



Forest Breeding Bird Grid Census 2024 Report

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Introduction

Since 1984, the Beaverhill Bird Observatory has been monitoring populations of migratory and local breeding birds in the Beaverhill Natural Area. This includes the operation of 3 MAPS (Monitoring Avian Productivity and Survivorship) stations within the natural area, which is a continent-wide program run by the Institute for Bird Populations that aims to precisely determine population trends and status for breeding populations of North American species.

As a complement to this, the observatory began a forest breeding bird census starting in 2016. The breeding bird census uses the territory mapping technique, which involves surveying the same area repeatedly during the breeding season to precisely determine the number of breeding birds in that area. With global bird populations in decline, getting a complete picture of local breeding birds helps to establish long term population trends. By monitoring the same area over time, changes in bird population arising from shifts in habitat can also be tracked.

Methods

8 surveys were run at sunrise along a 10 x 10 grid of points spaced 50 meters apart located within the Beaverhill Natural Area. These surveys occurred on June 14, 15, 28, 29, 30, July 1, 7, 8. The positions of individual birds were recorded on a paper map of the survey grid, and territorial behaviours such as counter-singing were noted for each individual. The starting point and direction of travel were changed for each survey to not bias data by consistently surveying certain points earlier in the morning when bird activity is higher.

Once surveys were completed, species maps were made for species detected on a minimum of 5 surveys and for which at least 1 territory could be clearly delineated. Territory boundaries were determined based on clusters of sightings and the location of counter-singing events. Territories on the edge of the survey grid were counted as 0.5 of a territory, so that density estimates for the entire grid were not inflated by birds whose territories were not fully in the survey area.

Results

A total of 159.5 territories for 8 species of birds were identified upon the completion of all 8 surveys. Least Flycatcher was the most abundant species with 75.5 territories, followed by Yellow Warbler with 42 territories and House Wren with 15 territories.

Table 1. Summary of territory numbers and densities for 8 species in the forest breeding bird grid

Species	# of territories	Territory density (# / ha)
Least Flycatcher	75.5	3.02
Yellow Warbler	42	1.68
House Wren	15	0.60
Baltimore Oriole	12	0.48
Warbling Vireo	11	0.44
Yellow-rumped Warbler	1.5	0.06
White-throated Sparrow	1.5	0.06
Red-eyed Vireo	1	0.04

The number of territories identified was higher in 2024 than in 2023, but lower than in 2022 and 2021. The only species that was less abundant than previous years was Red-eyed Vireo, with only a single territory being identified. Territories for White-throated Sparrow and Yellow-rumped Warbler were also identified for the first time since the project’s inception in 2016.

Table 2. Territory numbers for 8 species in the forest breeding bird grid over the last 5 years

Species	Territories (2024)	Territories (2023)	Territories (2022)	Territories (2021)	Territories (2020)
Least Flycatcher	75.5	66	91	148	43
Yellow Warbler	42	37	51	60	10
House Wren	15	16.5	28	24	24
Baltimore Oriole	12	5.5	12	8	1
Warbling Vireo	11	4.5	10	14	4
Red-eyed Vireo	1	2.5	8	17	0
Yellow-rumped Warbler	1	0	0	0	0
White-throated Sparrow	1	0	0	0	0

Discussion

Least Flycatcher territory numbers continue to be higher in the Beaverhill Natural Area than in other areas where similar studies have been conducted (Van Brompt et al., 2024). Aerial insectivore populations are in steep decline continent wide, so preservation of areas like the Beaverhill Natural Area could play an important part in preserving these species in the future.

The number of House Wrens is influenced by the 25 nest boxes that are present in the study area. However, only 3 boxes were occupied in the census area which means that 12 of the wren nests are believed to be in natural cavities. This is significant since the forest is an early successional aspen-balsam forest. The trees are now large enough to host woodpeckers which in turn provide cavities for the wrens. Tree Swallows outnumbered House Wrens in these nest boxes in 2024, but no territories for the species could be identified based on mapping alone. One limitation of the territory mapping technique used in this study is that species that vocalize infrequently or are largely silent (such as Tree Swallows) can be missed or undercounted during surveys.

The presence of White-throated Sparrow and Yellow-rumped Warbler territories for the first time on these surveys suggests that the forest in the Beaverhill Natural Area is transitioning to a more mature habitat structure. Both these species show preference for more mature deciduous habitats on the breeding grounds (Hunt and Flaspohler, 2020). Likewise the number of wrens in natural cavities reflects the shifting structure in the natural area to older forest. The increased presence of species such as Pileated Woodpeckers and Barred Owls in the natural area further supports this hypothesis, as these species also favour forests with more mature habitat structures (Bull and Jackson, 2020). More years of survey data should provide more clarity on this trend in the future.

Based on previous years of surveys, forest songbird numbers appear to be reasonably stable within the Beaverhill Natural Area. Observer inconsistency is a limiting factor when comparing data between years, as the determination of precise territory boundaries from species maps is inherently subjective. For this reason, the same observer (the author) has conducted this survey since 2022. Reanalyzing data from previous years using GIS modelling would allow for more accurate between year comparisons by reducing the effect of observer bias.

Works Cited

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