Generic biodiversity indicators for tropical forests

Supplementary Online Material

Appendix S1
Methods

Study areas. A DOMAIN map (Fig. S1) is used to provide a broadscale (0.5 degree grid) visual display of similarities and differences between the two ecoregions surveyed in this study. The map provides a climate-based, geographic range of other forested ecoregions with similar climate values where output from this study has potential application. For this study additional climate data were obtained from the Federal University of Mato Grosso, Cuiabá Brazil (Nunes 2003) and the Meteorological and Geophysical Agency, Indonesia (BMG: Badan Meteorologi dan Geofisika) http://www.bmkg.go.id/BMKG_Pusat/Depan.bmkg (accessed 3 February 2013)

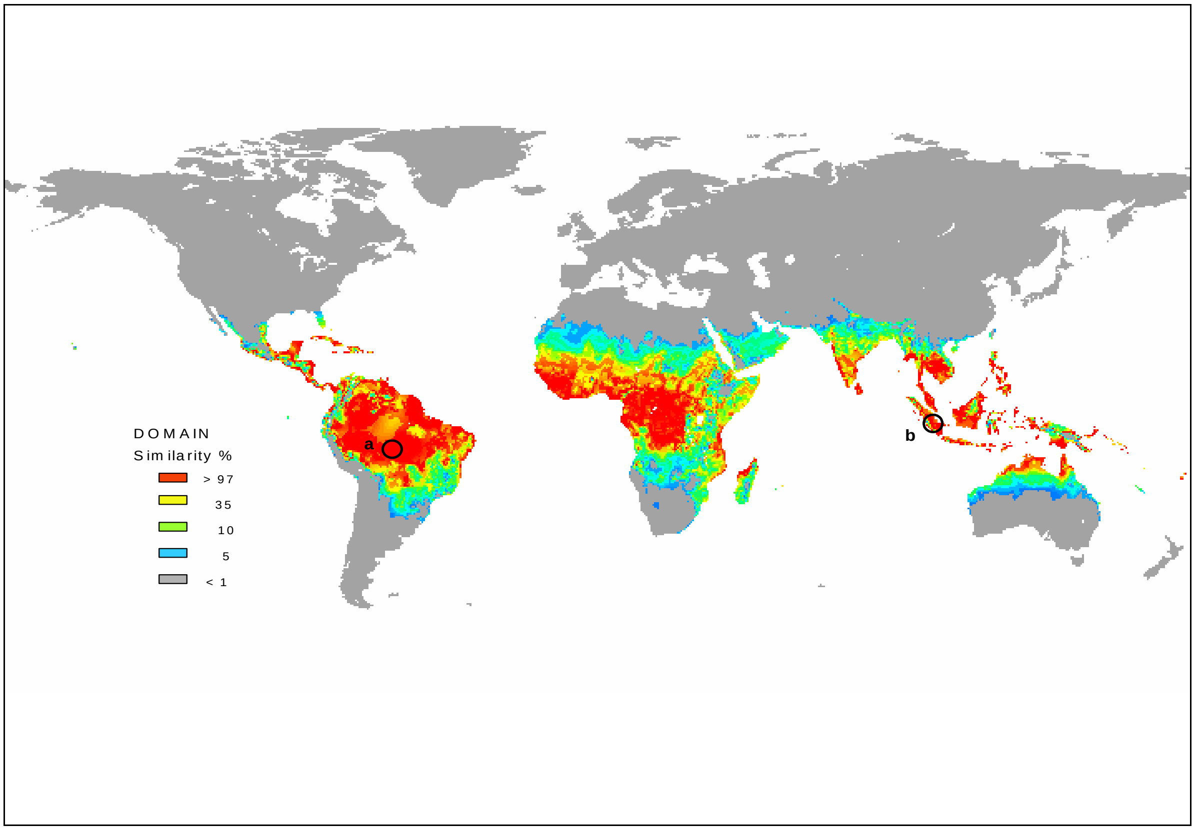

Figure S1. Ecoregional baseline locations in (a) Mato Grosso, Brazil and (b) Sumatra, Indonesia. DOMAIN map illustrates representative coverage of global environmental domains based on elevation, minimum temperature of the coldest month, mean annual precipitation and total annual actual evapotranspiration (data at 0.5 deg. grid) Ecoregional baseline sites (a,b,) occur within Domains with > 97% similarity.The Brazilian Amazon basin contains about 40% of the world's remaining tropical rain forest and the entire basin is considered to be the richest source of terrestrial biodiversity (Fearnside 2005). Indonesia contains almost 10% of the world's remaining humid tropical forests, much of it formerly on lowland Sumatra that, as with Mato Grosso, is under extreme threat from deforestation and land use intensification (Crirical Ecosystem Partnership Fund 2001).

Gradsects. Gradsect survey design is now well established internationally (Grossman et al. 1998; Wessels et al.1998; USGS-NPS 2003; FAO 2005). Where the central aim is to maximise information about the distribution of biota, it is a proven low-input, high-return alternative to traditionally high-input, low-return surveys based on random sampling. As the sampling approach is gradient- rather than area-based it is not subject to sample bias associated with the comparison of widely differing area sizes (e.g. Brazil *vs* Sumatra). Because gradsects avoid the need for standard survey methods based primarily on random or systematic (e.g. grid-based) design, they greatly reduce logistic demands while improving outcomes for spatial modelling of taxa under known or assumed environmental determinants. Where quantitative estimates of numbers of items (e.g. species) per unit area are required, then standard survey designs incorporating random sampling should be used. In our case, by sampling gradients of environmental variables considered to be important ecoregional determinants of both species and PFTs, we aimed to capture spatially referenced information that could be used to detect correlations between environment and biota and help identify appropriate biodiversity indicators. Once acquired, such information can be used directly in extrapolating and testing actual and potential spatial distributional patterns of biota under different management scenarios.

Vegetation. Software for the VegClass protocol used in this study is available via the public domain at www.cbmglobe.org and www.cifor.org .

Invertebrate fauna. We selected termites because of their acknowledged role as ‘soil ecosystem engineers’ conditioning soil, and because they are both readily observable and taxonomically tractable, as well as being a key invertebrate group already known to respond sensitively along perceived land use intensity gradients (Constantino 1992; Martius 1994; Bignell et al. 1997; Lavelle et al. 1997; Jones et al. 2002). Our analysis indicates that the termite faunas of both continents are amenable to comparison although the sampling methods were not quite the the same in both. However, our goal is not to compare the termite faunas of Brazil and Sumatra, but to demonstrate cross-correlations with other elements of the biota. Phylogenetic differences at the family level are small between the two regions. While fungus growers (Macrotermitinae) do not occur in Brazil they represent only 5 out of 53 species in Table S11 and are a subfamily. Transect-based methods are designed to identify functional groups, which are distributed as follows (proportion of species):

Group	***Brazil***	***Sumatra***
wood-feeding	29%	49%
soil-feeding	40%	40%
intermediate	22%	9%
litter-feeding	9%	-
epiphyte	-	2%

The proportion of soil-feeders is the same, and this is usually the most sensitive group in terms of response to habitat disturbance.

In terms of families, the proportions are:

Family	*Brazil*	*Sumatra*
Kalotermitidae	-	2%
Rhinotermitinae	6%	15%
Termitidae	94%	83%

In Sumatra, termites were extracted from plant litter, mounds, above-ground runways and soil monoliths along a 100 x 2m line intercept centred on a vegetation transect, following an established protocol (Jones et al. 2002). In Mato Grosso, termites were sampled intensively mainly aboveground by two people for two hours inside the same transects used for vegetation (40x5m). In both Brazil and Sumatra we found high correlations between different termite feeding groups, plant-based biodiversity features and specific soil properties.

Soil. Although soil and vegetation samples were co-located for all sites in each region actual methods of soil sampling differed in several minor respects. In Brazil we sampled the 0-10 cm surface horizon by compositing three collections taken from the center and both ends of each transect. In Sumatra we sampled both 0-5 and 5-10 cm depths (consolidated from 8 sample points within each transect). For the purposes of this study we took the mean of analytical results from the combined Sumatran 0-5 and 5-10 cm data. In Brazil soil sampling in extreme environments on exposed granitic and sandstone pavements restricted samples to < 5 cm. While only the surface 0-10 cm data were used in the analysis in the present study, correlative analyses with soil data from deeper samples generally reflected those from the upper horizon (not reported here). Variation in laboratory procedures in each region meant that several elemental analyses (B, Fe, Mn, S, Zn) were completed in Brazil but not Sumatra, while total N and soil bulk density were measured only in Sumatra. A standard method of field survey was conducted in Brazil (EMBRAPA 1997) in which the methods for most soil analyses are specified to a set laboratory protocol (Soil Survey Division Staff 1993). In Sumatra, laboratory analyses were conducted at Brawijaya University, broadly following Anderson and Ingram (1993) and Hairiah and van Noordwijk (2000) Soil samples for the 0-5, 5-10, 10-20, 20-30 cm depth zone below the litter layer were passed through a 2 mm sieve and air-dried for analysis of texture (% sand, silt, clay), pH (1N KCl), pH(H_2O), P Bray$_{II}$, C$_{org}$ (Walkey and Black), N$_{tot}$ (Kjeldahl), exchangeable K, Ca, Mg, Na, Al and H, and effective cation exchange capacity (ECEC) by summation. Soil bulk density was measured for the 0-5 cm top soil layer (8 replicates per sampling point), by inserting a 165 cm^3 ring from the mineral soil surface, just below the litter layer.

Total and aboveground carbon (Sumatra). Methods for quantifying carbon stocks were used as specified in the Alternatives to Slash and Burn protocol (Palm et al., 1994). All tree diameters above 5 cm in the forest transects were converted into aboveground biomass with an allometric equation modified from (Brown 1997) on the basis of additional data collected in the Jambi area (Ketterings et al. 2001):

$$Y\ (\text{kg tree}^{-1}) = 0.092\ \text{Diam}^{\,2.60}$$

where tree diameter is measured in cm.

Understorey and herb layer vegetation was measured in eight 0.25 m^2 quadrat samples (or four 1-m^2 samples for non-forest plots); total fresh weight was measured and subsamples were collected for determining dry matter content. Diameter and length of dead wood (> 5 cm diameter) were measured within the 40 x 5 m^2 transect and converted to volume on the basis of a cylindrical form; three apparent density classes were used and ring samples were taken to assess the dry weight bulk density (g cm^{-3}) of the partly decayed wood. Surface litter (including wood < 5 cm diameter) was collected down to the surface of the mineral soil in eight 0.25 m^2 samples. To remove mineral soil particles, the litter samples were washed and sundried; subsamples were taken for dry matter content.

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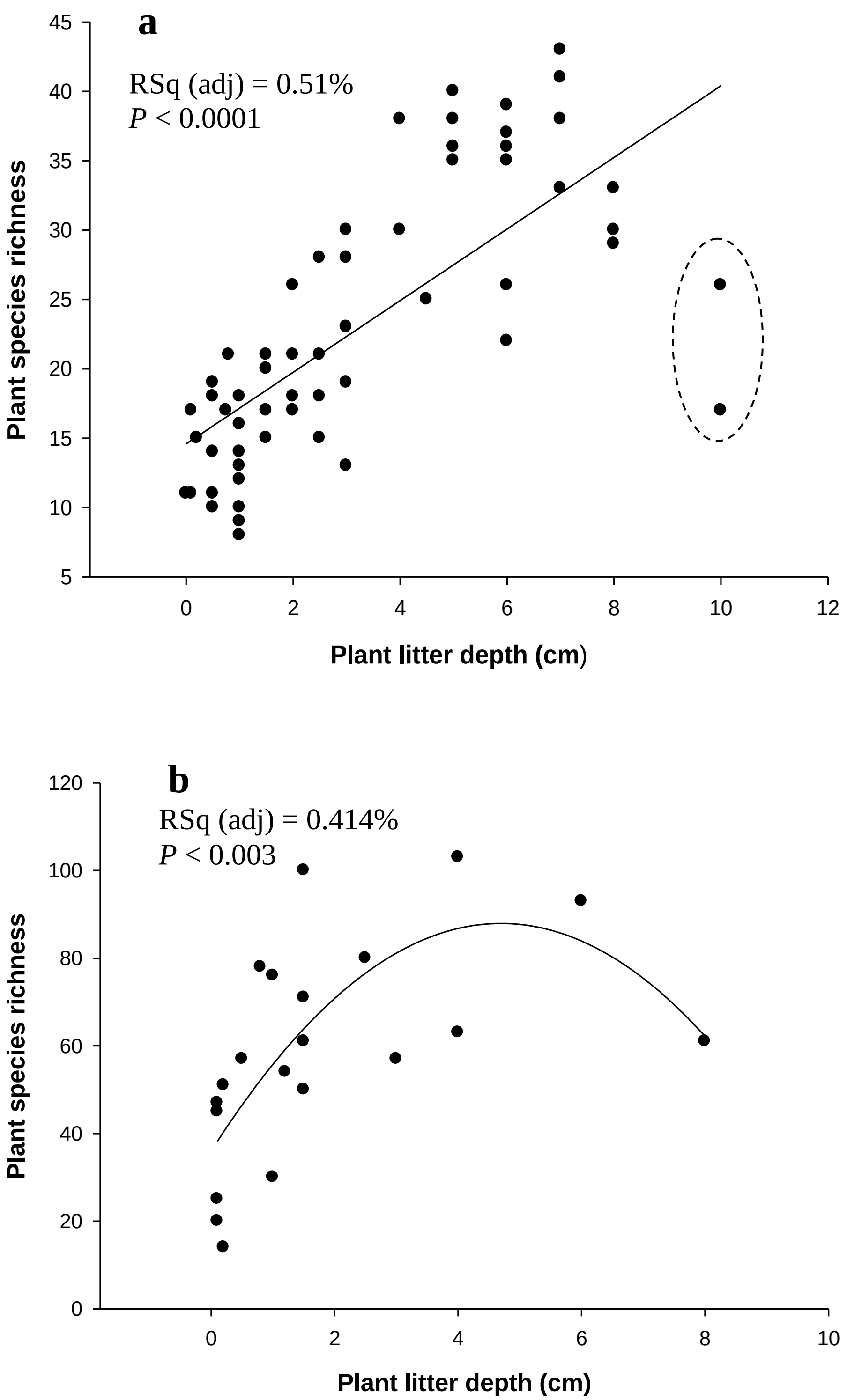

Fig. S2 Litter and species relationship along tropical forested landscape gradients. Points are 40x5m transects. **(a)** North Queensland, Australia. Two outlying transects enclosed in dotted line are wet sclerophyll forests dominated by *Eucalyptus* spp. If these are removed then RSq = 0.69%. **(b)** Cameroon, Central West Africa, Congo basin. Both areas include gradsects ranging from fired savanna woodlands through transitional forest to closed humid forest. In fired areas data were collected at a minimum of six months following fire allowing rebuilding of the litter base.

Appendix S2
Further discussion

Biodiversity and soils. The high correlation between vegetation and soil chemical elements raises questions about cause and effect especially with respect to soil chemistry. For this reason, we focus on fixed soil structural features that are largely independent of plants and other biota. In the Brazilian study correlations between soil texture and PFT diversity and certain of their functional elements indicate a plant adaptive response to gradients of soil texture. Other studies in the Peruvian Amazon basin (Tuomisto et al. 2003) indicate soils determine vegetation type, rather than the dispersal by diaspores. In both regions, we found chamaephytic (shrub-like) life-forms to be closely associated with soil texture (%sand, silt, clay) indicating a possible adaptive response to seasonal water availability.

Application to tropical forest environments. The similarity patterns in the DOMAIN map (Fig. S1, supplementary material) are based on a range of key climate attributes and suggest that the results from this study are at least broadly applicable to forested landscapes areas with > 95% similarity in the climatic domain envelope. Other scale-related climate factors as well as variation in soil substrate, hydrology and land use history all play a potential role in determining the relevance of the indicators identified in this study. The level of spatial resolution of ground data and the availability of adequate computerised potential distribution mapping procedures and geographic information systems are also key factors in determining the extent to which such indicators can be successfully extrapolated for both science and management-related purposes. Experience in the Congo basin (Kotto-Same et al. 2000), India (Gillison 2004) and Thailand (Gillison and Liswanti 1999) using the same vegetation-based rapid survey methodology suggests that the core bioindicators identified in the present paper can be applied to these and probably most lowland tropical forests.

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Appendix S3
Data analysis

Multidimensional scaling. Attempts to identify bioindicators using alternative analyses approaches may prove valuable. Our own initial efforts with multidimensional scaling suggest that the added complexity compromises the ease of ecological interpretation. But these and other multivariate approaches require further examination.

Correlation and regression analyses. We calculated Pearson product-moment correlation using Minitab (v.14.2) software. In the tables presented in this study, correlations were sorted according to most significant *P* values and then *r* values. For linear regression, we used simple Ordinary Least Squares (OLS) as this appeared consistent with our goal of finding simple indicators to use in the field. Since in general, OLS regression is relatively robust against non-normality (except in the presence of extreme outliers; Lumley et al. 2002), no test was considered necessary to detect non-normality in the residuals. In situations involving ecological outliers such as vegetation on upland sandstone pavements in Brazil, these sites were removed to facilitate comparative analysis (Table S16, supplementary materials). In certain cases where the residuals were clearly heteroskedastic, and the line of best fit was required to pass through the origin, OLS regression was relinquished in favour of weighted regression through the origin and the Satterthwaite approximation (Satterthwaite 1946).

Thus, for Fig. 2, we assumed heteroskedasticity and compared the regression slopes using the Satterthwaite approximation as follows: the OLS plot of species diversity against PFT diversity for the Brazil survey indicated a straight line relationship. The intercept on the species axis was insignificant, indicating the relationship can pass through the origin. By contrast, the comparable Sumatra OLS plot had a negative intercept on the species axis. Since negative values for species are unrealistic, we still adjusted the regression to pass through the origin. To test whether the Brazil and Sumatra slopes have significantly different variances, the means of ratios were compared using the Satterthwaite approximation to the regular t-test. Using Satterthwaite's approximation we calculate t^2 as as that fraction which has the numerator {(Sumatra mean of ratios) minus (Brazil mean of ratios)}^{2} or $\{(1.9481 - 1.4006)\}^2$ and the denominator $(w_1 + w_2)$ where in our case,

$w_1 = \{(s_1)^2\}/n_1 = 0.48630/16 = 0.030394$ and
$w_2 = \{(s_2)^2\}/n_2 = 0.05350/32 = 0.001672.$

Thus $t^2 = \{(1.9481 - 1.4006)\}^2/(0.030394 + 0.001672) = 0.5475^2/0.032066$

and $t = 0.5475/\{(0.032066)^{0.5}\}$
$= 0.5475/0.1791$
$= 3.057.$

For the degrees of freedom (df), Satterthwaite uses

$\mathrm{df} = (w_1 + w_2)^2/[\{(w_1)^2\}/(n_1 - 1)\} + \{(w_2)^2\}/(n_2 - 1)\}]$
$= (0.030394 + 0.001672)^2/[\{(0.030394^2)/15\} + \{(0.001672^2)/31\}]$
$= (0.032066^2)^2/(0.000061586 + 0.000000090)$
$= 0.0010282/0.000061676$
$= 16.67.$

The critical values for 16 and 17 degrees of freedom and (two-tailed) $P \leq 0.01$ are 2.921 and 2.898 respectively, thus the difference between the regions is significant at the 1 per cent level.

t Tests. We conducted two-tailed t tests for small sample sizes ($n < 10$) for all correlated pairs of dependent variables where $P \leq 0.05$. These tests were restricted to termites (Tables S13, S14, S16, supplementary material) and confirmed that the sample sizes in each case were statistically acceptable. The results of these tests are not reported here.

Iterative modelling and other indicator assessment methods. To be consistent with our initial aim, that the final choice of indicators should be driven by practical as well as scientific criteria, we eliminated multiple and polynomial regressions as well as multi-dimensional-scaling and a suite of ecological diversity indices including a measure of plant functional complexity (PFC) (Gillison 2002) although initial investigations showed many were highly significant. Iterative modelling approaches for predicting species distribution (and related biodiversity indicators) can generate theoretically desirable outcomes but often frequently fail in practice, whereas predictive, information-theoretic models that take into account existing knowledge about species and ecosystem behaviour may be closer to reality (Rushton et al. 2004).

Addressing false discovery rates. It is common practice to regard estimated regression coefficients (the slopes of the lines of best fit) as significant if their *P*-statistics fall in the range $P < 0.05$. However, falling in this range means only that if the true value of the coefficient is zero, an observed value equally or more extreme than the actual one will only be achieved less than five per cent of the time. It is usually more useful to ask, "Given the observation, what is the probability that the true value of the coefficient is either zero, or very close to zero?" The answer to this question is indicated by the False Discovery Rates (EFDRs) displayed in Table S23 (below). It is shown there that those observed slopes for which $0.05 > P > 0.01$ actually have about a 30 per cent probability of being "rare events", occurring only by chance, and not indicative of any appreciable departure from zero. Observed slopes with $0.01 > P = 0.001$ and $0.001 > P = 0.0001$, however, are predominantly in the "real difference" category and those with $P < 0.0001$ overwhelmingly so.

Soriç's original definition of a False Discovery Rate (FDR), or as we describe it here**,** an EFDR, has been used in preference to later versions for several reasons (Soriç 1989). First, it is substantially simpler to describe and to understand. Secondly, it is easier to apply to specified ranges of *P*-values. Thirdly, a previous objection by Benjamini and Hoffberg (1995), that it is "a mixture of expectations and realizations" remains unsettled. Finally, the "False Nondiscoveries" mentioned by Sankar (2006), are by definition undetectable, and even if they could be detected they would still tend to be small and onour context thus likely to be unimportant. Moreover, to take them into account would reduce the reported FDR. In our view it is preferable to desist from claiming a few genuine but marginal discoveries, and thereby to avoid attributing additional false discoveries as real.

Tables S21 and S22 display both the *P*-values and other regression slopes. S21 relates to significantly positive observations, and S22 to significantly negative observations. Table S23 displays the numbers of those observations, positive and negative separately, in each of the twenty 5% segments of *P*-values. S21 and S22 indicate that the transition from significant to insignificant observations occurs relatively suddenly when the relevant False Discovery Rate (FDR) is close to 0.05, which value was suggested by Fisher (1925) as being a sensible choice for defining “significance”. In S23, the most relevant figures in that table are the following:

1. The numbers of positive and negative regression slopes in the supposedly “significant” range, namely $0.05>P>0.00$, which numbers are 271 and 103 respectively; and
2. The numbers of undeniably significant positive and negative regression slopes in the range $0.0025>P>0.00$, which are 148 and 12 respectively.

If we now ask ourselves which of these two sets of observations is the more convincingly significant, there is an unambiguous answer. When the *P*-value is 0.00256 (to five decimal places), or roughly 1/390, the relevant ratio of significant to insignificant is a mere 19 to one. Consequently there is no way that any of the 271 positives and 103 negatives in the range $0.05>P>0.0025$ can be convincingly regarded as “significant”. Our favoured alternative is therefore that of defining “significance“to mean “roughly in the range $0.0025>P>0.00$”

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Appendix S4
Supplementary Tables

Table S1. Plant functional attributes and elements used to construct PFTs

Attribute	**Element**	**Description**
[Photosynthetic envelope]		
Leaf size class	nr	no repeating leaf units
	pi	picophyll $< 2mm^2$
	le	leptophyll 2 - 25
	na	nanophyll 25 - 225
	mi	microphyll 225 - 2025
	no	notophyll 2025 - 4500
	me	mesophyll 4500 - 18200
	pl	platyphyll 18200 - 36400
	ma	macrophyll 36400 - 18 x 10^4
	mg	megaphyll > 18 x 10^4
Leaf inclination	ve	vertical >30° above horizontal
	la	lateral ±30° to horizontal
	pe	pendulous >30° below horizontal
	co	composite
Chlorotype	do	dorsiventral
	is	isobilateral or isocentric
	de	deciduous
	ct	cortic (photosynthetic stem)
	ac	achlorophyllous (without chlorophyll)
Morphotype	ro	rosulate or rosette
	so	solid 3-D
	su	succulent
	pv	parallel-veined
	fi	filicoid (fern) (Pteridophytes)
	ca	carnivorous (e.g. *Nepenthes*)
[Supporting vascular structure]		
Life form	ph	phanerophyte
	ch	chamaephyte
	hc	hemicryptophyte
	cr	cryptophyte
	th	therophyte
	li	liane
Root type	ad	adventitious
	ae	aerating (e.g. pneumatophore)
	ep	epiphytic
	hy	hydrophytic
	pa	parasitic

PFTs are constructed from PFEs according to a rule-based grammar[22] . For example the PFT for an individual plant of *Brosimum guianensis* would be recorded as a combination of six PFEs no-co-do-de-ct-ph (i.e. with notophyll-sized leaves, composite leaf inclination, dorsiventral leaf, deciduous with green stem or photosynthetic subrhytidome or cortex ct and a phanerophytic life form (woody plant with perennating organs > 2m above ground)).

Table S2. Site location, physical environment and land use type NW Mato Grosso

Site No.	MT code.	Fauna site	Location	Municip-ality.	Latitude deg.min.sec.	Longitude deg.min.sec.	Elev. (m)	Slope %	Aspect Deg.
1	**PN01**		Vale do Amenhecer L8	Juruena	10-22-27 S	58-27-11 W	259	0	0
2	**PN05**	**TF**	Manejo florestal, Rhoden	Juruena	10-32-55 S	58-30-30 W	230	0	0
3	**PN06**	**TF**	Chapada Dardanelos	Juruena	10-23-36 S	58-53-11 W	281	10	125
4	**PN07**	**TF**	Chapada Dardanelos	Juruena	10-23-40 S	58-53-03 W	285	1	210
5	**PN08**	**TF**	Chapada Dardanelos	Juruena	10-23-33 S	58-53-15 W	270	2	60
6	**PN09**	**TF**	Manejo florestal, Rhoden	Juruena	10-28-10 S	58-34-55 W	232	0	0
7	**PN10**		Pastagem do Rizzieri	Juruena	10-31-41 S	58-35-28 W	265	0	0
8	**PN11**	**F**	Manejo florestal, Rhoden	Juruena	10-33-47 S	58-25-55 W	239	0	0
9	**PN12**		Linha Parana	Cotriguaçu	09-57-55 S	58-31-00 W	266	0	0
10	**PN14**		Fazenda Imburana	Castanheira	10-55-21 S	58-24-57 W	260	10	98
11	**PN15**		Fazenda Imburana	Castanheira	10-55-21 S	58-24-52 W	263	5	280
12	**PN16**	**F**	Vale do Amenhecer L8	Juruena	10-26-13 S	58-27-10 W	265	0	0
13	**PN17**	**F**	Vale do Amenhecer L8	Juruena	10-27-08 S	58-27-05 W	265	0	0
14	**PN18**		Vale do Amenhecer L8	Juruena	10-26-08 S	58-27-02 W	265	0	0
15	**PN19**	**F**	Vale do Amenhecer L8	Juruena	10-26-10 S	58-27-01 W	263	0	0
16	**PN20**	**F**	Vale do Amenhecer L8	Juruena	10-26-09 S	58-26-54 W	266	0	0
17	**PN21**		Alcalinas Canamá	Juruena	10-04-52 S	58-47-49 W	225	40	255
18	**PN22**	**TF**	Pronatura Res. Stn. Bxa.	Juruena	10-21-26 S	58-27-49 W	260	25	275
19	**PN23**	**TF**	Km 3 Estrada	Juruena	10-21-34 S	58-29-25 W	241	0	0
20	**PN24**	**F**	Alcalinas Canamá	Juruena	10-04-06 S	58-46-00 W	180	0	0
21	**PN25**	**T**	S. Reserva indígena	Cotriguaçu	09-46-29 S	58-40-40 W	285	5	90
22	**PN26**	**TF**	Fazenda Sào Nicolao	Cotriguaçu	09-51-33 S	58-17-16 W	242	5	275
23	**PN27**	**TF**	Fazenda Sào Nicolao	Cotriguaçu	09-51-38 S	58-13-38 W	237	3	5
24	**PN28**	**F**	Fazenda Sào Nicolao	Cotriguaçu	09-51-26 S	58-14-27 W	247	5	180
25	**PN29**		Vale do Amenhecer L2	Juruena	10-22-20 S	58-27-06 W	268	0	0
26	**PN30**	**T**	Research Stn Pronatura	Juruena	10-21-04 S	58-27-15 W	253	7	210
27	**PN31**		Fazenda Coroado	Castanheira	10-55-06 S	58-21-22 W	208	0	0
28	**PN32**		Fazenda Coroado	Castanheira	10-55-11 S	58-22-34 W	241	10	61
29	**PN33**		Vale do Seringal	Castanheira	10-43-03 S	58-33-34 W	242	0	0
30	**PN34**		Vale do Seringal	Castanheira	10-44-48 S	58-34-16 W	264	6	99
31	**PN35**		Fazenda Cruzeiro do Sul	Castanheira	10-51-22 S	58-38-59 W	295	45	148
32	**PN36**		Fazenda Cruzeiro do Sul	Castanheira	10-51-21 S	58-39-59 W	300	15	55

(Continued next page)

Table S2. Site location, physical environment and land use type NW Mato Grosso (continued)

Site No.	MT code.	Parent rock	Soil Type	Soil Funct. type	Land-scape type	Land Use Type (LUT)
1	**PN01**	Granite, sedim.	Ultisol	2	III	Primary forest, logged
2	**PN05**	Granite, sedim.	Ultisol	2	III	Primary forest, logged
3	**PN06**	Granite, coarse	Entisol	1	I	Campina cerrado
4	**PN07**	Granite, coarse	Entisol	1	I	Campina cerrado
5	**PN08**	Granite, coarse	Oxisol	3	I	Campinarana
6	**PN09**	Granite	Ultisol	3	III	Campinarana, disturbed
7	**PN10**	Granite	Oxisol	2	III	Pasture with termitaria
8	**PN11**	Granite	Ultisol	2	III	Primary forest, logged
9	**PN12**	Granite	Ultisol	2	II	Primary forest, logged
10	**PN14**	Granite	Ultisol	2	III	Pasture with termitaria
11	**PN15**	Granite	Ultisol	2	III	Pasture with termitaria
12	**PN16**	Granite comp.	Ultisol/oxisol	2	III	Primary forest, logged
13	**PN17**	Granite comp.	Ultisol/oxisol	2	III	Secondary forest, *Cercropia*
14	**PN18**	Granite comp.	Ultisol/oxisol	2	III	Subsistence garden > 1 yr old
15	**PN19**	Granite comp.	Ultisol/oxisol	2	III	Subsistence garden < 1 yr old
16	**PN20**	Granite comp.	Ultisol/oxisol	2	III	Cassava garden 2 years old
17	**PN21**	Granite	(Shallow soil)	2	II	Primary forest, semi-deciduous
18	**PN22**	Granite	Ultisol	2	III	Pasture, degraded
19	**PN23**	Granite	Ultisol	2	III	Teak plantation 5 years old
20	**PN24**	Granite	Ultisol	3	II	Primary forest, logged
21	**PN25**	Granite	Ultisol	2	II	Primary forest, logged
22	**PN26**	Granite	Ultisol	2	III	Primary forest, disturbed
23	**PN27**	Granite	Ultisol	2	III	Secondary forest (Capoéira 5 yrs)
24	**PN28**	Granite	Ultisol	2	III	Teak plantation and pasture
25	**PN29**	Granite	Ultisol	2	III	*Coffea* plantation, 20 months old
26	**PN30**	Granite	Ultisol	2	III	Primary forest logged 11 years
27	**PN31**	Granite	Ultisol	2	II	Primary forest, disturbed
28	**PN32**	Granite	Ultisol	2	II	Pasture > 5 years old
29	**PN33**	Granite	Ultisol	2	II	*Coffea* plantation 4 yrs old
30	**PN34**	Granite A	(Shallow soil)	4	II	Primary forest, logged
31	**PN35**	Granite B	(Shallow soil)	3	II	Cerradão with succulents
32	**PN36**	Granite B	(Shallow soil)	3	II	Cerradão, deciduous

MT code = Pró-Natura site No., (Fauna site, **T** = Termites, **F** = other fauna); **Elev.:** Elevation; **Parent rock: Granite comp. =** granite and sedimentary complex, A = intermediate,B = intermediate to basic (apatite-biotite); **Soil type** (USDA soil taxonomy- Order); **Soil functional type:** 1= Sandstone derived, 2 = Well-drained - formed in acid igneous material,3 = Poorly drained, 4 = High base status; **Landscape type**: I = Upland sandstones, II = Exposed granite outcrops and footslopes, III = Lowland plains with sediments

Table S3 Site location, physical environment and land use type, Jambi, Sumatra, Indonesia

Transect No.	Location in Jambi Province	Latitude deg.min.sec.	Longitude deg.min.sec.	Elev'n (m)	Slope %	Aspect Deg.	Parent rock	Soil type	Land Use Type (LUT)
1	Pasir Mayang	01 04 47 S	102 06 02 E	76	25	7	Sedim.	Ultisol	Intact primary rain forest
2	Pasir Mayang	01 04 45 S	102 05 53 E	60	36	115	Sedim.	Ultisol	Intact primary rain forest
3	Pasir Mayang	01 04 43 S	102 05 55 E	85	12	150	Sedim.	Ultisol	Secondary forest logged 1984
4	Pasir Mayang	01 04 53 S	102 06 09 E	90	45	130	Sedim.	Ultisol	Secondary forest logged 79/80
5	Pasir Mayang	01 04 56 S	102 06 05 E	75	25	75	Sedim.	Ultisol	Logged over primary forest
6	Pasir Mayang	01 04 59 S	102 06 43 E	65	20	202	Sedim.	Ultisol	*Paraserianthes* plantation (3.5 yrs)
7	Pasir Mayang	01 03 09 S	102 08 10 E	55	12	202	Sedim.	Ultisol	*Paraserianthes* plantation (3.5 yrs)
8	Pasir Mayang	01 05 25 S	102 07 05 E	53	3	183	Sedim.	Ultisol	Rubber plantation 8 yrs
9	Pasir Mayang	01 05 27 S	102 06 56 E	53	3	188	Sedim.	Ultisol	Rubber plantation 8 yrs
10	Pancuran Gading	01 10 12 S	102 06 50 E	30	0	0	Sedim.	Ultisol	Jungle rubber agroforest
11	Pancuran Gading	01 10 13 S	102 06 46 E	30	0	0	Sedim.	Ultisol	Jungle rubber agroforest
12	Kuamang Kuning	01 35 58 S	102 21 11 E	40	5	225	Sedim.	Ultisol	*Imperata* degraded grassland
13	Kuamang Kuning	01 35 56 S	102 21 12 E	40	5	130	Sedim.	Ultisol	*Imperata* degraded grassland
14	Kuamang Kuning	01 36 05 S	102 21 22 E	48	0	0	Sedim.	Ultisol	Cassava plantation 10 yrs
15	Kuamang Kuning	01 36 05 S	102 21 21 E	48	9	311	Sedim.	Ultisol	Cassava plantation 10 yrs
16	Pancuran Gading	01 10 13 S	102 06 58 E	30	0	0	Sedim.	Ultisol	*Chromolaena*, *Clibadium* regrowth

Table S4. Vegetation summary data for NW Mato Grosso*

Transect No.	MT code	Spp.	PFTs	Spp.: PFTs	Ht	CCTot	CCwdy	CC nwdy	Litt.	FI	B. area	Bryo.	Wdy plts	PFC
1	PN01	44	27	1.63	26.00	90	90	0	5.00	25.75	58.00	4	7	324
2	PN05	35	31	1.13	30.00	95	95	0	3.00	26.00	32.67	5	5	375
3	PN06	39	33	1.18	2.50	80	65	15	2.50	77.25	1.00	1	7	334
4	PN07	10	9	1.11	1.80	60	30	30	0.10	92.40	1.00	1	7	83
5	PN08	57	31	1.84	9.00	90	85	5	12.00	26.75	26.67	3	7	305
6	PN09	27	19	1.42	12.00	90	90	0	15.00	20.55	27.33	4	2	160
7	PN10	23	14	1.64	0.50	80	20	78	0.50	46.25	0.01	0	1	104
8	PN11	56	33	1.70	25.00	95	95	0	6.00	29.75	20.67	5	8	364
9	PN12	50	31	1.61	25.00	90	90	0	7.00	21.75	23.33	4	8	324
10	PN14	14	12	1.17	0.50	85	5	80	0.50	59.50	0.01	0	1	90
11	PN15	22	17	1.29	0.50	95	5	90	0.50	63.00	0.01	1	1	129
12	PN16	60	40	1.50	30.00	90	90	0	7.00	23.50	32.67	5	7	366
13	PN17	71	47	1.51	4.00	98	95	3	7.00	32.40	4.67	2	6	456
14	PN18	54	33	1.64	1.50	85	40	45	0.30	79.70	0.10	1	6	275
15	PN19	23	15	1.53	2.30	80	75	5	0.50	85.00	0.67	1	1	88
16	PN20	43	34	1.26	1.50	80	75	5	2.00	36.80	1.00	1	8	379
17	PN21	50	36	1.39	15.00	60	60	0	12.00	41.25	16.67	6	7	368
18	PN22	23	13	1.77	0.60	80	75	5	0.50	80.00	0.01	1	1	81
19	PN23	25	15	1.67	7.00	70	65	5	18.00	39.00	14.67	1	7	106
20	PN24	75	54	1.39	20.00	80	70	10	5.00	16.25	24.67	7	8	596
21	PN25	55	42	1.31	35.00	98	95	3	7.00	14.75	22.67	6	5	436
22	PN26	44	28	1.57	25.00	90	90	0	3.00	26.50	27.33	4	5	249
23	PN27	52	37	1.41	7.00	85	75	10	6.00	58.65	11.33	1	6	388
24	PN28	24	24	1.00	1.00	95	5	90	7.00	10.00	1.00	1	1	239
25	PN29	21	19	1.11	0.80	45	45	0	0.30	30.40	0.10	1	8	148
26	PN30	57	39	1.46	25.00	95	95	0	8.00	21.00	32.00	6	8	423
27	PN31	42	31	1.35	32.00	90	90	0	5.00	30.50	28.00	3	6	345
28	PN32	8	7	1.14	0.30	85	0	85	0.20	100.00	0.00	1	1	40
29	PN33	46	31	1.48	1.00	95	15	80	3.00	24.35	0.50	1	6	292
30	PN34	53	35	1.51	30.00	85	85	0	7.00	17.75	20.67	4	9	419
31	PN35	11	11	1.00	2.50	15	5	10	0.01	10.00	0.33	1	0	111
32	PN36	23	21	1.10	4.50	60	60	0	5.00	65.00	58.00	3	1	214

* **Spp.** = plant species diversity; **PFTs** = plant functional type diversity; **spp.:PFTs** = ratio; **Ht** = mean canopy height (m); **CCTot** = canopy cover % total; **CCwdy** = canopy cover % woody plants; **CCnwdy** = canopy cover % non-woody plants; **Litt** = plant litter depth (cm); **FI** = mean furcation index; **B.area** = basal area all woody plants (m^2 ha^{-1}) **Bryo** = Domin scale cover-abundance of bryophytes; **Wplts** = Domin scale cover-abundance of woody plants < 1.5 m tall; **PFC** = Plant Functional Complexity. Compild using VegClass.

Table S5. Vegetation summary data for Jambi, Sumatra*

Transect No.	Spp.	PFTs	Spp.: PFTs	Ht	CC Tot	CC wdy	CC nwdy	Litt.	FI	B. area	Bryo.	Wdy plts	PFC
1	102	37	2.76	21.0	75	70	5	10.0	13.50	27.33	2	7	182
2	101	36	2.81	20.0	65	60	5	10.0	15.50	32.67	5	5	214
3	50	20	2.50	10.0	35	20	15	15.0	10.25	13.33	3	6	122
4	108	39	2.77	24.0	80	70	10	6.0	9.50	32.67	3	7	192
5	113	38	2.97	28.0	70	65	5	8.0	9.75	27.33	4	6	210
6	42	27	1.56	6.0	85	40	45	3.0	43.75	6.00	1	4	144
7	46	33	1.39	16.0	75	30	45	6.0	16.50	8.00	2	5	192
8	65	36	1.81	11.0	85	65	20	5.0	39.25	14.67	4	4	194
9	54	29	1.86	12.0	75	60	15	5.0	41.50	15.33	4	4	150
10	112	47	2.38	14.0	80	65	15	8.0	38.50	18.00	3	6	236
11	98	41	2.39	14.0	75	65	10	6.0	40.25	20.67	3	7	198
12	10	10	1.00	1.0	90	5	85	0.1	0.00	0.33	1	1	86
13	7	7	1.00	1.0	90	5	85	0.1	0.00	0.33	1	0	66
14	14	11	1.27	1.8	50	35	15	0.5	98.75	0.33	1	5	50
15	19	13	1.46	1.8	40	30	10	0.2	98.00	0.33	1	4	92
16	42	34	1.24	2.0	95	75	20	4.0	71.50	0.33	1	9	176

* **Spp.** = plant species diversity; **PFT** = plant functional type diversity; **spp.:PFTs** = ratio; **Ht** = mean canopy height (m); **CCTot** = canopy cover % total; **CCwdy** = canopy cover % Woody plants; **CCnwdy** = canopy cover % non-woody plants; **Litt** = plant litter depth (cm); **FI** = mean furcation index; **B.area** = basal area all woody plants (m^2 ha^{-1}) **Bryo** = Domin scale cover-abundance of bryophytes; **Wplts** = Domin scale cover-abundance of woody plants < 1.5 m tall; **PFC** = Plant Functional Complexity. Compiled using VegClass©

Table S6. List of vascular plant species and PFTs collected in the Mato Grosso study area (sample page). *

Transect number	PFT	Family	genus	species	quadrat
PN01	na-la-do-fi-hc-ad	Adiantaceae	*Adiantum*	104	1
PN01	me-la-do-ch-li	Bignoniaceae	*Arabidaea*	107	1
PN01	no-co-do-de-ct-ph	Moraceae	*Brosimum*	*guianensis*	1
PN01	no-la-do-ct-ph	Celastraceae	*Cheiloclinium*	*cognatum*	1
PN01	pl-la-do-ph	Meliaceae	*Guarea*	106	1
PN01	no-la-do-ph	Euphorbiaceae	*Indet*	103	1
PN01	no-la-do-ct-ph	Fabaceae	*Indet*	109	1
PN01	me-la-do-ph	Rutaceae	*Metrodoria*	*flavida*	1
PN01	me-la-do-ph	Lauraceae	*Ocotea*	111	1
PN01	pl-la-do-ph	Cercropiaceae	*Pouroma*	108	1
PN01	ma-la-do-ro-pv-ph	Arecaceae	*Socratea*	*exorhiza*	1
PN01	no-la-do-fi-hc-li-ad-ep	Fern	*Stenochlaena*	110	1
PN01	me-la-do-ch	Loganiaceae	*Strychnos*	113	1
PN01	me-la-do-ch-li	Bignoniaceae	*Arabidaea*	115	2
PN01	pl-la-do-ro-pv-ph	Arecaceae	*Astrocaryum*	116	2
PN01	no-la-do-pv-hc-ad	Poaceae	*Bambusa?*	114	2
PN01	no-la-do-ph-li	Indet	*Indet*	118	2
PN01	me-la-do-ph	Tiliaceae	*Indet*	119	2
PN01	me-ve-do-su-hc-li-ad-ep	Araceae2	*Indet*	121	2
PN01	na-la-do-fi-hc-ad	Fern	*Indet*	122	2
PN01	pi-la-do-ph	Rubiaceae	*Isertia*	117	2
PN01	me-la-do-ph	Sapotaceae	*Pouteria*	120	2
PN01	pi-la-do-ph	Lauraceae	*Aniba*	126	3
PN01	pl-la-do-ch-li	Bignoniaceae	*Bignonia*	125	3
PN01	me-la-do-ch-li	Bignoniaceae	*Cuspidaria*	128	3
PN01	me-la-do-ch-li	Mimosaceae	*Indet*	127	3
PN01	pl-la-do-pv-hc-ad	Marantaceae	*Maranta*	124	3
PN01	me-la-do-ph-ad	Quiinaceae	*Quiina*	123	3
PN01	pl-la-do-ch-li	Fabaceae	*Indet*	129	4
PN01	me-la-do-ch	Lauraceae	*Nectandra*	130	4
PN01	ma-la-is-ro-pv-hc-ad	Bromeliaceae	*Ananas*	144	5
PN01	no-la-do-ph	Chrysobalanaceae	*Hirtella*	*ciliata*	5
PN01	mi-la-do-hc-ad	Rubiaceae	*Indet*	134	5
PN01	mi-la-do-ch-li	Fabaceae	*Indet*	136	5
PN01	ma-la-do-ct-ph	Cercropiaceae	*Pourouma*	131	5
PN01	mi-la-do-ph	Burseraceae	*Protium*	*pilosa*	5
PN01	no-la-do-ct-ph	Meliaceae	*Trichilia*	132	5
PN01	no-la-do-su-hc-ad	Piperaceae	*Piper*	138	6
PN01	no-co-do-pv-hc-ad	Cyperaceae	*Scleria*	*corymbosa*	6
PN01	me-pe-do-pv-hc-li-ad-ep	Araceae	*Indet*	142	7
PN01	na-ve-do-de-ph	Mimosaceae	*Parkia*	*multijuga*	7
PN01	me-la-do-ch	Rubiaceae	*Psychrotria*	141	7
PN01	pl-la-do-ph	Sterculiaceae	*Theobroma*	*sylvestris*	7

* Full tables are available on request from contact author

Table S7. List of vascular plant species and PFTs collected in the Jambi, Sumatra study area (sample page). *

Transect number	PFT	Family	genus	species	authority
BS01	no-co-do-ph	Sapindaceae	*Xerospermum*	*noronhianum*	Blume
BS01	no-la-do-ct-ph	Burseraceae	*Dacryodes*	*rugosa*	(Blume) H.J. Lam
BS01	mi-ve-do-ph	Fabaceae	*Sindora*	*leiocarpa*	Backer ex. K. Heyne
BS01	no-la-do-ph	Myristicaceae	*Knema*	*cinerea*	(Poir.) Warb.
BS01	no-co-do-ph	Myrtaceae	*Eugenia*	*ochneocarpa*	Merr.
BS01	me-co-do-ph	Myristicaceae	*Knema*	*mandahoran*	(Miq.) Warb.
BS01	me-la-do-de-ph	Sterculiaceae	*Scaphium*	*macropodum*	(Miq.) Beumee
BS01	me-la-do-ph	Annonaceae	*Polyalthia*	*lateriflora*	(Blume) King.
BS01	no-co-do-ph	Sapotaceae	*Palaquium*	*gutta*	(Hook.f.) Baillon
BS01	pl-la-do-ph	Myristicaceae	*Horsfieldia*	*grandis*	(Blume) Warb
BS01	no-ve-do-ph	Burseraceae	*Santiria*	*graffithii*	(Hook.f.) Engl.
BS01	no-ve-do-ph	Myrtaceae	*Eugenia*	*palembanica*	(Miq.) Merr.
BS01	no-co-do-ph	Theaceae	*Gordonia*	sp13	(empty)
BS01	mi-ve-do-ph	Fabaceae	*Koompassia*	*malaccensis*	Maing. ex Benth.
BS01	mi-la-do-ph	Trigoniaceae	*Trigoniastrum*	*hypoleucum*	Miq.
BS01	no-la-do-ph	Ulmaceae	*Gironniera*	*hirta*	Ridl.
BS01	no-ve-do-ph	Dipterocarpaceae	*Shorea*	*macropera*	Dyer
BS01	no-la-do-ph	Moraceae	*Artocarpus*	*anisophyllus*	Miq.
BS01	no-la-do-ct-ph	Euphorbiaceae	*Drypetes*	*longifolia*	Pax. & Hoffm.
BS01	no-la-do-ct-ph	Fabaceae	*Fordia*	*johorensis*	T.C. Whitm.
BS01	no-la-do-ct-ph	Thymelaeaceae	*Gonystylus*	*maingayi*	Hook.f.
BS01	mi-la-do-ct-ph	Connaraceae	*Agelaea*	*borneensis*	(Hook.f.) Merr.
BS01	no-la-do-ph	Lecythidaceae	*Barringtonia*	*scortechinii*	King
BS01	me-la-do-ph	Rubiaceae	*Timonius*	*stipulosus*	(Scheff.) Boerl.
BS01	me-la-do-ph-li	Dilleniaceae	*Tetracera*	*scandens*	(L.) Merr.
BS01	no-la-do-ph-li	Connaraceae	*Connarus*	*monocarpus*	L.
BS01	ma-la-do-ro-pv-ph	Arecaceae	*Licuala*	*spinosa*	Wurmb.
BS01	me-la-do-ph	Burseraceae	*Dacryodes*	*incurvata*	(Engler.) H.J. Lam
BS01	no-la-do-ph	Flacourtiaceae	*Hydnocarpus*	*polipetala*	(v. Sloot.) Sleumer
BS01	no-la-do-ph	Sapotaceae	*Madhuca*	*sandakaensis*	van Royen
BS01	me-la-do-ph	Celastraceae	*Bhesa*	*paniculata*	Arn.
BS01	no-la-do-ph	Annonaceae	*Polyalthia*	*beccarii*	King
BS01	me-la-do-ph-li	Connaraceae	*Agelaea*	*macrophylla*	(Zoll.) Leenh.
BS01	na-la-do-ph-li	Fabaceae	*Derris*	*sp34*	(empty)
BS01	me-la-do-ro-pv-hc	Arecaceae	*Licuala*	*ferruginea*	Becc.
BS01	no-la-do-ph	Thymelaeaceae	*Gonystylus*	*velutinus*	Airy Shaw
BS01	mi-la-do-ph-li	Connaraceae	*Rourea*	*minor*	(Gaertn.) Leenh.
BS01	no-la-do-ph	Euphorbiaceae	*Aporusa*	*subcaudata*	Merr.
BS01	mi-la-do-su-hc-ad-ep	Piperaceae	*Piper*	sp39	(empty)
BS01	mi-la-do-ph-li	Annonaceae	*Desmos*	*chinensis*	Lour.

* Species contained in quadrat 1. Complete list available from contact author

Table S8. Vertebrate fauna listed according to Class and transect in NW Mato Grosso*

Class	Family	Species	MT Code	Transect No.
AVES	Falconidae	*Daptrius ater* (Vieillot, 1816)	PN 05	2
AVES	Cracidae	*Pipile cajubi* (Pelzen, 1858)	PN 05	2
AVES	Emberizidae	*Psarocolius decumanus* (Pallas, 1769)	PN 05	2
AVES	Ramphastidae	*Ramphastos vitellinus* (Lichtenstein, 1823)	PN 05	2
AVES	Psittacidae	*Amazona aestiva* (Linnaeus, 1758)	PN 05	2
AVES	Psittacidae	*Ara ararauna* (Linnaeus, 1758)	PN 05	2
AVES	Psittacidae	*Ara macao* (Linnaeus, 1758)	PN 05	2
AVES	Psittacidae	*Deroptyus acciptinus* (Linnaeus, 1758)	PN 05	2
AVES	Psittacidae	*Pionus menstruus* (Linaeus, 1766)	PN 05	2
AVES	Caprimulgidae	*Caprimulgus nigrescen* (Cabanis, 1848)*s*	PN 06/07	3/4
AVES	Acciptridae	*Buteo magnirostris* (Gmelin, 1758)	PN 06/07	3/4
AVES	Falconidae	*Herpethoteres cachinnans* (Linnaeus, 1758)	PN 06/07	3/4
AVES	Emberizidae	*Euphonia chlorotica* (Linnaeus, 1766)	PN 06/07	3/4
AVES	Tyrannidae	*Megarynchus pitangua* (Linnaeus, 1766)	PN 06/07	3/4
AVES	Tyrannidae	*Myiozetetes cayenensis* (Linnaeus, 1766)	PN 06/07	3/4
AVES	Tyrannidae	*Tyrannus melancholicus* (Vieillot, 1819)	PN 06/07	3/4
AVES	Psittacidae	*Ara macao* (Linnaeus, 1758)	PN 06/07	3/4
AVES	Tinamidae	*Rhynchotus rufescens* (Temminck,1815)	PN 06/07	3/4
AVES	Emberizidae	*Cacicus cela* (Linnaeus, 1758)	PN 08	5
AVES	Emberizidae	*Sporophila caerulescens* (Vieilot, 1823)	PN 08	5
AVES	Emberizidae	*Tangara chilensis* (Vigor, 1832)	PN 08	5
AVES	Muscicapidae	*Turdus amaurochalinus* (Cabanis, 1851)	PN 09	6
AVES	Columbidae	*Columbina talpacoti* (Temminck, 1811)	PN 11	8
AVES	Hirundinidae	*Reinarda squamata* (Cassin, 1853)	PN 11	8
AVES	Bucconidae	*Monasa morphoeus* (Hahn & Kuster, 1823)	PN 11	8
AVES	Trogonidae	*Trogon curucui* (Linnaeus, 1766)	PN 11	8
AVES	Trochilidae	*Phaethornis ruber* (Linnaeus, 1758)	PN 16	12
AVES	Columbidae	*Leptotila verreauxi*(Bonaparte, 1855)	PN 16	12
AVES	Corvidae	*Cyanocorax crysops* (Vieillot, 1818)	PN 16	12
AVES	Cotigidae	*Lipaugus vociferans* (Wied, 1820)	PN 16	12
AVES	Bucconidae	*Chelidoptera tenebrosa* (Pallas, 1782)	PN 16	12
AVES	Ramphastidae	*Ramphastos vitellinus* (Lichtenstein, 1823)	PN 16	12
AVES	Psittacidae	(Hellmayr, 1906)	PN 16	12
AVES	Psittacidae	*Amazona aestiva* (Linnaeus, 1758)	PN 16	12
AVES	Psittacidae	*Ara ararauna* (Linnaeus, 1758)	PN 16	12
AVES	Psittacidae	*Ara macao* (Linnaeus, 1758)	PN 16	12
AVES	Psittacidae	*Brothogeris chrysopteris* (Linnaeus, 1766)	PN 16	12
AVES	Columbidae	*Columbina talpacoti* (Temminck, 1811)	PN 17	13
AVES	Cuculidae	*Crotophaga ani* (Linnaeus, 1758)	PN 17	13
AVES	Emberizidae	*Thraupis palmarum* (Weid, 1821)	PN 17	13
AVES	Troglodytidae	*Campilorhynchus turdinus* (Weid, 1821)	PN 17	13
AVES	Psittacidae	*Ara macao* (Linnaeus, 1758)	PN 17	13
AVES	Columbidae	*Columbina talpacoti* (Temminck, 1811)	PN 19	15
AVES	Cuculidae	*Crotophaga ani* (Linnaeus, 1758)	PN 19	15
AVES	Formicariidae	*Formicarius colma*	PN 19	15
AVES	Phasianidae	*Gallus gallus* (Linnaeus, 1758)**	PN 19	15
AVES	Thamnophilidae	*Thamnophilus doliatus* (Linnaeus, 1764)	PN 19	15
AVES	Columbidae	*Columbina talpacoti* (Temminck, 1811)	PN 20	16
AVES	Cuculidae	*Crotophaga ani*(Linnaeus, 1758)	PN 20	16
AVES	Emberizidae	*Cissops leveriana* (Gmelin, 1788)	PN 20	16
AVES	Emberizidae	*Coryphospingus cuculatus* (Müller, 1776)	PN 20	16
AVES	Emberizidae	*Ramphocelus carbo* (Pallas, 1764)	PN 20	16
AVES	Emberizidae	*Scaphidura oryzivora* (Linnaeus, 1758)	PN 20	16
AVES	Emberizidae	*Volatina jacarina* (Linnaeus, 1766)	PN 20	16
AVES	Tyrannidae	*Myiarchus tyrannulus* Müller, (1776)	PN 20	16
AVES	Charadriidae	*Vanellus chilensis* (Gmelin, 1789)	PN 22	18
AVES	Scolopacidae	*Tringa solitaria* (Wilson, 1813)	PN 22	18
AVES	Ardeidae	*Bubulcus ibis* (Linnaeus, 1758)	PN 22	18
AVES	Cuculidae	*Crotophaga ani* (Linnaeus, 1758)	PN 22	18
AVES	Emberizidae	*Leistes militaris* (Linnaeus, 1758)	PN 22	18

Class	**Family**	**Species**	**MT Code**	**Transect No.**
AVES	Emberizidae	*Ramphocelus carbo* (Pallas, 1764)	PN 22	18
AVES	Psittacidae	*Ara ararauna* (Linnaeus, 1758)	PN 22	18
AVES	Psittacidae	*Pionus menstruus* (Linaeus, 1766)	PN 22	18
AVES	Columbidae	*Columbina talpacoti* (Temminck, 1811)	PN 23	19
AVES	Acciptridae	*Buteo magnirostris* (Gmelin, 1758)	PN 23	19
AVES	Emberizidae	*Thraupis palmarum* (Wied, 1821)	PN 23	19
AVES	Cotigidae	*Lipaugus vociferans* (Wied, 1820)	PN 26	22
AVES	Dendrocolaptidae	*Sittasomus griseicapillus* (Vieillot, 1818)	PN 26	22
AVES	Emberizidae	*Thraupis palmarum* (Weid, 1821)	PN 26	22
AVES	Muscicapidae	*Turdus amaurochalinus* (Cabanis, 1851)	PN 26	22
AVES	Troglodytidae	*Cyphorhinus arada* (Hermann, 1783)	PN 26	22
AVES	Tyrannidae	*Myiozetetes cayenensis* (Linnaeus, 1766)	PN 26	22
AVES	Picidae	*Melanerps cruentatus* (Boddaert, 1783)	PN 26	22
AVES	Trogonidae	*Trogon curucui* (Linnaeus, 1766)	PN 26	22
AVES	Caprimulgidae	*Caprimulgus maculicaudus* (Lawrence, 1862)	PN 27	23
AVES	Emberizidae	*Ramphocelus carbo* (Pallas, 1764)	PN 27	23
AVES	Thamnophilidae	*Myrmeciza atrotorax* (Boddaert, 1783)	PN 27	23
AVES	Tinamidae	*Crypturellus parvirostris* (Wagler, 1827)	PN 27	23
AVES	Charadriidae	*Vanellus chilensis* (Gmelin, 1789)	PN 28	24
AVES	Columbidae	*Columba cayennensis* (Bonnaterre, 1792)	PN 28	24
AVES	Cuculidae	*Crotophaga ani* (Linnaeus, 1758)	PN 28	24
AVES	Psittacidae	*Ara auricolis* (Cassin, 1853)	PN 28	24
MAMMALIA	Tayassuidae	*Tayassu pecari* (Link, 1795)	PN 05	2
MAMMALIA	Tapiridae	*Tapirus terrestris* (Linnaeus, 1758)	PN 05	2
MAMMALIA	Dasyproctidae	*Dasyprocta azarae* (Lichtenstein, 1823)	PN 05	2
MAMMALIA	Cervidae	*Mazama americana* (Erxleben, 1777)	PN 06/07	3/4
MAMMALIA	Tayassuidae	*Tayassu pecari* (Link, 1795)	PN 06/07	3/4
MAMMALIA	Hidrochaeridae	*Hydrochaeris hydrochaeris* (Linnaeus, 1766)	PN 06/07	3/4
MAMMALIA	Tayassuidae	*Tayassu pecari* (Link, 1795)	PN 08	5
MAMMALIA	Myrmecophagidae	*Tamandua tetradactyla (*Linnaeus, 1758)	PN 08	5
MAMMALIA	Cervidae	*Mazama americana* (Erxleben, 1777)	PN 09	6
MAMMALIA	Tayassuidae	*Pecari tajacu* (Linnaeus, 1758)	PN 09	6
MAMMALIA	Canidae	*Cerdocyon thous* (Linnaeus, 1766)	PN 09	6
MAMMALIA	Myrmecophagidae	*Tamandua tetradactyla* (Linnaeus, 1758)	PN 09	6
MAMMALIA	Tapiridae	*Tapirus terrestris* (Linnaeus, 1758)	PN 09	6
MAMMALIA	Tayassuidae	*Pecari tajacu*(Linnaeus, 1758)	PN 11	8
MAMMALIA	Dasypodidae	*Dasypus novemcinctus* (Linnaeus, 1758)	PN 11	8
MAMMALIA	Tapiridae	*Tapirus terrestris*(Linnaeus, 1758)	PN 11	8
MAMMALIA	Suidae	*Sus scrofa domesticus*	PN 16	12
MAMMALIA	Tayassuidae	*Tayassu pecari* (Link, 1795)	PN 16	12
MAMMALIA	Canidae	*Canis familiaris* Linnaeus (1758)	PN 16	12
MAMMALIA	Felidae	*Felis catus* Linnaeus (1758)	PN 16	12
MAMMALIA	Dasypodidae	*Dasypus kappleri*(Krauss,1862)	PN 16	12
MAMMALIA	Dasypodidae	*Dasypus sp*	PN 16	12
MAMMALIA	Tapiridae	*Tapirus terrestris* (Linnaeus, 1758)	PN 16	12
MAMMALIA	Cebidae	*Lagotrix lagotricha* (Humboldt, 1812)	PN 16	12
MAMMALIA	Dasyproctidae	*Dasyprocta azarae* (Lichtenstein, 1823)	PN 16	12
MAMMALIA	Dasypodidae	*Dasypus novemcinctus* (Linnaeus, 1758	PN 19	15
MAMMALIA	Muridae	*Oryzomys spp*	PN 19	15
MAMMALIA	Dasypodidae	*Dasypus sp*	PN 20	16
MAMMALIA	Cervidae	*Mazama americana* (Erxleben, 1777)	PN 24	20
MAMMALIA	Tayassuidae	*Tayassu pecari* (Link, 1795)	PN 24	20
MAMMALIA	Tapiridae	*Tapirus terrestris* (Linnaeus, 1758)	PN 24	20
MAMMALIA	Cebidae	*Lagotrix lagotricha* (Humboldt, 1812)	PN 24	20
MAMMALIA	Agoutidae	*Agouti paca* (Linnaeus, 1766)	PN 24	20
MAMMALIA	Cebidae	*Lagotrix lagotricha* (Humboldt, 1812)	PN 26	22
MAMMALIA	Agoutidae	*Agouti paca* (Linnaeus, 1766)	PN 26	22
MAMMALIA	Dasyproctidae	*Dasyprocta azarae* (Lichtenstein, 1823)	PN 26	22
MAMMALIA	Suidae	*Sus scrofa domesticus*	PN 27	23
MAMMALIA	Tapiridae	*Tapirus terrestris* (Linnaeus, 1758)	PN 27	23

* Source: I.C.L Assumpção, D.M. de Oliveira, R.J.V. Neto

Table S9. Vertebrate (mammal) fauna recorded in Jambi, Sumatra, Indonesia*

No.	Family	Species	Tr 1	Tr 2	Tr 3	Tr 4	Tr 5	Tr 6	Tr 7	Tr 8	Tr 9	Tr 10	Tr 11	Tr 12	Tr 13	Tr 14	Tr 15
1	Cercopithecidae	*Macaca fascicularis*	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0
2	Cercopithecidae	*Presbytis melalophos*	1	1	1	1	1	1	0	1	1	1	1	0	0	0	0
3	Cercopithecidae	*Trachyphitecus cristatus*	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0
4	Cervidae	*Cervus unicolor*	0	0	0	0	0	0	1	0	0	1	1	0	0	1	1
5	Cervidae	*Muntiacus muntjak*	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
6	Felidae	*Felis bengalensis*	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
7	Hylobatidae	*Hylobates lar agilis*	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0
8	Muridae	*Maxomys rajah*	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0
9	Muridae	*Maxomys whiteheadi*	0	0	1	1	1	1	0	1	1	1	1	0	0	0	0
10	Muridae	*Rattus rattus*	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
11	Muridae	*Rattus exulans*	0	0	0	0	0	1	1	1	1	0	0	1	1	0	0
12	Muridae	*Rattus tiomanicus*	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
13	Pteropodidae	*Pteropus vampirus*	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Pteropodidae	*Balionycteris maculata*	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
15	Pteropodidae	*Cynopterus brachyotis*	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0
16	Pteropodidae	*Rousettus amplexicaudatus*	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17	Rhinolophidae	*Rhinolophus lepidus*	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
18	Sciuridae	*Callosciurus prevostii*	1	0	0	1	0	1	0	1	1	1	1	0	0	0	0
19	Sciuridae	*Petinomys genigarbis*	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
20	Sciuridae	*Ratufa affinis*	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
21	Sciuridae	*Sundasciurus hippurus*	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
22	Sciuridae	*Callosciurus notatus*	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
23	Sciuridae	*Sundasciurus lowii*	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
24	Suidae	*Sus barbatus*	1	1	0	1	0	1	1	1	1	1	1	0	0	0	0
25	Suidae	*Sus scrofa*	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
26	Tragulidae	*Tragulus javanicus*	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
27	Tupaidae	*Tupaia tana*	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
28	Tupaidae	*Tupaia glis*	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
29	Ursidae	*Helarctos malayanus*	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0
30	Vespertilionidae	*Pipistrellus javanicus*	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
31	Viverridae	*Hemigalus derbyanus*	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*Source: I. Maryanto

Table S10. Vertebrate (bird) fauna listed according to family and transect in Jambi, Sumatra, Indonesia*

Family	Species	Tr 1	Tr 2	Tr 3	Tr 4	Tr 5	Tr 6	Tr 7	Tr 8	Tr 10	Tr 12	Tr 13	Tr 16
Accipitridae	*Accipiter gularis*	0	0	0	0	0	0	1	1	0	0	0	0
Accipitridae	*Accipiter trivirgatus*	0	0	1	0	1	0	0	0	0	0	0	0
Alcedinidae	*Ceyx erithacus*	1	1	0	0	1	0	0	0	0	0	0	0
Alcedinidae	*Halcyon smyrnensis*	0	0	0	0	0	0	1	1	0	1	1	0
Anatidae	*Dendrocygna arcuata*	0	0	0	0	0	0	0	0	0	1	0	0
Apodidae	*Aerodramus fuciphagus*	0	0	1	1	0	1	0	0	0	0	0	0
Apodidae	*Cypsiurus balasiensis*	0	0	0	0	0	1	0	0	0	0	0	0
Apodidae	*Hirundapus caudacutus*	0	0	0	0	0	1	0	0	0	0	0	0
Ardeidae	*Ardea cinerea*	0	0	0	0	0	0	0	0	0	0	1	0
Bucerotidae	*Anthracoceros albirostris*	0	0	1	0	0	0	0	0	1	0	0	0
Bucerotidae	*Anthracoceros malayanus*	0	0	0	1	1	0	1	0	1	0	0	0
Bucerotidae	*Buceros rhinoceros*	1	0	0	1	0	0	0	0	1	0	0	0
Bucerotidae	*Rhinoplax vigil*	1	1	1	1	1	0	0	0	0	0	0	0
Campephagidae	*Coracina striata*	1	0	0	0	0	0	0	0	0	0	0	0
Campephagidae	*Hemipus hirundinaceus*	0	1	1	0	0	0	0	0	0	0	0	0
Campephagidae	*Pericrocotus igneus*	0	0	0	0	1	0	0	0	0	0	0	0
Campephagidae	*Pericrocotus spp.*	0	1	1	0	0	0	0	0	0	0	0	0
Capitonidae	*Calorhamphus fuliginosus*	0	0	0	0	0	0	0	0	1	0	0	0
Capitonidae	*Megalaima australis*	0	0	1	1	0	0	0	0	1	0	0	1
Capitonidae	*Megalaima rafflesi*	1	1	1	1	1	0	0	0	0	0	0	0
Columbidae	*Chalcophaps indica*	0	0	1	1	1	0	0	1	1	0	0	1
Columbidae	*Ducula aenea*	0	0	0	0	0	0	0	0	1	0	0	0
Columbidae	*Geopelia striata*	0	0	0	0	0	0	0	0	0	1	0	0
Columbidae	*Ptilinopus (jambu)*	0	0	0	0	0	0	0	0	0	0	0	1
Columbidae	*Streptopelia chinensis*	0	0	0	0	0	0	0	0	0	1	1	1
Columbidae	*Treron curvirostra*	0	0	0	0	0	0	0	0	0	1	1	0
Columbidae	*Treron vernans*	0	1	0	0	0	0	0	0	0	0	0	0
Coraciidae	*Eurystomus orientalis*	0	0	0	0	0	0	0	0	0	1	0	1
Corvidae	*Corvus enca*	0	1	0	0	0	1	1	1	1	0	0	0
Corvidae	*Platysmurus leucopterus*	0	0	0	0	0	0	0	1	1	0	0	0
Cuculidae	*Cacomantis merulinus*	0	0	0	0	0	1	1	0	0	1	1	1
Cuculidae	*Cacomantis sonneratii*	1	0	0	1	0	0	0	0	1	0	0	0
Cuculidae	*Centropus bengalensis*	0	0	0	0	0	1	1	1	1	1	1	1
Cuculidae	*Centropus sinensis*	0	0	0	0	1	0	0	0	0	0	0	0
Cuculidae	*Cuculus micropterus*	0	0	0	0	0	0	1	0	0	0	0	1
Cuculidae	*Cuculus saturatus*	0	0	0	1	1	0	0	0	0	0	0	0
Cuculidae	*Rhamphococcyx curvirostris*	0	0	0	0	1	0	0	0	0	0	0	0
Cuculidae	*Rhopodytes sumatranus*	0	0	0	0	0	0	0	0	1	0	0	0
Cuculidae	*Surniculus lugubris*	0	0	0	0	0	0	1	0	1	0	0	1
Dicaeidae	*Dicaeum spp.*	0	0	1	1	1	0	0	0	0	0	0	0
Dicaeidae	*Dicaeum trigonostigma*	1	1	1	1	1	0	0	0	1	0	0	1
Dicaeidae	*Prionochilus percussus*	0	0	0	0	0	0	0	1	1	0	0	0
Dicruridae	*Dicrurus aeneus*	0	0	1	0	1	0	0	0	0	0	0	0
Dicruridae	*Dicrurus paradiseus*	1	1	1	1	1	0	1	0	1	0	0	1
Estrildidae	*Lonchura leucogastra*	0	0	0	0	0	0	0	0	0	0	0	1
Estrildidae	*Lonchura maja*	0	0	0	0	0	0	0	0	0	1	1	1
Estrildidae	*Lonchura punctulata*	0	0	0	0	0	1	0	0	0	1	1	0
Eurylaimidae	*Corydon sumatranus*	0	0	1	0	0	0	0	0	0	0	0	0
Eurylaimidae	*Eurylaimus ochromalus*	0	0	1	1	1	0	1	1	1	0	0	0
Falconidae	*Microhierax fringillarius*	0	0	0	0	0	1	1	0	0	0	0	0
Hemiprocnidae	*Hemiprocne comata*	0	1	1	1	1	0	0	0	0	0	0	0
Hirundinidae	*Hirundo rustica*	0	0	0	0	1	1	1	0	0	1	1	1
Irenidae	*Aegithina tiphia*	0	0	0	0	0	0	0	0	0	0	0	1
Irenidae	*Aegithina viridissima*	0	0	0	0	1	0	0	0	0	0	0	0
Irenidae	*Chloropsis cochinchinensis*	0	0	1	0	0	0	0	0	0	0	0	0
Irenidae	*Chloropsis cyanopogon*	0	0	0	1	1	0	0	0	0	0	0	0
Irenidae	*Chloropsis sonnerati*	1	1	1	0	0	0	0	0	0	0	0	0
Irenidae	*Irena puella*	0	1	0	0	0	1	0	0	0	0	0	0

Family	**Species**	**Tr 1**	**Tr 2**	**Tr 3**	**Tr 4**	**Tr 5**	**Tr 6**	**Tr 7**	**Tr 8**	**Tr 10**	**Tr 12**	**Tr 13**	**Tr 16**
Laniidae	*Lanius tigrinus*	0	0	0	0	0	0	0	0	0	0	0	1
Meropidae	*Merops viridis*	0	1	0	1	1	1	1	1	1	1	1	1
Meropidae	*Nyctyornis amictus*	0	0	0	0	1	0	0	0	0	0	0	0
Monarchidae	*Hypothymis azurea*	0	1	1	0	1	0	0	0	1	0	0	0
Monarchidae	*Philentoma pyrhopterum*	0	0	0	0	1	0	0	0	0	0	0	0
Monarchidae	*Rhipidura perlata*	0	0	0	1	1	0	0	0	0	0	0	0
Monarchidae	*Terpsiphone paradisi*	0	1	0	0	1	0	0	0	0	0	0	0
Muscicapidae	*Culicicapa ceylonensis*	1	0	0	0	0	0	0	0	0	0	0	0
Muscicapidae	*Cyornis tickelliae*	1	1	1	1	1	0	0	0	0	0	0	0
Muscicapidae	(Unidentified flycatcher)	0	0	0	0	1	0	0	0	0	0	0	0
Nectariniidae	*Aethopyga siparaja*	0	0	1	1	1	0	0	0	0	0	0	0
Nectariniidae	*Anthreptes malacensis*	1	0	0	1	1	0	1	0	1	0	0	1
Nectariniidae	*Anthreptes simplex*	0	0	0	0	1	0	0	0	0	0	0	0
Nectariniidae	*Arachnothera affinis*	1	1	1	0	1	0	0	0	0	0	0	0
Nectariniidae	*Arachnothera longirostra*	1	0	1	1	1	0	0	0	0	0	0	0
Nectariniidae	*Hypogramma*	0	0	0	0	1	0	0	0	0	0	0	0
Nectariniidae	*hypogrammicum*	0	0	0	0	0	0	1	1	0	0	0	0
Oriolidae	*Nectarinia jugularis*	0	0	0	1	1	0	0	0	1	0	0	0
Orthonychidae	*Oriolus xanthonotus*	0	1	0	0	0	0	0	0	0	0	0	0
Phasianidae	*Eupetes macrocerus*	0	0	0	0	0	0	0	0	0	1	1	0
Picidae	*Gallus gallus*	0	0	0	1	0	0	0	0	0	0	0	0
Picidae	*Blythipicus rubiginosus*	0	0	0	0	0	0	0	0	0	0	1	0
Picidae	*Chrysocolaptes lucidus*	1	0	0	0	0	0	0	0	0	0	0	0
Picidae	*Dinopium rafflesii*	1	1	1	1	0	0	0	0	0	0	0	0
Picidae	*Dryocopus javensis*	0	0	1	0	1	0	0	0	0	0	0	0
Picidae	*Hemicircus concretus*	1	0	0	0	0	0	0	0	0	0	0	0
Picidae	*Meiglyptes tukki*	0	0	1	1	0	0	0	1	1	0	0	0
Picidae	*Picus puniceus*	0	0	0	0	0	0	0	0	1	0	0	0
Psittacidae	*Sasia abnormis*	1	1	1	1	1	1	0	1	0	0	0	0
Psittacidae	*Loriculus galgulus*	0	0	0	0	0	0	0	0	0	1	1	0
Psittacidae	*Psittacula longicauda*	1	1	1	1	1	1	0	1	0	0	0	0
Pycnonotidae	*Psittinus cyanurus*	1	1	1	0	1	0	0	0	0	0	0	0
Pycnonotidae	*Criniger phaeocephalus*	0	0	1	0	0	0	0	0	0	0	0	0
Pycnonotidae	*Hypsipetes criniger*	0	0	0	1	1	0	0	1	1	0	0	0
Pycnonotidae	*Pycnonotus atriceps*	0	0	0	0	0	0	0	0	0	1	1	0
Pycnonotidae	*Pycnonotus aurigaster*	0	0	1	1	1	1	1	1	1	0	0	1
Pycnonotidae	*Pycnonotus brunneus*	0	0	0	0	0	1	1	0	0	1	1	1
Pycnonotidae	*Pycnonotus goiavier*	0	0	0	0	0	0	0	1	1	0	0	0
Pycnonotidae	*Pycnonotus melanicterus*	0	0	0	1	0	1	0	0	1	0	0	0
Pycnonotidae	*Pycnonotus simplex*	1	1	0	1	0	0	0	0	0	0	0	0
Rallidae	*Pycnonotus spp.*	0	0	0	0	0	0	0	0	0	0	1	0
Sturnidae	*Amaurornis phoenicurus*	1	1	1	1	1	0	0	0	0	0	0	0
Sturnidae	*Aplonis panayensis*	0	1	1	0	1	1	1	1	0	0	1	1
Sylviidae	*Gracula religiosa*	0	0	0	0	0	0	0	0	1	0	0	0
Sylviidae	*Cettia vulcania*	0	0	0	0	0	0	0	0	0	1	0	1
Sylviidae	*Cisticola exilis*	0	0	0	0	0	0	0	0	0	1	1	0
Sylviidae	*Cisticola juncidis*	0	1	1	1	1	1	1	1	1	1	1	1
Sylviidae	*Orthotomus atrogularis*	1	1	1	1	1	1	1	0	0	1	1	1
Sylviidae	*Orthotomus ruficeps*	0	1	1	1	1	1	1	0	0	0	0	0
Sylviidae	*Orthotomus sericeus*	0	0	0	0	0	1	1	0	1	1	1	1
Sylviidae	*Prinia familiaris*	0	0	0	0	0	1	0	1	0	1	1	1
Timaliidae	*Prinia flaviventris*	0	0	0	0	1	0	0	0	0	0	0	0
Timaliidae	*Alcippe brunneicauda*	0	1	0	0	0	0	0	0	0	0	0	0
Timaliidae	*Kenopia striata*	0	0	0	1	0	1	1	0	1	1	1	1
Timaliidae	*Macronous gularis*	0	1	0	0	0	0	0	0	0	0	0	0
Timaliidae	*Malacopteron cinereum*	1	1	0	0	1	0	0	0	0	0	0	0
Timaliidae	*Malacopteron magnirostre*	1	0	0	0	0	0	0	0	0	0	0	1
Timaliidae	*Malacopteron magnum*	0	0	0	0	1	0	0	0	0	0	0	0
Timaliidae	*Pellorneum capistratum*	0	0	0	0	1	0	0	1	0	0	0	0
Timaliidae	*Pomatorhinus montanus*	0	0	1	1	1	0	0	0	1	0	0	0
Timaliidae	*Stachyris erythroptera*	0	0	0	1	0	0	0	0	0	0	0	1
Timaliidae	*Stachyris maculata*	0	0	1	0	0	0	0	0	0	0	0	0

Family	Species	Tr 1	Tr 2	Tr 3	Tr 4	Tr 5	Tr 6	Tr 7	Tr 8	Tr 10	Tr 12	Tr 13	Tr 16
Timaliidae	*Stachyris nigricollis*	1	1	0	0	0	0	1	0	0	0	0	0
Timaliidae	*Stachyris sp.*	0	1	0	0	0	0	0	0	0	0	0	0
Timaliidae	*Trichastoma abbotti*	0	0	0	0	1	0	0	0	0	0	0	0
Timaliidae	*Trichastoma bicolor*	0	0	1	0	0	0	0	0	1	0	0	0
Timaliidae	*Trichastoma malaccense*	1	1	0	0	0	0	0	0	0	0	0	0
Trogonidae	*Trichastoma sepiarium*	1	1	0	0	1	0	0	0	0	0	0	0
Trogonidae	*Harpactes kasumba*	0	0	0	1	0	0	0	0	0	0	0	0
Turdidae	*Harpactes oreskios*	0	1	0	1	0	1	0	0	0	0	0	0
Turdidae	*Copsychus malabaricus*	0	0	0	0	0	1	1	0	0	1	1	1
Turdidae	*Copsychus saularis*	0	0	0	0	0	1	1	0	0	0	0	0
Turnicidae	*Turdus obscurus*	0	0	0	0	0	0	0	0	0	1	1	1
Zosteropidae	*Turnix suscitator*	0	0	1	0	1	0	0	0	0	0	0	0
Species A	*Zosterops palpebrosus*	1	0	0	0	0	0	0	0	0	0	0	0
Species B	-	1	0	0	0	0	0	0	0	0	0	0	0
Species C	-	0	1	0	0	0	0	0	0	0	0	0	0
Species D	-	0	1	0	0	0	0	0	0	0	0	0	0
Species E	-	0	1	0	0	0	0	0	0	0	0	0	0
Species F	-	0	1	0	0	0	0	0	0	0	0	0	0
Species G	-	0	1	0	0	0	0	0	0	0	0	0	0
Species H	-	0	0	1	0	0	0	0	0	0	0	0	0
Species I	-	0	0	1	1	0	0	0	0	0	0	0	0
Species J	-	0	0	0	0	1	0	0	0	0	0	0	0
	-												

* Source P. Jepson, Djawardi

Table S11. Invertebrate fauna (termites) recorded in Mato Grosso according to taxa, feeding group and transect*

Family (subfamily)	**Species**	**Feeding group**	**Tr 2**	**Tr 3**	**Tr 4**	**Tr 5**	**Tr 6**	**Tr 18**	**Tr 19**	**Tr 23**	**Tr 24**	**Tr 25**	**Tr 26**
Rhinotermitidae	*Coptotermes testaceus*	X	0	0	0	0	0	0	0	1	0	0	1
	Dolichorhinotermes longilabius	X	0	0	0	2	0	0	1	2	0	0	0
	Heterotermes tenuis	X	1	0	0	2	0	2	0	0	1	0	0
	Rhinotermes marginalis	X	0	0	0	1	0	0	0	0	0	0	2
Termitidae													
Apicotermitinae: (*Anoplotermes*-group)	*Anoplotermes banksi*	H	0	0	0	0	1	0	0	0	0	0	0
	Anoplotermes sp. A	H	1	0	0	2	1	0	1	5	0	1	3
	Anoplotermes sp. B	H	0	0	0	0	0	0	0	0	1	1	2
	Anoplotermes sp. C	H	2	0	0	0	0	0	0	1	1	0	0
	Anoplotermes sp. D	H	0	0	0	0	0	0	0	0	0	1	1
	Anoplotermes sp. E	H	0	0	0	0	1	0	0	0	0	0	0
	Grigiotermes sp. A	H	0	0	0	0	0	0	0	2	0	0	2
	Ruptitermes reconditus	L	0	0	0	0	0	0	0	0	0	0	1
	Ruptitermes sp. A	L	0	0	0	0	0	0	0	1	0	0	0
	Ruptitermes sp. B	L	0	0	0	0	0	0	1	1	0	0	0
	Tetimatermes sp. A	H	0	0	0	0	0	0	1	0	0	0	0
(Termitinae)	*Cavitermes parvicavus*	H	0	0	0	0	1	0	0	0	0	0	0
	Cavitermes tuberosus	H	0	0	0	0	1	0	0	0	0	0	0
	Cornicapritermes mucronatus	X	0	0	0	0	0	0	0	1	0	0	0
	Crepititermes verruculosus	H	0	0	0	1	1	0	0	0	1	1	0
	Cylindrotermes flangiatus	X	0	0	0	4	0	1	0	0	0	1	0
	Dentispicotermes globicephalus	H	0	0	0	0	0	0	1	0	0	0	0
	Dentispicotermes sp. A	H	0	0	0	0	0	0	0	0	0	1	0
	Microcerotermes strunckii	X	1	0	0	0	0	0	0	1	0	0	0
	Neocapritermes opacus	I	0	0	0	0	0	0	0	0	1	0	0
	Neocapritermes unicornis	I	0	0	0	0	2	0	0	0	0	0	0
	Planicapritermes planiceps	X	0	0	0	2	0	0	0	0	0	0	0
	Spinitermes nigrostomus	I	0	0	0	0	0	0	0	0	0	1	0
	Termes medioculatus	I	0	0	1	0	2	0	0	1	0	0	0
(Nasutitermitinae*)*	*Anhangatermes macarthuri*	H	0	0	0	0	0	0	1	0	0	0	0
	Atlantitermes raripilus	H	0	0	0	0	0	0	0	1	0	1	0
	Atlantitermes snyderi	H	0	0	0	0	0	0	1	0	0	0	0
	Atlantitermes stercophilus	H	0	0	0	0	1	0	0	0	0	0	0
	Atlantitermes sp. A	H	0	0	0	0	1	0	0	0	0	0	0
	Coatitermes clevelandi	H	0	0	0	0	1	0	0	0	0	1	0
	Coatitermes sp. A	H	0	0	0	0	1	0	0	0	0	0	0
	Diversitermes diversimiles	L	0	0	0	0	0	0	0	0	0	1	1
	Nasutitermes brevipilus	I	0	0	0	0	1	0	0	0	0	0	0
	Nasutitermes corniger	X	2	0	0	0	0	0	0	0	0	2	1
	Nasutitermes coxipoensis	L	0	4	1	0	0	0	0	0	0	0	0
	Nasutitermes ephratae	X	0	0	0	0	0	0	0	0	1	0	1
	Nasutitermes major	X	0	0	0	5	0	0	0	0	0	0	0
	Nasutitermes octopilis	X	0	0	0	1	0	0	0	0	0	0	0
	Nasutitermes similis	X	0	0	0	2	0	3	3	0	1	0	2
	Nasutitermes surinamensis	X	0	0	0	0	0	1	0	0	1	0	0
	*Nasutitermes wheeleri**	X	0	0	0	0	0	0	0	0	0	0	0
	Nasutitermes sp. A	X	0	0	0	0	0	2	0	0	0	1	0
	Nasutitermes sp. B	X	0	0	0	2	0	0	0	0	0	0	0
	Nasutitermes sp. C	X	0	0	2	0	0	0	0	0	0	0	0
	Subulitermes microsoma	H	0	0	0	0	0	0	4	0	0	2	0
	Triangularitermes triangulariceps	I	0	0	0	0	1	0	0	0	0	0	0
	Velocitermes sp. A	L	0	0	0	1	0	0	0	2	0	0	0
(Syntermitinae)	*Cornitermes bequaerti*	I	1	0	0	0	0	2	0	1	1	3	0
	Cornitermes pugnax	I	0	0	0	1	0	0	0	0	1	0	0
	Cornitermes sp. D	I	0	0	0	0	0	0	0	0	0	0	1
	Curvitermes odontognathus	H	0	0	0	0	0	0	1	0	0	1	0
	Embiratermes latidens	I	0	0	0	0	0	0	1	0	0	0	0
	Embiratermes neotenicus	I	1	0	0	0	1	0	0	1	0	0	2
	Embiratermes cf. *silvestrii*	I	0	0	0	0	0	0	1	0	0	0	0

Labiotermes labralis	H	0	0	0	0	1	0	0	0	0	0	1
Labiotermes pelliceus	H	0	0	0	0	0	0	1	0	0	1	0
Labiotermes orthocephalus	H	0	0	0	0	0	0	1	0	0	0	0
Mapinguaritermes peruanus	I	0	0	0	0	0	0	0	0	0	0	1
Silvestritermes holmgreni	I	0	0	0	0	2	1	0	0	1	0	1
Species richness		**7**	**1**	**3**	**13**	**17**	**7**	**14**	**14**	**11**	**16**	**16**
Abundance		**9**	**4**	**4**	**26**	**20**	**12**	**19**	**21**	**11**	**20**	**23**

* Source: R. Constantino. Feeding groups: H= humus; X= wood; L= leaf-litter; I= intermediate; E = epiphyte; abundance = number of colonies per species. Site numbers: top line = original MT listing; lower line =site number used in this study.

Table S12. Invertebrate fauna (termites) recorded in Jambi, Sumatra according to taxa, feeding group and transect*

Family (subfamily)	**Species**	**Feeding group**	**Tr 1**	**Tr 3**	**Tr 6**	**Tr 8**	**Tr 10**	**Tr 12**	**Tr 14**
Kalotermitidae	*Glyptotermes* sp.	X	0	0	0	1	0	0	0
Rhinotermitidae	*Coptotermes curvignathus*	X	1	1	1	3	1	0	0
	Coptotermes sepangensis	X	0	0	4	0	0	0	0
	Coptotermes borneensis	X	0	0	1	0	0	0	0
	Heterotermes tenuior	X	1	0	0	0	0	0	0
	Parrhinotermes near *minor*	X	0	0	0	0	1	0	0
	Parrhinotermes near sp. C	X	0	1	0	0	0	0	0
	Schedorhinotermes sarawakensis	X	1	0	9	0	0	0	0
	Schedorhinotermes medioobscurus	X	7	7	7	3	10	0	0
Termitidae	*Ancistrotermes pakstanicus*	X	0	0	0	0	3	0	0
(Macrotermitinae)	*Macrotermes gilvus*	X	0	0	0	0	0	0	1
	Macrotermes ahmadi	X	1	0	0	0	0	0	0
	Odontotermes denticulatus	X	0	0	0	0	5	0	0
	Odontotermes sarawakensis	X	10	9	0	0	0	0	0
(Termitinae)	*Coxocapritermes* sp. *A*	H	6	1	0	0	0	0	0
	Coxocapritermes sp. C	H	2	3	0	0	0	0	0
	Coxocapritermes sp. D	H	1	3	0	0	2	0	0
	Dicuspiditermes nemorosus	H	11	18	0	12	12	0	0
	Dicuspiditermes santschii	H	6	5	2	2	1	0	0
	Globitermes globosus	X	8	4	0	0	1	4	0
	Homallotermes eleanorae	I	1	0	0	3	0	0	0
	Homallotermes foraminifer	I	1	4	0	0	0	0	0
	Kemneritermes sarawakensis	H	4	1	0	0	0	0	0
	Labritermes buttelreepeni	H	0	0	0	2	1	0	0
	Malaysiocapritermes prosetiger	H	0	2	0	0	10	0	0
	Microcerotermes near *havilandi*	X	0	1	0	0	0	0	0
	Microcerotermes serrula	X	3	7	0	1	0	0	0
	Mirocapritermes connectans	H	0	2	0	0	10	0	0
	Pericapritermes dolichocephalus	H	0	0	0	0	6	0	0
	Pericapritermes nitobei	H	1	0	0	0	2	0	0
	Pericapritermes semarangi	H	2	0	0	0	0	5	0
	Procapritermes near minutus	H	4	0	0	0	1	0	0
	Procapritermes neosetiger	H	0	0	0	1	0	0	0
	Procapritermes sandakanensis	H	0	0	0	0	3	0	0
	Procapritermes setiger	H	8	6	0	0	2	0	0
	Procapritermes sp. A	H	0	0	0	0	5	0	0
	Prohamitermes mirabilis	I	3	7	4	6	0	0	0
	Termes comis	I	4	1	1	0	0	0	0
	Termes propinquus	I	3	0	1	12	0	0	0
(Nasutitermitinae)	*Bulbitermes germanus*	X	2	0	0	0	0	0	0
	Bulbitermes prabhae	X	1	0	0	0	0	0	0
	Bulbitermes sp. A	X	3	1	0	0	0	0	0
	Havilanditermes proatripennis	X	0	0	0	6	0	0	0
	Hospitalitermes hospitalis	E	4	0	0	2	0	0	0
	Leucopitermes sp. A	H	1	0	0	0	0	0	0
	Malaysiotermes malayanus	H	1	3	0	0	0	0	0
	Malaysiotermes sp. B	H	2	3	0	0	0	0	0
	Nasutitermes havilandi	X	1	0	3	0	2	0	0
	Nasutitermes matangensis	X	0	0	0	0	2	0	0
	Nasutitermes neoparvus	X	0	0	0	1	0	0	0
	Nasutitermes sp. C	X	0	0	0	2	0	0	0
	Nasutitermes sp. D	X	1	0	2	0	0	0	0
	Oriensubulitermes inanis	H	2	4	0	0	2	0	0
Species richness			**34**	**23**	**11**	**15**	**21**	**2**	**1**
Abundance			**110**	**94**	**35**	**62**	**82**	**9**	**1**

* Source: Jones et al. (2003). Feeding groups: H = humus; X = wood; I = intermediate; E = epiphyte. Abundance = No. colonies per species.

Table S13. Target groups and significant indicators occurring in at least one region (excluding PFEs for fauna)

Target group	Indicator	Brazil		Sumatra	
		‘*r*’	*P* <	‘*r*’	*P* <
Plant species	PFT diversity	0.956	0.0001	0.900	0.0001
	Bryophyte cover/abundance	0.642	0.0001	0.716	0.002
	Woody plants < 2m tall c/a	0.688	0.0001	0.614	0.011
	Mean canopy height	0.558	0.001	0.894	0.0001
	Basal area woody plants	0.499	0.004	0.925	0.0001
	Litter depth	0.359	0.043	0.674	0.004
	……………………………..	……..	……...	……..	……...
	PFT-weighted PFEs				
	Dorsiventral ls. (do)	0.958	0.0001	0.900	0.0001
	Mesophyll (me)	0.818	0.0001	0.837	0.0001
	Phanerophyte (ph)	0.816	0.0001	0.954	0.0001
	Lateral incl. ls.(la)	0.789	0.0001	0.921	0.0001
	Platyphyll (pl)	0.721	0.0001	0.840	0.0001
	Green p/s stem (ct)	0.687	0.0001	0.908	0.0001
	Composite incl. ls. (co)	0.507	0.003	0.838	0.0001
	Succulent (su)	0.488	0.005	0.826	0.0001
	Rosulate ls.(ro)	0.463	0.008	0.833	0.0001
	Lianoid life form (li)	0.822	0.0001	0.744	0.001
	Graminoid (pv)	0.578	0.001	0.734	0.001
	Notophyll (no)	0.815	0.0001	0.712	0.002
	Epiphyte (ep)	0.465	0.007	0.707	0.002
	Adventitious roots (ad)	0.722	0.0001	0.593	0.015
	Microphyll (mi)	0.399	0.024	0.503	0.047
	Hemicryptophyte (hc)	0.668	0.0001	0.500	0.048
	Filicoid ls. (fi)	0.788	0.0001	-0.300	*
	Chamaephyte (ch)	0.517	0.002	-0.166	*
Bird species	Litter depth	-0.695	0.003	0.619	0.032
	Spp.:PFTs ratio	-0.173	*	0.771	0.003
	Mean canopy height	0.449	*	0.721	0.008
	Basal area woody plants	0.161	*	0.646	0.023
	Plant species	0.031	*	0.625	0.030
	Crown cover non woody plts	-0.101	*	-0.634	0.027
	……………………………...	……..	……...	…….	…….
	Termite abundance	-0.898	0.001	0.623	*
	Termite species	-0.885	0.001	0.535	*
Mammal species	PFT diversity	0.293	*	0.847	0.0001
	Plant species	0.262	*	0.782	0.001
	Crown cover woody plants	0.256	*	0.734	0.002
	Basal area woody plants	0.613	0.012	0.617	0.014

Target group	**Indicator**	**Brazil**		**Sumatra**	
		‘r’	$P <$	‘r’	$P <$
	Mean canopy height	0.597	0.015	0.615	0.015
	Spp.:PFTs ratio	-0.112	*	0.606	0.017
	Bryophyte cover/abundance	0.608	0.012	0.378	*
Termite species	Spp.:PFTs ratio	0.441	*	0.970	0.0001
	Basal area woody plants	0.614	0.045	0.966	0.001
	Mean canopy height	0.356	*	0.963	0.001
	Litter depth	0.710	0.014	0.847	0.013
	Plant species	0.496	*	0.853	0.015
	Mean furcation index	-0.720	0.012	-0.453	*
Termite abundance	Spp.:PFTs ratio	0.586	*	0.977	0.0001
	Basal area woody plants	0.548	*	0.949	0.001
	Mean canopy height	0.260	*	0.929	0.003
	Litter depth	0.718	0.013	0.907	0.005
	Plant species	0.620	0.042	0.847	0.016
	Mean furcation index	-0.671	0.024	-0.483	*

Ranked in order of regional statistical significance; * ($P > 0.05$); ‘species’ indicates species richness or diversity (number of species recorded per sample). See Table S1 for PFE coding.

Table S14. Significant PFE indicators common to both regions

Target group	Indicator	Brazil		Sumatra	
		‘*r*’	*P* <	‘*r*’	*P* <
Plant species	Dorsiventral ls. (do) †	0.958	0.0001	0.900	0.0001
	Mesophyll (me) †	0.818	0.0001	0.837	0.0001
	Phanerophyte (ph) †	0.816	0.0001	0.954	0.0001
	Lateral incl. ls.(la) †	0.789	0.0001	0.921	0.0001
	Platyphyll (pl) †	0.721	0.0001	0.840	0.0001
	Green p/s stem (ct) †	0.687	0.0001	0.908	0.0001
	Composite incl. ls. (co) †	0.507	0.003	0.838	0.0001
	Succulent (su) †	0.488	0.005	0.826	0.0001
	Rosulate ls.(ro) †	0.463	0.008	0.833	0.0001
	Lianoid life form (li) †	0.822	0.0001	0.744	0.001
	Graminoid (pv) †	0.578	0.001	0.734	0.001
	Notophyll (no) †	0.815	0.0001	0.712	0.002
	Epiphyte (ep) †	0.465	0.007	0.707	0.002
	Adventitious roots (ad) †	0.722	0.0001	0.593	0.015
	Microphyll (mi) †	0.399	0.024	0.503	0.047
	Hemicryptophyte (hc) †	0.668	0.0001	0.500	0.048
Mammal species	Succulent leaves (su)*	0.491	0.053	0.784	0.001
	Filicoid leaves (fi)*	0.625	0.010	0.569	0.027
	Filicoid leaves (fi) †	0.621	0.010	0.564	0.029
	Lateral incl. leaves (la)†	0.517	0.040	0.898	0.0001
	Adventitious roots (ad)†	0.616	0.011	0.537	0.039
Termite species	Lateral incl. leaves (la)*	0.669	0.024	0.838	0.019
Termite abundance	Lateral incl. leaves (la)*	0.721	0.012	0.839	0.018
	Lateral incl. leaves (la)†	0.606	0.048	0.763	0.046
	Dorsiventral leaves (do)*	0.623	0.040	0.839	0.018
	Mesophyll size leaves (me)*	0.735	0.010	0.765	0.045

* species-weighted PFTs; † unique PFT-weighted

Table S15. Vegetation structure and soil properties

PFE	Indicator	Brazil		Sumatra	
		‘*r*’	*P* <	‘*r*’	*P*
Mean canopy height	Silt%	0.355	0.046	-0.019	*
Woody plants <2m tall	Silt%	0.423	0.016	0.540	0.031
	Sand%	-0.404	0.022	-0.293	*
Bryophyte cov./abund.	Silt%	0.432	0.013	-0.196	*

Table S16. Species and PFT diversity and soil correlates using combined regional data

Target group	Indicator	Brazil + Sumatra	
		‘*r*’	*P* <
Plant species	Silt%	0.499	0.0001
	Sand%	-0.287	0.048
PFT diversity	Silt %	0.451	0.001
	Sand %	-0.411	0.004
Bird species	Silt%	0.380	0.046
Mammal species	Silt%	0.597	0.0001
Termite abundance	Silt%	0.554	0.017
All fauna species*	Silt%	0.624	0.013

* Based on joint occurrence of birds mammals and termites

Table S17. Soil analyses for Mato Grosso (0-10 cm depth only)*

Transect No.	Clay %	Silt %	Sand %	pH H_2O	pH_1 $CaCl_2$	C org %	P Melich mg kg^{-1}	K $cmol_c$ kg^{-1}	Ca $cmol_c$ kg^{-1}	Mg $cmol_c$ kg^{-1}	Al $cmol_c$ kg^{-1}
1	24.0	5.0	71.0	4.4	3.7	0.9	1.4	0.08	0.30	0.20	1.00
2	32.3	6.7	61.0	6.1	5.2	2.4	2.3	0.20	5.10	1.50	0.00
3	14.0	3.3	82.7	4.3	3.6	1.5	3.2	0.07	0.30	0.20	1.80
4	11.6	3.3	85.1	4.3	3.6	0.9	0.8	0.05	0.20	0.00	1.00
5	11.6	3.3	85.1	3.6	3.0	5.7	5.4	0.07	0.20	0.00	4.00
6	15.7	3.3	81.0	4.7	3.0	3.4	1.7	0.12	0.20	0.10	2.80
7	18.0	7.0	75.0	5.6	4.9	0.8	1.4	0.10	1.00	0.30	0.00
8	32.3	30.0	37.7	4.3	3.6	2.0	5.1	0.20	0.90	0.40	2.30
9	19.0	6.7	74.3	4.7	4.0	0.1	2.9	0.08	1.10	0.80	0.30
10	17.3	3.3	79.4	6.1	5.2	0.1	10.2	0.08	2.90	2.30	0.60
11	12.3	3.4	84.3	5.3	4.5	0.1	18.0	0.01	1.00	0.70	0.30
12	63.3	18.3	18.4	4.3	3.8	1.8	1.1	0.11	0.20	0.10	2.40
13	61.6	13.3	25.1	4.5	3.9	1.8	0.8	0.10	0.50	0.30	2.00
14	64.9	13.4	21.7	4.8	4.2	2.1	1.4	0.16	1.40	0.70	1.10
15	66.6	11.7	21.7	5.7	4.9	2.5	9.8	0.17	2.80	1.30	0.00
16	68.3	11.6	20.1	4.7	4.1	1.9	1.4	0.10	1.00	0.50	1.10
17	41.6	13.3	45.1	6.4	5.7	6.1	272.0	0.30	14.40	2.20	0.00
18	21.6	6.7	71.7	6.3	5.4	1.5	6.8	0.14	3.30	0.60	0.00
19	68.3	10.0	21.7	4.7	4.1	1.9	1.1	0.09	1.50	0.50	0.90
20	38.3	20.0	41.7	4.8	4.2	1.6	1.1	0.15	1.20	0.70	0.60
21	30.6	15.1	54.3	4.4	3.7	1.3	2.3	0.19	0.50	0.30	1.10
22	22.3	6.7	71.0	5.7	5.0	1.0	2.0	0.17	1.80	0.70	0.00
23	19.0	6.7	74.3	5.4	4.7	1.0	1.4	0.13	1.20	0.40	0.20
24	15.7	3.3	81.0	6.2	5.3	0.8	1.7	0.19	1.40	0.50	0.00
25	52.3	6.7	41.0	4.7	4.1	1.5	2.6	0.08	1.30	0.50	0.80
26	29.0	8.3	62.7	4.6	3.9	1.1	1.4	0.16	0.40	0.20	1.00
27	19.0	10.0	71.0	6.5	5.7	2.7	6.1	0.27	8.50	1.10	0.00
28	15.7	3.3	81.0	6.1	5.3	0.9	3.8	0.15	2.10	0.60	0.00
29	39.0	20.0	41.0	4.6	4.0	1.7	1.7	0.14	1.40	0.80	0.90
30	57.3	11.7	31.0	6.5	5.7	4.2	1.4	0.31	11.50	2.60	0.00
31	29.0	6.7	64.3	6.8	6.3	6.6	230.9	0.44	29.10	1.50	0.00
32	29.0	6.7	64.3	5.2	6.0	5.7	5.2	0.26	10.60	1.00	0.00

(continued next page)

Table S17. (continued)

H cmol$_c$ kg^{-1}	ECEC cmol$_c$ kg^{-1}	Base Sat %	Al Sat %	Zn mg kg^{-1}	Cu mg kg^{-1}	Fe mg kg^{-1}	Mn mg kg^{-1}	S mg kg^{-1}	B mg kg^{-1}
3.10	1.6	12.4	63.3	0.7	2.0	333.0	38.5	3.9	0.4
3.20	6.8	67.8	0.0	2.6	0.8	113.0	215.0	3.9	0.3
4.10	2.3	8.9	75.4	0.5	0.2	58.0	4.3	8.5	0.3
4.00	0.9	9.3	65.8	0.3	0.1	121.0	1.0	4.4	0.2
15.00	4.1	2.5	89.1	1.3	0.2	119.0	5.0	8.5	0.5
12.10	3.2	2.8	86.6	0.6	0.1	378.0	1.5	3.4	0.3
2.00	1.4	40.9	0.0	0.3	0.4	315.0	19.3	3.9	0.4
4.80	3.7	17.6	60.0	1.1	0.4	257.0	10.6	6.4	0.3
0.50	3.7	28.1	29.7	0.8	0.7	226.0	93.4	7.4	0.2
0.00	5.6	57.5	0.0	3.2	0.4	358.0	105.2	3.5	0.3
0.30	3.2	30.0	19.3	0.7	0.1	112.0	5.3	5.9	0.3
4.90	2.8	5.4	85.1	0.5	2.3	212.0	34.2	3.9	0.2
5.10	2.9	11.3	68.9	0.5	1.4	186.0	35.5	3.6	0.2
6.40	3.4	23.1	33.2	0.9	0.8	162.0	8.1	4.5	0.3
6.10	4.3	41.3	0.0	2.3	1.0	186.0	15.0	5.5	0.4
5.30	2.8	19.9	41.3	0.8	0.8	175.0	50.0	3.9	0.2
8.60	16.9	66.4	0.0	16.5	0.2	17.0	245.0	4.6	0.8
2.60	4.1	60.6	0.0	2.1	0.8	196.0	59.7	6.6	0.3
5.10	2.9	26.1	29.4	1.0	1.8	206.0	33.7	5.4	0.2
3.70	2.6	32.4	23.4	3.1	1.1	185.0	135.0	5.0	0.3
3.60	2.1	17.5	53.1	1.5	0.7	372.0	86.7	8.3	0.3
2.40	2.7	52.7	0.0	1.4	2.0	196.0	150.0	9.0	0.4
3.00	2	34.9	10.3	0.9	0.6	314.0	151.0	8.1	0.3
1.70	2	55.9	0.0	1.4	0.4	182.0	150.0	7.3	0.3
4.40	2.7	26.7	28.5	0.8	2.0	365.0	65.8	17.3	0.3
3.60	1.7	14.3	56.7	0.7	1.7	386.0	51.7	3.5	0.3
2.10	9.9	82.2	0.0	6.9	1.3	92.0	170.0	10.6	0.3
1.70	2.8	63.3	0.0	2.1	0.3	219.0	135.8	11.8	0.2
4.30	3.2	31.2	27.2	0.8	0.9	383.0	72.9	4.0	0.3
4.20	14.4	77.6	0.0	7.7	9.5	135.0	177.0	10.0	0.3
4.40	31	87.6	0.0	5.5	0.8	11.0	160.0	10.1	0.3
10.20	11.8	53.9	0.0	2.6	0.5	35.0	214.0	9.4	0.3

* Source: E.G. Couto. Note: High P values in transects 17 and 31 are from ultrabasic outcrops. Complete profile data available from contact author

Table S18. Soil and carbon analyses for Jambi, Sumatra (averaged 0-10 cm depth only)*

Transect number	Clay %	Silt %	Sand %	pH H_2O	pH KCl	C org %	N tot %	P $Bray_{II}$ mg kg^{-1}	K $cmol_c$ kg^{-1}
1	16.0	22.0	62.0	4.35	3.65	2.9	0.21	7.2	0.12
2	11.5	20.5	68.0	4.45	3.65	2.6	0.16	7.9	0.15
3	23.5	9.0	67.5	4.85	3.75	1.7	0.125	3.9	0.11
4	9.5	10.5	80.0	4.25	3.55	3.9	0.23	11.6	0.13
5	8.0	13.0	79.0	4.35	3.55	3.2	0.20	6.2	0.15
6	8.0	9.0	83.0	4.35	3.90	2.5	0.15	13.8	0.12
7	31.0	23.5	45.5	5.20	3.85	3.2	0.22	5.0	0.31
8	67.0	19.0	14.0	4.55	3.60	4.5	0.28	0.7	0.15
9	58.0	28.0	14.0	4.60	3.65	2.8	0.42	8.8	0.20
10	29.5	64.0	6.5	5.15	3.80	5.1	0.37	29.0	0.37
11	40.0	51.0	9.0	5.35	3.90	4.5	0.32	21.5	0.35
12	21.0	12.5	66.5	5.65	4.15	2.1	0.12	7.3	0.16
13	24.5	9.0	66.5	5.65	4.00	2.2	0.12	3.6	0.14
14	25.0	16.0	59.0	5.00	3.80	1.4	0.10	12.1	0.10
15	20.0	15.5	64.5	5.10	3.85	1.7	0.11	12.6	0.11
16	28.5	62.5	9.0	5.50	4.05	4.1	0.30	26.5	0.38

Table S18 continued..

Na $cmol_c$ kg^{-1}	Ca $cmol_c$ kg^{-1}	Mg $cmol_c$ kg^{-1}	Al $cmol_c$ kg^{-1}	H $cmol_c$ kg^{-1}	ECEC $cmol_c$ kg^{-1}	Al sat. %	Ag C kg m^2	Tot C kg m^2
0.29	0.29	0.46	4.19	1.00	7.67	54.7	52.39	55.72
0.27	0.27	0.36	3.62	1.05	6.99	52.1	42.27	45.85
0.27	0.27	0.36	2.81	0.52	5.87	47.8	13.30	16.43
0.25	0.25	1.18	3.72	1.23	7.85	47.4	22.03	27.49
0.33	0.33	0.76	2.83	1.31	6.98	40.7	39.86	43.81
0.28	0.28	0.91	2.64	0.59	6.24	42.3	11.24	15.77
0.53	0.53	1.35	1.61	0.54	8.76	18.7	5.01	10.18
0.32	0.32	0.63	3.38	1.66	8.41	40.3	10.01	15.84
0.37	0.37	0.50	4.45	1.55	8.525	51.2	13.89	18.19
0.66	0.66	0.59	5.18	2.06	10.90	47.6	16.09	22.60
0.56	0.56	0.28	3.68	1.64	8.42	43.7	14.24	20.48
0.36	0.36	0.72	1.12	0.33	4.36	26.7	0.15	4.68
0.43	0.43	0.61	1.33	0.67	4.17	31.9	0.12	5.58
0.24	0.24	0.87	2.13	0.45	4.91	43.4	0.12	3.28
0.35	0.35	0.48	1.51	0.59	4.73	32.0	0.15	4.22
0.79	0.79	1.49	1.92	1.18	7.84	25.2	0.40	6.82

* Source: K. Hairiah, M. van Noordwijk. Complete profile data available from contact author; Ag C kg m^2 = Aboveground carbon, Tot C kg m^2 = Total carbon

Table S19. Indicators of aboveground and total carbon - Sumatran baseline

Indicator	Aboveground Carbon (kg m^{-2})		Total Carbon (kg m^{-2})	
	‘*r*’	*P* <	‘*r*’	*P* <
Crown cover %, woody:non-woody plts	0.929	0.0001	0.932	0.0001
Tree species diversity	0.885	0.0001	0.893	0.0001
Mean canopy height	0.880	0.0001	0.892	0.0001
Spp.:PFTs	0.861	0.0001	0.867	0.0001
Basal area	0.846	0.0001	0.861	0.0001
Plant species diversity	0.789	0.0001	0.827	0.0001
Plant litter depth	0.663	0.005	0.662	0.005
Plant Functional Complexity (PFC)	0.603	0.013	0.640	0.008
Unique PFT diversity	0.577	0.019	0.621	0.010
Bryophyte cover abundance	0.601	0.014	0.612	0.012
Crown cover % woody plants	0.552	0.027	0.586	0.017
Crown cover % non-woody plants	-0.535	0.033	-0.534	0.033
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Termite species diversity	0.890	0.007	0.898	0.006
Termite abundance	0.789	0.035	0.802	0.030

Table S20. Data variables recorded for each 40 x 5 m transect (VegClass)*

Site feature	Descriptor	Data type
Location reference	Location	Alpha-numeric
	Date (dd-mm-year)	Alpha-numeric
	Plot number (unique)	Alpha-numeric
	Country	Text
Observer/s	Observer/s by name	Text
Physical	Latitude deg.min.sec. (GPS)	Alpha-numeric
	Longitude deg.min.sec. (GPS)	Alpha-numeric
	Elevation (m.a.s.l.) (aneroid and GPS)	Numeric
	Aspect (compass deg.) (perpendicular to plot)	Numeric
	Slope percent (perpendicular to plot)	Numeric
	Soil depth (cm) (sample taken 0-10, 10-20cm)	Numeric
	Soil type (US Soil taxonomy preferred)	Text
	Parent rock type	Text
	Litter depth (cm)	Numeric
	Terrain position	Text
Site history	General description and land-use / landscape context	Text
Vegetation structure	Vegetation type	Text
	Mean canopy height (m)	Numeric
	Canopy cover percent (total)	Numeric
	Cover-abundance (Domin Scale) - bryophytes	Numeric
	Cover-abundance (DS) woody plants <1.5 m tall	Numeric
	Basal area (mean of 3) (m^2ha^{-1});	Numeric
	Furcation index (mean and cv % of 20)	Numeric
	Profile sketch of 40x5 m plot (scannable)	Digital
Plant taxa (vascular)	Family	Text
	Genus	Text
	Species	Text
	Botanical authority	Text
Plant Functional Type	Plant functional elements combined according to published rule set.	Text
Photograph	Hard copy and digital image	JPEG

* Does not include soil analytical and faunal data. VegClass program downloadable at www.cbmglobe.org and www.cifor.org

Table S21 Significant and close-to significant positive regression slopes

Regressand variable	**Regressor variable**	**d.f.**	***P*-value millionths**	***t*-value**	**FDR millionths**
Spp	phw	46	0	12.599	0
Spp	SPRAT	46	0	10.151	0
Spp	dow	46	0	10.069	0
Spp	PFT	46	0	10.066	0
Spp	law	46	0	8.988	0
Spp	mew	46	0	7.736	0
Spp	now	46	0	7.572	0
la	Al	46	0	7.504	0
me	Al	46	0	7.311	0
do	Al	46	0	7.228	0
no	Al	46	0	7 150	0
Spp	ctw	46	0	7.096	0
Spp	liw	46	0	6.969	0
Spp	PFC	46	0	6.681	0
Spp	row	46	0	6.501	0
T.Abd	SPRAT	16	0	9.519	0
SPRAT	Al	46	0	6.467	0
Mam	la	29	0	7.194	0
All.F	T.Abd	13	0	10.823	0
T.Abd	ph	16	0	9.512	0
ch	Silt	46	0	6.030	1
ph	Al	46	0	6.028	1
Spp	Al	46	0	5.986	1
mi	Al	46	0	5.940	2
Mam	do	29	1	6.265	3
li	Al	46	1	5.657	4
Mam	no	29	1	6.152	4
Birds	All.F	13	1	8.463	3
Mam	me	29	1	6.038	5
ct	Al	46	2	5.466	7
T.Abd	no	16	2	7.282	5
Spp	suw	46	2	5.442	8
Birds	la	26	2	5.998	8
Spp	adw	46	3	5.340	11
Birds	me	26	4	5.907	10
T.Abd	la	16	4	6.895	9
T.Spp	T.Abd	16	4	6.833	10
Birds	ph	26	4	5.802	13
Birds	ct	26	4	5.799	13
T.Abd	do	16	5	6.679	14
hc	Silt	46	5	5.144	20
chw	Clay	46	5	5.143	20
Mam	Al	29	9	5.389	27

Regressand	**Regressor**	***P*-value**		**FDR**	
Mam	law	29	9	5.363	29
T.Spp	SPRAT	16	9	6.369	23
T.Abd	li	16	9	6.363	23
Birds	do	26	12	5.382	37
All.F	ph	13	14	6.751	30
T.Abd	me	16	21	5.941	50
li	Silt	46	22	4.725	72
T.Spp	ph	16	24	5.864	57
Spp	Mam	29	25	5.005	73
Spp	Barea	46	28	4.648	91
Birds	no	26	33	5.002	93
Spp	pvw	46	34	4.593	107
Mam	li	29	36	4.871	103
Spp	Ht	46	37	4.564	117
Mam	ct	29	45	4.797	125
me	Silt	46	48	4.488	146
T.Abd	ct	16	50	5.488	113
do	Silt	46	53	4.457	160
All.F	la	13	53	5.892	110
Mam	ph	29	53	4.732	147
ch	Clay	46	55	4.445	166
Spp	hcw	46	56	4.440	168
Birds	SPRAT	26	64	4.757	169
Mam	mi	29	80	4.586	213
dew	C org	46	81	4.324	236
phw	Al	46	83	4.319	240
Spp	T.Abd	16	94	5.163	207
Spp	W plts	46	96	4.271	275
Birds	Mam	26	107	4.592	251
de	C org	46	112	4.224	315
Spp	T.Spp	16	116	5.061	250
Spp	fiw	46	119	4.206	332
de	K	46	122	4.199	339
dew	CEC	46	124	4.193	345
T.Spp	la	16	125	5.025	268
la	Silt	46	128	4.184	354
T.Spp	no	16	134	4.989	286
de	Ca	46	158	4.117	427
de	CEC	46	162	4.109	438
All.F	do	13	165	5.222	320
All.F	li	13	173	5.194	334
mi	Silt	46	182	4.072	485
vew	Ca	46	184	4.068	490
All.F	ct	13	203	5.102	389
All.F	SPRAT	13	211	5.081	402
All.F	me	13	214	5.073	407
Spp	Bryo	46	219	4.013	572
Mam	su	29	219	4.221	530

Regressand	Regressor	*P*-value		FDR	
All.F	no	13	220	5.056	418
crw	Silt	46	236	3.989	610
hew	Silt	46	254	3.965	653
Birds	mi	26	261	4.222	606
dew	K	46	262	3.955	670
Mam	fi	16	284	4.126	668
Spp	Silt	46	304	3.908	763
Mam	phw	29	314	4.089	730
Mam	All.F	13	330	4.828	608
no	Silt	46	336	3.875	834
T.Spp	li	16	337	4.537	668
Birds	T.Abd	16	369	4.765	435
Mam	SPRAT	29	377	4.022	858
T.Spp	do	16	379	4.480	743
Mam	Silt	29	390	4.010	885
law	Al	46	391	3.826	951
Mam	fiw	29	452	3.955	1007
Birds	li	26	458	4.008	999
Mam	P	29	463	3.946	1030
mew	Al	46	520	3.733	1217
su	Silt	46	532	3.725	1243
Mam	suw	29	564	3.873	1224
now	Silt	46	586	3.694	1350
Spp	CCwdy	46	693	3.638	1559
fi	Al	46	696	3.636	1565
T.Spp	phw	16	711	4.178	1308
Mam	now	29	716	3.785	1505
All.F	T.Spp	13	739	4.384	1266
Spp	plw	46	759	3.607	1686
liw	Silt	46	795	3.592	1752
T.Abd	Al	16	844	4.096	1522
fiw	Silt	46	849	3.570	1853
ad	Silt	46	859	3.566	1872
fi	Silt	46	1093	3.485	2294
pe	C org	46	1152	3.467	2396
Spp	Litt	46	1170	3.462	2429
pew	Clay	46	1235	3.443	2540
Spp	epw	46	1238	3.442	2545
dow	Silt	46	1297	3.427	2645
PFT	Silt	46	1313	3.422	2672
Mam	hc	29	1336	3.550	2564
now	Al	46	1372	3.407	2772
Mam	me	29	1391	3.535	2653
pew	C org	46	1397	3.401	2814
pew	CEC	46	1474	3.383	2941
fiw	Al	46	1514	3.374	3007
law	Silt	46	1596	3.355	3140
pew	K	46	1671	3.395	3260

Regressand	**Regressor**		***P*-value**		**FDR**
pe	CEC	46	1674	3.339	3264
mew	Si	46	1707	3.332	3317
Birds	Al	26	1730	3.492	3129
Spp	Birds	26	1752	3.487	3163
T.Abd	phw	16	1813	3.733	2956
T.Spp	ct	16	1839	3.726	2991
pe	Clay	46	1967	3.283	3723
Mam	T.Abd	16	2064	3.772	2755
pe	K	46	2099	3.260	3925
Spp	cow	46	2118	3.257	3954
Spp	All.F	13	2134	3.818	3213
Mam	hew	29	2318	3.339	4045
T.Spp	Litt	16	2403	3.599	3749

The eight positive slopes below are borderline significant, having *P*-values in excess of 0.0025 (2500 in the relevant column). However they could be sufficiently close to significance to be of interest. All eight of them have *t*-values in excess of 3.000. The test statistic, *t*, is the slope of the line divided by its standard error.

Regressand variable	**Regressor variable**	**d.f.**	***P*-value millionths**	***t*-value**	**FDR millionths**
T.Spp	me	16	2542	3.573	3928
suw	Silt	46	3142	3.117	5407
W plts	Al Sat	46	3216	3.109	5507
Litt	H	46	3381	3.091	5725
pew	H	46	3564	3.072	5964
Mam	ad	29	3727	3.154	5910
All.F	Al	13	4436	3.435	5909
T.Abd	mi	16	4510	3.301	6265

The cut-off between significance and non-significance is taken to be *P*= 0.0025. This corresponds closely to an FDR of 0.04908, or approximately to one of 5%. The immediately next ten slopes of either sign consisted of five positives and five negatives, of themselves suggesting that the remaining slopes would be approximately half positive and half negative. However taking the next 50 slopes (instead of the next ten) of either sign, these were comprised of 31 positives and 19 negatives, instead indicating an estimated 38% False Discovery Rate (FDR) in that range of *P*-values. After these first 50, the estimated FDR still initially continued to increase. In consequence it seemed unnecessary to carry this table any further. (For further details as to the performance of the FDR at high values of *P*, see Table S21.) It is, however, consistent with a finding in Part 3 of Brewer et al. (2012a) to report that the regression coefficients with the largest values of *P* (say those between *P*= 0.85 or 0.90 and *P*= 1.00) appeared to be dominated by an inferred subpopulation labelled P_0; which consisted entirely of observations that were distributed symmetrically around zero.

Brewer KRW, Hayes G, Gillison AN (2012) Understanding and using Fisher's *p*. Part 3: Examining an empirical data set. Math Scientist 37:20-26.

Table S22. Significant and close-to significant negative regression slopes

Regressand variable	Regressor variable	d.f.	*P*-value millionths	*t*-value	FDR millionths
ch	Sand	46	0	-8.057	0
O	K	26	65	-4.753	170
chw	Sand	46	135	-4.167	371
now	Sand	46	144	-4.145	394
fi	Sand	46	281	-3.932	713
W plts	pH_2	46	341	-3.871	844
fiw	Sand	46	440	-3.788	1054
Totcc	P	46	716	-3.627	1604
liw	Sand	46	829	-3.578	1816
Totcc	Ca	46	913	-3.546	1972
Spp	pH_2	46	1562	-3.363	3085
li	Sand	46	2136	-3.254	3980

The two slopes below are borderline significant. The values of Fisher's *P*-statistic exceed 0.0025 (2500 in millionths) and the values of *t* (especially when the degrees of freedom are few) tend to be larger than 3. The test statistic, *t*, is the slope of the line divided by its standard error.

Regressand variable	Regressor variable	d.f.	*P*-value millionths	*t*-value	FDR millionths
mew	Sand	46	2672	-3.175	4760
SPRAT	PH_2	46	3141	-3.118	5406

The cut-off between significance and non-significance is taken to be *P*= 0.0025. This corresponds closely to an FDR of 0.04908, or approximately to one of 5%.

Table S23. False discovery rates from an analysis of 1307 regressions: numbers of regression slopes within 20 ranges of Fisher's P statistic.

Ranges	1.00>P>0.95	0.95>P>0.90	0.90>P>0.85	0.85>P>0.80	0.80>P>0.75	0.75>P>0.70
Positive	10	16	15	17	21	26
Negative	18	19	17	22	23	27
Total	28	35	32	39	44	53
% positive	35.7	45.7	46.9	43.5	47.7	49.1
Ranges	0.70>P>0.65	0.65>P>0.60	0.60>P>0.55	0.55>P>0.50	0.50>P>0.45	0.45>P>0.40
Positive	17	26	11	23	27	31
Negative	25	23	31	30	17	20
Total	42	49	42	43	44	51
% positive	40.5	53.1	26.2	53.5	61.4	60.8
Ranges	0.40>P>0.35	0.35>P>0.30	0.30>P>0.25	0.25>P>0.20	0.20>P>0.15	0.15>P>0.10
Positive	24	27	15	29	21	36
Negative	25	28	28	25	25	53
Total	49	55	43	54	46	89
% positive	49.0	49.1	34.9	53.7	45.7	40.4
Ranges	0.10>P>0.05	0.05>P>0.00			0.05>P>0.0025	0.0025>P
Positive	52	271	Significantly positive		0	148
Negative	43	103	Significantly negative		0	12
Total	95	374	Total significant		0	160
% positive	54.7	72.5	Total not significant		214	0
Totals over all ranges combined						
Total positive 715		Total negative 592		Grand total 1307		