Short communication

Notes on the feeding rhythm of a barn owls' brood (*Tyto alba*) in an agricultural area of the province of Venice

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Abstract - The feeding rhythm of a brood of barn owls in an agricultural area of Venice (VE, NE Italy) was investigated. The results show that offspring are fed exclusively at nighttime, highlighting a peak of transport of prey to the nest in the first part of the night.

Keywords: Barn owl, feeding rhythm, camera trapping, Veneto.

Riassunto - Note sul ritmo di alimentazione di una nidiata di barbagianni (*Tyto alba*) in un'area agricola della provincia di Venezia.

È stato indagato il ritmo di alimentazione di una nidiata di barbagianni in un'area agricola veneziana (VE). I risultati dimostrano come la prole venga nutrita esclusivamente nelle ore notturne, evidenziando un picco di trasporto di prede al nido nella prima parte della notte.

Parole chiave: barbagianni, ritmo di alimentazione, fototrappolaggio, Veneto.

The barn owl (*Tyto alba*) is a typical species of the agroecosystem, considered to be in decline at the European and national level, especially in the Po Valley where a 50% decrease is hypothesised (Mezzavilla *et al*., 2016). In the province of Venice, a marked decrease in breeding pairs has been found (Bon *et al*., 2014). The decrease is probably due to the destruction and transformation of nesting and feeding habitats, to the use of pesticides and rodenticides (Pascotto *et al*., 2011) and finally to the impact with vehicles. In Veneto, although barn owl's diet was particularly studied in the 90s of the last century (Bon *et al*., 1992; 1993; 1994; 1997; Baldin & Ciriello, 1999), other aspects of reproductive ecology have never been investigated, among these, the feeding rhythm of the brood has never been a subject of research. The data used for the following study were collected as part of a collaboration established between Barbasso Srl and the "Le Tenute di Cattolica" farm, in the context of a project aimed at protecting the barn owl in the properties of the estate. In particular, the reproductive success of a brood was followed up at one of the nest boxes installed as part of the project, in Portegrandi (VE) at a round bale deposit (45°33'35.9"N; 12°25'49.3"E).

Considering a radius from the site of about 1 km, which is approximately the average radius of the home range of the species during the reproductive period as indicated by "The Barn Owl Trust" (https://www.barnowltrust.org.uk/), the area under examination is almost totally covered by extensive arable land (~ 100 ha) and by the inhabited area of Portegrandi (~ 20 ha). To a lesser extent there are mowing and alfalfa meadows (~ 5 ha) and small hedges and wooded areas, especially near the river Sile and the round bale deposit. To study the feeding rhythm, about 1 month after the first egg hatched (4 in total), a camera trap (model Dörr Snapshot 5.1) was placed outside the nest box, with the aim of documenting the activity of the brood. The camera trap, active 24 hours a day, has been set in photo mode, minimizing the time interval between one shot and the next. To extrapolate information relating to the feeding rhythm of the young barn owls, only the photos were used, accompanied by the timetable, in which there was certain evidence of the transport and / or passage of prey from the adult to the young (Fig. 1). The camera trap remained on site from 15 July 2021 to 10 September 2021, and collected 58 useful photographs which were used to process the feeding rhythm of the brood. The processing was performed using the R software (version 4.0.2; R Core Team, 2020) and the overlap package (Meredith & Ridout, 2014).

The result is expressed by the Kernel density function (Fig. 2) which highlights how the transport of prey to the nest is concentrated exclusively at night. In accordance with what emerged from other European studies, the "parents" feed the brood mainly in the first part of the night (Michelat & Giraudoux, 1992; Ritter & Görner, 1975; Roulin, 2001; Durant & Handrich, 2013), with a peak recorded around 11.00 pm. The analysis also highlights the presence of a second peak, almost imperceptible in the second part of the night, approximately 2-3 hours before dawn, as also highlighted by Scriba

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Fig. 1 - Example of photos in which there is certain evidence of the transport of prey to the nest. / Esempio di materiale fotografico in cui vi sono evidenze certe del trasporto di prede al nido.

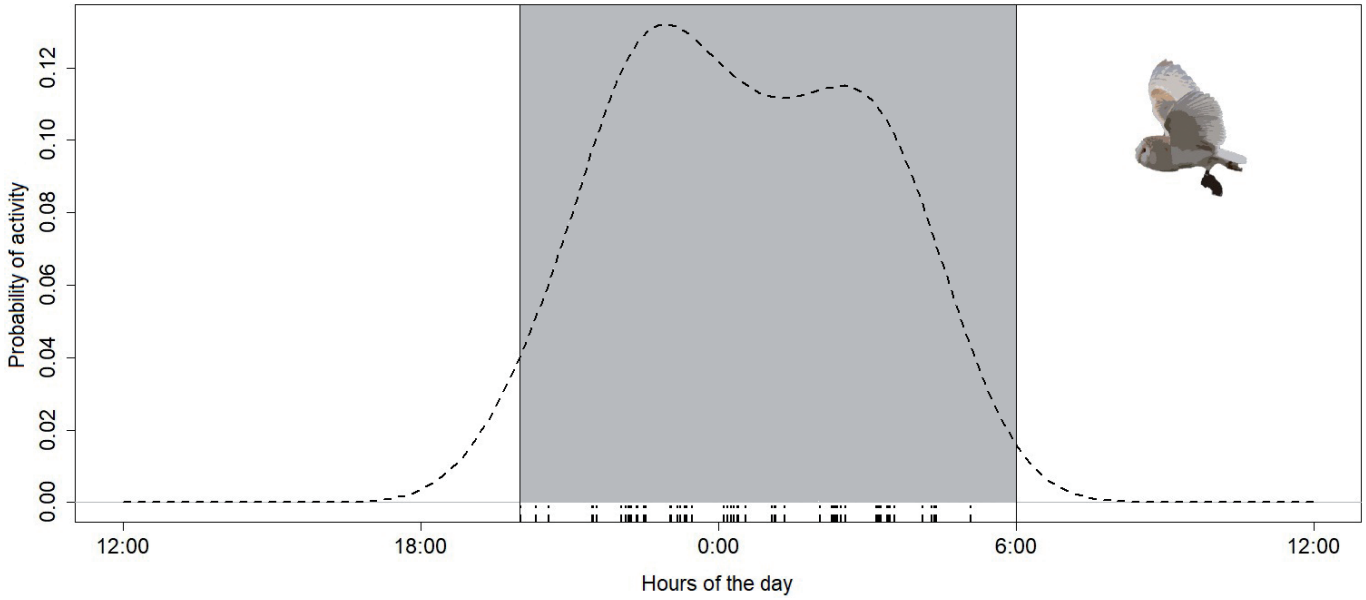

Fig. 2 - Feeding rhythm of barn owls' offspring. The gray area indicates the night hours. / Ritmo di alimentazione della prole di barbagianni. L'area grigia indica le ore notturne.

et al. (2017). Although the species is also occasionally active during the day (Bunn, 1972; Mastrorilli, 2019), it can therefore be said that in an agricultural context such as the one in question, activities such as the care and feeding of the offspring are linked to the night hours. What was found is probably due to the fact that during the night the anthropic disturbance is minimized and consequently there is also a greater activity of the prey.

Through the photographic material examined it was not possible to identify with certainty the prey transported to the nest, but the wads found near the nest box used were collected and analyzed throughout the reproductive period. These first unpublished data (Nardotto, unpub.) highlight the massive presence of osteological material, primarily *Microtus arvalis*, followed by *Apodemus sylvaticus*. What was found seems to differ from the diet observed in almost the same location at the beginning of the 1990s, when the most predated species was *Crocidura suaveolens* (Bon *et al*., 1993), once the apparently most predated species in the eastern Veneto plain (Bon *et al*., 1997). In view of this, it will be interesting to deepen the analysis of the Strigiform diet and compare it with what emerged almost 30 years later. In the light of the data collected, it is believed that camera trapping is a technique capable of collecting useful information, helping to make hypotheses and improve the understanding of the ecological, spatial and behavioral dynamics of the species contacted. The potential of camera trapping is also confirmed in its increased use in the study of species that are difficult to contact, such as the barn owl and other nocturnal birds of prey. Among the aspects recently investigated are the foraging of offspring (Séchaud *et al*., 2020), predation on species of conservation interest (Raine *et al*., 2019) and the effectiveness and use of nest houses (Whyle, 2015; Kross *et al*., 2016).

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