

Supporting Information

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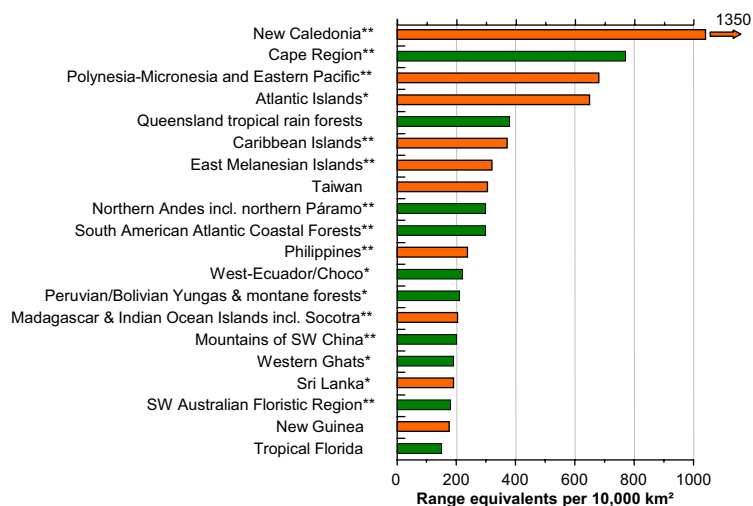


Fig. S1. Top 20 regions according to the level of endemism richness of vascular plants. Asterisks indicate congruence (**) or large overlap (*) with the biodiversity hotspots by Conservation International (Mittermeier, et al. 2004). Orange bars indicate island regions, green bars mainland regions.

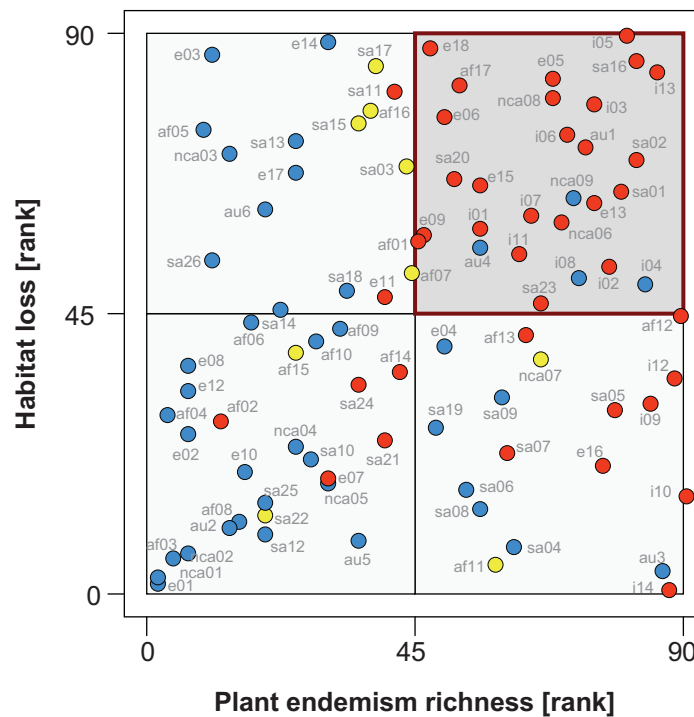


Fig. S4. Rank-based values of past habitat loss plotted against plant endemism richness per standard area. Colored dots indicate congruence with biodiversity hotspots (sensu Mittermeier, et al. 2004): red color, identical or almost identical (overlap >75%), yellow, significant overlap (10–75%), blue, no or minor overlap (0–10%). Labels indicate unique identifiers for each region (compare Table S1). Among the regions that are in the top half with regard to both habitat loss and endemism richness per standard area (*Upper Right* sector of the figure), only 4 are not part of a hotspot: New Guinea, Taiwan, the Eastern and Southeastern Australian temperate forests, and tropical Florida. All of these discrepancies can be explained. On New Guinea and Taiwan and in Eastern and Southeastern Australia, habitat loss is only little above the median, and it is very low in the Queensland tropical rain forests. Tropical Florida was formerly part of the “Caribbean hotspot” (Myers, et al. 2000) but later explicitly excluded for phylogeographic reasons and because of the small total number of endemic species (Mittermeier, et al. 2004). Similarly, Taiwan shows very high plant endemism richness, but does not meet the minimum criterion of 1,500 strict endemic species.

Table S1. Endemism richness (ER) and data situation for vascular plants by region

ID	Region	Area [km ²]	ER	Data quality	References (taxon-based)	References (inventory-based)	TI	TI remarks
af01	Mediterranean regional center of endemism	330,000	34.0	3	BISAP (1)	(2)	I	Not well covered in BISAP data set. Relatively detailed inventory-based data available.
af02	Mediterranean/Sahara transition zone	473,000	5.7	3	BISAP (1)	(2)	I	Values from BISAP database are too high because (i) the distribution outside Africa is not covered in BISAP—this is particularly relevant for Saharo-Sindian species that have a large part of their distribution area outside Africa and (ii) the Sahara/Sahel region is heavily overrepresented in BISAP with regard to the number of collection points per species.
af03	Sahara transition zone	7,387,000	1.4	3	BISAP (1)	(2)	I	See af02 above
af04	Sahel transition zone	2,482,000	1.2	3	BISAP (1)	(2)	I	See af02 above
af05	Sudanian regional center of endemism	3,731,000	3.2	3	BISAP (1)	(2)	T	Comparatively well represented in BISAP data set. Inventory-based data are less reliable because of low degree of strict endemism.
af06	Guinea-Congolia/Sudanian transition zone	1,165,000	8.7	3	BISAP (1)	(2)	T	See af05 above
af07	Guineo-Congolian regional center of endemism	2,800,000	33.4	3	BISAP (1)	(2)	TI	Inventory data probably lead to overestimate because level of strict endemism seems to be lower than estimated by White (1983). Taxon-based data probably lead to underestimate because the Congo basin, which forms the largest portion of the Guineo-Congolian region, is underrepresented in the BISAP data set.
af08	Guinea-Congolia/Zambezia transition zone	705,000	7.9	3	BISAP (1)	(2)	T	See af06 above
af09	Zambeziian regional center of endemism	3,770,000	16.6	3	BISAP (1)	(2)	TI	
af10	Kalahari-Highveld transition zone	1,223,000	13.8	3	BISAP (1)	(2)	TI	
af11	Karoo-Namib regional center of endemism	661,000	67.0	3	BISAP (1)	(2)	T	Comparatively well represented in BISAP data set.
af12	Cape regional center of endemism	90,000	771.4	4	BISAP (1)	(2)	I	Detailed inventory-based data available.
af13	Tongaland-Pondoland regional mosaic	148,000	84.6	3	BISAP (1)	(2)	TI	
af14	Zanzibar-Inhambane regional mosaic	330,000	26.6	3	BISAP (1)	(2)	TI	
af15	Somalia-Masai regional center of endemism	1,900,000	12.0	3	BISAP (1)	(2)	TI	

ID	Region	Area [km ²]	ER	Data quality	References (taxon-based)	References (inventory-based)	TI	TI remarks
af16	Lake Victoria regional mosaic	224,000	22.8	3	BISAP (1)	(2)	T	Inventory-based data are less reliable than the taxon-based data because of low degree of strict endemism.
af17	Afromontane regional center of endemism	715,000	56.5	3	BISAP (1)	(2)	T	Inventory-based endemism richness value is presumably underestimated because of the low total species number given by White (1983). The level of endemism richness is very unevenly distributed across the Afromontane RCE with relatively low values per standard area in the Ethiopian part and with higher values in the regions of, e.g., Mt. Cameroon and the Eastern Arc, a difference which could not be resolved in this study for reasons of scale (subregions of the Afromontane RCE are too small to be treated as different regions here).
au1	SW Australian floristic region	310,755	180	3	(3)	(4–6)	I	SW portion is heavily underrepresented in the taxon-based data set as stated by Laffan and Crisp (2003)
au2	Arid Australia	3,753,731	6	3	(3)	(7), (8)	T	Inventory-based estimate probably too low because of conservative estimate of plant species number by Beadle (1981)
au3	Queensland tropical rain forests	32,113	380	3	(3)	(9)	TI	
au4	E and SE Australian temperate forests	502,888	60	3	(3)	NA	T	
au5	Tropical shrublands and savannas of Australia	2,123,016	20	3	(3)	NA	T	
au6	Temperate shrublands and savannas of Australia	886,281	10	3	(3)	NA	T	
e01	Arctic region of Eurasia	2,903,340	1	2	NA	See nca01	I	
e02	Eurasian boreal region	13,177,000	2	2	NA	(10)	I	
e03	European temperate broadleaved forests	5,320,289	5	1	NA	(11, 12)	I	
e04	Mountains of Central Europe	331,966	50	2	NA	(13)	I	
e05	Northern and Eastern Mediterranean	1,295,427	100	2	NA	(6), (14–16)	I	
e06	Caucasus	532,658	50	2	NA	(6)	I	
e07	Somali-Masai and Afromontane Phytochorion in SW Asia	530,594	15	2	NA	(13)	I	
e08	Saharo-Sindian Zone in SW Asia	4,372,390	2	2	NA	(13, 17)	I	
e09	Irano-Anatolian Region	899,773	40	2	NA	(6)	I	

ID	Region	Area [km ²]	ER	Data quality	References (taxon-based)	References (inventory-based)	TI	TI remarks
e10	Central Irano-Turanian Region	3,792,187	8	2	NA	(18, 19) (20)	I	
e11	Mountains of Central Asia	863,362	25	2	NA	(6)	I	
e12	Tibetan-Mongolian Grassland and Desert Region	6,821,577	2	1	NA	(21–24)	I	
e13	Western Ghats	125,548	190	2	NA	(6, 17, 25)	I	
e14	Core region of India	2,261,143	15	1	NA	(17)	I	
e15	Himalaya	741,706	60	2	NA	(6)	I	
e16	Mountains of SW China	262,446	200	2	NA	(6)	I	
e17	Subtropical and temperate forests of Eastern Asia	4,138,588	12	1	NA	(17)	I	
e18	Indo-Burma	2,372,996	41.5	3	(26)	(6)	TI	
i01	Japan	373,490	60	2	NA	(6, 19)	I	
i02	Madagascar and Indian Ocean Islands including Socotra	604,086	203	4	NA	(6, 13)	I	
i03	Sri Lanka	66,786	190	2	NA	(6, 17, 25)	I	
i04	Taiwan	35,976	306	3	NA	(29)	I	
i05	Philippines	297,179	238	3	(26)	(6, 19)	T	The uncertainty of the inventory-based estimates is rather high because of contradicting numbers of strict endemics in the literature. The figure 3,510 endemic spp (Groombridge 1992: 80) is a rather conservative estimate whereas other authors give much higher number (6091 spp according to Mittermeier et al. 2004: 33). The taxon-based calculation supports the latter, higher figure.
i06	Sundaland	1,501,063	129	3	(26)	(6)	TI	
i07	Wallacea	338,494	91	3	(26)	(6)	TI	
i08	New Guinea	808,510	176	3	(26)	(17)	TI	
i09	East Melanesian Islands	99,384	320	3	(26)	(6)	I	The taxon-based data set yields a value that is much lower than the theoretical minimum based on the estimated number of strict endemics alone, so we assume that the sample in the taxon-based data set is not representative for the entire flora here, as we were able to show for New Caledonia.

ID	Region	Area [km ²]	ER	Data quality	References (taxon-based)	References (inventory-based)	TI	TI remarks
i10	New Caledonia	18,972	1350	4	(26)	(6, 27, 28)	I	The taxon-based data set yields a value of endemism richness that is higher than the theoretical maximum based on the very reliable total species number (the theoretical maximum is the figure one would get when assuming that 100% of all species are strict endemics and it is 1,724 range equivalents per 10,000 km ² for New Caledonia). Given that there are little uncertainties about the total vascular plant species number on New Caledonia, this shows that the taxon-based data set is not representative for the entire flora here.
i11	New Zealand and Tasmania	337,537	74	3	NA	(6, 17, 21, 30)	I	
i12	Polynesia-Micronesia and Eastern Pacific	55,587	680	3	NA	(6, 17, 21, 31–34)	I	
i13	Caribbean Islands	234,400	370	2	NA	(6), (32)	I	
i14	Atlantic Islands	18,986	650	2	NA	(13, 15, 16, 19, 24, 35)	I	
nca01	Arctic region of North America	5,320,712	1	2	NA	(36–39)	I	
nca02	Boreal region of North America	6,552,574	2	2	NA	(40)	I	
nca03	North American Atlantic region	5,862,584	6	1	(41)	NA	I	
nca04	Rocky Mountain region	2,271,641	12	2	(41)	(40)	I	
nca05	Madrean Core region	2,112,592	15	2	(41)	(40)	I	
nca06	Californian province	221,648	110	2	NA	(40)	I	
nca07	Madrean Pine-Oak Woodlands	460,000	95	3	NA	(6)	I	
nca08	Mesoamerican region	1,008,858	100	2	NA	(6, 32, 42)	I	
nca09	Tropical Florida	23,000	150	2	NA	(40)	I	
sa01	West-Ecuador/Choco	148,456	220.9	3	(43)	(5, 6, 32)	T	Inventory-based data are available, but were regarded to be a conservative estimate.
sa02	Northern Andes including northern Páramo	337,811	300	3	(43)	(44)	I	The (higher) inventory-based value was regarded more reliable than the taxon-based value, which is probably too low because of edge effects (overlap of most grid cells with surrounding regions most of which have considerably lower values of endemism richness).

ID	Region	Area [km ²]	ER	Data quality	References (taxon-based)	References (inventory-based)	TI	TI remarks
sa03	Northern Venezuela/Colombia	869,240	33.3	3	(43)	(45)	TI	
sa04	Guayanan Highlands	386,432	71.6	3	(43)	(45, 46)	T	Taxon-based data were regarded as more reliable because the (lower) inventory-based endemism richness figure based on Gentry (1992) appears to be too low when comparing the total species number given by Gentry (1992) with the figure given by Berry et al. (1995) who estimate 9,500–10,300 spp for the Venezuelan part of the Guayana Shield.
sa05	Peruvian/Bolivian Yungas and montane forests	231,429	210.4	2	(43, 47)	(18)	T	The figure derived from the data set by Nowicki (2004) was deemed more reliable, inter alia because of its higher spatial resolution compared to the data set of Morawetz and Raedig. Inventory-based data were only available for the total species number.
sa06	Southwest Amazon	1,026,366	58.2	2	(43, 47)	(18)	T	The Morawetz and Raedig data are more representative for the entire region than the Nowicki data, which only cover the smaller Bolivian part. Inventory-based data were only available for the total species number.
sa07	Tucumanian-Bolivian Forest	55,337	70.0	2	(43, 47)	NA	T	The Morawetz and Raedig data are more representative for the entire region than the Nowicki data, which only cover the smaller Bolivian part.
sa08	Guyanas	673,699	60	3	(43)	(18, 45)	TI	We gave more weight to the inventory-based data (70%) than to the taxon-based data (30%) because the latter are presumably influenced by above-average collection density. However, inventory-based data were not deemed reliable enough to solely base the estimate on them.
sa09	Northwest Amazon	459,693	68.1	3	(43)	(18, 31, 44)	T	Inventory data were deemed somewhat less reliable than the taxon-based data.

ID	Region	Area [km ²]	ER	Data quality	References (taxon-based)	References (inventory-based)	TI	TI remarks
sa10	Moxos-Pantanal flooded savannas	297,120	13	2	(43, 47)	(18)	T	Region probably underrepresented in Morawetz and Raedig data (relatively large portion of grid cells with no collections at all). Thus Nowicki data seem to be more reliable. Inventory-based data were only available for the total species number.
sa11	Cerrado	1,916,882	26.2	3	(43)	(6)	TI	
sa12	Southern Andean-Patagonian steppe	716,792	10	2	NA	(32)	I	
sa13	Humid Argentinian-Uruguayan savannas	712,969	12	1	NA	(32)	I	
sa14	Chaco	634,314	10.2	2	(47)	(18)	T	Inventory-based data were only available for the total species number.
sa15	Humid Chaco and moist forests of Southern Brazil	1,034,655	20	2	(43)	(48)	I	Result from taxon-based calculation was somewhat lower, presumably because of low collection density.
sa16	South American Atlantic Coastal Forests	246,812	300	3	(43)	(32, 49) (6)	I	Edge effects affect the taxon-based data, making them an underestimate.
sa17	Caatinga s.l.	1,285,700	24.6	2	(43)	(18)	T	Inventory-based data were only available for the total species number.
sa18	Southern Amazonian dry forests	645,975	17.8	2	(43), (47)	(18)	T	Region probably underrepresented in Morawetz and Raedig data (relatively large portion of grid cells with no collections at all). Thus Nowicki data seem to be more reliable. Inventory-based data were only available for the total species number.
sa19	Amazonia	3,480,272	46.4	2	(43)	NA	T	
sa20	South American Pacific coastal dry forests	70,726	52.4	2	(43)	(18)	T	Inventory-based data were only available for the total species number.
sa21	Inter-Andean forests, southern Paramo, and Puna	385,699	25	2	(43, 47)	(18)	TI	
sa22	South American Pacific coastal deserts, montane Atacama, and desert Puna	599,549	10	2	(43, 47)	(18, 32)	TI	
sa23	Chilean matorral	148,509	95	2	NA	(6, 32)	I	
sa24	Valdivian temperate forests	248,088	20	2	NA	(32, 50)	I	
sa25	Magellanic subpolar forests	164,636	10	1	NA	(32)	I	
sa26	Monte and dry Pampas	1,000,553	5	1	NA	(18, 32, 51)	I	

ID: Unique identifier for each region, beginning with an area code. af, Africa; au, Australia; e, Eurasia; I, Oceanic Islands; nca, Northern and Central America; sa, South America.

ER: Endemism richness [range equivalents per 10,000 km²].

Data quality (suitability and quality of underlying data): 1, very poor; 2, poor; 3, good; 4, very good. The assessment of data situation is a subjective estimate

based on the following criteria: Were both taxon-based and inventory-based data available, or only one type of data? How large was the sample of taxon-based data and how was its representativity judged in the region, taking into account both taxonomic representativity and spatial differences in collecting intensity? How detailed was chorological information available for inventory-based data and how large is the percentage of strict endemics? How reliable were the underlying data estimated to be? How well did the geographic boundaries of the region match with the boundaries of the regions or grid cells for which data were available?

TI: T, only taxon-based data were used for the assessment of endemism richness; I, only inventory-based data were used; TI, both types of data were used and both types of data were given equal weight unless a different weighting is stated in the column "TI remarks."

TI remarks: When both types of data were available, explanations are given if 1 type of data was not used or weighted differently.

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Table S2. Summary information on the number of range equivalents (RE) for vascular plants and terrestrial vertebrates in mainland and island regions

	Total RE	Islands			Mainlands		
		RE	%	RE/10 ⁴ km ²	RE	%	RE/10 ⁴ km ²
Vascular plants	315,903	82,546	26.1	172.3	233,357	73.9	18.2
Amphibians	4,792	986	20.6	2.1	3,806	79.4	0.3
Reptiles	7,506	1,952	26.0	4.1	5,553	74.0	0.4
Birds	9,585	2,227	23.2	4.7	7,358	76.8	0.6
Mammals	4,703	1,013	21.5	2.1	3,690	78.5	0.3
Terrestrial vertebrates	26,586	6,178	23.2	12.9	20,407	76.8	1.6

Table S3. Endemism richness (ER) for terrestrial vertebrates by region (range equivalents per 10,000 km²)

ID	Region	Amphibians	Reptiles	Birds	Mammals	Terrestrial vertebrates
af01	Mediterranean RCE	0.01	0.59	0.16	0.23	1.00
af02	Mediterranean/Sahara RTZ	0.02	0.34	0.23	0.27	0.85
af03	Sahara RTZ	0.01	0.07	0.09	0.07	0.23
af04	Sahel RTZ	0.02	0.14	0.36	0.18	0.70
af05	Sudanian RCE	0.07	0.23	0.49	0.26	1.04
af06	Guinea-Congolia/Sudania RTZ	0.47	0.49	0.86	0.62	2.43
af07	Guineo-Congolian RCE	0.65	0.52	1.02	0.77	2.96
af08	Guinea-Congolia/Zambezia RTZ	0.22	0.48	0.99	0.44	2.13
af09	Zambezi RCE	0.26	0.62	0.85	0.38	2.11
af10	Kalahari/Highveld RTZ	0.15	0.68	0.69	0.35	1.86
af11	Karoo-Namib RCE	0.21	1.58	0.78	0.51	3.08
af12	Cape RCE	1.95	2.89	1.42	0.96	7.22
af13	Tongaland-Pondoland	0.96	2.35	1.09	0.64	5.04
af14	Zanzibar-Inhambane RM	0.71	2.40	1.82	0.83	5.77
af15	Somali-Masai RCE	0.12	0.72	1.00	0.51	2.35
af16	Lake Victoria RM	0.52	0.64	1.66	1.03	3.85
af17	Afromontane RCE	1.55	1.40	2.44	1.53	6.91
au1	SW Australian Floristic Region	0.68	1.87	0.78	0.56	3.89
au2	Arid Australia	0.06	0.64	0.32	0.16	1.19
au3	Queensland tropical rain forests	7.80	10.03	2.50	1.24	21.57
au4	E and SE Australian temperate forests	0.97	1.77	1.34	0.62	4.71
au5	Tropical shrublands and savannas of Australia	0.31	1.32	0.81	0.53	2.97
au6	Temperate shrublands and savannas of Australia	0.15	0.58	0.66	0.21	1.60
e01	Arctic region of Eurasia	0.00	0.00	0.07	0.02	0.10
e02	Eurasian boreal region	0.01	0.01	0.12	0.06	0.18
e03	European temperate broadleaved forests	0.04	0.06	0.11	0.13	0.35
e04	Mountains of Central Europe	0.16	0.12	0.10	0.14	0.51
e05	Northern and Eastern Mediterranean	0.27	0.45	0.17	0.24	1.13
e06	Caucasus	0.06	0.38	0.15	0.32	0.90
e07	Somali-Masai and Afromontane Phytochorion in SW Asia	0.08	0.78	0.37	0.30	1.52
e08	Saharo-Sindian Zone in SW Asia	0.02	0.34	0.22	0.15	0.72
e09	Irano-Anatolian region	0.11	0.51	0.15	0.21	0.98
e10	Central Irano-Turanian region	0.02	0.18	0.11	0.14	0.44
e11	Mountains of Central Asia	0.04	0.10	0.25	0.19	0.58
e12	Tibetan-Mongolian grassland and desert region	0.04	0.08	0.30	0.18	0.60
e13	Western Ghats	7.07	7.54	1.82	0.96	17.39
e14	Core region of India	0.10	0.40	0.50	0.35	1.34
e15	Himalaya	0.83	0.94	1.06	0.49	3.32
e16	Mountains of SW China	0.81	0.33	1.00	0.76	2.91
e17	Subtropical and temperate forests of Eastern Asia	0.32	0.32	0.54	0.24	1.43
e18	Indo-Burma	0.74	1.24	1.48	0.79	4.25
i01	Japan	1.22	0.89	0.43	1.34	3.89
i02	Madagascar and Indian Ocean Islands incl. Socotra	2.40	6.38	3.12	2.24	14.13
i03	Sri Lanka	5.29	13.68	3.78	2.28	25.02
i04	Taiwan	5.26	6.34	4.11	3.50	19.20
i05	Philippines	2.59	5.95	6.97	3.40	18.90
i06	Sundaland	1.37	2.34	2.40	1.75	7.86
i07	Wallacea	1.09	3.54	8.60	4.10	17.33
i08	New Guinea	2.80	2.44	5.06	2.19	12.48
i09	East Melanesian Islands	3.90	6.39	16.63	4.50	31.43
i10	New Caledonia	0.00	32.12	13.62	3.26	49.00
i11	New Zealand and Tasmania	0.20	1.31	2.61	0.26	4.37
i12	Polynesia-Micronesia and Eastern Pacific	0.54	9.33	36.55	2.40	48.82
i13	Caribbean Islands	5.82	13.52	7.53	1.72	28.59
i14	Atlantic Islands	5.82	19.31	29.70	3.74	58.57
nca01	Arctic region of North America	0.00	0.00	0.03	0.02	0.04
nca02	Boreal region of North America	0.01	0.00	0.09	0.05	0.15
nca03	North American Atlantic region	0.22	0.20	0.25	0.15	0.82
nca04	Rocky Mountain region	0.14	0.05	0.21	0.32	0.72
nca05	Madrean Core region	0.15	0.82	0.56	0.58	2.11
nca06	Californian province	0.45	0.50	0.65	0.93	2.53
nca07	Madrean Pine-Oak Woodlands	1.88	3.72	2.61	1.97	10.19
nca08	Mesoamerican Region	2.98	3.96	3.52	1.54	12.00

Table S4. Main biogeographical classifications used for the delineation of endemism regions

Continent	Underlying biogeographical classification
Africa	UNESCO/AETFAT/UNSO vegetation map (1)
Australia	Biomes and ecoregions (2)
North America	Flora of North America (3)
Central America	Biodiversity hotspots (4)
South America	Biomes and ecoregions (2)
Eurasia	Biomes and ecoregions (2), biodiversity hotspots (4)
Islands	Biodiversity hotspots (4)

See *Methods* for information on the 3 further criteria that guided the delineation.

1. White F (1983) *The Vegetation of Africa: A Descriptive Memoir to Accompany the UNESCO/AETFAT/UNSO Vegetation Map of Africa* (UNESCO, Paris), p 356.
2. Olson DM, et al. (2001) Terrestrial ecoregions of the world: A new map of life on earth. *BioScience* 51:933–938.
3. Thorne RF (1993) *Phytogeography. Flora of North America North of Mexico, Vol 1*, ed Flora of North American Committee (Oxford Univ Press, Oxford, UK), Vol 1, pp 132–153.
4. Mittermeier RA, et al. (2004) *Hotspots Revisited. Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions* (CEMEX, New Mexico).