

Supplementary Materials: Connectivity of Protected Areas: Effect of Human Pressure and Subnational Contributions in the Ecoregions of Tropical Andean Countries, *Land* 2020, 9, Article No. 239

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Table S1. Criteria and steps implemented in each TAC country for the compilation, validation, and complementation of PA official datasets.

Steps / description	Description by country (if applies)
Step 1. Download or compile official PA information Most official databases were originally downloaded in 2017/2018 for the first scrutiny. As some PAs were created between 2017/2018 and November 2019, the new polygons were compiled based on official documents, reports, or updated databases.	Bolivia
	<i>Source of information:</i> National Service of Protected Areas (SERNAP, for its Spanish acronym). Downloaded from GeoBolivia: https://geo.gob.bo/mapfishapp/ <i>Date accessed:</i> February/2018 <i>Information characteristics:</i> Polygon layer of national and subnational PAs. Attributes: area name, extension, national designation, and official document establishing the area. Updated until June 30, 2016.
	Colombia
	<i>Source of information:</i> National Unified Registry of Protected Areas (RUNAP, for its Spanish acronym). Downloaded from https://mapas.parquesnacionales.gov.co/ . <i>Date accessed:</i> November/2019 <i>Information characteristics:</i> Polygon layer of national and subnational PAs. Attributes: area name, extension, national designation, IUCN category, official document establishing the area and establishment date.
	Ecuador
	<i>Source of information:</i> Environmental Ministry. Interactive Map of the National System of Protected Areas. https://sni.gob.ec/coberturas.js <i>Date accessed:</i> October/2019 <i>Information characteristics:</i> Polygon layer of PAs at national level. Attributes: area name, extension, national designation, establishment date, ministerial Decree number.
	Perú
	<i>Source of information:</i> National Service of Protected Areas (SERNANP, for its Spanish acronym): http://geo.sernanp.gob.pe/visorsernanp/ <i>Date accessed:</i> 09/2019 <i>Information characteristics:</i> Polygon layer of national and subnational PAs (Regional Conservation Areas and Private Conservation Areas). Attributes: area name, national designation, and official document establishing the area. Updated until September 2019.
	Venezuela
	<i>Source of information:</i> Natural Resources Management and Land Planning Project (MARNOT, for its Spanish acronym) and Management Information System for Spatial Planning (SIGOT, for its Spanish acronym) databases of the former Environment Ministry. <i>Date accessed:</i> October/2017

<p>Step 2. Data revision and filtering.</p> <p>For each polygon we checked if the category or designation is recognized in the national legislation as a protected area. We only considered polygons that have clear spatial limits. We also checked the name of each protected area, seeking to avoid the category being included in the name. Then, we assigned to each polygon the year of designation as a way of ensuring that it has a legal supporting document.</p>	<p><i>Information characteristics:</i> We compiled all the PA polygons using DATUM REGVEN and the Lambert Conformal Conic projection, which is the one used by the database MARNOT. Attributes: area name, extension, national designation, IUCN category, establishment date, and designation in English.</p>
	<p>Bolivia</p> <p><i>Type of errors found in the official database:</i> Polygons of subnational PAs still in the establishment process, or areas without clear spatial limits.</p> <p><i>Type of polygons eliminated:</i> Areas without clear spatial limits (e.g., Uchumachi Municipal Protected Area, El Curichi la Madre Municipal Protected Area); areas with undefined designation or category (e.g., Área de Protección Ambiental Serranía Cordillera de los Milagros); areas without a legal document of support (e.g., Quebracho Colorado Reserve, Serranía).</p>
	<p>Colombia</p> <p><i>Type of errors found in the official database:</i> Some PA names include the management category (national designation). We found some inconsistencies between the date of establishment and the registry date in the RUNAP. We had to read some official documents of the PA declaration to clarify the establishment year.</p> <p><i>Type of polygons eliminated:</i> none.</p>
	<p>Ecuador</p> <p><i>Type of errors found in the official database:</i> not applicable</p> <p><i>Type of polygons eliminated:</i> not applicable</p>
	<p>Perú</p> <p><i>Type of errors found in the official database:</i> As listed in the official SERNANP database, the Zona Reservada (Restricted zone) is a transitory category that may be subject of changes in its extension when finally categorized. These areas do not fit in any UICN category, so we did not include them in the analysis.</p> <p><i>Type of polygons eliminated:</i> Polygons of Zona Reservada.</p>
	<p>Venezuela</p> <p><i>Type of errors found in the official database:</i> Significant discrepancies are found for reported sizes in the different official databases. Direct measurements made with GIS software differ substantially from sizes reported in official documents. We chose to report official data instead of results based on GIS calculations. There seem to be important mistakes in the construction of some shapefiles since they were made at various times, by different people, offices or departments within the Environment Ministry. For more consistency, we reported the PAs size published in MARNR (1992) and INPARQUES (2005)</p> <p><i>Type of polygons eliminated:</i> Polygons not matching the official location or not upgraded according to legal changes. e.g., National Park Agustin Codazzi, National Park Chorro el Indio and Wildlife Refuge Cuare.</p>
	<p>Bolivia</p> <p><i>Alternative sources of information:</i> We contrasted and validated the Geobolivia data with the official report “Áreas Protegidas Subnacionales en Bolivia, Situación Actual 2012” (MMAyA, 2012, La Paz, 87pp). We also used the Fundación Natura Bolivia database since it includes new subnational PA polygons.</p> <p><i>Information characteristics:</i> The MMAyA is a government document that organizes and describes the current situation of national and subnational PAs. It includes information about the name of each PA, year of establishment, conservation objective, extension, and category (national designation). The Fundación Natura Bolivia database contains spatial information from municipalities, regional governments, and NGOs.</p> <p><i>Examples of PAs edited or included:</i> At least 15 new subnational protected areas were incorporated, based on the Fundación Natura Bolivia database (e.g., Natural Integrated Management Area Santa Rosa de Abuna; Natural</p>
<p>Step 3. Incorporating or contrasting with other sources of information.</p> <p>We contrasted the official information with alternative databases of PAs (if they exist) or other legal documents. For those PAs whose name, category (national designation), or geographical limits do</p>	

<p>not have correspondence between sources of information, further research was done to determine the correct name, category, or limits. If the PA was not included in the official dataset, it was added to each country database. In some cases, geographical limits were reconstructed based on information in the official documents. We assigned to the new polygons the year of designation as a way of ensuring that it has a legal supporting document. We also downloaded the WDPA for each country (Nov. 2019) to contrast information and identify the main differences.</p>	Integrated Management Area Cuenca Alta Río Parapeti).
	Colombia
	<i>Alternative sources of information:</i> Some PAs were recently established in 2019 but still not included in the RUNAP database. Thus, we gathered the polygon layers and official documents of declaration for the new PAs. These files are available in the Humboldt Institute PA-database and the official websites of regional environmental authorities.
	<i>Information characteristics:</i> Official documents of subnational PA declaration and shapefiles.
	<i>Examples of PAs edited or included:</i> Integrated Management Regional District Páramo de Vida Maitamá or Natural Regional Park Páramo de las Ovejas Tauso.
	Ecuador
	<i>Alternative sources of information:</i> Decentralized autonomous governments' databases of municipal and provincial conservation areas. Ordinances for the establishment of conservation areas from decentralized autonomous governments.
<p>Step 4. Homologation of IUCN categories and assignment of the level of governance.</p> <p>We followed the instructions found in Dudley (2008) "Directrices para la aplicación de las categorías de gestión de</p>	<i>Information characteristics:</i> Polygon layers of subnational PAs. Each polygon has descriptive attributes of the name, extension, and establishment date.
	<i>Examples of PAs edited or included:</i> Municipal and Provincial Conservation and Sustainable Use Areas (ACUS). Other local protected areas such as "Municipal Reserves" or "Ecological Protection Areas" were also included.
	Perú
	<i>Alternative sources of information:</i> Not applicable
	<i>Information characteristics:</i> Not applicable
	<i>Examples of PAs edited or included:</i> None
	Venezuela
<p>Step 4. Homologation of IUCN categories and assignment of the level of governance.</p> <p>We followed the instructions found in Dudley (2008) "Directrices para la aplicación de las categorías de gestión de</p>	<i>Alternative sources of information:</i> DGSPN-INPARQUES (a modified or updated version of MARNOT) and ECOSIC (IVIC).
	<i>Information characteristics:</i> We enquired with their respective GIS officers, cross-matched their data and concluded that none of them was completely reliable. Nevertheless, MARNOT remains the most reliable, combined with that of DGSPN-INPARQUES, which is an updated version of MARNOT especially for national parks and natural monuments.
	<i>Examples of PAs edited or included:</i> We did not use MARNOT database as our main source of spatial data for PAs polygons, we used the following sources:
	- ECOSIG: Yacambu National Park, La Tortuga Arrau Wildlife Refuge, Gran Morichal Wildlife Reserve, Tucurere Wildlife Reserve.
	- SIGOT: Chorro El Indio National Park, Cuevas de Paraguaná Wildlife Sanctuary, Medanos de Coro, and Mochima National Parks.
	- DGSPN-INPARQUES: National Parks and Monuments south of the Orinoco river.
	- Google Earth: we detected significant inconsistencies with Piedra del Cocuy Natural Monument, so we decided to create an original polygon using Google Earth and the text indications of the original designation. We used this tool as well to digitalize the degazetted Agustín Codazzi National Park polygon following the Decree indications.
<p>Step 4. Homologation of IUCN categories and assignment of the level of governance.</p> <p>We followed the instructions found in Dudley (2008) "Directrices para la aplicación de las categorías de gestión de</p>	Bolivia
	<i>Notes on assignation of IUCN categories to PAs:</i> Starting from the IUCN homologation analysis done in the document "Áreas Protegidas Subnacionales en Bolivia, Situación Actual 2012" (MMAyA 2012), a new review was carried out based on the criteria of Dudley (2008). The category of some PAs was then adjusted at the subnational level. IUCN equivalent categories: (II): Conservation and Ecological Importance Area, Department Park, National Historical Park, National Park, National Park and Indigenous Territory, National Park and National Reserve of Andean Fauna, National Park and Integrated Management Unit, Regional Park; (III):

áreas protegidas” for the assignation of an IUCN category to each PA.

This exercise also allowed us to validate if the PA category meets the UICN and CDB definition of PA, especially if its primary objective is the conservation of nature. Furthermore, based on the local legislation, we assigned to each PA the corresponding level of governance (i.e., national or subnational).

Ecological and Archaeological Scientific Reserve, Ecological Park, Environmental Protection Area, Fiscal Reserve, Historic and Water Reserve, Municipal Park, Municipal Protected Area Urban Park of Ecological Preservation, Municipal Reserve of Flora and Fauna, Natural Heritage Landscape National Park, Natural Landscape Heritage, Natural Monument, Natural Reserve, Sanctuary of Water; (IV): Andean Fauna National Reserve, Biological Reserve, Ecological Wildlife Municipal Reserve, Forest Reserve Area, Historic and Wildlife Reserve, National Reserve of Flora and Fauna, National Wildlife Reserve of the Amazon, Natural Wildlife Refuge, Sanctuary of Water, Wildlife and Natural Area of Integrated Management, Wildlife Refuge, Wildlife Reserve, Wildlife Sanctuary; (VI): Biosphere Reserve, Community Protected Area, Municipal Protected Area, National Heritage and Ecological Reserve, Natural Area of Integral Water Management, Natural Integrated Management Area, Natural Integrated Management Unit, Protection of Green Area, Reserve of the Biosphere and Indigenous Territory, Water conservation area, Watershed Protection Area. Some designations can have more than one IUCN category. Here, the primary conservation objective of each PA determines its category. See the PA database for specific examples.

Notes on assignation of governance levels to PAs: Based on the revision of the PAs regulations (laws, municipal ordinances, decrees, resolutions) and the document “Áreas Protegidas Subnacionales en Bolivia, Situación Actual 2012” (MMAyA 2012), the corresponding level of governance was assigned.

Colombia

Notes on assignation of IUCN categories to PAs: Equivalent IUCN categories: (I): Natural Reserve; (Ib): Fauna Sanctuary, Flora and Fauna Sanctuary, Flora Sanctuary; (II): Natural National Park, Natural Regional Park; (III): Park Way, Unique Natural Area; (V): Recreation Area; (VI): Civil Society Natural Reserve, Forest Protection National Reserve, Forest Protection Regional Reserve, Integrated Management National District, Integrated Management Regional District, Soil Conservation District.

Notes on assignation of governance levels to PAs: According to the Decree 1076 of 2015: National PAs: Natural Reserve, Fauna Sanctuary, Flora and Fauna Sanctuary, Flora Sanctuary, Natural National Park, Park Way, Unique Natural Area, Forest Protection National Reserve, Integrated Management National District. Subnational PAs: Recreation Area, Natural Regional Park, Civil Society Natural Reserve, Forest Protection Regional Reserve, Integrated Management Regional District, Soil Conservation District. Civil Society Natural Reserve are envisioned, created and managed by private owners. However, as private owners are not environmental authorities, the National Natural Parks agency recognizes the existence of each one of them through a legal decree.

Ecuador

Notes on assignation of IUCN categories to PAs: Equivalent IUCN categories: (Ia): Biological Reserve, Ecological Reserve; (Ib): Community Protected Area, Municipal Ecological Conservation Area, Private Protected Area, Provincial Ecological Conservation Area, Wildlife Refuge; (II): Biological Reserve, National Park; (III): Geobotanical Reserve; (IV): Municipal Reserve; (V): Marine Reserve, National Recreation Area; (VI): Fauna Production Reserve, Marine Reserve, Municipal Reserve, Provincial Reserve. Some designations can have more than one IUCN category. Here, the primary conservation objective of each PA determines its category. See the PA database for specific examples.

Notes on assignation of governance levels to PAs: The subnational level of governance is assigned when PAs are established and managed by local governments: i.e., Community Protected Area, Municipal Ecological Conservation Area, Municipal Reserve, Private Protected Area, Provincial Ecological Conservation Area, Provincial Reserve.

Perú	
	<p><i>Notes on assignment of IUCN categories to PAs:</i> Equivalent IUCN categories: (II): National Park; (III): National Sanctuary; (IV): Wildlife Refuge; (V): Historic Sanctuary, Landscape Reserve; (VI): National Reserve, Communal Reserve, Protection Forest, Hunting Reserve, Regional Conservation Area, Private Conservation Area. This assignment was revised by the specialist Antonio Tovar from the Conservation Data Centre of the Universidad Nacional Agraria La Molina (CDC – UNALM).</p> <p><i>Notes on assignment of governance levels to PAs:</i> According to Protected Areas Law (26834). National PAs: National Park, National Sanctuary, Historic Sanctuary, National Reserve, Wildlife Refuge, Landscape Reserve, Communal Reserve, Protection Forest, Hunting Reserve. Subnational PAs: Regional Conservation Areas and Private Conservation Areas. The last ones are envisioned, created and managed by private owners, and legally recognized through a ministerial decree.</p>
Venezuela	
	<p><i>Notes on assignment of IUCN categories to PAs:</i> PAs are part of a broader group of territorial management categories called <i>Áreas Bajo Régimen de Administración Especial</i> (ABRAE for its Spanish acronym). There is controversy regarding which of the 25 categories of ABRAE are actual PAs, according to IUCN definition. We conclude that only the following national designations and IUCN categories are actual PAs: (II) Parque Nacional (National Park), (III) Monumento Natural (Natural Monument), (IV) Refugio de Fauna Silvestre (wildlife refuge), (VI) Reserva de Fauna Silvestre (wildlife reserve) and (Ib) Santuario de Fauna Silvestre (wildlife sanctuary). Search, findings, and analyses have been restricted to these five categories.</p> <p><i>Notes on assignment of governance levels to PAs:</i> All PAs are centralized and depend on national government institutions.</p>
Step 5. Merging databases and coding each PA	<p>Using the merging geoprocessing tool of ArcMap 10.7.1 (considering the Mollweide geographical projection), we joined the countries datasets in a single database. We identified each PA with a unique code made up of the country initials (BOL: Bolivia; COL: Colombia; ECU: Ecuador; PER: Perú; and VEN: Venezuela) and a consecutive number (3 or 4 digits). Example: BOL_034.</p> <p>This coding allowed us to discriminate PAs that have similar names but are located in different areas, as well as to identify PAs that have multiple polygons yet corresponding to a single PA.</p> <p>Coding was also needed for counting PAs in each country.</p>
Step 6. Cutting the compiled database to continental land.	<p>We cut the PA database using the terrestrial limits of the countries, obtained from the Global Administrative Unit Layers, developed by the Food and Agricultural Organization (FAO). Later we calculated the area (in hectares) of each polygon using the geometry calculator of ArcMap 10.7.1.</p> <p>This PA-database can be downloaded from: https://doi.org/10.6084/m9.figshare.12568502</p>
Step 7. Splitting databases according to the level of governance	<p>To identify the contribution of subnational PAs, we created a new database of PAs where subnational PAs were eliminated. This new database (only national PAs) could be contrasted with the full database of PAs (national and subnational PAs). In this way, differences can be attributed to subnational PAs.</p>
Step 8. Eliminating overlapping of PAs.	<p>Many PAs overlap partially or totally with each other. To avoid double-counting, we used the dissolve geoprocessing tool of ArcMap 10.7.1. This was done for both databases (i.e., all PAs and national PAs). These resulting layers were used in the R <i>Makurhini</i> package for our study purposes.</p>

Table S2. Ecoregions $Prot$, $ProtConn_{Eu}$, and $ProtConn_{CD}$, for all d_{med} considered.

[illegible]

Japurá-Solimoes-Negro Moist Forests	3.5	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	1	0.6
La Costa Xeric Shrublands	6.9	3.4	1.4	1.5	1.6	2.0	2.3	2.5	1.4	1.4	1.4	1.4	1.5	1.6	3.4	1.4	1.4	1.4	1.4	1.5	1.6	1.6	4	9.7
Lake: Neotropic	0.8	4.0	3.5	3.5	3.5	3.7	3.8	3.8	3.5	3.5	3.5	3.6	3.7	3.8	4.0	3.5	3.5	3.5	3.6	3.7	3.8	3.8	0	10.6
Lara-Falcón Dry Forests	1.7	4.1	2.0	2.1	2.2	2.8	3.2	3.4	2.0	2.0	2.0	2.2	2.4	2.7	4.1	2.0	2.0	2.0	2.2	2.4	2.7	2.7	3	7.5
Llanos	37.8	6.5	2.8	2.8	2.9	3.2	3.6	4.0	2.8	2.8	2.8	2.8	2.8	2.8	6.0	2.8	2.8	2.8	2.8	2.8	2.8	2.8	3	5.0
Madeira-Tapajós Moist Forests	5.9	39.8	34.9	35.6	36.4	38.0	38.6	38.9	24.7	24.7	24.7	24.7	24.7	24.7	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	3	2.4
Magdalena Valley Dry Forests	2.0	2.5	1.9	1.9	1.9	2.0	2.1	2.2	1.8	1.8	1.8	1.8	1.8	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	12.3
Magdalena Valley Montane Forests	10.5	15.4	5.6	6.1	6.7	8.8	10.3	11.3	5.3	5.3	5.3	5.3	5.3	5.4	3.8	1.5	1.5	1.5	1.5	1.6	1.6	1.6	3	10.2
Magdalena-Urabá Moist Forests	7.7	7.5	2.9	3.0	3.1	3.8	4.5	5.1	2.9	2.9	2.9	2.9	2.9	3.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	4	10.6
Marañón Dry Forests	1.1	5.7	3.9	4.0	4.1	4.6	4.9	5.1	3.4	3.4	3.4	3.4	3.5	3.6	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	4	6.8
Maracaibo Dry Forests	3.0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	4	11.0
Napo Moist Forests	25.2	26.3	19.9	21.3	22.8	24.7	25.3	25.6	19.9	19.9	19.9	19.9	20.0	20.1	13.5	6.9	6.9	6.9	6.9	6.9	7.1	7.1	3	2.0
Negro-Branco Moist Forests	15.3	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	3	0.5
Northern Andean Páramo	3.0	45.9	13.2	16.1	18.3	23.7	27.4	30.3	12.5	12.5	12.5	12.5	12.7	13.1	36.7	11.5	11.5	11.5	11.5	11.6	11.9	11.9	1	7.3
Northwestern Andean Montane Forests	8.1	17.4	7.9	8.0	8.3	9.5	10.4	11.2	7.9	7.9	7.9	7.9	8.0	8.2	13.1	6.1	6.1	6.1	6.1	6.2	6.3	6.3	3	8.3
Orinoco Delta Swamp Forests	2.1	7.7	7.5	7.5	7.5	7.5	7.6	7.6	7.5	7.5	7.5	7.5	7.5	7.5	7.7	7.5	7.5	7.5	7.5	7.5	7.5	7.5	1	2.3
Orinoco Wetlands	0.6	29.0	20.1	20.2	20.4	22.4	24.1	25.1	20.0	20.0	20.1	20.8	22.0	23.1	29.0	20.0	20.0	20.1	20.8	22.0	23.1	23.1	1	4.4
Pantanal	3.2	57.1	41.0	46.3	49.7	53.1	54.2	54.8	41.0	41.0	41.0	41.0	41.0	41.0	53.5	40.3	40.3	40.3	40.3	40.3	40.3	40.3	3	3.1
Pantepui forest & shrubland	4.4	76.6	48.3	50.1	54.7	63.8	67.5	69.6	48.3	48.3	48.3	48.3	48.4	48.6	76.6	48.3	48.3	48.3	48.3	48.4	48.6	48.6	1	0.4
Paraguana Xeric Scrub	1.6	4.5	2.8	2.8	2.9	3.2	3.4	3.6	2.8	2.8	2.8	2.8	2.8	2.9	4.5	2.8	2.8	2.8	2.8	2.8	2.9	2.9	4	9.8
Patía Valley Dry Forests	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4	10.4
Peruvian Yungas	18.7	15.4	7.4	7.8	8.1	9.6	10.8	11.6	7.4	7.4	7.4	7.4	7.4	7.4	12.9	7.2	7.2	7.2	7.2	7.2	7.2	7.2	4	5.8
Purus Varzea	3.3	25.9	15.5	15.5	15.9	18.5	20.4	21.6	15.5	15.5	15.5	15.5	15.5	15.6	25.3	15.5	15.5	15.5	15.5	15.5	15.6	15.6	3	0.7
Rio Negro Campinarana	1.6	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.4	1	0.3
Santa Marta Montane Forests	0.5	46.0	45.8	45.9	45.9	46.0	46.0	46.0	45.8	45.8	45.8	45.8	45.8	45.8	45.8	45.8	45.8	45.8	45.8	45.8	45.8	45.8	3	7.7
Santa Marta Páramo	0.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	97.1	1	7.0
Sechura Desert	18.4	4.2	1.7	1.7	1.7	1.8	2.0	2.2	1.7	1.7	1.7	1.7	1.7	1.8	3.8	1.7	1.7	1.7	1.7	1.7	1.8	1.8	4	6.1
Sinú Valley Dry Forests	2.5	2.6	2.4	2.4	2.4	2.5	2.6	2.6	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	4	11.6
Solimoes-Japurá Moist Forests	13.2	24.2	16.1	16.1	16.5	19.3	20.8	21.6	16.1	16.1	16.1	16.1	16.3	16.8	18.1	11.9	11.9	11.9	12.0	12.5	13.0	13.0	3	0.5
South American Pacific Mangroves	1.0	21.5	9.8	10.0	10.1	10.9	12.1	13.3	9.7	9.7	9.8	10.0	10.5	11.0	14.4	7.6	7.6	7.6	7.9	8.2	8.6	8.6	3	8.2
Southern Andean Yungas	2.8	31.6	14.9	18.3	21.9	27.2	28.8	29.5	14.4	14.4	14.4	14.4	14.5	14.6	9.6	6.4	6.4	6.4	6.4	6.4	6.4	6.4	3	5.2
Southwest Amazon Moist Forests	43.3	25.3	14.4	15.2	16.2	19.6	21.3	22.2	14.1	14.1	14.1	14.1	14.1	14.2	20.5	13.9	13.9	13.9	13.9	13.9	13.9	13.9	3	2.2
Tumbes-Piura Dry Forests	4.1	7.4	4.6	4.7	4.9	5.2	5.6	5.8	4.5	4.5	4.5	4.6	4.7	4.8	4.7	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4	7.5
Ucayali Moist Forests	11.5	20.9	13.3	13.8	14.0	15.3	16.5	17.3	13.0	13.0	13.0	13.0	13.0	13.0	19.9	12.9	12.9	12.9	12.9	13.0	13.0	13.0	1	2.7
Venezuelan Andes Montane Forests	2.9	21.3	14.3	14.9	16.0	18.6	19.5	20.0	14.3	14.3	14.3	14.3	14.3	14.4	21.3	14.3	14.3	14.3	14.3	14.3	14.4	14.4	1	10.0
Western Ecuador Moist Forests	3.4	5.2	3.6	3.7	3.7	4.1	4.3	4.5	3.6	3.6	3.6	3.7	3.8	4.0	4.1	3.4	3.4	3.4	3.5	3.5	3.6	3.6	3	10.8

Note: Monte Alegre Varzea and Purus-Madeira Moist Forest were not included in our results as these ecoregions barely overlap (<600 ha) with the TAC. Proxy to transformation obtained from Dinerstein's Nature Need Half (NNH) four categories: (1) and (2) = more than half of the ecoregion's natural habitat remains (either

protected [1] or partially protected [2]); (3) = between 20 and 50% of the ecoregion remains natural (protected or not); and (4) = less than 20% of the ecoregion remains natural (protected or not). These NNH categories' definitions were adapted from Dinerstein et al. (2017) for our study purposes. Global Human Footprint (GHF) indexes (Venter et al. 2016) for each ecoregion were obtained by the zonal statistics function of ArcMap 10.7 (median values). Geospatial data are available for download from <https://doi.org/10.6084/m9.figshare.12568502>.

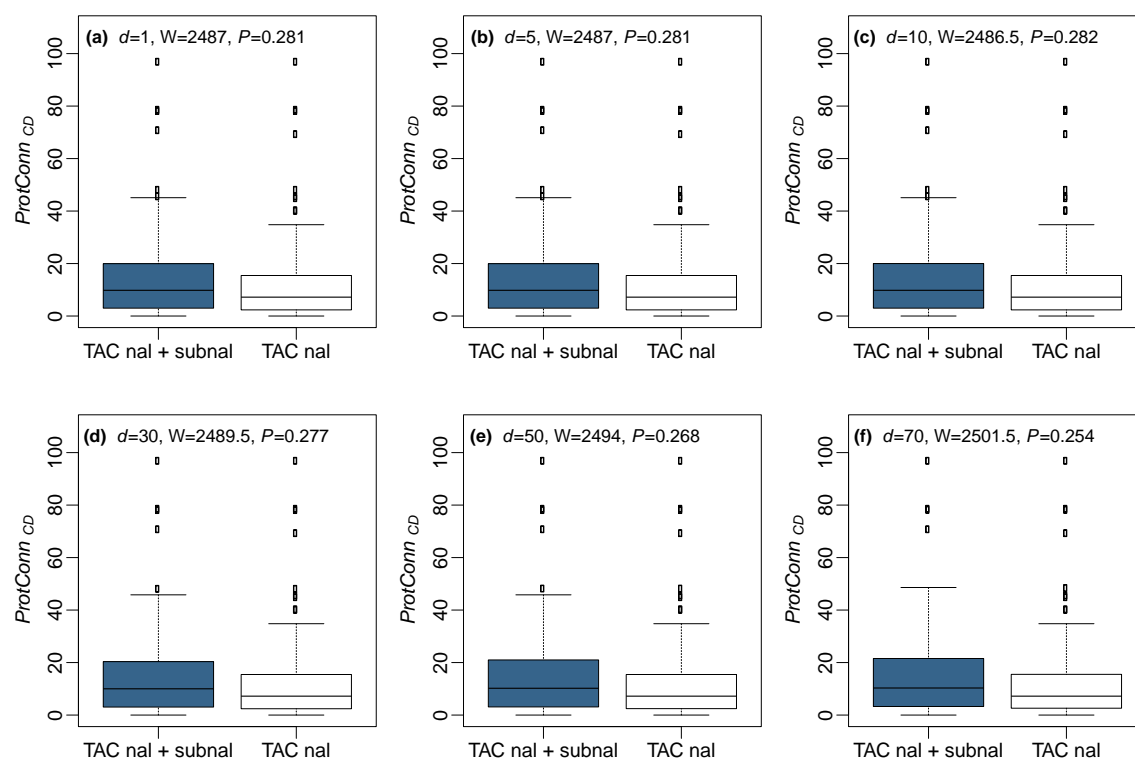


Figure S1. Wilcoxon test for the comparison of $ProtConn_{CD}$ between TAC national PAs (i.e. without subnational PAs; white boxes) and TAC national and subnational PAs (i.e. all PAs; blue boxes). Dispersal distances refer to: (a) $d_{med} = 1$ km; (b) $d_{med} = 5$ km; (c) $d_{med} = 10$ km; (d) $d_{med} = 30$ km; (e) $d_{med} = 50$ km and (f) $d_{med} = 70$ km. Confidence intervals are shown in dotted lines.

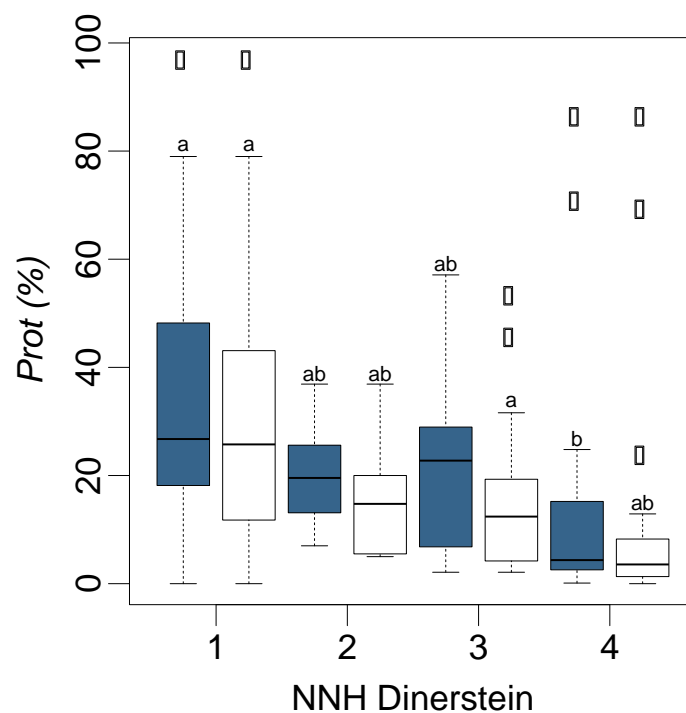


Figure S2. Wilcoxon test for the comparison of *Prot* between TAC national PAs (i.e., without subnational PAs; white boxes) and TAC national and subnational PAs (i.e., all PAs; blue boxes) for each Nature Need Half (NNH) category (Dinerstein *et al.* 2017): (1) and (2) = more than half of the ecoregion's natural habitat remains either protected [1] or partially protected [2]; (3) = between 20 and 50% of the ecoregion remains natural (protected or not); and (4) = less than 20% of the ecoregion remains natural (protected or not). These NNH categories' definitions were adapted from Dinerstein *et al.* (2017) for our study purposes. Different letters show significant differences between groups ($P < 0.05$).

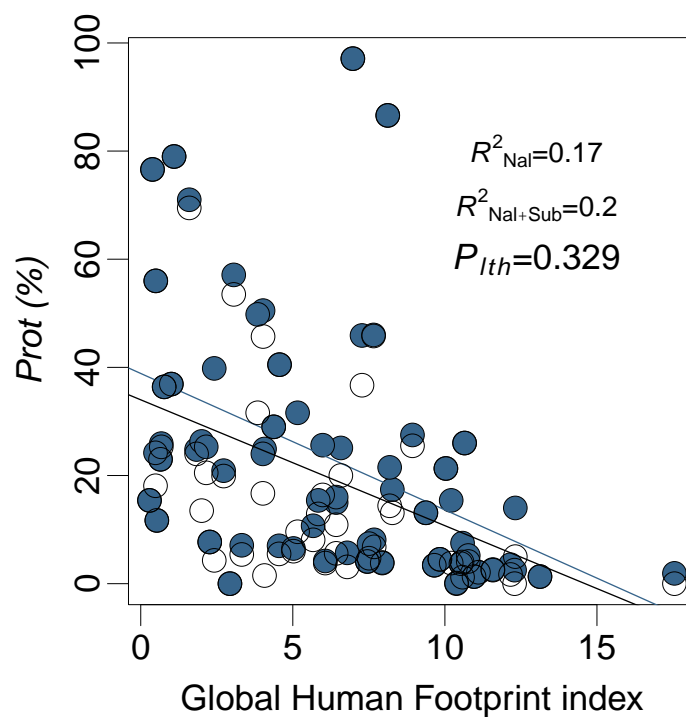


Figure S3. Linear hypothesis test (lth) for the relationship between *Prot* and the Global Human Footprint (GHF) index (Venter *et al.* 2016). Higher GHF means greater ecoregion's transformation. White dots refer to the national PAs values (i.e., without subnational PAs) and blue dots represent all PA values (i.e., national and subnational PAs). The black continuous line denotes the regressed slope for national values and the blue continuous line the regressed slope for all PA values.