First record of Long-eared Owl (*Asio otus*) on the island of Porto Santo, Portugal

Primeiro registo de Bufo-pequeno (*Asio otus*) na ilha do Porto Santo, Portugal

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ABSTRACT

The Long-eared Owl (*Asio otus*) has a wide resident population distribution across the Northern Hemisphere, with the population present in Portugal representing less than 1% of the European population. In this short note, we present the first ever record of a Long-eared Owl on the island of Porto Santo, Madeira, which also represents the first visual record of this species in the Madeiran archipelago. A juvenile was recorded and photographed in August of 2020, near the city of Vila Baleira, Porto Santo. The identification and approximate age of the bird were confirmed using audio analysis (compared against previous recordings of juvenile Long-eared Owls in other parts of Europe). The presence of a juvenile Long-eared Owl on the island of Porto Santo suggests a dispersal event of an individual from the breeding populations of mainland Portugal, northwestern Morocco, the Azores or the Canary Islands. While van Bemmelen et al. (2020) recently suggested the presence of a breeding population of Long-eared Owl on the Island of Madeira based on the recording of begging calls of three juveniles, this assumption requires further study and does not support the evidence that the juvenile observed in Porto Santo may also represent a breeding population on the island.

Keywords: *Asio otus*, juvenile, Long-eared Owl, Madeira, Porto Santo.

RESUMO

O Bufo-pequeno (*Asio otus*) tem uma ampla distribuição populacional residente no hemisfério norte, e a população em Portugal representa menos de 1% da população europeia. Nesta breve nota, apresentamos o primeiro registo de Bufo-pequeno na ilha do Porto Santo, Madeira, que representa também o primeiro registo visual da espécie no arquipélago madeirense. Um juvenil foi gravado e fotografado em agosto de 2020, nas proximidades da cidade de Vila Baleira, Porto Santo. A identificação e a idade aproximada da ave foram confirmadas por análise de áudio (em comparação com gravações anteriores de juvenis de Bufo-pequeno em outras partes da Europa). A presença de um Bufo-pequeno juvenil na ilha do Porto Santo sugere um evento de dispersão de um indivíduo das populações nidificantes em Portugal Continental, Noroeste de Marrocos, Açores ou Ilhas Canárias. Embora recentemente van Bemmelen et al. (2020) sugeriram a existência de uma população reprodutora de Bufo-pequeno na Ilha da Madeira, baseando-se em registos auditivos de chamamentos de três indivíduos juvenis, esta evidência requer mais investigação e não sustenta necessariamente a hipótese de que o juvenil observado no Porto Santo possa também representar uma população reprodutora na ilha.

Palavras-chave: *Asio otus*, Bufo-pequeno, juvenil, Madeira, Porto Santo

Introduction

The Long-eared Owl (*Asio otus*) has an extensive resident population distribution, spanning the continents of Europe, Asia, and North America (BirdLife International 2020). While the overall population trend is declining, the population decrease is not considered rapid enough to meet the criteria for the Vulnerable status granted by the IUCN Red List (BirdLife International 2021). Due to this fact, and to the expansion of the range of resident populations, the Long-eared Owl is evaluated as Least Concern (BirdLife International 2021). BirdLife International's 2015 European Red List of Birds estimates the number of Long-eared Owl at 304,000 to 776,000 pairs in Europe (BirdLife International 2015). Mainly a resident species in Portugal, data collected from 2008 to 2012 estimated the population of the Long-eared owl in Portugal to range between 200 and 1000 pairs, which represents less than 1% of the European population (BirdLife International 2015). Within the Madeiran archipelago, the presence of this species is limited to one dubious record in the updated Checklist of the Birds of the Archipelago of Madeira and Selvagens (Romano et al. 2010) and one audio record of two (possibly three) juvenile birds on the island of Madeira in August of 2019 (van Bemmelen et al. 2020). Here, we present a new record of a juvenile Long-eared Owl, registered for the first time on the island of Porto Santo (Archipelago of Madeira) in August of 2020, with both audio and visual evidence. The registry has been submitted to the Portuguese Rarities Committee (Comité Português de Raridades) and is awaiting decision. This new record will contribute to the general knowledge of the species distribution.

Methods

Location and circumstances

Our first observation took place on August 5th, 2020, at 22h42, in Vila Baleira in Porto

Santo, Archipelago of Madeira, Portugal. Due to the lack of lighting in the area, we were not able to see the individual in detail, though we were able to distinguish a light-coloured, medium-sized bird. The individual was perched atop a power-line post between residential houses, at an estimated distance of 20 m from our position. We recorded its calls using one of our phones. After approximately 15 minutes and no change in the bird's location, we left the area. On the following night, August 6th, at 22h22, we observed an owl approximately 50 m away from the first observation's location (Figure 1). The bird was perched on a metal fence, in an area with tall grass, palm (*Phoenix canariensis*) and olive trees (*Olea europaea*). This time, we were able to approach the owl at a distance of approximately 3 m and were able to photograph and record a video of the individual (Figure 2). After approximately 2 minutes, the owl flew away, heading due east.

On the following night, August 7th, at approximately 22h30, we heard a faint call, identical to the ones from the previous nights, originating from the eastern side of the island. The call was too low in amplitude to be recorded by our recording devices. For the remainder of our time on Porto Santo, we did not hear nor see the owl again, although we visited the area between 22h00 and 23h00 each night until August 17th. We also attempted to find Long-eared Owl pellets and feathers in the areas where we observed the owl, but we were unsuccessful in our search.

Figure 1- Map of the locations of the two observations of a juvenile Long-eared owl (*Asio otus*) on August 5th and August 6th, 2020, on the island of Porto Santo, Madeira.

Figura 1 - Mapa dos locais das duas observações de um Bufo-pequeno (*Asio otus*) juvenil nos dias 5 e 6 de Agosto de 2020, na ilha do Porto Santo, Madeira.

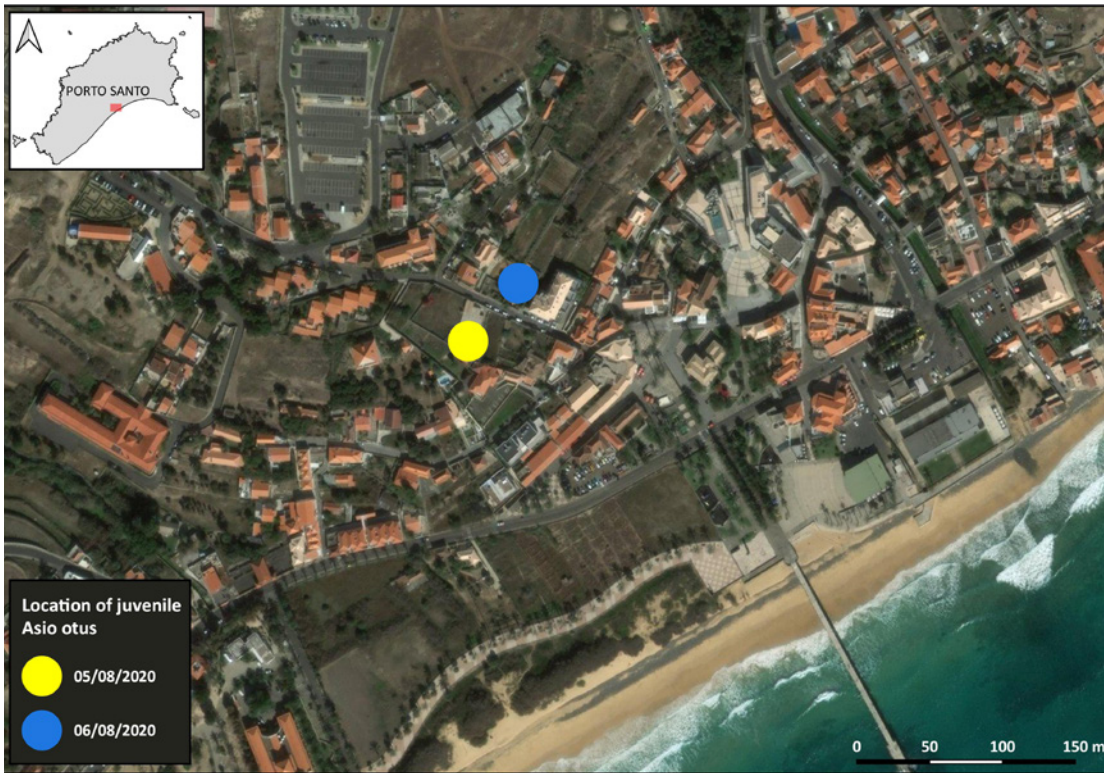


Figure 2 - Photograph of a juvenile Long-eared owl (*Asio otus*) on the island of Porto Santo, Madeira, taken on August 6th, 2020.

Figura 2 - Fotografia de um Bufo-pequeno (*Asio otus*) juvenil na ilha do Porto Santo, Madeira, tirada a 6 de Agosto de 2020.

Audio recording analysis

We analysed the audio recordings of the juvenile's calls from the two nights, to verify if the owl we observed on the two nights was the same individual. Furthermore, we compared these calls with previous recordings of Long-eared Owls from other parts of Europe, including from the island of Madeira, in order to further confirm the species identification and approximate age (i.e. juvenile) of the individual.

The audio analysis was performed using Raven Pro 1.6 software (Center for Conservation Bioacoustics 2019), while the spectrogram was created using iZotope RX 5 Audio Editor (iZotope 2016) and edited using Adobe Lightroom Classic (Sylvan n.d.).

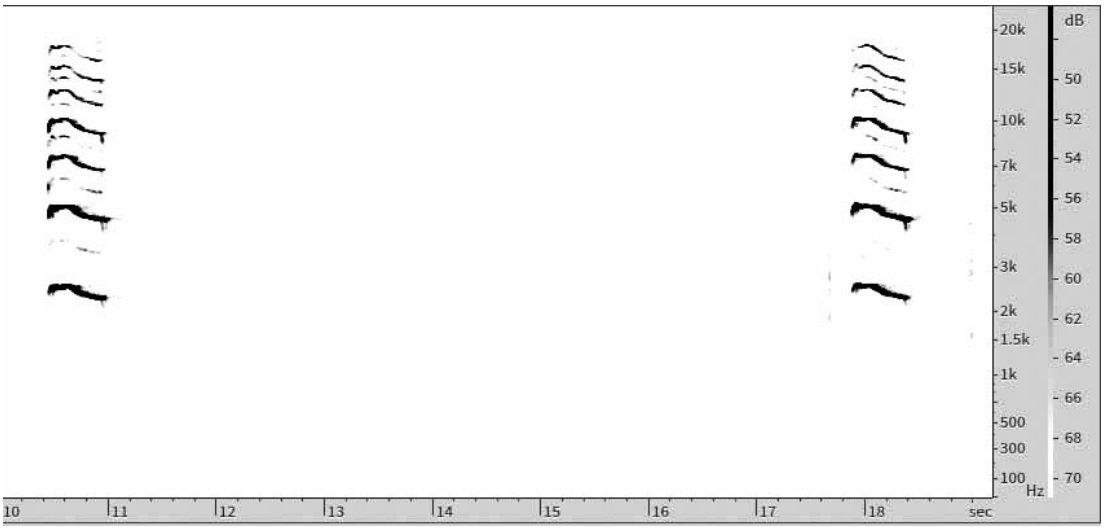
Results

While we could not approach the bird on the first night (August 5th) as it was located in a fenced-off area, we identified the individual as a juvenile Long-eared Owl by its calls. Through visual confirmation on the second night (August 6th), we were able to confirm the identification and confirm that the Long-eared Owl was a juvenile.

The acoustic repertoire of the bird on both days exhibited an average call duration of 0.55 s (SD=0.04 s, n=19) and an average call interval of 7.48 s (SD=2.16 s, n=19). The spectral components showed an average peak frequency of 2.46 kHz (SD=0.1 kHz, n=18), with the calls containing 3 inflection points at minimum (Figure 3).

Figure 3 - Spectrogram of juvenile Long-eared Owl (*Asio otus*) calls on Porto Santo, Madeira, recorded on August 5th, 2020.

Figura 3 - Espectrograma de chamamentos de um Bufo-pequeno (*Asio otus*) juvenil na ilha do Porto Santo, Madeira, gravado a 5 de Agosto, 2020.



It was not possible to correlate the calls from the two separate days using sound-analysis software, as only one call was recorded on the second day. Furthermore, the calls were recorded at different distances from the point of origin of the sound (20 m vs. 3 m). Therefore, we could not prove that the bird observed on the two different nights was the same individual using sound analysis. However, based on the proximity of the two locations between the two nights and the similar time stamps (22h42 *vs*. 22h22), we can assume it was the same individual.

Comparisons of our recordings against recordings of juvenile Long-eared Owl on the citizen-science website Xeno-canto (Xeno-canto Foundation 2020) further confirmed that the individual observed on Porto Santo was a juvenile. Additionally, the spectrogram generated showed a similar structure to the two spectrograms by van Bemmelen et al. (2020) of the Long-eared Owl juveniles recorded on the island of Madeira in 2019.

Discussion

The period of time of mating until hatching of Long-eared Owls in Europe ranges between February and June (Galeotti et al. 2000; König et al. 2008; Hardey et al. 2009). At 20 days of age, Long-eared owlets begin leaving the nest, perching on nearby branches (Mikkola 1983). At this time, they can be considered fledglings, beginning to fly within the nesting territory (Tome 2011), while continuing to be fed by their parents for the following two months. During this period (between 20 and 80 days of age), juveniles call out to their parents at dusk with a high-pitched begging call, to which parents often respond (König et al. 2008). Between 50 and 80 days after fledgling (70 to 100 days of age), the juveniles leave the nesting territory and disperse, becoming more independent (Tome 2011). Assuming the juvenile observed in Porto Santo on August 6th and 7th had dispersed from its nesting territory and as it was still using begging calls, we estimate its age to be between 70 and 80 days.

While knowledge on the distribution of Long-eared Owls in Portugal is limited, there are confirmed resident populations throughout mainland Portugal, as well as in the Azores (Svensson et al. 2009, Costa et al. 2018). Additionally, audio recordings of two

(possibly three) different Long-eared Owl juveniles in 2019 on the island of Madeira (van Bemmelen et al. 2020) presented the first audio record and, according to the authors, the first breeding record of the species in the Madeiran archipelago.

In Northern and Central Europe, Long-eared Owl often migrate for winter over long distances (>2000 km; Cramp & Simmons 1985), heading as far south as the Mediterranean coast of Egypt, south Turkey and northwestern Morocco (Mikkola 1983, Cramp & Simmons 1985, Glue & Nilsson 1997, Michalonek et al. 2005, Emin et al. 2018). In southern Europe, Long-eared Owls are mostly sedentary, although juveniles still exhibit post-natal dispersion (Mikkola 1983, Cramp & Simmons 1985, Glue & Nilsson 1997). Given the tendencies for Long-eared Owl juveniles to disperse, it is possible that the presence of the juvenile individual on the island of Porto Santo can be the result of a migratory or dispersal movement from the breeding populations of mainland Portugal (distance of ca. 850-1280 km), the Azores (ca. 900-1280 km), or northwestern Morocco (ca. 780-1280 km). It is also possible that the individual could have originated from the Canary Islands (ca. 510-620 km), where the subspecies *Asio otus canariensis* is resident on all islands (Martín & Lorenzo 2001, Cortés & Martí 2003, Palacios 2004). Additionally, the individual could have been a vagrant originating from the island of Madeira (ca. 70 km), if the juveniles recorded by van Bemmelen (2020) in 2019 are indicative of a new Long-eared Owl population breeding on the island of Madeira, as claimed by the authors. However, the evidence of a newly-discovered breeding population on the Island of Madeira requires confirmation. As Long-eared Owls have not been recorded before in Porto Santo, the possibility of a breeding population on the island is unlikely, but further research should confirm or refute this hypothesis.

This first record of a Long-eared Owl on the island of Porto Santo represents a significant addition to the limited knowledge on the status of the Long-eared Owl in the Madeiran archipelago.

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