



EXPERIENCES OF SURVEYING URBAN BIRDS DURING THE ANTHROPAUSE IN COLOMBIA

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Abstract · The COVID-19 lockdowns set a singular opportunity to perform scientific research in idle cities. The expected changes in urban ecology led us to conform a community composed of several volunteers which, following standardized protocols, conducted structured bird surveys across Colombia. We describe the process and experience of this initiative, conducted between 30 March and 30 June, 2020, and discuss recommendations to apply to future projects. The volunteer-based survey that we organized began with 93 collaborators in 40 urban centers, but ended with just 45 collaborators from 22 urban centers. Some issues that probably explain the drop in collaborators are commented on. This exercise was successful, gathering over 75,000 bird records of at least 250 bird species.

Resumen · Experiencias de tomas de datos de aves urbanas durante la antropopausa en Colombia

Las cuarentenas debidas al COVID-19 brindaron una oportunidad singular para realizar investigación científica en ciudades inactivas. Debido a los cambios esperados en la ecología de las ciudades, decidimos conformar una comunidad de colaboradores que, siguiendo protocolos estandarizados, tomó datos de aves en Colombia. Describimos el proceso y la experiencia de esta iniciativa, realizada entre el 30 de marzo y el 30 de junio de 2020, y damos algunas recomendaciones para aplicar a futuros proyectos. La comunidad comenzó con 93 colaboradores en 40 centros urbanos, pero terminó con solo 45 colaboradores de 22 centros urbanos. Se comentan algunos factores que probablemente explican la disminución de colaboradores. Este ejercicio fue exitoso, ya que compiló más de 75,000 registros de al menos 250 especies de aves.

Key words: Bird surveys · COVID-19 lockdown · Monitoring biodiversity · Urban ecology

INTRODUCTION

Throughout history, anthropogenic activity in the environment has increased, generating a major force of change on Earth's ecosystems (Dirzo et al. 2014, Williams et al. 2015). However, as a consequence of the COVID-19 pandemic, billions of people worldwide sheltered-in-place for several months during 2020. This scenario altered human activities in ways that had never been seen before, leading to what has been coined as the "anthropause" (Rutz et al. 2020) and resulting in a reduction of human activity in cities (Google 2020, Ruktanonchai et al. 2020). Secondary to all the devastating effects that the pandemic has had in relation to human health and economy, COVID-19 lockdowns have also engendered a singular opportunity to perform scientific research in idle cities, such as the effects of human activity on wildlife (Rutz et al. 2020). For instance, scientists have found a reduction in noise and have reported drops in air pollution (Dutheil et al. 2020, Gibney 2020, Venter et al. 2020), suggesting a shift in the ecology of cities during lockdowns. Obtaining data on urban bird species during this period could be instrumental to further evaluate ecological questions. Such data can be obtained conducting standard scientific research in a regional scale by participation of volunteers from different cities. This way of obtaining data can be considered a citizen science initiative from an instrumental perspective (Eitzel et al. 2017), but we did not use such framework to refer to this work because "citizen science" has several definitions and the experience we report here applies just to one of them.

Studies have rapidly indicated biodiversity responses to the anthropause both in urban and non-urban areas, but have mainly focused on exploring the relationships between lockdowns and wildlife appearances in unexpected sites (Rutz et al. 2020). Because birds are bioindicators of environmental changes (Pollack et al. 2017) and can be surveyed under lockdown conditions, some intriguing yet unanswered urban ecology questions could be addressed using data from avian surveys giv-

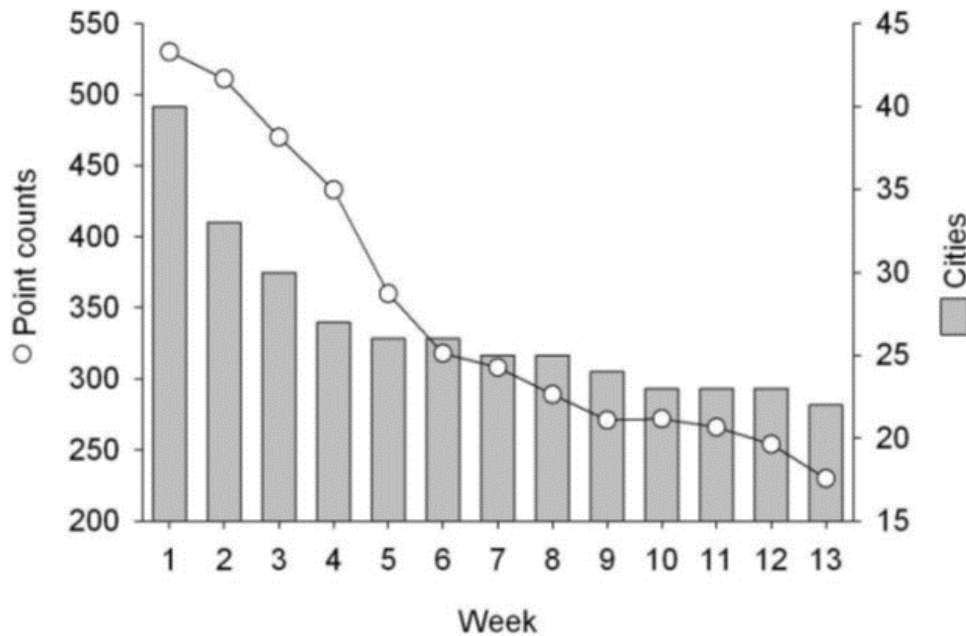


Figure 1. Number of collaborators and point counts per week in the anthropause bird surveys in urban Colombia across 13 weeks.

en the unique conditions brought on by lockdowns.

Colombia, with 1954 species (Asociación Colombiana de Ornitología 2020), is the country with most bird species on Earth (BirdLife International 2017). In this country, approximately 40 million citizens confined themselves for four months after the government declared a strict lockdown in March 2020 (Consejería Presidencial para las Regiones 2020). Given the pandemic emergency and the associated biosanitary rules, gathering information on bird presence and abundance across Colombian urban centers required a methodological approach, using reliable standardized methodologies with homogeneous criteria (Hochachka et al. 2012). Here, we report the experience of a research initiative to obtain data about the bird species present during the unprecedented opportunity offered by the anthropause in several sites in Colombian cities and discuss recommendations to apply to future projects aiming to compile biodiversity data in cities.

METHODS

We summoned birdwatchers and ornithologists from across Colombia to join a community of researchers using email, social media, and direct phone calls immediately after the strict lockdown was announced by the authorities, between 25 and 29 March 2020 (Consejería Presidencial para las Regiones 2020). The initial contact occurred through direct contacts, but the invitation also spread by “word of mouth” among other interested collaborators. Along with the invitation, we sent an electronic survey for interested people to share basic information on their location, availability, and years of birdwatching experience (Supplementary Information 1). Afterwards, after having identified that we were dealing with a country-wide scale monitoring scheme to compile bird species records from volunteers, we sent a follow-up survey (Supplementary Information 2) to refine details, and shared standard methodological procedures to survey birds (a process that generated feedback until all volunteers understood the standard procedures, i.e., 10 min

fixed-radius 50 m circular or semicircular point-count, depending on whether volunteers surveyed from the ground, an apartment window, or somewhere similar).

Subsequently, we sent all confirmed volunteers an onlinespreadsheet in Google Drive to record their observations, which could be daily or several times a week (Supplementary Information 3). On 30 March 2020, the observations began, which lasted until 30 June 2020. As we expected, many adjustments were required in the initial week (e.g., how to correctly enter the data in the online spreadsheet, ensure that scientific names followed a quotable taxonomy), which we conducted closely on a personalized basis via e-mail. Periodically, we checked if collaborators were uploading records; when we noted delays, we contacted each collaborator by e-mail to encourage them to update their records. We also checked their records for geographic consistency in the ranges of the recorded species and for bird name typos and synonyms, among other details. After 30 June, mainly because many of the volunteers were returning to their work activities and could not continue with the bird surveys, we sent a final participant survey in which we asked for information about the experience from the point of view of collaborators (supplemental Information Appendix 4). We present information on the characterization of the avian surveys, and we used the polls to examine and comment on the experience.

RESULTS AND DISCUSSION

The group of volunteers that answered the last poll ($N = 64$, supplemental material Appendix 4) was composed mainly by academics (i.e., 36% postgraduate, 38% graduate, and 22% university students). From the initial 108 interested collaborators (Supplementary List 5), only 93 began sharing information during the first week and just 45 remained for the entire study. Point-count repetitions decreased over time (Figure 1). Geographic coverage also changed, going from 40 to 22 urban centers (Figure 2). Due to the great initial enthusiasm of participants in this initiative in March, but the lack

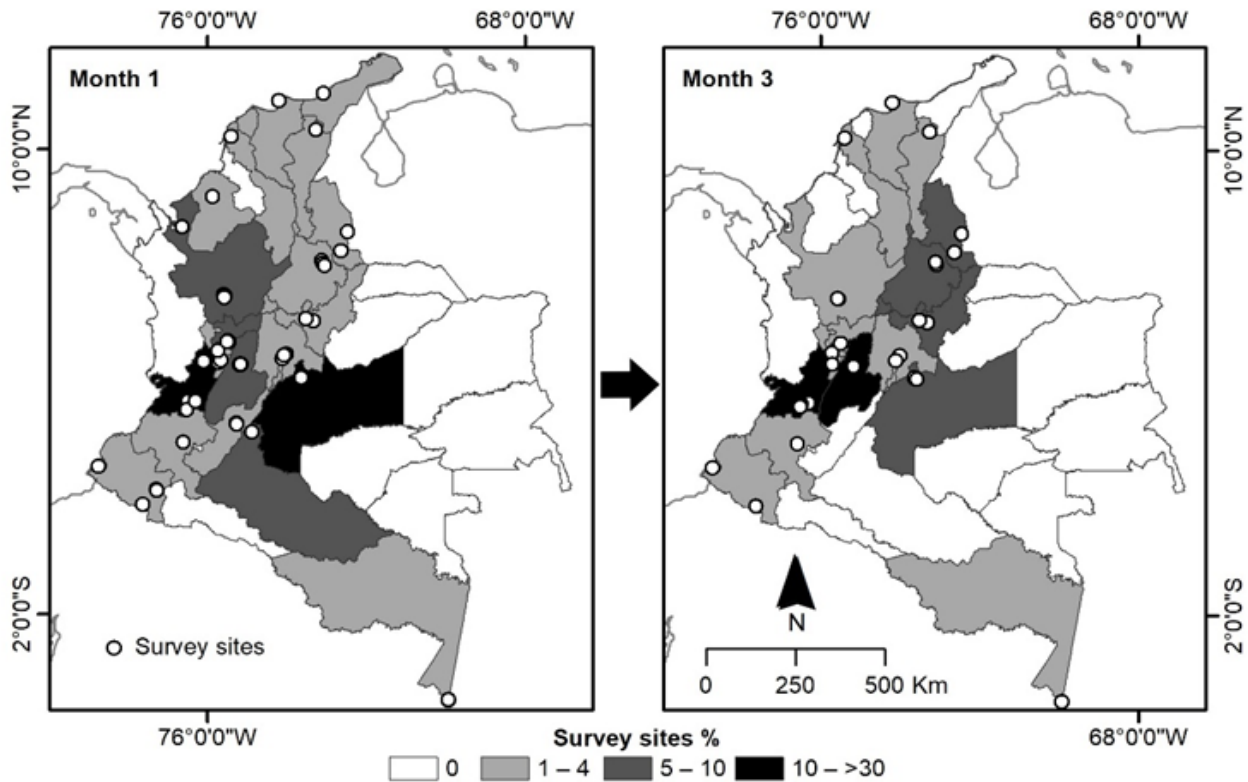


Figure 2. Maps of Colombia depicting departments according to the percentage of point-counts during the first (left) and last (right) month. Survey sites are indicated with circles in each period.

of consistency throughout, we think short term projects involving several volunteers and socialized massively will have a large number of participants, but these long term studies would require an additional effort to keep up the work. For example, the BigDay promoted by the Cornell Lab of Ornithology (Sullivan et al. 2009) is a very well perceived strategy in the country with increasing numbers of participants each year. Unlike the initiative we present here, the BigDay only requires one day or weekend to be accomplished, which makes it a very accessible project.

Regarding replies to the last poll, 90% of the collaborators that finished the surveys indicated that their motivation was academic rather than leisure. In addition, the main reason behind most volunteers (51%) ending their surveys before the agreed date were “personal,” which concurs with a previous work in which volunteer collaborators pointed out “lack of time” as one of the main challenges to participate until the end of the project (Domroese & Johnson 2017). The group of volunteers included males (63%) and females (37%), and we noted that a larger proportion of females (64%), compared to males (51%), finished the survey. Most of the people involved had limited experience in birdwatching (less than 3 years), with a 73% decrease in their participation, whereas for the high-experienced collaborators (more than 3 years) the decrease was lower (47%).

This bird survey included 70% of Colombia’s continental departments with a stronghold in the central Andean region and the Caribbean region, where most urban centers are concentrated (Instituto Geográfico Agustín Codazzi 2008), in contrast with the Orinoquia and Chocó regions (Figure 2). We consider the data gathered during this anthropause bird survey in Colombia will be useful in two ways: (1) as a geographic extended dataset of bird records, with 73 sites in 26

urban centers in Colombia that included several observation days, and (2) as a time-extended dataset with bird records from 45 sites in 22 urban centers over the course of three months of the anthropause. The method we implemented and the georeference of each survey site might aid in understanding ecological hypotheses (MacGregor-Fors 2010) under the framework of a data-intensive science (i.e., contrasting biodiversity data with independent variables from other sources for the same time and place *sensu* Kelling et al. 2009).

Despite the fact that South America comprises around 35% of the Earth’s bird species (Gill & Donsker 2018), relatively few volunteer-based initiatives have been established to monitor such overwhelming biodiversity (Chandler et al. 2017). Although urban ecology studies in Colombia are increasing, they are still scattered across the literature (Delgado-V & Correa-H 2013, MacGregor-Fors & Escobar-Ibáñez 2017). Notably, basic knowledge of Colombian biodiversity is still incomplete, with huge areas of future research opportunities (Arbeláez-Cortés 2013). The volunteer-based survey across urban Colombia that we described gathered over 75,000 bird records of at least 250 bird species in 4,512 point-count repetitions obtained under a strict and standardized protocol, allowing for a proper balance between data quantity and quality, which has been shown to be critical when conducting data-intensive science (Kelling et al. 2009, Hochachka et al. 2012). The dataset compiled has a rate of records per month comparable to the historical rates of eBird (eBird Colombia 2019, Acevedo-Charry et al. 2020). The total effort of surveys was 752 h in 95 survey sites across 40 Colombian urban centers, which is a huge geographic coverage for an urban ecology study in the Neotropics.

Results of this experience render several lessons that

could be considered in similar initiatives for monitoring urban biodiversity over broad geographical scales. For instance, community research by academics can be gathered in a short period of time under conditions similar to the lockdowns due to COVID-19 using communication technologies. However, a short training period is advisable before starting with surveys for the community to become familiar with the methods and procedures. In this particular experience, such pilot surveys were not possible due to the implied urgency and contingency scenario, as one of our main goals was to describe the urban bird assemblages during the strict lockdown whose length was unknown when we started. With the experience provided by this exercise, we believe that the commitment of less experienced collaborators could have been enhanced with more interactive communication dynamics, for instance, by showing how their data would contribute to the resolution of the ecological questions in hand.

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