Supplementary material from "The demography of a resource specialist in the tropics: Cecropia trees and the fitness of three-toed sloths

Methods S1. Comparing threat to mammalian arboreal folivores with all other mammalian species

We used the full list of all known mammals assessed using the IUCN Red List categories and criteria corresponding to version 2017-3 [1]. We considered threatened species as those Critically Endangered, Endangered, or Vulnerable [2]. Then, we assessed the level of threat for the 260 species of mammals identified as arboreal folivores [3]. As arboreal folivores represent a diverse group of Mammals, we also compared by order. We did not include are order Carnivora given the low representation of mammalian arboreal folivores in this group (only one species); however, this species is classified as vulnerable. We also excluded the orders Dermoptera and Hyracoidea due the lack of threatened species in these groups of mammals.

1 IUCN 2017. *The IUCN Red List of Threatened Species. Version 2017-3*. <http://www.iucnredlist.org>. Downloaded on 06 May 2018.

2 Eisenberg JF. 1978 The evolution of arboreal herbivores in the class mammalia. In *The ecology of arboreal folivores* (ed. GG Montgomery), pp. 135–152. Washington, DC: Smithsonian Institution Press.

3 Mounce R, Rivers M, Sharrock S, Smith P, Brockington S. 2017 Comparing and contrasting threat assessments of plant species at the global and sub-global level. *Biodivers. Conserv.* **27**, 907–930. (doi:10.1007/s10531-017-1472-z)

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Methods S2. Range of distribution of three-toed sloths (*Bradypus* spp.) and trees of the genus *Cecropia* in Neotropical areas

To build the distribution of the genus *Cecropia,* we combined the distributions for all the species of this genus following the proposed by Berg et al. 2005 [1]. We compiled the distribution of the genus *Bradypus* from spatial data housed at the IUCN Red List version 2018-1 [2].

1 Berg, C. C., Rosselli, P. F., & Davidson, D. W. 2005. Cecropia. *Flora Neotrop.* **94**, 1–230.

2 IUCN 2017. *The IUCN Red List of Threatened Species. Version 2018-1*. <http://www.iucnredlist.org>. Downloaded on 26 August 2018.

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Methods S3. Density of *Cecropia obtusifolia* in Neotropical areas

We conducted a search of articles and books in different search engines such as google scolar, Scielo, Springer Link that reported density of *Cecropia obtusifolia* in neotropical areas using as keywords: *Cecropia obtusifolia*, guarumo and yarumo. We found seven results which report the density of *C. obtusifolia* [1,2,3,4,5,6,7] distinguishing the type of habitat in which this species is present.

1 Arroyo-Rodríguez V, Mandujano S, Benítez-Malvido J, Cuende-Fanton C. 2007 The Influence of Large Tree Density on Howler Monkey (*Alouatta palliata mexicana*) Presence in Very Small Rain Forest Fragments. Biotropica 39, 760–766. (doi:10.1111/j.1744-7429.2007.00330.x)

2 Hartshorn GS. 1978. Tree fails and tropical forest dynamics. In *Tropical trees as living systems* (eds. PB Tomlinson, MH Zimmermann), pp. 617–638. Cambridge: Cambridge University Press.

3 López-Mata L, Godínez-Ibarra O. 2002. Estructura, composición, riqueza y diversidad de árboles en tres muestras de selva mediana subperennifolia. Anales del Instituto de Biología serie Botánica 73, 283–314.

4 Sánchez-Rodríguez EV, López-Mata L, García-Moya E, Cuevas-Guzmán R. 2003. Estructura, composición florística y diversidad de especies leñosas de un bosque mesófilo de montaña en la Sierra de Manantlán, Jalisco. Boletín de la Sociedad Botánica de México 73, 17–34.

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5 Muñoz D, Estrada A, Naranjo E. 2005. Monos aulladores (*Alouatta palliata*) en una plantación de cacao (*Theobroma cacao*) en Tabasco, México: aspectos de la ecología alimentaria. Universidad y Ciencia 2005, 35–44.

6 Sánchez-Merlos D, Harvey CA, Grijalva A, Medina A, Hernández B, Vílchez S. 2014 Diversidad, composición y estructura de la vegetación en un agropaisaje ganadero en Matiguás, Nicaragua. Revista de Biología Tropical 53, 387. (doi:10.15517/rbt.v53i3-4.14601)

7 Escobar-Ocampo M, Ochoa-Gaona S. 2007 Estructura y composición florística de la vegetación del Parque Educativo Laguna Bélgica, Chiapas, México. Revista mexicana de biodiversidad 78, 391–419.

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Table S1. Rankings of known fate models estimating survival (ϕ) a probabilities for 2-3 year old juveniles three-toed sloths in northeastern Costa Rica. AICc = Akaike information criterion corrected for small sample sizes, *K* = number of parameters, *w* = AICc weight, st = stages (dependent, independent). Models are ranked based on AICc. The order in which the models were computed is shown in bold numbers.

Model	*K*	AICc	Δ AICc	*w*
2 S (.)	1	20.498	0.000	1.00
1 S (t)	19	62.229	41.731	0

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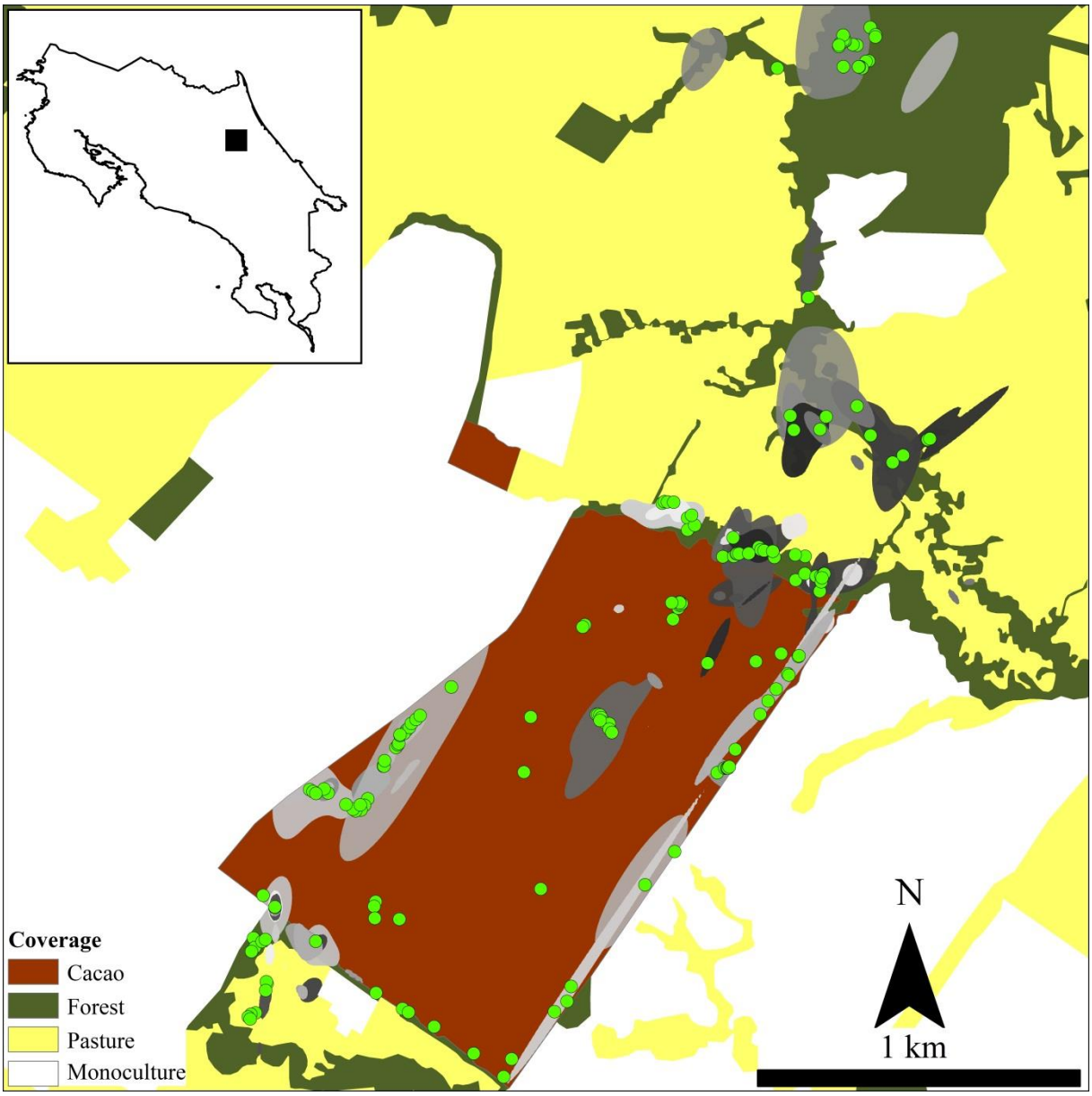

Figure S1. Location of *Cecropia obtusifolia* (green dots) and core area (grey scale polygons) of adult of three-toed sloths (*Bradypus variegatus*) in northeaster Costa Rica.

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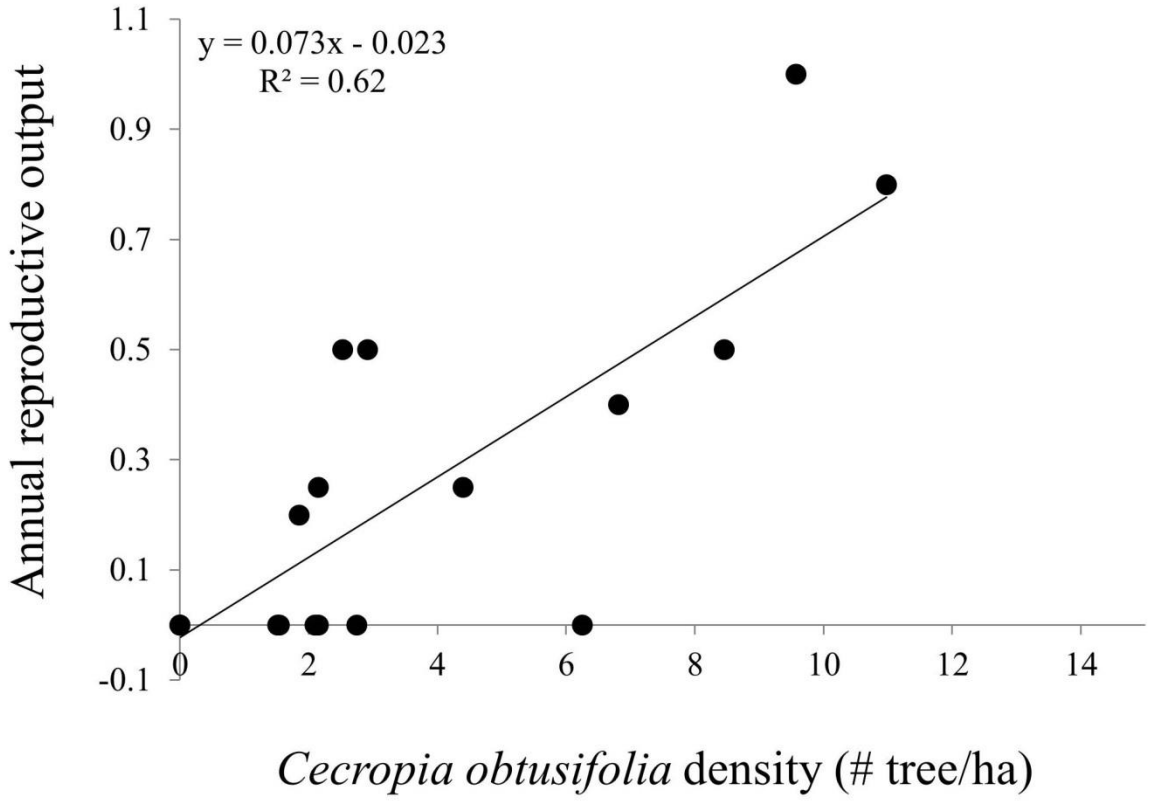

Figure S2. Relationship between *Cecropia obtusifolia* density and the index of reproductive output of males excluding a single male with unusually high reproductive output. Mean reproductive output increase with increasing of the density of *Cecropia obtusifolia* in the core area for male three-toed sloths ($F_{1, 34}$ = 7.31, P< 0.01).