# 70 People engaging with biodiversity in urban parks: insights from citizen science and social media for birds

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## Introduction

Bird watching, or avitourism, is both a highly popular form of nature-based tourism as well as a recreation activity undertaken by hundreds of thousands of people, including in Australia (Lopez et al., 2020; Steven et al., 2015). Many people engaging in bird watching do so in their local area, and as a result bird watching is a popular pastime in many urban parks and other green spaces in cities. These often smaller and fragmented spaces are (i) easy to access and popular places for people to visit regularly, and (ii) able to support relatively high levels of biodiversity in otherwise low diversity urban landscapes (Catterall et al., 2010). Monitoring where people engage with nature in cities including bird watching can be challenging due to the diversity of locations and multiple ways people access and traverse them. Surveys and other methods have been used to assess the popularity of bird watching and other activities in urban parks and more broadly (Pickering et al., 2020). Recently researchers have started to utilize citizen science and social media records of birds as a way to assess where people engage with nature including in cities (Lopez et al., 2020). Here we compare two sources of data – the popular citizen science app/website iNaturalist, and images posted to the social media platform Flickr to assess how such data could be used to understand where people are bird watching. We use the large subtropical city of Brisbane, Australia as a case study as it contains high bird diversity, many urban parks, bird watching is popular (Catterall et al., 2010) and there are hundreds of geolocated records associated with images of birds available on the two platforms for the city.

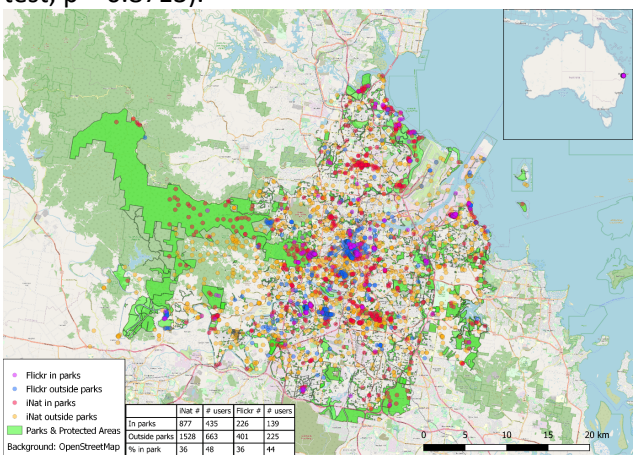
## Methods

Brisbane is the capital of Queensland and is located in the south-eastern corner of the state (Figure 1). It is the third largest Australian city with an estimated population of 2.3 million in the Greater Brisbane area in 2020 (Queensland Government, 2021).

A total of 24,415 records of birds posted by 1,212 users were downloaded from the iNaturalist website for the Brisbane City Council Area. For Flickr, the Application Programming Interface **(https://www.flickr.com/services/api)** was used to download metadata of images using the terms "Brisbane" "birds" in tags, titles or descriptions resulting in 19,597 images from 2,451 users. For both iNaturalist and Flickr, geolocated records from outside the Brisbane City Council Area were removed from the datasets. To avoid biases associated with intensive posting by some users, we randomly selected one record per user per month from each dataset. The Flickr images were also manually screened to remove those not showing birds. The remaining records in both datasets were then overlayed in QGIS on a layer showing all urban parks and natural vegetation in the City Council Area.

## Results

There was a total of 3,032 records of birds across Brisbane, with far more records and users on iNaturalist (2,405 records, 79%, 903 users) than Flickr (627 records, 21%, 315 users). Although records covered many areas of Brisbane, there were distinct clusters of bird watching in parks as well as the city centre. Overall, 36% of records were in parks and posted by 574 users. The proportion of records from parks was the same for both datasets (Chi-Squared test, p = 0.8713).




| | iNat # | # users | Flickr # | # users |
|---|---|---|---|---|
| In parks | 877 | 435 | 226 | 139 |
| Outside parks | 1528 | 663 | 401 | 225 |
| % in park | 36 | 48 | 36 | 44 |

*Figure 1: Location of iNaturalist records and Flickr images of birds inside and outside parks and protected areas in the Brisbane City Council area.*

**Discussion**

Bird watching is popular and people often share their experiences via citizen science projects and on social media, with around 1,400 people recoding encounters with birds in Brisbane across the two datasets analysed here. Although much of the engagement occurred within urban parks, far more records were from other parts of the city, highlighting how they can also be important places for bird watching and engaging with nature. This differs to the study by Lopez et al. (2020) in Chicago that found over half of bird sightings were in greenspaces. The data will now be used to look at (i) which bird species people engage with, (ii) what traits of those species may account for their popularity, (iii) when people engaged with them, and (iv) detailed hotspot mapping of the current records by adding in other data sources.

**References**

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