

New breeding evidence of Zitting Cisticola *Cisticola juncidis* in South Tyrol after 1970/1980s

Abstract

Cisticola juncidis was considered extinct in Trentino-South Tyrol since 1980, but recent records indicate that the species is recolonizing the region. Initial detections were made during standardized monitoring programs conducted by local research institutes, followed by additional observations reported through citizen science platforms. Confirmed reproduction over two consecutive years suggests a potential expansion of the species within the region. Most observations occurred inside protected areas where open habitats are maintained through extensive management practices. These findings underline the importance of protected areas providing crucial habitats in an intensively managed agricultural landscape and highlight the effectiveness of combining citizen science data with standardized monitoring for tracking species distribution shifts and detecting new occurrences or for tracking restricted populations.

Keywords: Citizen science, standardized survey, range expansion, protected areas.

Introduction

The Zitting Cisticola *Cisticola juncidis* is the only European representative of the genus *Cisticola* and currently comprises 18 recognized subspecies (RYAN 2020). It occupies a vast distribution range from the Mediterranean region to Southern Africa, South and Southeastern Asia, and Northern Australia. In the 19th century, the species was restricted to the Mediterranean region. Since the early 20th century, it has expanded northward, mainly due to relatively mild winters (NÉMETH & Cs 2008; MAUMARY et al. 2021; SCHULZ & GÜNTHER 2024). It is generally resident throughout its entire range, and in Europe, it occasionally expands into new territories during irruptive movements. However, its distribution is limited by harsh temperatures, and it tends to disappear from new areas after severe winters (BENSUSAN 2008; LARDELLI 2022) resulting in highly fluctuating population trends in Europe (ŠKORPILOVÁ et al. 2025).

Associated with open habitats such as grasslands (i.e. meadows and pastures) or extensive crop fields, the Zitting Cisticola primarily requires tall and dense herbaceous covering, as its nest is built from intertwined grass stems. It prefers to build nests near waterbodies or within wetlands using plants such as *Juncus* and *Phragmites*. The species can also inhabit drier environments where it utilizes various species of *Poaceae* to build its nest (RYAN 2020).

In Italy, the Zitting Cisticola is widely distributed, and its population showed an increasing trend between 2000 and 2011 (SILVA & ROSSI 2011). The species is currently classified as Least Concern (LC) at both national and global levels (BIRDLIFE INTERNATIONAL 2017; GUSTIN et al. 2021), and is cited in annex II of EU Birds directive (2009/147/EC). The northern part of its distribution in Italy is mostly limited by the Alps (Figure 1).

Based on available data, the species is currently considered extinct in South Tyrol as a breeding species, with no confirmed nesting records since the 1970s–1980s (UNTERHOLZNER 2018; CERESA & KRANEBITTER 2020). However, recent sightings reported both in

Addresses of the authors:

¹ Institute for Alpine Environment, Eurac Research, Drususallee/Viale Druso 1, I-39100, Bolzano/Bozen, Italy

² Museum of Nature South Tyrol, Via Bottai, I-39100, Bolzano/Bozen, Italy

³ Museo delle Scienze di Trento (MUSE), Ufficio Ricerca e Collezioni, Corso del Lavoro e della Scienza 3, 38122 Trento, Italy

⁴ Via Rovigo 30/5, 39100 Bolzano, Italy

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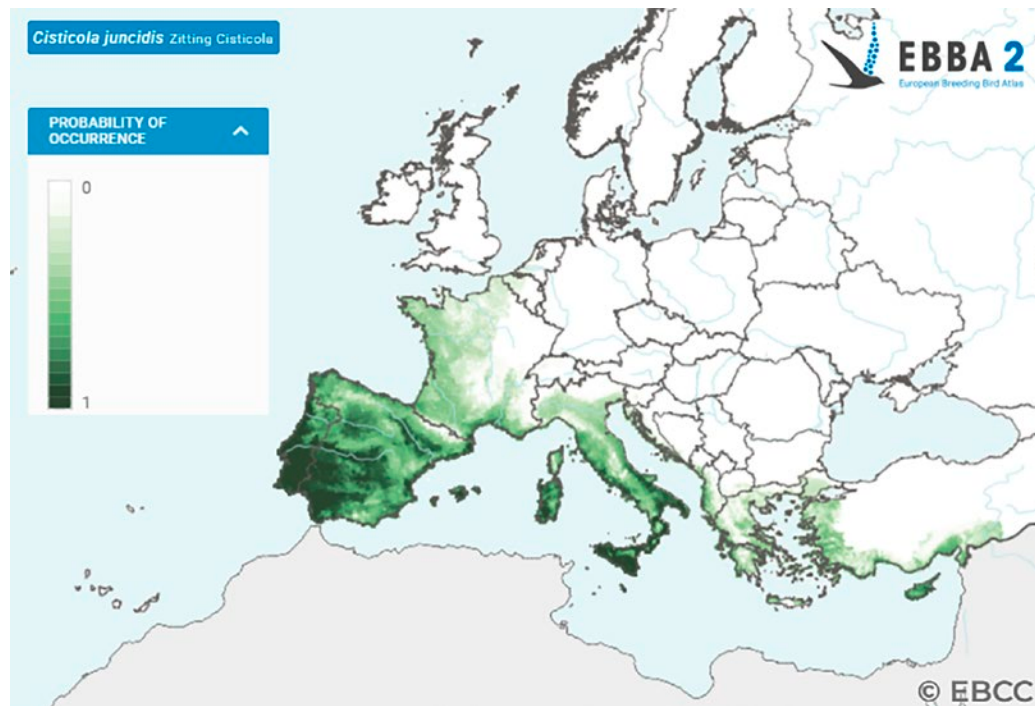


Figure 1: *Cisticola juncidis*: distribution in Europe (EBCC 2022).

Citizen Science platforms and during standardized bird monitoring schemes suggest that the species may be recolonizing the province, with confirmed nesting.

Methods

As a part of the long-term Biodiversity Monitoring of South-Tyrol (BMS) carried out by Eurac research since 2019 (HILPOLD et al. 2023), standardized bird monitoring was conducted within the province using point counts and integrated in 2024 by passive acoustic monitoring. In total, 64 different points are sampled every year using AudioMoth 1.2.0 recorders from Open Acoustic Devices (HILL et al. 2019) which are usually deployed during the breeding season (mid-April to mid-July). Each recorder is active for two periods of four hours per day: one starting one hour before sunrise and one starting three hours before sunset (SCANFERLA et al. 2025). Each point is also sampled three times during the same period by a professional ornithologist counting every bird heard or seen for 10 minutes within the three hours following sunrise (HILPOLD et al. 2023).

A further bird monitoring scheme in South Tyrol is focused on the breeding species listed in the Annex I of the Birds Directive (2009/47/EC) and other species of particular conservation interest and is conducted by the Museum of Nature South Tyrol and the Autonomous Province of Bolzano/Bozen since 2023 (2022 for farmland birds). This scheme includes a detailed monitoring scheme of meadow and shrubland birds, using a high number of point counts (N = 240) and territory mapping designed especially for rare species (CERESA et al. 2025). The main wetlands within the province are also regularly surveyed applying the same scheme and period.

The data from citizen science were derived from Ornitho.it (Ornitho.it 2025) and iNaturalist (iNaturalist 2025), two platforms increasingly used in South Tyrol (GUARIENTO et al. 2019), and eBird (eBird 2025) which is widely used worldwide (SULLIVAN et al. 2009). Sightings of the Zitting Cisticola were extracted from all available records since the creation of the different platforms across the region Trentino-South Tyrol.

Results

Since the last documented reproduction in the 1980’s (UNTERHOLZNER 2018), different individuals of Zitting Cisticola were observed in several sites across the region (Table 1; Figure 2). An individual was caught during a ringing session in April 1996 in Foci dell’Avisio (Adige valley) (PEDRINI et al. 2005). The next sighting occurred in September 2000 within a bog in the Biotopo Lake Caldaro without reporting an atlas code. Moreover, in 2023, two singing males were recorded: one at Biotopo Lake Caldaro in July (atlas code reported 3) and another in the meadows near Monguelfo (Pusteria valley) in June (atlas code reported 3), during the meadow/shrubland bird monitoring conducted by the Museum of Nature South Tyrol. In 2024, citizen science platforms reported 28 sightings (Figure 3), all from the Lake Caldaro area, including observations of fledglings (atlas code reported 13) in August. The other sightings reported an atlas code 2 for individuals found in suitable habitat (n=4) and atlas code 3 for a singing male spotted (n=9). In 2025, a total of 31 observations were documented through both standardized monitoring projects and citizen science contributions (Figure 4). In this year, the species was detected not only at the Biotopo Lake Caldaro but also at three additional sites in Trentino: La Rocchetta (maximum atlas code reported 3), Foci dell’Avisio (no atlas code reported) and Torbiera delle Viote (maximum atlas code reported 3). Fledglings were again observed in the southern part of Lake Caldaro during the Biodiversity Monitoring South Tyrol long-term project, indicating a second consecutive successful breeding event for the species in the same area.

Table 1: Description of the sites where the Zitting Cisticola was observed within Trentino-South Tyrol.

Name	Protection status	Surface (ha)	Description
Lake Caldaro	Protected: ("Biotopo")	241	A mosaic of reed beds, wet meadows, and patches of colonizing woodland and shrubs.
La Rocchetta	Protected: ("Biotopo")	89	Humid grasslands with dense herbaceous cover along the Noce stream.
Foci dell’Avisio	Protected: ("Biotopo")	100	Grasslands and marshes distributed along the meanders of the Avisio stream.
Torbiera delle Viote	Protected: ("Biotopo")	24	High-altitude peatland composed of bogs, fens, and wet meadows.
Monguelfo meadows	None	62	Agricultural areas dominated by wide meadows.

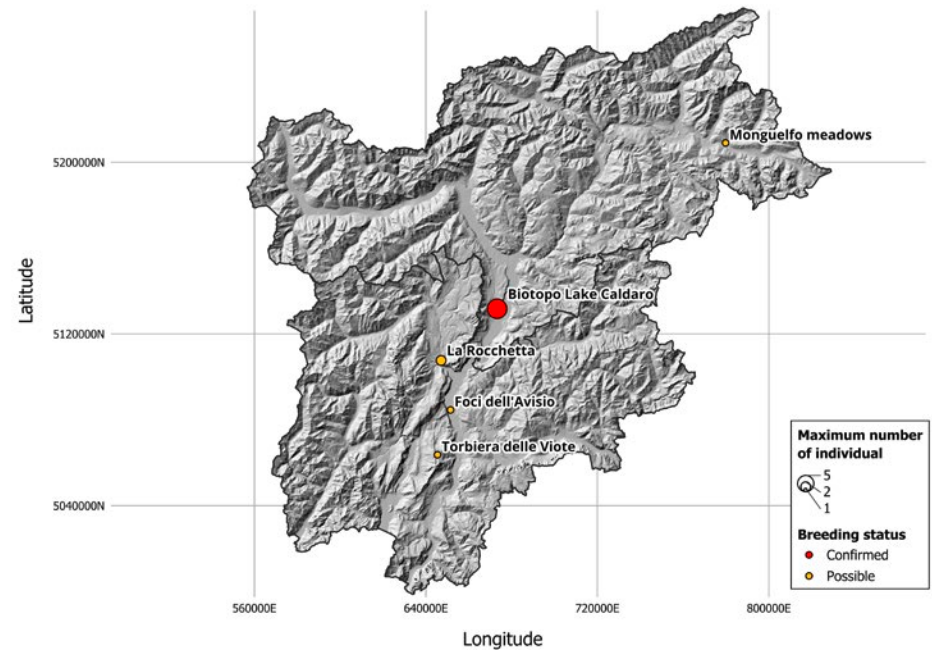


Figure 2: Zitting Cisticola sightings within Trentino-South Tyrol from citizen science platforms and monitoring projects from local research institutes.



Figure 3: Individual of *Cisticola juncidis*, taken on 14 June near the Biotopo Lake Caldaro (Photo: R. Maistri).

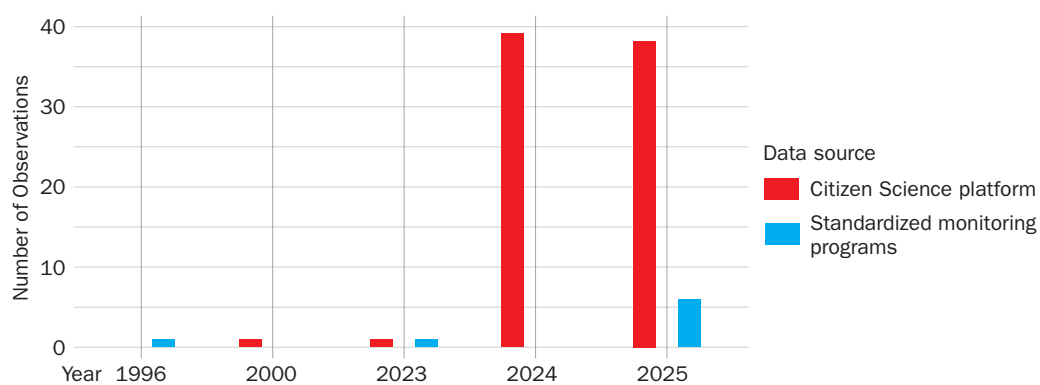


Figure 4: Annual number of Zitting Cisticola records in Trentino-Alto Adige submitted to Citizen Science platforms or observed through standardized monitoring projects since 1980.

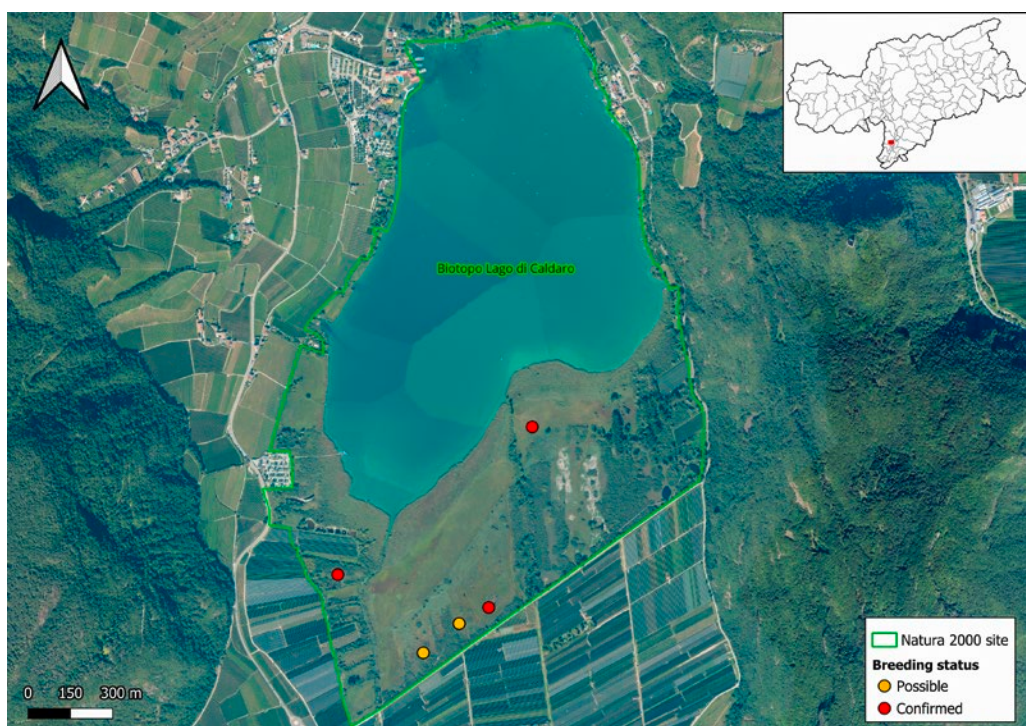


Figure 5: Zitting Cisticola sightings in Biotopo Lake Caldaro in South Tyrol since 1980.

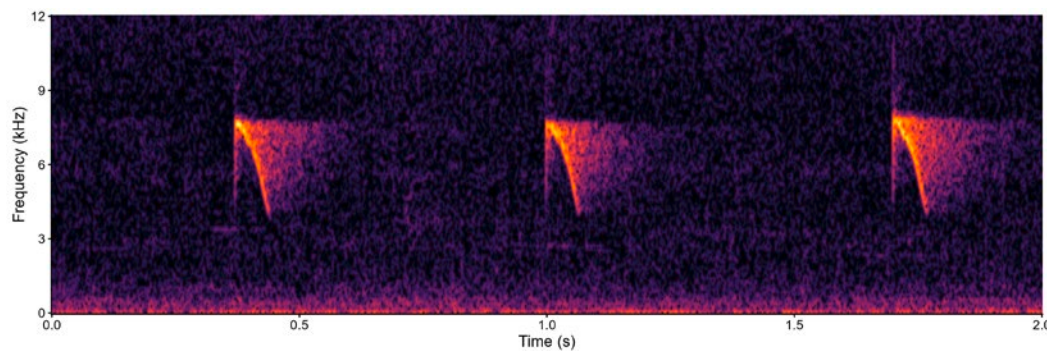


Figure 6: Example of the song of *Cisticola juncidis*, recorded on July 18, 2025, at 6:30 a.m. near the Biotopo Lake Caldaro.

Within the suitable habitats in the southern part of Lake Caldaro, Zitting Cisticola was observed at multiple sites. Juveniles were recorded in both 2024 and 2025. In 2024, a juvenile was observed being fed by an adult in July, followed by sightings of three molting juveniles in August, located approximately 300 meters apart (observed by R. Maistri). In 2025, three juveniles were observed in a different section of the wetland, near the BMS sampling site (Figure 5).

Overall, the species was observed in Trentino-South Tyrol from June to September. The first singing male recorded by means of recording device was in the evening of the 1st of June 2025 (Figure 6). From that date until August 27th, the species was detected by the recording device almost daily.

Discussion

Joint survey efforts by citizens and local research institutes provided new insights on the Zitting Cisticola status in the Trentino-South Tyrol region. It was assessed that the species successfully bred at the Biotopo Lake Caldaro for two consecutive years, possibly involving several breeding pairs. This represents the northernmost confirmed breeding site in Italy. Additional singing males were recorded in other suitable areas across the region indicating potential further breeding events in the near future, a situation that must be kept under observation. These findings suggest a possible settlement of a local breeding population in the region.

If the species breeds in the region, its year-round resident status remains unconfirmed. All sightings occurred between June and September, with the first singing male recorded on the 1st of June whereas in the northern part of its range, the Zitting Cisticola typically begins singing in March (FAUNE-FRANCE 2025). This temporal shift suggests that the species is absent in the region in winter and returns in late spring possibly undertaking short-distance migrations to overwinter in more southern areas, such as the Po valley or the Adriatic coast. However, given its discreet and cryptic behavior outside the breeding season, the area will be intensively monitored during the next winters to clarify its status. Bird ringing sessions at Lake Caldaro, scheduled between December and March in collaboration with several organizations, may help determine whether the species overwinters in the area. These sessions are part of the MonITRing project coordinated by ISPRA (Istituto Superiore per la Protezione e la Ricerca Ambientale) which focuses on constant-effort monitoring of Italian birdlife.

The species' range is known to be expanding northwards in other parts of Europe due to milder winters related to climate change (NÉMETH & Cs 2008; MAUMARY et al. 2021; SCHULZ & GÜNTHER 2024). Therefore, the rising temperatures observed in our province (SCHLÖGEL et al. 2020; DUMONT et al. 2025) could be a facilitating factor for the recolonization of this species sensitive to winters severity. Its return to the area may also have been favored by the presence of protected areas. Indeed, the species was almost exclusively observed in legally protected areas of high ecological value called Biotopi (Provincia Autonoma di Trento 2007; PROVINCIA Autonoma di Bolzano 2018). These areas

mostly consist of open habitats maintained through late mowing or extensive grazing, and public access is limited (EUROPEAN COMMISSION 2001; EUROPEAN ENVIRONMENT AGENCY 2025a, 2025b). Such conditions not only minimize disturbances but also match the ecological requirements of the Zitting Cisticola. This highlights the importance of those protected lowland wetlands and grasslands, especially under rapidly changing climate, that constitute a rare habitat in the region where open landscapes are dominated by vineyards or apple orchards directly and indirectly impacting the bird species (ANDERLE et al. 2025). However, although they represent crucial refuges for many species, BRAMBILLA et al. (2020) showed that these lowland protected areas in Trentino are not sufficiently interconnected and that their management is not adapted to the most specialized species, which showed strong declines in the last decades (e.g., Reed bunting *Emberiza schoeniclus* and Great reed warbler *Acrocephalus arundinaceus*) (FRANZOI et al. 2024). The same scenario is very likely to occur also in South Tyrol, given the decline and the critical conservation status of the same species (CERESA & KRANEBITTER 2020). The recolonization by a species with relatively broad ecological requirements, such as the Zitting Cisticola (see RYAN 2020), further supports this pattern of positive outcomes for generalist species within the network of protected lowland areas in Trentino-South Tyrol, while for more specialized species there remains a need to develop and implement more targeted and effective habitat management strategies. Despite the current availability of potentially suitable habitat, this newly established Zitting Cisticola population can be threatened by exceptionally cold temperatures (BENSUSAN 2008; LARDELLI et al. 2022) and the loss of open habitats due to the progressive encroachment observed within the Biotopo Lake Caldaro (EUROPEAN ENVIRONMENT AGENCY 2025a).

Like in other regions, citizen science data uploaded to different platforms (e.g., Ornitho, iNaturalist, and eBird) are increasing (GUARIENTO et al. 2019) and have already enabled the discovery of new species colonizing the region (GUARIENTO et al. 2021). Despite this growth, the activity of citizen scientists is mostly concentrated in species rich hot-spots (CALLAGHAN et al. 2022) in highly accessible, low-elevation areas such as the Lake Caldaro (EUROPEAN COMMISSION 2001; ANDERLE et al. 2022), while remote and difficult to access areas are scarcely visited. Thus, despite the strong growth of citizen science platforms, rigorously standardized monitoring schemes remain indispensable. Not only to obtain reliable estimations of species' trends and population sizes, but also to properly describe species' distributions in scarcely accessible areas, through representative and balanced sampling designs.

The specific case reported in this study confirms the importance of combining citizen science data and standardized monitoring projects to enable more fine-scale, accurate, and responsive tracking of species distribution changes, new species occurrence or monitoring small and isolated populations. This data is crucial for adapting management plans in protected areas, implementing new conservation measures, and improving our understanding of large-scale changes in animal communities (GUARIENTO et al. 2019). Therefore, additional surveys will be conducted over the coming years to monitor the development of the breeding population of the Zitting Cisticola in Trentino-South Tyrol. This will allow us to assess whether the management plans for protected areas enable the species to establish in the longer term, although targeted monitoring of specialist species remains essential to evaluate their effectiveness.

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