



COLOMBIA: THE WORLD'S BIRDIEST COUNTRY

At just one-seventh the area of Australia, Colombia boasts over twice as many bird species. Colombian-born **Eduardo Gallo** guides us around the world's birdiest country.

A country's bird list is far from being an immutable figure. The number depends on whether vagrant species are included, as well as what taxonomical list is being followed. But it is generally agreed by bodies such as BirdLife International and the American Ornithologists' Union that Colombia, with a bird list topping the 1,800 mark (nearly 20 per cent of the world's bird species), hosts the greatest diversity of birds of any country in the world, edging out such species-rich countries as Peru, Brazil, and Indonesia.

But what is behind this remarkable diversity?

Northern South America, of which Colombia is a substantial part, has an astonishingly high concentration of bird species including many representatives of cosmopolitan bird families such as ducks, eagles, pigeons, cuckoos, and swallows—plus a huge range of Neotropical birds. The Neotropics is the zoogeographical region with the highest number of bird families not found anywhere else in the world and to an Australian border, Colombia's bird list is peppered with unfamiliar and exotic-sounding birds—tinamous, screamers, Hoatzins, trumpeters, Oilbirds, potoos, jacamars, puffbirds, toucans, antbirds, antpittas, and tapaculos—to name a few.

This diversity can be attributed to the intricate Colombian geography in which the Andes play a prominent role. This mountain system, the longest on Earth, branches out into three ranges on its path through Colombia, dissecting the country dramatically between the extensive plains of the Amazon and Orinoco basins to the east and the lowlands along the Pacific and Caribbean coasts to the west. The Western Cordillera is the lowest, while the Central and Eastern Cordilleras have snowy peaks over 5,000 metres in elevation. These cordilleras have corresponding valleys between them, while to the north of the Andes across the Caribbean lowlands, the isolated Santa Marta Massif reaches an altitude of almost 6,000 metres. Additionally, two oceans sprinkled by archipelagos surround Colombia, the Atlantic to the north and the Pacific to the west.

This complex topography allows for a diverse array of habitats. For instance, cloud forest develops on the windward slopes of the mountains, whilst the leeward versants (slopes) tend to be drier due to rain shadows. The ridges of the Andes, frequently exposed to cold temperatures and gusty winds, are dominated by moorlands known as *Páramos*. To the east of the Andes, extensive grasslands and rainforest roll over vast plains, whereas to the north dry forest and desert are the norm.

Historical processes over a geological time scale have also driven species evolution. For example, sea level fluctuations involving the flooding of vast areas of the Amazon Basin have resulted in the long-term isolation of sections of rainforest as islands—favouring species diversification. The uplift of the northern Andes promoted further diversification of mountainous bird species from areas further south, as well as the colonisation by lowland species, inducing more speciation. Subsequent glacial pulses in this mountain system expanded and contracted the cloud forest, stimulating further evolutionary processes. Furthermore, the uplift of the Andes created speciation in lowland species, as the western and eastern lowlands were separated by insurmountable barriers. In addition to these *in situ* processes, many Nearctic birds, such as thrushes and pipits, colonised South America via what is now Colombia, as Central America and South America were joined together around three million years ago.

This combination of spatial complexity, ecosystem diversity, and historical events, has translated into high levels of species diversity. For instance, whilst bird species occurring in the inter-Andean valleys and the Caribbean lowlands are generally quite similar to those occurring more widely elsewhere in the lowlands of the Neotropics, the Santa Marta massif and the Andes have resulted in distinctive species assemblages with high levels of endemism. Likewise, there is a turnover of species between the lowlands of the Pacific coast and those of the Amazon.

The Andes is perhaps the main geographic feature adding bird species to Colombia. This mountain system presents higher diversity of bird species per unit of area than the famed Amazon region. Whilst the versants of each cordillera contain quite distinctive sets

Colombia's secret to hosting almost 20 per cent of the world's bird species—a complex topography that supports a vast array of different habitat zones.

Opposite, clockwise from top left:

Purple-throated Woodstar.
Photo by Bruce Thompson

Swallow-tailed Kite.
Photo by Juan José Arango

Golden Tanager.
Photo by Bruce Thompson

Andean Cock-of-the-rock.
Photo by Christopher Calonje

Horned Screamer.
Photo by Christopher Calonje



of species, there is also a marked replacement of species at different elevational belts. For instance, the diversity of species within the genus *Tangara*, which includes the Flame-faced Tanager, peaks at mid-elevations. These are typically replaced by species within different genera at higher elevations, such as the Hooded Mountain-Tanager, Scarlet-bellied Mountain-Tanager, and Golden-crowned Tanager.

These mountains present an idiosyncratic bird assemblage. For example, birds in the Andes have a higher representation of nectarivorous species, in particular hummingbirds, than in the lowlands. Moreover, many species occurring here are restricted to the highlands, such as the Torrent Duck, Yellow-eared Parrot, Golden-headed Quetzal, Andean Cock-of-the-rock, and Golden Tanager. Even typical Neotropical groups such as the toucans, perhaps better known for their lowland representatives, have analogous species in the highlands, like the Plate-billed and Black-billed Mountain-toucans, which unlike their lowland counterparts have blue body plumages.

To the east of the rugged Andes, the Amazon rainforest may seem largely uniform, however, on closer inspection this proves to be illusory. For instance, soil fertility generally declines eastwards away from the Andes, hence more complex and lush forest grows closer to this mountain system, whereas forest growing closer to the border with Venezuela and Brazil is not as luxuriant.

But just as the forest is not homogenous, so too bird species in the Amazon are far from being uniformly distributed, (bird diversity slightly declines eastward within this region of Columbia). Additionally, while some species, such as the Channel-billed Toucan, are widespread from west to east, others, like the Brown-rumped Foliage-gleaner, are restricted to the forest adjacent to the Andes foothills, and birds such as the Barred Tinamou, Green-tailed Goldenthrout, Chestnut-crested Antbird, and Azure-naped Jay keep to the easternmost forest.

Flooding regimes also shape different forest types even within relatively smaller regions of the Amazon. There are broadly two types of rivers in this basin, white-water and black-water. White-water rivers, such as the Amazon, primarily flow off the Andes and through sediment-rich plains, which results in high loads of nutrients making them murky. Conversely, black-water rivers, such as the Rio Negro, flow off mountains within the Guiana Shield with ancient substrates that yield virtually no sediments and through areas with quartz-rich soils. This feature results in black tea-looking waters loaded with tannins leached from leaves. Hence, some forests are never flooded, and are known as *terra firme* forest, whereas others are seasonally flooded, and are known as *várzea* forest if flooded by white-water rivers and *igapó* forest if flooded by black-water rivers. These different hydrological processes affect soil conditions, which in turn create different types of forest.

Different assemblages of bird species tend to occur in forests subject to different flooding regimes. For instance, the

Tawny-bellied Screech-owl, Black-faced Antbird, and Blue-crowned Manakin are more common in *terra firme* forest. By contrast, the American Pygmy-kingfisher, White-bearded Hermit, and Spot-breasted Woodpecker are more common in *várzea* forest. Other species are more common in *igapó* forest, such as the Ferruginous Pygmy-owl, Green-and-rufous Kingfisher, Black-chinned Antbird, and Yellow-crowned Manakin. At the other end of the spectrum are species that move across the landscape from one forest type to another (following feeding opportunities), such as the Blue-and-Yellow Macaw and Scarlet Macaw.

The plains north of the Amazon rainforest, known as ‘The Llanos’, are tropical savannahs where waterbirds dominate the landscape. This region, part of the Orinoco basin, harbours vast grasslands immersed in a landscape with riparian forests, as well as permanent and ephemeral wetlands. Extensive annual flooding is common here, so waterbirds disperse and congregate accordingly. During the dry season, the remaining waterholes provide great opportunities to see some of the most charismatic species, such as the Scarlet Ibis, Roseate Spoonbill, Orinoco Goose, Wood and Maguari Storks, and Jabiru (not to be confused with the Black-necked Stork occurring in Australia).

West of the Andes is a relatively small region that adds a significant number of bird species to the Colombian list. Precipitation here can reach over 10,000 millimetres per year, one of the highest rates of rainfall in the world. This rainforest, part of the Chocó Bioregion, lies on a narrow belt of lowlands along the Pacific coast which abruptly ascend to the Western Cordillera. Isolated from Amazonia, this region harbours many species that are restricted to the western side of the Andes. Some are endemic to this area whereas others also occur more widely through Central America. Birdlife here features some spectacular species, such as the Banded Ground-cuckoo, Five-coloured Barbet, Glistening-green Tanager and Long-wattled Umbrellabird, a counterpart of the Amazonian Umbrellabird.



Geographical changes over many millennia have provided the birds of Colombia with a diverse range of habitats.

From top:

Map showing the main mountain ranges of Colombia.

White-whiskered Puffbird. Photo by Bruce Thompson

From top:

A noisy, inquisitive bird, the Crimson-rumped Toucanet favours the humid montane forests of Colombia.

The Hoatzin has developed a foregut fermentation system, which allows it to get valuable calories from highly fibrous leaves—and releases a stench similar to a herd of cows.

A female Masked Trogon, one of ten species of Trogon found in Colombia.

Photos by Christopher Calonje

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Beyond the mainland, many species of seabirds soar over Colombian waters. One of the seabird strongholds is Malpelo, a steep oceanic island 380 kilometres west of the Pacific Coast surrounded by several islets. Numerous seabird species occur here, including Masked and Red-footed Boobies. However, the most impressive feature of this island is the breeding colony of the Nazca Booby, which with over 24,000 individuals is the largest breeding colony of this species in the world.

The birdlife of Colombia does not only consist of resident species—many migratory species, predominantly from Northern Hemisphere breeding grounds, provide a great spectacle when they visit during the northern winter. For instance, the Blackburnian Warbler, American Redstart, and Canada Warbler often flutter along mossy branches, seasonally adorning the montane forests with their colourful plumages. These birds are part of the family of New World Warblers, which along with shorebirds, comprise the most prominent groups of migratory species here.

But if this wealth of bird species is not striking enough, the advent of new research tools, and an invigoration of ornithological study in Colombia, has seen twelve species new to science described in

the country since the 1990s. While some of these species have been discovered in remote regions, like the Gorgeted Puffleg, which was found on an isolated ridge of the Western Cordillera, others have been discovered in places close to large settlements—the Antioquia Wren was detected in close proximity to the two million people who inhabit the city of Medellín.

The stunning bird diversity of Colombia provides an incredible opportunity for birdwatchers to witness one of the apogees of avian evolution on earth. While some magnificent birds, such as the Toucan Barbet, are often hidden along winding dirt roads far from civilisation, many other equally amazing species like Andean Motmots and Green Jays, as well as a myriad of hummingbird and tanager species, can easily be spotted close to some of the main cities. Indeed, if you ever plan to visit Colombia, don't be too concerned about where to go birding, for this truly is the world's birdiest country.

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Further reading

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Colombian Bird Fair

Reflecting the recent surge of interest by Colombians in their birdlife, the first Colombian Bird Fair was held in the city of Cali in February 2015. Promoting bird tourism for both a local and international market with the aim of supporting bird conservation, there is possibly no better introduction to Colombian birding. To find out more about the 2016 Colombian Bird Fair, visit www.colombiabirdfair.org

Above:

The only primarily blue bird in its family, the Golden-naped Tanager forages for fruit, nectar and insects in the forest canopy. Photo by Bruce Thompson