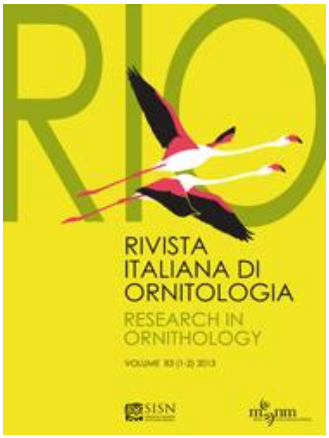

Rivista Italiana di Ornitologia - Research in Ornithology

eISSN 2385-0833 https://sisn.pagepress.org/rio

Rivista Italiana di Ornitologia 2026 [Online ahead of print]

To cite this Article:
Nardotto A, Bertolin C, Pastres M, et al. **Considerations on the first confirmed nesting records of *Tyto alba guttata* in northern Italy**. *Rivista Italiana di Ornitologia* doi: 10.4081/rio.2026.943

Submitted: 18-08-2025
Accepted: 18-10-2025

Considerations on the first confirmed nesting records of *Tyto alba guttata* in northern Italy

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Abstract - We report the first breeding records of two Western Barn Owl (*Tyto alba*) nests regarded as belonging to the subspecies *guttata* of the Barn Owl (*Tyto alba guttata*) in northern Italy. On June 20th, 2025, a nesting female was captured and ringed in a nest box located in Ca' Tron, Treviso Province. The individual was raising 7 chicks and exhibited typical plumage features associated with *T. a. guttata*. On June 24th, 2025, another female and her three chicks were ringed during an operation to recover a chick that had fallen from its nest in the San Fermo area, Mantua Province. These records suggest a possible expansion of the breeding range of the *guttata* morph/subspecies or, alternatively, an extreme example of morphological variability within a local population of *Tyto alba*. We briefly discuss the taxonomic implications and recommend further genetic and ecological investigations.
Key words: *Tyto alba guttata*, Western Barn Owl, breeding, northeastern Italy, dispersal.

Riassunto - Segnaliamo la prima nidificazione confermata di Barbagianni Nordico *(Tyto alba guttata*) nel nord d'Italia. Il 20 giugno 2025 è stata catturata e inanellata una femmina in cova all'interno di una cassetta-nido situata a Ca' Tron, in provincia di Treviso. L'individuo stava allevando 7 pulli e mostrava i tipici caratteri di piumaggio riconducibili a *T. a. guttata*. Il 24 giugno 2025 invece, un'altra femmina e i relativi 3 pulli vengono inanellati nell'ambito di un intervento di recupero di un nidiaceo caduto dal nido in località San Fermo, in provincia di Mantova. Questi dati fanno ipotizzare un'espansione dell'areale riproduttivo della forma/sottospecie *guttata* oppure, in alternativa, una variabilità morfologica locale all'interno di *Tyto alba*. Vengono brevemente discusse le implicazioni tassonomiche e si raccomandano ulteriori indagini di tipo genetico ed ecologico.
Parole chiave: *Tyto alba guttata*, barbagianni, riproduzione, Italia nord-orientale, morfotipo vs. sottospecie, espansione dell'areale, dispersione.

Introduction

The Western Barn Owl (*Tyto alba*) is a species distributed in Europe, Africa and Middle-East, and although its intraspecific taxonomy remains debated (Roulin, 2021), the latest updated taxonomic checklists still recognize the presence of several subspecies (Birdlife International 2024; Clemens et al. 2024; AviList Core Team, 2025). In Italy we can find three subspecies: *Tyto alba alba*, distributed in western and southern Europe; western Canary Islands, and North Africa; *Tyto alba Ernesti*, in Sardinia and Corsica; and, rarely, *Tyto alba guttata*, usually finding in central Europe eastward to Latvia, Lithuania, and Ukraine, and southeastward to Albania, Macedonia, Romania, and northeastern Greece (AviList Core Team. 2025). The grayer dorsal, deep buff ventral parts and denser spotting on the underparts of the *T. a. guttata* contrast with the paler and wither western European *T. a. alba* (Scherzinger & Mebs, 2022). In Italy, this subspecies is considered a regular wintering bird in the Po Valley, with occasional observations also in Tuscany, Liguria, and Piedmont (Brichetti & Fracasso, 2006). The wintering population in Italy also includes migrants of the subspecies *T.a. guttata*, mainly from Germany and Switzerland (Spina & Volponi, 2008).

Despite a mention of the possibility of *T. a. guttata* breeding in NE Italy (Matics, 2003), this has never been supported by data until now. Indeed, according to the most recent checklist of Italian birds, this subspecies is categorised in class A20, where A refers to AERC categories (i.e. "taxa recorded in an apparently natural state at least once since 1st January 1950."), 2 to the general status (i.e. "irregular: taxa recorded more than 10 times and in more than 5 years since 1950 but in fewer than 9 out of the last 10 years"), and 0 to the breeding status (i.e. "taxa never recorded breeding.") (Bacetti et al., 2021). Here, we report the first confirmed records of breeding of a *T. a. guttata*-type Northern Italy, as a result of potential range extension or an example of extreme plumage variation in a local population. We can also consider the possibility of a natal dispersion since the North of Italy is in a particularly favourable position, bordering the *T.a. guttata* range, even if hindered by the Alps.

Discussion

Catch information

During a scheduled inspection of nest boxes in June 2025, a female Western Barn Owl was found incubating inside a wooden nest box installed on a walnut tree (*Juglans regia*) at the Ca' Tron estate (45°34'28.6"N 12°26'29.1"E), in the province of Treviso, northeastern Italy. The site is located at approximately 3 m a.s.l. in an agroforestry mosaic landscape.

The female was captured, on June 20th, under national authorization from ISPRA (Italian Institute for Environmental Protection and Research). Morphological measurements were collected, and high-quality photographs were taken. The bird was promptly released and the brood was not disturbed

except visual counting of the hatchlings. A total of seven chicks of different age were observed. The female resumed care of chicks shortly after release. No adult male was observed during the visit.
During the same breeding season, in a recovery operation following a report to the Mantua "Parcobaleno" CRAS of a barn owl chick that had fallen from the nest, three chicks and an adult compatible with the morphology of *T.a. guttata* were captured and ringed, although it was not possible to determine the sex, in the locality of San Fermo, in the province of Mantua (45°11'24.8"N 10°32'07.7"E). No biometric measurements were taken on this occasion. About a month and a half later, on August 4, following a further inspection of the site, two of the three ringed chicks were observed again, having completed their development and were photographed to evaluate their morphological characteristics.

Identification

The female bird caught in Ca'Tron (TV) was characterized by morphological features traditionally deemed as distinctive of *T. a. guttata* (Fig. 1 and Tab. 1), such as dark buff underparts that extend to the belly, legs, and undertail. Its face is characterized by extensive dark markings around the eyes that spread across the facial disc, which is edged with a darker brown. The upperparts are predominantly grey, with this coloration being more extensive than the buff tones. Key features include a mostly or entirely grey crown, bold dark bars across the outer primaries, and dark grey tips on the primaries. (Cramp, 1985; French P. R., 2009). The morphological measurements of *T. a. alba* and *T. a. guttata* generally overlap, with exception of tail length, which is greater in *T. a. guttata*. (Demongin et al., 2016) The individual captured at Ca' Tron showed a tail measurement consistent with the range observed in *T. a. guttata*.
The adult captured in San Fermo (MN) also showed characteristics typical of this subspecies, as listed above. One of the two juveniles observed a month and a half later at the same site showed the morphological characteristics typically distinctive of *T. a. guttata*, while the other showed characteristics intermediate between *T.a. alba* and *T. a. guttata*, with a lighter background color, more similar to that of the nominate subspecies (Fig. 2).

Considerations

Although, some individuals assigned to the *guttata* subspecies have also been reported in Italy especially in the winter months (Cauli et al., 2022; Bacetti et al., 2021), but no confirmed cases of nesting have ever been reported, except anecdotally (Tenan, in Matics, 2003).
So, the presents records are the firsts confirmed nesting of *Tyto alba guttata* in Italy, and could represent a possible extension of the known breeding range of this subspecies. These records, located

in the lowland plains of Veneto and Lombardia regions, raise relevant questions about the dynamics of Western Barn Owl distribution across Europe, particularly in transitional zones between subspecies.

While this finding is noteworthy from a biogeographical perspective, it also highlights ongoing debate about in the taxonomic status of Western Barn Owl subspecies. Recent works , have questioned the validity of traditional subspecific subdivision of the Western Barn Owl based largely upon phenotypic traits (Antoniazza et al., 2010; Roulin & Jensen, 2015). In particular, Cumer et al. (2022) found that much of the morphological variability observed in Western Barn Owls across Europe is linked with environmental gradients, such as temperature and humidity, rather than with different genetic lineages. The same authors suggest that traits like plumage darkness or spotting intensity may develop via sexual selection or local adaptation rather than subspecific divergence.

Moreover, molecular data reveal high gene flow across Western Barn Owl populations in southern and central Europe, with no clear genetic breaks that would justify rigid subspecies differentiation (Cumer et al., 2022). This suggests the possibility that individuals with intermediate or aberrant phenotypes (Mátics & Hoffmann, 2002), such as the one documented in this study, do not represent genetically distinct subspecies, but rather, local morphs existing along a continuous gradient of variation (Cumer et al., 2024).

Given these considerations, the assignment of these birds to *T. a. guttata* should be approached with caution. While their plumage characters match those usually regarded as typical of this subspecies, it is not clear whether such features are subspecies-diagnostic or simply indicative of phenotypic plasticity or intergradation within the *Tyto alba* complex. Previous studies have proposed the existence of hybrid or contact zones between *T. a. alba* and *T. a. guttata* (Matics, 2002), and north-eastern Italy might represent one of them.

On the other hand, despite genetic evidence of continuity, many taxonomic authorities and operational checklists, including Avibase, BirdLife International, and some checklists cited in the introduction continue to recognize *Tyto alba guttata* as a distinct subspecies. This approach reflects a practical convention based on phenotypic and biogeographic criteria, useful for ornithological communication and conservation management. From a biogeographical perspective, the observed pattern is consistent with clinal variation: *T.a. guttata* occupies more inland and humid regions of central Europe, where darker coloration could offer thermoregulatory or camouflage advantages (Romano et al., 2019). However, no genetic or behavioral barriers have been identified that would justify species or independent evolutionary unit status.

Furthermore, observations of *T.a. guttata* individuals breeding in northern Italy could be explained by the postnatal dispersal dynamics of the species, which in exceptional cases can disperse over 600

km (Huffeldt et al. 2012). Furthermore, it appears that phenotypically dark and reddish barn owls move for greater distances than their paler conspecifics (Van den Brink et al., 2012; Roulin, 2013), and some individuals may have crossed the Alps and settled in northern Italy.

These results, therefore, constitutes a contribution to Western Barn Owl ecology in Italy but also to the wider discussion of bird taxonomy in widespread morphologically variable species. Future research should prioritize integrative approaches, combining morphometric, ecological, and genomic data, to clarify the evolutionary and taxonomic interrelationships of European *Tyto alba* populations.

Conclusions

This first confirmed breeding records of a *Tyto alba guttata*-type Western Barn Owl in northern Italy underlines the need to carry out further investigations of the taxonomic makeup of Western Barn Owls across the European transition zones. An integrative approach combining morphology, genetics, and ecology will be required to put an end to the longstanding morph vs. subspecies controversy.

Acknowledgments

We would like to thank once again Cattolica Agricola s.a.r.l., and the wider Genagricola group, owners of the estates of Ca'Tron site for their sensitivity to environmental issues. Special thanks to Niccoló De Din, Sebastiano Gottardi, Daniele Colombo and the sustainability team. For the access to the ceiling, we thank Franca Furano and Favini Paolo, for the reporting of the owlet fallen from the nest Andrea Fiozzi from Parcobaleno. Special thanks to Andrea Ravagnani, with whom we are in frequent contact regarding all matters relating to the study of the barn owl in Italy.

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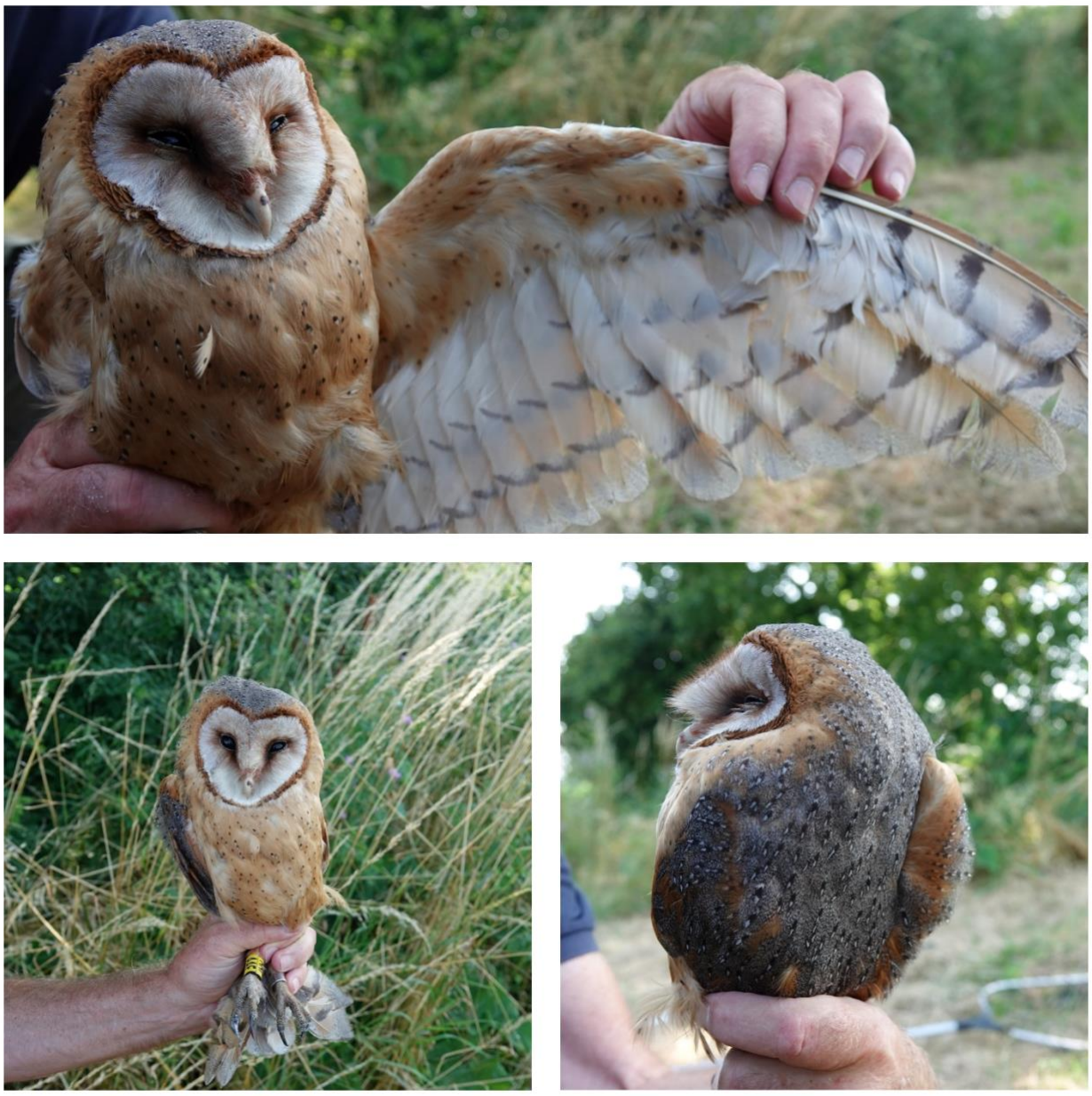

Fig. 1 – Female Western Barn Owl with *Tyto alba guttata* phenotype captured in a nest box, near Ca'Tron (TV, Italy) on 20/06/2025.

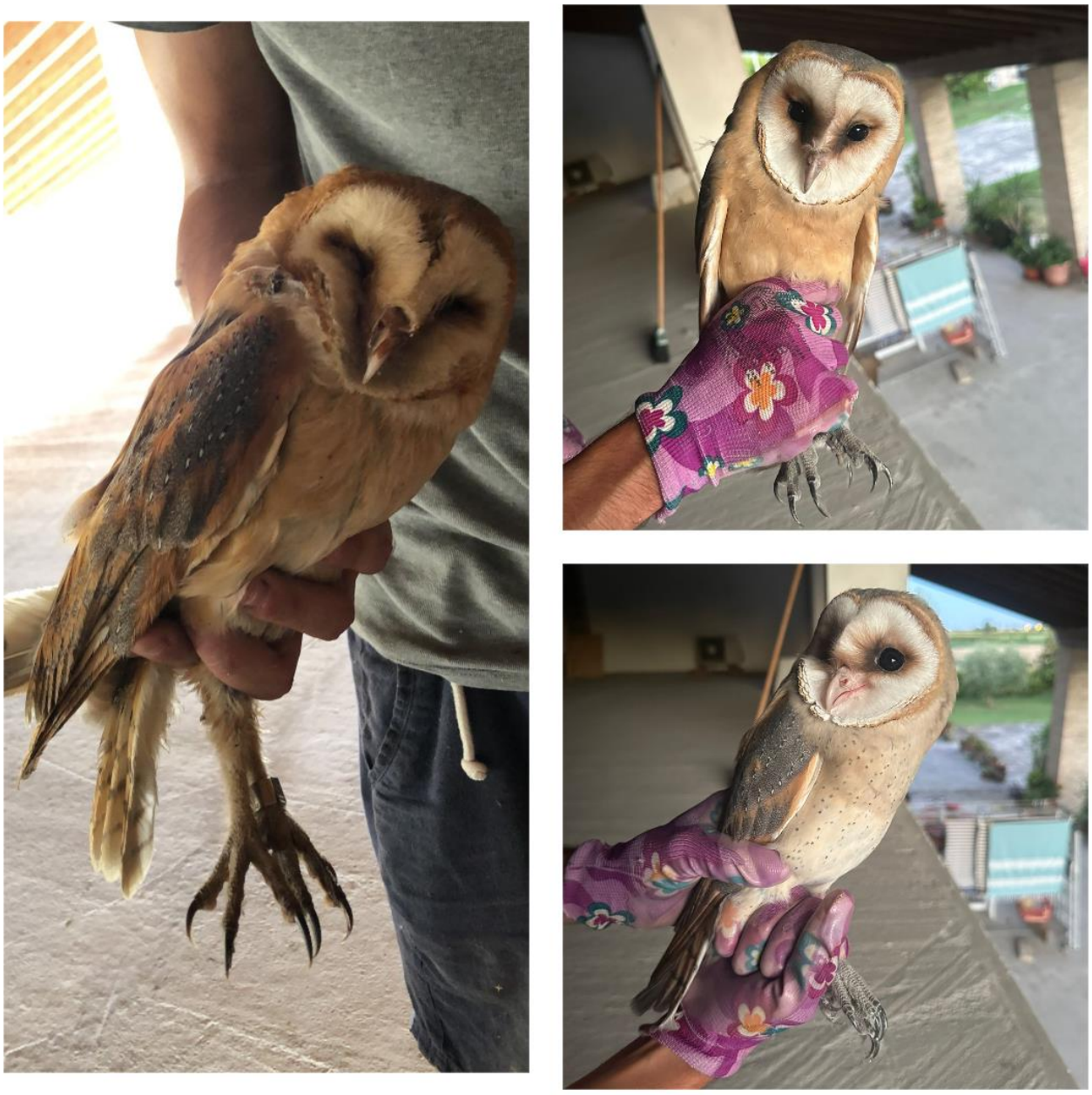

Fig. 2 – On the left, adult ringed on 24/06/2025 in San Fermo (MN), on the right, above, juvenile with phenotypic characteristics distinctive of the subspecies *T. a. guttata*, below, juvenile with phenotypic characteristics intermediate *between T. a. alba* and *T.a. guttata*.

Tab. 1 – Morphological parameters of the female caught in Ca'Tron, (TV, Italy). The second and third columns report the minimum and maximum measurements of the subspecies reported in Demongin et al. (2016). The extreme measurements are reported in brackets.

	Tyto alba alba	Tyto alba guttata	Female caught
Wing	(270) 277-309	270-310	293
Tail	109-124	107-137	135
Bill to cere	17.2-20.4 (21.5)	16.5-21.0	18.0
Bill to skull	30-33 (34)	29-33	/
Tarsus	53.7-67.1	52-65.5	65.5
Weight	240-360 (442)	(187) 250-370 (480)	312