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Research note

Andrzej WUCZYŃSKI

Institute of Nature Conservation PAS, Lower-Silesian Field Station,  
Podwale 75, 50–449 Wrocław, Poland  
e-mail: a.wuczynski@pwr.wroc.pl

## WINTER BREEDING BY THE BLACKBIRD, *TURDUS MERULA* DURING HARSH WEATHER CONDITIONS

**ABSTRACT:** Birds may occasionally breed far beyond the average breeding time for particular species. Nesting attempts in winter during unfavorable weather and unfavorable environmental conditions, however, are particularly rare events. In this note I report an unsuccessful attempt of a Blackbird *Turdus merula* L. observed in January, 2009 in SW Poland. The clutch was abandoned at the final stage of incubation. Unlike other reported cases, it had been started on the outskirts of an average-sized town, in a period of harsh weather—low ambient temperature and snow cover present. This is the first winter brood of this species recorded in Poland and probably the easternmost in Europe. It is suggested that winter breeding by Blackbirds may occur more regularly and in wider areas than previously reported.

**KEY WORDS:** *Turdus merula*, timing of nesting, phenology, response to temperature, climate change

Winter breeding by birds in temperate latitudes is an exceptional and poorly recognized phenomenon. Unlike many other biological events, it can hardly be explained by the advancement of spring. Such winter breeding, however, may be forced by recent climate change. Apart from a few early season nesters, breeding attempts in winter were

recorded in several species from different taxonomic or ecological groups (Mackrill 1987, Borgula and Lustenberger 2006, Minder 2006). I'm not aware, however, of any summary which has been done of the existing data about winter breeding. Most cases of early breeders were reported from western Europe and occurred in particularly mild winters. These cases were usually explained by an increased food availability on a local scale which was the result of favorable weather conditions (McNair 1997, Dies *et al.* 2003). Only exceptional nesting attempts were commenced during periods of extreme weather (Biricik 1997). Consequently, this phenomenon is rarely documented and difficult to explain on an ecological, physiological or evolutionary basis. In the present note, I provide documentation of a breeding attempt by the Blackbird *Turdus merula*, commenced in the harsh January winter season of SW Poland. This is the first record of a winter breeding by this species in Poland. To my knowledge, it is also the easternmost case in Europe.

The Blackbird nest containing two eggs was found during tree trimming on 23<sup>rd</sup> January 2009 in the city of Dzierżoniów in SW Poland (N 50°44'21", E 16°38'30"). Partly

exposed, the nest was not abandoned. It was still possible to observe the incubating female on 26<sup>th</sup> January, although the nest contents were not checked. During the next control, on 8<sup>th</sup> February, three cold eggs were present in the nest, also other signs indicated brood abandonment. Two eggs contained almost fully developed embryos (egg teeth present), and the third egg was infertile. The reason for the clutch loss remains unknown. It is possible that the clutch loss was caused by the severe weather conditions, especially the two big snowfalls which occurred on 31<sup>st</sup> January and 1<sup>st</sup> February. The Blackbird nest was hidden among the branches of a locust tree, at a height of 2.7 m, close to the tree trunk. Two rows of these trees lined a frequently used street (Złota Str), in a residential district on the outskirts of Dzierżoniów, Poland. On 10<sup>th</sup> February 2009 I searched the surrounding trees and shrubs. No other Blackbird nests were found, although 5–8 birds were present revealing prominent territorial behaviour.

January 2009 was a cold month, the average daily temperature was  $-2.0^{\circ}\text{C}$ . This was lower than the long-term average for this area (Fig. 1). Although the precise date of brood beginning was not recorded, usual Blackbird timing indicates that it probably began in the particularly cold and snowy, first half of January (Fig. 2). Nest building by Blackbirds lasts several days (10–14 according to Birds of the Western Palearctic Interactive 2006, 2–5

according to Glutz von Blotzheim and Bauer 1988). For first broods and during adverse weather, nest building is particularly prolonged. It may last up to 16 days (Stephan 1985, Glutz von Blotzheim and Bauer 1988). Assuming that the nest was found during the egg laying period, nest building may have started shortly after the absolute minimum temperature for the winter 2008/09, which was  $-23.0^{\circ}\text{C}$  noted on 7<sup>th</sup> January.

A review of available data revealed no accounts of winter breeding by Blackbirds east of Germany. Also, inspection of unpublished data collected by the Polish Nest Record Scheme indicated the lack of appropriate observations ( $N = 5346$  cards for Blackbird, 1978–2008, see Wesołowski and Czapulak (1986) for analysis of early cards, *i.e.* 1978–1983). According to these data, the earliest breeding attempt was 6<sup>th</sup> March, and broods commenced in this month amounted to a mere 0.01% (58 cards). In other parts of Europe nesting attempts during winter were occasionally recorded, and they were always considered a rarity. The most complete list provided by Glutz von Blotzheim and Bauer (1988) reported 26 cases from western Europe for the period 1951–1983, including 1, 1, 3, 15 and 6 broods started during the months of October–February, respectively. The high number of January broods is noteworthy. Because of high latitude an attempt recorded in January 1971 in Shetlands is

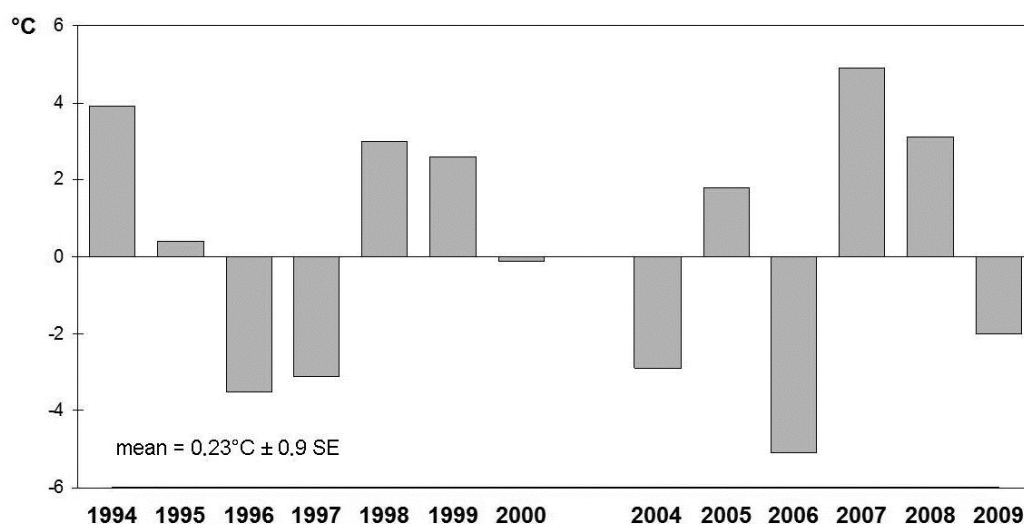


Fig. 1. Mean temperatures for January during a 13 year period. Data obtained from two meteorological stations 9 km apart in SW Poland: 1994–2000 (Dzierżoniów), and 2004–2009 (Sieniawka).

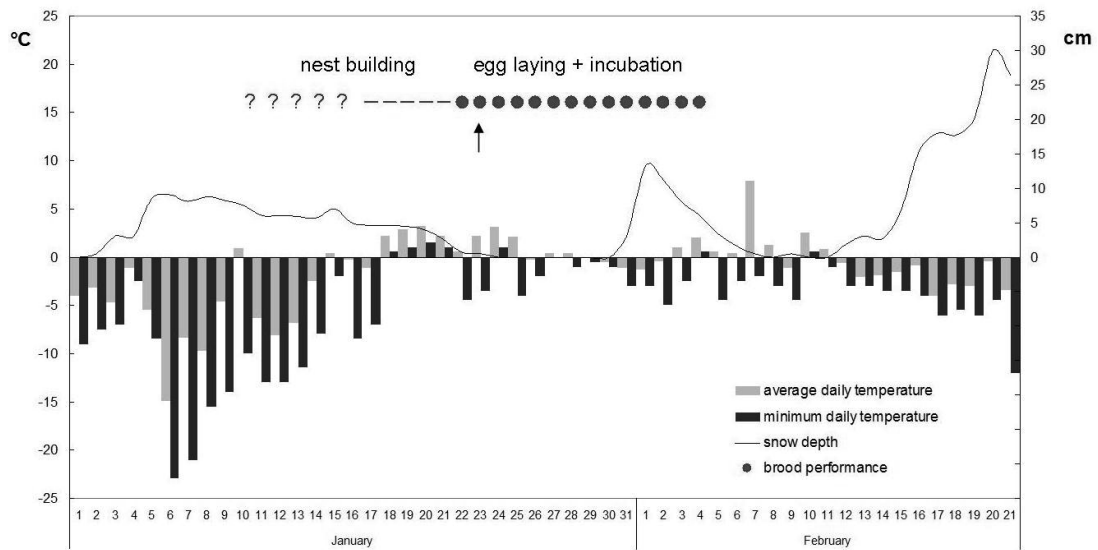


Fig. 2. Timing of the Blackbird nesting attempt in Dzierżoniów town (SW Poland) and weather conditions for January–February 2009. Data obtained from meteorological station in Sieniawka (see Fig. 1), Poland. Arrow indicates the date of nest finding. Period of nest building was calculated backwards based on usual length of this brood stage (see text).

also worthwhile noting. Interestingly, many of these winter nests were successful. There were 8 successful broods out of 18 which had a known outcome. The statistics above do not concern England, where winter breeding is noted more regularly with up to dozen or so cases per one (mild) winter (Stephan 1985). Moreover, Sparks *et al.* (2007) found that the Blackbird population in the UK shows earlier breeding activity and a greater response to temperature than populations adapted to a more continental climate in Poland.

In the majority of cases, winter breeding by Blackbirds was explained by: particularly mild winters, location in the big city centers or industrial land areas, and by the influence of intensive illumination. Response to the urban environment is of particular importance. The migration to European cities and adaptation to this novel ecological niche is well documented in Blackbirds (Luniak *et al.* 1990). Winter breeding is said to be one among several other phenotypic adjustments to the local urban environment. Examples of these adjustments are: increased sedentariness, higher breeding density and incidence of albinism, greater longevity, extended breeding season, longer daily activity time, or lower stress response (Luniak 2004, Partecke *et al.* 2006, Partecke and Gwinner 2007). It is supposed, that these adjustments result

from the distinct isolation of urbanised from the non-urbanised populations of the Blackbird. Nevertheless, there are notable differences between the described nesting attempt in Dzierżoniów, Poland and the usual conditions supporting winter breeding. The differences include, that it took place during a harsh weather period, was situated in the peripheral part of the town (about 0.5 km from the edge), and in a town that was average-sized (35 thousand inhabitants). It seems questionable that in this town, conditions and phenomenon existed which are known to big cities and which can support winter breeding, like the heat island effect. It also seems questionable that the urban Blackbird population was isolated from the nearby forest-living Blackbirds.

Apart from photoperiod, it is temperature which has a direct effect on the timing of reproduction. Low ambient temperatures may significantly constrain hormone circulation and gonadal development (Wingfield *et al.* 2003, Silverin *et al.* 2008), and increase the expenditure required for egg production (Stevenson and Bryant 2000). Consequently, birds experiencing thermal stress refrain from breeding, or they commence egg laying later than do birds in warmer conditions (Visser *et al.* 2009). The described case of the wild Blackbird brood shows that even

after experiencing extremely low temperature prior to egg formation, the female was able to produce fertile eggs and conduct incubation.

In conclusion, this article suggests that winter broods may be initiated by Blackbirds partly irrespective of weather and environmental conditions. Winter brooding serves as examples of phenological disjunction in which a bird species becomes out of synchrony with its environment (Crick 2004). Surprisingly though, many of these attempts are successful as proved by existing data. Winter nesting, then, may occur more regularly, albeit rarely, and in wider areas than previously reported. It remains unclear if winter nesters are stimulated by recent climate change. It also remains unclear just what is the adaptive significance of winter breeding by birds.

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