**APPENDIX B**

TABLE B1. List of seed species captured in seed traps in restoration sites and mature forests in southern Costa Rica, February 2012-Feburary 2013. Taxonomy follows Tropicos.org (http://www.tropicos.org; accessed 7 January 2014). Dispersal syndromes: A=Animal, G=Gravity, W=Wind. Size groups correspond to seed length (mm): (1) length ≤ 2; (2) >2 & ≤5; (3) >5 & ≤10; (4) >10; (5) no measurement. Seed deposition rate (seeds $m^{-2}$ $y^{-1}$) means and standard errors are shown.

| | | | | | C | | I | | P | | R | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Species | Code | Dispersal type | Growth form | Size group | Mean | *SE* | Mean | *SE* | Mean | *SE* | Mean | *SE* |
| **Adoxaceae** | | | | | | | | | | | | |
| *Viburnum costaricanum* (Oerst.) Hemsl. | VIBCOS | A | Tree | 3 | 0.00 | *0.00* | 0.97 | *0.93* | 0.10 | *0.07* | 4.67 | *3.85* |
| **Apocynaceae** | | | | | | | | | | | | |
| *Prestonia portobellencis* (Beurl.) Woodson | PREPOR | W | Vine | 3 | 0.10 | *0.05* | 0.00 | *0.00* | 0.30 | *0.40* | 0.73 | *0.44* |
| **Araceae** | | | | | | | | | | | | |
| *Anthurium* sp. | ANT032 | A | Herb | 1 | 0.00 | *0.00* | 0.00 | *0.00* | 0.03 | *0.03* | 0.00 | *0.00* |
| *Monstera* sp. | MON262 | A | Epi | 4 | 0.17 | *0.13* | 0.17 | *0.07* | 0.03 | *0.03* | 3.13 | *1.18* |
| MS149 | MS149 | A | | 4 | 0.03 | *0.03* | 0.00 | *0.00* | 0.07 | *0.04* | 12.53 | *12.37* |
| **Arecaceae** | | | | | | | | | | | | |
| *Chamaedorea* sp. | CHA131 | A | Palm | 3 | 0.00 | *0.00* | 0.00 | *0.00* | 0.03 | *0.03* | 0.00 | *0.00* |
| *Oenocarpus mapora* H. Karst. | OENMAP | A | Palm | 4 | 0.03 | *0.03* | 0.03 | *0.03* | 0.10 | *0.05* | 0.27 | *0.27* |
| *Pinanga* sp. | PIN236 | A | Palm | 4 | 0.00 | *0.00* | 0.03 | *0.03* | 0.03 | *0.03* | 0.00 | *0.00* |
| **Asparagaceae** | | | | | | | | | | | | |
| *Dracaena fragrans* (L.) Ker Gawl. | DRAFRA | A | Shrub | 4 | 0.00 | *0.00* | 0.00 | *0.00* | 0.00 | *0.00* | 0.07 | *0.07* |
| **Asteraceae** | | | | | | | | | | | | |
| *Verbesina turbacensis* Kunth | VERTUR | W | Shrub | 1 | 54.73 | *19.58* | 70.23 | *43.63* | 4.90 | *2.90* | 6.27 | *6.18* |
| *Vernonia patens* Kunth | VERPAT | W | Shrub | 2 | 83.77 | *46.71* | 56.80 | *22.43* | 33.00 | *12.34* | 10.07 | *6.01* |
| **Bignoniaceae** | | | | | | | | | | | | |
| *Martinella obovata* (Kunth) Bureau & K. Schum. | MAROBO | W | Liana | 4 | 0.03 | *0.03* | 0.33 | *0.16* | 1.67 | *1.35* | 3.13 | *1.38* |
| *Tabebuia ochracea* (Cham.) Standl. | TABOCH | W | Tree | 4 | 0.03 | *0.03* | 0.00 | *0.00* | 0.00 | *0.00* | 0.00 | *0.00* |
| **Boraginaceae** | | | | | | | | | | | | |
| *Tournefortia bicolor* Sw. | TOUBIC | A | Shrub | 2 | 8.87 | *4.32* | 15.50 | *7.13* | 7.80 | *2.74* | 1.53 | *0.44* |
| **Combretaceae** | | | | | | | | | | | | |
| *Terminalia amazonia* (J.F. Gmel.) Exell | TERAMA | W | Tree | 2 | 2.93 | *2.58* | 12.20 | *11.90* | 15.27 | *10.64* | 2.60 | *1.78* |
| **Cucurbitaceae** | | | | | | | | | | | | |
| *Sechium tacaco* (Pittier) C. Jeffrey | SECTAC | G | Vine | 4 | 0.00 | *0.00* | 0.07 | *0.07* | 0.00 | *0.00* | 0.40 | *0.40* |
| **Cyclanthaceae** | | | | | | | | | | | | |
| *Carludovica drudei* Mast. | CARDRU | A | Herb | 2 | 0.07 | *0.07* | 1.10 | *0.73* | 0.07 | *0.07* | 0.00 | *0.00* |
| **Euphorbiaceae** | | | | | | | | | | | | |
| *Acalypha arvensis* Poepp. | ACAARV | G | Herb | 1 | 0.07 | *0.07* | 0.13 | *0.10* | 0.10 | *0.10* | 0.00 | *0.00* |
| *Alchornea latifolia* Sw. | ALCLAT | A | Tree | 3 | 0.10 | *0.07* | 2.97 | *2.11* | 0.13 | *0.09* | 9.20 | *8.95* |
| **Fabaceae** | | | | | | | | | | | | |
| *Erythrina poeppigiana* (Walp.) O.F. Cook | ERYPOE | W | Tree | 4 | 0.00 | *0.00* | 0.83 | *0.66* | 0.53 | *0.37* | 0.07 | *0.07* |

| Species | Code | Dispersal type | Growth form | Size group | C | | I | | P | | R | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Mean | *SE* | Mean | *SE* | Mean | *SE* | Mean | *SE* |
| *Flemingia* sp. | FLE000 | G | Shrub | 2 | 0.00 | *0.00* | 0.07 | *0.07* | 0.00 | *0.00* | 0.00 | *0.00* |
| *Flemingia macrophylla* | FLEMAC | G | Shrub | 2 | 0.00 | *0.00* | 0.03 | *0.03* | 0.00 | *0.00* | 0.00 | *0.00* |
| *Inga edulis* Mart. | INGEDU | A | Tree | 4 | 0.00 | *0.00* | 0.20 | *0.17* | 1.33 | *0.67* | 0.00 | *0.00* |
| *Inga* sp. | ING231 | A | Tree | 4 | 0.00 | *0.00* | 0.03 | *0.03* | 0.80 | *0.76* | 0.20 | *0.20* |
| *Senna papillosa* (Britton & Rose) H.S. Irwin & Barneby | SENPAP | A | Tree | 3 | 0.07 | *0.04* | 0.27 | *0.27* | 0.63 | *0.33* | 5.87 | *3.80* |
| **Heliconiaceae** | | | | | | | | | | | | |
| *Heliconia latispatha* Benth. | HELLAT | A | Herb | 3 | 0.43 | *0.30* | 0.40 | *0.27* | 0.33 | *0.16* | 7.87 | *7.87* |
| **Lauraceae** | | | | | | | | | | | | |
| *Persea americana* Mill. | PERAME | A | Tree | 4 | 0.00 | *0.00* | 0.00 | *0.00* | 0.10 | *0.05* | 0.07 | *0.07* |
| Lauraceae sp. | LAU000 | A | Tree | 4 | 0.00 | *0.00* | 0.00 | *0.00* | 0.00 | *0.00* | 1.13 | *1.13* |
| **Loranthaceae** | | | | | | | | | | | | |
| *Struthanthus* sp. | STR146 | A | Epi | 3 | 0.00 | *0.00* | 0.00 | *0.00* | 0.00 | *0.00* | 0.07 | *0.07* |
| **Malpighiaceae** | | | | | | | | | | | | |
| *Byrsonima crassifolia* (L.) Kunth | BYRCRA | A | Tree | 3 | 0.00 | *0.00* | 0.00 | *0.00* | 0.00 | *0.00* | 0.60 | *0.31* |
| **Malvaceae** | | | | | | | | | | | | |
| *Heliocarpus appendiculatus* Turcz.[1] | HELAPP | W | Tree | 2 | 345.10 | *157.53* | 149.73 | *45.78* | 97.83 | *42.68* | 153.67 | *90.45* |
| **Melastomataceae** | | | | | | | | | | | | |
| *Miconia*/*Conostegia* spp.[2] | MEL000 | A | Tree | 1 | 341.43 | *230.71* | 8.83 | *2.73* | 71.10 | *57.90* | 786.53 | *747.37* |
| *Tococa platyphylla* Benth. | TOCPLA | A | Shrub | 1 | 0.00 | *0.00* | 0.10 | *0.10* | 0.00 | *0.00* | 0.07 | *0.07* |
| **Meliaceae** | | | | | | | | | | | | |
| *Cedrela tonduzii* C. DC. | CEDTON | W | Tree | 4 | 0.00 | *0.00* | 0.10 | *0.10* | 0.10 | *0.10* | 0.20 | *0.20* |
| **Menispermaceae** | | | | | | | | | | | | |
| *Cissampelos pareira* L. | CISPAR | A | Vine | 2 | 9.53 | *6.99* | 13.33 | *5.00* | 8.90 | *4.26* | 5.53 | *2.37* |
| **Moraceae** | | | | | | | | | | | | |
| *Pseudolmedia glabrata* (Liebm.) C.C. Berg | PSEGLA | A | Tree | 4 | 0.00 | *0.00* | 0.13 | *0.07* | 0.10 | *0.10* | 2.93 | *2.60* |
| **Myristicaceae** | | | | | | | | | | | | |
| *Virola* sp. | VIR237 | A | Tree | 4 | 0.00 | *0.00* | 0.00 | *0.00* | 2.60 | *2.60* | 2.47 | *2.08* |
| **Myrtaceae** | | | | | | | | | | | | |
| *Psidium guajava* L. | PSIGUA | A | Tree | 2 | 8.77 | *6.52* | 2.17 | *1.06* | 3.30 | *1.50* | 3.20 | *1.88* |
| **Piperaceae** | | | | | | | | | | | | |
| *Piper arboreum* Aubl. | PIPARB | A | Shrub | 1 | 0.00 | *0.00* | 0.00 | *0.00* | 0.57 | *0.57* | 0.13 | *0.13* |
| *Piper friedrichsthalii* C. DC. | PIPFRI | A | Shrub | 1 | 54.37 | *35.92* | 152.63 | *149.79* | 2.30 | *2.30* | 0.00 | *0.00* |
| **Polygalaceae** | | | | | | | | | | | | |
| *Monnina xalapensis* Kunth | MONXAL | A | Shrub | 3 | 1.17 | *0.61* | 7.33 | *4.67* | 1.03 | *0.65* | 4.00 | *2.42* |
| *Securidaca sylvestris* Schltdl. | SECSYL | W | Liana | 4 | 0.03 | *0.03* | 0.00 | *0.00* | 0.00 | *0.00* | 2.73 | *2.32* |
| **Ranunculaceae** | | | | | | | | | | | | |
| *Clematis haenkeana* C. Presl | CLEHAE | W | Vine | 2 | 1.70 | *1.10* | 2.30 | *1.45* | 2.87 | *2.29* | 3.53 | *1.13* |
| **Rhamnaceae** | | | | | | | | | | | | |
| *Gouania polygama* (Jacq.) Urb. | GOUPOL | W | Vine | 2 | 0.33 | *0.20* | 3.90 | *2.34* | 2.33 | *1.21* | 0.07 | *0.07* |
| **Rubiaceae** | | | | | | | | | | | | |

| Species | Code | Dispersal type | Growth form | Size group | C | | I | | P | | R | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Mean | *SE* | Mean | *SE* | Mean | *SE* | Mean | *SE* |
| *Gonzalagunia rosea* Standl. | GONROS | A | Shrub | 2 | 20.20 | *12.43* | 2.87 | *1.67* | 2.07 | *0.77* | 1.67 | *1.02* |
| **Rutaceae** | | | | | | | | | | | | |
| *Citrus* sp. | CIT000 | A | Tree | 3 | 0.00 | *0.00* | 0.03 | *0.03* | 0.00 | *0.00* | 0.00 | *0.00* |
| **Sapindaceae** | | | | | | | | | | | | |
| *Allophylus psilospermus* Radlk. | ALLPSI | A | Tree | 3 | 0.00 | *0.00* | 0.00 | *0.00* | 0.00 | *0.00* | 0.60 | *0.60* |
| **Smilacaceae** | | | | | | | | | | | | |
| *Smilax domingensis* | SMIDOM | A | Vine | 3 | 0.03 | *0.03* | 0.00 | *0.00* | 0.00 | *0.00* | 1.60 | *1.36* |
| **Solanaceae** | | | | | | | | | | | | |
| *Acnistus arborescens* (L.) Schltdl. | ACNARB | A | Tree | 1 | 8.80 | *8.80* | 0.00 | *0.00* | 0.00 | *0.00* | 0.00 | *0.00* |
| *Cestrum schlechtendalii* G. Don | CESSCH | A | Shrub | 3 | 0.00 | *0.00* | 0.03 | *0.03* | 0.00 | *0.00* | 0.00 | *0.00* |
| *Solanum accedens* Domin | SOLACC | A | Shrub | 3 | 59.90 | *29.79* | 67.77 | *53.50* | 8.17 | *3.57* | 4.33 | *2.00* |
| *Solanum lancifolium* Sessé & Moc. | SOLLAN | A | Herb | 2 | 1.10 | *0.65* | 0.53 | *0.37* | 0.07 | *0.07* | 0.47 | *0.47* |
| *Solanum umbellatum* Mill. | SOLUMB | A | Shrub | 1 | 610.17 | *428.20* | 14.77 | *8.60* | 24.80 | *9.25* | 4.93 | *1.25* |
| *Witheringia solanacea* L'Hér. | WITSOL | A | Shrub | 1 | 21.13 | *20.33* | 2.43 | *2.08* | 0.30 | *0.30* | 1.00 | *1.00* |
| **Theaceae** | | | | | | | | | | | | |
| *Gordonia fruticosa* (Schrad.) H. Keng | GORFRU | W | Tree | 2 | 1.20 | *1.09* | 0.07 | *0.07* | 2.70 | *2.66* | 4.47 | *4.38* |
| **Ulmaceae** | | | | | | | | | | | | |
| *Ulmus mexicana* (Liebm.) Planch. | ULMMEX | W | Tree | 2 | 30.70 | *30.63* | 3.33 | *3.26* | 0.97 | *0.73* | 0.60 | *0.60* |
| **Urticaceae** | | | | | | | | | | | | |
| *Cecropia obtusifolia* Bertol. | CECOBT | A | Tree | 2 | 16.30 | *4.36* | 177.63 | *118.88* | 182.90 | *160.71* | 80.73 | *34.28* |
| *Cecropia peltata* L. | CECPEL | A | Tree | 2 | 3.00 | *1.42* | 7.77 | *3.00* | 6.73 | *3.19* | 10.20 | *4.90* |
| **Verbenaceae** | | | | | | | | | | | | |
| *Lantana camara* L. | LANCAM | A | Shrub | 2 | 10.33 | *3.95* | 4.97 | *2.25* | 3.00 | *2.08* | 2.27 | *0.58* |
| **Family unknown** | | | | | | | | | | | | |
| MS009 | MS009 | A | | 1 | 0.03 | *0.03* | 0.00 | *0.00* | 0.00 | *0.00* | 0.00 | *0.00* |
| MS060 | MS060 | A/G | | 3 | 1.20 | *0.80* | 0.90 | *0.50* | 0.53 | *0.23* | 4.47 | *3.34* |
| MS132 | MS132 | A | | 2 | 0.40 | *0.40* | 0.00 | *0.00* | 0.00 | *0.00* | 0.47 | *0.47* |
| MS158 | MS158 | W | | 5 | 0.00 | *0.00* | 0.00 | *0.00* | 0.00 | *0.00* | 0.07 | *0.07* |
| MS168 | MS168 | A | | 2 | 0.10 | *0.07* | 0.13 | *0.09* | 0.00 | *0.00* | 0.00 | *0.00* |
| MS171 | MS171 | A | | 2 | 1.33 | *1.33* | 0.00 | *0.00* | 0.00 | *0.00* | 0.00 | *0.00* |
| MS184 | MS184 | A | | 2 | 0.00 | *0.00* | 0.00 | *0.00* | 0.00 | *0.00* | 1.33 | *1.33* |
| MS195 | MS195 | A | | 3 | 0.13 | *0.10* | 0.17 | *0.10* | 0.03 | *0.03* | 6.27 | *3.22* |
| MS222 | MS222 | | | 2 | 0.00 | *0.00* | 0.00 | *0.00* | 0.50 | *0.50* | 0.00 | *0.00* |
| MS225 | MS225 | | | 2 | 0.33 | *0.33* | 0.20 | *0.17* | 0.00 | *0.00* | 0.00 | *0.00* |
| MS227 | MS227 | | | 5 | 23.47 | *18.13* | 7.17 | *4.45* | 2.23 | *1.29* | 3.00 | *0.90* |

[1] A second *Heliocarpus* species, *H. americanus* (L.), is rarer but may be represented in the data. The seeds of the two species are indistinguishable.

[2] *Miconia* and *Conostegia* seeds are combined because they are tiny and difficult to separate. The principal species in this group are *Miconia trinervia* (Sw.) D. Don ex Loudon and *Conostegia xalapensis* (Bonpl.) D. Don ex DC, but several species are likely represented.