Supplementary Material

Table S1. List of the species studied in the Rebio União and their respective identification codes (ID code), family, number of observed individuals (No. ind.), basal area (DBA), dispersal syndrome (ane = anemochory; zoo = zoochory), and flowering and fruiting times, from August 2006 to August 2008. .

					Flowering			Green Fruit			Mature Fruit		
Family	Species	No. ind.	DBA	Dispersal syndrome	2006	2007	2008	2006	2007	2008	2006	2007	2008
ANACARDIACEAE	*Astronium* sp.	4	0.110	ane									
ANACARDIACEAE	*Tapirira guianensis* Aubl.	2	0.023	zoo		Dec	Jan		Jul-Aug				
ANNONACEAE	*Annona dolapripetala* Raddi	3	0.006	zoo	Nov	Nov							
ANNONACEAE	Annonaceae sp.	1	0.045										
ANNONACEAE	*Oxandra nitida* R.E. Fr.	3	0.046	zoo									
ANNONACEAE	*Trigynaea axilliflora* D.M.Johnson & N.A.Murray	4	0.090	zoo		Nov	Jun						
ANNONACEAE	*Unonopsis* sp.	2	0.069	zoo	Sep	Dec	Jan						
ANNONACEAE	*Xylopia sericea* A.St.-Hil.	1	0.024	zoo	Dec					Jan-May		Jan. Mar, May-Sep	Jan
APOCYNACEAE	*Geissospermum laeve* (Vell.) Miers	5	0.110	zoo									
ARALIACEAE	Schefflera morototoni (Aubl.) Maguire et al.	1	0.007	zoo									
ARECACEAE	*Astrocaryum aculeatissimum* (Schott) Burret	6	0.120	zoo		Mar-May	Jan, Mar-May		May-Aug	Apr	Aug	Jun-Sep	
ARECACEAE	*Euterpe edulis* Mart.	8	0.099	zoo									
BIGNONIACEAE	*Tabebuia* sp.	1	0.010	ane									
BURSERACEAE	*Protium* sp.	2	0.088	zoo		Nov				Aug	Nov-Dec		
CARICACEAE	*Jacaratia* sp.	3	0.028	zoo									
CELASTRACEAE	*Maytenus communis* Reissek	2	0.029	zoo									
CELASTRACEAE	*Maytenus obtusifolia* Mart.	1	0.029	zoo		Nov							
CELASTRACEAE	*Maytenus* sp.	1	0.024	zoo									
CHRYSOBALANACEAE	Chysobalanaceae sp. 1	1	0.004										
CHRYSOBALANACEAE	Chysobalanaceae sp. 2	1	0.016				Jun		Oct	Jun		Nov	Jul
CHRYSOBALANACEAE	Chysobalanaceae sp. 3	1	0.000										

CHRYSOBALANACEAE	Chysobalanaceae sp. 4	1	0.058										
CHRYSOBALANACEAE	*Couepia schottii* Fritsch	1	0.012	zoo									
CHRYSOBALANACEAE	*Couepia* sp.	1	0.007	zoo					Sep				
CHRYSOBALANACEAE	*Hirtella hebeclada* Moric. ex DC.	1	0.008	zoo									
CHRYSOBALANACEAE	*Hirtella* sp.	1	0.007	zoo									
CLETHRACEAE	*Clethra scapra* Pers.	1	0.009	ane	Dec	Jan-Feb, Dec	Jan	Oct	Jan-May	Jan-Jul	Nov	Feb-Jun	Feb-Aug
CLUSIACEAE	*Tovomita* sp.	1	0.007	zoo		Mar							
CUNONIACEAE	*Lamanonia ternata* Vell.	1	0.007	ane		Apr, Jun	May, Jul						
ELAEOCARPACEAE	*Sloanea hirsuta* (Schott) Planch ex Benth.	1	0.012	zoo		Jan-Feb, Dec	Jan	Sep			Sep-Dec	May-Jul, Sep-Oct,	Mar-Aug
ERYTHROXYLACEAE	*Erythroxylum pulchrum* A.St.-Hil.	1	0.005	zoo									
EUPHORBIACEAE	*Actinostemon verticillatus* (Klotzsch) Baill.	5	0.029	aut		Apr-Jun, Sep		Oct	Sep		Nov	Oct	
EUPHORBIACEAE	*Alchornea glandulosa* Pöpp.	2	0.015	zoo									
EUPHORBIACEAE	Euphorbiaceae sp. 1	1	0.006	aut									
EUPHORBIACEAE	Euphorbiaceae sp. 2	3	0.051	aut	Aug	Aug-Oct							
EUPHORBIACEAE	Euphorbiaceae sp. 3	1	0.010										
EUPHORBIACEAE	*Hieronyma alchorneoides* Allemão	2	0.039	zoo		Dec							
EUPHORBIACEAE	*Mabea ffistulifera* Mart.	9	0.246	zoo	Aug	Sep-Oct	Jun, Aug	Aug-Nov		Mar-Jul	Aug-Nov		Mar-Jul
EUPHORBIACEAE	*Pogonophora schomburgkiana* Benth.	3	0.016	aut			Aug	Aug					
EUPHORBIACEAE	*Senefeldera verticillata* (Vell.) Croizat	22	0.274	aut	Aug-Oct	Aug-Sep, Nov	Aug	Sep-Nov	Feb-Mar	Oct-Nov	Oct-Dec	Nov-Dec	
EUPHORBIACEAE	*Tetraplandra leandrii* Baill.	1	0.006	zoo									
FABACEAE	*Abarema* sp.	3	0.074	zoo			Jan					Jun,Dec	
FABACEAE	*Albizia pedicellaris* (DC.) L.Rico	1	0.022	zoo		Jan, Sep			Mar, Nov				
FABACEAE	*Apuleia leiocarpa* (Vogel) J.F.Macbr.	1	0.066	aut			Aug	Dec	Feb-Apr, Aug, Nov-Dec			Jan, Mar-May, Sep, Dec	Jan
FABACEAE	*Bauhinia forficata* Link	1	0.006	aut			Feb		May-Jun, Aug	Mar, May-Jul		Jun-Nov	Apr, Jun-Aug

FABACEAE	*Chamaecrista ensiformis* (Vell.) H.S.Irwin & Barneby	4	0.045	ane		Oct-Nov		Oct-Nov	Apr	Dec			
FABACEAE	Fabaceae sp.	1	0.008	ane									
FABACEAE	*Hymenolobium janeirense* Kuhlm.	1	0.005	ane									
FABACEAE	*Inga capitata* Desv.	3	0.061	ane									
FABACEAE	*Machaerium incorruptibile* (Vell.) Benth.	1	0.004	ane						Jan-Feb			
FABACEAE	*Moldenhawera polysperma* (Vell.) Stellfeld	3	0.029	ane									
FABACEAE	*Peltogyne angustiflora* Ducke	4	0.054	ane						Aug			
FABACEAE	*Poecilanthe falcata* (Vell.) Heringer	1	0.007	ane									
FABACEAE	*Pseudopiptadenia contorta* (DC.) G.P.Lewis & M.P.Lima	5	0.298	ane	Sep	Aug		Aug, Oct-Dec	Jan-Dec	Jan-Jun	Aug-Dec	Jan-Feb	Jan, May-Aug
FABACEAE	*Pseudopiptadenia warmingii* (Benth.) G.P.Lewis & M.P.Lima	1	0.025	ane		Dec							
FABACEAE	*Pterocarpus rohrii* Vahl	2	0.015	zoo									
FABACEAE	*Swartzia apetala* Raddi	2	0.010	zoo					Nov				
FABACEAE	*Tachigali denudata* (Vogel) Oliveira-Filho	5	4.032	zoo		Dec							
FABACEAE	*Zollernia glabra* (Spreng.) Yakovlev	1	0.005	zoo									
LAURACEAE	*Anibafirmula* (Nees & Mart. ex Nees) Mez	4	0.105	zoo		Nov	Jan, Apr	Oct					Feb-Aug
LAURACEAE	*Beilschmiedia fluminensis* Kosterm.	7	0.154	zoo									
LAURACEAE	*Cryptocarya moschata* Nees & Mart. ex Nees	3	0.032	zoo		Sep							
LAURACEAE	*Cryptocarya saligna* Mez	2	0.048	zoo									
LAURACEAE	Lauraceae sp. 1	1	0.005										
LAURACEAE	Lauraceae sp. 2	1	0.007	zoo									
LAURACEAE	*Licaria* sp.	4	0.034	zoo	Nov	Aug-Sep, Nov-Dec	Aug		Dec				
LAURACEAE	*Nectandra puberula* (Schott) Nees	3	0.009	zoo									
LAURACEAE	*Ocotea aciphylla* (Nees & Mart. ex Nees) Mez	3	0.029	zoo									
LAURACEAE	*Ocotea argentea* Mez	1	0.012	zoo			Jan						
LAURACEAE	*Ocotea diospyrifolia* (Meisn.) Mez	3	0.038	zoo									Aug
LAURACEAE	*Ocotea dispersa* (Nees & Mart. ex Nees) Mez	4	0.047	zoo	Aug	Aug-Sep			Dec	May-Aug			
LAURACEAE	*Ocotea divaricata* (Nees) Mez	1	0.027	zoo									
LAURACEAE	*Ocotea glaziovii* Mez	3	0.043	zoo		Mar							

LAURACEAE	*Ocotea insignis* Mez	1	0.062	zoo		Aug-Sep			Oct			Nov	
LAURACEAE	*Ocotea laxa* (Nees) Mez	1	0.014	zoo									
LAURACEAE	*Ocotea odorifera* (Vell.) Rohwer	4	0.067	zoo				Sep-Nov	Dec	Aug			
LAURACEAE	*Ocotea silvestris* Vattimo-Gil	1	0.005	zoo									
LAURACEAE	*Ocotea* sp. 1	3	0.061	zoo									
LAURACEAE	*Ocotea* sp. 2	1	0.018	zoo	Oct						Dec		
LAURACEAE	*Ocotea teleiandra* (Meisn.) Mez	2	0.064	zoo		Dec		Sep-Nov					Jan
LAURACEAE	*Pleurothyrium bahiense* (Meisn.) Barroso	6	0.033	zoo			Mar, May, Aug		Jun			Jan-Sep	Jun-Jul
LAURACEAE	*Urbanodendron verrucosum* (Nees) Mez	2	0.015	zoo		Dec							
LECYTHIDACEAE	Lecythidaceae sp. 1	1	0.005	zoo		Aug-Sep					Sep, Nov	Nov	
LECYTHIDACEAE	Lecythidaceae sp. 2	3	0.011	zoo		May	Mar-May	Aug-Sep,	Jul-Sep, Nov	Jun	Sep-Oct	Jul-Oct, Dec	Jul
LECYTHIDACEAE	Lecythidaceae sp. 3	1	0.009	zoo									
LECYTHIDACEAE	*Lecythis lanceolata* Poir.	1	0.017	ane	Dec	Jan-Feb, May-Jun, Dec				Mar-Apr		May-Jun, Oct	
MALVACEAE	*Eriotheca pentaphylla* (Vell. emend. K.Schum.) A.Robyns	3	0.204	ane	Sep-Oct	Oct-Dec	Jan	Nov			Dec		
MALVACEAE	*Sterculia curiosa* (Vell.) Taroda	1	0.058	ane		Feb, Nov				Jan-Jul			
MELASTOMATACEAE	*Miconia cinnamomifolia* (DC.) Naudin	9	0.140	zoo	Oct-Nov	Oct-Dec		Oct	Jan-May	Jan-Apr, Aug	Nov	Feb-Jun	Feb-May
MELASTOMATACEAE	*Miconia lepidota* DC.	6	0.027	ane	Aug	May	Jun	Oct-Dec	Dec				
MELASTOMATACEAE	*Tibouchina estrellensis* (Raddi) Cogn.	2	0.023	zoo	Sep-Oct	Feb, Sep-Dec	Feb-Mar, May	Nov	Mar		Dec	Apr	
MELIACEAE	*Capralea canjerana* (Vell.) Mart.	7	0.267	zoo									
MELIACEAE	Meliaceae sp.1	1	0.010	zoo									
MELIACEAE	*Trichilia lepidota* Mart.	5	0.088	zoo	Sep	Dec		Sep		Jan-Jul			
MELIACEAE	*Trichilia* sp.	1	0.004	zoo									
MONIMIACEAE	*Mollinedia oligantha* Perkins	2	0.019	zoo		Sep							

MORACEAE	*Brosimum guianense* (Aubl.) Huber	4	0.116	zoo		Dec	Jan, May-Aug		Dec	Jan, May-Aug		Dec	Jan, May-Aug
MORACEAE	*Brosimum lactescens* (S.Moore) C.C.Berg	1	0.004	zoo									
MORACEAE	*Brosimum glaziovii* Taub.	5	0.142	zoo	Sep	Oct, Dec		Sep	Oct, Dec		Sep	Oct, Dec	
MORACEAE	*Ficus gomelleira* Kunth & C.D.Bouché	2	4.315	zoo									
MORACEAE	*Ficus maxima* Mill.	1	0.017	zoo									
MORACEAE	*Helicostylis tomentosa* (Poepp. & Endl.) Rusby	10	0.202	zoo		Dec	Jan-Apr		Dec	Jan-Apr		Dec	Jan-Apr
MORACEAE	Moraceae sp.	1	0.009			Nov							
MORACEAE	*Pseudolmedia hirtula* Kuhlm.	2	0.081	zoo									
MYRISTICACEAE	*Virola bicuhyba* (Schott ex Spreng.) Warb.	9	0.270	zoo	Dec	May	Feb-Mar. May	Aug	Jun, Sep-Oct		Aug-Sep	Aug-Nov	
MYRISTICACEAE	*Virola gardneri* (A.DC.) Warb.	4	0.066	zoo									
MYRTACEAE	*Calyptranthes concinna* DC.	1	0.007	zoo									May
MYRTACEAE	*Campomanesia eugenioides* (Cambess.) D.Legrand ex Landrum	2	0,081	zoo		Nov							Feb
MYRTACEAE	*Eugenia* sp.	1	0.008	zoo									
MYRTACEAE	*Eugenia excelsa O.Berg*	2	0.015	zoo	Sep	Oct	Jul						
MYRTACEAE	*Eugenia macahensis* O.Berg	4	0.044	zoo		Dec	Jan						
MYRTACEAE	*Eugenia rostrata* O.Berg	1	0.292	zoo	Sep								
MYRTACEAE	*Eugenia villaenovae* Kiaersk.	1	0.027	zoo			Apr-May			Apr-May			Aug
MYRTACEAE	*Marlierea* sp. 1	1	0.006	zoo									
MYRTACEAE	*Marlierea* sp. 2	1	0.006	zoo									
MYRTACEAE	*Marlierea* sp. 3	1	0.006	zoo									
MYRTACEAE	*Marlierea excoriata* Mart.	1	0.008	zoo					Dec	Jan, Jun			
MYRTACEAE	*Myrcia splendens* (Sw.) DC.	2	0.114	zoo	Dec	Dec	Feb						May-Jun
MYRTACEAE	*Myrcia tijucensis* Kiaersk.	3	0.110	zoo									
MYRTACEAE	Myrtaceae sp. 1	1	0.004	zoo	Aug-Sep	Sep, Dec	Jan	Oct-Dec	Sep-Oct			Oct-Nov	Oct-Dec
MYRTACEAE	Myrtaceae sp. 2	1	0.008	zoo									
MYRTACEAE	Myrtaceae sp. 3	1	0.005	zoo									
MYRTACEAE	Myrtaceae sp. 4	1	0.004	zoo									
MYRTACEAE	Myrtaceae sp. 5	1	0.004	zoo									
MYRTACEAE	Myrtaceae sp. 6	1	0.016	zoo									

MYRTACEAE	Myrtaceae sp. 7	3	0.004	zoo		Dec	Jan, Jun			Mar, Jun		Apr, Jul	
MYRTACEAE	Myrtaceae sp. 8	1	0.020	zoo					Apr, Sep			May, Oct	
MYRTACEAE	Myrtaceae sp. 9	1	0.004	zoo									
MYRTACEAE	Myrtaceae sp. 10	1	0.038	zoo		Nov-Dec				Mar-Apr			
NYCTAGINACEAE	*Guapira opposita* (Vell.) Reitz	9	0.186	zoo									
OLACACEAE	*Heisteria ovata* Benth.	4	0.019	zoo									
OLACACEAE	*Heisteria* sp.	1	0.003	zoo	Oct-Nov	Oct-Dec		Aug-Dec	Jan-Oct	Jan, Apr-Jun		Feb-Apr Aug-Nov	May-Jul
OLACACEAE	Olacaceae sp.	1	0.006	zoo	Sep, Nov	Dec	Jan				Nov-Dec	Jan	
ROSACEAE	*Prunus brasiliensis* Dietrich	1	0.036	aut		Mar				May			
RUBIACEAE	*Bathysa mendoncae* K.Schum.	4	0.025	zoo	Dec	Mar-Jun	Jan-Aug						
RUBIACEAE	*Psychotria carthagenensis* Jacq.	1	0.013	zoo				Dec	Jan-Mar, May-Jun, Aug	Mar-Jul		Jun-Jul, Sep	Jun-Aug
RUBIACEAE	*Psychotria vellosiana* Benth.	2	0.014	zoo	Oct-Dec	Jan, Oct-Nov	Jan, May						
RUBIACEAE	Rubiaceae sp.	1	0.006	zoo				Nov-Dec	Feb-May	Feb, Apr-Jul, May	Dec	Jan, Mar-Jun	Mar, May-Aug
RUBIACEAE	*Rudgea erythrocarpa* Müll.Arg.	1	0.004	zoo									
RUTACEAE	Rutaceae sp.	2	0.043	zoo			Aug						
SALICACEAE	*Casearia arborea* (L.C.Rich.) Urb.	7	0.142	zoo	Nov-Dec	Jan, Sep-Dec	Jan			Jan			Feb
SALICACEAE	*Casearia commersoniana* Cambess.	2	0.015	zoo						Aug			Aug
SAPINDACEAE	*Cupania furfuracea* Radlk.	1	0.009	zoo		Jun	Jun		Jun			Jul	
SAPINDACEAE	*Cupania racemosa* (Vell.) Radlk.	7	0.263	zoo		May, Sep, Dec	Feb-May	Aug-Oct	Aug-Oct		Sep-Nov	Sep-Nov	
SAPINDACEAE	*Cupania* sp. 1	1	0.010	zoo				Aug-Sep	May-Sep	Apr, Jul	Sep-Oct	Jun-Oct	May, Aug
SAPINDACEAE	*Cupania* sp. 2	1	0.038	zoo		Sep	Feb-Mar, May	Aug			Sep		
SAPINDACEAE	Sapindaceae sp. 1	1	0.012				Feb	Aug-Sep	Sep		Sep-Oct	Oct	

SAPINDACEAE	Sapindaceae sp. 2	2	0.145					Aug-Oct	Sep-Oct	Apr, Jul	Sep-Nov	Oct-Nov	May, Aug
SAPINDACEAE	*Talisia* sp.	1	0.006	zoo									
SAPOTACEAE	*Chrysophyllum splendens* Spreng.	6	0.153	zoo									
SAPOTACEAE	*Ecclinusa ramiflora* Mart.	7	4.306	zoo		Nov	Jan			Mar			Apr
SAPOTACEAE	*Micropholis crassipedicellata* (Mart. & Eichler ex Miq.) Pierre	5	4.003	zoo		Dec	Jun						
SAPOTACEAE	*Micropholis guyanensis* (A.DC.) Pierre	2	0.037	zoo		Mar-Jul			Oct				Jan
SAPOTACEAE	*Micropholis* sp.	2	0.084	zoo							Aug		
SAPOTACEAE	*Pocteria bangii* (Rusby) T.D.Penn.	4	0.062	zoo	Oct-Nov	Oct-Dec	Mar, Jul						
SAPOTACEAE	*Pocteria gardneriana* (A.DC.) Radlk.	1	0.013	zoo								Jul-Sep	
SAPOTACEAE	*Pocteria guianensis* Aubl.	5	0.115	zoo	Dec	Nov		Sep-Nov					
SAPOTACEAE	*Pocteria* sp. 1	3	0.054	zoo								Jan	
SAPOTACEAE	*Pocteria* sp. 2	2	0.005	zoo									
SAPOTACEAE	*Pocteria* sp. 3	1	0.071	zoo						Aug			
SAPOTACEAE	*Pocteria* sp. 4	1	0.005	zoo									
SAPOTACEAE	Pradosiakuhlmannii Toledo	3	0.207	zoo		Oct-Nov			Oct			Nov	
SAPOTACEAE	Sapotaceae sp. 1	1	0.020								Nov		Jan
SAPOTACEAE	Sapotaceae sp. 2	2	0.034										
SAPOTACEAE	Sapotaceae sp. 3	1	0.030										
SAPOTACEAE	Sapotaceae sp. 4	1	0.026		Sep-Nov				Jul-Dec	Jul-Aug		Aug-Nov	Jan, Aug
SAPOTACEAE	Sapotaceae sp. 5	1	0.029	zoo							Dec	Jan	
SAPOTACEAE	*Sarcaulus brasiliensis* (A. DC.) Eyma	5	0.068	zoo				Aug	Apr-May	Jan, Apr-Jul			
SIMAROUBACEAE	*Simaba* sp.	3	0.035	zoo				Oct		Aug	Nov		
SIMAROUBACEAE	*Simarouba amara* Aubl.	4	0.087	zoo	Sep	Aug-Oct, Dec							
SIPARUNACEAE	*Siparuna guianensis* Aubl.	5	0.044	zoo			Jul-Aug		Nov-Dec	Jan			
SIPARUNACEAE	*Siparuna* sp.	1	0.011	zoo		Apr-May. Jul, Dec	Jan, Apr-Aug				Aug		
SOLANACEAE	*Acnistus arborescens* (L.) Schltdl.	1	0.014	zoo			Jan		Apr-Jul, Dec	Apr-Aug	Apr-Jul	Jan	Apr-Aug

SOLANACEAE	*Solanum* sp.	1	0.014	zoo									
URTICACEAE	*Cecropia hololeuca* Miq.	6	0.099	zoo	Aug-Sep	Mar-Dec	Jan-Aug	Aug-Sep	Mar-Dec	Jan-Aug	Aug-Sep	Mar-Dec	Jan-Aug
URTICACEAE	*Cecropia pachystachya* Trécul	3	0.044	zoo	Aug-Oct	Dec	Jan-Jul	Aug-Oct	Dec	Jan-Jul	Aug-Oct	Dec	Jan-Jul
URTICACEAE	*Pourouma guianensis* Aubl.	2	0.031	zoo	Oct-Nov	Nov		Oct-Nov	Nov		Oct-Nov	Nov	
VIOLACEAE	*Rinorea guianensis* Aubl.	17	0.209	ane	Sep-Oct	Oct-Dec	Aug			Jan-Apri			
VOCHYSIACEAE	Vochysiaceae sp.	1	0.020	ane				Sep-Dec	Dec	Jan-Feb	Nov-Dec	Jan	Jan-Mar

Table S2. Comparison of models with different fixed effects (models without or with lagged predictors) and random effects terms (with or without plot identity random effect term) by means of their AIC values for activity data on (a) leaf flush, (b) leaf fall, (c) flowering, (d) fruiting (green), and (e) fruiting (mature). Models are ranked according to their AIC values ΔAIC represents the difference in AIC between each model and the model with the lowest AIC value for a given response.

Model	Df	AIC	ΔAIC
(a) Leaf flush			
No lagged predictors	7	12786.83	0
No lagged predictors + Plot identity as a random effect	8	12796.28	9.44
Predictors lagged 1 month	7	12812.35	25.52
Predictors lagged 1 month + Plot identity as a random effect	8	12821.79	34.96
Predictors lagged 3 months	7	12856.6	69.77
Predictors lagged 2 months	7	12860.93	74.1
Predictors lagged 2 months + Plot identity as a random effect	8	12878.15	91.32
Predictors lagged 3 months + Plot identity as a random effect	8	12880.98	94.14
(b) Leaf fall			
No lagged predictors	7	11585.22	0
No lagged predictors + Plot identity as a random effect	8	11631.67	46.45
Predictors lagged 1 month	7	11667.54	82.32
Predictors lagged 2 months	7	11686.23	101.01
Predictors lagged 1 month + Plot identity as a random effect	8	11725.19	139.97
Predictors lagged 3 months	7	11751.75	166.53
Predictors lagged 2 months + Plot identity as a random effect	8	11793.24	208.01
Predictors lagged 3 months + Plot identity as a random effect	8	11828.19	242.97
(c) Flowering			
No lagged predictors	7	2079.85	0
Predictors lagged 2 months	7	2081.89	2.03
Predictors lagged 3 months	7	2089.07	9.22
Predictors lagged 1 month	7	2095.63	15.78
No lagged predictors + Plot identity as a random effect	8	2103.77	23.92
Predictors lagged 2 months + Plot identity as a random effect	8	2107.59	27.73
Predictors lagged 3 months + Plot identity as a random effect	8	2112.97	33.12
Predictors lagged 1 month + Plot identity as a random effect	8	2122.74	42.89
(d) Fruiting (green)			
Predictors lagged 2 months	8	1913.7	0
No lagged predictors	8	1916.46	2.76
Predictors lagged 3 months	8	1918.83	5.12
Predictors lagged 1 month	8	1920.49	6.79
Predictors lagged 2 months + Plot identity as a random effect	8	1936.22	22.51
No lagged predictors + Plot identity as a random effect	8	1939.89	26.19
Predictors lagged 3 months + Plot identity as a random effect	8	1940.22	26.52
Predictors lagged 1 month + Plot identity as a random effect	8	1942.57	28.86
(e) Fruiting (mature)			
Predictors lagged 2 months	8	1474.33	0
Predictors lagged 1 month	8	1474.83	0.5
No lagged predictors	8	1475.81	1.48
Predictors lagged 3 months	8	1475.9	1.57
No lagged predictors + Plot identity as a random effect	8	1816.78	342.45
Predictors lagged 1 month + Plot identity as a random effect	8	1817.27	342.94
Predictors lagged 2 months + Plot identity as a random effect	8	1817.5	343.17
Predictors lagged 3 months + Plot identity as a random effect	8	1819.63	345.3

Table S3. Comparison of models with different fixed effects (models without or with lagged predictors) and random effects terms (with or without plot identity random effect term) by means of their AIC values for intensity data on (a) leaf flush, (b) leaf fall, (c) flowering, (d) fruiting (green), and (e) fruiting (mature).

Model	Df	AIC	ΔAIC
(a) Leaf flush			
No lagged predictors	7	17143.65	0
No lagged predictors + Plot identity as a random effect	8	17162.32	18.67
Predictors lagged 1 month	7	17171.81	28.17
Predictors lagged 1 month + Plot identity as a random effect	8	17193.53	49.89
Predictors lagged 3 months	7	17267.48	123.84
Predictors lagged 2 months	7	17268.81	125.16
Predictors lagged 2 months + Plot identity as a random effect	8	17326.96	183.32
Predictors lagged 3 months + Plot identity as a random effect	8	17334	190.36
(b) Leaf fall			
No lagged predictors + Plot identity as a random effect	8	15766.03	0
No lagged predictors	7	15822.21	56.18
Predictors lagged 1 month + Plot identity as a random effect	8	15860.85	94.82
Predictors lagged 1 month	7	15899.32	133.29
Predictors lagged 2 months + Plot identity as a random effect	8	15904.68	138.65
Predictors lagged 2 months	7	15905.99	139.96
Predictors lagged 3 months + Plot identity as a random effect	8	16045.02	278.99
Predictors lagged 3 months	7	16051.92	285.89
(c) Flowering			
No lagged predictors	8	2434.66	0
Predictors lagged 2 months	8	2438.03	3.37
Predictors lagged 3 months	8	2445.32	10.67
Predictors lagged 1 month	8	2451.28	16.62
No lagged predictors + Plot identity as a random effect	9	2457.5	22.84
Predictors lagged 2 months + Plot identity as a random effect	9	2462.44	27.78
Predictors lagged 3 months + Plot identity as a random effect	9	2468.21	33.55
Predictors lagged 1 month + Plot identity as a random effect	9	2476.95	42.29
(d) Fruiting (green)			
Predictors lagged 2 months + Plot identity as a random effect	9	3140.93	0
No lagged predictors + Plot identity as a random effect	9	3145.65	4.71
Predictors lagged 2 months	9	3146.08	5.15
Predictors lagged 3 months + Plot identity as a random effect	9	3151.15	10.22
No lagged predictors	9	3151.78	10.85
Predictors lagged 1 month + Plot identity as a random effect	9	3153.09	12.16
Predictors lagged 3 months	9	3157.96	17.03
Predictors lagged 1 month	9	3158.82	17.89
(e) Fruiting (mature)			
Predictors lagged 2 months	8	2320	0
Predictors lagged 3 months	8	2322.99	2.99
Predictors lagged 1 month	8	2325.36	5.36
No lagged predictors	8	2325.4	5.4
Predictors lagged 3 months + Plot identity as a random effect	8	2680.29	360.29
Predictors lagged 1 month + Plot identity as a random effect	8	2681.38	361.37
No lagged predictors + Plot identity as a random effect	8	2683.07	363.07
Predictors lagged 2 months + Plot identity as a random effect	8	2686.56	366.56

Models are ranked according to their AIC values; ΔAIC represents the difference in AIC between each model and the model with the lowest AIC value for a given response.

Table S4. Comparison among models containing predictors with different lags when analyzing data on phenological activity for (a) leaf flush, (b) leaf fall, (c) flowering, (d) fruiting (green), and (e) fruiting (mature).

Lag in Predictors. in the Full Model (t−*n*)	AIC	ΔAIC
(a) Leaf flush		
Lag 0	8758.418	0
Lag 1	8784.553	26.134
Lag 3	8828.779	70.36
Lag 2	8833.166	74.747
(b) Leaf fall		
Lag 0	8264.373	0
Lag 1	8346.478	82.106
Lag 2	8365.087	100.714
Lag 3	8430.163	165.79
(c) Flowering		
Lag 0	1876.789	0
Lag 2	1877.919	1.13
Lag 3	1885.852	9.063
Lag 1	1891.985	15.196
(d) Fruiting (green)		
Lag 2	1724.219	0
Lag 0	1726.692	2.473
Lag 3	1729.682	5.463
Lag 1	1731.014	6.795
(e) Fruiting (mature)		
Lag 1	1238.759	0
Lag 2	1238.781	0.022
Lag 0	1239.839	1.08
Lag 3	1241.637	2.879

For each response variable, we used the difference between the AIC values of each model and the lowest AIC value (ΔAIC) to select the appropriate lagged predictors to be used in the model selection approach. All models contained the lagged predictors photoperiod, growing degree-days, total precipitation, and rainfall days, and we included the lag by relating the response variable in time t to the value of that predictor on time t (lag 0), $t-1$ (lag 1), $t-2$ (lag 2), and $t-3$ (lag 3). Across all response variables, models with the lowest AIC were chosen and submitted to the main model selection approach.

Table S5. Comparison among models containing predictors with different lags when analyzing data on phenological intensity for (a) leaf flush, (b) leaf fall, (c) flowering, (d) fruiting (green), and (e) fruiting (mature).

Lag in predictors in the full model (t – n)	AIC	ΔAIC
(a) Leaf flush		
Lag 0	11363.167	0
Lag 1	11392.761	29.595
Lag 3	11488.979	125.812
Lag 2	11489.475	126.308
(b) Leaf fall		
Lag 0	10749.978	0
Lag 1	10826.999	77.021
Lag 2	10834.327	84.349
Lag 3	10981.229	231.251
(c) Flowering		
Lag 0	3243.874	0
Lag 3	3257.442	13.568
Lag 2	3257.59	13.717
Lag 1	3264.817	20.943
(d) Fruiting (green)		
Lag 2	2636.519	0
Lag 0	2639.691	3.172
Lag 1	2648.588	12.069
Lag 3	2648.744	12.225
(e) Fruiting (mature)		
Lag 2	1960.423	0
Lag 3	1961.774	1.351
Lag 0	1963.798	3.375
Lag 1	1965.123	4.7

For each response variable, we used the difference between the AIC values of each model and the lowest AIC value (ΔAIC) to select the appropriate lagged predictors to be used in the model selection approach. All models contained the lagged predictors photoperiod, growing degree-days, total precipitation, and rainfall days, and we included the lag by relating the response variable in time *t* to the value of that predictor on time *t* (lag 0), $t - 1$ (lag 1), $t - -2$ (lag 2), and $t - 3$ (lag 3). Across all response variables, models with the lowest AIC were chosen and submitted to the main model selection approach.

Table S6. Pearson correlation coefficients between each of the five phenophases for (a) activity and (b) intensity data.

Phenophase	Leaf fall	Leaf flush	Flowering	Fruiting (green)	Fruiting (mature)
(a) Activity					
Leaf fall	1	0.506	0.125	0.082	0.086
Leaf flush	0.506	1	0.199	0.197	0.158
Flowering	0.125	0.199	1	0.205	0.065
Fruiting (green)	0.082	0.197	0.205	1	0.547
Fruiting (mature)	0.086	0.158	0.065	0.547	1
(b) Intensity					
	Leaf fall	**Leaf flush**	**Flowering**	**Fruiting (green)**	**Fruiting (mature)**
Leaf fall	1	0.42	0.103	0.062	0.079
Leaf flush	0.42	1	0.221	0.179	0.147
Flowering	0.103	0.221	1	0.157	0.045
Fruiting (green)	0.062	0.179	0.157	1	0.549
Fruiting (mature)	0.079	0.147	0.045	0.549	1

Table S7. Models that were better supported by the data according to the Akaike Information Criteria (AIC) for data on phenological intensity on (a) leaf flush, (b) leaf fall, (c) flowering, (d) fruiting (green), and (e) fruiting (mature).

Model	Lag (t – n)	df	logLik	AIC	ΔAIC	w_i
(a) Leaf flush						
~ Photoperiod + Growing degree-days + Rainfall days†	Lag 0	6	−5675.14	11362.27	0.00	0.61
~ Photoperiod + Growing degree-days + Rainfall days + Total precipitation	Lag 0	7	−5674.58	11363.17	0.90	0.39
(b) Leaf fall						
~ Photoperiod + Total precipitation†	Lag 0	5	−5369.73	10749.46	0.00	0.32
~ Photoperiod + Growing degree-days + Rainfall days + Total precipitation	Lag 0	7	−5367.99	10749.98	0.52	0.25
~ Photoperiod + Rainfall days + Total precipitation	Lag 0	6	−5369.09	10750.19	0.73	0.22
~ Photoperiod + Growing degree-days + Total precipitation	Lag 0	6	−5369.15	10750.30	0.84	0.21
(c) Flowering						
~ Photoperiod + Growing degree-days + Total precipitation†	Lag 0	7	−1614.42	3242.84	0.00	0.63
~ Photoperiod + Growing degree-days + Rainfall days + Total precipitation	Lag 0	8	−1613.94	3243.87	1.03	0.37
(d) Fruiting (green)						
~ Flowering + Rainfall days†	Lag 2	6	-1311.52	2635.04	0.00	0.30
~ Photoperiod + Growing degree-days + Flowering + Rainfall days	Lag 2	8	-1310.11	2636.23	1.19	0.16
~ Growing degree-days + Flowering + Rainfall days	Lag 2	7	-1311.20	2636.39	1.35	0.15
~ Photoperiod + Growing degree-days + Flowering + Rainfall days + Total precipitation	Lag 2	9	-1309.27	2636.53	1.49	0.14
~ Flowering + Rainfall days + Total precipitation	Lag 2	7	-1311.39	2636.77	1.73	0.12
~ Photoperiod + Flowering + Rainfall days	Lag 2	7	-1311.40	2636.80	1.76	0.12
(e) Fruiting (mature)						
~ Growing degree-days + Fruiting (green) †	Lag 2	5	-973.71	1957.42	0.00	0.36

~ Fruiting (green)	Lag 2	4	-975.32	1958.64	1.21	0.19
~ Growing degree-days + Fruiting (green) + Rainfall days	Lag 2	6	-973.41	1958.82	1.40	0.18
~ Photoperiod + Growing degree-days + Fruiting (green)	Lag 2	6	-973.64	1959.27	1.85	0.14
~ Growing degree-days + Fruiting (green) + Total precipitation	Lag 2	6	-973.70	1959.41	1.98	0.13

We used a mixed-effects model using a binomial distribution (link logit) for (a), (b), and (e), and a negative binomial distribution for (c) and (d). Following the model selection, we ranked models according to their AIC values, and selected the models within Δ AIC ⩽ 2 of the model with the lowest AIC value for inference. The Akaike weight for a given model, wi, represents the probability that a given model is the best model in the set, and the ratio of wi between models can indicate the strength of evidence in favor of one model over the other. The column 'Lag' refers to the selected lag used for the predictor variables photoperiod, growing degree-days, total precipitation, and rainfall days in the models. When "Flowering" and "Fruiting (green)" appear as predictors in a given model, they represent whether a given individual was in that phenophase in the previous month. The symbol "†" denotes the final model for data on each phenophase, which was selected based on the smallest number of predictors within ΔAIC ⩽ 2.

Table S8. Intercept (β_0), Slopes, standard errors, z and p values, the lag used for each predictor included in the final models for data on phenological intensity on (a) leaf flush, (b) leaf fall, (c) flowering, (d) fruiting (green), and (e) fruiting (mature).

Predictor	Lag (t – n)	Slope	SE	z	p
(a) Leaf flush					
β_0		-1.79	0.02	-97.95	<0.001
$\beta_{\text{Rainfall days}}$	Lag 0	-0.19	0.02	-7.43	<0.001
β_{GDD}	Lag 0	0.17	0.04	4.72	<0.001
$\beta_{\text{Photoperiod}}$	Lag 0	0.26	0.04	7.45	<0.001
(b) Leaf fall					
β_0		-2.19	0.05	-48.14	<0.001
$\beta_{\text{Total precipitation}}$	Lag 0	-0.4	0.04	-10.29	<0.001
$\beta_{\text{Photoperiod}}$	Lag 0	-0.51	0.03	-15.27	<0.001
(c) Flowering					
β_0		-3.59	0.11	-33.58	<0.001
$\beta_{\text{Photoperiod}}$	Lag 0	1.64	0.26	6.36	<0.001
β_{GDD}	Lag 0	-0.74	0.25	-2.93	0.003
$\beta_{\text{Total precipitation}}$	Lag 0	-0.4	0.19	-2.03	0.042
(d) Fruiting (green)					
β_0		-4.54	0.15	-29.77	<0.001
$\beta_{\text{Rainfall days}}$	Lag 2	-0.33	0.11	-3.1	0.002
$\beta_{\text{Flowering}}$	Lag 1	0.44	0.08	5.7	<0.001
(e) Fruiting (mature)					
β_0		-4.6	0.13	-34.97	<0.001
β_{GDD}	Lag 2	-0.17	0.1	-1.79	0.073
$\beta_{\text{Fruiting (green)}}$	Lag 1	1.29	0.07	18.96	<0.001

In each case, we used the structure of the model with the smallest number of predictors within ΔAIC ≤ 2 units of the model with the lowest AIC for each response variable, as shown in Table 1. When "Flowering" and "Fruiting (green)" appear as predictors in a given model, they represent the proportional intensity of that phenophase for a given individual in the previous month.

Table S9. Standardized effect size estimates, standard errors, 95% confidence intervals, and z and p values for each predictor included in the averaged model for activity data on (a) leaf flush, (b) leaf fall, (c) flowering, (d) fruiting (green), and (e) fruiting (mature).

Predictor	Lag (t – n)	Estimate	SE	Lower 95% CI	Upper 95% CI	z	p	Importance
(a) Leaf flush								
$\beta_{Photoperiod}$	Lag 0	0.08	0.05	-0.01	0.18	1.772	0.076	1.00
β_{GDD}	Lag 0	0.27	0.05	0.18	0.37	5.695	<0.001	1.00
$\beta_{Rainfall\ days}$	Lag 0	-0.22	0.04	-0.30	-0.14	5.537	<0.001	0.50
$\beta_{Total\ precipitation}$	Lag 0	0.04	0.05	-0.06	0.15	0.786	0.432	0.50
(b) Leaf fall								
$\beta_{Photoperiod}$	Lag 0	-0.60	0.06	-0.72	-0.47	9.284	<0.001	1.00
β_{GDD}	Lag 0	0.09	0.05	-0.02	0.19	1.652	0.099	1.00
$\beta_{Rainfall\ days}$	Lag 0	0.01	0.06	-0.10	0.12	0.250	0.802	0.67
$\beta_{Total\ precipitation}$	Lag 0	-0.39	0.05	-0.49	-0.28	7.266	<0.001	0.33
(c) Flowering								
$\beta_{Photoperiod}$	Lag 0	1.44	0.19	1.07	1.81	7.652	<0.001	1.00
β_{GDD}	Lag 0	-0.61	0.16	-0.93	-0.30	3.833	<0.001	1.00
$\beta_{Rainfall\ days}$	Lag 0	0.17	0.17	-0.16	0.51	1.011	0.312	1.00
$\beta_{Total\ precipitation}$	Lag 0	-0.71	0.20	-1.10	-0.31	3.520	<0.001	0.50
(d) Fruiting (green)								
$\beta_{Photoperiod}$	Lag 2	-0.02	0.12	-0.25	0.20	0.201	0.841	1.00
β_{GDD}	Lag 2	0.05	0.12	-0.17	0.28	0.469	0.639	1.00
$\beta_{Flowering}$	Lag 1	1.48	0.27	0.95	2.01	5.483	<0.001	0.25
$\beta_{Rainfall\ days}$	Lag 2	-0.26	0.12	-0.48	-0.03	2.224	0.026	0.25
$\beta_{Total\ precipitation}$	Lag 2	0.12	0.14	-0.16	0.40	0.842	0.400	0.25
(e) Fruiting (mature)								
$\beta_{Photoperiod}$	Lag 1	-0.06	0.12	-0.31	0.18	0.486	0.627	1.00
β_{GDD}	Lag 1	-0.10	0.13	-0.35	0.15	0.773	0.439	0.43
$\beta_{Fruiting\ (green)}$	Lag 1	4.74	0.28	4.19	5.30	16.855	<0.001	0.29
$\beta_{Rainfall\ days}$	Lag 1	0.20	0.14	-0.08	0.47	1.373	0.170	0.29
$\beta_{Total\ precipitation}$	Lag 1	-0.10	0.16	-0.41	0.22	0.586	0.558	0.14

The importance of a predictor is given by the sum of Akaike weights (w_i) over all models that included that predictor, and represents the probability of that predictor appearing the in the best model. Predictors included in the model averaging were those included in the confidence set containing all models within ΔAIC ≤ 2 from the model with the lowest AIC.

Table S10. Standardized effect size estimates, standard errors, 95% confidence intervals, and z and p values for each predictor included in the averaged model for intensity data on (a) leaf flush, (b) leaf fall, (c) flowering, (d) fruiting (green), and (e) fruiting (mature).

Predictor	Lag (t – n)	Estimate	SE	Lower 95% CI	Upper 95% CI	z	p	Importance
(a) Leaf flush								
$\beta_{\text{Photoperiod}}$	Lag 0	0.27	0.04	0.19	0.35	6.567	<0.001	1.0
β_{GDD}	Lag 0	0.17	0.04	0.10	0.23	4.661	<0.001	1.0
$\beta_{\text{Rainfall days}}$	Lag 0	-0.17	0.03	-0.24	-0.11	5.054	<0.001	1.0
$\beta_{\text{Total precipitation}}$	Lag 0	-0.05	0.04	-0.13	0.04	1.050	0.294	0.5
(b) Leaf fall								
$\beta_{\text{Photoperiod}}$	Lag 0	-0.48	0.06	-0.59	-0.37	8.571	<0.001	1.0
β_{GDD}	Lag 0	-0.06	0.04	-0.14	0.03	1.277	0.202	1.0
$\beta_{\text{Rainfall days}}$	Lag 0	-0.42	0.06	-0.53	-0.31	7.622	<0.001	0.5
$\beta_{\text{Total precipitation}}$	Lag 0	0.06	0.04	-0.03	0.14	1.315	0.188	0.5
(c) Flowering								
$\beta_{\text{Photoperiod}}$	Lag 0	1.69	0.28	1.15	2.24	6.077	<0.001	1.0
β_{GDD}	Lag 0	-0.75	0.26	-1.25	-0.25	2.950	0.003	1.0
$\beta_{\text{Rainfall days}}$	Lag 0	0.24	0.24	-0.23	0.71	0.984	0.325	1.0
$\beta_{\text{Total precipitation}}$	Lag 0	-0.48	0.26	-0.98	0.03	1.854	0.064	0.5
(d) Fruiting (green)								
$\beta_{\text{Flowering}}$	Lag 1	0.44	0.06	0.33	0.56	7.577	<0.001	1.0
$\beta_{\text{Photoperiod}}$	Lag 2	-0.26	0.23	-0.72	0.20	1.103	0.270	1.0
β_{GDD}	Lag 2	0.23	0.18	-0.14	0.59	1.222	0.222	1.0
$\beta_{\text{Rainfall days}}$	Lag 2	-0.38	0.13	-0.62	-0.13	3.028	0.002	0.5
$\beta_{\text{Total precipitation}}$	Lag 2	0.17	0.17	-0.16	0.51	1.003	0.316	0.3
(e) Fruiting (mature)								
$\beta_{\text{Photoperiod}}$	Lag 2	0.05	0.13	-0.21	0.31	0.388	0.698	1.0
β_{GDD}	Lag 2	-0.18	0.11	-0.39	0.03	1.674	0.094	0.8
$\beta_{\text{Fruiting (green)}}$	Lag 1	1.29	0.07	1.15	1.42	18.836	<0.001	0.2
$\beta_{\text{Rainfall days}}$	Lag 2	0.07	0.09	-0.11	0.25	0.774	0.439	0.2
$\beta_{\text{Total precipitation}}$	Lag 2	-0.01	0.10	-0.21	0.19	0.128	0.898	0.2

The importance of a predictor is given by the sum of Akaike weights (w_i) over all models that included that predictor, and represents the probability of that predictor appearing the in the best model. Predictors included in the model averaging were those included in the confidence set containing all models within ΔAIC ≤ 2 from the model with the lowest AIC.

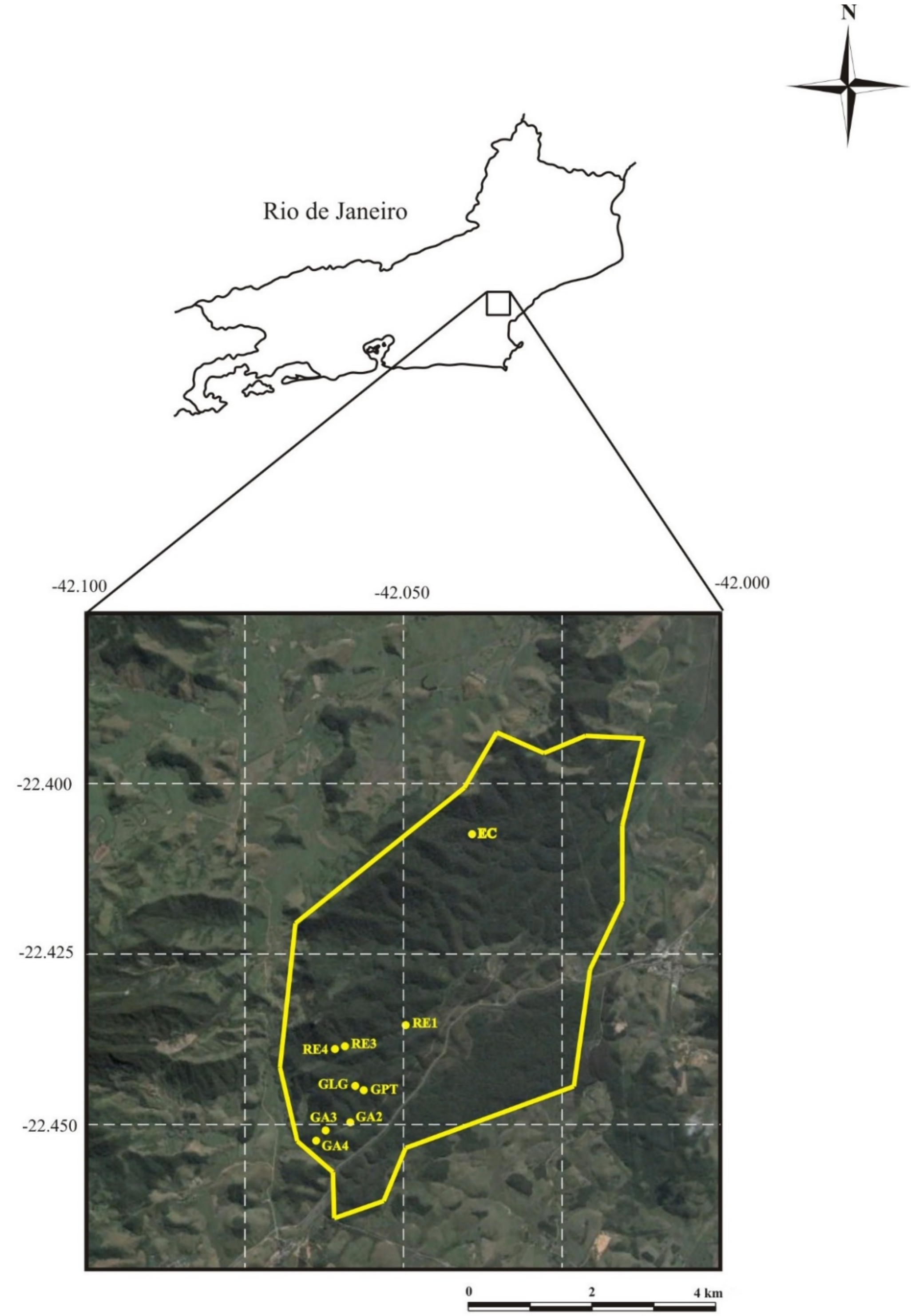

Figure S1. Location of the União Biological Reserve in the State of Rio de Janeiro, Brazil, and satellite image of the reserve during the study, showing the sampling plots. Where: GA2, GA3, and GA4 indicate plots located in the edges of a gas-pipeline clearing; RE1, RE3, and RE4 are plots in the edges of an electric transmission-line clearing; EC, GPT, and GLG are plots in the forest interior. Source: Google Earth 2010.

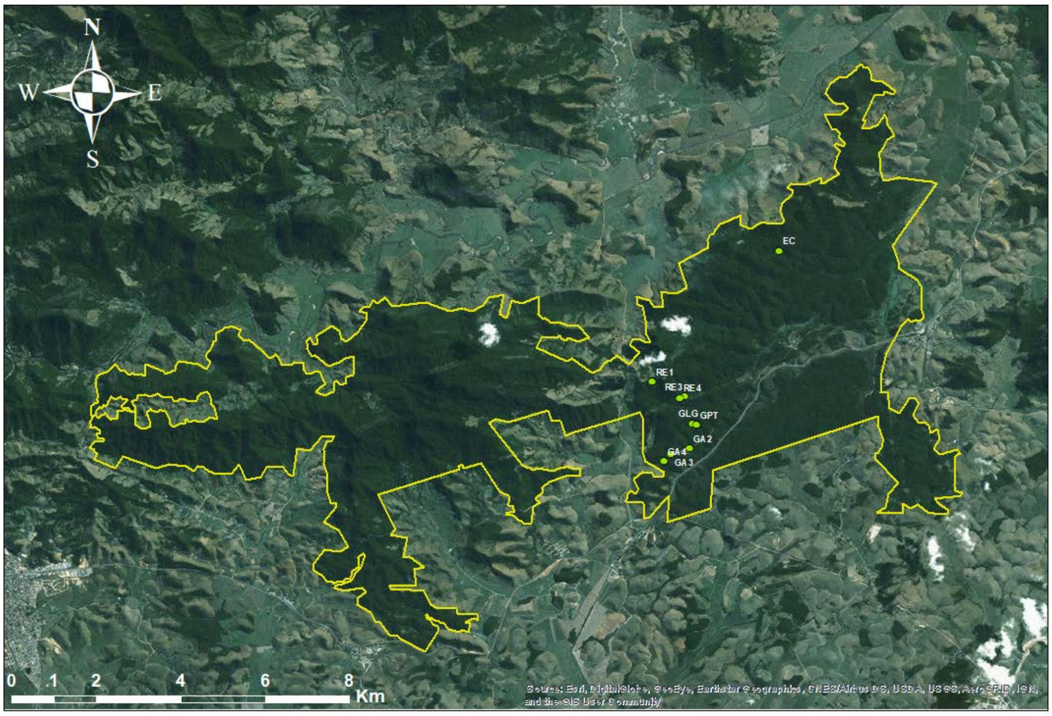

Figure S2. Satellite image of the União Biological Reserve after the enlargement of its area on June 5, 2017. Source: Google Earth 2017.

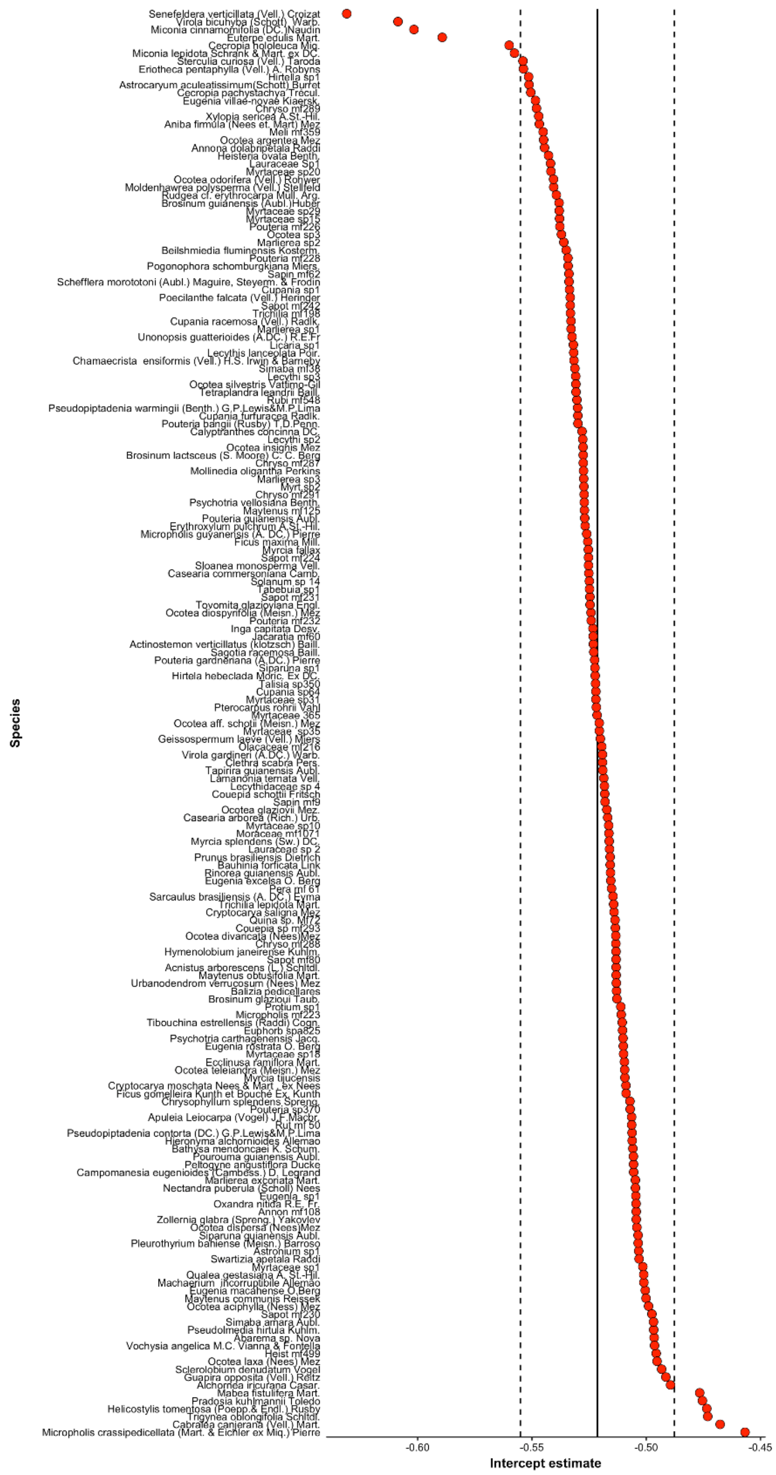

Figure S3. Species-specific deviation from the intercept for the model on the variation in the probability of leaf flushing using phonological activity data. The solid line represents the intercept estimate, while the dashed lines represents its 95% confidence interval. Species to the right of the upper 95% confidence interval are species with a greater probability of leaf flushing than predicted by the model, while species to the left of the lower 95% confidence interval represent the contrary. Values on the *x* axis can be back-transformed to probability values by exponentiation.

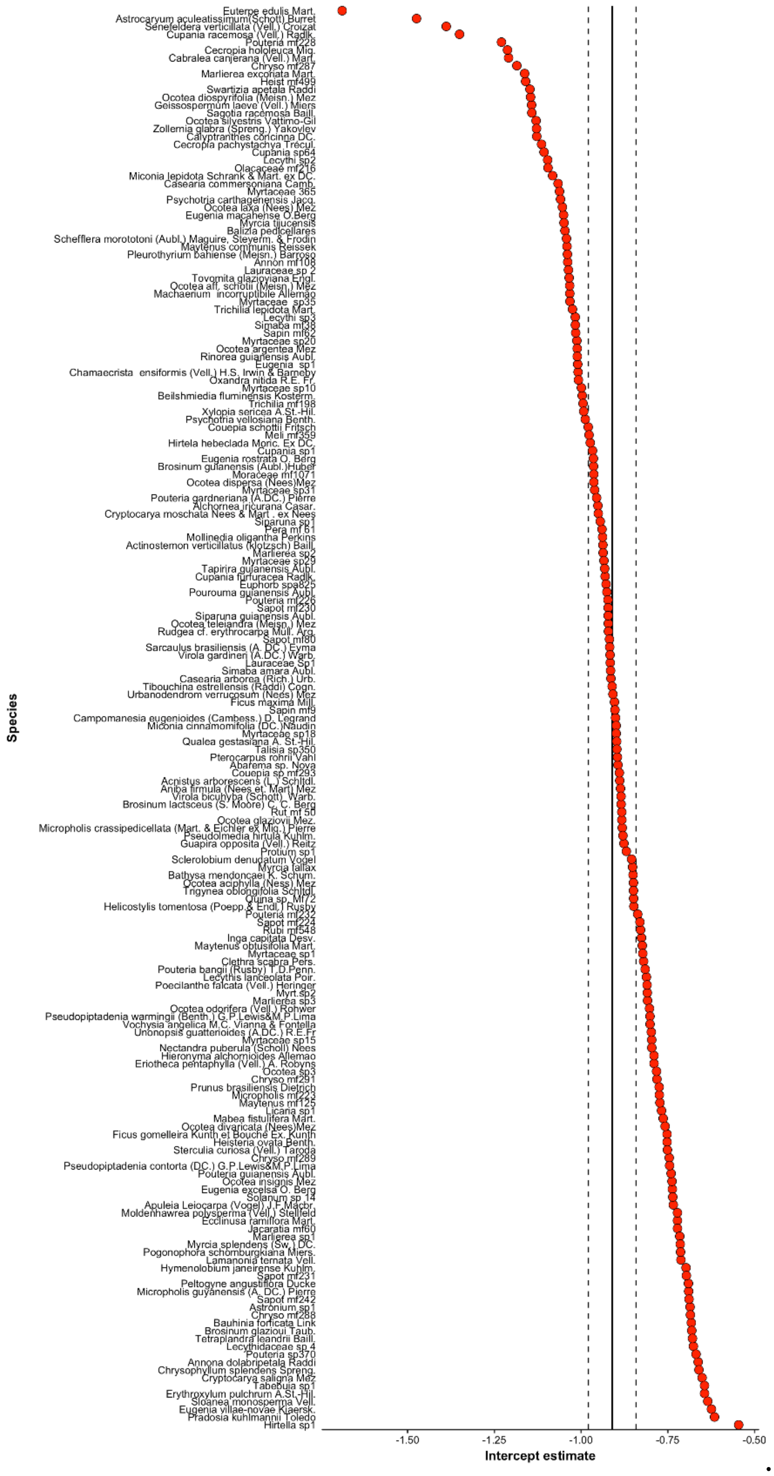

Figure S4. Species-specific deviation from the intercept for the model on the variation in the probability of leaf fall using phonological activity data. The solid line represents the intercept estimate, while the dashed lines represents its 95% confidence interval. Species to the right of the upper 95% confidence interval are species with a greater probability of leaf fall than predicted by the model, while species to the left of the lower 95% confidence interval represent the contrary. Values on the *x* axis can be back-transformed to probability values by exponentiation.

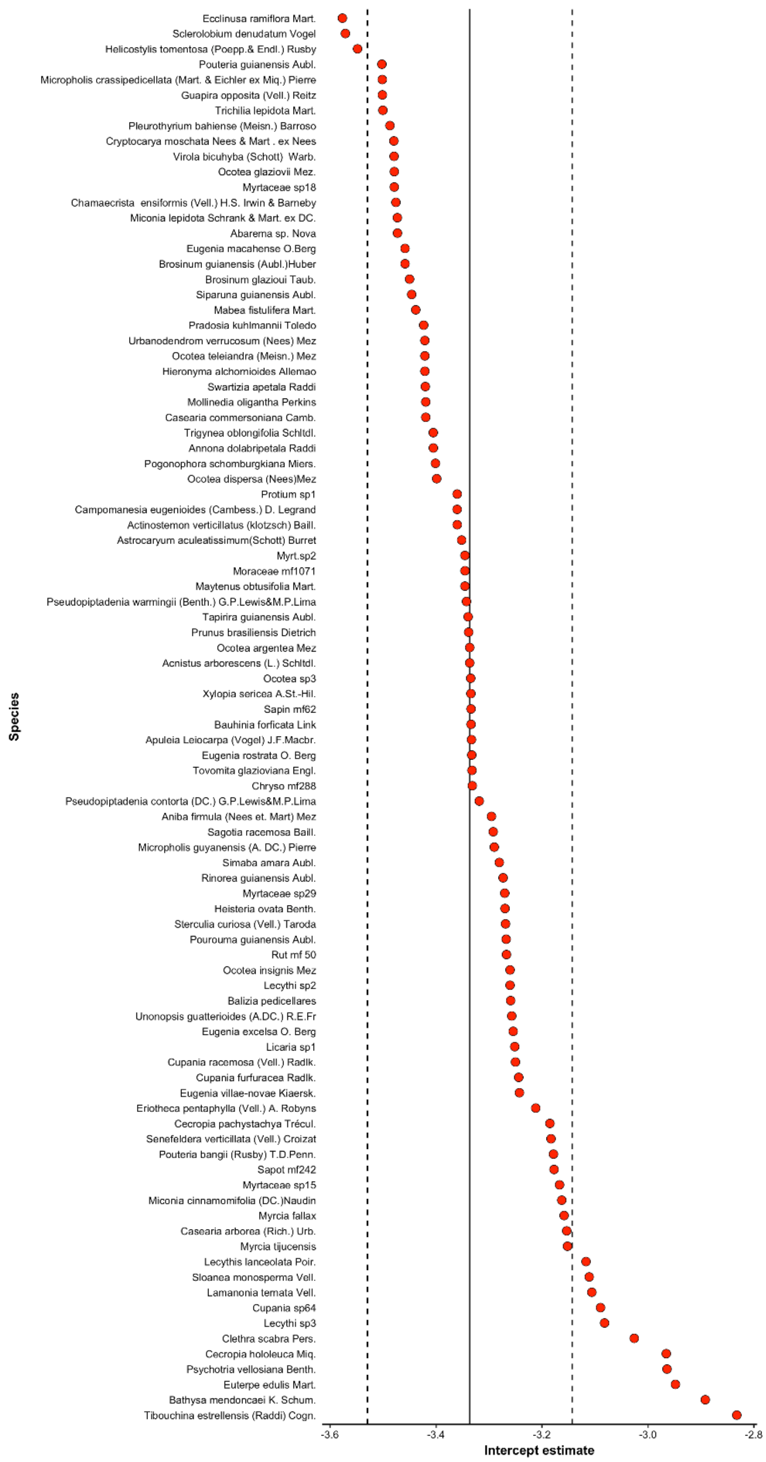

Figure S5. Species-specific deviation from the intercept for the model on the variation in the probability of flowering using phonological activity data. The solid line represents the intercept estimate, while the dashed lines represents its 95% confidence interval. Species to the right of the upper 95% confidence interval are species with a greater probability of flowering than predicted by the model, while species to the left of the lower 95% confidence interval represent the contrary. Values on the *x* axis can be back-transformed to probability values by exponentiation.

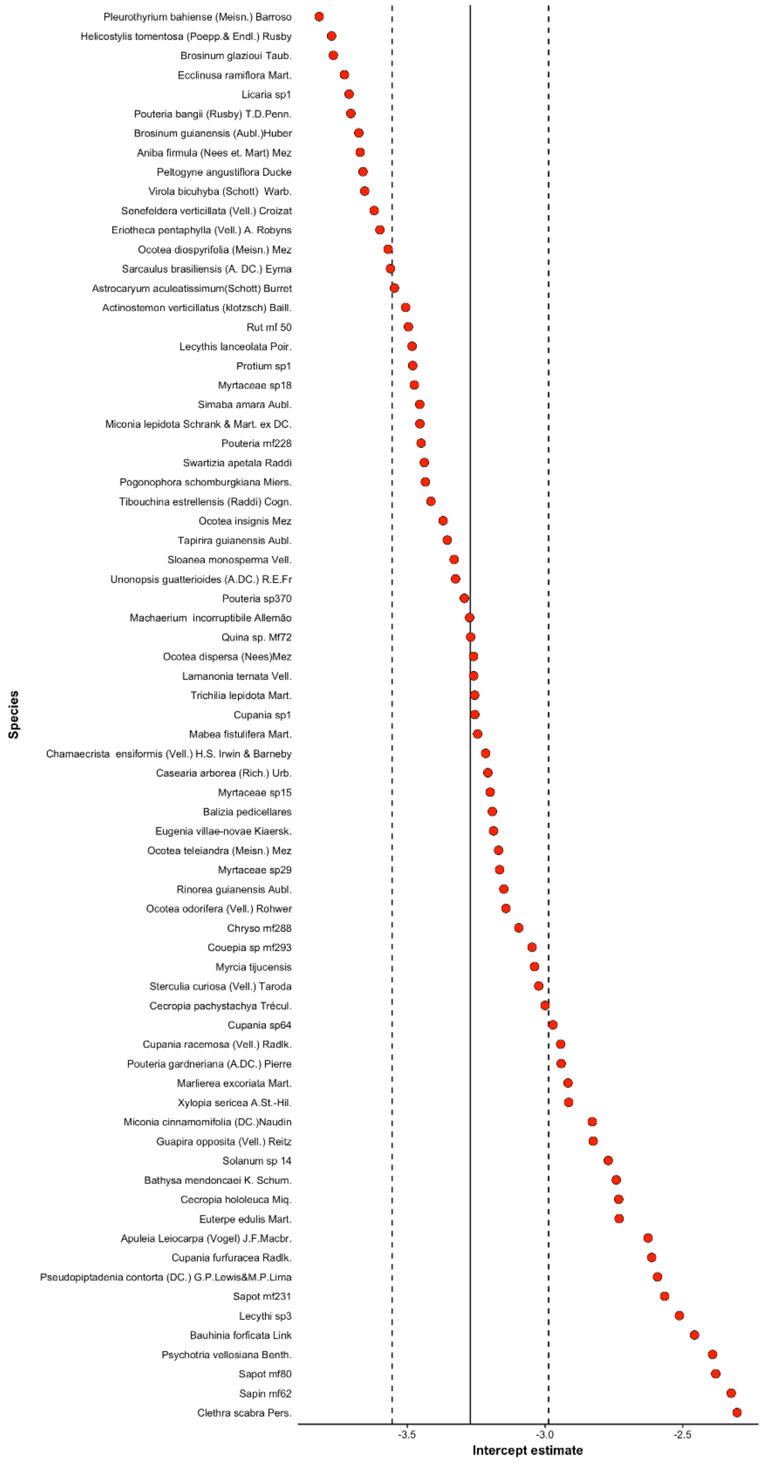

Figure S6. Species-specific deviation from the intercept for the model on the variation in the probability of fruiting (green) using phonological activity data. The solid line represents the intercept estimate, while the dashed lines represents its 95% confidence interval. Species to the right of the upper 95% confidence interval are species with a greater probability of exhibiting green fruits than predicted by the model, while species to the left of the lower 95% confidence interval represent the contrary. Values on the *x* axis can be back-transformed to probability values by exponentiation.

Figure S7. Species-specific deviation from the intercept for the model on the variation in the probability of fruiting (mature) using phonological activity data. The solid line represents the intercept estimate, while the dashed lines represents its 95% confidence interval. Species to the right of the upper 95% confidence interval are species with a greater probability of exhibiting mature fruits than predicted by the model, while species to the left of the lower 95% confidence interval represent the contrary. Values on the *x* axis can be back-transformed to probability values by exponentiation.