ARPHA Conference Abstracts 8: e153404
doi: 10.3897/aca.8.e153404

Conference Abstract

Assessing bird biodiversity using LifePlan audio recording

Ricardo Dìaz-Delgado‡, José Luis Arroyo‡, José Luis del Valle‡

‡ ICTS Doñana. Estación Biológica de Doñana-CSIC, Seville, Spain

Corresponding author: Ricardo Dìaz-Delgado (rdiaz@ebd.csic.es)

Received: 19 Mar 2025 | Published: 28 May 2025

Citation: Dìaz-Delgado R, Arroyo JL, del Valle JL (2025) Assessing bird biodiversity using LifePlan audio recording. ARPHA Conference Abstracts 8: e153404. https://doi.org/10.3897/aca.8.e153404

Abstract

Acoustic data were collected in Doñana LTSER Platform in the context of the project Lifeplan, an international initiative for characterising biodiversity across the globe. For the present study, we extracted acoustic data recorded in years 2021 and 2023. Data were collected via passive acoustic monitoring (PAM) using AudioMoth v1.2 devices. For any one time, there were up to five AudioMoth devices operated within a 1-ha area (see https://www.protocols.io/view/lifeplan-audio-recording-protocol-kqdg3xbp1g25/v2), 4 in the corners and one in the centre, located inside the Doñana Biological Reserve (37.0240292,-6.55344). The corner AudioMoths were programmed to record for 1 minute every 10 minutes at 48 kHz to record birds. The sampling period included April to December 2021 and January to May 2023. The total number of recordings varied between years, with 6,290 for 2021 and 6,456 for 2023. Data were subsampled to the level of almost 100 hours. The sampling plot is also systematically pictured with a phenocam enabling the retrieval of vegetation phenology in order to check its relationship with bird species occurrence and abundance,

Audio data were collected at a 48-kHz sampling rate using 16 bits per sample. Data were stored in AudioMoth devices as encrypted files. Thus, potential human voices present in the audio recordings were not available to anyone accessing the memory card of the physical recorder at the sampling site. Encrypted data were transferred to object storage Allas at CSC – IT Center for Science, Finland. Before analysis, the files were decrypted

into standard WAV files. Due to artefacts in the beginning of some recordings, all data were processed so that the first second of a recording was removed.

Bird species were identified using BirdNET-Analyzer version 2.414. The results were restricted by the site-specific species list for Doñana site. These lists were generated using the script species.py of the BirdNET-Analyzer package. Two confidence thresholds (0.3 and 0.8) were used to filter the detections. All statistical analyses were performed based on detections using the threshold of 0.8.

A total of 121 bird species were identified. Assessment of bird species occurrence was carried out according to expert analysis. A total of 6 species identifications were deprecated as non occurrent bird species in the area. Another 3 bird species were also discarded due to scarce occurrence. Data were used to characterize bird species community including monthly (Fig. 1) and hourly (Fig. 2) occurrence, phenology (combined with Phenocam data), species diet, species protection level and species geographical distribution (migrant, resident, etc.). Results will allow us to assess these methods to monitor long-term trends and changes in avian diversity in Doñana LTSER Platform according to data from traditional census techniques.

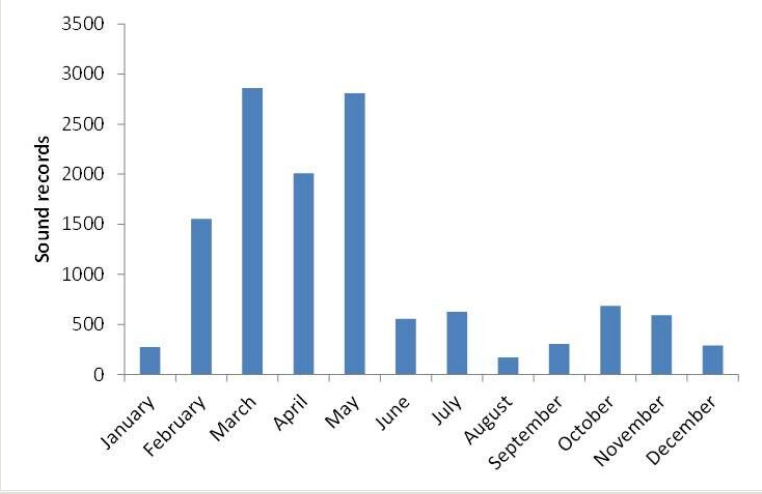

Figure 1. doi
Monthly number of bird sounds recorded at Doñana LifePlan site in Doñana LTSER Platform.

Presenting author

Ricardo Díaz-Delgado

Presented at

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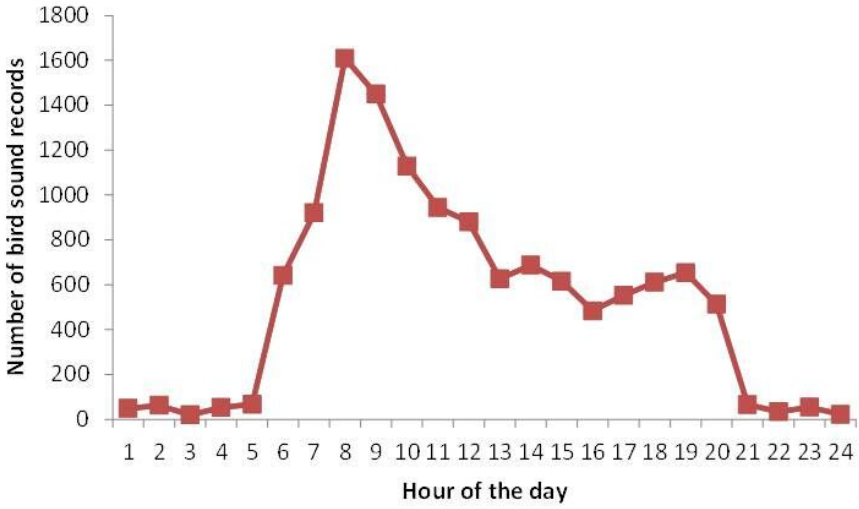

Figure 2. doi

Hourly bird records at Doñana LifePlan site in Doñana LTSER Platform.

Funding program

Sound identification and processing were funded by the European Research Council 900 (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No 901 856506; ERC-synergy project LIFEPLAN). Data collection and acces by ICTS Doñana monitoring program. Part of this work was also funded by the eLTER Plus project (INFRAIA, Horizon 2020, Agreement no. 871128).

Hosting institution

ICTS Doñana. Estación Biológica de Doñana-CSIC. c/ Américo Vespucio 26, 41092. Seville, Spain.

Conflicts of interest

The authors have declared that no competing interests exist.