

## Short Communication

# Just found and already in danger: first observations of the Italian endemic *Coenagrion castellani* Roberts 1948 (Odonata: Coenagrionidae) in Lunigiana, northern Tuscany, with a new altitudinal record

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**Abstract** - The presence of the Italian endemic odonate *Coenagrion castellani* is herein reported for the first time in the province of Massa-Carrara, in two distinct areas of the Lunigiana historical region. One population was found in 2025 in the SAC IT5110002 “Monte Orsaro” and is located about 100 m from the border of the Tuscan-Emilian Apennine National Park, where the species is not reported. The second site is known for two specimens collected in 2012 in a wetland situated at 1150 m a.s.l. in the Zeri Valleys, about 15 km apart from the first site and outside any protected area. This latter observation represents the new upper altitudinal limit for the species. Unfortunately, this wetland has undergone significant habitat alteration, and the species has not been confirmed in 2025. This valuable Italian endemic species is included in the Annex II of the Habitats Directive and is classified as Vulnerable by the IUCN; however, its geographical distribution has not yet been exhaustively defined. These observations highlight the urgency of identifying unknown populations of this Species of Community interest, particularly in stations outside protected areas to protect them adequately.

**Key words:** distribution update, Habitat Directive, Tuscan-Emilian Apennines, Zygoptera.

**Riassunto** - Appena scoperto e già in pericolo: prime osservazioni dell'endemita italiano *Coenagrion castellani* Roberts 1948 (Odonata: Coenagrionidae) in Lunigiana, Toscana settentrionale, con una nuova segnalazione altitudinale.

Si segnala per la prima volta la presenza del raro odonato *Coenagrion castellani* in provincia di Massa-Carrara, in due aree distinte della Lunigiana. Una popolazione è stata trovata nel 2025 nella ZSC IT5110002 “Monte Orsaro” a circa 100 metri dal confine del Parco Nazionale dell'Appennino Tosco-Emiliano, dove la specie non era segnalata. Il secondo sito è noto per due esemplari raccolti nel 2012 in una zona umida situata a 1150 m s.l.m. nelle Valli di Zeri, a circa 15 km di distanza dal primo e al di fuori di qualsiasi area protetta. Questa stazione rappresenta il nuovo limite altitudinale per la specie. Purtroppo, la zona umida ha subito importanti alterazioni dell'habitat e la specie non è stata confermata nel 2025. Questo prezioso endemismo italiano è incluso nell'Allegato II della Direttiva Habitat ed è classificato come Vulnerabile dalla IUCN; tuttavia, la sua distribuzione geografica non è ancora stata definita in maniera esaustiva. Le presenti osservazioni evidenziano l'urgenza di individuare popolazioni non note di questa Specie di interesse Comunitario, in particolare in stazioni al di fuori delle aree protette al fine di proteggerle adeguatamente.

**Parole chiave:** Appennino Tosco-Emiliano, aggiornamento della distribuzione, Direttiva Habitat, Zygoptera.

Local extinction of threatened species' populations before their discovery is probably one of the worst nightmares in conservation science. Populations are indeed a key element for species survival, notably when the species' range is highly fragmented (Işik, 2011). The Italian bluet *Coenagrion castellani* is a damselfly endemic

to Italy with a highly fragmented distribution and a high number of isolated populations (Riservato *et al.*, 2014; Dijkstra *et al.*, 2023). The species was recently recognized as distinct from *Coenagrion mercuriale* (Charpentier 1840). Consequently, it shares the same conservation status of the former (Dijkstra *et al.*, 2023), which is protected under the European Union's Habitats Directive (Council Directive 92/43/EEC) where it is listed in the Annex II as an *animal and plant species of community interest whose conservation requires the designation of special areas of conservation*. Moreover, it is classified as Vulnerable by the IUCN due to its decreasing population trend and the threats posed by the intensification of agricultural practices and livestock farming, climate change, pollution and water management (De Knijf *et al.*, 2023). The scattered distribution of *C. castellani* is most likely linked to its narrow ecological requirements (Dijkstra *et al.*, 2023). Its typical habitat is represented by small slow-flowing waters (e.g. springs, sunny rivulets and canals)

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Received for publication: 5 November 2025

Accepted for publication: 14 May 2026

Online publication: 2 July 2026

with aquatic plants and surrounded by helophytic riparian vegetation (Riservato *et al.*, 2014). The species has a marked preference for alkaline limestone substrates, and the presence of soft sediments in the aquatic reproductive sites is important for the larval stages (Riservato *et al.*, 2014). *Coenagrion castellani* is more common at low altitudes (even along the coast) with the maximum altitudinal limit recorded at 1050 m a.s.l. (Dijkstra *et al.*, 2023). Herein, we report the discovery of two new populations of *C. castellani* in northern Tuscany, in the province of Massa-Carrara, where the species was never recorded before (see Fig. 1 for a review of the records in the northern part of the species range), including a new upper altitudinal limit for this endemic damselfly.

The first population was discovered by the authors on 7 June 2025 in an area known as “Prati di Logarghena”, where G. B. photographed a mating pair. On returning in the same locality on 19 June 2025, G. B. observed at least 20 individuals, including several mating pairs (Fig. 2A) and immatures. The site falls into the Special Areas of Conservation (SAC) IT5110002 “Monte Orsaro” and is located about 100 m from the border of the Tuscan-Emilian Apennine National Park (PNATE), where the species has not been reported. The PNATE, which manages the SAC, has been informed of the discovery and requested that the coordinates of the observation site remain undisclosed. This population occurs in an area of about 5500 m<sup>2</sup> located

at 970 m a.s.l., where the habitat consists of an extensive meadow intersected by small rivulets fed by perennial springs (Fig. 2B). After the identification of the species from the photograph taken on 7 June 2025, A. B. re-examined damselfly specimens collected in Lunigiana during fieldwork for his bachelor’s thesis. This led to the discovery of two specimens of *C. castellani* collected on 1 July 2012 (Fig. 2C) in a small wetland at “Roncacci” (44°22’39.0”N 9°45’25.0”E). The two specimens, one male and a female, are now kept at the Natural History Museum of the University of Pisa. This second occurrence area is about 15 km from the first one and is located in the municipality of Zeri outside any protected area. This new locality is particularly relevant because it is located at an altitude of 1150 m a.s.l., which therefore is the new upper altitudinal limit for the species. In 2012, the habitat was highly suitable for *C. castellani*, with small rivulets fed by springs in the upper part of the wetland and abundant vegetation. On 29 June 2025, A. B. surveyed the same site for the presence of the species, but he could not find it; conversely, he discovered that the upper part of the wetland habitat was heavily modified by intensive livestock grazing (Fig. 2D). These observations emphasise the need for greater survey effort to clarify the current distribution of *C. castellani* in Lunigiana and throughout its potential range, where it remains poorly studied (Dijkstra *et al.*, 2023). This is particularly urgent given the populations are highly isolated in small suitable habitats that are easily lost over

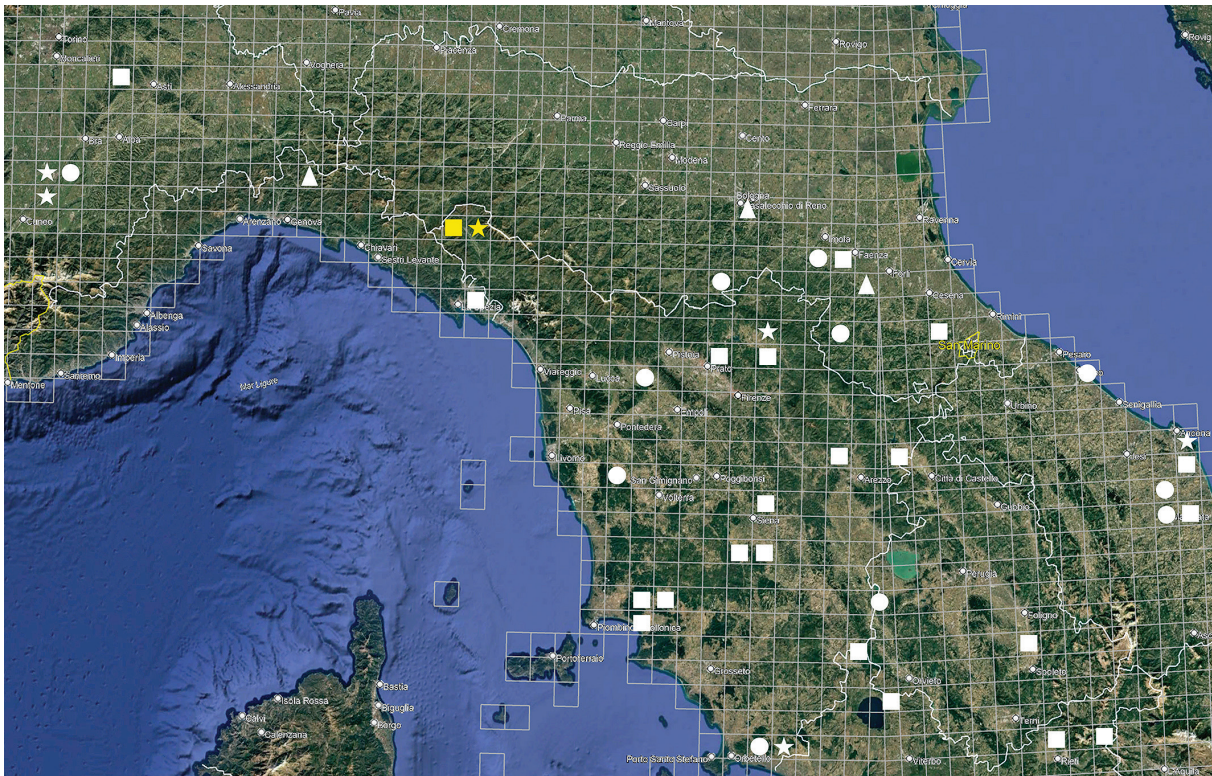


Fig. 1 - Distribution of *Coenagrion castellani* in the northern part of its range on a 10×10 km UTM grid. Data from Dijkstra *et al.* (2023), updated with geolocated records from iNaturalist. Triangles indicate records collected before 1950; dots, records from 1950 to 1999; squares, records from 2000 to 2020; stars, records after 2020. / Distribuzione di *Coenagrion castellani* nella porzione settentrionale dell’areale su griglia UTM 10×10 km. I dati sono ripresi da Dijkstra *et al.* (2023) e aggiornati con osservazioni geolocalizzate da iNaturalist. I triangoli indicano segnalazioni precedenti al 1950; i cerchi, segnalazioni dal 1950 al 1999; i quadrati, segnalazioni dal 2000 al 2020; le stelle, le segnalazioni successive al 2020. Le osservazioni del presente studio sono evidenziate in giallo.

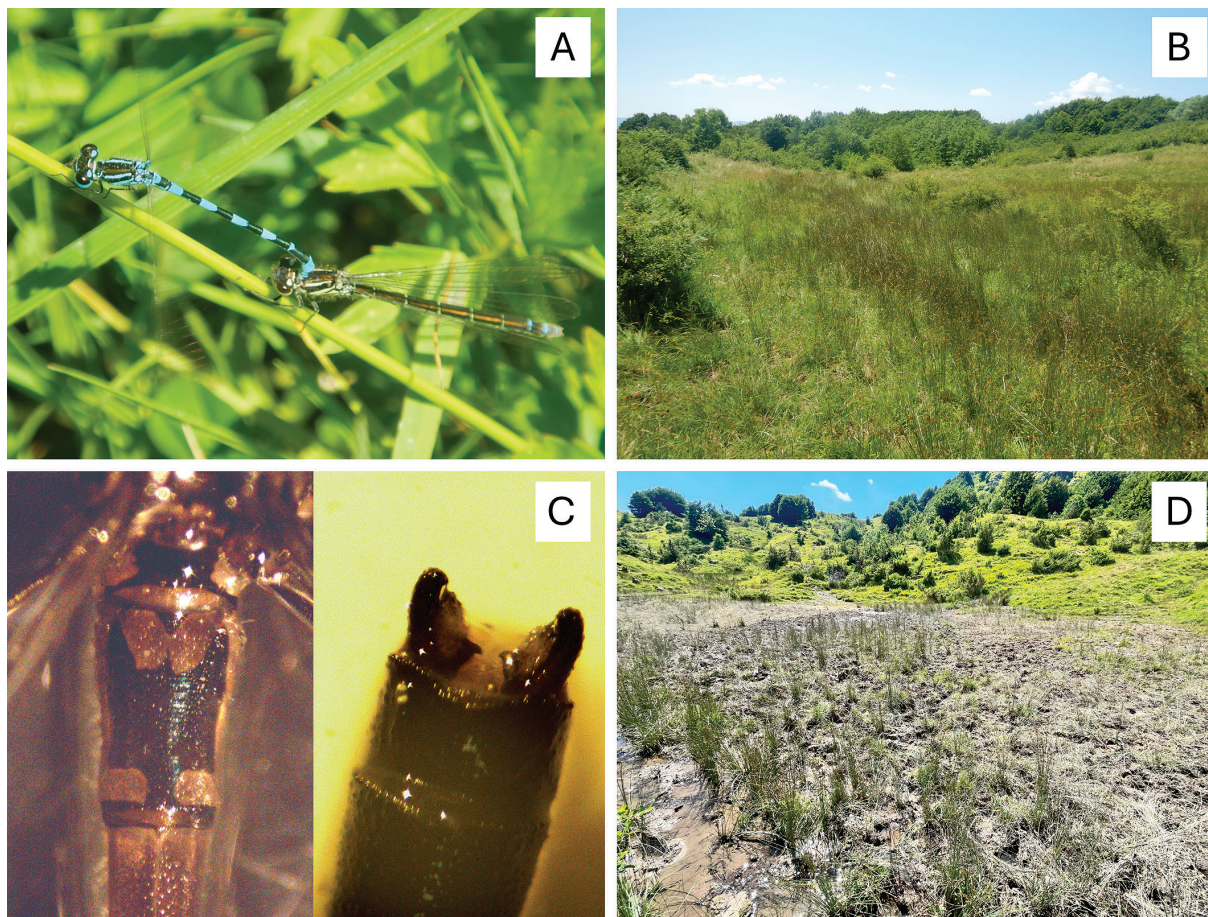


Fig. 2 - *Coenagrion castellani* and its habitats in Lunigiana. A) A pair observed on 19 June 2025 in the SAC IT5110002 “Monte Orsaro”; B) Habitat of *C. castellani* in the SAC IT5110002 “Monte Orsaro”; C) The diagnostic black marking on S2 in the preserved *C. castellani* male from “Roncacci” wetland; D) The habitat of *C. castellani* in the “Roncacci” wetland on 26 June 2025 destroyed by intensive grazing. / *Coenagrion castellani* e il suo habitat in Lunigiana. A) Coppia osservata il 19 giugno 2025 nella ZSC IT5110002 “Monte Orsaro”; B) Habitat di *C. castellani* nella ZSC IT5110002 “Monte Orsaro”; C) La marcatura nera tipica sul segmento S2 e le appendici nel maschio di *C. castellani* proveniente dalla zona umida di “Roncacci”; D) L’habitat di *C. castellani* nell’area umida di “Roncacci” il 26 giugno 2025, distrutto dal pascolo intensivo.

time (Fabbri, 2018; De Knijf *et al.*, 2023). The likely local extinction of *C. castellani* in “Roncacci” wetland must be a warning to act promptly in the search for new populations and protect them. In conclusion, the present article provide an important contribution to support the proposal for the designation of a new Special Area of Conservation (SAC) including the locality “Roncacci”, and for the incorporation of specific conservation measures for the species into the management plan of SAC IT5110002 “Monte Orsaro”.

### Acknowledgements

We would like to thank the Editor Giorgio Chiozzi, Giacomo Assandri and one anonymous reviewer for their valuable comments and revisions, which have greatly improved the manuscript. We are also grateful to Giovanni Carotti for the information about past research on the species in the Tuscan-Emilian Apennine National Park.

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