ELECTRONIC SUPPLEMENTARY MATERIAL OF:

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S1 Description of the Habitat Suitability Models for mammals

Each combination of land-cover, land-use and elevation within a grid cell was scored as either suitable or not according to the land-cover and altitudinal preferences of species and their sensitivity to different land-uses reported by IUCN taxonomic experts (1). For each species, suitable habitat within the 6' cells inside a species range was calculated as the proportion of suitable land-cover/land-use within the cell multiplied by the proportion of suitable altitude within the cell. The ESH was the sum of all suitable habitat within a species' range.

Table S1. Assumptions of Business-as-usual and Consumption Change scenarios for the year 2050 (2).

Assumption	Business-as-usual	Consumption Change
Access to food	250 million people globally have insufficient access to food in 2050	Inequality in access to food due to income inequality converges to zero by 2050
Consumption	+65% energy consumption, + 50% food consumption	Meat consumption per capita levels off at twice the consumption level suggested by a supposed healthy diet (3) which would imply reducing meat and egg consumption in all regions by 76-88%.
Waste	Stable 30% of total production	Waste is reduced by 50% respect to BAU by 2030
Agricultural productivity	Yield increase by 0.06% annually (+27% by 2050)	In all regions, 15% increase in crop yields by 2050, compared with the BAU scenario
Protected areas	No further protected areas respect to 2010	17% of each of the 65 realm-biomes protected by 2020. Expansion allocated close to existing agriculture to protect areas currently most threatened by habitat loss
Forestry	+30% in clearcut +35% plantation -12.5% selective logging. No reduced impact logging.	Forest plantations supply 50% of timber demand; almost all selective logging based on Reduced Impact Logging by 2020.

Table S2. Sustainability goals adopted in the Rio+20 study and applied to design the Consumption Change scenario.

Goals for food, land and biodiversity loss	Goals for energy, air pollution and climate
• Halve, the proportion of people who suffer from hunger by 2030, and fully eradicate hunger by 2050; • Halve the rate of loss of biodiversity by 2020 and maintain biodiversity at the 2020/2030 level by 2050 (depending on region).	• Achieve universal access to electricity and modern cooking fuels by 2030; • Avoid temperature increases above 2 °C keep atmospheric greenhouse gas concentrations below 450 ppm CO2 equivalent; • Keep annual PM2.5 concentrations below 35 μg/m3 by 2030.

Table S3. Regional area demand for different land-uses by 2020 under the Business-as-usual socio-economic scenario.

Region code	Region name	Cropland	Pastures	Plantations	Clear-cut	Logging
1	Canada	609,524	160,342	0	501,112	0
2	USA	1,647,216	1,926,053	221,031	857,241	0
3	Mexico	267,760	593,352	3,792	117,288	96,145
4	Rest Central America	167,520	188,128	5,476	149,776	131,490
5	Brazil	741,772	2,035,753	48,990	1,308,755	817,810
6	Rest South America	752,532	2,170,288	25,195	697,091	423,144
7	Northern Africa	253,446	528,227	0	0	0
8	Western Africa	1,570,337	2,507,722	1,923	362,605	1,778,662
9	Eastern Africa	623,715	1,996,176	2,240	112,465	147,670
10	Southern Africa	512,857	3,122,754	3,012	144,474	0
11	OECD Europe	857,155	507,552	164,788	680,398	0
12	Eastern Europe	544,454	194,777	47,663	486,957	0
13	Turkey	334,835	156,334	12,943	53,642	0
14	Ukraine + Belarus	552,425	152,050	7,148	54,281	0
15	Central Asia	306,708	512,789	1,770	70,025	0
16	Russia	1,368,070	960,923	143,309	1,123,420	0
17	Middle East	352,043	628,533	0	0	0
18	South Asia	1,906,092	133,457	31,491	552,633	15,570
19	North+South Korea	45,683	2,913	10,311	85,257	0
20	China+Mongolia+Taiwan	1,533,755	2,591,865	276,571	638,941	0
21	South East Asia	743,504	49,014	19,496	774,129	140,704
22	Indonesia + PNG	497,482	139,443	9,662	760,800	236,367
23	Japan	38,399	3,720	57,433	256,798	0
24	Oceania	473,659	1,406,584	53,712	396,170	0
25	Greenland	0	0	0	0	0

Table S4. Regional area demand for different land-uses by 2020 under the Consumption Change socio-economic scenario.

Region code	Region name	Cropland	Pastures	Plantations	Clear-cut	Logging
1	Canada	444,509	126,327	0	685,128	0
2	USA	1,509,125	1,573,340	246,475	1,241,098	0
3	Mexico	258,940	463,326	3,994	105,267	61,418
4	Rest Central America	144,047	177,939	6,080	150,660	73,451
5	Brazil	722,170	1,526,149	57,932	1,587,846	396,074
6	Rest South America	645,980	1,602,345	29,526	967,729	385,631
7	Northern Africa	277,953	496,296	0	0	0
8	Western Africa	1,538,671	2,468,004	2,405	347,268	917,136
9	Eastern Africa	666,793	1,954,646	2,673	114,865	85,317
10	Southern Africa	515,862	2,733,406	3,012	201,662	0
11	OECD Europe	831,614	504,659	178,774	697,080	0
12	Eastern Europe	522,195	185,079	47,905	512,439	0
13	Turkey	271,859	131,279	12,925	57,879	0
14	Ukraine + Belarus	485,878	142,412	7,611	78,918	0
15	Central Asia	298,078	473,949	1,792	71,399	0
16	Russia	1,268,960	799,840	146,067	1,312,802	0
17	Middle East	352,205	612,132	0	0	0
18	South Asia	1,981,069	134,025	51,178	530,047	5,056
19	North+South Korea	44,074	3,325	14,112	75,189	0
20	China+Mongolia+Taiwan	1,482,546	2,567,081	275,541	670,093	0
21	South East Asia	586,056	48,254	24,250	777,985	80,837
22	Indonesia + PNG	383,608	130,684	12,897	762,439	147,251
23	Japan	37,968	3,451	60,192	246,151	0
24	Oceania	570,642	1,302,283	53,417	280,045	0
25	Greenland	0	0	0	0	0

Table S5. Shortfall in thousands of km^2 of areas dedicated to agriculture and forestry when implementing the protected area expansion plan for country/ecosystem targets under Business-as-usual (BAU) and Consumption Change socio-economic scenarios (CC). The shortfall area is the difference between the area that would be needed to meet regional and global demands for agricultural products and timber under the respective socio-economic scenario, and the area that was possible to allocate to these land-uses based on land suitability and protected area constraints.

Region code	Region Name	Cropland		Pasture		Clear-cut		Logging	
		BAU	CC	BAU	CC	BAU	CC	BAU	CC
1	Canada	0	0	0	0	0	0	0	0
2	USA	0	0	0	0	0	0	0	0
3	Mexico	0	0	0	0	0	0	0	0
4	Rest Central America	0	0	0	0	0	0	0	0
5	Brazil	0	0	0	0	0	0	0	0
6	Rest South America	0	0	0	0	0	0	0	0
7	Northern Africa	43.9	68.4	127.8	95.9	0	0	0	0
8	Western Africa	0	0	0	0	0	0	0	0
9	Eastern Africa	0	0	0	0	0	0	0	0
10	Southern Africa	0	0	0	0	0	0	0	0
11	OECD Europe	0	0	0	0	0	0	0	0
12	Eastern Europe	0	0	0	0	0	0	0	0
13	Turkey	0	0	0	0	0	0	0	0
14	Ukraine + Belarus	0.4	0	3.2	0	0	0	0	0
15	Central Asia	0	0	0	0	36.4	37.7	0	0
16	Russia	0	0	0	0	0	0	0	0
17	Middle East	19.4	8.1	0	0	0	0	0	0
18	South Asia	0	0	0	0	0	0	0	0
19	North+South Korea	0	0	0	0	0	0	0	0
20	China+Mongolia+Taiwan	0	0	0	0	0	0	0	0
21	South East Asia	0	0	0	0	72.7	78.4	13.2	8,.1
22	Indonesia + PNG	0	0	0	0	0	0	0	0
23	Japan	0	0	0	0	0	0	0	0
24	Oceania	0	0	0	0	0	0	0	0
25	Greenland	0	0	0	0	0	0	0	0

Table S6. Shortfall in thousands of km^2 of areas dedicated to agriculture and forestry when implementing the protected area expansion plan for threatened species targets under Business-as-usual (BAU) and Consumption Change socio-economic scenarios (CC). The shortfall area is the difference between the area that would be needed to meet regional and global demands for agricultural products and timber under the respective socio-economic scenario, and the area that was possible to allocate to these land-uses based on land suitability and protected area constraints.

Region code	Region Name	Cropland		Pasture		Clear-cut		Logging	
		BAU	CC	BAU	CC	BAU	CC	BAU	CC
1	Canada	0	0	0	0	0	0	0	0
2	USA	0	0	0	0	0	0	0	0
3	Mexico	0	0	0	0	0	0	0	0
4	Rest Central America	0	0	8.4	0	0	0	0	0
5	Brazil	0	0	0	0	0	0	0	0
6	Rest South America	0	0	0	0	0	0	0	0
7	Northern Africa	50.8	75.4	113.8	81.8	0	0	0	0
8	Western Africa	0	0	0	0	0	0	0	0
9	Eastern Africa	0	0	0	0	0	0	0	0
10	Southern Africa	0	0	0	0	0	0	0	0
11	OECD Europe	0	0	0	0	0	0	0	0
12	Eastern Europe	0	0	0	0	0	0	0	0
13	Turkey	0	0	0	0	0	0	0	0
14	Ukraine + Belarus	0.3	0	0	0	0	0	0	0
15	Central Asia	0	0	0	0	36.5	37.8	0	0
16	Russia	0	0	0	0	0	0	0	0
17	Middle East	9.0	0.1	0	0	0	0	0	0
18	South Asia	0	0	0	0	0	0	0	0
19	North+South Korea	0	0	0	0	0	0	0	0
20	China+Mongolia+Taiwan	0	0	0	0	0	0	0	0
21	South East Asia	0	0	0	0	76.3	80.6	13.9	8.4
22	Indonesia + PNG	0	0	0	0	0	0	0	0
23	Japan	0	0	0	0	0.6	0	0	0
24	Oceania	0	0	0	0	0	0	0	0
25	Greenland	0	0	0	0	0	0	0	0

Table S7. Spatial datasets used in the analyses.

Dataset & source*	**Details**
Protected Areas: January 2013 version of the World Database on Protected Areas (WDPA; IUCN and UNEP-WCMC 2013)	• Added 2,437 PAs (12,178 km^2) from Estonia (sensitive sites that are not publicly available in the WDPA). • Included internationally designated sites, except UNESCO Biosphere Reserves (because they may include large areas that are not considered PAs: Coetzer *et al.* 2013). • Excluded 2,663 proposed sites, 3,330 sites with unknown designation status, and 7,276 sites lacking both spatial boundaries and reported extent. • Represented 21,697 sites with a point locality and reported extent using geodetic buffers of the appropriate area. • Spatially 'dissolved' overlapping areas into a single polygon, applying the earliest year of designation of any of the overlapping sites.
Species: non-birds from IUCN (2012), birds from BirdLife International and NatureServe (2012)	• Number of mapped extant threatened species = 1,112 mammals, 1,181 birds (115 of which are migratory and had conservation targets set for both breeding and non-breeding ranges), 1,924 amphibians • Included polygons with origin coded as native or reintroduced, and presence coded as extant, probably extant or possibly extinct. • IUCN range maps show the distribution extent of each species, and are based on a variety of sources, including localities of specimens and observations, known occurrences in PAs (and, for birds, Important Bird Areas), detailed distribution atlases (including those with presence-absence and/or abundance data), field-guides, family monographs, habitat extent and expert knowledge, all derived from both published and unpublished sources.
Ecoregions: terrestrial ecoregions from Olson *et al.* (2001)	

BirdLife International & NatureServe (2012). *Bird species distribution maps of the world. Version 2.0*. BirdLife International, Cambridge, UK and NatureServe, Arlington, USA. Coetzer, K.L., Witkowski, E.T.F. & Erasmus, B.F.N. (2013). Reviewing Biosphere Reserves globally: effective conservation action or bureaucratic label? *Biol. Rev*., 89, 82–104. IUCN (2012), IUCN (2012). *IUCN Red List of Threatened Species*. *Version 2012.1.* Available at: http://www.iucnredlist.org. Accessed 1 October 2013. IUCN & UNEP-WCMC (2013). The World Database on Protected Areas. Available at http://www.protectedplanet.net. Accessed 1 Oct 2013. Olson, D.M., Dinerstein, E.D., Wikramanayake, E. *et al*. (2001). Terrestrial ecoregions of the world: A new map of life on Earth. *BioScience*, **51**, 933–938.

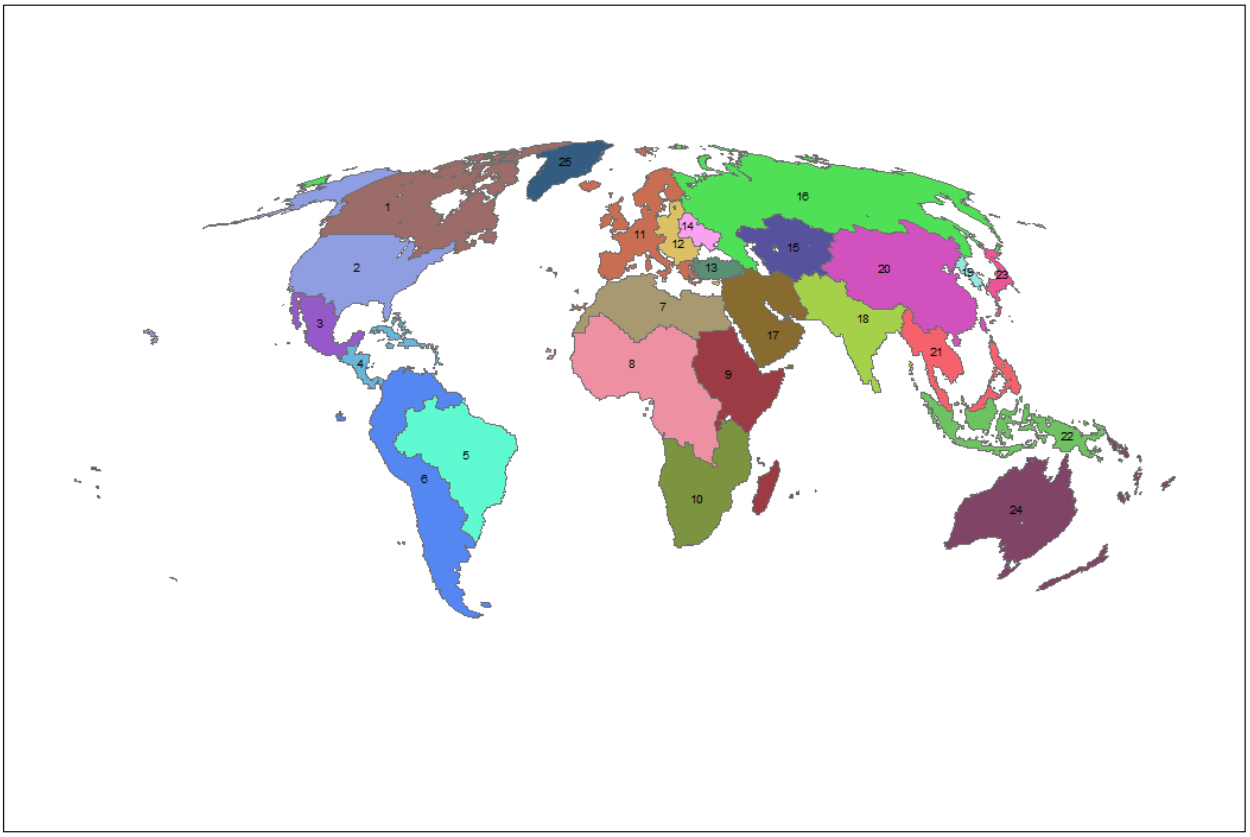

Figure S1. Map of the 25 Macro-Regions used by the IMAGE Integrated Assessment Model to simulate macro-economic scenarios. 1 Canada, 2 USA, 3 Mexico, 4 Rest of Central America, 5 Brazil, 6 Rest of South America, 7 Northern Africa, 8 Western Africa, 9 Eastern Africa, 10 Southern Africa, 11 OECD Europe, 12 Eastern Europe, 13 Turkey, 14 Ukraine + Belarus, 15 Central Asia, 16 Russia, 17 Middle East, 18 South Asia , 19 North + South Korea, 20 China + Mongolia + Taiwan, 21 South East Asia, 22 Indonesia + Papua New Guinea, 23 Japan, 24 Oceania, 25 Greenland.

1. Rondinini C, Di Marco M, Chiozza F, Santulli G, Baisero D, Visconti P, et al. Global habitat suitability models of terrestrial mammals. Philosophical Transactions of the Royal Society B: Biological Sciences. 2011;366(1578):2633-41.
2. PBL. Roads from Rio+20 Pathways to achieve global sustainability goals by 2050. The Hague, The Nederlands2012. 283 p.
3. Stehfest E, Bouwman L, van Vuuren DP, den Elzen MG, Eickhout B, Kabat P. Climate benefits of changing diet. Climatic Change. 2009;95(1-2):83-102.