Bird Biodiversity Monitoring

Report 2025

Biodiversity

Urban bird biodiversity plays a critical role in maintaining healthy urban ecosystems though services such as pest regulation, and seed dispersal (Luck et al. 2012; McCloy et al. 2024). Additionally, research has shown that increased bird biodiversity has a positive effect on humans' mental health and wellbeing (Cameron et al. 2020). Understanding and actively promoting bird biodiversity is critical for creating sustainable and livable cities for both wildlife and humans.

Phoenicurus ochruros (Black Redstart), an amber listed U.K. breeding bird that visits the City of London during the Summer (RSPB 2025).

Our Work

From February 21st to June 23rd of 2025, researchers from Imperial College in collaboration with the City of London Corporation and the Friends of the City Garden, conducted field research on green roofs and gardens in the City of London. The research employed bioacoustics and machine learning techniques to identify bird species. Additionally, ultrasonic bat detector recordings were collected during the study period but have not yet undergone analysis.

Results from Inner Temple Garden

During the 98-day recording period **24** bird species were identified. The list included *Phoenicurus ochruros* (black redstart) a species of importance for the City of London Biodiversity Action Plan (City of London Corporation 2022). A total of **2** vocalizations from this species were recorded during the study period.

Findings Summary

24 Bird Species

2 vocalizations of black redstart

Notable Species

1) Black Redstart
2) Eurasian Treecreeper
3) Coal Tit
4) Mistle Thrush
5) Eurasian Jay
6) Grey Wagtail

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Appendix

Table 1: Bird species identified on site, showing common and Latin names and total vocalizations recorded during the 98-day study period. Vocalization numbers represent conservative estimates as data were rigorously filtered to prioritize identification accuracy over detection quantity (see methods below).

Common Name	**Latin Name**	**Total Vocalizations**
Eurasian Wren	*Troglodytes troglodytes*	2128
Rose-ringed Parakeet	*Psittacula krameri*	427
Great Tit	*Parus major*	287
Eurasian Blue Tit	*Cyanistes caeruleus*	253
European Robin	*Erithacus rubecula*	242
Eurasian Blackbird	*Turdus merula*	128
Eurasian Magpie	*Pica pica*	121
Coal Tit	*Periparus ater*	52
Dunnock	*Prunella modularis*	49
European Goldfinch	*Carduelis carduelis*	48
Common Wood-Pigeon	*Columba palumbus*	21
Mistle Thrush	*Turdus viscivorus*	9
Gray Wagtail	*Motacilla cinerea*	7
Eurasian Treecreeper	*Certhia familiaris*	6
Long-tailed Tit	*Aegithalos caudatus*	5
White Wagtail	*Motacilla alba*	3
Black Redstart	*Phoenicurus ochruros*	2
Common Chiffchaff	*Phylloscopus collybita*	2
Rock Pigeon	*Columba livia*	2
Stock Dove	*Columba oenas*	2
Common Firecrest	*Regulus ignicapilla*	1
Eurasian Jay	*Garrulus glandarius*	1
European Greenfinch	*Chloris chloris*	1
Herring Gull	*Larus argentatus*	1

Methodology

Audio data was recorded using the Song Meter Mini Bat 2 (Wildlife Acoustics 2024), programed to record one minute of audio every ten minutes, 24 hours a day, from February 21st to June 23rd, 2025. To identify which bird species were calling, I used a computer program called BirdNET - an artificial intelligence system trained to recognize different bird songs and calls (Kahl 2019).

The computer program identified many possible bird sounds, but to make sure these identifications were accurate, I filtered out any detections the program wasn't very confident about, then manually listened to samples of recordings for each bird species to verify the model got it right. For each species, I listened to 20 random recordings (or all of them if there were fewer than 20) and compared them to reference recordings from the Cornell Lab of Ornithology | Macaulay Library to confirm the identifications were correct (Sullivan et al. 2009, Sethi et al. 2024).

I only kept species where the computer program was at least 90% accurate in its identifications. Through this quality control process, I ended up with a reliable dataset of verified bird vocalizations from 41 different bird species across all study sites. This rigorous approach ensured that my results accurately reflect which birds are using your site.

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