Mammals under pressure: presence data for assessing extinction of endemic, threatened and mammals subject to use in Colombia

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Abstract

Background

Colombia is considered the sixth country in mammal richness worldwide with 551 species and the fourth in America after Brazil, Mexico, and Peru. This high diversity represents a challenge given the responsibility for conservation and management issues. Although in recent years there have been advances in understanding of the systematics, distribution and other aspects of mammalian biology, the book "*Libro Rojo de los Mamíferos de Colombia"* published in 2006 was a massive effort to assess the risk category of mammals of Colombia. To contribute to new risk assessments, species' records are essential to increase the information for this taxonomic group in Colombia, especially for little-documented taxa. This dataset contains the records of 129 mammal species, 24% of those reported across the country by trail cameras and museum specimens provided by 51 institutions. The dataset also includes comments about the occurrences that can be useful for the identification of priority areas for conservation of these species.

New information

This is the first dataset that provides a complete compilation of mammal records based on trail cameras, human observations and specimens deposited in biological collections in Colombia. We compiled a dataset with unpublished information, including 122,336 records corresponding to 129 species, of which 38 are endemic, 92 identified as species subject to use by humans in the literature, and 56 are categorized as Data Deficient or threatened according to national or international assessments. The information comes from 30 out of 32 departments of Colombia and constitutes relevant input for future distribution and conservation assessments. Most records (n=120,835, 98%) come from non-invasive sampling methods such as trail cameras. However, we highlight the contribution of museum specimens (n= 1,412), especially for small and medium-sized species, many of them with restricted distributions in the country. This dataset constitutes a joint collaborative and interinstitutional effort that serves as the basis for cooperative work to comprehensively assess the current conservation status of all mammal species in Colombia.

Keywords

Biological Collections, Conservation, Distribution, Departments, Mammalia, Camera trap

Introduction

In Colombia, several initiatives have sought to provide information and legally protect species that have some risk of extinction. The most recent embodied in the Red Book of Mammals of Colombia (Rodríguez-Mahecha et al., 2006) was the input for resolution 1912 of the year 2017 by the Ministry of Environment and Sustainable Development - MADS (MADS, 2017). Since then, the information on threatened species had not been updated or adjusted to recent taxonomic changes in the country (e.g., Ramírez-Chaves et al., 2021) or at the global level (Burgin et al., 2020). Currently, the checklist of mammal species in Colombia supports the presence of 545 species (Ramírez-Chaves et al., 2021), but there is limited knowledge about their ecology or conservation requirements limiting the effectiveness of conservation policies and management actions in the areas where they inhabit. This situation may directly affect the country's mammal conservation strategies and mainly affects species with restricted distributions within the national territory (Ramírez-Chaves et al., 2016). Additionally, some species are subject to use by human communities (Osorno et al., 2014; Racero-Casarrubia & González-Maya, 2014), or have a high risk of extinction due to multiple causes (Rodríguez- Mahecha et al., 2006).

The incipient knowledge of basic biology, population status, and distribution for most mammals in Colombia difficulties the assessment of the threat status, limiting the design of effective conservation strategies at a national scale (Suárez-Castro et al., 2021). This scenario affects most mammal species in the country, and although some larger species might have better information, small-sized species are subject to information gaps. For example, while Colombia has the second-highest number of bats (Chiroptera) in the world (Burgin et al. 2018), none of those species is included in national risk assessments (MADS, 2017). Additionally, several endemic mammals and other species categorized by the Red List of Threatened Species of the International Union for Conservation of Nature – IUCN (e.g., Solari, 2016; Roach & McCay, 2019) are not included in the national red list. This problem has been highlighted in recent works where the urgency of a national risk assessment for all mammals has been mentioned (Cruz-Rodríguez et al., 2018), as well as specific examples for different groups; for example, the inclusion of several species of bats within the list of threatened species of the Ministry of Environment and Sustainable Development (Rodríguez-Posada et al., 2017, 2018; Morales-Martínez & López-Arévalo, 2018; Cruz-Rodríguez et al., 2018; Ramírez-Chaves et al., 2020; Morales-Martínez et al., 2020: Esquivel et al., 2020) or several species of marsupials, shrews, and some endemic rodents (Gardner , 2008; Patton et al., 2015; Díaz-Nieto & Voss, 2016; Noguera-Urbano et al., 2019).

Although there have been advances in understanding mammal distribution of Colombia as is the case of "*Atlas de la Biodiversidad*" (Henao-Díaz et al, 2020; Ramírez-Chaves et al. 2022), there is the need to update its conservation status and to implement management or conservation policies. Therefore, it is imperative to consolidate the most up-to-date ecological and distributional data to update its conservation status that may

impact the national risk assessments. In Colombia, these data are dispersed in consultancy reports, theses, and information deposited in biological collections, institutional repositories, and databases such as the Colombian Biodiversity Information System (SiB Colombia). A compilation of data on the presence of these species from different sources of information is very relevant to facilitate their availability and use for decision-makers. This work presents a data set with 129 species corresponding to endemics, subject to use, and threatened mammals compiled from biological collections, non-governmental organizations, research groups from universities, and independent researchers.

General description

Purpose: This work contains a data set compiling information on 129 mammal species of Colombia listed as threatened, endemic, or subject to use in the country. It also provides valuable information about the presence of several mammal species in Colombia by passive methods such as trail cameras, human observation, and collected specimens that are contained in biological collections across the country.

Sampling methods

Description: The information seeks to increase the knowledge about the threatened, endemic or subject-to-use mammals in Colombia. Also, it represents the effort to publish information for recognizing the diversity of mammals and to support their presence in the country that allows monitoring changes in species in time and identifying key conservation areas.

Sampling description: This paper provides records of 129 mammal species, including taxa previously reported under some threat category (Rodríguez-Mahecha et al., 2006; MADS, 2017). Also information on endemic species to Colombia (Solari et al., 2013; Ramírez-Chaves et al., 2016), and species that present some type of use by human communities according to literature (Racero-Casarrubia & González-Maya, 2014) is included. Using the list, we call on the biological collections to the Registro Nacional de Colecciones (RNC), the Colombian Photo-trapping Network, non-governmental organizations, academic institutions, and independent researchers to systematize and release records of the targeted species. Finally, the information received was compiled using a Darwin Core format.

Quality control: We refined the scientific names to be consistent with current taxonomy based on recent taxonomic treatments (e.g. Burgin et al., 2020), portals with taxonomic information (e.g., Mammal Diversity Database: https://www.mammaldiversity.org/), and following the most updated checklist of mammals of Colombia (Ramírez-Chaves et al., 2021). Additionally, the data set was refined to include only information at the species level, georeferenced localities within the maritime and continental areas of Colombia, and corroborated under the standards of the Biomodelos of the Instituto de Investigación

de Recursos Biológicos Alexander von Humboldt (Velásquez-Tibatá et al., 2019, http://biomodelos.humboldt.org.co/).

Step description:

1. We generated a dataset of mammal species to assess extinction risk based on three characteristics:
    1. Species previously reported under some category of threat at the national and global levels (Rodríguez-Mahecha et al., 2006; MADS, 2017; IUCN, 2020).
    2. Species endemic to Colombia (Solari et al., 2013; Ramírez-Chaves et al., 2016, 2020)
    3. Species that present some type of use by human communities (Racero-Casarrubia & González-Maya, 2014).
2. We validated the names according to Burgin et al. (2020; https://www.mammaldiversity.org/). For species not included there, we followed the next information available in portals such as the IUCN Red List (https://www.iucnredlist.org/), Integrated Taxonomic Information System (ITIS; https://www.itis.gov/), Encyclopedia of Life (EOL; https://eol.org/) and BatNames (https://batnames.org/), and the most updated lists of species for the country (Ramírez-Chaves et al., 2016, 2021).
3. For each species on the list, we integrated the trail camera data and information of specimens deposited in biological collections. Data not available in the database of the ´Sistema de Información sobre Biodiversidad de Colombia - SiB Colombia were requested at the species level from the collections attached to the Registro Nacional de Colecciones (RNC), the Colombian Photo-trapping Network, non-governmental organizations, academic institutions, and independent researchers.
4. We compiled all the information at the species level.
5. We organized the information received following the Darwin Core standard for the documentation of biological records.

Geographic coverage

Description: The study area corresponds to the Colombian territory, specifically reporting records for 2,387 localities distributed in 31 departments and 314 counties of the five natural regions of Colombia excluding the insular region (Archipelago of San Andrés and Providencia in the Caribbean Sea and Malpelo, and Gorgona Islands in the Pacific Ocean) (Fig. 1).

Coordinates: 4°34'15.1"; 74º17'50.4" and .

Taxonomic coverage

Description: The dataset includes records on 129 species of mammals (Mammalia), classified in 32 families and 12 orders (Fig. 2) (Ramírez-Chaves et al., 2016, 2021). The families with the highest number of recorded species were Cricetidae (17 species), Didelphidae (11 species), and Phyllostomidae and Cebidae (nine species respectively). The families with the highest number of records were Dasyproctidae (29075 records), Cuniculidae (16325 records), and Didelphidae (11958 records). Taxonomy follows current national list (Ramírez-Chaves et al., 2016, 2021) and was validated by national experts in mammal taxonomy.

Temporal coverage

Notes: Data range:

1903 – 2019

Collection data

Collection name: Colección Zoológica Universidad de Nariño (PSO-Z); Instituto de Ciencias Naturales (ICN (MHN)), Universidad Nacional de Colombia; Instituto de Investigación de Recursos Biológicos Alexander von Humboldt (IAvH (M)); Instituto Tecnológico Metropolitano (ITM (CSJ-m)); Museo de La Salle - Bogotá (MLS); Universidad de Caldas (MHN-UCa-M); Universidad de Los Andes (UniAndes (ANDES-M)), Universidad Distrital Francisco José de Caldas (UDFJC (MUD)).

Specimen preservation method: Dried or fluid (ethanol).

Usage licence

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Data resources

Data package title: Mammals under pressure: presence data for assessing extinction of endemic, threatened, and mammals subject to use, in Colombia

Resource link: https://zenodo.org/records/11179929

Number of data sets: 1

Data set name: Mammals under pressure: presence data for assessing extinction of endemic, threatened and mammals subject to use in Colombia

Download URL: https://zenodo.org/records/11179929

Data format: Tab separated text file

Data format version: Darwin Core

Description: This is the first dataset that provides a complete compilation of mammal records based on camera traps, human observations, and specimens deposited in biological collections in Colombia. We compiled a dataset with unpublished information, including 97,944 records corresponding to 136 species, of which 38 are endemic, 92 are identified as species subject to use by humans in the literature, and 33 are categorized either as Data Deficient or threatened according to international or unofficial national assessments. The information comes from 31 out of 32 departments of Colombia and constitutes relevant input for future distribution and conservation assessments. Most records (n=96,417, 98.44%) come from non-invasive sampling methods such as camera traps. However, we highlight the contribution of museum specimens (n= 1,333), especially for small and medium-sized species, many of them with restricted distributions in the country. This dataset constitutes a joint collaborative and interinstitutional effort that serves as the basis for cooperative work to comprehensively assess the current conservation status of all mammal species in Colombia.

Additional information

Order and family to the species included in the dataset. Also contains theirs categories according the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Cites); the threatened extinction risk adopted by the the International Union for Conservation of the Nature (UICN) an the resolution 1912 of 2017 at the Ministry of Environment and Sustainable Development (MADS) and species that are endemic to our country (Endemic). Finally include the number of records per specie which basis of record were: Human Observation (HO), Machine Observation (MO) and Preserved Specimen (PS)

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