Nest Reuse by Eurasian Blackcap Sylvia atricapilla

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Source: Ardea, 100(1) : 98-100

Published By: Netherlands Ornithologists' Union

URL: https://doi.org/10.5253/078.100.0115

Nest reuse by Eurasian Blackcap *Sylvia atricapilla*

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Zieliński J. 2012. Nest reuse by Eurasian Blackcap *Sylvia atricapilla*. Ardea 100: 98–100.

Reusing old nests for breeding might provide birds with benefits such as saving the time and energy needed to build a new nest, or by decreasing the risk of predation while building a nest. Despite these benefits, many species use their nests only once. This study aimed to determine how frequently Eurasian Blackcaps *Sylvia atricapilla*, which build delicate open cup nests that are particularly susceptible to damage, might reuse their nest within a season and if extensive damage to a nest limited its reuse. I conducted the study in 2002–2008 in forests next to the city of Bydgoszcz in central Poland. I examined 479 Blackcap nests after the failure or success of the nest was known. Nests were classified as damaged or undamaged (73.7% of the sample). Only four nests were reused, representing 0.8% of all nests and 1.1% of the undamaged nests. The large number of undamaged but inactive nests indicated that the extent of damage was unlikely to be the reason that nests were rarely reused. The study also showed that Blackcaps rarely used material from an old nest to build a new nest.

Key words: renesting, nest site selection, sylviid warblers

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Reusing old nests for breeding might provide birds with benefits such as saving the time needed to build a new nest, and consequently enable the birds to start a new clutch earlier than if they had to build it afresh (Aguilar & Marini 2007, Redmond *et al.* 2007, Richmond *et al.* 2007). They might also benefit by reducing the energy expended on building a new nest or by limiting exposure to predation during nest building (Curson *et al.* 1996, Bergin 1997, Friesen *et al.* 1999). Despite these potential benefits, many bird species use their nests only once. This occurs particularly in non-colonial passerines that build open cup nests (Curson *et al.* 1996, Bergin 1997, Friesen *et al.* 1999, Wysocki 2004), especially species that build a delicate nest susceptible to damage (Bergin 1997). The Eurasian Blackcap *Sylvia atricapilla* builds nests of this type (Bocheński 1985). This species experiences relatively low breeding success (e.g. Bairlein *et al.* 1980, Weidinger 2000, Schaefer 2002, Remeš 2003), therefore Blackcaps often repeat nesting attempts after nest loss (Bairlein 1978, Berthold & Querner 1978, Schaefer 2002). Despite this, there are only two records of Blackcaps reusing nests for a later breeding attempt (Chance 1930). No previous studies have quantified how often the Blackcap and other species of *Sylvia* reuse nests. This study aimed to identify how often Blackcaps reused a nest in the same season and to determine if the extent of damage to a nest limited its reuse.

Methods

I conducted the study in two forest plots next to the city of Bydgoszcz (53°10'N, 18°00'E) in central Poland. One study plot was about 335 ha of managed pine forest with 40- to 100-year-old trees. The sparse undergrowth in this forest was dominated by Black Cherry *Padus serotina* and European Raspberry *Rubus idaeus*, and in some places by Pedunculate Oak *Quercus robur*. The second 27.6 ha plot was in floodplain forest on the flood terrace of the Vistula River and was protected as a nature reserve. European Ash *Fraxinus excelsior* and Field Elm *Ulmus minor* dominated this multilayered forest with trees of diverse ages. The undergrowth was well developed and was dominated by Common Dogwood *Cornus sanguinea*, European Elder *Sambucus nigra*, elm seedlings and Bird Cherry *Prunus padus*.

I conducted the study in 2003–2004 and in 2006 in the pine forest, and in 2002–2003 and in 2007–2008 in the riparian forest. I examined nests after the nesting attempt had concluded and the success or loss of the nest (eggs or nestlings) was known. The nests were

checked 2–4 days, 6–10 days and 15–20 days after the eggs or nestlings had been lost or if the fledglings had left the nest. The second and third examinations were skipped if predators had pulled out the nests from their location and they were lying on the ground or on branches below the original location. These nests were torn in pieces and automatically counted as not being reused due to the extensive damage.

Following Cavitt *et al.* (1999), I determined each nest's suitability for a second clutch. Studies in captivity have shown that more than 40% of Blackcaps that attempted further breeding started the next clutch within five days after nest loss, and the median interval was six days (Schaefer 2002). So in the second examination I classified the nests as damaged or undamaged. Damaged nests were defined as those that were deformed, such as being flattened in any plane, showed signs of material being torn out, were tilted from the initial position or were partially moved from the initial location. Undamaged nests did not show any of these signs of damage. I also noted nests that showed any signs of being stripped for their material.

To determine nest reuse I checked all the nests categorised as undamaged and damaged (Table 1). Nests that had been pulled out from their location by a predator were counted as not reused (see above).

Results and discussion

I analysed 479 Blackcap nests – 142 that successfully produced broods and 337 that did not (Table 1). Most of the nests were identified as undamaged after the first breeding attempt (73.7%; Table 1). Nest reuse was observed in only four undamaged nests, representing 1.1% of the undamaged nests (n = 353) and 0.8% of all examined nests (n = 479). One case of nest reuse occurred after a successful brood had fledged (in the pine forest). Three other records of reuse occurred in depredated nests (one in the floodplain forest and two in the pine forest).

As most nests did not show any sign of damage, it seemed that Blackcaps had plenty of opportunities to reuse their old nests. Moreover, it is to be suspected that less time and energy would be required to repair a slightly damaged nest than to build a new nest. An explanation for the lack of a second clutch in successful nests is that Blackcaps rarely attempt a second clutch after breeding successfully. There are only six records of a second brood (Glutz von Blotzheim & Bauer 1991) and one record of three broods in a season (Weidinger 2004).

One reason posited for birds not reusing their nests after depredation is that they do not risk laying a clutch in a nest where they had failed to protect their nest from predators (Styrsky 2005). Blackcaps have a limited ability to actively defend their nests (Weidinger 2002, Schaefer 2004). Their main defence strategy is to maximise the safety of the nest location (Weidinger 2002, Remeš 2005). So, they might intentionally avoid reusing an unsuccessful nest.

Another reason old nests are not reused might be an accumulation of parasites that attack nestlings and therefore reduce nesting success (e.g. Barclay 1988, Møller & Erritzøe 1996, Stanback & Dervan 2001). Several parasites occur in Blackcap nests (JZ, unpubl. data), including feather mites (Acari) that can be transferred between birds (Pérez-Tris *et al.* 2002).

Old nests can also be used as a source of material for a new nest, which would save the time and energy to find new material (Mountjoy & Robertson 1988). I observed that Blackcaps lined their nests with animal hair and small roots that were difficult to acquire, so it seemed they would benefit from reusing these materials. Despite that, I recorded only 19 cases where material disappeared from old nests, mostly from the lining. This material might have been used to build new nests, but I was sure that this happened in only three cases. The risk of moving ectoparasites with the material from an old nest to a new nest might account for the few

Table 1. Number of Blackcap nests by study area, nest fate, and quality after first breeding. Percentages by quality are given in parentheses. The number of reused nests is given, all reused nests were undamaged.

Study area	Nest fate	Quality			Total	Nest reused
		Undamaged	Damaged	Pulled out		
Floodplain forest	Successful	71(84.5)	13 (15.5)	0	84	0
	Failed	126 (66.0)	60 (31.4)	5 (2.6)	191	1
Pine forest	Successful	51 (87.9)	7 (12.1)	0	58	1
	Failed	105 (71.9)	38 (26.0)	3 (2.1)	146	2
Total		353 (73.7)	118 (24.6)	8 (1.7)	479	4

instances of old nests being disassembled (Mountjoy & Robertson 1988).

Building a new nest for each breeding attempt, and therefore adding to the number of old nests at the breeding site, might also offer protection against search-strategy predators (Watts 1987). The increasing number of unused nests over the season would cause an increased and unprofitable expenditure of energy for many predators searching through all the nests.

To identify the precise factors that preclude Blackcaps from using old nests, experiments are needed. For example, removing or adding nests at a site would test if the accumulation of old nests helps to protect against nest predation.

References

Aguilar T.M. & Marini M.Â. 2007. Nest and nest-site reuse within and between breeding seasons by three neotropical flycatchers (Tyrannidae). Braz. J. Biol. 67: 537–540.

Bairlein F. 1978. Über die Biologie einer südwestdeutsche Population der Mönchsgrasmücke (*Sylvia atricapilla*). J. Ornithol. 119: 14–51.

Bairlein F., Berthold P., Querner U. & Schlenker R. 1980. Die Brutbiologie der Grassmücken *Sylvia atricapilla*, *borin*, *communis* und *curruca* in Mittel- und N-Europa. J. Ornithol. 121: 325–369.

Barclay R.M.R. 1988. Variation in the costs, benefits, and frequency of nest reuse by Barn Swallows (*Hirundo rustica*). Auk 105: 53–60.

Bergin T.M. 1997. Nest reuse by Western Kingbird. Wilson Bull. 109: 735–737.

Berthold P. & Querner U. 1978. Über die Brutleistung der Mönchsgrasmücke *Sylvia atricapilla*. J. Ornithol. 119: 114.

Bocheński Z. 1985. Nesting of the *Sylvia* Warblers. Acta Zool. Cracov. 29: 241–328.

Cavitt J.F., Pearse A.T. & Miller T. 1999. Brown thrasher nest reuse: a time saving resource, protection from search strategy predators, or cues for nest-site selection? Condor 101: 859–862.

Chance E.P. 1930. Blackcap laying twice in same nest. Brit. Birds 24: 76.

Curson D.R., Christopher C.B. & Mathews N.E. 1996. Nest-site reuse in the Western Wood-Peewee. Wilson Bull. 108: 378–380.

Friesen L.E., Wyatt V.E. & Cadman M.D. 1999. Nest reuse by Wood Thrushes and Rose-breasted Grosbeaks. Wilson Bull. 111: 132–133.

Glutz von Blotzheim U. & Bauer K.M. (eds) 1991. Handbuch der Vögel Mitteleuropas. AULA-Verlag. Wiesbaden.

Mountjoy D.J & Robertson R.J. 1988. Nest-construction tactics in the Cedar Waxwing. Wilson Bull. 100: 128–130.

Møller A.P. & Erritzøe J. 1996. Parasite virulence and host immune defense: host immune response is related to nest reuse in birds. Evolution 50: 2066–2072.

Pérez-Tris J., Carbonell R. & Tellería J.L. 2002. Parasites and the blackcap's tail: implications for the evolution of feather ornaments Biol. J. Linn. Soc. 76: 481–492.

Redmond L.J., Murphy M.T. & Dolan A.C. 2007. Nest reuse by eastern kingbirds: adaptive behavior or ecological constraint? Condor 109: 463–468.

Remeš V. 2003. Effects of exotic habitat on nesting success, territory density, and settlement patterns in the Blackcap (*Sylvia atricapilla*). Conserv. Biol. 17: 1127–1133.

Remeš V. 2005. Nest concealment and parental behaviour interact in affecting nest survival in the blackcap (*Sylvia atricapilla*): an experimental evaluation of the parental compensation hypothesis. Behav. Ecol. Sociobiol. 58: 326–333.

Richmond S., Nol E., Campbell M. & Burke D. 2007. Conspecific and Interspecific Nest Reuse by Wood Thrush (*Hylocichla mustelina*). Northeast. Nat. 14: 629–636.

Schaefer T. 2002. Nest predation and renesting in the blackcap *Sylvia atricapilla*. Vogelkdl. Ber. Niedersachs. 33: 205–208.

Schaefer T. 2004. Video monitoring of shrub-nests reveals nest predators. Bird Study 51: 170–177.

Stanback M. & Dervan A.A. 2001. Within-season nest-site fidelity in Eastern Bluebirds: disentangling effects of nest success and parasite avoidance. Auk 118: 743–745.

Styrsky J.N. 2005. Influence of predation on nest-site reuse by an open-cup nesting neotropical passerine. Condor 107: 133–137.

Watts B.D. 1987. Old nest accumulation as a possible protection mechanism against search-strategy predators. Anim. Behav. 35: 1566–1568.

Weidinger K. 2000. The breeding performance of Blackcap *Sylvia atricapilla* in two types of forest habitat. Ardea 88: 225–233.

Weidinger K. 2002. Interactive effects of concealment, parental behaviour and predators on the survival of open passerine nests. J. Anim. Ecol. 71: 424–437.

Weidinger K. 2004. Triple brooding by the blackcap. Biologia 59: 679–681.

Wysocki D. 2004. Nest re-use by Blackbirds – the way for safe breeding? Acta Ornithol. 39: 164–168.

Samenvatting

Bij veel vogelsoorten wordt een nest maar één keer in het seizoen gebruikt. Hergebruik van oude nesten zou voordelen kunnen opleveren uit het oogpunt van tijd- en energiebesparing. Bij de stad Bydgoszcz in het centrale deel van Polen werd gedurende zeven jaren het hergebruik van 479 nesten bij de Zwartkop *Sylvia atricapilla* onderzocht. Doel van het onderzoek was te bepalen hoe vaak een nest binnen hetzelfde seizoen werd hergebruikt door hetzelfde of een ander paar en na te gaan of beschadigde nesten minder vaak werden hergebruikt dan onbeschadigde. Na het beëindigen van een nestpoging waren 353 nesten (73,7%) nog in goede staat. Slechts vier (1,1%) hiervan werden nogmaals gebruikt. Van de 126 beschadigde nesten werd geen enkel nest opnieuw gebruikt. Of in een nest jongen waren grootgebracht, leek evenmin een factor van belang. Bij mislukte nesten, waar de kans op een nieuwe broedpoging het grootst is, werd 1,3% (n = 231) opnieuw gebruikt. Bij de succesvolle nesten was die kans 0,8% (n = 122). Het is dus onwaarschijnlijk dat de toestand waarin het oude nest verkeert, de mate van hergebruik beïnvloedt. Voor de bouw van een nieuw nest werd zelden materiaal van een oud nest gebruikt. (DH)

Corresponding editor: Dik Heg
Received 16 February 2011; accepted 10 October 2011