AMAZONIA CAMTRAP*: a dataset of mammal, bird and reptile species recorded with camera traps in the Amazon forest*

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INTRODUCTION

The Amazon is the largest and most biodiverse tropical rainforest on Earth, with 34 million people (RAISG 2009; ARA 2011), and half of the stored terrestrial carbon from tropical forests on the planet, a total of 100 billion tons of carbon in biomass (Feldpausch et al. 2012). This hyper-diverse region has more than 15,000 tree species (ter Steege et al. 2020) distributed in a variety of habitats, such as savannas, white sand forests (campinaranas), flooded and unflooded forests (Maretti et al. 2014). Intersecting these habitats, the Amazon river is the world's largest river basin in length and volume (Venticinque et al. 2016), holding 12 to 20% of global freshwater (Goulding et al. 2003). This complex and immense mosaic of habitats shelters more than 5520 vertebrate species (Da Silva, Rylands, and Da Fonseca 2005), and together, provides the world with essential ecosystem services (Fearnside 2018; Strand et al. 2018).

Despite the importance of this forest, the Amazon is currently facing the highest rates of deforestation and non-natural fire events in the last decade (Escobar 2019; INPE 2020). Increased human pressure comes on many fronts, such as land-grabbing, illegal mining, logging, infrastructure projects (e.g. roads and dams), and agricultural expansion (Richards, Walker, and Arima 2014; Lees et al. 2016; Sonter et al. 2017; Azevedo-Ramos and Moutinho 2018; Brancalion et al. 2018; Fearnside 2017). Despite numerous NGOs and scientists' warnings (Ferrante and Fearnside 2018; Lovejoy and Nobre 2018), few governmental actions have been taken to mitigate the impacts of these anthropogenic pressures. Moreover, some politicians seem to have opposing and contrary agenda, encouraging resource exploitation in Protected Areas (PAs), including the invasion of indigenous lands (ISA 2020; Andrade, Ferrante, and Fearnside 2021) and discrediting scientific information (Escobar 2019).

In this context, gathering data and generating scientific information on species occurrence and distribution patterns are pressing needs (Maestre et al. 2012) to support effective conservation measures (Jambari et al. 2019; De Marco et al. 2020). Among these, vertebrates play a crucial role in maintaining the essential ecosystem services provided by the Amazon forest (Brockerhoff et al. 2017). Herbivores contribute to the dispersal of a wide variety of plant species (Moreira-Ramírez et al. 2016; Regolin et al. 2020), so supporting both natural forest regeneration (Paolucci et al. 2019) and the long-term maintenance of above-ground carbon storage (Peres et al. 2016). Predators such as jaguars provide top-down pressure on their prey species, thereby regulating herbivore populations and preventing overexploitation of plants (Terborgh et al. 2001). Nevertheless, scientific knowledge of vertebrate species richness and composition is strongly spatially biased (Oliveira et al. 2016), and valuable data are usually scattered within peer-reviewed publications or grey literature, or in many cases neither published nor accessible.

Over the past two decades, the increasing use of camera traps for wildlife detection and monitoring has expanded our understanding of vertebrate species distributions and ecological relationships (O'Connell, Nichols, and Karanth 2011; Ahumada, Hurtado, and Lizcano 2013). Camera trapping is a non-invasive and cost-effective survey method that allows the detection of low density and elusive species that might otherwise be underestimated when monitoring studies and inventories using other methods are applied (Ahumada et al. 2011). Furthermore, studies using different methods to monitor biodiversity are usually hard to compare and integrate for broader biodiversity analysis (Steenweg et al. 2017). In this sense, camera traps have the potential to provide a more standardized tool for monitoring terrestrial vertebrate biodiversity (Steenweg et al. 2017), because human influence and error are limited to placement and maintenance of traps, evaluation of model effectiveness, and identification of the photographs (Ahumada et al. 2013). Despite such benefits, camera trap data is still fragmented and unavailable for many areas of the world (Ahumada et al. 2020). There is a current need for more collaborative networks, to increase coordination of camera trap surveys, and to make ecological data more freely available.

Considering the importance of the Amazon forest and the immediate threat to its ecosystems and species, this study aims to unify and summarize existing camera trap data by creating a large-scale repository of such data from within the Amazon. In this AMAZONIA CAMTRAP data paper, we summarize information from camera trap inventories conducted in the Amazon forest, including published and raw and unpublished data. This study represents the largest camera trap dataset ever organized for the Amazon forest.

METADATA

CLASS I – DATA SET DESCRIPTORS

A. Data set identity

Title: AMAZONIA CAMTRAP*: a dataset of mammal, bird and reptile species recorded with camera traps in the Amazon forest*

B. Data set and metadata identification code

AMAZONIA_CAMTRAP_DATASET.csv

AMAZONIA_CAMTRAP_METADATA.pdf

C. Data set description

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6. Fernando Ferreira de Pinho. Programa de Pós-Graduação em Ecologia, Conservação e Manejo da Vida Silvestre, Departamento de Biologia Geral, Universidade Federal de Minas Gerais. Avenida Antônio Carlos 6627, 31270-901, Belo Horizonte - MG, Brasil; Grupo de Pesquisa em Ecologia e Conservação de Felinos na Amazônia, Instituto de Desenvolvimento Sustentável Mamirauá. Estrada do Bexiga, 2584, bairro Fonte Boa, Tefé-AM, 69.553-225, Brasil.

Abstract:

The Amazon forest has the highest biodiversity on earth. However, information on Amazonian vertebrate diversity is still deficient and scattered across the published, peer-reviewed and grey literature and in unpublished raw data. Camera traps are an effective non-invasive method of surveying vertebrates, applicable to different scales of time and space. In this study, we organized and standardized camera trap records from different Amazon regions to compile the most extensive dataset of inventories of mammal, bird and reptile species ever assembled for the area. The complete dataset comprises 154,123 records of 317 species (185

birds, 119 mammals and 13 reptiles) gathered from surveys from the Amazonian portion of eight countries (Brazil, Bolivia, Colombia, Ecuador, French Guiana, Peru, Suriname and Venezuela). The most frequently recorded species per taxa were: mammals - *Cuniculus paca* (11,907 records); birds - *Pauxi tuberosa* (3,713 records); and reptiles - *Tupinambis teguixin* (716 records). The information detailed in this data paper opens-up opportunities for new ecological studies at different spatial and temporal scales, allowing for a more accurate evaluation of the effects of habitat loss, fragmentation, climate change and other human-mediated defaunation processes in one of the most important and threatened tropical environments in the world.

D: Keywords

Data paper, Vertebrates, Tropical forest, Amazonia

E: Description

The complete database includes camera trap data from 43 data sets, from 155 study areas, and contains a total of 154,123 records from 317 species (185 birds, 119 mammals and 13 reptiles). However, for our analysis, we considered only records from studies conducted within the Amazon forest limits (as defined by RAISG 2020 - Fig. 1) and where animals could be identified to the species level.

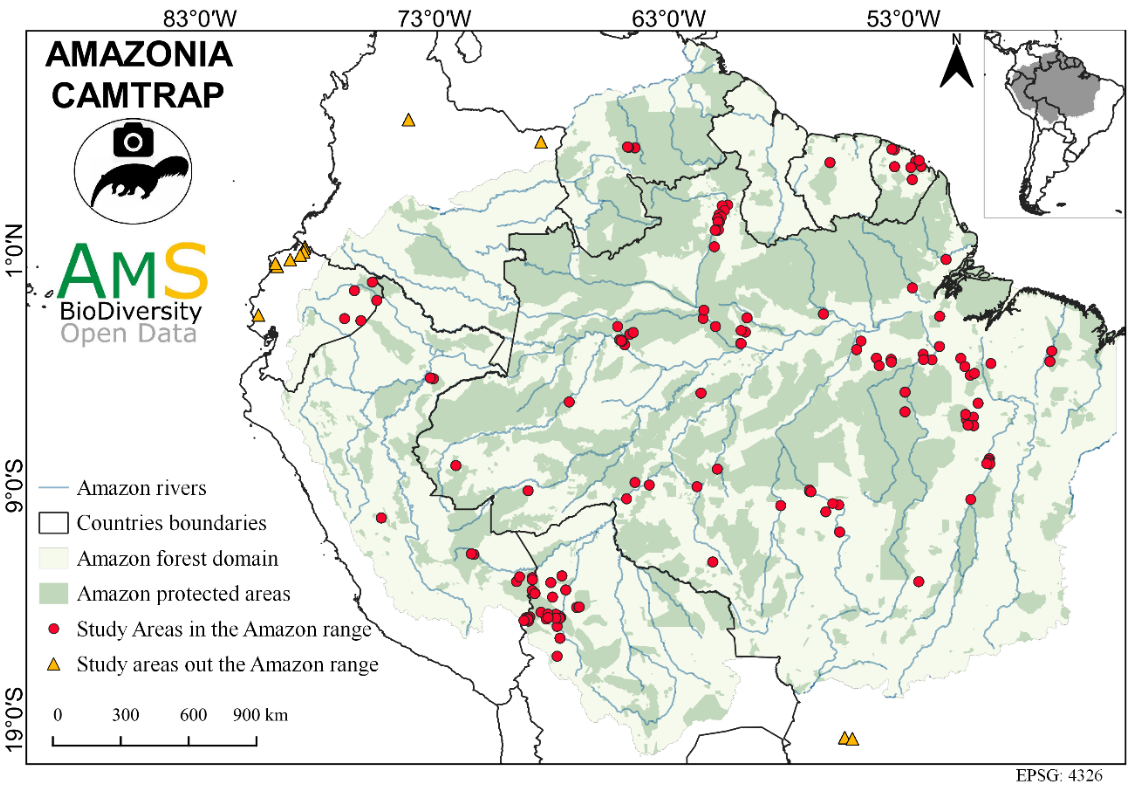

Fig. 1. Distribution of camera trap studies. Red and yellow dots represent study areas within and outside the Amazon Forest limits from this study, respectively. Each red dot represents one study area that englobes multiple sampling units (or camera trap stations).

Considering the filtered dataset, for our analysis, we used data from 42 data sets, 143 study areas, and a total of 122,534 records, from which we identified 289 species (166 birds, 111 mammals and 12 reptiles), from 196 genera, 77 families, and 31 orders (Fig. 2). The most frequent species recorded per taxa were: mammals - *Cuniculus paca* (10,495 records); birds - *Pauxi tuberosa* (3,713 records); reptiles - *Tupinambis teguixin* (708 records). Baits were used in 21% of the data sets. On average, the minimum distance between stations was 1270 ± 714 meters (mean ± SD). The time interval established for determining independent detections varied between studies: 37% of studies used 30 minutes, 15% 1 hour, 6% 24 hours, 22% used both 30 minutes and 24 hours (for *Panthera onca*), 16% used other time intervals, while 4% did not report this criterion. For most studies, the time interval was determined by the ecological question and the species studied (Sollmann 2018). The mean sampling effort among study areas was 2127 traps/days (min 3 – max 18,566), with more intense effort in Central Amazonia. The effort was evaluated by multiplying the number of sampling units by the number of days these units were operational. The number of study sites also varied per country, with 59% of the surveys conducted in Brazil, 25% in Bolivia, 3% in Ecuador, 6% in French Guiana, 4% in Peru, 2% in Venezuela, and 0.6% in Suriname.

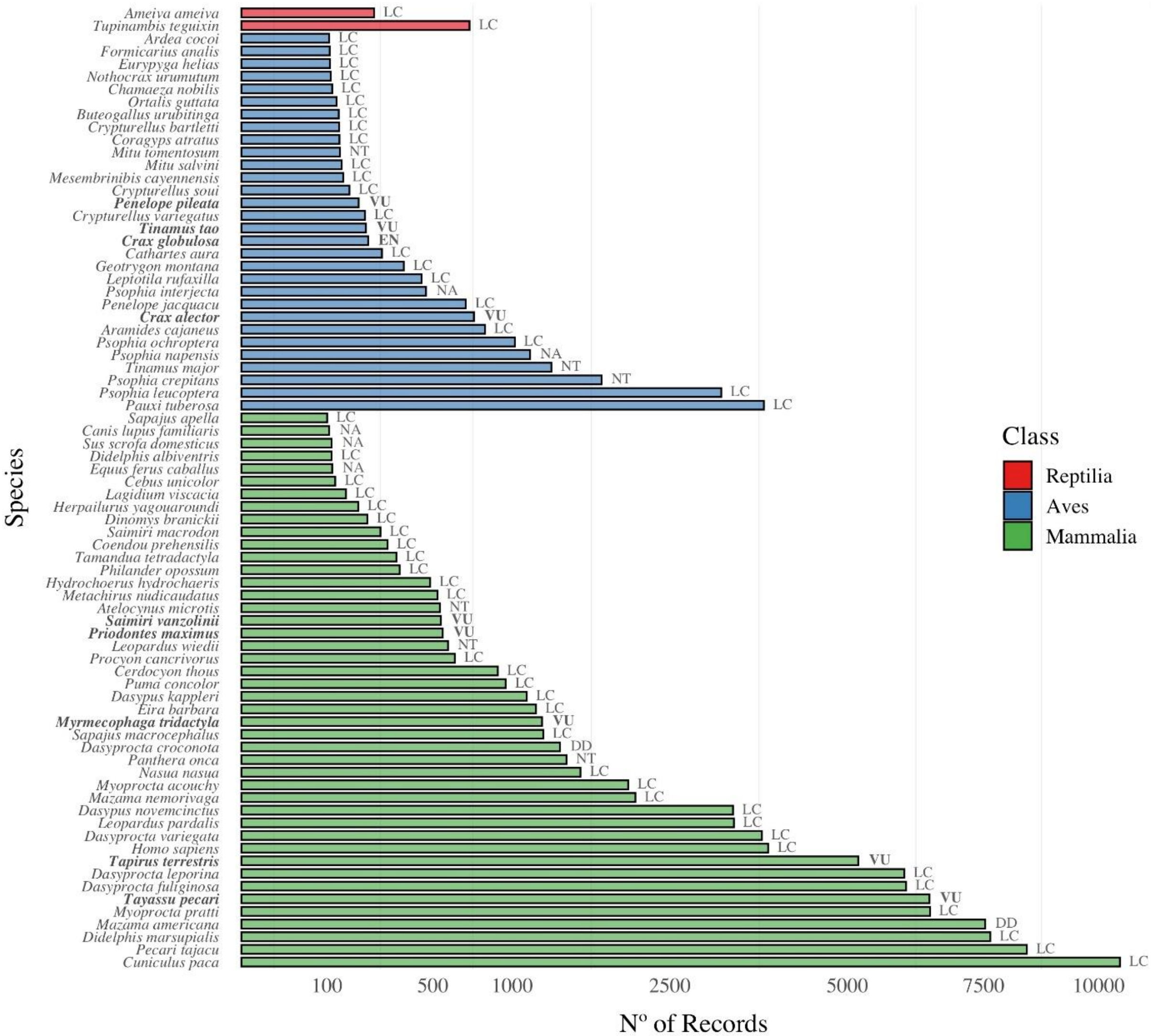

Fig. 2. Number of records of species with more than 100 records. The symbols from the global assessment were: LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, DD = Data Deficient, NA = Data Not Available. Vulnerable and endangered species are shown in bold.

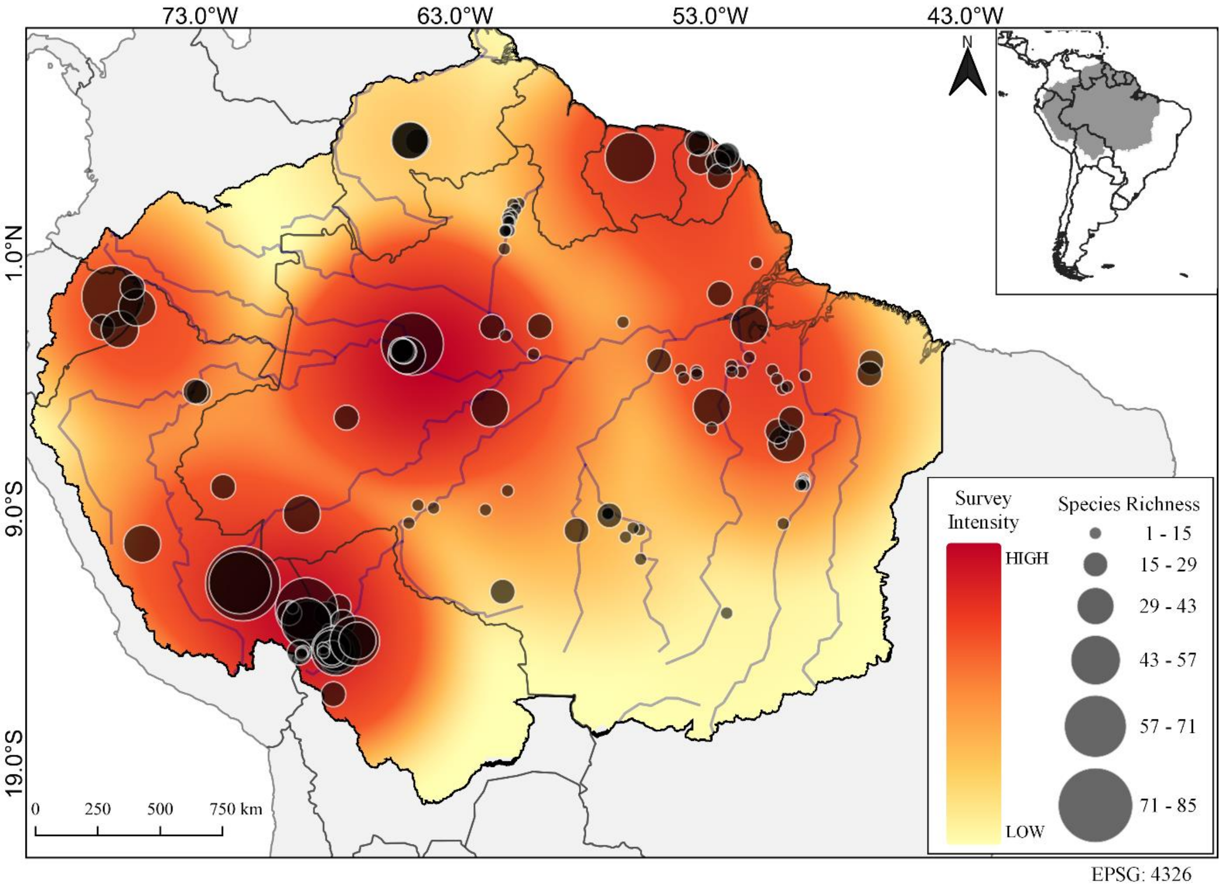

Fig. 3. Species richness and sampling effort per study area. Species richness was higher in areas with more intense sampling effort.

The average detected species richness per site was 18.8 ± 15.6 species (mean ± SD), with the highest recorded richness in southwestern Amazon, between northwestern Bolivia and southeastern Peru (Fig. 3). About 88% of records occurred inside PAs, while the remaining 9% were in non-protected areas. For 3% of the records the information was not specified. Both species richness and sampling effort were higher in Protected Areas with sustainable use of natural resources, when compared to other classes of protected and non-protected areas (Fig. 4). The sampling effort varied widely among and within PA classes: Ia - 1765.3 ± 2655.8 cameras*day (mean ± SD); Ib - 1721.9 ± 3270.9 cameras*day; II - 1579.2 ± 3847.9

cameras*day; V - 2104.8 ± 4356.1 cameras*day; VI - 1660.4 ± 3356.4 cameras*day; NA - 1669.5 ± 2759.8 cameras*day.

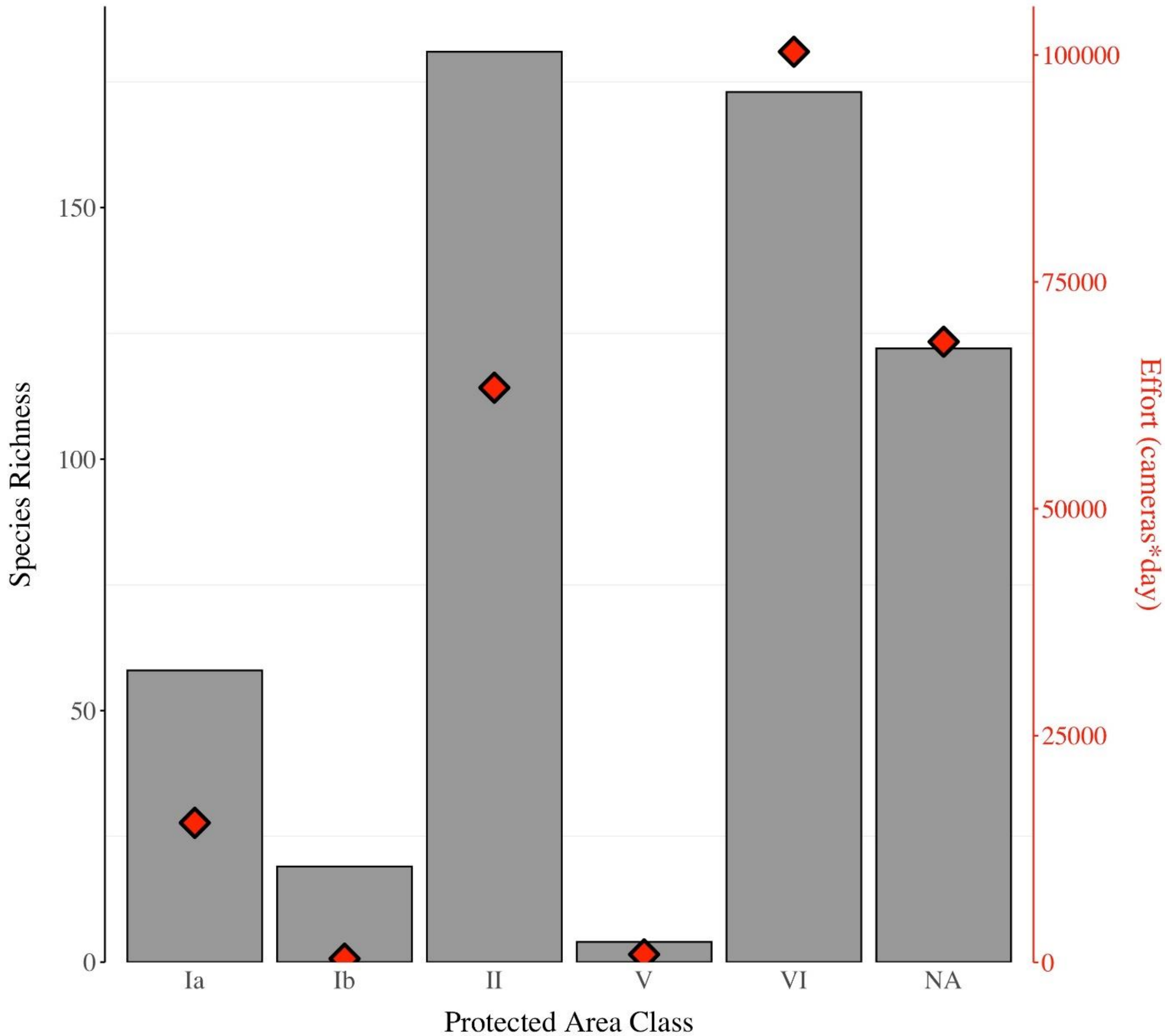

Fig. 4. Species richness (gray bars) and sampling effort (red diamonds) per class of Protected Area. IUCN Protected Area Management Categories were: Ia – Strict Nature Reserve; Ib – Wilderness Area; II – National Park; V – Protected Landscape/Seascape; VI – Protected Area with sustainable use of natural resources; and NA - Non-protected Area (not an IUCN category).

CLASS II – RESEARCH ORIGIN DESCRIPTORS

A. Overall project description

1. Identity

A dataset compilation with information on terrestrial mammals, birds, and reptile species from camera trap records in the Amazon forest.

2. Originators

The AMAZONIA CAMTRAP project was coordinated by Ana Carolina Antunes, Guilherme Costa Alvarenga, Anelise Montanarin, Erison Carlos dos Santos Monteiro, Fernando Ferreira de Pinho and Diogo Maia Gräbin. The following collaborators were part of the support team:

Graphs and statistics: Guilherme Costa Alvarenga, and Fernando Ferreira de Pinho

Dataset standardization: Ana Carolina Antunes, Guilherme Costa Alvarenga, Anelise Montanarin, Erison Carlos dos Santos Monteiro, Diogo Maia Gräbin, and Fernando Ferreira de Pinho

Co-authorship coordination: Anelise Montanarin and Ana Carolina Antunes

Map generations: Fernando Ferreira de Pinho and Ana Carolina Antunes

Manuscript writing: Ana Carolina Antunes, Guilherme Costa Alvarenga, Anelise Montanarin, Erison Carlos dos Santos Monteiro, Diogo Maia Gräbin, Fernando Ferreira de Pinho, Robert B. Wallace, Emiliano Esterci Ramalho, and Milton Cezar Ribeiro.

Species distribution range and taxonomy validation: Daniel Lane, Jean Boubli, Marcélia Basto, Mario Cohn-Haft, Rafael N. Leite, and Ronaldo G. Morato

3. Period of study

Species records range from 2001 to 2020.

4. Objectives

Our main objectives were: (1) To summarize information from camera trap inventories conducted in the Amazon forest, exploring raw, unpublished, and published data; (2) to identify species distribution, richness, the spatial pattern of sampling effort, and knowledge gaps. Therefore, we provide a database with information that can be used in further macroecological studies.

5. Sources of funding

The compilation of this dataset was supported by grants, fellowships, and scholarships from: Amazon Region Protected Areas Program (ARPA); Brazilian National Council for Scientific and Technological Development (CNPq - Grant numbers 150123/2018-3; 142352/2017-9; 201475/2017-0; 441443/2016-8; 441703/2016-0; 307084/2013-2; bolsa PCI-D; processos individuais número 300087/2016-0, 312539/2016-9, 300057/2017-2, 300444/2019-2 e 132510/2019-7); Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES - Grant numbers 88882.184240/2018-01; Doutorado Pleno no Exterior/ nº:88881.128140/2016-01); Darwin Initiative for the Survival of Species (Grant number 20-001); DEAL Guyane (French Ministry of Environment); Dean Amadon Grant from the Raptor Research Foundation; Disney World Conservation Fund; Ecopetrol; EERC University of Salford internal grants; ERDF

Funds; Fundação Grupo Boticário de Proteção à Natureza; Fundação Monsanto; Fundação Pantanal Com Ciência; Fundación Marío Santo Domingo; Idea Wild; Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio); Instituto de Desenvolvimento Sustentável Mamirauá (IDSM); Instituto Nacional de Pesquisas da Amazônia (INPA - FDB/Vale S.A.); Jaguar Conservation Program (Wildlife Conservation Society – WCS); Leme Engenharia; Liz Claiborne Art Ortenberg Small Grant (Panthera Foundation); National Science Foundation (Division of Environmental Biology - Grant number 1146206); Norte Energia; People's Trust for Endangered Species (PTES); Phoenix Herpetological Society; Projeto Conservação de Vertebrados Aquáticos Amazônicos (Aquavert) – Programa Petrobras Ambiental; PROCAD-AM, (Grant number 88881.314420/2019-01); The Explorers Club; The Gordon and Betty Moore Foundation; The International Osprey Foundation Endowment; The Rufford Foundation Small Grants (Grant numbers 12231-1; 16299-1; 20754-1); USAID; Wildlife Research; Woodland Park Zoo; World Wide Fund for Nature (WWF).

B. Specific Subproject description

1. Site Description

The Amazon is the largest rainforest in the world. This study is focused on an area of 8,414,085 km² encompassing eight countries: Brazil, Bolivia, Colombia, Ecuador, French Guiana, Peru, Suriname, and Venezuela (RAISG 2020). Dominated by rivers, the Amazon forest mainly consists of lowland plains, however along the frontiers among Venezuela, Brazil, and Guiana, the highlands of Guiana Shield have peaks that can reach up to 3,000 m (Lujan and Armbruster 2011). Rainfall ranges from 1,500 to 3,000 mm annually (Salati and Vose 1984), resulting in extensive seasonally-flooded areas (Junk et al. 2011). Combined with a marked annual flood pulse, the wide range of soil profiles covering the Amazon forest drives vegetation composition and structure (Quesada et al. 2010).

The Amazon forest comprises a complex mosaic of 53 major ecosystems and over 600 different types of land and freshwater habitat (Salati et al. 2012). Most of the Amazon consists of upland forests, or *terra firme* forests, which occur at well-drained sites above the high-water levels (Melack and Hess 2010). Wetlands cover between 14 - 30% of the Amazon basin and result from the heavy annual rainfall, unevenly distributed between seasons, and consequent rising river levels and inundation of adjacent floodplains of up to 230 days per year (Junk et al. 1989, Melack and Hess 2010, Junk et al. 2011).

The physical and chemical parameters of the major Amazonian floodplain rivers characterize the three dominant habitats in these wetlands: the *várzea* forests, flooded by sediment-rich white-water rivers originating in the Andes; the paleo-várzeas formed from ancient Andean sediments and therefore with intermediate fertility; and the *igapós*, associated with nutrient-poor black and clearwater rivers (Prance 1979; Irion et al. 2010; Sioli 1956; Junk et al. 2011). *Campinas* and *campinaranas*, the Amazonian savannahs, are associated with sandy, very nutrient-poor soils, often subject to periodic flooding (Pires and Prance 1985). Other vegetation types are also present and cover small areas, but are quite distinct. Those include mangrove forest, restinga, and swamps (for more details on each vegetation type, see Pires and Prance 1985, Junk et al. 2011).

These ecosystems are interconnected and have different levels of resilience to anthropogenic alterations. In the Amazon Basin, PAs are considered a viable way to conserve biodiversity and reduce deforestation and forest degradation (Sobral-Souza et al. 2018). In, for example, the Brazilian Amazon, PAs cover 2.2 million km^2, with 44% comprised of forests (Verissimo et al. 2011). Nevertheless, PA effectiveness as a conservation tool may vary depending on the type, size, administrative level, and exposure to deforestation (Nogueira et al. 2018). Amazonian deforestation is concentrated mainly in the "arc of deforestation", an area located on its southern and eastern limits, along the Andean piedmont (Malhi et al. 2008). It is estimated that, for the entire Amazon Basin, around 100Gt (gigatons = billion tons) of carbon, as above-ground live biomass, roots, dead trees and soil stocks, could be released into the atmosphere if the forest is converted to non-forest vegetation (Fearnside 2008).

2. Data Compilation

A collaborative network of researchers shared their published and unpublished camera trap data for the Amazon forest. The invitation was open; therefore, we tried to reach every potential collaborator and invited them to contribute and participate as a co-author in the AMAZON CAMTRAP data paper.

3. Research Methods

This data paper is part of the AMAZONIA, NEOTROPICAL, ATLANTIC, and BRAZIL series initiative, which aims to compile information on the biodiversity of these regions, making data available publicly. Until now, the following data papers of these series have been published: NEOTROPICAL – GPS jaguar movements (Morato et al. 2018), Xenarthrans (Santos et al. 2019), Carnivores (Nagy-Reis et al. 2020), Alien mammals (Rosa et al. 2020); BRAZIL: Road kills (Grilo et al. 2018), ATLANTIC: Plant-animal frugivory (Bello et al. 2017), Terrestrial mammals (Lima et al. 2017; Bovendorp et al. 2017; Souza et al. 2019), Bats (Muylaert et al. 2017), Birds (Hasui et al. 2018), Amphibians (Vancine et al. 2018), Frugivorous butterflies

(Santos et al. 2018), Mammal and bird traits (Gonçalves et al. 2018; Rodrigues et al. 2019), Epiphytes (Ramos et al. 2019) and Primates (Culot et al. 2019).

In this data paper, we compiled records of mammals, birds, and reptiles obtained from camera trap records. Most of these records occurred on or near the ground; however, we also included arboreal sampling efforts. The records were subdivided into two-scale categories: sampling unit and study area. For each study area, we used centroid coordinates of each respective sampling units. All the geographic coordinates are expressed in decimal degrees, using the WGS 84 datum. We focused our data paper on the Amazon forest, and the precise limits of which were defined using RAISG 2020. We maintained records from outside the Amazon forest limits in the dataset, but they were not included in the analysis, graphs, and figures. Data was compiled mostly from unpublished data, but also included data from Negrões et al. 2011; Zapata-Ríos and Araguillin 2013; Benchimol and Peres 2015; Campos et al. 2016; Isasi-Catalá et al. 2016; Abrahams, Peres, and Costa 2017, 2018; Aguiar-Silva et al. 2017; Torralvo, Botero-Arias, and Magnusson 2017; Alvarenga et al. 2018; Costa, Peres, and Abrahams 2018; Antunes et al. 2019; Wang et al. 2019; and Rocha et al. 2020.

4. Taxonomic Data

Each collaborator was responsible for identifying the species recorded in the data shared. After we received the data, the verification and standardization used the following steps: first, the Amazon Camtrap Core Team identified errors in species nomenclature and synonymies species, and standardized all names according to IUCN (2020), Catalog of Life (Roskov et al. 2019), Reptile Database (Uetz et al. 2020), and Patton et al. (2015). After this standardization, we generated maps for the distribution of records of each species and sent them for verification by specialists of each taxonomic group (reptiles - Marcélia Bastos; birds - Mario Cohn-Haft and Daniel Lane; primates - Jean Boubli; rodents and marsupials - Rafael Leite; medium and large mammals - Ronaldo Morato). Finally, the specialists evaluated whether records needed double-checking. In positive cases, we asked collaborators for photos or videos of the specific species records. After this double-checking, collaborators were informed of the specialist's conclusion. Taxonomic uncertainties were retained at the genus level or excluded from the dataset.

C. Data Limitations and Potential Enhancements

Our dataset compiles information on mainly terrestrial Amazon mammals, birds, and reptiles. Since each study had a different objective, additional care is required when comparing the data, as the study design may influence the detectability of target species (Meek et al. 2014). It is also necessary to consider the time interval independence and the sampling effort per study, both of which can directly influences the number of records and species richness (Fig. 5). Some studies also used baits, which may bias the detection and number of records of some species (e.g., Rocha et al. 2016). In addition, different camera trap brands and models may influence species detection (Meek et al. 2014).

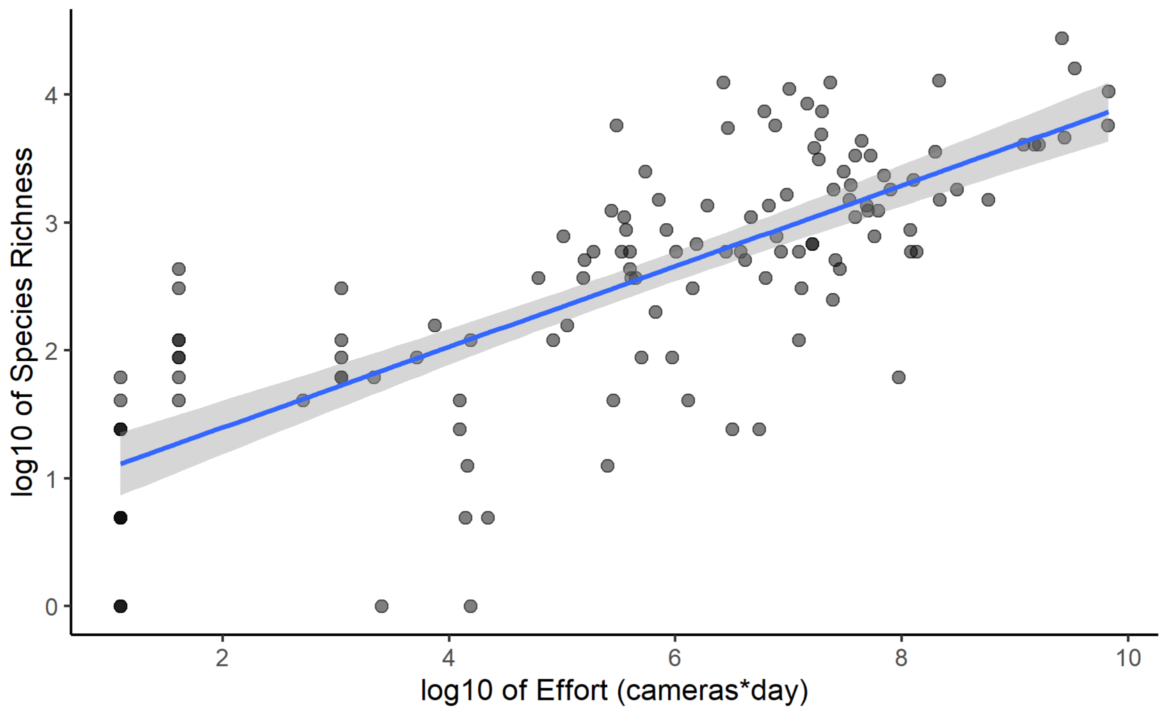

Fig. 5. Positive effect of sampling effort on species richness in the AMAZON-CAMTRAP database. The slope for the effort-richness relationship was 0.32. Gray area represents the 95% confidence interval (0.27-0.36) and each dot represents one study area. Overlapped dots are represented by a darker color. $R^2 = 0.604$, $p < 0.001$.

Spatial and temporal sampling efforts varied considerably across studies and should be considered when using this dataset. While on a local scale, animal trait, camera specifications, and vegetation type might affect animal detection, on a broader scale, it is important to consider processes such as animal density and movement, sampling unit size, number of cameras, and survey duration (Burton et al. 2015). Abundance data should be carefully used and interpreted. It is not recommended to use the number of records as a measure of abundance, doing so only if the study has specified this (e.g., accounting for individual identification) (Burton et al. 2015). We suggest researchers check the "data type" in our data file prior to using data in this manner.

It is also important to highlight that, even though the Amazon Camtrap Core Team and taxon-specific experts checked the taxonomy and distribution of the species involved, species identification was made independently by the groups who collected the data. Finally, we also highlight the variation in sampling effort, as well as the uneven sampling across the different regions of the Amazon. Similarity of species composition is known to decrease with the distance from access infrastructure (Oliveira et al. 2016). This might be an important issue in the Amazon forest since many regions are remote or hard to access, dangerous, logistically challenging or simply too expensive to receive studies. Additionally, local economic and social conflicts can make it highly challenging to conduct scientific activities in some areas.

Notwithstanding these limitations, this study contributes to the large-scale perspective of research into macroecological processes, and helps answer questions related to anthropogenic impacts on Amazonian biodiversity. This data paper represents a massive effort, and has resulted in the compilation of the largest-ever camera trap dataset for the Amazon forest. In doing so, we provide information that was never accessible before, such as reports and non-published data, and explore data on broad spatial and temporal scales.

CLASS III – DATA SET STATUS AND ACCESSIBILITY

A. Status

Latest update: 20/08/ 2021

Latest Archive data: 20/08/ 2021

Metadata Status: Latest update on 20/08/2021 refers to the submitted version of the revision process.

B. Accessibility

Original AMAZONIA CAMTRAP dataset can be accessed on the GitHub Inc. repository (https://github.com/LEEClab/Amazon_camtrap). All the data – both the updated version and complementary material – are fully available for public use and research purposes. The dataset will be updated on a regular basis on the GitHub Inc. repository and the acquisition of new data is possible by contacting the authors of this manuscript.

1. Storage location and medium

The dataset and its future updates can be accessed on the GitHub Inc. repository (https://github.com/LEEClab/Amazon_camtrap) in .CSV format, as well as its metadata. A mirror of this repository will also be available at https://github.com/LEEClab/Amazon_series, where all the other data-papers of AMAZON SERIES are available.

2. Contact people

Ana Carolina Antunes, German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Germany and Friedrich-Schiller-University Jena, Germany. E-mail: ana_carolina.antunes@idiv.de

Milton C. Ribeiro, Universidade Estadual Paulista (UNESP), Instituto de Biociências, Departamento de Ecologia, Rio Claro (SP), 13506-900, Brazil. E-mail: miltinho.astronauta@gmail.com

3. Copyright restrictions:

None.

4. Proprietary restrictions

Please cite this data-paper when using its data in publications. We also request that researchers and educators inform us of how they are using this data.

5. Costs:

None.

CLASS IV – DATA STRUCTURAL DESCRIPTORS

A. Data Set File

1. Identity

AMZ_CAMTRAP_AREA.csv

AMZ_CAMTRAP_UNIT.csv

2. Size

1.5 KB

21.7 KB

3. Format and storage mode

Comma-separated values (.csv).

4. Data anomalies

If no information is available for a given record, this is indicated as ‘NA’.

B. Variable Information

Tab Name	Column Abreviation	Column Full Name	Description	Example
All tabs	DATASET	Dataset responsible(s)	Your name and/or team name.	RosaClarissa_LECOM/UFLA
All tabs	DATA_TEAM	Data owners	Names of data owners.	Rosa, C.; Ribeiro, M.
All tabs	RECORD_ID	Record id	Your own record id.	INV1
All tabs	REFERENCE	Reference	Add complete reference if data has already been published. Otherwise, add "unpublished".	Unpublished
All tabs	TYPE_REF	Reference type	Type of reference (e.g., master’s dissertation, unpublished, etc).	Published peer reviewed
All tabs	DATA_TYPE	Type of data	Record type (Presence-only, Presence-absence, Abundance).	Presence_absence
All tabs	DATA_AIM	Aim of data collection	Please specify if data are "primary" (your study was designed to collect this specific information on this species) or "secondary" (your main objective was not to collect data on this specific species).	Primary
All tabs	SITE	Study site	Name of your study area (e.g., remnant name, protected area, etc).	Serra do Japi
All tabs	AREA_HA	Study area size	Size of study area (total in hectares).	35000
All tabs	MUNICIPALITY	Municipality	Name of the nearest city where the study area is located.	Jundiaí

All tabs	STATE	State	Name of the state/province where the studied area is located.	SP
All tabs	COUNTRY	Country	Name of the country where the studied area is located.	Brazil
Study_area	LONG_X_AREA	Longitude of the study area	Longitude of the study area in decimal degrees (centroid). Use 5 digits if possible.	-46.97554
Study_area	LAT_Y_AREA	Latitude of the study area	Latitude of the study area in decimal degrees (centroid). Use 5 digits if possible.	-23.27613
Sampling_unit	LONG_X_POINT	Longitude of the sampling unit	Longitude of the record in decimal degrees. Use 5 digits if possible.	-46.97554
Sampling_unit	LAT_Y_POINT	Latitude of the sampling unit	Latitude of the record in decimal degrees. Use 5 digits if possble.	-23.27613
Study_area	ALTITUDE	Altitude	Altitude of your sampling unit (i.e., point where species was recorded). If not available, use average altitude of study area.	900
Study_area	ANNUAL_RAIN	Annual rain precipitation	Total annual precipitation for your study area.	1424
Study_area	VEG_LANDUSE_TYPE_AREA	Study area's main vegetation or land cover type	Main vegetation or land cover type of study area.	Semidesciduous forest
Study_area	VEG_LANDUSE_TYPE_AREA_BUFFER5KM	Vegetation or land cover surrounding study area	Vegetation or land cover around your study area (5 km buffer around the entire study area). One or more.	Forest
Sampling_unit	VEG_LANDUSE_TYPE_POINT	Point's vegetation or land cover type	Vegetation or land cover type of your sampling unit (i.e., point where you recorded the species).	Semidesciduous forest
Sampling_unit	VEG_LANDUSE_TYPE_POINT_BUFFER5KM	Vegetation or land cover surrounding sampling unit	Vegetation or land cover around your sampling unit (5 km buffer around the point where data was collected).	Forest
All tabs	PROTECT_AREA	Protected area	Is the sampling unit where you recorded the species located within a protected area? Yes or no.	Yes
All tabs	PROTECT_AREA_TYPE	Type of protected area	If the sampling unit where you recorded the species is located within a protected area, add here the protected area management category according to IUCN: Ia, Ib, II, III, IV,	Ia

			V, VI (Please see guidelines or https://www.iucn.org/theme/protected-areas/about/protected-area-categories).	
All tabs	ORDER	Order	Order of the species.	Carnivora
All tabs	FAMILY	Family	Family of the species.	Felidae
All tabs	GENUS	Genus	Genus of the species.	*Leopardus*
All tabs	SPECIES	Species	Most recent name of the species.	*Leopardus pardalis*
All tabs	COL_START_MO	Data collection start month	Month in which data collection started.	Mar
All tabs	COL_START_YR	Data collection start year	Year in which data collection started.	2015
All tabs	COL_END_MO	Data collection end month	Month in which data collection ended.	Apr
All tabs	COL_END_YR	Data collection end year	Year in which data collection ended.	2017
All tabs	METHOD	Method for data collection	Method used to collect data (Camera trap, Paired Camera trap).	Camera trap
All tabs	CAM_TYPE	Camera type	Camera-trap model used in the study.	Reconyx
All tabs	BAIT	Baiting	Presence or absence of bait.	Yes
All tabs	OCCUR	Occurrence	Occurrence (zero or 1).	1
All tabs	N_RECORDS	Number of records	Number of records (number of photos, number of individuals counted).	4
Study_area	TOTAL_EFFORT	Total sampling effort	Total sampling effort: Camera trap/night.	5000
Sampling_unit	EFFORT	Sampling effort	Sampling effort: Camera trap/night.	120
All tabs	IND_CAM	Independence for camera records	Time interval (in min) for independence between records.	60
All tabs	MIN_DIST_CAM	Minimum distance between cameras	Minimum distance (in m) between camera traps.	2000
All tabs	MAX_DIST_CAM	Maximum distance between cameras	Maximum distance (in m) between camera traps.	3000

All tabs	OBS	Observations	Any important observation that users should know to better understand your data.	NA

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