2024 Eastern Whip-poor-will Survey:

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Annual Report to

Vermont Fish & Wildlife Department

VERMONT CENTER FOR ECOSTUDIES
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Acknowledgements

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Introduction

The Eastern Whip-poor-will (*Antrostomus vociferus*) is a crepuscular and nocturnal aerial insectivore that breeds across eastern North America and overwinters in southern Florida, eastern Mexico, and Central America (Sibley 2003; Skinner et al. 2022). In their breeding range, Eastern whip-poor-wills use dry, low-elevation forests for nesting and diurnal roosting, in addition to nearby open habitats for foraging (Spiller and King 2021). These medium-sized birds primarily feed on moths and beetles (Souza-Cole et al. 2022). Their breeding season generally occurs from late May through early July, with egg-laying timed so that hatching coincides with the full moon phase (Cink 2002). Eggs are laid on the forest floor and incubated for approximately 20 days (Raynor 1941).

Habitat requirements for this species are complex and necessitate a mix of open-understory forests for breeding and rearing young, and large tracts of open land to forage successfully (Hunt 2006). Examples of breeding habitat include forests with dry, nutrient-poor soils such as Pine Barrens and Pine-oak woodlands. Suitable foraging habitats include fields, open wetlands, linear infrastructure rights-of-way, agricultural fields, and recently logged or burned areas (Hunt 2013).

In Vermont, Whip-poor-will records can be found across most of the state but tend to be concentrated along the western and eastern edges of the state at low elevations, and are not typically found in the mid to high elevations of the Green Mountains or in much of the Northeastern Highlands (eBird 2022). In 2011, the State of Vermont Endangered Species Committee formally listed the Eastern whip-poor will as threatened. This listing was based on meeting two required criteria for threatened designations, an estimated fewer than 300 reproducing individuals (females) in the state and an overall decline in the species at the state or regional level.

Project Background

Volunteer Surveys

With concern over the status of Whip-poor-wills in Vermont and reason to believe that traditional bird survey methods such as those used in the Breeding Bird Survey do not adequately represent nocturnal or crepuscular species (Bart et al. 2005), species-specific survey methods have been used to better monitor Eastern Whip-poor-wills. Because of this, in 2005, the Northeast Nightjar Survey expanded to Vermont in the form of nocturnal survey

routes. Routes were selected based on the presence of open or edge habitat (National Land Cover Database), well-drained soils, elevations under 1,500', and appropriate forest cover types (Hunt 2006). Each route was established with a series of ten points spaced 0.5 miles apart, with surveyors completing a three-minute count at each point. In 2007, the protocol was updated to its current version, which uses ten six-minute point counts at locations spaced one mile apart (Hunt 2007). Supplemental points are surveyed to assist in the tallying and triangulation of individual whip-poor-wills detected at the original points. Supplemental points are chosen 0.8km (0.5 miles) in each cardinal direction away from the original points.

Whip-poor-will surveys are timed to occur at least 15 minutes after sunset and end no later than 15 minutes before sunrise on waxing and waning moon cycles where there is at least 50% moon face illumination in order to maximize the effect moonlight has on detectability. Whip-poor-will detection probability is approximately 50% when the moon is greater than half full, over two times greater than when the moon is less than 25% full (Wilson and Watts 2006). To further increase the detectability of birds on a given route, surveys are only conducted on clear nights with wind speeds under 8mph and when background noises have no appreciable effect on the surveyor's ability to hear Whip-poor-wills. The survey period varies based on latitude and a start date two weeks after the average arrival date. For 2024, the survey period for southern Vermont extended from May 15th to May 30th and again from June 14th through the 28th. While in northern Vermont, the survey period ran from May 25th to May 30th and again from June 14th and ended June 28th.

VCE Surveys

For 2024, VCE did not conduct its staff-driven surveys but resumed its role in coordinating volunteer surveys and collecting those data.

Also in 2024, VCE contributed survey data to a multi-state analysis of Nightjar monitoring efforts led by the US Fish and Wildlife Service. This analysis helped identify the need for an additional survey route in Northeastern VT that would help to better represent the state as a whole. As a result, VCE established a new route in Canaan Vermont using the same criteria used when establishing other EWPW routes in VT, elevation below 1,500', well-drained soils, and presence of open and edge habitat.

Methods

As in previous years, surveys started 20–30 minutes after sunset and continued as long as the

moon was visible and the weather was suitable. During the waning moon, surveys began after sunset, continued until dark, then were delayed for varying amounts of time until the moon rose above the horizon. Early morning surveys ended 15 minutes before sunrise. Surveys were not conducted if conditions were windy (wind speed > 8 mph), cloudy (> 50% cloud cover), or rainy. Some points were repeated due to declining weather conditions in the first survey or if a survey ended at a point with a calling Whip-poor-will. If a calling individual was detected just before dawn, moon set, or declining weather, the original point would be re-surveyed and cluster sampling would begin.

Each point on a given route included a six-minute count, during which time two observers listened and recorded birds independently of one another. At each point, latitude, longitude, wind speed, cloud cover, temperature, and noise were noted. Passing cars were noted during the course of the survey. The survey consisted of listening for one-minute intervals for six minutes, with a compass bearing and qualitative proximity assessment ("very close," "close," "far," or "very far") if a Whip-poor-will was heard. Because Whip-poor-wills are often found in clusters, we used cluster sampling to potentially detect more birds in the vicinity of a detection. If a bird was detected at a point, a supplemental point survey would be completed approximately 0.5 miles away in as many directions as possible. Ideally, there would have been two to three supplemental points available for each original point where a Whip-poor-will was heard; however, this was not always possible due to a lack of roads, impending sunrise or moonset, inclement weather, or time constraints.

If a Whip-poor-will was detected, observers would take a bearing to estimate the location of the individual bird. At the end of each point count, observers would review the quantity and possible location of calling birds and make notes of directions based on the visible landscape at the point. Any detections were mapped along the compass bearing and noted to be approximately 1 km for a "very far" distance code, 0.5 km - 0.75 km for a "far" distance code, and 0.25 km or less for "close" or "very close" distance codes.

Results and Discussion

Volunteer Surveys

In 2024, volunteers surveyed 22 established Whip-poor-will routes under the conditions and methodology described above. The routes surveyed were, Brandon, Cambridge, Concord, Coventry, Fair Haven, Fairfax, Ferrisburg, Georgia Plains, Hartland, Highgate, Orwell, Panton, Pawlet, Randolph, Rockingham, Rutland, Salisbury, Snake Mountain, South

Tunbridge, Vernon, Wells, and West Haven. Coordinates for each survey point, the number of Whip-poor-wills encountered and route maps are included in the tables and appendices below. Eight routes had Whip-poor-wills calling during the surveys with a total of 26 singing males across 17 of the 223 total points surveyed (Salisbury has 11 established survey points; the Brandon survey included two ad-hoc points). Routes with Whip-poor-wills in 2024 were Brandon, Concord, Fair Haven, Highgate, Snake Mountain, South Tunbridge, Wells and West Haven. This is consistent with surveys at these sites over the past five years where Whip-poor-will have typically been recorded at these sites. These counts resulted in an average of 3.25 singing Whip-poor-wills per route with positive identification. From 2011-2023 our surveys averaged 3.13 singing birds per occupied route.

eBird Observations

15 distinct Whip-poor-will observations across 14 different sites, separate from those recorded in surveys, from across the state were submitted to eBird in the month of June. Search query into eBird data was limited to June in order to capture reported singing birds during peak breeding season. These observations in addition to those routes surveyed this year occurred over 23 Breeding Bird Survey blocks. From 2020-2022, Whip-poor-wills have been documented on 44 different Breeding Bird survey blocks in Vermont, similar to the 2017-2019 (42), and 2014-2016 (41) totals. Observations across 23 blocks represent an increase from the 19 blocks in 2022 is likely a result of increased route adoption by volunteers in 2024. This continues a reduction in June eBird observations of EWPW in VT compared to previous years (37 in 2022, 42 in 2021, 159 in 2020, 56 in 2019).

Future Directions

Progress has been made toward the future directions proposed in the 2022 EWPW report, including adding an additional survey route. Below are several strategies that may be used moving forward to help improve Whip-poor-will surveys in Vermont.

- Increase contributions from eBird

With 159 contributed observations to eBird during peak breeding season, 2020 stands out as an example of how eBird can be mobilized to collect data on a species not always effectively captured by other survey protocols. An intentional outreach effort aimed at getting birders out in the evenings of June throughout the state to listen for Whip-poor-wills and report their checklists to eBird can go a long way in improving what we know about the distribution of this species in the state, inform the state's population estimate and identify

areas for future targeted surveys.

- Improve survey effort at Whip-poor-will “hotspots”

Most Whip-poor-will routes have few if any birds recorded, but some, such as West Haven and Benson have at times had Whip-poor-will abundances several times greater than the average of the other routes in the state. These areas, while reliably having Whip-poor-wills, also have great variability in the number of birds reported. Increasing survey effort at these sites by using trained surveyors over several visits during the breeding season can reduce this variability, improve our confidence in the abundance on site and help refine population estimates.

-Expand volunteer group

The Whip-poor-will monitoring effort has benefited immensely from a dedicated group of volunteers that adopt routes in Whip-poor-will habitat. As some volunteers have retired routes and new individuals join the group, a concerted effort should be made to fill vacancies and have any newly established routes adopted to maximize the area covered by volunteers during the breeding season.

-Consistent and well-planned use of Autonomous Recording Units (ARUs) to document Whip-poor-wills

ARUs have been deployed in the past to increase sampling effort in areas where Whip-poor-wills were expected to be present. This type of passive acoustic monitoring has the potential to be scaled up beyond what has been used with Whip-poor-wills in the past to gain a much better understanding of this species (Holderried et al. 2024).

Conclusion

The 2024 survey effort reconfirmed Whip-poor-will occupancy along eight established routes and failed to identify Whip-poor-wills along fourteen additional routes that were surveyed. These data help to inform the distribution of the species across the state as well as inform a statewide population estimate.

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Table 1: 2024 Whip-poor-will survey point locations and number of observations

Route Name	Point	Date	Individuals	Lat	Long
Brandon	AdHoc	6/17/24	1	43.788	-73.241
Concord	7	5/23/24	1	44.2007	-71.814
Concord	8	5/23/24	3	44.4246	-71.795
Concord	9	5/23/24	3	44.4258	-71.775
Concord	10	5/23/24	1	44.4257	-71.756
Fair Haven	2	6/20/24	1	43.5786	-73.237
Highgate	1	6/25/24	1	44.9357	-73.094
Highgate	6	6/25/24	2	44.9552	-73.092
Snake Mountain	4	6/19/24	5	44.0352	-73.256
South Tunbridge	10	5/25/24	1	43.893	-72.526
Wells	2	5/22/24	1	43.4504	-73.232
Wells	5	5/22/24	1	43.4124	-73.244
Wells	10	5/22/24	1	43.3603	-73.246
West Haven	1	5/16/24	1	43.65	-73.393
West Haven	2	5/16/24	1	43.637	-73.391
West Haven	8	5/16/24	1	43.5744	-73.391
West Haven	10	5/16/24	1	43.5823	-73.42

Table 2: June 2024 eBird Whip-poor-will observation locations

Location	Latitude	Longitude	Date
3195 VT-22A, Bridport US-VT	43.98494	-73.3129	6/16/24
205 Colin Dr, Bristol US-VT	44.09061	-73.1002	6/3/24
517 Snake Mountain Rd, Middlebury US-VT	43.99843	-73.2518	6/1/24
Residence	44.19015	-73.2479	6/23/24
Southern end of Snake Mtn. Cornwall/Bridport	44.0071	-73.2575	6/22/24
Lavigne Hill, Hinesburg US-VT	44.32677	-73.0931	6/4/24
Nulhegan Pond - Brighton	44.79101	-71.817	6/3/24
115 Wayne Hill Rd, Bradford US-VT	44.04503	-72.197	6/2/24
115 Wayne Hill Rd, Bradford US-VT	44.04503	-72.197	6/17/24
Tunbrige	43.90758	-72.4831	6/1/24
Avalon Beach Rd, Fair Haven, VT	43.64344	-73.2229	6/20/24
Buckner Mem. Preserve/Bald Mtn.	43.57546	-73.409	6/20/24
Galick Rd, Fair Haven US-VT	43.57119	-73.4019	6/20/24
Scotch Hill Rd, Fair Haven	43.63195	-73.2495	6/13/24
212 Perkins Hill Rd, Springfield US-VT	43.37244	-72.4732	6/4/24