BioByte
The Quarterly Newsletter of
Project BioMap

www.biomap.net

BioMap

Increasing biodiversity knowledge to support conservation

Issue 8 December 2004 Page 1 of 10

Editorial

Species locality data and conservation planning

I'm greatly honoured to have the opportunity to write this editorial for BioByte. Having been lucky enough to watch BioMap grow from its roots at the VI Neotropical Ornithological Congress in Monterrey, Mexico, and survive the host of scientific, technological, political, and financial difficulties that face any such program, it is a delight to witness its ultimate success. BioMap has broken new ground in bringing together the important historical perspectives provided by museum specimen data with the volume of sight records from contemporary birdwatchers, and now has comprehensive coverage of the great majority of locality records for Colombian birds, ever. The main message of this editorial will be to emphasize why BioMap and the approach of compiling species locality data is so important, but also to caution that there is no room for complacency – there are numerous major challenges ahead.

We know that biodiversity faces a crisis. We know that species extinction rates are a thousand times higher than normal through our planet's history. We know that this catastrophe will have tragic economic, health, cultural, and moral consequences for humanity. And we know what is driving it – massive destruction of natural habitats, combined with direct overexploitation, and the effects of alien invasive species. However, there is also a lot that we don't know. For a start, we have no idea of the number of species on the planet – we have named only a small fraction of them so far. Even for those species that we do know, we know very little about their ecology, distribution, or conservation status. And even where we have such information, we have almost no idea about how to make conservation successful.

In the face of such ignorance, how can we plan conservation? A popular shortcut is the so-called "coarse filter" approach of using land classes such as "ecoregions" as conservation targets, with a goal of establishing protected areas covering a certain percentage (say, 10%) of each. Advocates of this approach argue that such environmental surrogates represent unknown biodiversity (although, by definition, without evidence). This approach is in fact extremely dangerous. For a start, it requires arbitrary choices of both the land classification system and the percentage target. Even more seriously, it has been shown that land classes are poor surrogates for species, because species are distributed unevenly. Some land classes therefore require much more conservation effort than others. Investing conservation effort into a biodepauperate habitat (such as the llanos) at the expense of a biodiverse one (such as the Andean oak forests) is wasteful at best. At worst it could have an opportunity cost of extinction.

The alternative to planning biodiversity conservation based on such environmental surrogates is to use taxonomic surrogates. This is more a promising approach, but numerous pitfalls remain. First, it is essential to restrict assessment to those taxonomic groups within which all species within the region of interest can be considered, to allow comparisons that are unbiased taxonomically. Geographic biases are another problem: most sampling of biodiversity follows roads, rivers, and other access routes. A common way in which this sampling bias is tackled is through extrapolation, either through the development of an "Extent of Occurrence" range map, or through the construction of a geographic model (such as "GARP") combining species distribution data with the environmental data that characterize that distribution. These approaches have considerable utility (to which I'll return in my last paragraph) but are far from ideal for use in planning for conservation on the ground. This is because, as extrapolations, they include many false positives – places where a species appears to occur but in fact does not. In conservation planning, false positives are much more serious than false negatives. In the latter case, a species will always be targeted somewhere where it occurs, whereas in the former case, conservation could target a species where it does not occur, potentially allowing its extinction.

This brings us around to the importance of species locality data in conservation planning. This approach is riddled with false negatives of course – but, as I point out above, these are acceptable if undesirable. The important point is that all species in a conservation plan based on locality data will be conserved somewhere. Another key advantage of working from locality data is that it yields realistic units for conservation on the ground: sites. This forms the basis for the implementation of the "AICA" concept (developed by the BirdLife International partnership). Extrapolated data, by

contrast, requires subdivision into arbitrary units (e.g., grid cells) before analysis, which have little conservation relevance on the ground.

What lessons can we learn from the experience of BioMap? One is the cost of the project, which, at ~$120k per year for three years, appears to run at ~$200 per species. This is an average, and masks large variation depending on the number of specimens and observations per species. One way of economizing could be to only consider the rarer species – for example, threatened and restricted-range species. Those species that do not require conservation at the site scale are generally common and widespread, and so make up a disproportionate share of any locality dataset. Another important lesson from BioMap is the importance of working from up-to-date gazetteers, and of georeferencing all data at source.

I opened this editorial by hinting at the many challenges ahead. First and most immediately, of course, work in data quality assurance within BioMap needs completion, and the data need wide dissemination through (electronic?) publication. From here, a number of directions are necessary. One is to feed the data into research, and build its credibility through publication in the peer-reviewed literature. A second it to fill sampling gaps within Colombia. This influx of new field data should be strategically guided by the development of the kind of extrapolation models mentioned above. More broadly, it would be highly beneficial to expand BioMap to incorporate other taxa (amphibians, following the recent launch of the Global Amphibian Assessment, www.globalamphibians.org, would seem like a sensible place to start, followed by mammals) and other countries (the rest of the Andean nations would be an obvious starting point). Maybe most importantly of all, a huge task now falls to conservation agencies to implement the ambitious conservation program necessary to safeguard all the AICAs highlighted by BioMap. The exceptional work of Fundación ProAves is a model in this regard. Finally, the longest-term contribution of BioMap will be in organizing and stimulating the flow of monitoring data – essential to track the state of biodiversity, to report the success of conservation investments, and to ensure the sustainability of BioMap itself.

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Center for Applied Biodiversity Science
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NewsByte Summary

June–August 2004. Revising the Darwin Database.

June–August 2004. Revision of Los Angeles County Museum

June–Nov 2004. Revision and geo-referencing localities.

July 2004. Completion of revision of 26,357 American Museum of Natural History specimens.

July 2004. Alvaro Espinel visited Colombia, for training workshop of Darwin Database.

July 2004. Databasing 109 specimens from Parque Nacional Natural Gorgona collection.

July–September 2004. BioMap participated on several meetings to implement the CI-Colombia quality plan.

July–October 2004. Planning and organization of the workshop "Importance of scientific collections to assess research and conservation in Colombia".

July–September 2004. Calling for applications to BioMap fellowships to participate in the workshop "Importance of scientific collections to assess research and conservation in Colombia", I National Ornithology Congress (NOC) and XVII National Ornithological Meeting (NOM).

August 2004. Addition of 244 new records from La Planada Biological Station, specimens placed in Nariño University.

August–September 2004. Correction of the taxonomy table of the Darwin Database.

August–October 2004. Digitizing of 6,500 records from the catalogues of INDERENA.

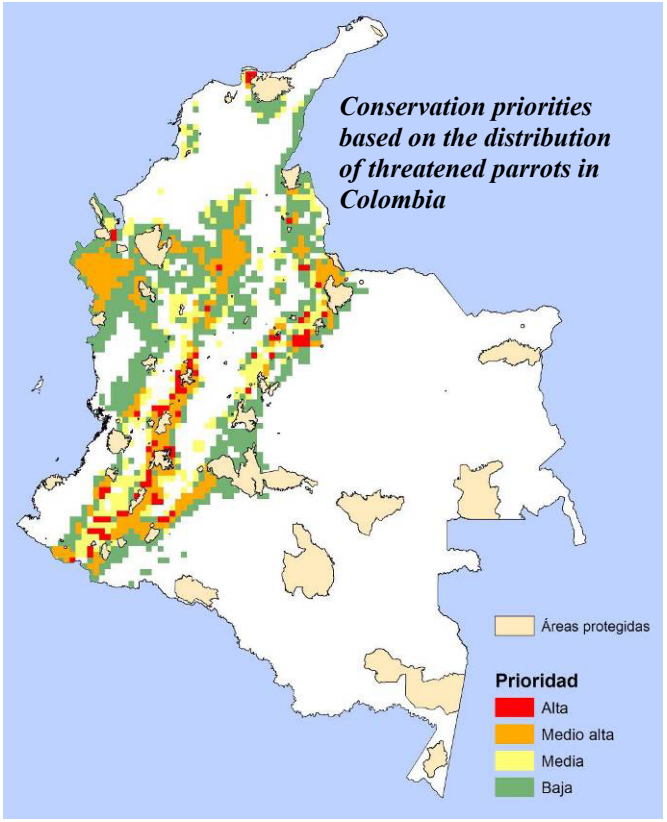
September 2004. Meeting of the Directive committee of BioMap at the ICN, National U., Bogotá.

September–October 2004. Digitizing of 28,399 records from the National Museum of Natural History, USA.

October–November 2004. Participation of BioMap in a training course of ACCESS at CI.

October 2004. BioMap–IAvH workshop at the I NOC and the XVII NOM. BioMap team presented 6 talks.

November 2004. Final report preparation for DI.



General NewsBytes

News from Colombia

During this period, BioMap has been engaged principally with the tasks of geo-referencing localities and the revision and correction of the Darwin Database. A detailed revision of every collection was undertaken, comparing the original information with the information in the database, correcting inconsistencies and errors in taxonomy, as well as standardizing dates, notes, collectors and localities primarily.

A great effort was dedicated to unify and correct the localities, by the team of BioMap, as well as Ana Milena Piñeros and Angélica Pérez who collaborated in this work, adding municipalities, departments, and assessing the precision of every locality. Many localities were duplicated, so we performed a homogenization of site names, which resulted in a reduction of the number of localities from 8,000 to 4,800. However, 300 sites are missing coordinates, although presently still being searched for.

Additions to the Darwin Database

In this period, we added 244 records from La Planada N ature Reserve sent by Jhon Jairo Calderon of the University of Nariño and 109 from the collection of Gorgona Island. The collection of La Planada is in good condition and now it is placed in the U. of Nariño. The majority of the collections were taken by Jorge Orejuela and Guillermo Cantillo and personnel of the reserve. The La Planada collection has mainly small passerines including hummingbirds, tanagers and flycatchers. In Gorgona, the collection is in poor condition owing to humidity and high temperatures; it has specimens from 1986, the majority from 1991, and in most cases of marine seabirds. We are grateful for the collaboration of the director of the park, Claudia Acevedo, the biologist Luis Chasqui and Gary Stiles.

Many people and projects have requested information from the Darwin Database, which demonstrates the utility and relevancy of the information. By January 31st 2005 we hope to have a Beta version of the database online for BioMap Alliance partners to review and approve, before a **final public release** date in February.

Andrea Morales took part in the Course of **MS Access** offered at CI-Colombia to representatives of all the current projects. The course was 40 hours of instructions between October 19 to November 10 2004.

The contract of **Loreta Rosselli** as Colombian Coordinator of the project BioMap finished on November 15 2004. Loreta is grateful to all the persons who collaborated to her during her participation in this important initiative.

BioMap Workshop

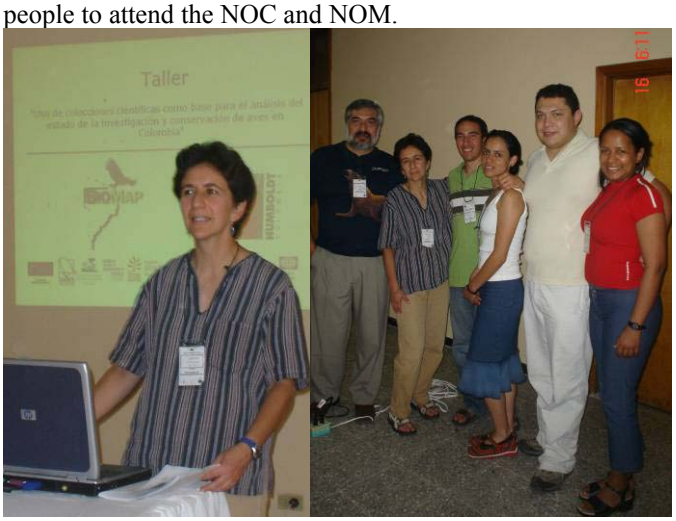
"Importance of scientific collections to assess research & conservation in Colombia"

Precedents

The workshop was planed from the outset as part of the final products for the Darwin Initiative by Project BioMap. Planning began in early 2004, for the workshop to be held at the 1st National Ornithology Congress (I NOC) and the XVII National Ornithological Meeting (NOM) where a large part of the Colombian ornithologists' community would meet. Project BioMap made a significant contribution to the event offering scholarships to support the assistance of many participants. It was decided to do the workshop in two parts one in the Congress and other one in the workshop to support equally the two meetings.

BioMap fellowships supporting NOC/NOM participants

In July 2004, BioMap announced the fellowships, which were directed to any student or professional, who had interest to participate in the I NOC and the XVII NOM, giving preference to those participants who had an oral presentation or written paper inscribed. The total of each fellowship was $250,000 distributed in half to pay the inscription costs to the NOC and NOM. Supporting individuals costs helped the assistance of people at both events as well as taking part in the two workshops by BioMap. BioMap supported a total of 24 people to attend the NOC and NOM.



Workshop agenda

Aim: "To establish a National Bird Research and Conservation Action Plan for Colombia"

A summary of talks can be found through:
www.biomap.net/noticias.htm

Day 1. " Collections in research"

Objective: To report on the state of bird collections in Colombia, and their current condition, gaps of information and uses of criteria of selection of places for collection, in order to attract attention on areas that need a major research efforts.

Activities of Friday, October 15th (14:00 – 18:00 hrs).

1. Introduction and presentation of the workshop methodology, by Loreta Rosselli.
2. Project BioMap activities, by Loreta Rosselli.
3. The Darwin Database, by Juan Carlos Rodríguez.
4. Available resources for research related to collections and bird sampling (collections, literature, observations), by Maria Angela Echeverry.
5. Criteria for the selection of areas to work in collections, by Ana Maria Umaña.
6. Colombian bird collections assessment; a) physical (problems, conditions), b) dates and localities (emphasis in gaps), c) Uses. By Diana Arzuza.
7. Bird species richness in Colombia: environmental controls and conservation, and other examples of uses of collections. By Juan Carlos Verhelst.
8. Presentation of topics for working groups. By Sergio Córdoba.
9. Working groups in four roundtables.
10. Presentation of results per working group.
11. Conclusions.

Day 2. " Colombian birds: where to protect?"

Objective: To identify gaps in bird conservation in Colombia based on collections.

Activities of Saturday, October 16th (16:00-19:00)

1. Introduction and presentation of the workshop methodology. Loreta Rosselli.
2. Criteria, objects and methodology of conservation. Sergio Córdoba and Claudia Múnera
3. Example of application of criteria "AICAS of the Valle del Cauca". Gustavo Bravo.
4. Study of case: Project BioMap information on threatened and endemic birds. Andrea Morales.
5. Analysis of omissions and priorities of conservation for Colombian threatened parrots. Jorge Velásquez.
6. Presentation of topics for the working groups. Loreta Rosselli.
7. Working groups in four roundtables.
8. Presentation of results per working group.
9. Conclusions.

The working groups during the two days were:

1) Chocó, Western Cordillera, and Pacific Ocean islands;
2) Caribbean Region and Caribbean Sea Islands;
3) Central Cordillera and Magdalena and Cauca valleys,
4) Eastern Cordillera, Orinoquia and Amazonia.

The working groups focused on the identification of key sites for research and conservation of birds in each region as well as the resources and outstanding needs in each area. The information was recorded in pre-determined formats. Each working group had a laptop computer to complete the forms, different maps with localities and collection effort of different groups of species provided by BioMap. Also we distributed on each table booklets with the program, copies of the presentations, and lists of museums and environmental entities of interest; Red Books of Birds of Colombia, CITES manuals and methodological manuals of GEMA methodologies for sampling published by IAvH.

Results

The workshop had the enthusiastic participation of 55 persons of 23 entities of different parts of the country. 136 key sites were identified for investigation and conservation (45 in the Central Cordillera/Magdalena & Cauca valleys, 26 in the Western Cordillera/Chocó/Pacific Ocean Islands, 40 in the Eastern Cordillera/Orinoquia/Amazonia and 27 in the Caribbean Region and islands).

Caribbean Region

In the Caribbean, the importance of major wetlands was highlighted, as well as the intense transformation and relative ease to access in the region. Principal entities participating included the University of Atlantico (Jorge Tadeo Lozano), bird groups and associations (Orniat, Fosin, universities groups), autonomous regional corporations, the national parks administration unit (Salamanca, Tayrona, Rosario Reefs, Providence, Macuira, Flamenco, Mono Hernández (between Sucre and Cordoba), Cienaga Grande, Sierra Nevada, Los Colorados), ecological groups, INVEMAR, and department and municipality governments. They considered important using IBAs, indigenous reserves, 10 national parks, RAMSAR sites, nature reserves, and conservation ex-situ. Equally it was considered important to fill the gaps of information in conservation, to advance legislative measurements that protect the mangrove forests, CONIF, to use the biogeographical information of BioColombia, and to raise funds for major research and environmental education programs.

They considered the crucial needs as: bibliography, to recover the studies of environmental impact made in the region and to evaluate its reliability, to produce and to recover non-published theses in universities, and to recover maps done by Marta Fandiño (U. Javeriana).

It was considered that the best way to canalize funding in a effective way might be across projects and creating alliances. Important themes include multidisciplinary and sanitary (migratory birds as possible vectors of viruses) projects. Another considered strategy is the participation of foreign researchers in projects in Colombia.

Western Cordillera and Pacific Region

In this region, the working groups noted the paucity of information about the region, despite its high degree of endemism and the difficulty of access into the region. Existing information has been produced mainly by non-governmental organizations together with efforts of Universities and Corporations. Among the entities and key resources were identified Fundación ProAves, the Universities of Valle, Nariño, and Cauca, the CVC, National Parks, the Pacific Ocean Research Institute, WWF, and Calidris. Projects as BioPacific and the Chocó-Manabí Conservation Corridor of Conservation International were considered as possible sources for funding and information.

Central Cordillera and Magdalena and Cauca valleys

In this region, it was noted that the exists a great quantity of threatened and restricted range species. Additionally, was pointed out that University of Antioquia, CorAntioquia and ProAves have played an important role in research and conservation in the region.

Eastern Cordillera, Orinoquia and Amazonia

In the east of Colombia, there are a variety of problems. The Eastern Cordillera is of concern as there are many threatened and endemic species in the northern region (e.g. Serranía de Perijá) and the highest upland areas that are largely deforested and fragmented. Conversely, the Amazon and Orinoquia region has relatively intact habitat, but the problem is the absence of information and difficulty of access. It was considered that it would be useful to prepare a list of the organizations that have jurisdiction in the zone and of funding institutions. In the Orinoquia CorpOrinoquía was named as a key institution, and the projects GEF Andes, and Project Orinoquia as possible funding opportunities. In the Amazonia, the corporations, National parks unit, and universities (Unitropica) were identified as key institutions. In general, research is very scarce in the region and there are few specimens and a lack of information, which in many cases is restricted to observation records.

It was thought that the main needs in the region are related to problems of public order and funding. For funding, the potential entities, depending on each project, are the corporations, the Environmental Action Fund, Conservation International and Dutch government. A possibility would be to use the abandoned research facilities to establish renewed scientific stations. Also it is important to be able to access information of foreign collections since there are few Amazonia collections in Colombia, especially from the Guiana region of eastern Colombia.

Alliances were considered the effective means to canalize support of activities in the region, particularly with indigenous groups. Possible funding sources include the Amazonian Cooperation Agreement (OTC), which will manage GEF resources.

Across Colombia, there is much information, but much of this is difficult to accessible as it remains in the form of unpublished documents with autonomous regional corporations, government institutions (e.g. MMA, IAVH), and individuals. In all regions, the need for resources to conduct field research and conservation was identified.

Discussion

None of the roundtable discussion groups finished within the time period allocated. However, participants circulated the format amongst members of the same group until November 15th to include additional information about publications, investigations, sites of interest, etc. Furthermore, the information would become available on the homepage of the National Bird Observers Network, in order to be complemented by a wider group of persons in the future.

First steps towards the National Bird Research & Conservation Action Plan

The conference stated the importance of an assessment of the actual status of the National Strategy for Bird Conservation, published in 2001, which was based on the collaboration of many Colombian ornithologists. Since its publication the strategy has not been evaluated and in the majority of cases it has not been used as a guide for direct conservation actions.

To assess the success in the strategy, concrete questions must be asked on whether the strategy was used at all. This workshop has gone a step further and identified and prioritized the specific conservation and research activities needed, at the spatial and temporal scale, to establish a first draft of the National Bird Research and Conservation Action Plan.

Discussion on scientific collection

During the workshop, a discussion on the importance and need for collecting was presented by Gary Stiles. The uses of the specimens and the tiny impact on populations was emphasized. In comparison to other natural and artificial sources of mortality (habitat loss), collecting in a controlled fashion does not threatened species. Rebeca Franke of National Parks Administration suggested that there was a potentially risk that any areas that were highlighted as gaps in knowledge would attract collecting without careful and specific objectives. Other participants thought that it is important to do collecting without specific objectives since it is difficult to predict what will occur in the future with each habitat/ site. Some collectors asked for arguments and literature of support to justify collections, to which the reading "Why must we continue collecting specimens of birds?" by Gary Stiles was highlighted (BioByte Issue #3). Gary offered to give additional references to anyone who requests it.

News from North America

In early August, the volunteer Sylvia Heredia (Colombian biologist) checked the database of Los Angeles County Museum (LACM). In Berkeley, Juan Luis Parra collaborated with the corroboration of some information of the collection digitized by BioMap previously.

Alvaro Espinel moved on from CI at the end of October 2004. We are enormously grateful to Alvaro for all his support and enthusiasm in all phases of the project. Alvaro continues collaborating with ideas in the final phase of BioMap.

News from Europe

The Darwin Fellows, Clara Isabel Bohórquez and Juan Carlos Verhelst, successfully completed their MSc in "Modeling, Monitoring and Management of the Environmental Change" at King's College (University of London) in the UK with the dissertations "Setting conservation priorities in Colombian Andean forests: problems and solutions to the geographical analysis" and "Bird species richness in Colombia: environmental controls and conservation" respectively. The MSc course lasted one year, the first semester of classes between September 2002 and January 2003, and the second semester of classes between January and May 2004, and the dissertation between May and September 2004.

Other News

The BioMap family continues growing! We give the welcome to William Salaman, son of Paul and Sara who was born on October 26th 2004. Congratulations!

Acknowledgements

The **BioMap team is extremely grateful** to all the directors, curators and staff of the visited collections as well as to the directives of the different institutions for their wonderful collaboration and hospitality. Many people and institutions supported us with accommodation and logistics in over 50 cities worldwide. The constant support of the administrative staff at Conservation International and ICN, National University of Colombia has been key to the whole process. **To all – THANK YOU very much!**

BioMap Diary

Activities to be completed in early 2005:

- Finalize locality geo-referencing.
- Finish revising the database.
- Perform first analyses of the information.
- Publish the Darwin Database.
- Finish and deliver the project final report.

BioMap Directive Committee

Workshop results:

Preliminary database for Colombian Bird Research and Conservation Action Plan

Priority localities for research and conservation of birds in Colombia

Summary of priority sites identified for the Colombian Bird Research and Conservation Action Plan (see completed table in www.biomap.net)

Mesa de trabajo	Sitio nombre	Departamento	Priori dad	importan cia (1-3)
Cord Central y Valles	Alicante	Antioquia	C	3
Cord Central y Valles	Amalfi/Anorí	Antioquia	C	3
Cord Central y Valles	Cuchilla Jardín	Antioquia	C	3
Cord Central y Valles	Farallones del Citará	Antioquia	I	2
Cord Central y Valles	Humedales de Nechí	Antioquia	C	3
Cord Central y Valles	Humedales de Yondó	Antioquia	C	3
Cord Central y Valles	Páramo de Sonsón y Rio Verde	Antioquia	C	2
Cord Central y Valles	Río Claro	Antioquia	I	3
Cord Central y Valles	Río Blanco	Caldas	I	3
Cord Central y Valles	Río La Miel y Cuenca del Río Samaná	Caldas	C	2
Cord Central y Valles	Selva de Florencia	Caldas	C	2
Cord Central y Valles	Parque Nacional Natural Puracé	Cauca	C	3
Cord Central y Valles	Madres Viejas y Humedales del Valle del Rio Cauca	Cauca/Valle	C	3
Cord Central y Valles	La Plata	Huila	C	3
Cord Central y Valles	La Cocha	Nariño	C	2
Cord Central y Valles	Bosques y Páramos de Genova y Alto Quindio	Quindio	C	1
Cord Central y Valles	Cuenca del Río Barbas/Bremen	Quindio	C	3
Cord Central y Valles	Cuenca del Río Roble	Quindio	C	3
Cord Central y Valles	Bosques del Oriente de Risaralda	Risaralda	I	2
Cord Central y Valles	Bosques del Carare	Santander	C	3
Cord Central y Valles	Serranía Yariguíes	Santander	C	1
Cord Central y Valles	Serranía de las Quinchas y Río Minero	Santander/Boyaca	I	1
Cord Central y Valles	Bosques secos del Norte del Tolima	Tolima	I	3
Cord Central y Valles	Cuchilla del Brasil, municip. de Ibagué y Anzoátegui	Tolima	I	3
Cord Central y Valles	Cuenca del Río Cuamo/Falan	Tolima	I	3
Cord Central y Valles	Cuenca Mayor Río Coello	Tolima	I	3
Cord Central y Valles	Cuenca Mayor Río Prado	Tolima	I	3
Cord Central y Valles	Cuenca Río Amoyá	Tolima	I	2
Cord Central y Valles	Humedales de Ambalema	Tolima	I	3
Cord Central y Valles	Planada	Tolima	I	2
Cord Central y Valles	Roncesvalles	Tolima	C	1
Cord Central y Valles	El Aguila	Valle del Cauca	I	3
Cord Central y Valles	Laguna de Sonso	Valle del Cauca	C	2
Cord Central y Valles	Páramo de Barragán	Valle del Cauca	I	2
Cord Central y Valles	Páramo del Duende	Valle del Cauca	I	2
Cord Central y Valles	Yotoco	Valle del Cauca	C	1
Cord Central y Valles	PNN Las Hermosas	Valle del Cauca/Tolima	I	1
Cord Central y Valles	Planadas Zona amortiguadoras Nevado del Huila	varios	C	1
Cord Central y Valles	PNN Nevados y zona amortiguación	Caldas/Quindio/Risar./Tolima	I	2
Cord Central y Valles	Bosques secos del Norte y Centro del Valle	Valle, Risaralda, Quindio	C	3
Corda Occidental-Choco	norte de la cordillera occidental, Paramillo	Antioquia, Córdoba,	I	1
Corda Occidental-Choco	Orquídeas, Vertiente occidental cord Occidental	Antioquia, Risaralda,	I	1
Corda Occidental-Choco	Isla Gorgona	Cauca	I	3
Corda Occidental-Choco	Munchique	Cauca	C	1
Corda Occidental-Choco	Cerros del Darién	Chocó	I	1
Corda Occidental-Choco	Golfo de Tribugá y Cupica	Chocó	I	2

Corda Occidental-Choco	Serranía del Baudó	Chocó	I	1
Corda Occidental-Choco	Sur del Chocó hasta delta del San Juan	Chocó	I	3
Corda Occidental-Choco	Bajo Atrato, zona cenagosa	Chocó/Antioquia	I	3
Corda Occidental-Choco	Alto de Pisones-Caramanta	Chocó, Antioquia, Risaralda	C	2
Corda Occidental-Choco	Paso Galápagos	Valle/Chocó	I	3
Corda Occidental-Choco	Chiles, Cumbal, Galeras y Azufral	Nariño	I	2
Corda Occidental-Choco	Cuenca del Río Güiza	Nariño	I	3
Corda Occidental-Choco	Ensenada de Tumaco	Nariño	I	3
Corda Occidental-Choco	Límite del Ecuador, Río Tapaje, Cuenca del río San Juan	Nariño	I	1
Corda Occidental-Choco	Piedemonte pluvial del sur de Nariño	Nariño	I	1
Corda Occidental-Choco	Planicie de Nariño (Valle del río Patía)	Nariño	I	2
Corda Occidental-Choco	Isla Malpelo	Valle	I	2
Corda Occidental-Choco	Alto y Medio Calima	Valle del Cauca	C	2
Corda Occidental-Choco	Bahía Málaga	Valle del Cauca	I	3
Corda Occidental-Choco	Enclave subxerofítico del Dagua	Valle del Cauca	C	3
Corda Occidental-Choco	Farallones de Cali y zonas de amortiguación (San Antonio)	Valle del Cauca	I	3
Corda Occidental-Choco	Serranía del Paraguas	Valle del Cauca	I	2
Corda Occidental-Choco	Costas del Sur del Valle/Cauca	Valle, Cauca	I	2
Corda Occidental-Choco	Desembocadura del Naya, Yurumangui e Isla Ají	Valle	I	3
Cord Eastern-Amazon	Trapecio amazonico	Amazonas/Caquetá/Putumayo	I	3
Cord Eastern-Amazon	Tarapacá, rio Putumayo	Amazonas	I	3
Cord Eastern-Amazon	Esteros de norte de Arauca	Arauca	I	3
Cord Eastern-Amazon	Páramo de Mamapacha	Boyacá	C	3
Cord Eastern-Amazon	Páramo La Rusia	Boyacá	C	3
Cord Eastern-Amazon	Sierra nevada del Cocuy	Boyacá	C	1
Cord Eastern-Amazon	Pisba	Boyacá-Casanare	C	2
Cord Eastern-Amazon	Orteguaza	Caquetá	I	3
Cord Eastern-Amazon	Caguinarí	Caquetá-Vaupés	I	3
Cord Eastern-Amazon	Cusiana	Casanare	I	3
Cord Eastern-Amazon	Parte baja de Casanare	Casanare	I	3
Cord Eastern-Amazon	Farallones de Gachalá	Cundinamarca	I	3
Cord Eastern-Amazon	Laguna de la Herrera	Cundinamarca	C	2
Cord Eastern-Amazon	Guainía, escudo guyanés	Guainía	I	3
Cord Eastern-Amazon	Perijá (incluyendo los Montes de Oca)	Guajira-Cesar	I	1
Cord Eastern-Amazon	Guaviare	Guaviare	I	3
Cord Eastern-Amazon	Territorio Nukak	Guaviare	I	3
Cord Eastern-Amazon	Serranía de Minas	Huila-Cauca	C	1
Cord Eastern-Amazon	Depresión de la Uribe	Huila-Meta, Caquetá	I	3
Cord Eastern-Amazon	Picachos	Meta	I	2
Cord Eastern-Amazon	Río Manacasías	Meta	I	3
Cord Eastern-Amazon	Serranía la Macarena	Meta	C	1
Cord Eastern-Amazon	Guamués (conexión La Cocha Putumayo)	Nariño-Putumayo	C	1
Cord Eastern-Amazon	Catatumbo	Norte de Santander	C	1
Cord Eastern-Amazon	Chinácota, valle seco de Pamplonita	Norte de Santander	C	3
Cord Eastern-Amazon	La Paya, medio Putumayo	Putumayo	I	3
Cord Eastern-Amazon	Sibundoy-Patascoy	Putumayo	C	2
Cord Eastern-Amazon	Valle del Sibundoy	Putumayo	C	3
Cord Eastern-Amazon	Cañón del Chicamocha	Santader-Boyacá	C	1
Cord Eastern-Amazon	Guanentá, Cachalú, Costilla de Fara	Santander	C	1
Cord Eastern-Amazon	Mesa de los Santos	Santander	C	2
Cord Eastern-Amazon	Tamá	Santander	I	1
Cord Eastern-Amazon	Serranía de los Yariguíes	Santander-Arauca	C	1
Cord Eastern-Amazon	Bajo Vaupés y bajo Caquetá (Caparú)	Vaupés-Caquetá	I	3
Cord Eastern-Amazon	Tuparro	Vichada	I	3
Cord Eastern-Amazon	Alto Orinoco	Guainía, Vichada	I	3
Cord Eastern-Amazon	Zona donde termina amazonia biogeografica	Guainía, Vichada	I	2
Cord Eastern-Amazon	Zonas fronterizas del oriente del país	Guainía, Vichada	I	1
Costa Atlántica	Zona bananera Carepa - Turbo, Apartadó, Urabá	Antioquia	C	3
Costa Atlántica	Sistema montañoso del Cerro de la Vieja	Atlántico	C	2

Costa Atlántica	Ciénaga de Zapatosa y complejo cenagoso (Cuerpos de agua del sur del dpto. Magdalena)	Cesar, Bolívar, Santander	C	3
Costa Atlántica	Sierra Nevada de Santa Marta	Cesar, Magdalena, Guajira	C	1
Costa Atlántica	Cuenca del río San Jorge (Cienaga de Ayapel, Porro, Cintura)	Córdoba	C	2
Costa Atlántica	Cuenca media del Río Sinú Betancí, ciénaga grande del bajo Sinú	Córdoba	C	2
Costa Atlántica	Bahía de Tucacas y Cosinetas	Guajira	C	3
Costa Atlántica	Bahías de la Guajira	Guajira	C	1
Costa Atlántica	Complejo de Humedales Costeros de La Guajira (Laguna Grande, Navío Quebrado, La Raya, El Pájaro, Musichi, Cardón, Soruipa, Umakaha, Carrizal, Bahía Portete, Honda y Hondita)	Guajira	C	1
Costa Atlántica	Desierto de la Guajira	Guajira	C	3
Costa Atlántica	Serranías de la Alta Guajira (Cocinas, Jarará, Makuira)	Guajira	I	1
Costa Atlántica	Cerro Tacarcuna entre Panamá y Colombia	Choco	I	1
Costa Atlántica	Bosques del sureste del depto. del Magdalena	Magdalena	C	2
Costa Atlántica	San Andrés y los Cayos	San Andrés	C	2
Costa Atlántica	Golfo de Morrosquillo	Sucre	C	3
Costa Atlántica	San Bernardo del Viento	Sucre	C	3
Costa Atlántica	Ciénaga de la Caimanera	Sucre	C	3
Costa Atlántica	Confluencia del Magdalena y Cauca	Bolívar	C	3
Costa Atlántica	Desembocadura de los ríos Magdalena y Cauca	Atlántico	C	3
Costa Atlántica	Montes de María (Colosó, serranía de San Jacinto)	Sucre	I	3
Costa Atlántica	Páramos en la Sierra Nevada	Magdalena, Cesar, Guajira	I	1
Costa Atlántica	Sabanas de Sucre y Córdoba	Sucre, Córdoba	C	3
Costa Atlántica	Serranía de San Lucas	Bolívar	I	1
Costa Atlántica	Urabá en Sasardi	Antioquia	C	3

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