

Supporting landowner stewardship and conservation of at-risk aerial insectivores in
Southern Ontario



Eastern Whip-poor-will / Grant Davis



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BACKGROUND

Purpose and Goals

The Eastern Whip-poor-will (*Antrostomus vociferous*) is a nocturnal aerial insectivore, which means that it feeds exclusively on insects while flying. The aerial insectivore group is experiencing the fastest population declines of any other bird group in Canada, with a dramatic population drop of 59% since 1970 (North American Bird Conservation Initiative, 2019). The Eastern Whip-poor-will is listed as Threatened under the federal Species at Risk Act (2011) and provincially in Ontario under the Endangered Species Act (2009). The principle threats, as identified in the Provincial Recovery Strategy for Eastern Whip-poor-will, are declining insect prey abundance and habitat loss on the breeding and overwintering grounds (Ministry of the Environment, Conservation and Parks, 2019). Through this Birds Canada project, we will fill critical knowledge gaps regarding habitat selection, prey availability, migratory paths, and overwintering sites of Eastern Whip-poor-will – focusing on breeding populations in Norfolk County, Ontario. This is particularly important in southern Ontario, as an understudied population for this species, with increasing intensity of land alteration and reduction of forested areas and edge habitat in known critical habitat (English et al. 2016). Additionally, we will directly engage with landowners who host Eastern Whip-poor-will on their properties in Norfolk County to increase their level of awareness and appreciation of these species, and highlight the importance of restoration, maintenance, or enhancement of habitat for nesting and roosting sites, as well as insect prey availability.

Methods

Tagging

To determine habitat selection and preferences on the breeding grounds, identify migratory paths, and target efficient landowner stewardship on sites with known Eastern Whip-poor-will occupancy, adult and juvenile Eastern Whip-poor-wills were captured during the breeding season between May and September 2023 to attach radio transmitters to the birds to track their movement throughout their breeding territories. All birds were captured using 38mm mist-netting and audio lures (“whip-poor-will” call broadcasts), and dip nets, using protocols similar to those described in Grahame et al. 2021 and Bakermans et al. 2022 (Figure 1). All banding took place in calm weather conditions (i.e., no wind, no precipitation, temperature between 15C - 25C, etc.). In sites with targeted mist-netting in known Eastern Whip-poor-will territories, birds were extracted immediately from the net. At sites where multiple mist-nets were deployed to increase capture rate, nets were checked at least every 10-20 minutes to ensure that birds were safe and to reduce/eliminate the possibility of injury. All birds were placed into clean, dry, cloth bags, and were monitored closely for signs of stress (e.g., inability to thermoregulate efficiently, eyes closing, open-mouth breathing, etc.) or injury, prior to processing. Birds were carefully removed from bags to ensure that remiges are not damaged, and held in a secure grip for processing (North American Banding Council, 2001). Birds were weighed, measured, aged, and sexed, and leg-banded with an aluminum Canadian Wildlife Service/United States Geological Survey bird band. Fecal samples were collected opportunistically and placed in vials or paper envelopes, labelled with the band number, tag number, date, and location of capture. Each bird that was deemed suitable (no injury, no signs of stress, within the recommended weight range for tagging) was tagged with Lotek radio

transmitters (<https://www.lotek.com/>) using the leg-loop style harness (NTQB2-6-1 for adults, NTQB2-4-2S for chicks (or similar) after day 10 – chick weight at least 28g). Transmitters including harness materials (superglue and stretch cord; Stretch Magic®) weighed approximately 1.2g (NTQB2-4-2S) and 1.8g (NTQB2-6-1), which is less than 5% of the birds body mass (adult weight: 43g-64g). Harnesses were attached to nanotags prior to capture of birds, to drastically reduce handling time. Tagged birds were tracked using the Motus Wildlife Tracking System (<https://motus.org/>), using towers that are permanently set up in the region, and supplemented with manual telemetry using Yagi antennas ~1 hr before sunset to ~4 hrs after sunset during peak foraging activity, and during the daytime to capture roosting location data.



Figure 1. Mist net array for Eastern Whip-poor-will capture.

Nests

Nest locations were found using eyeshine (Figure 2) of adult birds at night with headlamps, or by unintentionally flushing birds to reveal eggs/chicks on leaf litter while surveying. Location and nest stage (eggs, chicks, etc.), were recorded for each nest found, and were checked throughout the season to determine nest fate (success, predated, etc.). Trail cameras were set up at each nest to record adult behaviour on each nest, and identify nest predators when possible for targeted landowner stewardship.



Figure 2. Red/white night eyeshine of Eastern Whip-poor-will.

Results and Discussion

A total of 47 Eastern Whip-poor-will were tagged with radio transmitters, and 8 nests were found in 2023. Most birds were tagged on properties owned by the Nature Conservancy of Canada, St. Williams Conservation Reserve, Long Point Basin Land Trust, and private landowners, all of which have restored sites with the intention of increasing diversity for wildlife, plants, and insects. Tagged birds that were manually tracked during the field season appear to be using patchy habitat/fragmented forest edges (regenerating oak-savannah) next to open grassy areas. The transition between forested habitats with closed canopy cover to open grassy habitat allows for these nocturnal foraging birds to visually spot prey easier, while also seeking the ability to perch on open branches and trees. The male shown in Figure 3 was specifically noted to be using an open dead tree for perching, as these birds do seem to exhibit perch fidelity between and within years, suggesting that dead stands, stumps, etc., are important habitat features that need to be maintained instead of removed during forestry operations.



Figure 3. Tagged male Eastern Whip-poor-will tracked using Long Point Basin Land Trust properties. Red circle shows tag deployed on back of bird.

Tagged individuals were also tracked using the Motus Wildlife Tracking System permanent tower array in the Western Hemisphere, showing estimated migration routes of birds between August and November, 2023 (Figure 4). Many birds were observed passing through Veracruz, Mexico, highlighting the importance of this area as a migratory stopover site/overwintering location. Increasing our understanding of the general locations that Threatened birds, like Eastern Whip-poor-will, are using outside of the breeding grounds in southern Ontario allow for more efficient targeted conservation efforts and stewardship throughout the entirety of the annual life cycle, which is often a critical knowledge gap in avian conservation initiatives.

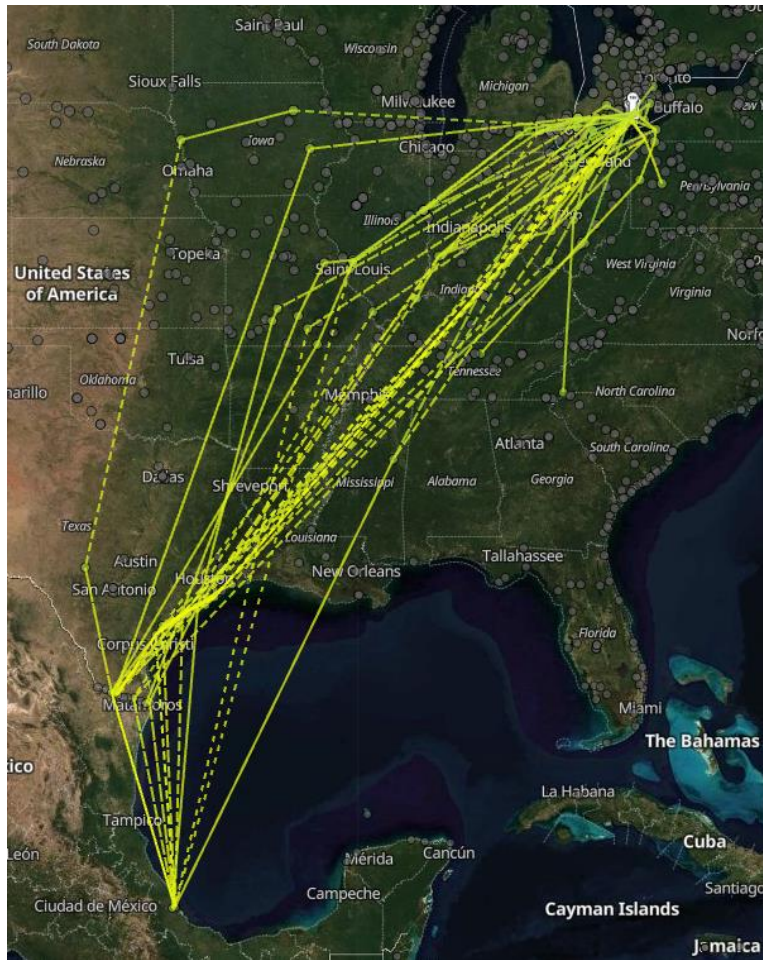


Figure 4. Estimated migratory routes of Eastern Whip-poor-will tagged in 2023. Yellow/green lines show approximate migratory routes of individual birds, and grey dots show Motus Wildlife Tracking System tower locations that detect tagged birds.

Communication Strategy

Discussions are ongoing with priority landowners (Nature Conservancy of Canada, St. Williams Conservation Reserve, Long Point Basin Land Trust, and private landowners) who host Eastern Whip-poor-will during the breeding season to share the areas which have been used by tagged birds and nest locations identified in 2023. The goal of sharing this information is to keep partners informed about species at risk abundance and occupancy on their properties, as well as help to use the provided species and habitat data collected to inform land-use management practices that result in positive conservation outputs. Annual meetings are planned for January-March to update landowners on the findings during the field season, to ensure that data being collected is usable by each organization/landowner for their land-use planning (restoration, plant removal/planting, site maintenance timing, etc.). The long history and strong relationships held by Birds Canada in Norfolk County with these landowners and partners, allow for better communication and collaboration on data collection and data use for direct conservation action.

Use of Funds

Item	Funds
Bird banding and tagging equipment	\$1,000.00
Staff transportation to field sites	\$1,177.00
Staff accommodation for field work	\$2,000.00
Overhead	\$823.00
Total	\$5,000.00

Future Survey Planning

Additional tagging and targeted nest searching will commence in 2024 (funding/personnel capacity permitting), and will also include insect sampling at nest and random (non-nest) locations. By the end of the project (2025-2026), we hope to have gathered sufficient data to answer questions specifically regarding nest-site selection and home range use by Eastern Whip-poor-will in the region, including the influence of insect availability and diversity. Additionally, by continuing to gather seasonal migratory data, we are better able to visualize and identify important stopover sites during migration (fall and spring), to advocate for protection of habitat throughout the life cycle, outside of the breeding grounds (southern Ontario). Finally, we will continue to work with established private and public landowners, as well as seek new partnerships, to interpret project data and provide recommendations on beneficial management practices for restored and other properties that Eastern Whip-poor-will currently occupy or could potentially occupy in the future.

References

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