum		0.65		16.9	31.7	15.3	21.9	232	762	7			54	51	59	0.026		2.6
Apodytes dimidiata		0.61		16.3	50.3	14.1	26.6	336	2137	16		1	38	34	37	0.081	1	4.2
Balthasarea schliebenii		0.59		28.0	60.5	19.3	28.4	824	3169	6			56	36	54	0.067	1	2.9
Beilschmiedia rwandensis	5	0.68	± 0.01	31.5	78.0	14.4	26.8	1452	5627	16			39	19	70	0.287	5	1.9
Bersama abyssinica		0.62		30.9	81.3	11.8	19.9	1145	4173	4			63	35	38	0.078	1	4.2
Bridelia brideliifolia		0.55		14.6	38.9	14.1	23.9	163	1063	14			40	44	63	0.042		2.5
Carapa grandiflora	8	0.57	± 0.08	12.8	73.9	13.5	27.6	196	4431	266	14	2	4	8	18	0.786	9	6.3
Casearia runssorica		0.63		14.1	39.6	12.7	26.7	222	1383	11	1		45	47	65	0.035		2.3
Cassipourea gummifera		0.63		9.7	9.7	11.7	11.7	40	40	1			77	77	60	0.001		2.6
Cassipourea ndando		0.63		6.8	9.6	9.5	11.7	18	39	5			59	71	12	0.003		7.7
Cassipourea ruwensoriensis		0.63		13.0	43.9	12.6	25.2	199	1608	21	5		36	37	20	0.063	1	6.1
Cassipourea spp		0.63		13.1	39.6	13.1	24.1	175	1261	11			46	48	36	0.030		4.3
Chassalia subochreata		0.59		5.8	8.6	8.7	10.9	11	28	37	1	3	26	57	44	0.015		3.9
Chionanthus africanus	4	0.53	± 0.03	9.7	38.8	10.8	24.2	61	1033	80	4	2	14	28	25	0.111		5.2
Chrysophyllum gorungosanum		0.54		21.1	36.0	17.0	23.2	341	861	10			52	38	57	0.059		2.6
Chrysophyllum rwandense		0.65		37.7	55.0	25.6	31.8	1692	3251	10			53	25	67	0.176	6	2.1

Species	ρ (g cm^{-3})			D (cm)		H (m)		Stem biomass (kg)		Number of trees			Rank			BA (m^2 ha^{-1})	No of big trees, D > 40 cm	RGR (% yr^{-1})
	#	Mean	SD	Mean	Max	Mean	Max	Mean	Max	Living	New	Dead	# stems	BA	RGR			
Cleistanthus polystachyus	8	0.63	± 0.09	27.4	75.2	20.9	38.8	1033	7025	71	3		16	7	49	0.790	16	3.5
Cremaspora triflora		0.59		9.5	17.1	11.3	16.1	49	155	12	1	1	44	58	32	0.015		4.8
Dasylepis racemosa		0.64		6.6	7.4	9.3	10.0	16	21	2			71	78	24	0.001		5.2
Dichaetanthera corymbosa		0.59		16.0	37.0	14.9	23.4	186	1005	26		2	30	31	47	0.092		3.6
Drypetes gerrardii		0.70		20.3	29.0	17.0	21.0	368	667	2			72	60	77	0.010		0.8
Drypetes occidentalis		0.71		6.8	9.6	9.4	11.7	21	44	4			64	74	11	0.002		7.8
Ekebergia capensis		0.47		14.5	126.1	13.0	34.8	420	12955	35	2	2	27	21	66	0.229	1	2.2
Erica johnstonii		0.59		16.4	16.4	15.8	15.8	140	140	1			78	70	80	0.003		0.5
Faurea saligna	3	0.76	± 0.03	54.8	102.2	29.0	37.7	4512	14936	49			20	3	79	1.804	38	0.5
Ficalhoa laurifolia	3	0.60	± 0.03	27.0	71.0	23.6	36.8	943	5689	66		6	18	9	74	0.735	14	1.2
Ficus oreadum		0.41		6.7	10.5	9.3	12.3	12	32	5	2		60	72	1	0.003		19.8
Galiniera coffeoides		0.59		7.8	18.8	10.1	16.9	28	195	241	36	13	5	23	23	0.185		5.7
Garcinia volkensii		0.73		13.1	30.5	13.4	21.5	140	785	39	1		24	33	50	0.086		3.0
Grewia mildbraedii		0.56		9.8	35.2	11.3	22.9	76	844	17			37	52	4	0.025		11.5
Hagenia abyssinica		0.57		17.9	55.9	14.8	27.6	369	2535	11	6	5	47	32	17	0.089	2	6.9
Harungana montana	2	0.53	± 0.06	31.6	86.9	20.0	31.8	1080	6438	44	5	2	21	10	10	0.701	11	8.2
Ilex mitis	2	0.51	± 0.02	15.7	67.7	14.3	27.0	268	3277	77	4	1	15	17	75	0.360	7	1.2
Ixora burundiensis		0.79		10.9	21.6	12.2	18.2	95	367	28	1	1	28	43	56	0.044		2.7
Lepidotrichilia volkensii		0.59		7.0	8.7	9.6	11.0	17	29	6			57	68	51	0.003		3.0
Lindackeria kivuensis		0.56		7.0	8.3	9.6	10.7	16	24	4	1		65	73	5	0.002		11.3
Macaranga kilimandscharica	9	0.44	± 0.03	15.9	70.7	15.4	24.5	158	2762	1977	245	58	1	2	9	7.468	59	8.2
Maesa lanceolata		0.68		10.2	20.0	6.0	10.0	37	150	26	3	5	31	46	28	0.040		5.1
Magnistipula butayei		0.59		9.7	12.1	11.6	13.3	41	65	4			66	67	22	0.004		5.5
Maytenus acuminata	2	0.74	± 0.02	10.6	54.1	11.9	21.4	96	2401	236	10	5	6	14	61	0.374	1	2.6
Maytenus undata		0.73		14.0	54.1	13.4	27.3	287	3023	14			41	42	45	0.049	1	3.7
Memecylon walikalense		0.77		13.9	29.1	13.4	21.0	219	732	14	2		42	45	31	0.041		5.0
Myrianthus holstii		0.47		14.9	29.7	14.1	21.2	148	475	6			58	55	19	0.019		6.1
Neoboutonia macrocalyx		0.33		7.6	13.6	9.9	14.2	17	50	4	1		67	69	2	0.003		17.6

Species	ρ (g cm^{-3})			D (cm)		H (m)		Stem biomass (kg)		Number of trees			Rank			BA (m^2 ha^{-1})	No of big trees, $D >$ 40 cm	RGR (% yr^{-1})
	#	Mean	SD	Mean	Max	Mean	Max	Mean	Max	Living	New	Dead	# stems	BA	RGR			
Newtonia buchananii		0.50		6.2	6.2	9.0	9.0	10	10	1			79	81	39	0.000		4.1
Nuxia congesta		0.68		17.4	29.1	15.9	21.0	221	647	25		2	32	30	71	0.095		1.7
Ochna afzelii		0.75		11.9	19.5	12.8	17.3	110	269	3			69	66	34	0.005		4.6
Ocotea kenyensis	4	0.52	± 0.11	26.5	99.1	17.8	38.0	1042	9822	67	4	1	17	6	15	0.902	14	6.5
Ocotea usambarensis	4	0.49	± 0.05	15.2	106.2	13.3	34.6	313	9677	195	10	2	8	5	27	0.971	13	5.1
Olea capensis		0.77		27.4	71.3	17.4	30.0	1491	6006	11		2	48	24	76	0.184	4	0.8
Olinia rochetiana	1	0.71		19.6	103.6	15.0	33.3	785	12741	62	7	3	19	12	41	0.538	6	4.2
Oricia renieri		0.59		7.2	12.6	9.8	13.6	20	72	11	1	1	49	64	21	0.007		5.8
Oxyanthus speciosus		0.53		5.0	5.0	7.9	7.9	6	6	1	1		80	83	30	0.000		6.5
Oxyanthus spp		0.53		16.8	28.0	14.6	20.7	234	461	1		1	81	63	29	0.009		4.8
Parinari excelsa		0.70		21.5	69.0	16.0	29.7	786	5067	11	1	1	50	29	48	0.104	2	3.7
Peddea spp		0.59		7.1	8.0	9.7	10.5	18	23	2			73	76	78	0.001		0.6
Pentadesma reyndersii		0.77		15.8	21.7	15.0	18.2	205	360	2			74	65	40	0.006		4.1
Pleiocarpa pycnantha		0.59		17.8	26.3	15.9	20.0	221	443	5			61	54	46	0.020		3.6
Podocarpus falcatus		0.60		11.7	25.0	12.4	19.6	104	399	5			62	61	82	0.010		0.2
Podocarpus latifolius	4	0.49	± 0.02	21.7	56.6	16.6	25.8	347	2108	42	1		23	20	72	0.271	4	1.7
Polyscias fulva	3	0.50	± 0.11	23.6	77.9	15.2	26.6	597	4166	103	20		12	4	3	1.008	26	13.2
Prunus africana	2	0.61	± 0.07	20.8	57.7	12.3	19.3	362	2042	25	3	1	33	26	35	0.171	3	4.8
Psychotria mahonii	3	0.56	± 0.04	9.6	34.8	6.5	14.3	37	523	268	34	22	3	15	16	0.367		6.6
Psydrax subcordata		0.76		11.3	36.8	12.3	23.4	117	1276	23	1	7	34	40	26	0.053		5.2
Rapanea melanophloeos	4	0.67	± 0.03	12.1	33.0	13.3	24.4	122	952	146	2	1	9	18	55	0.288		2.8
Rytigynia bridsoniae		0.59		5.6	5.6	8.4	8.4	9	9			1	83	82	73	0.0003		1.5
Rytigynia bugoyensis		0.59		7.3	7.3	9.9	9.9	18	18	1			82	79	83	0.001		-1.2
Rytigynia kigeziensis		0.59		8.1	24.9	10.2	19.5	41	388	23	1	3	35	53	62	0.024		2.6
Rytigynia kiwuensis		0.59		8.8	23.2	10.8	18.9	43	327	206	25	4	7	22	43	0.209		4.1
Sapium ellipticum		0.55		22.7	27.8	18.5	20.6	315	474	2			75	59	69	0.011		1.9
Sericanthe leonardii		0.59		8.6	16.2	10.8	15.7	35	135	11			51	62	58	0.010		2.6
Strombosia scheffleri	8	0.73	± 0.06	25.0	84.1	19.9	32.4	927	8400	38			25	16	53	0.360	5	2.9

Species	ρ (g cm⁻³)			D (cm)		H (m)		Stem biomass (kg)		Number of trees			Rank			BA (m² ha⁻¹)	No of big trees, D > 40 cm	RGR (% yr⁻¹)
	#	Mean	SD	Mean	Max	Mean	Max	Mean	Max	Living	New	Dead	# stems	BA	RGR			
Symphonia globulifera		0.60		20.7	62.7	15.4	28.8	640	3498	14	1		43	27	6	0.116	2	10.4
Syzygium guineense	11	0.63	± 0.08	24.3	131.4	16.0	30.8	880	16583	708	20	11	2	1	52	7.941	139	3.0
Tabernaemontana stapfiana		0.52		18.6	25.7	16.4	19.8	212	374	4			68	56	13	0.017		7.4
Tarenna rwandensis		0.69		8.7	21.8	10.7	18.3	49	326	27	1		29	49	7	0.026		8.8
Xymalos monospora		0.59		7.1	17.0	9.6	16.1	21	152	43	14	1	22	50	14	0.026		7.6
All speces:																		
Mean		0.60		15.4	40.9	13.5	21.4	356	2333									4.62
Sum	94									5970	519	191					406	

Table S3. Species specific relationship of height (*H*) vs diameter at breast height (*D*) were established for the most abundant species based on basal area (BA) of all plots. For the *H – D* relationship the fitting parameters a, b and c in eq. 2, the modelling efficiency (ME) and the simulated height at a *D* of 10, 40 and 80 cm are given. Only simulated *H* within the range of *H* of sampled trees is given. The number of stems (#), measured *D* (mean, min, max) and *H* (mean, min, max) of the sampled trees are given.

Species	Species abundence BA (m² ha⁻¹)	%	a	b	c	ME	10	40	80	#	Mean	Min	Max	Mean	Min	Max
			fitting				Simulated H (m) at D of:				D (cm)			H (m)		
Afrocrania volkensii	0.50	1.7	30	-0.059	1.1	0.83	14.5	28.3		15	22.8	6.7	59.3	20.2	9.5	30.5
Agauria salicifolia	0.56	1.9	141	-0.028	0.5	0.81	10.9	20.1		12	27.2	7.0	55.5	16.0	7.0	24.9
Beilschmiedia rwandensis	0.29	1.0	39	-0.034	0.8	0.86	7.7	19.2	27.0	14	31.0	5.3	78.7	14.3	2.0	32.8
Bersama abyssinica	0.08	0.3	20	-0.052	1.0	0.91	7.9	17.3	19.9	4	31.3	6.3	81.5	11.9	3.0	20.1
Carapa grandiflora	0.78	2.6	28	-0.039	1.2	0.71	12.9	26.7	27.6	56	21.5	6.4	74.0	18.5	6.9	32.8
Chionanthus africanus	0.11	0.4	31	-0.066	0.9	0.88	11.7	24.5		14	15.6	5.1	39.2	14.2	6.0	24.8
Chrysophyllum rwandense	0.18	0.6	80	-0.049	0.6	0.83	13.6	27.5		10	38.1	7.3	54.8	25.8	12.3	36.0
Cleistanthus polystachyus	0.79	2.6	208	-0.016	0.6	0.82	13.6	27.5	37.4	37	31.0	6.0	75.8	22.4	6.1	42.8
Faurea saligna	1.80	6.1	41	-0.033	0.9	0.77	10.1	26.3	35.3	40	57.1	5.2	102.3	29.5	6.7	43.8
Ficalhoa laurifolia	0.73	2.5	40	-0.045	1.0	0.84	13.6	27.5	37.4	32	36.5	8.8	72.2	27.3	7.5	38.0
Harungana montana	0.70	2.3	58	-0.156	0.3	0.75	16.5	23.9	28.3	18	44.4	9.0	88.8	23.5	15.5	30.7
Ilex mitis	0.36	1.2	32	-0.107	0.7	0.89	12.8	23.3		14	30.9	5.1	60.5	19.4	8.2	29.2
Macaranga kilimandscharica	7.40	24.8	29	-0.183	0.6	0.53	13.7	21.6	25.0	195	25.7	5.1	71.0	18.0	5.5	31.1
Maesa lanceolata	0.04	0.1	43	-0.025	0.8	0.52	6.1			15	12.7	6.0	20.7	7.1	3.0	12.6
Maytenus acuminata	0.37	1.2	21	-0.067	1.1	0.77	12.3			16	13.7	6.0	29.6	13.7	7.1	22.4
Ocotea kenyensis	0.90	3.0	58	-0.044	0.7	0.88	11.3	25.1	34.8	42	29.8	6.8	84.5	19.7	7.0	37.7
Ocotea usambarensis	0.97	3.2	42	-0.064	0.7	0.76	11.7	24.4	31.8	38	27.4	6.3	107.7	17.6	1.6	36.9
Olinia rochetiana	0.54	1.8	45	-0.007	1.2	0.98	5.1	22.0		3	27.8	31.0	40.7	15.4	21.6	24.0
Podocarpus latifolius	0.27	0.9	27	-0.038	1.1	0.74	10.2	23.9		24	24.9	6.3	56.7	17.8	6.4	31.1
Polyscias fulva	1.00	3.4	26	-0.026	1.3	0.78	10.0	24.4	25.8	63	30.6	6.7	78.0	18.3	5.2	32.1
Prunus africana	0.17	0.6	19	-0.009	1.7	0.82	7.2	19.2		20	22.8	7.3	47.8	13.9	5.4	22.8
Psychotria mahonii	0.36	1.2	15	-0.039	1.2	0.74	7.3	14.6		14	16.9	5.7	36.3	9.7	5.1	15.4
Rapanea melanophloeos	0.29	1.0	37	-0.060	0.8	0.75	12.3			34	16.9	5.3	32.8	16.4	6.0	25.4
Strombosia scheffleri	0.36	1.2	34	-0.062	0.9	0.89	12.8	27.1	32.2	22	25.4	6.1	86.2	19.7	8.3	32.7
Syzygium guineense	7.94	26.6	31	-0.057	0.9	0.69	10.8	23.8	29.1	175	41.3	5.1	106.6	21.1	2.1	45.2
All species																
Mean			47	-0.055	0.9	0.79	11.1	23.5	30.1		28.1	7.3	65.6	18.1	7.0	30.2
Sum	27.49	92.2								930						
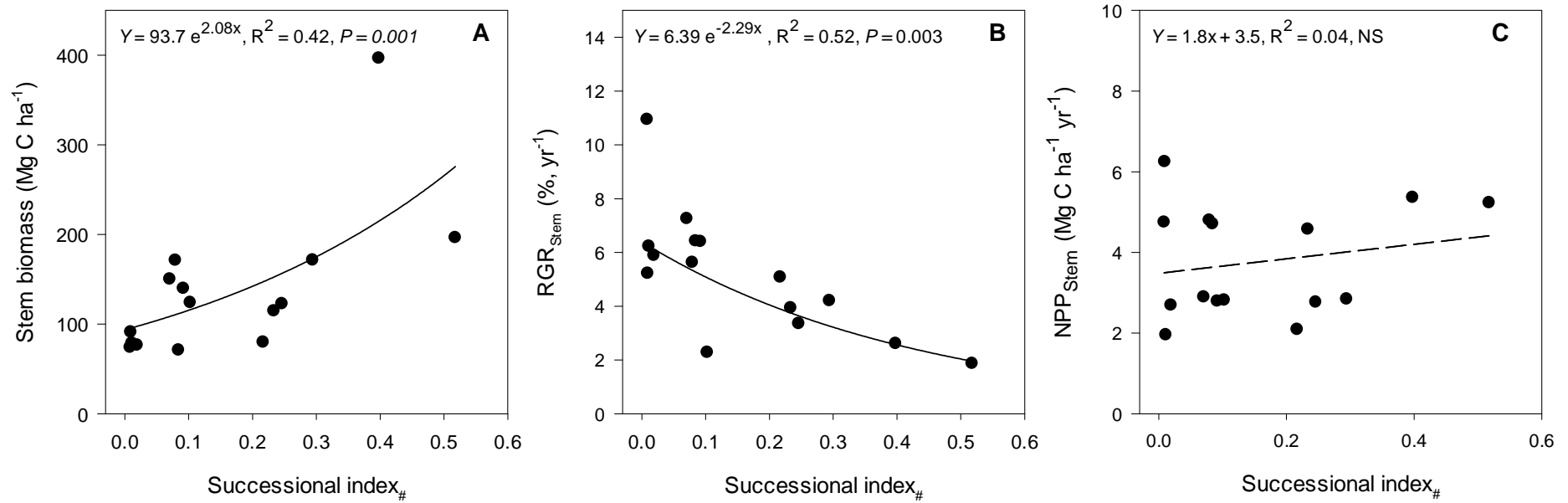
Figure S1. Biomass, relative growth rates (RGR) and net primary production (NPP) of stems including branches of each plot in relation to its successional index, based on number of stems (#) of the most abundant early and late successional species (eq 9). Biomass, RGR, and NPP is calculated from eq. 3, 6, 5, respectively based on measurements of D_{BH}, H and ρ.