

19 September 2024

How to translate text using browser t

Description of a Black-throated Blue Warbler (*Setophaga caerulescens*) incubating an empty nest and review of this breeding anomaly in birds

[August Davidson-Onsgard](#) , [Todd M. Jones](#) , [Kim Savides](#) , [Sara A. Kaiser](#)

[Author Affiliations +](#)

August Davidson-Onsgard¹ **Todd M. Jones**² **Kim Savides**² **Sara A. Kaiser**^{3,*}

¹ Department of Biological Sciences, Cornell University, Ithaca, NY, USA

² Migratory Bird Center, Smithsonian's National Zoo and Conservation Biology Institute, Washington, DC, USA

³ Center for Biodiversity Sciences, Cornell Lab of Ornithology, Cornell University, Ithaca, NY, USA

* Corresponding author: sak275@cornell.edu

[The Wilson J. of Ornithology](#). 136(3) :393-404 (2024). <https://doi.org/10.1676/24-00030>

Abstract

Incubation of an empty nest is a rarely detected phenomenon in birds but has been documented in a diversity of species. The causes of this breeding anomaly are unclear, but previous accounts have occurred in regions with elevated air pollution. We provide a detailed account of a female Black-throated Blue Warbler (*Setophaga caerulescens*) incubating an empty nest for 8 d at the Hubbard Brook Experimental Forest, New Hampshire, USA, May–June 2023, and explore possible explanations based on a literature review of this breeding anomaly. Our observation coincided with the presence of smoke from widespread wildfires in Quebec, Canada. The fires were caused by record temperatures and dry conditions. Wildfire smoke increased air particle pollution. We found 231 published accounts of 11 species incubating empty nests. Cavity-nesters in Europe comprised 45% of species (5 of 11) and 96% of accounts (225 of 231). Although many accounts lacked a clear explanation, the most common factors hypothesized to explain incubating empty nests were exposure to environmental pollution (81% of accounts, 167 of 206), calcium deficiency from environmental acidification (19% of accounts, 40 of 206), and disease and/or infertility (4% of accounts, 8 of 206). Our synthesis of published observations highlights the need for more data on individuals expressing this unusual behavior. Such data would improve our understanding of how egg laying and reproductive success respond to intrinsic and environmental factors, including wildfire emissions, which are predicted to increase with climate change.

Empty nest incubation is a rarely observed phenomenon in birds but has been documented in a variety of species. The causes of this reproductive anomaly are unclear but there have been previous reports from regions with high air pollution. We provide a detailed account of a female Warbler *Setophaga caerulescens* incubating an empty nest for 8 days at Hubbard Brook Experimental Forest, New Hampshire, USA, from May to June 2023 and explore possible explanations based on a literature review of anomalous reproduction. Our observation coincides with the presence of smoke from extensive wildfires in Quebec, Canada. The fires were caused by record temperatures and drought conditions. Wildfire smoke increased particulate pollution in the air. We found 231 published reports of 11 bird species incubating empty nests. Cavity-nesting species in Europe comprised 45% of species (5 of 11) and 96% of reports (225 of 231). Although many reports did not include a clear explanation, the most common hypotheses explaining empty nest incubation included exposure to environmental pollution (81% of reports, 167 of 206), calcium deficiency due to environmental acidification (19% of reports, 40 of 206), and disease and/or infertility (4% of cases, 8 of 206). Our synthesis of published observations highlights the need for more data on individuals expressing this unusual behaviour. Such data would improve our understanding of how egg laying and reproductive success respond to intrinsic and environmental factors, including emissions from wildfires, which are predicted to increase with climate change.

Keywords: air quality, abnormal behavior, air pollution, reproductive failure, wildfire smoke, empty nest incubation.

Citation [Download Citation](#) ▾

[August Davidson-Onsgard](#) , [Todd M. Jones](#) , [Kim Savides](#) , and [Sara A. Kaiser](#) "Description of a Black-throated Blue Warbler (*Setophaga caerulescens*) incubating an empty nest and review of this breeding anomaly in birds," *The Wilson Journal of Ornithology* 136(3), 393-404, (19 September 2024). <https://doi.org/10.1676/24-00030>

Received: 22 February 2024; Accepted: June 25, 2024; Published: 19 September 2024

PDF

Help

Searching 

PERSONAL SIGN IN

PURCHASE THIS CONTENT

PERSONAL SIGN IN

Full access may be available with your subscription

E-mail

Password

☐ Show

☐ Remember Email on this computer

☐ Remember Password

SIGN IN

No BioOne Digital Library account? [Create an account](#)
or [Access Institutional Sign In via Shibboleth](#) or [OpenAthens](#)

PURCHASE SINGLE ARTICLE

Price: \$10.00

ADD TO CART

Includes PDF & HTML, when available

PDF

Help