Table S1. Scheme for conversion of the biomes of Olson *et al.* (2001) to: (1) tropical forest; (2) tropical grassy biomes; or (3) other tropical biomes / uncertain. The 30 ecoregions which were not classified according to this scheme – based on our are listed.

Olson *et al.* (2001) biome	TGB or tropical forest (or other)?	Exceptions
Deserts and xeric shrublands	other tropical / uncertain	Deccan thorn scrub forests = TGB
Flooded grasslands and savannas	TGB	-
Mangroves	other tropical / uncertain	-
Montane grasslands and shrublands	TGB	Kinabalu montane alpine meadows = other tropical / uncertain
*Temperate coniferous forests	tropical forest	Florida sand pine scrub = TGB
*Temperate grasslands, savannas, and shrublands	TGB	-
Tropical and subtropical coniferous forests	tropical forest	Bahamian pine mosaic = TGB Belizian pine forests = TGB Hispaniolan pine forests = TGB Luzon tropical pine forests = TGB Miskito pine forests = TGB
Tropical and subtropical dry broadleaf forests	other tropical / uncertain	Central Deccan Plateau dry deciduous forests = TGB Central Indochina dry forests = TGB Chiquitano dry forests = TGB Fiji tropical dry forests = TGB Hawaii tropical dry forests = TGB Irrawaddy dry forests = TGB Khathiar–Gir dry deciduous forests = TGB Lesser Sundas deciduous forests = TGB South Deccan Plateau dry deciduous forests = TGB Southeastern Indochina dry evergreen forests = TGB Southern Vietnam lowland dry forests = TGB Sri Lanka dry-zone dry evergreen forests = TGB Sumba deciduous forests = TGB Timor and Wetar deciduous forests = TGB Zambezian *Cryptosepalum* dry forests = TGB
Tropical and subtropical grasslands, savannas, and shrublands	TGB	Dry Chaco = other tropical / uncertain Hawaii tropical low shrublands = other tropical / uncertain Itigi–Sumbu thicket = other tropical / uncertain Northwestern Hawaii scrub = other tropical / uncertain St. Helena scrub and woodlands = other tropical / uncertain
Tropical and subtropical moist broadleaf forests	tropical forest	Madagascar subhumid forests = TGB Mato Grosso seasonal forests = other tropical / uncertain

* Note that these biomes were defined as 'temperate' by Olson *et al.* (2001), but were considered 'tropical' according to our definition based on minimum monthly temperature ≥15°C.

Table S2. Results of the model ranking procedure to identify the best models of species richness, with models ranked according to the Akaike Information Criterion, AIC_c. ΔAIC_c is the difference between the model's AIC_c value and the minimum AIC_c value in the candidate set. w_i is the Akaike weight, or the probability of the model being the best in the candidate set. Well-supported models ($\Delta AIC_c \leq 2$) are shown in bold.

Model	ΔAIC_c	w_i
(a) Mammals		
realm * [log(rainfall) + latitude]	**0.0**	**0.63**
realm * [log(rainfall) + latitude] + TGB	**1.8**	**0.25**
realm * log(rainfall)	4.1	0.08
realm * log(rainfall) + TGB	5.5	0.04
realm * latitude + TGB	12.6	0.00
realm * latitude	13.7	0.00
realm + TGB	17.5	0.00
realm	19.3	0.00
(b) Birds		
realm * log(rainfall) + TGB	**0.0**	**0.59**
realm * log(rainfall)	**0.9**	**0.37**
realm * [log(rainfall) + latitude] + TGB	6.6	0.02
realm * [log(rainfall) + latitude]	7.7	0.01
realm + TGB	31.9	0.00
realm * latitude + TGB	37.6	0.00
realm	42.3	0.00
realm * latitude	47.1	0.00
(c) Amphibians		
realm * log(rainfall)	**0.0**	**0.73**
realm * log(rainfall) + TGB	2.2	0.25
realm * [log(rainfall) + latitude]	7.2	0.02
realm * [log(rainfall) + latitude] + TGB	9.4	0.01
realm + TGB	55.2	0.00
realm	57.0	0.00
realm * latitude + TGB	60.0	0.00
realm * latitude	61.3	0.00
(d) Vascular plants		
log(area) * realm * log(rainfall) + TGB	**0.0**	**1.00**
log(area) * realm * [log(rainfall) + latitude] + TGB	16.3	0.00
log(area) * realm * log(rainfall)	41.1	0.00
log(area) * realm * latitude + TGB	41.6	0.00
log(area) * realm + TGB	42.5	0.00
log(area) * realm * [log(rainfall) + latitude]	58.2	0.00
log(area) * realm * latitude	120.0	0.00
log(area) * realm	126.3	0.00