

ORNITOLOGIA NEOTROPICAL 23: 1–8, 2012  
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## A DECADE OF PROGRESS (2001-2010): OVERVIEW OF DISTRIBUTIONAL RECORDS OF BIRDS IN MAINLAND ECUADOR

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Resumen. – Desde la publicación de *Aves del Ecuador* (2001), el conocimiento sobre la historia natural y distribución de las aves del Ecuador ha aumentado considerablemente, a juzgar por el número de publicaciones. En esta nota revisamos el progreso del conocimiento sobre la distribución de las aves del Ecuador continental a partir de 2001, dada la importancia de comprender mejor los patrones de distribución de la avifauna tanto espacial como temporalmente. En esta década han aparecido 80 publicaciones con nueva 465 nuevos registros de distribución, 50% de ellos publicados en *Cotinga* y un porcentaje similar por autores residentes. Se incluyen 12 especies nuevas para el país y 74 especies globalmente amenazadas, pero apenas 31% de registros provienen del sistema nacional de áreas protegidas, mostrando un nivel deficiente de conocimiento sobre sus avifaunas. A más de explorar regiones poco conocidas, como la mayoría de las grandes áreas protegidas, recomendamos expandir el enfoque de las publicaciones hacia análisis en un contexto biogeográfico.

**Abstract. – A decade of progress (2001-2010): overview of distributional records of birds in mainland Ecuador.** – Since the publication of *Birds of Ecuador* (2001), knowledge about natural history and distribution of the birds of Ecuador has increased notably, as suggested by the increasing number of publications. In this note, we review progress in knowledge about bird species distribution in mainland Ecuador since 2001, due to the relevance of better understanding spatial and temporal species' distributional patterns. During the last decade, 80 publications appeared, contributing 465 new distribution records; 50% were published in *Cotinga* and resident ornithologists authored a similar percentage. 12 new country records and information on 74 globally threatened species is added, but only 31% of records were obtained within the national protected areas network, indicating poor knowledge about their avifaunas. Besides exploring deficiently known areas, as Ecuador's largest protected areas, we recommend undertaking more comprehensive analyses of new distribution information on biogeographic contexts.

**Key words:** Distribution, current knowledge, new records, range extensions, Ecuador.

## INTRODUCTION

Since the recent publication of *Birds of Ecuador* (Ridgely & Greenfield 2001), Ecuadorian ornithology entered a new phase, characterized by a considerable increase in numbers of publications (Freile *et al.* 2006). Every year, new data on Ecuadorian birds is published, particularly about breeding biology (Greeney *et al.* 2008) and species distributions (Carrasco *et al.* 2008).

The *Birds of Ecuador* accrued a large amount of distributional information from literature, museum specimens, and unpublished data. Fairly accurate range maps in volume II and detailed distribution accounts in *volume I* suggested that the distribution of birds in mainland Ecuador was well understood. Nonetheless, new country records, latitudinal range extensions, and new altitudinal reports were continuously published since 2001 (López Lanús 2001), indicating that this is not the case.

In this paper, we present an overview of current knowledge on bird species distribution in mainland Ecuador (*i.e.*, excluding the Galapagos Islands) after a decade of continuous progress. This revision is particularly relevant for threatened and poorly known species, as well as for understanding ongoing distributional changes due to deforestation and climate change, even for common and widespread species. Summarizing and analyzing a decade of new data on species distribution will allow us to further identify areas and/or taxonomic groups that have been overlooked and need more attention.

## METHODS

We compiled new publications on distribution of Ecuadorian birds as they appeared in serial peer-reviewed journals from late 2001 through late 2010. With these records we built a database that included: authors, year

of publication, journal, species, record type (specimen collected, observation, audio recording, photograph), record category (new country record, altitudinal extension, latitudinal or longitudinal extension, new locality), province, biogeographic region, threat status (global and national), endemism, and certainty of record. Additionally, we included two references (Krabbe *et al.* 1997, Coopmans & Krabbe 2000) apparently overlooked by Ridgely & Greenfield (2001).

Further we compiled records presented in non peer-reviewed formal publications (*e.g.*, Pitman *et al.* 2002) as well audio publications (Moore *et al.* 2009). Finally, we review updated records published by Ridgely & Greenfield (2006) in the Spanish version of the field guide. Although this information contributes to our further understanding, it was not used in quantitative analysis, as it is not refereed.

Records published in journals were quantitatively analyzed according to year of publication, journal, authors, record category, species threat status, biogeographic region, protected areas, and species detectability. Further, a numerical comparison in numbers of papers published in previous decades was performed using information published by Freile *et al.* (2006).

## RESULTS AND DISCUSSION

We compiled 80 journal publications appeared in 18 refereed and non-refereed sources that cover 465 new distribution records. Specific results were as follows:

*Journals and authors.* Records were published in 14 journals. Cotinga had the largest number of papers (N=40, 50%), followed by the next three journals having four to eight times less publications. Of the 40 papers in all journals excluding Cotinga, 11 (14%) appeared in *Bulletin of the British Ornithologists' Club*, 7 (9%) in *Ornitología Neotropical*, 5 (6%) in *Checklist*, 3 (4%) in *Boletín Sociedad Antio-*

queña de Ornitología, 2 each (3%) in Wilson Journal of Ornithology and Bird Conservation International, and the remaining 7 papers in seven journals.

Regional journals have played an important role in the development of ornithology from a national perspective, but there is no Ecuadorian ornithology journal to date. The creation of such a local journal is necessary, as it will encourage both amateur and professional ornithologists to publish their observations and research results, in a country with yet many more investigations to be pursued.

*Years of publication.* Number of publications increased threefold from 2001-2004, and attained its highest peak in 2008, followed by a decrease in 2010 at similar levels as those in the beginning of the decade (Fig. 1.). Higher numbers in 2008 were caused by the publication of an Ecuadorian special section in Cotinga, honoring the late Paul Coopmans, which comprised 15 papers on several subjects, including five papers on species distribution.

*Authors.* Papers were authored by resident birders and ornithologists in 40 cases (50%), by non-residents in 18 (22.5%) and by a combination of resident/non resident in 22 cases (27.5%), including the two pre-2001 papers. Amongst 67 resident authors, 52 were Ec-

uadorians. Interestingly, 55 (69%) of papers were authored or coauthored by 10 authors, of which seven reside in the country and the remaining three used to reside in Ecuador, at least partially.

Average number of Ecuadorian ornithologists actively publishing new ornithological findings is higher than previous decades (Freile 2005). However, it should be noted that many publications are produced by a handful of resident authors, reflecting a potential low recruitment of new ornithologists. Cooperative work between national and non-national Ecuadorian citizens, along with a seemingly increasing number of international ornithologists residing in Ecuador, has further enhanced in-country ornithology.

*New country records.* 12 new country records have been published in refereed journals (Table 1). On the contrary, one paper confirms that previous Ecuadorian records of Cinereuos Becard (*Pachyrampus rufus*) were incorrect (Janni & Pulcher 2007). Other 12 species were reported in non-refereed sources: eight species in Ridgely & Greenfield (2006), and one each in Pitman *et al.* (2002), and Moore *et al.* (2009). New country records are still been found; seven new records were published by Haase (2011) and others will be published in due course.

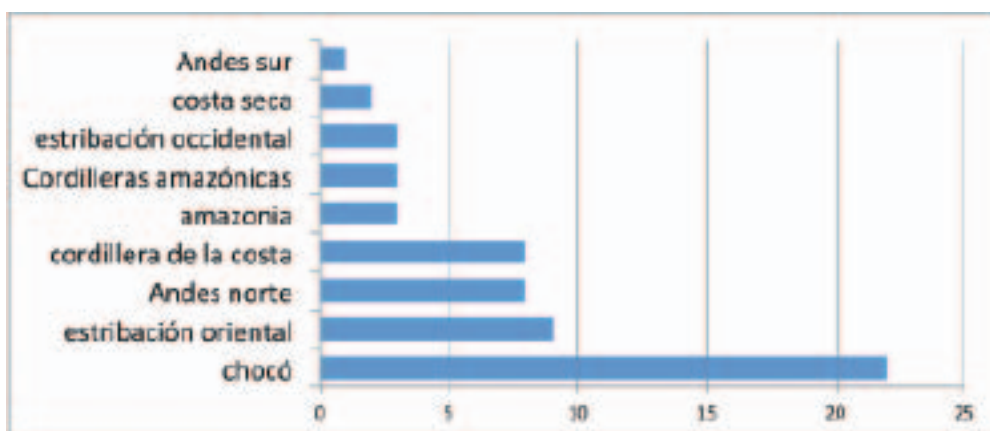


FIG. 1. Number of publications on the distribution of birds of Ecuador during the last decade.

TABLE 1. Summary of new country records published since the *Birds of Ecuador* (Ridgely & Greenfield 2001).

Species	Source	Locality (Province)
<i>Tinamus osgoodi</i>	Pitman <i>et al.</i> 2002	Sur Pax (Sucumbíos)
<i>Macronectes giganteus</i>	Ridgely & Greenfield (2006)	Salinas (Santa Elena)
<i>Syrigma sibilatrix</i>	Mena-Valenzuela & Jahn (2003)	Asociación El Puma (Orellana)
<i>Limnodromus scolopaceus</i>	Putnam <i>et al.</i> (2009)	Colta (Chimborazo)
<i>Heliangelus regalis</i>	Krabbe & Alhman (2009)	Nangaritza (Zamora Chinchipe)
<i>Leucippus taczanowskii</i>	Ridgely & Greenfield (2006)	Zumba (Zamora Chinchipe)
<i>Furnarius leucops tricolor*</i>	Krabbe (2004)	Unsuants (Morona Santiago)
<i>Hylexetastes stresemanni</i>	Moore <i>et al.</i> (2009)	Cuyabeno (Sucumbíos)
<i>Grallaria rufocinerea</i>	Nilsson <i>et al.</i> (2001)	Santa Bárbara (Carchi)
<i>Grallaricula ferrugineipectus</i>	Ridgely & Greenfield (2006)	Utuaña (Loja), Toisán (Imbabura) and Pululahua (Pichincha)
<i>Hemitriccus minimus</i>	Álvarez-Alonso & Whitney (2003)	Kapawi (Pastaza)
<i>Knipolegus signatus</i>	Navarrete <i>et al.</i> (2004)	Condor Mirador (Zamora Chichipe)
<i>Tumbezia salvini</i>	Athanas <i>et al.</i> (2009)	Zapotillo (Loja)
<i>Macbetornis rixosa</i>	Ridgely & Greenfield (2006)	Coca (Orellana)
<i>Myiarchus tyrannulus</i>	Ridgely & Greenfield (2006)	Zumba (Zamora Chinchipe)
<i>Vireo masteri</i>	Jahn <i>et al.</i> (2007)	Alto Tambo (Esmeraldas)
<i>Anthus cervinus</i>	Brinkhuizen <i>et al.</i> (2010)	Río Verde (Esmeraldas)
<i>Sporophila intermedia</i>	Ridgely & Greenfield (2006)	Carolina (Imbabura)
<i>Emberizoides berbicola</i>	Ridgely & Greenfield (2006)	Zumba (Zamora Chinchipe)
<i>Wilsonia pusilla</i>	Solano-Ugalde <i>et al.</i> (2007)	Mindo, Paz de las Aves (Pichincha), Catamayo (Loja)
<i>Dendroica caerulescens</i>	Martin <i>et al.</i> (2004)	Cosanga (Napó)

*Range extensions: latitudinal and altitudinal.* A total of 410 records contribute with new information on altitudinal, longitudinal or latitudinal species' distribution ranges. 230 records (56%) are increases in the upper altitudinal limit, contrasting with only 12% of downward altitudinal extensions. These range shifts might be associated with global climate change as has been documented for other taxonomic groups in tropical mountains (Chen *et al.* 2009, Pounds *et al.* 2009). The remaining 32% of records pertain to extensions in latitude and longitude. However, several new records extend currently known ranges in small scales, not being highly relevant from a

biogeographic point of view. Further, papers are only presenting new records but not discussing them in biogeographic contexts (Álvarez-Alonso & Whitney 2003, Latta *et al.* 2011).

A dozen papers published since Ridgely & Greenfield (2001) present information gathered before 2001, not included in that book. Likely, the dissemination of these data was triggered by the publication of the *Birds of Ecuador*. A minority of papers (12%) dealt with several species (10-48), with 56% papers dealing with a single species. 11% of papers resulted from intensive research at a single locality, while the remaining are mainly anecdotic observations.

Range extensions reported during this decade suggest that even in a small and relatively well-known country as Ecuador, exploration is still insufficient. It also suggests that more intensive geographic surveys are needed for a better understanding of species distribution in the country.

*Biogeographic regions and accessibility.* 37% of papers deal with birds of the Choco Endemic Bird Area (*sensu* Stattersfield *et al.* 1998), followed by the Tumbesian Bioregion with 16% of the publications. Both regions are rich in endemism, wherein research has been identified as an urgent action due to the high levels of habitat loss (Stattersfield *et al.* 1998). Moreover, both regions are reported as the least known—in terms of numbers of publications, along with the Southern Andes (Freile *et al.* 2006). The Eastern Andes and Northern Andes, with 14 and 13%, respectively, are next. Finally, the Amazon Lowlands, Isolated Amazonian Cordilleras and Southern Andes have lowest number of publications.

As reported by Freile *et al.* (2006), knowledge about the avifauna of mainland Ecuador's biogeographic regions is still deficient. The increase in numbers of publications for Choco and Tumbesian regions reflect a growing effort to survey remaining natural areas. On the contrary, lower number of publications on the Eastern Andes, Southern Andes and Amazonian Cordilleras suggests that ornithologists are not venturing away from accessible areas, as some of the most remote locales in Ecuador are located in these regions.

In general, most new records come from areas that were previously studied, including accessible sites previously feared as well known, but proven to be far from being “completely” surveyed (Freile 2008). There are with few notable exceptions of expeditions to unexplored areas only recently being conducted (Jahn 2008, Arcos-Torres & Solano-Ugalde 2008). New roads and improvements to existing ones have helped to continue exploring

new areas, some of which have resulted in the discovery of species new to the Ecuador's avifauna (Jahn *et al.* 2007).

*Threatened species.* A total of 74 new distribution records—i.e. not full papers, but individual records—on globally red list species were published (BirdLife International 2011). These include: 1 for a critically endangered, Black-breasted Puffleg (*Eriocnemis nigrivestis*); 1 for a data deficient species, Spot-fronted Swift (*Cypseloides chieriei*); 9 for endangered species—two of them for Esmeraldas Woodstar (*Chaetocercus berlepschi*); 35 for vulnerable species—four of them for Chestnut-bellied Cotinga (*Doliornis remseni*); and 28 for near threatened species—five of them for Imperial Snipe (*Gallinago imperialis*). A similar total number was published for Ecuador's red list species (Granizo *et al.* 2002), divided as follows: 43 for vulnerable species, 18 for endangered, 10 for near-threatened, 2 for data deficient and 1 for critically endangered. Records of threatened species only represent a 16% of all published records, reflecting poor knowledge on these globally important species, but also the fact that these species are less-frequently found.

*Protected areas.* 144 records (31%) come from 21 nationally protected areas, of the 45 areas currently protected by Ecuador. For most protected areas, information was compiled at a single locality, published in a single paper and contains mostly anecdotic observations (Freile 2008). Studies by Pitman *et al.* (2002) and Alverson *et al.* (2008) are the most intensive surveys from a number of sites within protected areas. In fact, Pitman *et al.* (2002) research and lobbying made afterwards resulted in the creation of Cofan-Bermejo Ecological Reserve. Information from protected areas is scanty and species inventories are very far from complete (Freile & Rodas 2008).

*Record type.* Of 465 records reported, 211 (45%) pertain to observations only; i.e., lack any supportive evidence (specimen, photographs, recordings, mist-netting), including

four new country records (Mena-Valenzuela & Jahn 2003, Ridgely & Greenfield 2006, Solano *et al.* 2007) and information on endangered species. Even though it is not always possible to document bird records accurately, increasing access to digital photography and audio recording are important aids. Likewise, publishing new field information or reporting it to a bird records committee are highly relevant for validating undocumented records. The Comité Ecuatoriano de Registros Ornitológicos (Ecuador's Bird Records Committee) was recently established and will begin publishing yearly reports since 2012.

## ACKNOWLEDGEMENTS

This paper was prepared under the moneyless auspices of Imaymana and Numashir foundations. Thanks to all colleagues who have compiled and published new information since the *Birds of Ecuador*, and to R. S. Ridgely and P. J. Greenfield for triggering a new stage in Ecuadorian ornithology. Comments by an anonymous reviewer are greatly appreciated. We dedicate this paper to Marimba and Mamba, for their unconditional support.

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