

# CCP1 SM

## Biodiversity Hotspots Supplementary Material

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**Table SMCCP1.1** | The projected vulnerability of the terrestrial hotspots to climate warming and loss of habitat derived from the current and future projected distributions of ~130,000 fungi, plants, invertebrates and vertebrates (Warren et al., 2018a). For each hotspot, there are two rows: (a) the percentage of the hotspot classified as a remaining climatically suitable area (i.e., a refugium) based on climate alone, assuming all areas are equally suitable, at the given global average temperature scenarios; (b) the percentage of natural land projected to be a climate refugium based on the ESA CCI 2015 satellite-derived land cover data, which is a measure of how much of potential refugium 'space' might have already been lost owing to habitat conversion. The colours are: >50% of the land as refugia – white; 30–50% of the land – yellow; 17–30% of the land – light red and <17% – dark red. These thresholds were chosen based on the current Convention on Biological Diversity 2020 (Aichi) targets of 17% of the land protected, proposed targets of 30% of land protected, and the Global Deal for Nature suggested goals of 30% and 50% land protected (Dinerstein et al., 2020). Hotspots are mapped in Figure CCP1.1. Projections were based on the averaged (50th percentile) impacts from 21 CMIP5 climate model patterns with no dispersal. Areas classified as snow or ice, bare rock or sand, or water are excluded from the analyses. Agricultural and urban land cover are considered unsuitable habitats for native biodiversity. The modelled spatial resolution was 20 km that was subsequently elevationally downscaled to 1 km. Warming levels were originally derived from the RCP2.6, 4.5, 6 and 8 scenarios and subsequently interpolated on a cell-by-cell basis to the temperatures listed following Warren et al., (2018b) which has more details on deriving the warming levels from specific RCP time points. The details of the modelling and caveats can be found in Warren et al. (2018a).

LABEL	0.5	1	1.5	2	2.5	3	3.5	4
Alaskan North Slope Coastal Tundra	97	88	86	82	76	64	55	48
	97	88	85	82	76	64	55	48
Albertine Rift Montane Forests	87	74	69	55	42	29	22	16
	41	33	31	24	18	13	10	8
Altai Sayan Montane Forests	89	81	79	69	56	43	35	25
	81	74	72	63	51	39	32	23
Amazon Orinoco Southern Caribbean Mangroves	99	70	47	7	1	0	0	0
	84	58	38	4	1	0	0	0
Amazon River and Flooded Forests	99	53	34	16	4	0	0	0
	95	52	34	16	4	0	0	0
Annamite Range Moist Forests	91	76	71	58	44	29	19	11
	77	66	62	51	39	26	18	11
Appalachian and Mixed Mesophytic Forests	99	98	97	90	61	10	4	1
	87	85	84	78	53	9	4	1
Arabian Highlands Woodlands and Shrublands	82	70	66	51	35	22	16	10
	70	61	58	45	31	19	13	8
Atacama Sechura Deserts	88	77	74	63	54	46	43	38
	84	74	71	61	52	45	42	37
Atlantic Dry Forests	95	66	50	13	3	1	0	0
	55	41	33	11	2	0	0	0
Atlantic Forests	96	80	74	50	33	22	16	10
	57	50	47	34	24	17	13	9
Borneo Lowland and Montane Forests	97	90	87	62	33	18	13	8
	71	66	63	47	30	17	12	8
California Chaparral and Woodlands	96	91	89	75	51	23	13	7
	76	73	71	63	44	22	13	7
Cameroon Highlands Forests	96	92	90	84	75	61	50	38
	87	83	82	76	68	54	45	34
Canadian Boreal Taiga	99	89	82	59	38	20	13	9
	99	89	82	59	38	20	13	9
Canadian Low Arctic Tundra	100	98	97	89	71	52	36	20
	100	98	97	89	71	52	36	20
Cardamom Mountains Moist Forests	89	63	50	25	14	8	5	3
	53	42	37	23	14	8	5	3
Carnavon Xeric Shrubs	96	54	42	16	2	0	0	0
	96	54	42	16	2	0	0	0
Caucasus Anatolian Hyrcanian Temperate Forests	71	53	48	35	24	16	11	8
	48	38	36	27	20	13	10	7

LABEL	0.5	1	1.5	2	2.5	3	3.5	4
Central and Eastern Miombo Woodlands	92	35	25	11	3	1	0	0
	78	28	21	9	2	1	0	0
Central and Eastern Siberian Taiga	87	67	62	48	40	33	29	24
	83	67	62	48	40	33	29	24
Central Andean Dry Puna	99	99	98	97	95	90	86	78
	98	97	97	96	94	89	85	77
Central Andean Yungas	83	69	66	57	49	40	36	31
	77	64	61	53	45	37	32	28
Central Asian Deserts	99	62	41	17	7	1	0	0
	79	52	35	16	6	0	0	0
Central Congo Basin Moist Forests	100	85	68	23	8	3	1	0
	92	78	62	21	7	3	1	0
Central Range Subalpine Grasslands	100	100	100	99	99	99	98	98
	98	98	98	98	97	97	97	96
Cerrado Woodlands and Savannas	89	36	24	6	2	1	0	0
	50	22	15	4	1	0	0	0
Chhota Nagpur Dry Forests	93	59	47	25	5	1	0	0
	21	15	12	6	3	1	0	0
Chihuahuan Tehuacán Deserts	97	92	90	74	37	9	3	1
	91	86	84	69	35	8	3	1
Chilean Matorral	95	90	87	75	55	33	24	15
	79	74	73	64	48	31	23	15
Chiquitano Dry Forests	89	18	8	2	1	0	0	0
	67	14	7	2	1	0	0	0
Chocó Darién Moist Forests	93	80	74	56	28	6	3	1
	64	55	51	38	19	5	3	1
Chukhote Coastal Tundra	89	78	73	60	49	41	37	31
	92	78	73	60	49	41	37	31
Coastal Venezuela Montane Forests	71	59	56	46	36	26	21	15
	63	52	50	41	32	24	19	14
Congolian Coastal Forests	100	99	99	96	85	48	34	19
	85	84	84	82	74	44	31	18
Daurian Mongolian Steppe	100	99	99	94	79	53	38	27
	77	76	76	72	60	40	28	19
Drakensberg Montane Woodlands and Grasslands	98	95	94	87	70	46	32	21
	79	76	75	70	56	38	27	18
East African Acacia Savannas	94	73	64	38	20	9	5	3
	62	51	47	29	16	7	4	2
East African Coastal Forests	99	97	95	76	47	4	1	0
	64	62	60	46	30	3	0	0
East African Mangroves	100	96	90	47	23	1	0	0
	72	71	65	27	12	0	0	0
East African Moorlands	99	99	98	97	94	89	85	80
	71	70	70	69	68	65	63	61
Eastern Arc Montane Forests	87	79	77	66	51	31	21	16
	51	46	44	37	29	19	13	10

LABEL	0.5	1	1.5	2	2.5	3	3.5	4
Eastern Australia Temperate Forests	99	94	90	72	55	36	25	15
	69	65	63	54	42	29	21	13
Eastern Deccan Plateau Moist Forests	89	59	50	24	7	2	1	0
	32	23	20	12	5	2	1	0
Eastern Himalayan Alpine Meadows	98	97	97	97	96	95	94	92
	95	94	94	93	92	91	90	89
Eastern Himalayan Broadleaf and Conifer Forests	84	78	77	72	65	58	53	48
	79	74	73	68	63	56	51	46
Ethiopian Highlands	92	86	84	77	66	53	44	35
	35	32	31	27	22	17	13	10
European Mediterranean Montane Forests	73	54	50	38	28	20	16	12
	60	48	45	35	27	19	15	11
Everglades Flooded Grasslands	100	100	100	76	11	0	0	0
	72	72	72	56	6	0	0	0
Fenno Scandia Alpine Tundra and Taiga	100	99	99	99	98	96	93	85
	98	98	98	97	97	95	92	84
Fynbos	97	94	92	83	71	54	41	29
	72	70	69	65	57	47	37	28
Galápagos Islands Scrub	97	92	89	78	57	35	22	15
	93	88	86	74	54	33	21	14
Great Sandy Tanami Central Ranges Desert	96	27	18	6	0	0	0	0
	96	27	18	6	0	0	0	0
Greater Antillean Moist Forests	83	67	62	41	22	12	9	5
	61	50	46	33	20	11	8	5
Greater Antillean Pine Forests	88	82	81	72	46	35	30	25
	68	63	62	56	40	30	27	23
Greater Sundas Mangroves	100	99	98	78	18	0	0	0
	62	62	61	48	11	0	0	0
Guianan Highlands Moist Forests	76	42	35	21	13	7	5	3
	75	42	35	21	13	7	5	3
Guianan Moist Forests	90	26	11	2	1	0	0	0
	89	25	11	2	1	0	0	0
Guinean Moist Forests	100	99	99	97	91	57	33	14
	28	27	27	26	24	16	11	6
Gulf of Guinea Mangroves	100	100	100	99	92	16	3	0
	81	81	81	81	75	12	2	0
Hawaii Dry Forest	98	95	93	86	75	62	56	50
	79	77	76	71	65	55	50	45
Hawaii Moist Forest	100	100	99	99	96	85	77	68
	86	86	86	85	83	76	69	62
Hengduan Shan Conifer Forests	90	86	85	82	78	73	70	66
	80	78	77	75	72	68	65	61
Horn of Africa Acacia Savannas	97	92	88	67	33	10	4	1
	90	85	82	62	30	10	4	1
Indochina Dry Forests	94	54	32	8	3	1	0	0
	29	22	16	6	2	1	0	0

LABEL	0.5	1	1.5	2	2.5	3	3.5	4
Kamchatka Taiga and Grasslands	100	100	99	97	92	84	76	65
	99	99	99	96	92	84	76	64
Kayah Karen Tenasserim Moist Forests	79	57	48	28	16	8	5	2
	56	42	38	26	16	8	5	2
Kinabalu Montane Shrublands	98	95	94	89	81	67	57	46
	81	79	78	75	70	61	53	44
Klamath Siskiyou Coniferous Forests	92	85	83	74	60	43	33	23
	86	81	79	70	58	42	33	22
Llanos Savannas	98	66	42	5	0	0	0	0
	87	57	36	5	0	0	0	0
Lord Howe and Norfolk Island Forests	100	100	100	100	100	34	23	23
	94	94	94	94	94	34	23	23
Madagascar Dry Forests	98	94	91	73	34	5	2	1
	91	87	85	70	33	5	2	1
Madagascar Forests and Shrublands	97	91	88	77	65	51	40	25
	78	72	69	59	48	36	29	19
Madagascar Mangroves	100	100	100	97	68	1	0	0
	87	87	87	84	59	1	0	0
Madagascar Spiny Thicket	98	85	78	47	18	2	0	0
	89	78	71	41	15	1	0	0
Mediterranean Forests Woodlands and Scrub	80	51	43	23	12	6	4	2
	34	24	21	14	8	4	3	2
Mesoamerican Pine Oak Forests	83	74	72	64	54	43	36	26
	70	63	61	54	45	36	30	22
Middle Asian Montane Woodlands and Steppe	76	62	56	44	35	27	22	18
	52	44	41	35	29	22	19	15
Moluccas Moist Forests	94	82	78	58	37	21	14	9
	87	77	73	56	36	21	14	8
Muskwa Slave Lake Boreal Forests	96	86	80	57	32	15	8	4
	96	86	80	57	32	15	8	4
Naga Manapuri Chin Hills Moist Forests	84	62	56	42	32	22	17	12
	75	58	53	40	30	21	16	11
Namib Karoo Kaokoveld Deserts and Shrublands	96	73	62	35	16	6	3	1
	94	72	61	35	16	6	3	1
Nansei Shoto Archipelago Forests	100	100	100	99	98	86	60	35
	61	61	61	60	59	56	47	32
Napó Moist Forests	91	45	31	13	7	2	1	1
	87	45	31	13	7	2	1	1
New Caledonia Dry Forests	100	99	99	95	84	28	8	3
	50	50	50	47	43	17	6	2
New Caledonia Moist Forests	100	100	99	98	92	77	63	38
	86	86	85	84	80	69	57	34
New Guinea Mangroves	99	91	72	20	6	0	0	0
	95	88	71	20	6	0	0	0
New Guinea Montane Forests	93	85	81	72	65	56	51	45
	85	78	75	67	60	52	47	42

LABEL	0.5	1	1.5	2	2.5	3	3.5	4
New Zealand Temperate Forests	100	99	99	97	91	67	45	26
	97	97	96	94	88	66	45	25
North Indochina Subtropical Moist Forests	78	65	62	49	36	23	17	11
	53	45	43	36	27	18	14	9
Northeastern Congo Basin Moist Forests	98	84	70	26	8	1	0	0
	85	72	60	22	7	1	0	0
Northern Andean Montane Forests	85	78	76	69	61	52	46	40
	75	68	67	61	54	45	40	35
Northern Andean Páramo	99	99	99	99	98	97	96	95
	90	90	90	89	89	88	87	86
Northern Australia and Trans Fly Savannas	100	88	82	58	25	2	0	0
	99	87	81	57	25	2	0	0
Northern Prairies	100	93	83	38	17	2	0	0
	68	64	59	32	14	1	0	0
Nusu Tenggara Dry Forests	94	85	81	67	50	33	25	18
	33	31	30	27	22	17	13	10
Pacific Temperate Rainforests	92	86	84	76	63	43	30	19
	91	86	84	75	62	42	30	19
Palawan Moist Forests	89	75	70	39	20	11	8	5
	54	47	44	30	18	10	8	5
Pantanal Flooded Savannas	98	65	22	1	0	0	0	0
	92	61	21	1	0	0	0	0
Patagonian Steppe	99	97	95	84	63	38	29	22
	98	95	93	83	62	37	28	21
Peninsular Malaysia Lowland and Montane Forests	92	77	70	46	24	11	9	6
	46	39	36	26	17	11	8	6
Philippines Moist Forests	90	74	66	42	27	16	13	9
	32	28	26	20	15	10	8	6
Queensland Tropical Forests	97	93	89	71	43	23	15	8
	80	76	74	59	38	21	14	8
Rann of Kutch Flooded Grasslands	100	21	17	8	0	0	0	0
	92	20	16	7	0	0	0	0
Rio Negro Juruá Moist Forests	98	55	40	18	2	0	0	0
	97	54	39	18	2	0	0	0
Russian Far East Broadleaf and Mixed Forests	100	100	100	100	99	96	93	88
	97	97	97	96	96	93	91	86
Seychelles and Mascarenes Moist Forests	100	100	100	99	96	91	85	75
	47	47	47	47	47	46	44	42
Sierra Madre Oriental and Occidental Pine Oak Forests	93	87	85	75	59	38	28	18
	91	85	83	73	58	37	27	18
Sierra Nevada Coniferous Forests	90	84	81	72	56	38	28	18
	88	83	80	71	55	38	28	18
Socotra Island Desert	99	94	92	83	68	50	38	25
	91	86	84	76	61	44	33	22
Solomons Vanuatu Bismarck Moist Forests	94	83	79	61	42	28	22	15
	91	81	77	60	41	27	21	15

LABEL	0.5	1	1.5	2	2.5	3	3.5	4
Sonoran Baja Deserts	98	95	93	84	60	22	10	4
	92	89	87	78	56	21	10	4
South American Pacific Mangroves	96	68	56	31	14	0	0	0
	82	59	49	29	14	0	0	0
Southeast China Hainan Moist Forests	86	62	51	27	15	7	4	2
	44	35	32	21	13	6	4	2
Southeastern Conifer and Broadleaf Forests	100	100	100	100	76	24	1	0
	84	84	84	84	63	21	1	0
Southern Australia Mallee and Woodlands	100	66	53	29	16	9	5	3
	54	25	19	12	8	6	4	2
Southern Mexican Dry Forests	86	78	75	64	47	26	15	6
	60	54	52	44	33	18	11	5
Southern New Guinea Lowland Forests	96	81	64	26	8	3	2	1
	91	77	61	26	8	3	2	1
Southern Pacific Islands Forests	100	100	100	100	97	84	69	50
	62	62	62	62	60	54	46	35
Southern Rift Montane Woodlands	90	79	75	59	43	27	18	11
	55	48	46	39	29	19	14	8
Southwest China Temperate Forests	87	65	56	37	25	16	12	8
	42	37	35	29	22	14	10	7
Southwestern Amazonian Moist Forests	94	19	10	2	0	0	0	0
	87	19	10	2	0	0	0	0
Southwestern Australia Forests and Scrub	96	50	40	19	10	6	4	2
	62	31	25	11	7	5	3	2
Southwestern Ghats Moist Forest	90	81	76	62	47	34	26	20
	58	54	52	45	38	29	22	17
Sri Lankan Moist Forest	96	91	89	73	44	31	26	21
	66	62	60	51	35	24	20	16
Sudanian Savannas	98	91	87	71	58	47	42	36
	82	76	73	59	46	37	32	27
Sudd Sahelian Flooded Grasslands and Savannas	100	90	83	79	72	51	29	9
	86	81	77	74	68	47	27	8
Sulawesi Moist Forests	87	75	71	57	43	31	26	21
	59	53	52	44	36	28	24	19
Sumatran Islands Lowland and Montane Forests	95	87	83	57	29	20	17	14
	43	39	38	31	22	17	14	12
Sundarbans Mangroves	100	99	90	56	22	0	0	0
	41	41	40	36	11	0	0	0
Taimyr and Russian Coastal Tundra	73	44	39	28	19	12	9	5
	72	44	39	28	19	12	8	5
Taiwan Montane Forests	99	91	84	71	63	54	49	44
	63	62	61	58	55	50	46	42
Talamancan Isthmian Pacific Forests	98	96	96	93	89	83	78	72
	91	89	88	86	82	77	72	66
Tasmanian Temperate Rainforests	100	100	100	100	99	95	90	77
	89	89	89	89	89	86	82	72

LABEL	0.5	1	1.5	2	2.5	3	3.5	4
Terai Duar Savannas and Grasslands	84	19	5	1	1	0	0	0
	17	7	4	1	1	0	0	0
Tibetan Plateau Steppe	98	97	97	95	94	91	90	87
	90	90	89	89	87	85	84	82
Tumbesian Andean Valleys Dry Forests	72	52	47	33	23	12	8	6
	52	40	36	26	18	10	7	5
Ural Mountains Taiga and Tundra	94	81	78	65	23	3	1	0
	90	78	75	63	22	3	1	0
Valdivian Temperate Rain Forests Juan Fernánde	97	94	94	90	83	74	67	58
	87	85	84	81	75	67	61	53
Western Congo Basin Moist Forests	100	92	82	47	25	6	2	0
	93	86	77	43	23	6	2	0
Western Himalayan Temperate Forests	67	52	48	42	37	31	27	23
	44	40	39	35	31	26	23	20
Western Java Montane Forests	93	84	81	71	57	43	35	28
	47	44	43	39	33	26	22	18
Zambeian Flooded Savannas	97	11	6	1	0	0	0	0
	81	8	5	0	0	0	0	0



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