

Birdwatching Technical Summary

Overview

Under the Caribbean Regional Oceanscape Project (CROP) Subcomponent 2.1, the Organisation of Eastern Caribbean States Commission (OECSC) engaged The Nature Conservancy (TNC) to develop ecosystem service (ES) models for five countries in the Eastern Caribbean (Dominica, Grenada, Saint Lucia, Saint Kitts and Nevis, and Saint Vincent and the Grenadines) using methodologies developed under TNC's Mapping Ocean Wealth (MOW) initiative, and to develop training and resources to improve data access for decision-makers.

This document provides a technical overview of the Birdwatching model created for this project. [Click here](#) to see the full technical report.

The Eastern Caribbean is home to interesting and diverse avifauna, with many species of potential interest to experienced birdwatchers, and many more that are enjoyed by occasional or opportunistic birdwatchers. These include endemic species, only found in the lesser Antilles, or even restricted to individual islands, but also rare, exotic, or spectacular species. While the overall numbers of tourists whose use birdwatching as their primary motivation for destination choice may be low, many more may consider it a positive contributing factor. While there is value in recognizing the current value and distribution of tourist-based birdwatching (avitourism), there is also an opportunity to promote birdwatching as an activity that can be done as part of a larger itinerary of nature-dependent tourism.

In this study, we developed four distinct layers to understand the intensity of birdwatching in the study area. The map of **birder footfall** captures birdwatching effort, while the map of **species importance** weights the map of effort by a species importance score intended to capture bird species that are likely to be of particular interest to birdwatchers. The **areas of conservation importance** layer captures both designated protected areas and Important Bird Areas¹, while the **birding hotspot layer** was compiled from various sources to identify additional areas that are known to attract birdwatchers.

This dataset will enable a broad range of users from the public to industry to government to better plan and manage both the tourism industry and any other active sectors within the blue economy.

¹ BirdLife International (2020) Important Bird and Biodiversity Area (IBA) digital boundaries: September 2020 version. BirdLife International, Cambridge, UK.

Data Sources

Data Layer	Source
Bird Observations	eBird Combined from all years to 2018
Birdwatching locations	Consultations with Environmental Protection in the Caribbean (EPIC), Caribbean Birding Trail , The Nature Conservancy Personal communications with Stephan Durand, Forest Officer at the Forestry Division, Dominica, & Vaughn Francis, Tropical Adventures
Important Bird Areas	BirdLife International
Protected Areas	The Nature Conservancy (developed from WDPA and information from local partners and governments)
Reviews	TripAdvisor
Species-specific information	BirdsCaribbean's Birds of the West Indies Checklist ²

Unless otherwise noted, all data sources were accessed in 2019.

Modelling and Geoprocessing

The methods presented below in the conceptual overview (Figure 1) and the subsequent descriptions are novel methodologies informed by the needs and data availability in the region. Methodologies and interim results were reviewed by stakeholders at in-person and virtual workshops in 2019 and 2020.

² Gerbracht, J., and A. Levesque. 2019. The complete checklist of the birds of the West Indies: v1.1. BirdsCaribbean Checklist Committee.

Conceptual Overview

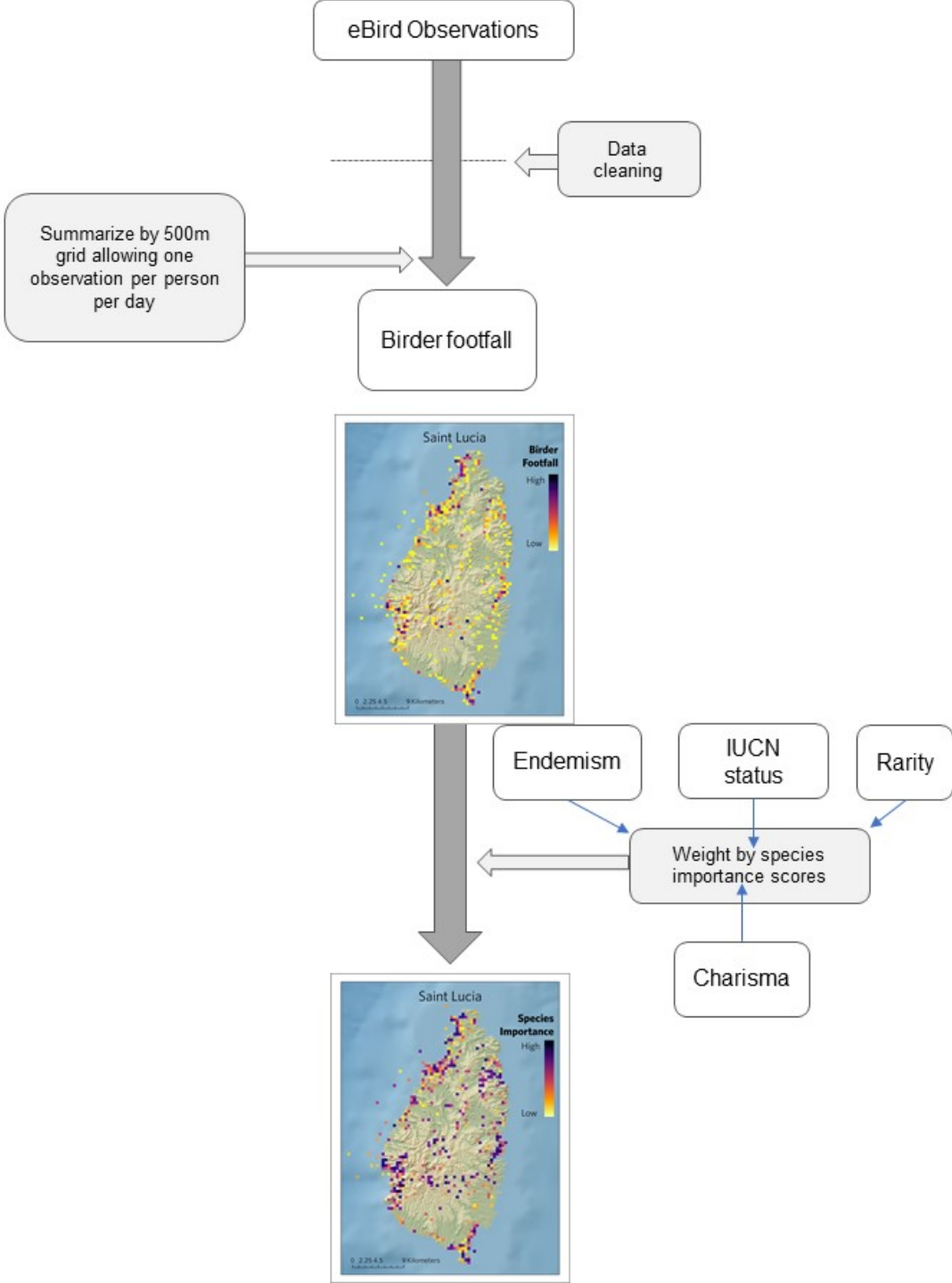


Figure 1. Conceptual overview of the Birdwatching modelling process

Birder footfall

Birder footfall visualizes birdwatching tourism density within each country. This map was developed from eBird observation data. This data was first cleaned with the removal of points that had non-specific locality names (e.g. 'Dominica', 'Saint Lucia'), if these points fell near the centroid of the island or otherwise appeared to be associated with a random location, rather than a likely area to record a bird observation. A grid of 500 x 500m cells was then generated spanning the entire region, from Saint Kitts and Nevis to Grenada. Using this grid, eBird observations were then summarized to "total observer days" (TOD), representing a count of the number of days in which observers had reported birds from that grid cell. Within each cell, only one observation was counted per observer per day, preventing double-counting where there were multiple observation uploads in a cell. The birder footfall layer shows the total observer days over the full time-period of the dataset (with 93% of observations from 2000 to 2018, and the remainder representing historical observations or non-dated observations).

Species importance

The species importance layer was developed to account for the fact that the birder footfall layer may be biased towards areas of heavy tourism/accommodation centers, and to capture the idea that there are a number of "must see" birds that will have a higher perceived value for many tourists. To capture these, we developed a weighting of species importance, scoring species importance based on key metrics that might encourage birdwatchers to travel to see.

Four broad attributes were used to select and weight species importance: charismatic interest, abundance, threat status and endemism. For the purpose of this study, birds of charismatic interest were identified based on input from local stakeholders and partners as well as information from Caribbean Birding Trail – although lacking a clear definition these are the species that are most frequently listed both by birdwatchers and in site or country descriptions, and are intended to capture birds that are likely to be a draw for birdwatchers. The remaining three categories were based on BirdsCaribbean's *Birds of the West Indies* Checklist (Gerbracht & Levesque 2019), with IUCN status obtained from the IUCN Red List (www.redlist.org). Each species was assigned a score of one or zero (Table 4), while an overall score of "species importance", was obtained by assigning and summing these scores for each species. Final scores (0-4) indicate species importance to the birdwatching industry. Any species with a total species importance score of at least 1 is considered a "key species".

	Score of 1	Score of 0	Source
Abundance	Uncommon, rare, very rare, extinct, or extirpated species	Common or fairly common	BirdsCaribbean's Birds of the West Indies Checklist
Charismatic Species	Identified as a species of charismatic interest	Not identified as such	Local experts, Environmental Protection in the Caribbean (EPIC), Caribbean Birding Trail
Endemism	All species that are endemic to the region (either West Indies,	Not endemic	BirdsCaribbean's Birds of the West Indies Checklist

	Score of 1	Score of 0	Source
	Lesser Antilles, or a specific country)		
IUCN Status	All threatened species (Vulnerable, Endangered, or Critically Endangered)	Near Threatened or Least Concern	BirdsCaribbean's Birds of the West Indies Checklist & IUCN Red List of Threatened Species (www.iucnredlist.org/)

The species importance map was then developed similarly to the birder footfall map, using the eBird observation data and the same 500 x 500m grid, but instead using species importance scores to develop a map of key species observation intensity. Similar to footfall, observations were counted once per species per day from a single observer in any grid cell (i.e. if one person saw 5 species in one location in one day, it would count as 1 TOD but 5 species observation counts; if one person saw 5 of the same species of parrot, it would be 1 TOD and 1 species observation count). The species observation counts were then multiplied by the weighted species scores to generate a total species importance score per grid cell.

Areas of conservation importance

Areas of conservation importance were compiled in order to summarize the tourism value of key areas in terms of birder footfall and species importance. This layer includes Important Bird Areas from Birdlife International and protected areas from The Nature Conservancy's Caribbean PA data layer.

Birding hotspots

Birding hotspots are known areas where birdwatching is occurring, independent of the eBird analysis. These areas were compiled from workshops and consultations with stakeholders and partners in the region and manually digitized using protected area data layers, Open Street Map, and Google Maps as guides. This layer was further enhanced to bring in data from the TripAdvisor birdwatching-related reviews. The web-based tool LightTag was used to label over 2,000 TripAdvisor reviews according to activities and elements described in each review. An expert team from Microsoft then applied a random-forest regression model to automatically classify the remainder of the reviews and return a list of reviews that described watching or enjoying birds. These could then be mapped as points based on the attraction to which they were linked.

There was some concern that this text-based analysis had been too broad, capturing almost all mentions of birds as opposed to positive and interest based observation and so these locations were filtered to capture only natural areas – trails, gardens, parks, etc., using keywords for inclusion ('beach', 'garden', 'park', etc.) and keywords for exclusion ('airport', 'bar', etc.). Areas were also considered natural if they were found within protected areas or offshore.

Limitations and Caveats

These are modelled data products based on a series of assumptions, including the motivations and activity patterns of birdwatchers. Model assumptions have been vetted by experts, stakeholders, and data where possible. The model is also largely based on crowd-sourced data points, which may be subject to bias. Areas not represented on the map are not necessarily completely unused for birdwatching. Values associated with the spatial data are unitless and while they can be summed to create scores for discrete areas, interpretation of these statistics, especially for very small areas, should be treated with caution. Estimates will be more robust when based on larger areas.

Suggested Citation

Spalding MD, McNulty VP, Longley-Wood K. 2020. Birdwatching in the Eastern Caribbean. Produced by The Nature Conservancy for the Organisation of Eastern Caribbean States under the Caribbean Regional Oceanscape Project

Data Access

[Click here to download modelled data](#)