



Peace is much more than doves: The economic benefits of bird-based tourism as a result of the peace treaty in Colombia



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ABSTRACT

Colombia has the greatest bird diversity of any country in the world, with approximately 1900 recorded species, equivalent to 20% of all bird species worldwide. Advances made by the Colombian government to achieve greater security within the country – putting an end to the long-standing armed conflict – and to promote ecotourism can help position Colombia as one of the most important bird watching destinations worldwide. This study estimates the economic benefits from bird-based tourism in post-war Colombia. In particular, we estimate the value that members of the US-based National Audubon Society place on a birding tour that includes the participation of local communities (some of whom were victims of the armed conflict), and visits to important areas for bird watching that are increasingly accessible. The study also approximates the demand for international bird watching tourism to the country. Through the application of the contingent valuation method, we show that birding enthusiasts would be willing to pay, on average, an additional \$58 per person per day for a tour in Colombia, as compared to a similar tour in terms of duration and services in Costa Rica, currently one of the main tourism destinations for bird-watchers. Our analysis indicates that a total of 278,850 North American bird watchers would be interested in visiting the country, generating an annual profit of \$9 million and 7516 new jobs. In addition to confirming demand for bird-based travel, the study provides information about potential visitors' preferences, which can help guide the development of a strategy to promote bird-based tourism to Colombia.

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1. Introduction

Bird watching is the fastest growing recreational activity in the United States, and is bringing about the development of specialized tourism around the world (IDB, Audubon & CREST, 2015). In this market, tropical Latin American countries are attractive and are taking advantage of opportunities to develop a range of bird watching tours. Colombia stands out among these countries for its tremendous potential due to a diversity of current ecotourism activities and its status as the country with the greatest diversity of birds on the planet.

The peace agreement signed in August 2016 and then ratified in November 2016, between the government of Colombia and the Revolutionary Armed Forces of Colombia (FARC) guerrillas, is expected to benefit tourism and attract more foreign visitors to the country. Considering these facts, and that bird watching is an activity done mainly by North Americans and Europeans, there are high expectations for an increased demand for bird watching tours in Colombia. Therefore, it is valuable to know the preferences of potential tourists and their willingness to spend money on what post-war Colombia has to offer.

This study seeks to answer these questions by analyzing the potential value of bird-based tourism in a post-war Colombia scenario. The strategy is to determine the Willingness to Pay (WTP) for a hypothetical bird watching tour in Colombia's Northern Caribbean, which offers great diversity of birds, visits to previously inaccessible areas that were occupied by illegal armed groups, participation of local communities in the provision of tourist services, and improved security while traveling. The analysis also

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includes an estimate of the potential demand for a bird-based tourism sector in Colombia and the benefits it would generate in the country.

The rest of this manuscript is structured as follows. The following section briefly describes the importance of bird watching as part of the travel industry globally and in Colombia. The third section describes the study methodology. The fourth section gives the main statistical and econometric results, as well as presenting the estimated demand for bird watching tourism in Colombia. The final section provides conclusions and recommendations based on the results.

2. Background

Tourism linked to bird watching is a rapidly growing activity worldwide, mainly in developing countries. The growing number of birdwatchers and birding trips is due to factors that include declining prices for birding equipment, an increased number of bird documentaries on television, innovation and technological sophistication in photo and video cameras, an increase in specialized guides, the variety of books about the subject, and a growing number of bird watching festivals. Tropical countries have great potential to develop attractive options for this group of specialized tourists. In multiple regions, bird tourism represents a good alternative for generating income in the private sector, protected areas and local communities (Glowinski, 2008). However, success will depend not only on the presence of birds, but also on safety, accessibility, infrastructure, and knowledgeable and experienced guides (IDB, Audubon & CREST, 2015).

Thanks to its many ecosystems, Colombia is one of the most biodiverse countries in the world (Romero, Cabrera, & Ortiz, 2008). This condition has permitted the development of specialized nature tourism, focused on the observation and appreciation of nature and traditional cultures. One of the categories included within nature tourism is ecotourism, which focuses on areas with special natural and cultural attractions, under a framework of sustainability. Within ecotourism, various specialized segments have been developed, among them bird watching, an activity characterized by observing and interpreting the behavior of birds in their natural environment (MCIT, 2012). This type of tourism is typically characterized by managing small groups of birdwatchers, with packages that are often costly because of the level of expertise required (Sanchez & Tsao, 2015).

Colombia has the greatest bird diversity of any country in the world (Remsen et al., 2016). Approximately over 1900 species have been recorded, equivalent to 20% of the global total. The country also has 79 endemic species, 193 near endemic (Chaparro-Herrera, Echeverry-Galvis, Córdoba-Córdoba, & Sua-Becerra, 2013), and a total of 139 species that are threatened or at risk of extinction (Renjifo et al., 2014).¹ The country is investing in these natural advantages, and bird watching is one of the activities with high growth prospects within Colombia's nature-based tourism sector (MCIT, 2013). Colombia currently has 59 national natural parks, covering approximately 11.3% of the country's land area. Currently the national parks authority promotes birdwatching in at least 25 of them.²

The country of origin of international birdwatchers traveling to Colombia is led by the US, with over 20% of visitors. Foreign birdwatchers most frequently visit the Departments of Boyacá, Caldas, Quindío, Risaralda, Cundinamarca, Tolima and Huila (GEF et al., 2014). Among several initiatives to promote birdwatching in

Colombia, the Audubon Society has been conducting a project whose goal is to use bird watching as a tool for economic development and biodiversity conservation in the north of the country. Northern Colombia has places of biological importance, such as the Perijá Mountains and the Sierra Nevada de Santa Marta, as well as highly threatened ecosystems, such as the dry tropical forest (Audubon, 2016). There are four national natural parks in this region: Flamencos, Sierra Nevada de Santa Marta, Tayrona y Catatumbo-Barí.

Although tourism in Colombia is a dynamic and growing sector, the armed conflict and the country's image regarding insecurity has affected the influx of tourists. The nature-based tourism market acknowledged this problem, with multiple areas identified as high security risks (MCIT, 2013). For instance, regions such as the Perijá Mountains and the Sierra Nevada de Santa Marta, both of which are important for biodiversity conservation, were also associated with the permanent presence of illegal groups involved in the armed conflict (for details see, for example, Gutierrez and Lemus (2014)).

In 2012, the Colombian government officially resumed peace talks with representatives of the armed guerrillas, aimed at putting an end to a war that lasted more than 50 years. The peace process, which culminated in a signed treaty with the FARC in 2016, constituted a major step forward. Statistics show a major decline in violence due to armed conflict. The Resource Center for Conflict Analysis (CERAC for its acronym in Spanish) states that the internal armed conflict between the FARC and Colombian national army has declined to its lowest levels in 52 years, in terms of number of victims, fighters wounded or killed, and related violent actions. Specifically, CERAC points out that the peace process prevented the death of approximately 2800 people, reduced military combats from 867 in 2007 to 105 in 2015 and 13 in 2016, and reduced civilian deaths from 1270 in 2007 to 101 in 2015 and 3 in 2016 (CERAC, 2016, 2017).

Therefore, the peace process and its observable outcomes have generated a sense of greater security through the country. Among the economic opportunities afforded by this security is the chance to tap into Colombia's bird watching tourism potential by allowing safe access to areas that were formerly inaccessible for tourism. Furthermore, new tourism could be an opportunity to work towards a sustainable economic future with local communities that have been affected by the armed conflict. While the second most important illegal leftist armed group, ELN, started peace negotiations in 2017, it is important to note that there are still some small illegal groups trying to take advantage of newly guerrilla-free areas, mainly for drug trafficking purposes.

3. Methodology

3.1. Valuation and demand estimation

This study used the Contingent Valuation (CV) method as the main tool for analysis. This method focuses on determining the value people assign to changes in their wellbeing as a result of changes in supply conditions of an environmental asset with no market value (Barzev, 2002). Contingent valuation is part of the family of stated preference methods used to estimate the value of a good or service through surveys that ask people if they would be willing to pay a certain amount of money for an increased environmental good or service (Bateman et al., 2002). The method is based on the random utility model (Haab & McConnell, 2002), which assumes that (in the case of an environmental improvement), an indirect utility function can be used to estimate the maximum amount of income that an individual would sacrifice to gain the relevant environmental improvement. To do that, the

¹ Details about the diversity of birds in Colombia can be found in the extensive guide by Hilty and Brown (1986).

² www.parquesnacionales.gov.co.

utility function can be divided into observable and unobservable components. The former includes the individual's income and other characteristics. The unknown component of the individual's utility is assumed to be random and therefore to have a statistical distribution, making the model probabilistic. Results will depend in part on researchers' assumptions about both this distribution and the functional form of the utility curve (Haab & McConnell, 2002).

Contingent valuation has been used in a wide range of valuation exercises, in particular because it can capture passive values, such as non-use values (Boyle, 2003), and values for situations that do not currently exist. Since its initial use in the 1970s, contingent valuation has been strengthened by contributions such as those from Mitchell and Carson (1989) and the NOAA panel report (Arrow et al., 1993). More recently, Whittington, Adamowicz, and Lloyd-Smith (2017) discuss important aspects of using the contingent valuation approach to reveal preference values.

In general terms, the method consists of designing a hypothetical market, which must be presented to the respondent along with all necessary information about the goods or services to be valued. Relevant information includes the amount of the good offered, the changes associated with its provision, and the payment vehicle (Bateman et al., 2002; Boyle, 2003; Barrera and Maldonado, 2013). This hypothetical market is part of a questionnaire presented to the respondent, accompanied by additional sections requesting supplementary information needed for analysis.

The hypothetical scenario to be valued must clearly define a baseline scenario, the change being considered, and a post-change scenario. This study considered as a baseline scenario a conventional bird watching tour in Costa Rica, which has similar characteristics to Colombia's Northern Caribbean tour in terms of duration, group size, and guide and transportation services. A tour of Costa Rica was considered as a point of comparison because that country is one of the main destinations for birdwatchers that make their first bird watching trip abroad, and is one of the main tourist destinations for bird watching in Latin America (IDB, Audubon & CREST, 2015).

The valuation scenario should be constructed carefully and rigorously. According Barzev (2002), there are four basic elements to be considered during the planning stages. These are listed below along with the specifics used in this study:

1. **Good or service to be valued:** potential bird watching tourism in Colombia, considering a post-conflict scenario. The survey was carried out in April of 2016, while the peace process was still under way; the peace agreement was signed in August of 2016.
2. **Baseline scenario or comparison scenario:** a 10-day bird watching tour in Costa Rica.
3. **Change of environmental good or service:** a 10-day bird watching tour in Colombia, in areas previously affected by the armed conflict, having greater diversity of birds and involving the local communities, formerly affected by the conflict, in providing tourist services. This change is part of the tour package designed by Audubon for Colombia's Northern Caribbean (Northern Caribbean Birding Trail), as defined at: https://www.audubon.org/sites/default/files/%20suggested_itinerary_colombia.pdf.
4. **Payment vehicle:** fare is paid per day per person for the tour of Colombia's Northern Caribbean.

In the contingent valuation method, there are different ways to ask about WTP. The most currently accepted to avoid bias in responses is known as a referendum format. This format prevents biases at the starting point and strategic biases that occur when respondents use their answers to try to influence the results of

the study. With this format, the respondent is presented with a predetermined payment, and asked if they are willing to pay that amount. The individual can only answer "yes" or "no" to this question.

To define the amounts to be evaluated, a pilot survey was conducted, asking 236 birdwatchers their willingness to pay using an open format (i.e., asking "what is the maximum amount you would be willing to pay per person per day for this tour"). The pilot survey was also used to adjust the final questionnaire for clarity.

The price vector was determined based on the values reported in the pilot survey, targeting a sufficiently wide range, but with feasible levels. The final price vector for the tour in Colombia included the following values per person per day: \$260 USD, \$275 USD, \$300 USD, \$350 USD and \$500 USD. In the final survey, each respondent was consulted about his WTP using one of these amounts at random.

To estimate the benefits that a bird-based tourism in Colombia would generate, demand was estimated based on the population defined from the WTP results. For this purpose, effective demand was limited to Audubon's members who: i) are interested in traveling abroad for bird watching; ii) are interested in traveling to Colombia; and iii) have a willingness to pay equal to or greater than the status quo price in Costa Rica, i.e. \$250 USD per day per person. This is a rather conservative estimate of potential demand, for two reasons: first, Audubon's membership is mostly limited to the United States, and there are many birdwatchers from other countries; and second, even within the US, Audubon's members do not include all North American birdwatchers.

Four assumptions were also used to estimate the benefits for Colombia in terms of potential impact on income and job creation:

1. People interested in visiting Colombia for bird watching, at a given price, would do so once over the next ten years.
2. Operating costs in Costa Rica and Colombia are similar, and markets are relatively competitive.
3. The number of jobs created per tourist by bird-based tourism would be similar to the proportion created by tourism in general. The World Bank (2016) estimates that 2.56 million international tourists visited Colombia in 2014. These visitors generated 510,000 jobs in hotels, restaurants, transportation and other areas that provide services to tourists (WTTC, 2015). Including the broader effects generated by investments, the impact on value chains, and increased revenues, it is estimated that, in total, tourism generates 1.29 million jobs in the country (WTTC, 2015). This means that there would be a ratio of 5 tourists for each service job directly associated with tourism, and 2 tourists per jobs associated with tourism in general.
4. Colombia can develop a range of travel packages for bird watching that meet the preferences of birdwatchers.

3.2. Survey

In a contingent valuation exercise, surveys must be prepared carefully and rigorously to minimize potential biases that could lead to unreliable results. The most sensitive part of the questionnaire's design is the valuation scenario, which must be constructed so that it is credible and the respondent feels he/she is making real decisions, even if it is a hypothetical setting.

In addition to the valuation scenario, the questionnaire should help identify variables that influence respondents' decisions regarding their WTP. Thus, the survey also includes questions related to respondents' preferences and their socioeconomic characteristics. The questionnaire designed for the study consisted of 61 questions, divided into eight sections, each designed to elicit a specific kind of information, as explained below:

1. **Introduction.** This section included questions related to the respondent's knowledge of general biodiversity issues, as well as individual bird-watching habits.
2. **Bird watcher's experience and profile.** This section included a set of questions to gather information on the type of observer he/she is, his or her level of experience, and travel preferences for bird watching.
3. **Knowledge about Colombia.** This section included questions on the respondent's general knowledge about Colombia, its potential as a bird watching destination, previous travel experience to the country, and interest in visiting.
4. **Current scenario.** Costa Rica was presented as a destination for bird watching, and an average package birding tour in that country was described, for purposes of comparison with Colombia's Northern Caribbean package.
5. **Hypothetical scenario.** This section of the survey described the hypothetical market for tours of Colombia's Northern Caribbean in a post-conflict scenario. The scenario displayed, which could be available after reaching a peace agreement, would imply a 10-day bird watching tour to five sites of interest including to previously inaccessible areas, with the possibility of a larger number of bird sightings (over 900 species), the participation of local communities previously affected by the armed conflict as tourist service providers, and greater security during the tour.
6. **Willingness to pay.** Whereas the objective of this study is to assess the bird-based tourism potential in Colombia in a post-conflict scenario, the strategy is to determine willingness to pay (WTP) for the hypothetical tour above mentioned, specifically in Colombia's Northern Caribbean. This scenario is compared with an average bird watching tour in Costa Rica, which would be similar in terms of accommodation, transportation, group size and other services, but is different from the Colombian tour in terms of bird diversity (wealth and abundance), the possibility of observing new species and involvement of local communities. This scenario is used as a strategy to determine the economic value that respondents give to the possibility of bird watching tourism in Colombia, a country where, in the past, security conditions limited such activity. Thus, the approach allows an approximation of the value, in terms of bird watching, of ending the armed conflict.

After presenting the details of the tours in Costa Rica and Colombia, the respondents were asked if they were willing or not to pay a specific amount for the tour. As mentioned, each respondent was randomly assigned one of the five values. The specific wording of the valuation question was as follows:

If an average tour package, such as that described for Costa Rica, costs \$ 250 USD per day per person, would you be willing to pay \$XXX USD per day per person for the tour in Colombia's Northern Caribbean, with all the characteristics described above, which are: greater abundance and diversity of birds, participation of local communities and improved tour conditions as a result of increased security after the Peace Treaty?

As shown, a comparison is made against a tour costing \$250 USD/day/person; therefore, the price vector used (260, 275, 300, 350 and 500 dollars) seeks to determine the additional marginal value associated with the Colombian tour (10, 25, 50, 100 and 250 dollars, respectively).

Following Li and Mattsson (1995), respondents were also asked to declare their confidence with respect to the decision just made about their willingness to pay. In particular, they were asked to rank confidence on a six-step scale.

7. **Follow-up and control questions.** Follow-up questions to the WTP response were asked to identify the reasons why respondents answered negatively to the willingness to pay question. This information permitted a determination of whether the respondent refused to pay as a form of protest, or based exclusively on socioeconomic factors, such as costs.
8. **Socioeconomic questions.** This final set of questions was designed to collect information on the personal characteristics of the bird watchers being surveyed, including related to their gender, age, marital status, level of education, occupation, place of residence and annual income.

The survey was designed to be posted online through an e-survey platform. Audubon sent invitations to registered members, and responses were received between April 8 and 17, 2016. In total, 5099 surveys were collected, of which 3118 provided responses to the valuation question. Given that Audubon had approximately 660,000 members at the time of the survey, the sample corresponds to about 1% of effective responses, and involves an error margin of around 2%, with a confidence level of 98%, in a system of simple random sampling.

According to Carver (2013), US Fish and Wildlife Service estimates from a sample of 9300 birdwatchers in the US show that "The average birder is 53 years old and more than likely has a better than average income and education. She is slightly more likely to be female and highly likely to be white." Given that most Audubon members are North Americans, a comparison of figures from Carver (2013) with those from our sample suggests that our survey reflects the US birdwatcher population." However, it is also significant to point out that there were a number of respondents in our sample from Canada and, a smaller number, from Latin America, Europe, Asia and Oceania.

4. Results

The results obtained from the questionnaires are presented in three parts. In the first part, we present statistical results relating to respondents' characteristics. Subsequently, econometric models were developed to calculate willingness to pay. In the third part, we present results related to estimated demand.

4.1. Descriptive statistics of respondents

Of the total respondents, 68% are female, which is consistent with the composition of Audubon's membership, as well as with the trends identified by IDB, Audubon & CREST (2015) and Carver (2013) for the US Fish and Wildlife Service. Ninety-one percent are US citizens with an average age of 58 years old. A large percentage of respondents (60%) reported being married or in a civil union.

Regarding educational levels, 76% of respondents have attended college or post-graduate study (41% postgraduate, 35% college), also consistent with the results found by IDB, Audubon & CREST (2015), which states that, on average, birdwatchers have high educational levels. Regarding occupation, the sample contained similar proportions of working (42%) and retired (43%) people. Average reported annual income level is around \$78,000 USD, with 42% of respondents reporting incomes below \$50,000 USD.

Of those surveyed, only 49% considered themselves active members of Audubon, although 64% reported themselves to be active birdwatchers. Seventy-seven percent go bird watching near home (less than a mile away), while 66% also go birding away from home (more than a mile away). Seventy-four percent have at some time gone birding in states other than their home state, with an average of 10 total states visited. It should be noted that, according

to a national survey carried out in 2011 by the U.S. Fish and Wildlife Service (USFWS), 88% of birdwatchers went birding near their homes, while only 38% did so far away. In this sense, results found in this study may reflect an increasing trend in recent years of birdwatchers wanting to travel to go bird watching.

Those who do not practice bird watching away from their homes or who do not travel to other states for that purpose stated that their decision is mainly because they do not have enough information about places to visit, costs are too high, or simply because they are not interested. Regarding respondents' skill and experience as birders, respondents on average have 19 years of experience as birdwatchers, and 34% have a bird list. Within this latter group, the average number of birds observed by a respondent is 330.

To classify respondents according to a typology of birdwatchers, we used the categorization proposed by IDB, Audubon & CREST (2015), as follows:

- i. Experts or hardcore birders. Specialist observers with intense dedication to bird watching, not interested in undertaking activities additional to bird watching, and willing to travel long distances to see new or rare species.
- ii. Enthusiasts. Type of birdwatcher who is a nature lover, who is satisfied with seeing any bird species, and is interested in socializing when traveling as well as experiencing other nature and cultural activities.
- iii. Casual travelers or ecotourists. Non-specialized tourists who combine bird watching with other activities, interested in visiting areas accessible by road and seeing flashy or iconic species with less effort and more comfort.

This study found that 2% of respondents define themselves as expert or hardcore birders, 40% as enthusiasts, and 58% as casual observers.

On a scale of 1–6, where 1 is novice and 6 is an expert, respondents rated themselves mostly in the first three levels, with an average value of 2.5. Moreover, the largest percentage of respondents (44%) reported that the number of birds they can identify, visually or audibly, is in the range of 1–20. Both results are consistent with the predominant types of birdwatchers in the sample – casual and enthusiastic, who, unlike hardcore birders, are less dedicated and competitive about bird watching because birding is not the only activity they practice, instead combining it with other pursuits associated with nature tourism. However, it is significant that, among respondents who declare being expert observers, only 59% claimed to be able to identify more than 100 species of birds.

Regarding experience in tours outside of respondents' place of residence, 47% of respondents reported having traveled to other countries to observe birds, with an average of 6 countries visited. Considering the most recent tours taken by these birdwatchers, the most visited countries were Costa Rica, Canada, Mexico and Ecuador. When asked about their intentions for future travel, 65% of respondents answered that the countries they wanted to visit were primarily Costa Rica, Australia and Brazil.

When we asked those who had recently (in the last two years) gone on a bird watching tour, the following information was obtained: the average cost of their tour was \$2884 USD, with an average duration of 9 days and an average group size of 11 people; this value did not include the price of tickets to and from their country of origin.

Within the group of people who have not traveled outside their country and do not intend to do so in the future, the main reasons stated were cost, lack of interest, personal security during travel, and health issues.

Birdwatchers' main interest (35%) when they go on tours is to see species that had never seen before. Also, when asked what they

expected to see when they took a birding trip, the types of birds that respondents mentioned most frequently were songbirds, birds of prey, and species that are migratory, colorful or endemic.

Regarding the importance that birders assign to different characteristics of potential birding sites (again using a scale of 1–6, where 6 is very important and 1 not important) respondents revealed that the features that are most important to them are: the diversity of habitats and landscapes (4.3), the abundance of birds (4.2), the presence of species they cannot see in other places (4.1), and the presence of migratory and endemic birds (4). On the other hand, using the same scale, aspects that respondents considered most important regarding tour logistics are: safe food and drinking water (4.8), personal safety during the trip (4.5) and availability of experienced guides (4.3).

Other characteristics considered important included: opportunities to learn new things (4.8), and have guides who are fluent in English (4.7) and have a lot of experience (4.7). It should also be emphasized that respondents considered important (4.3) that tours support local communities and that benefits be shared equitably.

Finally, respondents indicated that they are interested in participating in various additional activities during their bird watching trips. Among the most frequently mentioned are wildlife observation (besides birds), exploring the local cuisine, seeing different landscapes, visiting local monuments, taking photographs, visiting local communities, and learning more about indigenous cultures. Once again, these results are similar to those found by IDB, Audubon & CREST (2015), which finds that birdwatchers like to participate in additional activities, the most common being wildlife observation, gardening, hiking and photography.

In terms of the respondents' knowledge about Colombia, almost 50% were aware that the country is culturally diverse and one of the most biodiverse countries in the world. However, although 56% say that Colombia is an important country for bird watching, more than 70% did not know that Colombia has the world's greatest bird diversity. On the other hand, 54% believe it is an unsafe country to visit, due to the armed conflict.

Of those respondents who indicated they had never traveled to Colombia (94%), half of them stated that they are interested in visiting the country. Of those who have visited Colombia, they have done so an average of two times. Only 22% traveled to bird watch, but it is significant that those who traveled for this purpose have done so, on average, four times. The most visited areas for bird watching were the Sierra Nevada-Santa Marta, and Bogotá and surroundings. When consulted about their experience, people who have visited Colombia rated their tours positively: on a scale from 1 to 6 (1 very poor, 6 excellent), respondents gave high ratings to the experience of bird watching itself (5.0), as well as knowledgeable guides (4.7) and personal safety during travel (4.6). These good ratings are consistent with respondent's intention to visit the country again at some point: 94% of those who had visited Colombia want to do it again.

4.2. Estimation of the willingness to pay

Estimation of WTP was carried out only for the subset of respondents who reported an interest in leaving their country of residence for bird watching. This is because it is assumed that those who are not interested in a future trip would not be potential participants in the proposed Colombia tour, and therefore should not be considered.

Approximately 65% of respondents (2795) said they were interested in traveling abroad for bird watching. Seventy-eight percent of those in this group responded to the WTP question, resulting in a final sample of 2170 respondents from whom WTP was derived. It should be recalled that each respondent was asked about her will-

ingness to pay only one random value from the vector. Once the sample was filtered for interest in travel abroad, the distribution of these values was analyzed to verify its randomness among this subgroup. Table 1 shows that randomization is effective, i.e., values asked were evenly distributed (between 19% and 22% per consulted value, with an expected 20% each).

Table 1 also shows the percentage of positive and negative responses obtained for each value proposed. Economic theory predicts that higher values will generate a lower percentage of positive responses, which was confirmed by the results of this study. The percentage of “Yes” answers decreases when the cost of the hypothetical tour increased. This reduction occurs gradually as the proposed amount increased.

To estimate the WTP, a Probit regression model was used. The dependent is the decision to pay or not, and is dichotomous (1 if the respondent states they would pay for the tour at that price; 0 if not). First, a basic model (univariate) was estimated, using the proposed amount (*BID*) as the independent variable:

$$\text{Pr(Yes/No)} = \beta_0 + \beta_1 \text{BID} + \varepsilon$$

Afterwards, to examine how the respondents’ characteristics may affect their willingness to pay, we estimated a second model, which includes some additional relevant features as explanatory variables. Among the variables included were the socio-demographic characteristics of the respondent (income and age), characteristics related to his/her experience as a birder (type of observer: casual, enthusiastic or hardcore), and characteristics related to his/her experience as birdwatcher outside their country of residence (if the person had visited Colombia and if interested in visiting Colombia). To account for respondents’ certainty about their WTP decision, as recommended by a reviewer and following Ekstrand and Loomis (1998), we also incorporated results from the survey question in which respondents addressed that issue. We tried different approaches, and finally decided to include a dummy variable for respondents who felt confident about their response (score of four or more on the 1–6 scale). Including these variables, the Probit model used was:

$$\begin{aligned} \text{Pr(Yes/No)} = & \beta_0 + \beta_1 \text{BID} + \beta_2 \text{Income} + \beta_3 \text{Age} + \beta_4 \text{CasualBirder} \\ & + \beta_5 \text{HardCoreBirder} + \beta_6 \text{VisitCol} + \beta_7 \text{InterestCol} \\ & + \beta_8 \text{Certainty} + \varepsilon \end{aligned}$$

Since the type of observer consists of three categories that add up to 100%, it was necessary to remove one category from the regression to avoid perfect linearity. In this case, we omitted the enthusiastic-birder category, which became the basis of comparison for the effect of being in the other two categories.

Table 2 shows a summary of the descriptive statistics of variables included in the model (using the above-mentioned filter). The average annual income is approximately \$80,000, and the average age is 57 years. With regard to type of birdwatcher, casual birdwatchers or ecotourists represent 43% of the sample, 53% are enthusiasts, and 3% are experts (hardcore).

The results of the econometric analysis (Table 3) indicate that all variables are statistically significant; that is, they individually explain the probability of the respondent’s decision regarding willingness to pay the proposed amount. The first model shows that an increase in the amount to be paid decreases the probability of accepting the tour, at a 99% level of significance, which is consistent with the economic theory.

In the second regression, we found that the higher a respondent’s income, the more likely they are to say yes to paying for the tour, while an increase in respondent’s age decreases the probability of being willing to pay. In addition, birdwatchers who are classified as “casual” are six percentage points less likely to accept when compared to those who are classified as “enthusiasts”; but expert observers (“hardcore” birders) are 16 percentage points more willing to accept any bid compared to enthusiasts. On the other hand, having previously visited Colombia increases the likelihood of being willing to pay by 14 percentage points; while a declaration of interest in visiting Colombia as a bird watching destination increases the probability of being willing to pay by 20 percentage points. Finally, and as observed previously (Ekstrand & Loomis, 1998; Loomis & Ekstrand, 1997), uncertainty reduces willingness to pay; in this case the probability of accepting the bid is reduced by 22 percentage points for those who were confident about their decision.

Econometric results are used to estimate willingness to pay. In the univariate model, mean WTP can be estimated by calculating:

$$\text{WTP} = -\beta_0/\beta_1$$

In the case of the multivariate model, WTP is estimated by calculating:

Table 1
Payment vector and responses to the WTP question.

Value per day (\$USD)	Marginal	Number of total responses	Percentage	Number of YES responses	% YES Response	Number of NO responses	% NO Response
260	10	404	19%	237	59%	167	41%
275	25	488	22%	259	53%	229	47%
300	50	425	20%	218	51%	207	49%
350	100	408	19%	174	43%	234	57%
500	250	445	21%	81	18%	364	82%
Totals		2170	100%	969	45%	1201	55%

Table 2
Descriptive statistics of socio-demographic variables considered in the econometric model.

Variable	Number of observations	Average	Standard deviation	Minimum	Maximum
Income (\$USD)	1927	80,194	73,191	25,000	350,000
Age	2019	57	13.7	18	91
Bird watcher type “Ecotourist”	2392	43.4%	0.496	0	1
Bird watcher type “Enthusiast”	2392	53.5%	0.499	0	1
Bird watcher type “Hardcore/Expert”	2392	3.2%	0.175	0	1
Has already visited Colombia	2386	7.1%	0.256	0	1
Certainty about their response	2416	82.5%	0.380	0	1

Table 3

Estimates of Probit models (model 1, univariate; model 2, multivariate). Presented values are marginal effects.

Variables	Model 1 Decision/Pr(Yes/No)	Model 2 Decision/Pr(Yes/No)
BID	−0.00179*** (0.00013)	−0.00190*** (0.00015)
Income		0.00100*** (0.00017)
Age		−0.00292*** (0.00089)
Casual observer		−0.05828** (0.02483)
Hard-core observer		0.16175** (0.07048)
Visited Colombia		0.14431*** (0.04749)
Interest in visiting Colombia		0.19906*** (0.05575)
Certainty about the answer		−0.21935*** (0.02974)
Observations	2170	1855
Log likelihood	−1395.84	−1133.02
LR chi2	191.72***	290.84***
Pseudo R2	0.0643	0.1137
Willingness to pay (USD)		
Mean	303.03	307.61
Standard error	6.39	72.36
95% confidence interval	290.50–315.56	180.27–655.79

Note: Standard errors in parentheses. ***p < 0.01; **p < 0.05; *p < 0.1.

$$WTP = -[\beta_0 * Constant + \beta_2 * Income + \beta_3 * Age + \beta_4 * CasualBirder + \beta_5 * HardCoreBirder + \beta_6 * VisitCol + \beta_7 * InterestCol + \beta_8 * Certainty] / \beta_1$$

These calculations show that the average willingness to pay for a bird-based tour in Colombia's Northern Caribbean, which includes greater abundance and diversity of birds, participation of local communities in providing tourist services, and improvements in personal security conditions, is \$303 USD when no additional explanatory variable is considered (model 1 in Table 3). This means that respondents are willing to pay an average of 53 extra dollars per day per person for a bird watching tour in Colombia, as compared to a tour in Costa Rica (\$250 USD), because they positively value the characteristics described above.

When incorporating other explanatory variables (model 2), the estimated average WTP is \$308 USD, almost five dollars more than the WTP estimated in the model 1. This model corrects the previous estimation by considering respondents' characteristics, although the change observed is not particularly large in magnitude. Thus, in the multivariate model, it is estimated that respondents are willing to pay an average of an additional 58 dollars per day per person for a bird watching tour in Colombia, compared with the base tour in Costa Rica. Unlike Li and Mattsson (1995), we found that including the variable related with respondents' certainty about their WTP response has no effect on the mean WTP, although it increases variance.

4.3. Estimation of potential demand

These analyses show that international demand for bird watching in Colombia is significant, both in terms of percentage of birders interested in visiting the country, and in terms of their willingness to pay for a tour with the stated characteristics. However, as noted by an anonymous reviewer, it is important to be cautious in extrapolating results to the full population of birdwatchers. We use conservative estimates of multiple parameters to ensure that the estimate of potential demand is also conservative. First, we restrict the extrapolation only to members of the

National Audubon Society in the United States; in reality, there are many other birdwatchers not members of this association, and many more in other developed countries. Then, using data from the survey, the scope of the market is again restricted by multiplying the percentage of birdwatchers that declared an interest in visiting other countries to practice bird-based tourism (65% of Audubon members) by the percentage of birdwatchers who are specifically interested in visiting Colombia (another 65%). This calculation suggests that 278,850 members of Audubon (the defined population for this study) would be interested in visiting Colombia for bird watching. In addition, approximately 193,050 people combine their interest in visiting Colombia with a willingness to pay higher than average prices observed for Costa Rica.

To better understand the economic impact Colombia could expect if it develops a bird-based tourist sector, it is necessary to consider the relationship between the price of the tour and the expected number of visitors. To this end, a demand curve was estimated for a tour with the characteristics analyzed in this study. The demand curve was constructed based on the multivariate mode, which suggests a potential market size equivalent to 174,635 people interested in traveling to Colombia for bird watching and willing to pay at least \$250 USD/day/person for the tour.

There are several possible ways to estimate a demand curve based on the model used in this study (for example: Greiner & Rolfe, 2004; Kahn, 2009; Loomis & Keske, 2009; Bruner, Kessy, Mnaya, Wakibara, & Maldonado, 2015). In this case, we used the linear demand model. This choice is justified first because the distribution of the observed responses is linear, and second, linearity generates the curve that best fits the observed characteristics; that is, demand quantity is reduced by price increases, there are no negative demand values and demand is relatively elastic. Linear demand is calculated by extrapolating the marginal effect of price on probability of being willing to pay, estimated from the average values of all independent variables.

From this demand curve, at a price of \$310 USD per day per person, 86% of birdwatchers interested in traveling to Colombia would take the tour of the Northern Caribbean. However, if the daily cost per person were equal to the average cost of Costa Rica (\$250 USD), 97% would be interested in traveling to Colombia and take the tour. An equivalent to twice the average daily cost in Costa Rica (\$500 USD) would reduce the demand to half (about 87,465 people). The shock price would be at \$770 USD/day/person, which would induce an almost zero demand.

In order to keep estimates conservative, another assumption made is that this potential demand would travel to Colombia in a time span of 10 years, distributed evenly.

To provide an estimate of total expenditures on package tours, profits and job creation, we combine the demand curve at different prices with the assumptions described above. If the average price of a tour in Colombia was \$275 USD/day/person, the expected number of birdwatchers would be 16,126 a year, spending about \$44 million USD annually in tours, which would translate into \$4 million USD annual benefits, and generate 8092 new permanent jobs. A price equivalent to the estimated average WTP of \$310 USD/day/person

Table 4

Scope and economic impact of a bird watching market in Colombia at different price levels of the tour.

	Day/person Price (\$US)				
	250	275	310	350	500
Number of tourists per year	16,946	16,126	14,978	13,667	8747
Annual expenditure on tours (millions)	42.4	44.3	46.4	47.8	43.7
Annual profit (millions)	–	4.0	9.0	13.7	21.9
Jobs created	8503	8092	7516	6857	4389

would shift the annual number of birdwatchers to 14,978; spending would increase to \$46 million USD and annual earnings to \$9 million USD, and the number of new jobs created would be approximately 7516. Table 4 shows the expected economic impact of a bird-based tourism market in Colombia, according to a range of possible prices for a tour with the characteristics analyzed here.

5. Conclusions and discussion

This study analyzed the preferences of birdwatchers (mainly from US) for a birding tour in Colombia, in a post-conflict scenario. In particular, we evaluated a tour designed to include previously inaccessible areas that allow for better bird watching (diversity and abundance), ensure the participation of local communities in providing tourist services, and offer greater security while traveling. We carried out both an economic valuation and an estimation of demand for tours with the abovementioned characteristics. These exercises help to approximate the value of the benefits associated with a peace scenario in Colombia.

The analysis also helps to increase knowledge about the profile of bird watchers and Colombia's bird tourism potential, and the potential for packages such as the tour of the Northern Caribbean that can be put into practice in a post-conflict scenario.

The survey was sent to a large population of Audubon members in North America, and thousands of responses were received in a short period of time. Compared with other contingent-valuation studies, we have a large sample size, such that our estimates of value have a 99% confidence level and a margin of error of less than 2%. Furthermore, because that the main sociodemographic statistics of the sample coincide with those of birdwatchers in the US (Carver, 2013), we are confident that we have robust results both in terms of confidence and representativeness. From that, we can assert that this study is based on a statistically representative design and a valuation technique that allows us to reach strong conclusions about the value birdwatchers place on the particular features of the Colombian tour.

The information obtained shows that 65% of respondents would be interested in bird watching tours outside their country of residence. Within that group, 65% are interested in Colombia. In addition, of those birdwatchers who intend to travel outside their country, 45% are willing to pay an additional amount for a bird watching tour in Colombia (in a post conflict scenario), as compared to the price of a conventional tour in Costa Rica.

Econometric analysis showed that birders are willing to pay an average amount of \$308 USD/day/person for the tour in Colombia; that is, an additional \$58 above the amount they would pay in Costa Rica, because the tour in Colombia offers greater abundance and diversity of birds, participation of local communities that fell victim to the armed conflict, and improved security conditions as a result of the peace agreement. These characteristics are relevant to the participants in the survey, with personal security being the most relevant (important to 75% of respondents), followed by larger bird diversity in Colombia (65%) and the involvement of local communities in providing tourist services as an alternative form of income (65%).

Moreover, analysis of demand suggests that a total of 278,850 birdwatchers would be interested in visiting Colombia for birding in the future. Considering the population that would be willing to pay the estimated average WTP of \$310 USD/day/person for a tour with the particular characteristics analyzed, the number of birdwatchers would be 14,978 annually; these visitors would spend \$46 million USD and generate profits of \$9 million USD, while generating about 7516 new jobs.

In addition to the econometric and demand analysis, descriptive statistics are relevant regarding the steps that are needed to

promote bird watching in Colombia and improve the sector in alignment with respondents' preferences. In this regard, we found that a significant percentage of respondents (over 50%) are aware of Colombia's natural and cultural diversity and consider it an important destination for bird watching. However, over 70% do not know that the country has the greatest diversity of birds in the world. This suggests that it will be valuable to increase efforts to disseminate information about Colombia's tourism potential about bird watching. Such communications could help change travelers' intentions of visiting and shift the priority destinations of birdwatchers, considering that Colombia is not currently among the main places of interest for birding.

In relation to respondents' preferences related to bird watching during tours, we found that major interests include visiting places with a variety of habitats, bird abundance, and presence of birds that cannot be observed in other regions. On the other hand, the main types of birds that observers expect to see are songbirds, birds of prey, and those that are migratory, colorful or endemic. Since Colombia has representative birds within each of the preferred categories expressed by birdwatchers, it is important that the travel industry portrays this diversity as one of the country's unique qualities, which could help motivate and increase interest in visiting Colombia to practice bird watching in the future.

Furthermore, with respect to the characteristics of birding tours themselves, respondents give great importance to safety during the trip, the availability of healthy food and safe drinking water, and experienced guides fluent in English. In this regard, it is essential that bird-based tourism in Colombia take meaningful steps to promote ongoing improvement in each one of the abovementioned characteristics. The issue of personal security is particularly worth highlighting, because the end of the war with FARC guerrillas is helping to capture the interest of foreign tourists in general, and in particular the special segment comprised of birdwatchers.

The fact that a good percentage of birders who are members of Audubon are willing to pay an extra amount for the particular qualities of a tour in Colombia, in the post-conflict setting, reflects the value potential tourists give to a peace scenario. Meeting the expectations of birdwatchers will help to increase demand. This, along with better advertising efforts, information and services, would contribute in positioning Colombia among the top international destinations for bird watching.

In order to reach that goal, Colombia must develop a diverse birding tourism sector, designing tours that are competitive in the global market in terms of quality and price, so that business can benefit from a greater demand, as demonstrated by the willingness to pay estimate of Audubon members. Specifically, there appears to be significant opportunity for high-end tours that meet the expectations of market differentiation and provide enhanced features in line with higher prices.

Promoting these markets – and maximizing the benefits for Colombia's war victims – requires financial investment and a friendly political and legal atmosphere. In particular, we recommend investment in training local citizens so that they can acquire the necessary skills to work directly in this emerging sector, including through establishing local bird-based tour companies and travel agencies, as well as improving associated services such as food, handicrafts, transportation and accommodations. Priority means for ensuring that local citizens share in the profits generated by the sector include: i) specific training as bird watching guides and in English language; ii) promoting and getting government support to develop tourist activities, particularly nature tourism; and iii) greater coordination between the private sector (travel agencies, tour-Operators, etc.) and local communities.

Finally, we suggest that investments should focus in those areas of high priority for bird conservation, thus ensuring sustainability of the natural resources on which this source of revenue depends.

The active participation of local communities in offering such services is essential to ensuring not only the quality of services offered, but also sustainability. Bird watching has all the conditions in place to become a real source of local benefits. Growing interest around the world for bird watching and the associated emerging market present an alternative for the conservation of biodiversity that does not exclude local communities; instead appropriate promotion of Colombia's bird tourism sector has great potential to finally achieve the distribution of conservation benefits in a more equitable way.

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