

Geolocators give new insights into nesting behavior of godwits

April 21 2020



A black-tailed godwit in a Dutch meadow, with colour rings and a geolocator on its legs. The picture was used on the cover of the April issue of the Journal of Avian Biology. Credit: Jan van de Kam

To find out more about birds such as the black-tailed godwit, ecologists

have been conducting long-term population studies using standardized information on reproductive behaviour—such as dates of egg-laying or hatching and levels of chick survival. New information gathered using geolocators on godwits in the Netherlands shows that traditional observation methods can lead to inaccurate data. The study was published in the April-issue of the *Journal of Avian Biology*.

Ph.D. student Mo Verhoeven from the University of Groningen used geolocators attached to the legs of black-tailed godwits to follow their migration pattern. "These consist of a tiny chip that records light intensity every five minutes, together with the exact date and time," explains Verhoeven. This combination allows him to determine longitude and latitude from the times of sunrise and sunset. Geolocators can collect data for up to 26 months and the information is read after removal of the chip.

Shaded periods

Geolocators are generally used to learn about where [birds](#) migrate to and when they migrate. However, for this study, Verhoeven used the geolocators in a different way. "During the [nesting season](#), the geolocators registered shaded periods during the day," says Verhoeven. This happens when a bird is sitting on a nest, with its legs folded under its body. "We were, therefore, able to determine when these birds were nesting." This was interesting. Accurate data on nesting is difficult to obtain since every observation of a nesting bird will also disturb its behaviour.

The main revelation from Verhoeven's analysis is that the godwits in this study always started a second nest if their first nest failed. "So far, estimates of this re-nesting varied from 20 to 45 percent," says Verhoeven. Based on traditional observation techniques, many of these second attempts were previously thought to be first nests, or they were

not discovered at all. "During the season, our observations shifted focus from detecting nests to following the development of chicks," explains Verhoeven. His data also mean that counting nests to estimate the breeding population is not very accurate since many birds build a second nest.



Mo Verhoeven, first author of the study releases a black-tailed godwit caught during fieldwork on the nesting grounds. Credit: Bingrun Zhu

Conservation

The study also revealed a firm final date for re-nesting attempts: after 18 May, no godwit built another nest if its previous clutch failed. "There is something really cool here," says Verhoeven. "Back in 1954, a biologist experimented by destroying godwit nests. He noticed that they would not re-nest after 20 May, which is almost the same date! It is really intriguing that there is such a strict end to the nesting season. What causes it? That's something I would like to find out."

The fact that these birds make a second attempt after their first clutch is lost means that the breeding season for godwits is longer than previously thought. That has consequences for conservation. "These second attempts are on average less successful than the first clutches," says Verhoeven. "But they are not trivial." In [conservation areas](#), farmers delay mowing the meadows in which the birds [nest](#) until some time in June. "But the young from the second attempts may still be there with their parents in early July."

Magic

By re-purposing the information from the geolocators, Verhoeven and his colleagues revealed an unknown part of godwit life. "This also confronts us with our very limited understanding of the ecology of these birds and the bias in our observations," he says. This is succinctly described by the team at the end of the article in the *Journal of Avian Biology*: "Ultimately, part of the magic of ecology is its complexity and our permanent inability to fully understand that complexity."

More information: Mo A. Verhoeven et al, Geolocators lead to better measures of timing and re-nesting in black-tailed godwits and reveal the bias of traditional observational methods, *Journal of Avian Biology* (2020). [DOI: 10.1111/jav.02259](https://doi.org/10.1111/jav.02259)

Provided by University of Groningen

Citation: Geolocators give new insights into nesting behavior of godwits (2020, April 21)
retrieved 18 April 2024 from

<https://phys.org/news/2020-04-geolocators-insights-behavior-godwits.html>

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