BTO RESEARCH REPORT 816

Report on Danbury Nightingale Survey 2025

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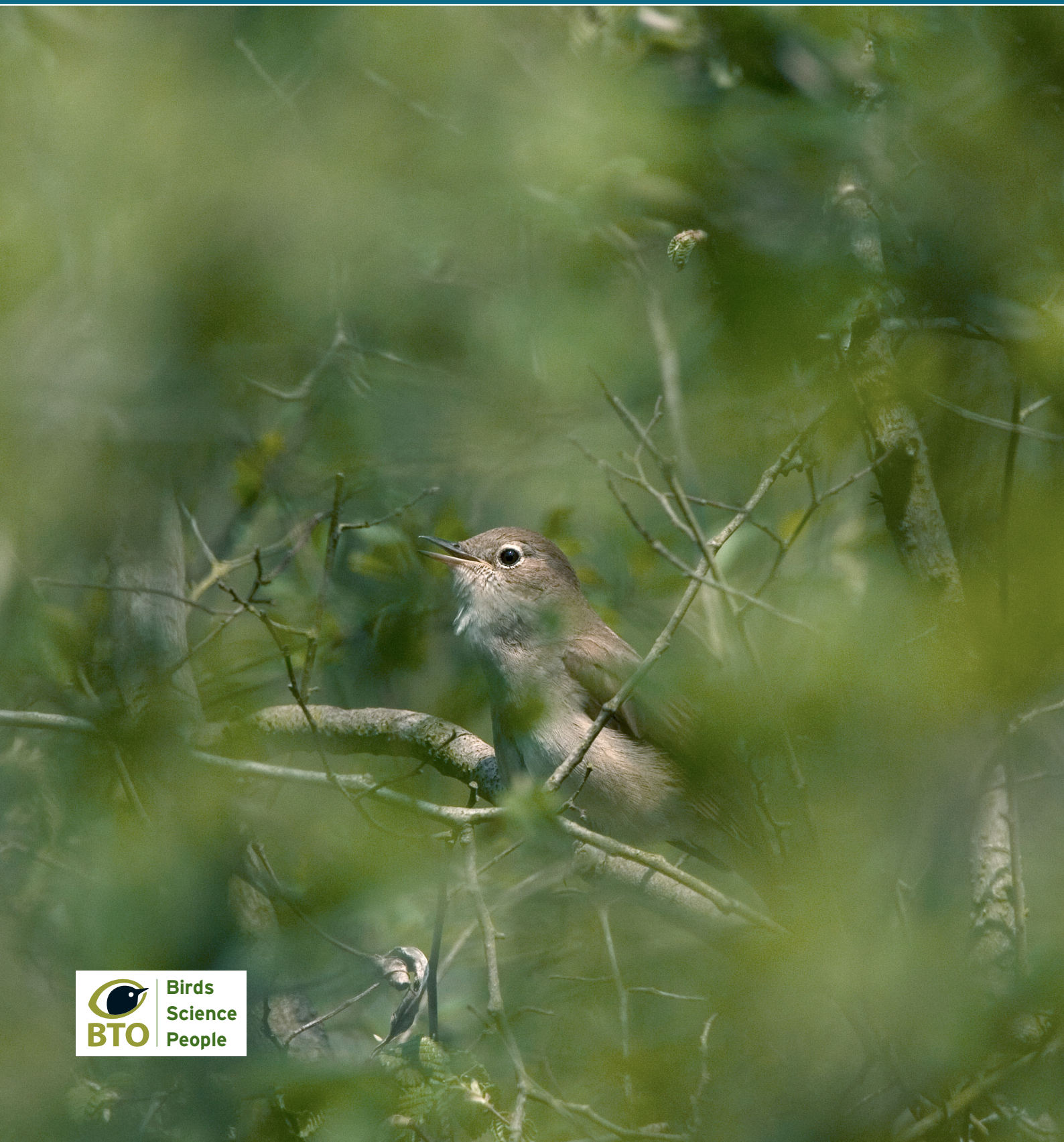

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ACKNOWLEDGEMENTS: We would like to thank all of the field surveyors who took part in the survey: Stuart Brooker, Adrian Dally, David Pallash, Neil Sumner, and Martin Pugh. We would also like to thank Martin Pugh for coordinating the surveys and compiling the data. The analysis and reporting were supported by funding from the Esmée Fairbairn Foundation, to whom we are very grateful.

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Registered Charity Number 216652 (England & Wales), SC039193 (Scotland).

ISBN 978-1-918170-18-4

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Contents

1. Introduction

This report presents the results of the Nightingale *Luscinia megaryhnchos* survey carried out in Danbury, Essex, during spring 2025.

Nightingale is a Red-listed species according to the Birds of Conservation Concern 5 (Stanbury *et al*. 2021). The species underwent a UK population decline of around 90% between 1967 and 2023 (BTO 2025), and a UK breeding range decline of just under 50% between 1968 and 2011 (Balmer *et al.* 2013).

The purpose of the 2025 survey was to obtain a current estimate of the Nightingale population (territorial males) and to determine population change since the 2012 national survey (Hewson *et al.* 2018). The BTO 2012 national survey protocol was followed to permit a direct comparison of population estimate and change in territory numbers.

2. Methods

2.1. Survey area

The survey area was located in Danbury, Essex (TL787053), five miles east of Chelmsford (Figure 1). Danbury is surrounded by substantial areas of heathland and woodland, which provide suitable Nightingale breeding habitat. Many of these areas are protected habitats, and the following are Sites of Special Scientific Interest: Danbury Common, Blakes Wood & Lingwood Common, and Woodham Walter Common. The survey area was split into separate sites, with surveyors assigned one or more of these, in order to ensure each could be fully covered on a single morning, where possible.

2.2. Field methods

The Nightingale is a single-brood species, with the egg period between late April and early July (Ferguson-Lees *et al.* 2011), meaning survey visits within this period coincide with peak song period, in which birds are most vocal and most likely to be detected as they defend their territories.

Between one and two visits were carried out to each site between April and May. Visits to all sites were carried out in the morning, starting up to 30 minutes before sunrise and lasting for one to three hours, within the period of peak song activity.

All surveyors were experienced with the species and in the survey methodology, and in most cases familiar with their designated survey site(s). Prior to the survey period, additional training was provided to surveyors by BTO staff, in order to further ensure that the data were collected following the same protocol and the standardised methods as used in the 2012 national survey.

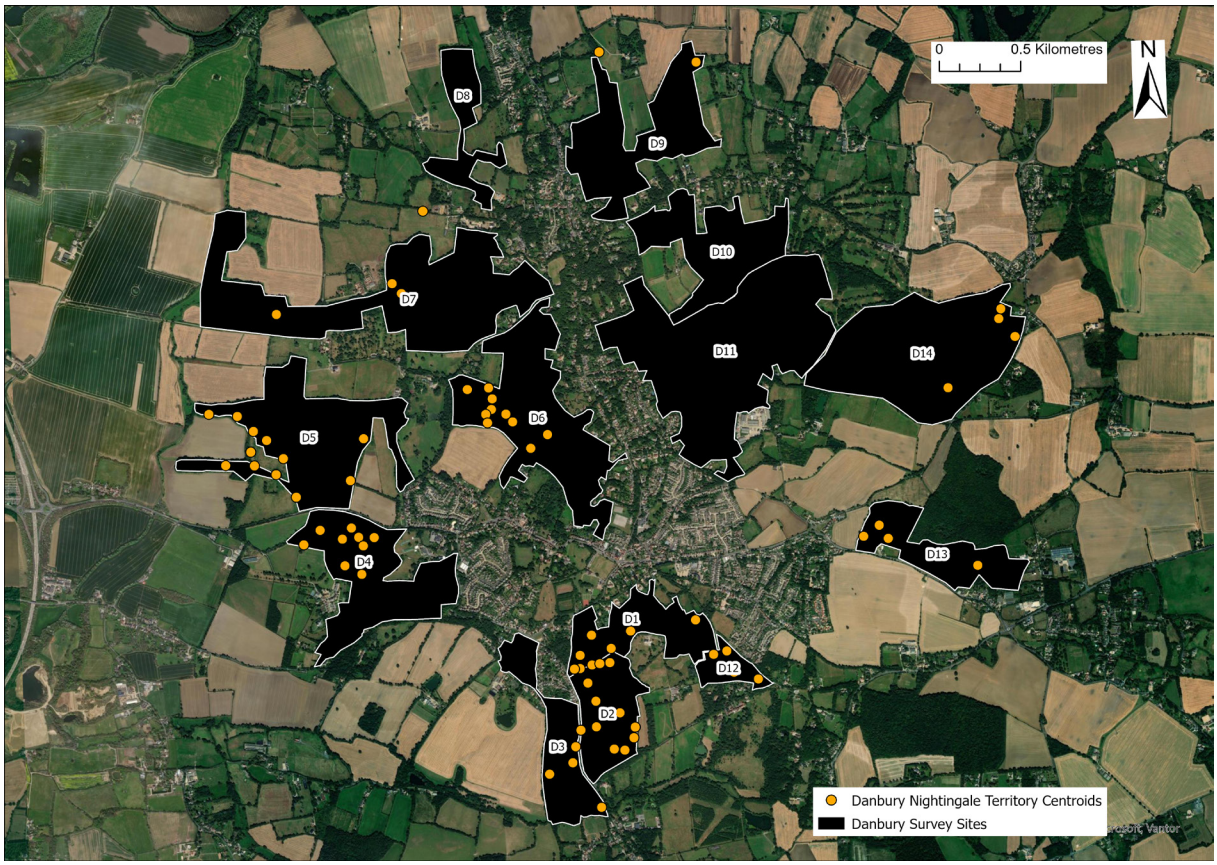
Sites with suitable habitat and prior occupation by Nightingale from the 2012 survey were selected for coverage (Figure 1).

The in-field survey was based on the Common Bird Census (CBC) methodology (Marchant 1983). This uses a standard methodology to record all observations (registrations) of birds, which are then plotted on site maps. Standardised codes are used to record species, sex and activity of each individual, with particular emphasis on singing birds, but most importantly to record the relationship between individual registrations. Relations between registrations were marked as follows: 1) dashed line showing definitely different individuals, 2) solid line showing multiple registrations of the same individual; and 3) question-marked lines showing uncertain registrations, i.e. it was unconfirmed if these pertained to the same or different individuals.

Particular efforts were made to record birds observed, or heard, simultaneously, as this provides the most useful and robust data when estimating territories during analysis. A territory is a discrete area in which a single male or pair of birds undertake breeding activity. Song is the main and most reliable way to identify a territory, which is defended throughout the breeding season.

To estimate the number of breeding bird territories (typically pairs or territorial singing males) the observations from all visits were combined and clusters of bird registrations were defined to provide a minimum estimate of territories present, following the methods of Hewson *et al.* 2018, based on Marchant (1983).

Figure 1: Map of 2025 Danbury Nightingale territories and Danbury survey sites.



2.3. Data processing

2.3.1. Data entry

Registrations were digitised using geographic information system (GIS) software in order to facilitate analysis, assess distribution and compare data. Data were digitised using QGIS by the field surveyors and provided to BTO for analysis.

2.3.2. Territory analysis

Territory mapping was carried out using ArcGIS Pro 3.6 (ESRI 2025). The methods for establishing territories followed those set out in the 2012 Nightingale survey (Hewson *et al.* 2018). Registrations were grouped into discrete territory clusters primarily based on confined different individuals per visit, and polygons drawn around these representing the territory. Each territory was based on an individual singing male in suitable habitat or territorial registrations on multiple visits. Additional individual non-territorial registrations (e.g. calling, seen only) per visit and surveyor were included within an existing territory.

In order to define distinct clusters constituting individual territories, three main criteria were applied in order of priority:

1. registrations of known different singing males;
2. distinct clusters consisting of registrations from multiple visits; and

3. registrations from the same visit separated by more than 250 m (95% of territories were within this distance, with a mean of 111 m (N=298)).

Where criteria for separate territories were not met, registrations were considered to pertain to the same bird and so grouped into the same territory polygon. The following criteria were applied in order of priority:

1. multiple registrations known to be the same mobile individual;
2. multiple same visit territorial registrations that couldn't be confirmed as different individuals, with insufficient other visit registrations to form additional clusters;
3. where individual visit registrations formed dispersed clusters between 250 m and 350 m (national maximum inter-territory distance threshold), without any indications of more than one individual present on a given visit.

3. Results

3.1. Survey coverage

Visits were carried out between 24 April and 13 May 2025, by a total of five surveyors (Table 1). All visits were carried out in the morning, and all but one sites received at least two visits.

3.2. Territory analysis

In 2025, a total of 72 Nightingale territories were detected across the Danbury survey area (Figure 1).

Table 1: Danbury Nightingale Survey 2025 survey visit dates and times, according to site.

		Visit One		Visit Two	
Survey site	**Site code**	**Date**	**Timing**	**Date**	**Timing**
Danbury Common (North)	D1	26/04/2025	05:58–07:58	05/05/2025	04:51–08:00
Danbury Common (South)	D2	26/04/2025	05:58–07:58	05/05/2025	04:51–07:20
Backwarden	D3	26/04/2025	05:18–07:25	05/05/2025	04:59–07:01
Danbury Country Park	D4	03/05/2025	05:00–08:00	11/05/2025	05:00–08:00
Hall Wood and Hall Pit	D5	03/05/2026	05:00–08:00	11/05/2026	05:00–08:00
Lingwood Common	D6	27/04/2025	05:15–07:15	04/05/2025	05:05–07:25
Blake's Wood	D7	02/05/2025	05:10–07:46	10/05/2025	04:44–07:35
Holybred Wood and Rectory Wood	D8	24/04/2025	05:20–08:00	06/05/2025	05:00–08:00
Heather Hills and Basset Wood	D9	24/05/2025	05:20–08:00	06/05/2025	05:00–08:00
Woodham Walter Common (North)	D10	25/04/2025	05:20–08:00	07/05/2025	05:00–08:00
Woodham Walter Common (South)	D11	25/04/2025	05:20–08:00	07/05/2025	05:00–08:00
Gay Bower's Lane	D12	04/05/2025	05:00–08:00	13/05/2025	05:00–08:00
Thrift Wood Quarry	D13	13/05/2025	05:00–08:00	N/A	N/A
Warren Pit	D14	04/05/2025	05:00–08:00	13/05/2025	05:00–08:00

4. Discussion

4.1. Population change

The total of 72 territories from the 2025 Danbury surveys compares to 33 territories detected in the 2012 national survey (Hewson *et al.*2018), in which all sites were covered except for the majority of D13 and D14 (Figure 1). This represents a 118% increase between the two surveys.

Generally, the national Nightingale population has shown a slight decline since 2012, according to the BTO/JNCC/RSPB Breeding Bird Survey (BTO 2005a). However, there are indications that the distribution has become more clumped with some localised sites seeing large increases over the same period (e.g. South Colchester) (Stokes & Conway 2026) whereas there have been reductions in areas of low-density occupation (Conway in prep.). Thus, these concentrated populations are more significant nationally and from a conservation and protection perspective.

The recent (post 2012) local population increase are likely due to a number of factors. The two main apparent drivers appear to be good breeding productivity and high overwinter survival, meaning more adults return and expand the source populations. In addition, habitat change may also play an important role as Nightingales are strongly associated with early successional vegetation, including young woodland and more typically scrub. Sites where fields and boundaries are less intensively managed, or not managed at all, can rapidly develop scrub that is suitable for Nightingale. However, succession growth and scrub clearance can rapidly render this vegetation type unsuitable for Nightingale.

4.2. Future work

It is paramount to maximise the use of the 2025 Danbury survey data to fully understand the current habitat use and requirements for Nightingale, to inform appropriate habitat management and help maintain this important population.

Additionally, regular population monitoring is recommended to assess population change and inform appropriate habitat management, as well as to inform potential development decisions, where the Nightingale population may be impacted.

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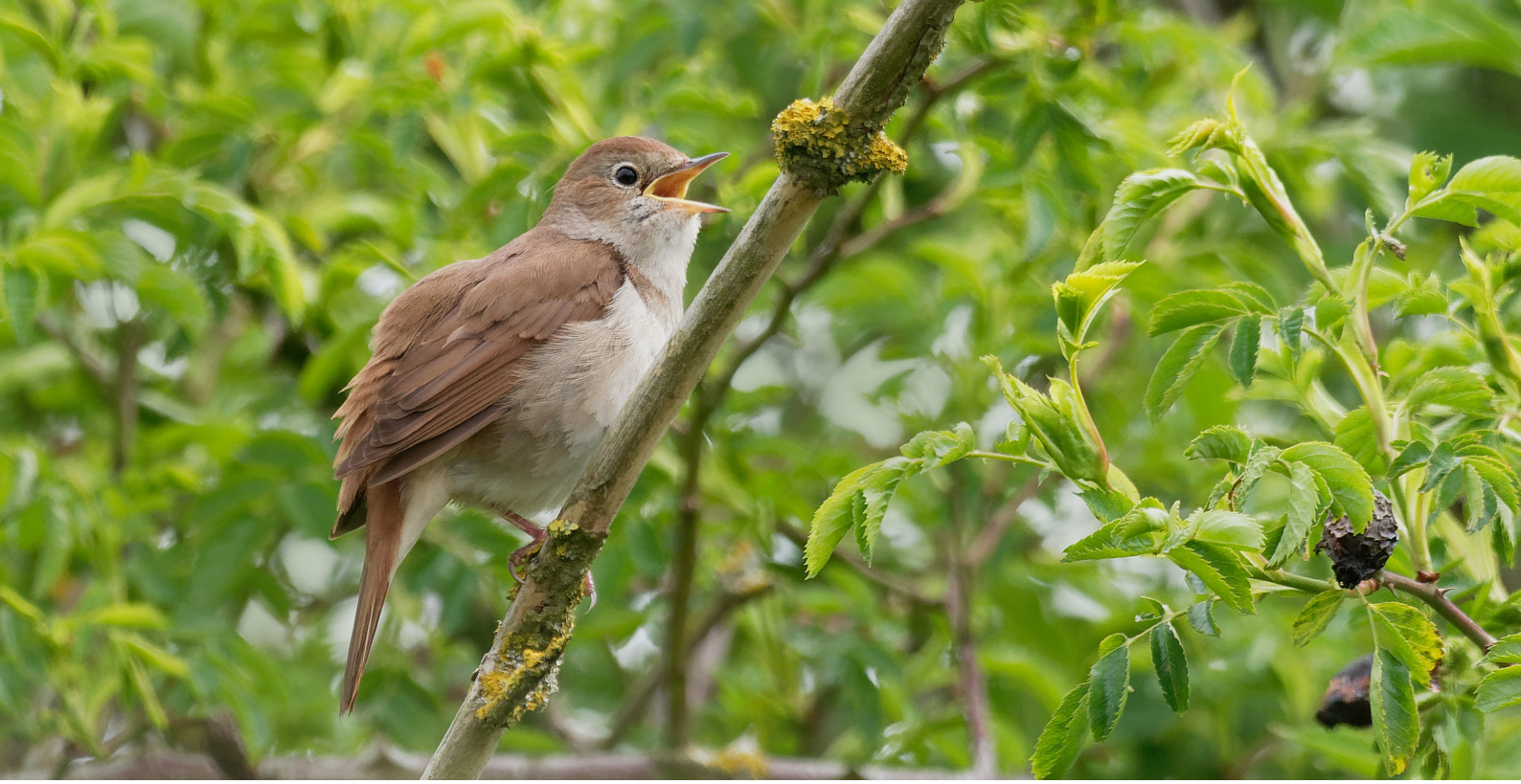

Front cover: Nightingale, by Chris Knights / BTO. Back cover: Nightingale, by Liz Cutting / BTO

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Suggested citation: Stokes, J. & Conway, G. 2026. Report on Danbury Nightingale Survey 2025. *BTO Research Report* **816**, BTO, Thetford, UK.

ISBN 978-1-918170-18-4

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