

Supplementary Information

Table S1. Variables used in the regression models to analyse the response of *Bertholletia excelsa* vital rates to timber logging and Amazon nut harvesting.

Response variables	Survival rate: trees that survived or died between 2014 and 2015. (0) Dead, (1) Alive
	Height growth rate: m that an individual grew between 2014 and 2015 (m year ⁻¹)
	DBH growth rate: cm that an individual grew between 2014 and 2015 (cm year ⁻¹)
	Probability of being reproductive: Chance of an individual to produce fruits.
	Fruit production: Average percentage of fruits produced between 2014 and 2015 per reproductive tree (# reproductive fruits tree ⁻¹)
Explanatory variables	Initial size: Size of a tree measured at plot establishment.
	Logging intensity: Percentage of area disturbed due to logging (%)
	Years since last logging: Time that has passed since last logging to plot establishment in 2014. Unlogged sites have a value of zero.
	Amazon nut harvesting intensity: Percentage of harvested fruits (%)
	Liana cutting: (1) tree with lianas cut, (0) tree without lianas cut
	Liana cutting intensity: Proportion of reproductive trees with lianas cut in a transect
	Crown position: (1) crown receiving full light, (2) crown receiving only vertical light, (3) crown receiving some vertical light, (4) crown receiving only lateral light, (5) crown receiving some light or no direct light
	Crown form (1) perfect, (2) good, (3) fairly good
	Liana infestation: (1) lianas affecting growth, i.e., trees with lianas reaching the crown; (0) lianas not affecting growth, i.e., trees without lianas and with lianas around the trunk

Table S2. Classification used to build *Bertholletia excelsa* size-structured matrices (size-classes). Stages in bold are reproductive stages because trees larger than 30 cm diameter at 1.3 m aboveground (DBH) presented fruits at our studied sites.

Size groups for modelling vital rates	Stage	Height (m)
Individuals ≤ 3 m height but ≤ 1 cm DBH (Seedlings)	1	0.0 - 0.5
	2	0.5 - 1.0
	3	1.0-1.5
	4	1.5 - 2.0
	5	2.0 - 2.5
	6	2.5 - 3.0
		DBH (cm)
Individuals 1-50 cm DBH (Juveniles)	7	1 - 4
	8	4 - 7
	9	7 - 10
	10	10 - 20
	11	20 - 30
	12	30 - 40
Individuals > 50 cm DBH (Adults)	13	40 - 50
	14	50 - 60
	15	60 - 70
	16	70 - 80
	17	80 - 90
	18	90 - 100
	19	100 - 110
	20	110 - 120
	21	120 - 130
	22	130 - 140
	23	140 - 150
	24	150 - 160
	25	160 - 170
	26	>170

Table S3. Output of the size-structured matrix with the effect of logging disturbance on *Bertholletia excelsa* population growth rate during the first four years following to logging.

Stage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	0.603	0	0	0	0	0	0	0	0	0	0	0.080	0.151	0.307	0.084	0.202	0.093	0.089	0.111	0.209	0.093	0.216	0.157	0.143	0.275	0.335
2	0.146	0.714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0.173	0.767	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0.186	0.790	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0.192	0.799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0.194	0.803	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0.195	0.888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0.112	0.874	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0.126	0.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0.141	0.939	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0.061	0.918	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0.082	0.896	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0.104	0.875	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0.125	0.912	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0.088	0.917	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0.083	0.923	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.077	0.928	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.072	0.933	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.066	0.939	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.061	0.944	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.056	0.949	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.050	0.953	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.045	0.957	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.039	0.960	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.034	0.960	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.028	0.980	0
Total	0.750	0.887	0.953	0.982	0.993	0.997	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.999	0.999	0.998	0.996	0.993	0.988	0.980

Table S4. Output of the size-structured matrix without the effects of logging disturbance on *Bertholletia excelsa* population growth rate during 16 years out of the 20 years timber cutting cycle.

Stage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	0.718	0	0	0	0	0	0	0	0	0	0	0.080	0.151	0.307	0.084	0.202	0.093	0.089	0.111	0.209	0.093	0.216	0.157	0.143	0.275	0.335
2	0.032	0.849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0.038	0.913	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0.041	0.940	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0.042	0.951	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0.042	0.955	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0.042	0.888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0.112	0.874	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0.126	0.859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0.141	0.939	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0.061	0.918	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0.082	0.896	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0.104	0.875	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0.125	0.912	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0.088	0.917	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.083	0.923	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.077	0.928	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.072	0.933	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.066	0.939	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.061	0.944	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.056	0.949	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.050	0.953	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.045	0.957	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.039	0.960	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.034	0.960	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.028	0.980
Total	0.750	0.887	0.953	0.982	0.993	0.997	1.000	1.000	1.000	1.000	1.000	1.080	1.151	1.307	1.085	1.202	1.093	1.089	1.110	1.208	1.092	1.213	1.153	1.137	1.264	1.315

Table S5. Resulting matrix resembling *Bertholletia excelsa* population dynamics of the population 20 years following to timber logging and yearly Amazon nut harvest.

Stage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1	0.001	0.000	0.000	0.000	0.000	0.001	0.007	0.023	0.059	0.119	0.311	0.479	0.502	0.438	0.348	0.330	0.279	0.331	0.400	0.423	0.394	0.470	0.409	0.475	0.628	0.629
2	0.005	0.019	0.000	0.000	0.000	0.000	0.002	0.006	0.018	0.041	0.124	0.221	0.254	0.230	0.168	0.171	0.130	0.152	0.190	0.211	0.183	0.235	0.197	0.225	0.316	0.327
3	0.009	0.053	0.081	0.000	0.000	0.000	0.000	0.002	0.005	0.012	0.044	0.090	0.113	0.109	0.072	0.080	0.055	0.063	0.081	0.095	0.076	0.106	0.086	0.096	0.142	0.151
4	0.008	0.058	0.163	0.145	0.000	0.000	0.000	0.000	0.001	0.003	0.011	0.026	0.036	0.038	0.022	0.027	0.017	0.019	0.025	0.031	0.023	0.035	0.027	0.030	0.046	0.051
5	0.004	0.035	0.143	0.260	0.182	0.000	0.000	0.000	0.000	0.000	0.002	0.005	0.008	0.010	0.005	0.007	0.004	0.004	0.006	0.008	0.005	0.009	0.007	0.007	0.011	0.013
6	0.001	0.014	0.073	0.209	0.313	0.198	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.002	0.003
7	0.000	0.004	0.027	0.112	0.274	0.355	0.093	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	0.000	0.000	0.004	0.023	0.084	0.195	0.202	0.067	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9	0.000	0.000	0.001	0.005	0.029	0.110	0.238	0.166	0.048	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
10	0.000	0.000	0.000	0.002	0.014	0.083	0.324	0.448	0.419	0.286	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
11	0.000	0.000	0.000	0.000	0.002	0.018	0.102	0.203	0.286	0.299	0.180	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	0.000	0.004	0.030	0.077	0.146	0.205	0.259	0.112	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
13	0.000	0.000	0.000	0.000	0.000	0.001	0.008	0.027	0.064	0.114	0.229	0.207	0.069	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
14	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.010	0.029	0.068	0.206	0.334	0.301	0.158	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.007	0.021	0.091	0.220	0.328	0.323	0.178	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.005	0.028	0.093	0.199	0.293	0.339	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.027	0.077	0.156	0.285	0.354	0.224	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.006	0.021	0.054	0.140	0.275	0.367	0.252	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.013	0.045	0.124	0.262	0.378	0.281	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.010	0.036	0.108	0.246	0.385	0.314	0.000	0.000	0.000	0.000	0.000	0.000
21	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.007	0.028	0.092	0.227	0.388	0.348	0.000	0.000	0.000	0.000	0.000
22	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.005	0.022	0.076	0.205	0.385	0.383	0.000	0.000	0.000	0.000
23	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.016	0.060	0.179	0.373	0.415	0.000	0.000	0.000
24	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.011	0.046	0.150	0.349	0.438	0.000	0.000
25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.007	0.032	0.118	0.310	0.444	0.000
26	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.023	0.098	0.318	0.666
Total	0.028	0.184	0.492	0.755	0.898	0.965	1.009	1.031	1.083	1.175	1.492	1.821	1.915	1.827	1.615	1.614	1.482	1.563	1.690	1.749	1.648	1.798	1.633	1.680	1.909	1.840