

(DRAFT) Monitoring bird sounds – Comparing results from BirdWeather PUC/BirdNET PI and humans

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Introduction

At Danish bird observatories long term trends in the numbers of migrating birds have been followed in decades. Migrating birds have been counted at tips along the coast and caught for ringing using standardized monitoring practices.

We would like to add automatic recording of bird sounds. A tool to do that could be BirdWeather PUC/BirdNET PI.

We wanted to find out how efficient and correct the BirdNet tools from Cornell Lab of Ornithology are recording the bird sound in an area. To do that simultaneous recordings were made by humans and by the BirdNET tools.

In this paper results from the tests are presented.

Materials and methods

The recordings of bird sounds were made in Denmark in the village Stensby (54,980°N, 12,049°Ø) surrounded by fields and forest and about 2 km from the coast.

Recordings have been made each half-month from November 2024 to October 2025. Recordings were made with the BirdNET tools for 24 hours from midnight to midnight. Tool settings: Recording time: 9 sec. Probability: 10%. Confidence: 75%.

The human recordings were made from the hour before sunrise to the hour after sunset. Records were made for 10 minutes each hour. In each minute it was recorded which bird species were heard.

The efficiency of the recording made by the tool was made by comparing recording made by the tool and the human. This was done by comparing minute by minute which species the tool and the human had recorded.

The correctness of the bird sound identifications made by the tool was made by listening to a series of 500 recordings made by the tool and comparing the bird species recorded by the tool and the human. Such a comparison was med every second month.

(Preliminary) Results

(Last updated 30 December 2024.)

The efficiency of the BirdWeather PUC

Sum of species recorded in average in each 10 times 1 minute periods each hour												
	Jan.1h	Jan.2h	Feb.1h	Feb.2h	Mar.1h	Mar.2h	Nov.1h	Nov.2h	Dec.1h	Dec.2h	Total
BirdWeathe PUC								4,5	2,4	6,1	1,8	14,8
Human								16,9	11,3	26,6	10,0	64,8

The tests showed that the BirdWeather PUC recorded only about a quarter of the bird sounds that I human standing beside the PUC did record. It was mostly weak sounds or remote birds that the BirdWeather PUC missed.

<Make a comparison for species and species groups and present the results.>

The correctness of the identifications of the BirdWeather PUC

Until now data from the first half of December 2024 has been analyzed. The author listened to a series of 500 records made by the BirdWeather PUC and compared the identification of the species made by the PUC and the author. See table (Texts in current version are in Danish.).

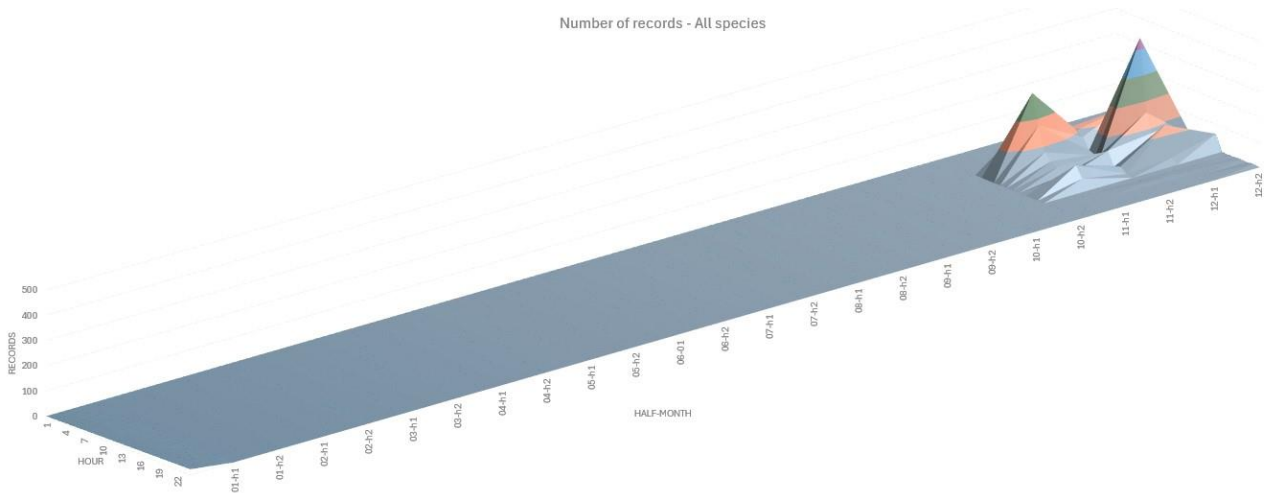
Out of the 500 records, the PUC and the author identified 492 to the same species, 1 to different species, for 3 the author was not sure and for 4 the sounds did not come from birds but from a zipper.

(Rather impressive results.)

Antal af Lydtype	Kolonnemærkater			
Rækkemærkater	Ja	Nej	Usikker	Hovedtotal
Allike	101			101
Blisgås		1	1	2
Bogfinke	4			4
Bramgås	73			73
Fuglekonge	2		1	3
Grønirisk	1			1
Grønsisken	1		1	2
Grågåse	210			210
Gærdesmutte	8			8
Halemejse	4			4
Husskade	1			1
Knopsvane		4		4
Musvåge	1			1
Råge	61			61
Solsort	2			2
Sumpmejse	2			2
Tornirisk	2			2
Vindrossel	19			19
Hovedtotal	492	5	3	500

Some examples

The data recorded by the BirdNET tools can be used for example to show diurnal and seasonal variation in bird sounds. The figure below shows data for all species from November and December. Graphs for each species will be more interesting.



After using the BirdNET tools some years long term trends will be shown.

Discussion

(To be written.)

Summary

(To be written.)

References

(To be written.)

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