A PROTOCOL FOR STANDARDISED NOCTURNAL FLIGHT CALL MONITORING

BTO
Looking out for birds

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The Sound Approach
Understanding bird sound

Recording nocturnal flight calls and logging the intensity of movement and species composition at different locations will provide valuable data for understanding bird movements at scales ranging from individual sites to continent-wide. These data will be most valuable if some basic parameters are standardised. This document outlines a simple protocol to enable individuals or groups to conduct Standardised Nocturnal Flight Call Monitoring (SNFCM) via audio recording and to submit data using Trektellen (https://www.trektellen.org).

WHERE TO RECORD

There are no restrictions; you can record at any location of your choice, but it should be somewhere where you/your group can record frequently. A feature of nocturnal migration is that birds can pass over virtually anywhere, so good recording locations are not restricted to coastal hotspots and even urban areas can be good NFC sites. Recording at wetlands may be best avoided owing to continual calling of stationary birds. Potential NFC sites should be tested for a couple of nights then, if suitable, registered by contacting the Trektellen NFC co-ordinator (http://trektellen.org/contact).

WHEN IN THE YEAR TO RECORD

In addition to key migration periods, certain species may disperse at other times; weather events (e.g. severe winter weather, rains in tropics) may cause movements, so you can record at any time of year. At most northern hemisphere, mid-latitude locations the most productive periods are likely to be mid-February to end of May and mid-July to mid-November; at high latitude locations, the summer break will be longer due to lack of darkness.

HOW OFTEN TO RECORD

Aim to record at least once per week during spring and autumn migration periods, but more often if you are able. Audible migration activity is often weather dependent so it pays to be opportunistic and record during promising conditions. However, data from a range of weather conditions will be useful for future analyses.

WHEN IN NIGHT TO RECORD

For the purposes of NFC monitoring, the period for which data should be submitted is between civil dusk and civil dawn, i.e. when the sun is at least 6º below the horizon, which is the transition between civil twilight and nautical twilight (see www.timeanddate.com/astronomy/different-types-

twilight.html). For example, in the UK and Netherlands, civil dusk is 35–70 minutes after sunset, depending on time of year and location. Civil dusk/dawn times are shown on Trektellen for registered sites; for other recording location see suncalc.net. Leave your recorder running continuously from civil dusk until civil dawn. Data for shorter recording sessions (e.g. from nautical dusk to nautical dawn, or truncated due to pronounced dawn chorus obscurring NFCs) can be submitted using Trektellen.

EVENT-TRIGGERED RECORDING

Do not use event-triggered recording as many calls are too quiet to trigger the recorder.

IDENTIFICATION

Identifying NFCs is often extremely difficult, and this is very much a collective work in progress. Recognising this, it is always better to err on the side of caution. Demand high standards of youself. Identify to species where possible, but if in any doubt, use one of the species aggregates (e.g. 'Flycatcher or chat spp') rather than guessing. Use the *Uncertain* indicator to share records of unconfirmed identification. For such difficult or rare species, upload the recording to Xeno-canto and enter its numeric identifier in the *Xeno-canto ID* field to embed the recording in your Trektellen submission. This allows others to form their own opinion about the identification.

COUNT ALL FLYOVERS

The aim is to record all birds detected in flight, regardless of whether they can be assumed to be migrants or not. This will avoid any subjectivity concerning whether a particular NFC relates to a local or migratory bird. If you are confident an NFC relates to a local bird rather than a migrant, set the *Migration type* field to Flying local bird.

STATIONARY BIRDS

Stationary calling birds, such as birds vocalising from trees or the ground (e.g. a hooting Tawny Owl, night-singing Robin, calling Pheasant) can be recorded but presence/totals must be kept completely separate from totals for flyovers.

PROCESSING PROTOCOL

Before processing your recordings, decide which of the following recording protocols you will follow. In all cases, flying birds must be recorded separately from stationary/grounded birds. It is important you adhere to these protocols to enable others to infer which species were not detected rather than simply not logged. Recording sessions where no flyovers were detected are valuable so do submit data for these occasions as the inferred zero counts can be useful for understanding when birds do not migrate.

- **All flyovers only** – no presumption is made that birds are migrants. No stationary/grounded birds submitted
- **All flyovers plus selected stationary birds** – as above but notable stationary/grounded highlights (e.g. a locally scarce hooting Tawny Owl) added in the Present field (appears as footnotes on day list)
- **All flyovers plus all stationary birds** – as above but all stationary/grounded detections are added in the Present field (see also Hourly subtotals, below).

HOURLY SUBTOTALS

Although Trektellen will allow submission of a single night-long count, we strongly encourage the submission of hourly counts, which will provide far greater capacity to link movements to weather data and provide a better understanding of bird behaviour. Assuming recording/processing has started at civil dusk, the first total should reflect birds detected between civil dusk and the next hour (e.g. 2117–2200), then use the *Add continuing count* feature to submit subsequent hourly data (2200–2300, 2300–0000, 0000–0100, etc) and concluding with a period ending at civil dawn (e.g. 0400–0434). Remember to submit hourly data even if no flyovers were detected so your recording effort is properly documented.

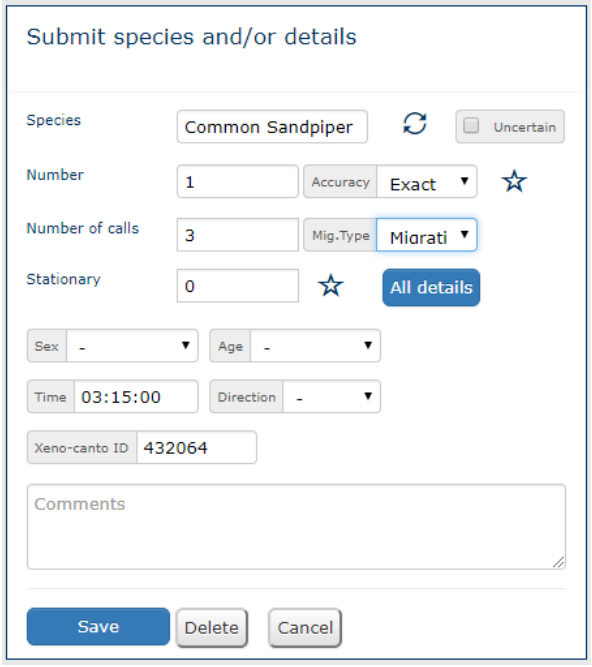
If you are following the protocol "All flyovers plus all stationary birds" then all the species that were detected and identified in each hour must be logged in each hour. Whilst undeniably more laborious, this approach adds value in various ways. For example, it could reveal any patterns that exist in the timing of vocalisation by stationary birds (nocturnal or otherwise) and it removes subjectivity about when birds that are both resident and migratory are logged, e.g. Song Thrush in the UK.

COUNTING CALLS OR INDIVIDUALS

Observers have the option to record number of calls and/or number of individuals. Wherever possible, we encourage observers to submit estimated counts of the number of individuals recorded as the primary metric of abundance. The decision can be made on a species-by-species basis, and falling back on providing the number of calls if estimating individuals is too difficult, or merely indicating presence if call counting is also too difficult. Estimating the number of individuals is difficult, and one of the following qualifiers should be used:

- **Exact** (default) – e.g. you're confident only one Coot flew over in the hour
- **Minimum** – e.g. a flock of at least 5 Wigeon
- **Estimate** – e.g. you think there could have been 200 White-fronted Geese in the hour

Please add number of calls as well if you can, especially for thrushes or other very abundant species for which call rates may be a useful proxy for the magnitude of migration.



ADDITIONAL DETAILS

We encourage the submission of extra contextual information, especially for scarce or rare species. Extra fields are provided in the Trektellen forms for submitting the following optional details which will be useful for future analysis and will provide extra context and interest to others:

- **Direction** – compass directions for direction of movement if it can be deduced (easier with stereo or microphone arrays)
- **Time** – noting the time of the NFC is especially useful for rarities and for movements near civil dawn/dusk for species not normally associated with nocturnal migration
- **Sex** – some NFCs can be assigned to sex
- **Age** – some NFCs can be assigned to age
- **Xeno-canto ID** – include the 6-digit numeric identifier from xeno-canto to embed a recording in your submission for others to play
- **Comments** – for adding other information of note, such as call types or interactions.

SUBMISSION OF DATA USING TREKTELLEN

We strongly encourage submission of data using Trektellen, which was updated in 2018 to provide an improved interface for the submission of SNFCM data. Please use the equipment field to indicate the type of recording equipment used.

Trektellen data for sites in the UK and Ireland are automatically shared with BTO BirdTrack and are available (with observer permission) on request by individuals and relevant in-country organisations.

SUBMISSION OF RECORDINGS

We encourage recordings of rare and scarce species, as well as flight calls of commoner species rarely heard at night to be uploaded to xeno-canto. This will contribute to everybody's learning of less commonly heard NFCs. Evidence of national and regional rarities should be submitted to the relevant authorities for consideration.

FURTHER INFORMATION

Additional resources for call identification, equipment and processing of recordings can be found at:

https://soundapproach.co.uk/

and

https://nocmig.wordpress.com/

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Record anywhere, any time of year

From civil dusk to civil dawn, ideally hourly

Count all flyovers even if local birds

Stationary grounded birds ignored or logged separately

Be cautious with identification; upload recordings to xeno-canto

Aim to count individuals and number of calls

Submit data using Trektellen

Cover photo: Simon Gillings / BTO

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