RE-EVALUATING THE ABUNDANCE AND DISTRIBUTION OF NORTHERN SAW-WHET OWL (*AEGOLIUS ACADICUS*) ON LONG ISLAND

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Abstract—The wintering patterns of Northern Saw-whet Owl (*Aegolius acadicus*; NSWO) on Long Island, New York, are poorly understood and seldom studied. We conducted systematic, night-time surveys using playback, targeting several habitat types known to be preferred by this species in winter. We found owls at more sites and in larger numbers than we expected. We concluded that wintering NSWOs were probably under-detected in the past, in part because observers focused on migration stopover sites and therefore overlooked other habitat types, and because historical effort tended to involve visual searches for roosting birds, rather than playback.

HISTORICAL BACKGROUND

Northern Saw-whet Owl has historically been considered a rare to uncommon but regular winter visitor and a very rare breeder on Long Island, New York (Bull 1964, Levine 1998). Bull (1964) states that "Like most woodland owls, the Saw-whet Owl is most often found in conifers during winter… Ordinarily, only one individual is seen at a locality, but on occasion more are found." Given the secretive nature and small size of NSWO, it has been difficult to accurately determine the abundance and distribution of the species.

Between 2000 and 2015, the nine Nassau and Suffolk County Christmas Bird Counts (CBCs) detected a total of 30 individual NSWOs. Though at least one individual was detected each year, never more than three were found in a count period and never more than three counts reported the species in a year. One count, Northern Nassau, only detected four individual NSWOs between 1975 and 2015. Saw-whet owls detected during CBCs were often found in large stands of white or Japanese black pine (*Pinus strobus, P. thunbergii*) or eastern redcedar (*Juniperus virginiana*), especially along the barrier beaches, settings that were traditionally perceived as favorable wintering sites for NSWO. However, there have long been indications that the species was more broadly distributed. For instance, records of road-killed birds were often far from known wintering sites, and often isolated from areas of dense pine stands (S. Mitra, per. comm.; eBird). Additionally, NSWOs have been detected adventitiously in areas

of open oak woodland with limited pine woods, and away from known roost sites. For instance, Shaibal Mitra (pers. comm.) related two instances from the Montauk CBC, involving one NSWO that responded during the day to whistled NSWO songs directed at passerines, and another that responded at night to playback of Eastern Screech-Owl (*Megascops asio*) vocalizations.

More recently, the winter habitat preferences of this species have been studied in better detail (Spahr pers. comm.), casting doubt on some of the historically prevailing local assumptions regarding where to look for NSWO during winter. We decided to sample sites in a variety of habitats in Nassau and Suffolk Counties, to re-assess the status and distribution of this enigmatic species.

METHODS

Sampling locations were chosen either via local knowledge or habitat type, using Google Earth. Habitat type was the primary consideration when selecting locations. Swengel (1987) listed the various habitats that NSWOs are known to use for nesting in Wisconsin, and personal communication with Tim Spahr, who has been conducting similar studies in Massachusetts, provided the authors with an understanding of what habitats the species prefers in the winter. We focused on four distinct habitat types: brushy woods with water sources, old brushy fields interspersed with cedars, mainland coniferous forest (Pine Barrens), and barrier beach sites where the species had been sought in the past. In order to detect the owls, the authors used playback from an Oontz Angle 3 bluetooth speaker playing recordings of NSWO obtained from the Macaulay Library at the Cornell Lab of Ornithology. Our playback protocol varied somewhat in the earliest efforts but was refined to comprise about four minutes of playback per effort. Recordings of owls that responded were either made via a Sennheiser MKE 300 microphone with an Olympus LS-10 recorder or an Audio-Technica AT8035 microphone with an Olympus WS600S recorder.

Occasionally, we encountered evidence of multiple NSWOs present in specific areas. Following other survey protocols (Tim Spahr), we judged birds responding to tape outside of a 400m radius of a previous point to represent distinct individuals. When multiple responses were heard from one survey point, we determined that multiple birds were present if the calls came from disparate locations within a short enough period of time that a single bird would have been unlikely.

RESULTS

A total of 29 individual NSWOs were detected at 15 locations in Nassau and Suffolk Counties, representing all of the major habitat types outlined above. Table 1 presents a list of locations, dates, numbers of owls detected, and other information on each encounter we had with the species within the region.

As a result of our sampling, we detected no fewer than seven distinct vocalizations, all of which can be found on eBird. The types of vocalizations varied throughout the year, with "fall and winter vocalizations" ("kew" calls) common in early winter and singing becoming more prevalent by February. Wail (agitation) responses were the most common response type and were given with little change in frequency throughout the entire survey period. As spring approached, response time seemed to decrease, though we did not record data to confirm this.

Both prevalence and abundance of NSWO was greatest in habitat type 3—coniferous woodland (Pine Barrens adjacent to freshwater), with at least one individual detected on 6 of 7 samples (85.7%), an overall average of 2.43 owls per sampling effort. Prevalence was second-highest in habitat type 1—hardwood swamp, with at least one owl detected on 10 of 15 samples (75.0%), an overall average of 0.73 owls per sampling effort. Prevalence was third-highest in habitat type 2—old fields with cedars, with at least one owl detected on 5 of 8 samples (63%), and an average of 1.38 owls per sampling effort. Prevalence was lowest in habitat type 4—barrier beaches, with owls detected on 2 of 4 efforts (50%), and abundance was also lowest in this habitat, with an average of 0.5 owls per effort.

Table 1: Observations of Northern Saw-whet Owls (*Aegolius acadicus*) at selected sites in Nassau and Suffolk Counties, Long Island, New York, December 2016-March 2017.

Date	Site	Town	AM/PM	Owls	Call Type[1]	Hab. Type[2]
3/18	Birch Creek Owl Pond CP	Flanders	Both	6	A,B,E	3
2/11	Cedar Beach	Oak Beach	AM	1	B,C	4
2/25	Froehlich Farms	Huntington	Both	2	A,B,D	2
12/24	Fuchs Pond Preserve	Northport	AM	1	B	1
1/2	Henry Ingraham Preserve	Northport	AM	1	B	1
12/17	Hither Woods Preserve	Montauk	Both	1	B	1
1/26	Iselin Preserve	Old Brookville	AM	1	C	1
2/11	Jones Beach	Wantagh	AM	1	B	4
1/31	Makamah Preserve	Fort Salonga	AM	1	B	1
2/27	Maple Swamp CP	Flanders	PM	3	A	3
1/7	Montauk State Park	Montauk	AM	1	B	1
1/26	Shu Swamp Preserve	Mill Neck	AM	2	B,C	1
2/12	Southard's Pond Park	Babylon	AM	1	B	1
2/18	Stillwell Woods Park	Syosset	Both	6	A,B,C,D	2
1/26	Uplands Farm	Cold Spring Harb.	AM	1	B	2
	Total			**29**		

[1]A—Song; B—Wail; C—Kew; D—Twittering; E—Bill Snapping. See text for full descriptions.
[2]1—Hardwood forest/swamp; 2—Old fields with cedars; 3—Coniferous woodland; 4—Barrier beach

DISCUSSION

Although our methods were not completely systematic, especially because we only sampled habitats that were deemed likely to contain owls and were not strictly rigorous with regards to the amount of effort per habitat type, our results clearly contradict some traditional beliefs regarding NSWO distribution and abundance on Long Island. Firstly, our observation that appropriate use of playback often elicited vocal response from NSWOs refuted the notion that this species will not vocalize outside of the breeding season, and will not respond to tape. Secondly, we detected NSWOs over a broad array of habitats, and prevalence and abundance were both highest in settings quite unlike the traditional sites outlined in the Historical Background section. The diverse habitats in which we encountered the species are difficult to categorize, but the presence of dense, low vegetation and fresh water were nearly universal and appeared more important than physiography or the identities of dominant plant species. One individual was even located in a suburban setting with relatively high human population density.

Most surprising to us was the difference between NSWO's prior perceived abundance and the abundance we observed. Though some (Bull 1964) suspected the species to be under-reported given its cryptic nature, our results showed how truly common this species can be, at least in some seasons. eBird shows only 10 total records in the study area over the past ten years away from the well-covered area of Jones Beach State Park. We detected nearly three times that number in one winter. Several locations contained multiple birds, with a single night at Owl Pond County Park detecting six NSWOs. Further, 10 NSWOs were detected in the confines of the Northern Nassau CBC, where only four individuals were detected on the count between 1975 and 2015.

Given that this study covered only a single, four-month period and not multiple migration cycles, there is some question as to whether these numbers are an atypical occurrence. Swengel (1987) discusses a possible four-year irruption-cycle of NSWO; banding stations which conduct fall migration efforts to capture NSWO's totals seem to be higher during "irruptive years" which tend to occur approximately every four years. Comments from NSWO banding stations throughout the Northeast indicated that this fall was expected to be an excellent year for the species. Although numbers of banded NSWOs were higher than the last three years in New York State, their expectation of a large irruption year did not appear to pan out (Patterson, pers. comm.).

Similar detection methods used by Tim Spahr in eastern Massachusetts netted incredible numbers of the species, including one night in which he detected 41 NSWOs in a single wildlife management area. Communication with him indicates that his efforts in prior years were not met with such success. However, he adds that his efforts were greater than in the past, and his detection methods may have improved. Another factor to consider is the rarity of the species in traditional roosting sites this winter. During past irruption years (e.g.,

2008), eBird records indicate a corresponding jump in sightings of roosting birds in city parks and pine stands through traditional locations in Region 10. This year, detection levels were actually down from the previous year, with sightings from only five different sites and never more than a single individual seen. We surmise that if numbers were much greater than usual, and if this year was an irruption winter for NSWO, the detection rate would have increased at least moderately at traditional locations, instead of falling slightly.

Still, more research is needed to confirm the results posited by this paper. Hopefully, birders in our area will use similar methods as the ones outlined above to detect NSWO in the future. This is especially true of CBCs, where we feel the detection rate fails to accurately represent the abundance of this species. Counters should include NSWO vocalizations in their owling efforts, and focus not only on pine-rich habitats, but brushy riparian areas, woodlands, and old fields as well—especially those sites which have considerable low, dense vegetation and fresh water. With such effort, it is possible that we may produce a more accurate representation of the presence of NSWO in our region.

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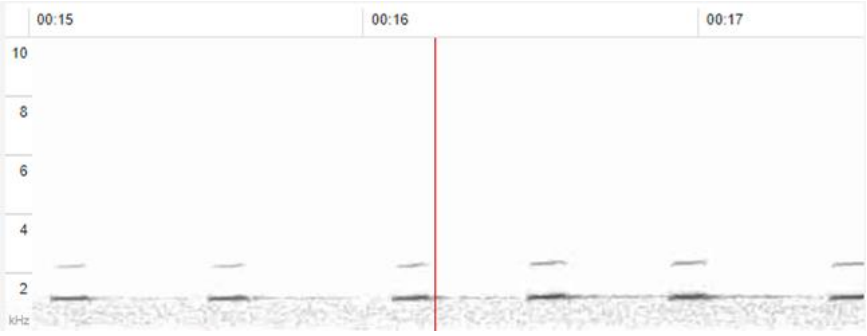
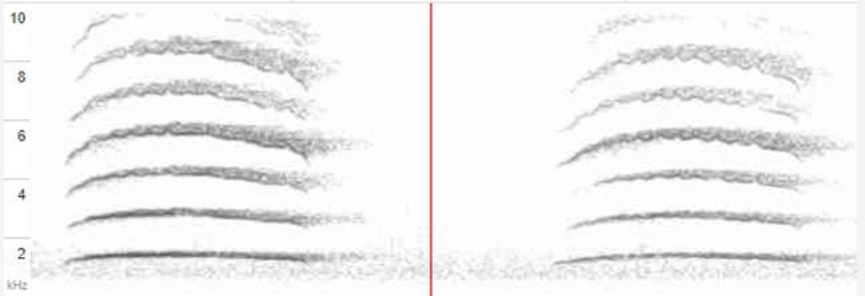
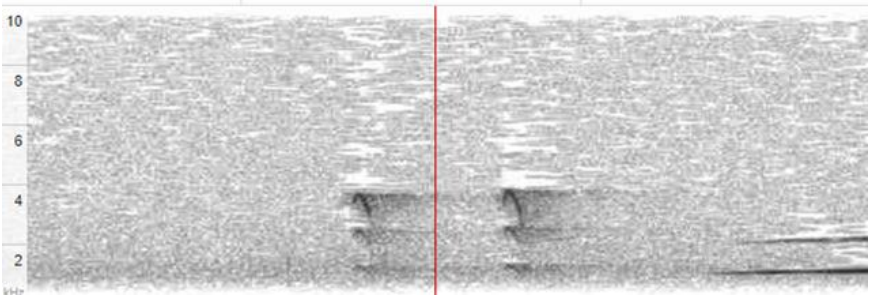
similar methods, and Andrea Patterson (Braddock Bay Bird Observatory) for her insight on this winter's NSWO flight. We would also like to show our gratitude to the Suffolk County Department of Parks for granting us permission to survey on their land and whose cooperation and assistance was crucial to our project. Lastly, we extend our gratitude to Dr. Shaibal Mitra, for the editing and review of our manuscript.



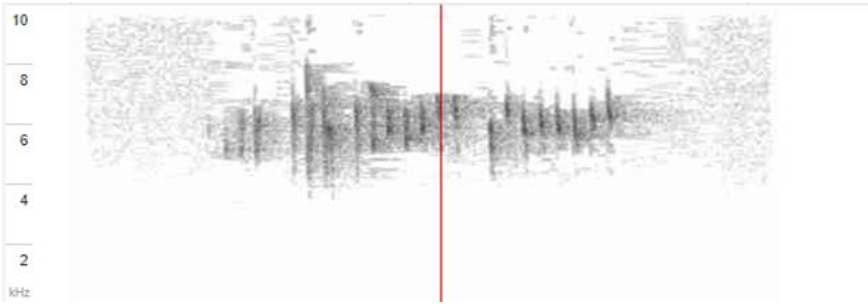
Vocalization Type A: Traditional song. Series of repeated toots, period of repetition varied from widely spaced individual toots to several per second. This vocalization became more predominant towards spring, perhaps due to males becoming more territorial.



Vocalization Type B: Wail. Ranged from soft and melodic to harsh and scolding. Length varied significantly, ranging from less than a second to several seconds long. The most commonly encountered vocalization throughout.



Vocalization Type C: "Fall call" or "kew". Brief, descending bark. Heard most often early in the season; less common towards the end of the study period.



Vocalization Type D: Twittering. High-pitched, rodent-like chitter. Seldom heard, often in response to extended periods of tape playing.