

Northern Saw-whet Owl banding in eastern Nebraska during fall 2020 — a major flight year



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Introduction

The Northern Saw-whet Owl (*Aegolius acadicus*; NSWO) is one of the smallest owls in North America. Once considered a rare sighting in the conterminous United States, recent banding efforts and other studies have increased overall knowledge about NSWO's distribution and occurrence. The species is actually now known to be common in some regions (Beckett and Proudfoot 2011). Despite advances in knowledge, there is still limited information about these birds in many areas, especially away from the Atlantic coast and Great Lakes where most banding programs occur.

NSWOs breed in forested regions across the northern United States and southern Canada as well as forested areas throughout the Rocky Mountains (Rasmussen et al. 2020). NSWOs migrate south from breeding areas during the late autumn months (Beckett and Proudfoot 2011). Relatively high densities occur around the Great Lakes annually (Rasmussen et al. 2020). This species is also prone to irruptive movements during some fall migrations, typically occurring at approximately four-year intervals (Beckett and Proudfoot 2011). Irruptions usually involve a high proportion of hatch year birds and are thought to be the result of high productivity resulting from abundant prey during the breeding season (Confer et al. 2014, Whalen and Watts 2002).

The central Great Plains is a region away from primary NSWO breeding areas and is where the status of the NSWO remains poorly defined. In Nebraska, directed efforts have improved information about breeding status in western areas of the state (Mollhoff 2014, 2018), but information about migration is especially sparse. Fall records were limited prior to 2019 with fewer than five accepted records in eastern Nebraska from 1950-2018 (Silcock and Jorgensen 2018). A targeted banding program that we undertook in the fall of 2019 (Brenner and Jorgensen 2019) resulted in NSWO captures, suggesting the species may migrate annually through the region, albeit in relatively low numbers. The Hitchcock banding station along the Missouri River bluffs in nearby western Iowa captures, bands, and releases 20-50 NSWOs every year during autumn migration (J. Toll, personal communication), further suggesting NSWO regularly migrate through Nebraska, but essentially go undetected most years without special efforts.

After we established the occurrence of NSWOs during fall in 2019 and the success of other banding attempts in our region, we increased our efforts in 2020. An additional motivation of this year's banding efforts was to participate in what appeared to be a NSWO irruption year based on various reports from owl banders at points farther north leading up to the season in Nebraska (N. Drilling and J. Toll, pers. comm.).

Methods

We used similar methods to our banding efforts in 2019 (Brenner and Jorgensen 2019). We attempted to capture NSWOs at four distinct public sites in the fall of 2020 with varying effort and success at each site. We used multiple sites to avoid interfering or interacting with other area users (e.g., hunters, hikers). Three were in Lancaster County: Branched Oak State Recreation Area (SRA; N 40.973, W- 97.874), Pawnee Lake SRA (N 40.846, -97.874), and Conestoga Lake Wildlife Management Area (WMA; N 40.765, W - 96.853). Our final site was Oak Glen WMA in eastern Seward County (N 40.979, W -97.987). We considered Branched Oak SRA as our main site and we focused the majority of our banding effort at this location. We set up nets in two different areas on opposite sides of the lake separated by 2.8 km (1.75 mi).

We used an array of two 12-meter mist nets (60 x 60 mm) centered on a nearby speaker playing NSWO calls on a continuous loop. Playback began ~30 minutes after sunset each night of operation. Net checks occurred between 30-45 minutes. At our main site at Branched Oak SRA, we operated two net arrays simultaneously, with one set at the northwest corner and the other set at the south end of the lake. Net arrays were set up at dusk and taken down each evening.

Results

We operated 82.5 net hours over 10 nights from 15 October – 19 November 2020. We captured and banded 20 NSWOs during the fall of 2020 (Table 1); 17 were Hatch Year (HY) birds and three were Second Year (SY) birds. The majority of the owls we banded were female (n = 15, 80%), with one being male and four being unknown sex. We banded one NSWO at Pawnee Lake SRA, three NSWOs at Oak Glen WMA, and the remaining 16 NSWOs at Branched Oak SRA. We spent one night of banding each at Pawnee Lake SRA and Conestoga Lake WMA. We spent the other 8 nights at Branched Oak SRA, with one of those nights having effort split at Oak Glen WMA. We recaptured one locally banded SY NSWO on 5 November; three nights after we initially banded it at Branched Oak SRA. We also captured and banded one HY Eastern Screech Owl (*Megascops asio*; EASO) at Conestoga Lake WMA.

Table 1. Total number of owls captured during fall 2020.

| Species | Age | Sex | Location | Date |
|---------|-----|-----|--------------------|------------|
| NSWO | HY | F | Branched Oak SRA | 10/15/2020 |
| EASO | HY | U | Conestoga Lake WMA | 10/20/2020 |
| NSWO | HY | F | Pawnee Lake SRA | 10/23/2020 |
| NSWO | HY | U | Branched Oak SRA | 10/27/2020 |
| NSWO | SY | F | Branched Oak SRA | 11/02/2020 |
| NSWO | SY | F | Branched Oak SRA | 11/02/2020 |
| NSWO | HY | F | Branched Oak SRA | 11/02/2020 |
| NSWO | HY | F | Branched Oak SRA | 11/02/2020 |
| NSWO | HY | F | Branched Oak SRA | 11/02/2020 |
| NSWO | HY | U | Branched Oak SRA | 11/02/2020 |
| NSWO | HY | F | Branched Oak SRA | 11/04/2020 |
| NSWO | HY | F | Branched Oak SRA | 11/04/2020 |
| NSWO | HY | U | Branched Oak SRA | 11/04/2020 |
| NSWO | HY | M | Branched Oak SRA | 11/04/2020 |
| NSWO | HY | F | Oak Glen WMA | 11/05/2020 |
| NSWO | HY | F | Oak Glen WMA | 11/05/2020 |
| NSWO | HY | U | Oak Glen WMA | 11/05/2020 |
| NSWO | SY | F | Branched Oak SRA | 11/05/2020 |
| NSWO | HY | F | Branched Oak SRA | 11/05/2020 |
| NSWO | HY | F | Branched Oak SRA | 11/05/2020 |
| NSWO | HY | F | Branched Oak SRA | 11/11/2020 |

Discussion

Our NWSO banding efforts in the fall of 2019 provided evidence that this species does in fact migrate through Nebraska in fall. What remained unclear is whether these owls migrate annually through eastern Nebraska and if captures of migrating NSWOs in our area would increase in a similar manner to the increase in captures at other banding stations north of our location during 2020 (i.e. Duluth, MN, Brookings, SD, and Point LaBarbe, MI). This season featured a much higher effort than our attempts in 2019. Our net hours increased nearly four times compared to last fall (82.5 hours vs 21.5 hours, respectively). Before our work in 2019, the last targeted effort to band NSWO during fall in Nebraska occurred in central Nebraska in 2004 (Kim 2005). This station operated for 370 net hours over 14 nights and captured 14 NSWOs. We exceeded this number of captures with both our overall season total (20) and our total at our main site at Branched Oak SRA (16). Our results, along with those from Kim (2005), provide evidence that NSWOs are annual statewide migrants.

Our results from this season provide further evidence of a brief fall migration window from late October through November with a peak during the first two weeks of November. In 2019, we captured all NSWOs (2) during this period and Kim (2005) banded the majority ($n = 11$, 79%) of owls during this time. The large majority ($n = 17$, 85%) of the owls we captured in 2020 were also banded in this timeframe. While we increased our effort considerably this season, we clearly experienced the large region-wide movements of NSWOs in 2020 compared to previous years, as we caught 8-times the number of owls than in 2019 during the peak movement dates alone. The nearest banding station to our location is in western Iowa at Hitchcock Nature Center also experienced an overall peak year for NSWO captures, banding ~70 owls (J. Toll, personal comm.). We also captured a large ratio of hatch-year birds compared to after-hatch year birds, which is expected during irruption years.

Additional remaining questions about the NSWOs that migrate through our area pertain to ones of origin and destination. As noted, information is much better in areas to our east where a network of banding stations has yielded invaluable information about NSWO movements through the large numbers of recaptures between sites (Confer et al. 2014). Limited banding returns from our region suggest NSWOs may migrate from points to our immediate north or even to our northeast (Confer et al. 2014). For example, a NSWO banded at Duluth, Minnesota was recaptured at the Hitchcock Nature Center in 2009 (Toll 2010), the latter site being southwest of the former location. However, the lack of foreign recaptures at our station for two years makes it impossible to determine the source of or the migratory pathway used by NSWOs in eastern Nebraska. Furthermore, the narrow window in which we successfully captured NSWOs and waning success in late November suggests most NSWOs do not regularly overwinter in our area. This assertion is supported by the dearth of reports away from the Missouri River valley in east-central and southeast Nebraska from December through mid-February (Silcock and Jorgensen 2020, www.eBird.org). Additional study is needed to answer these questions definitively, but the relatively large number of owls we banded in eastern Nebraska during the 2020 irruption increases the likelihood that banded individuals will be recaptured in subsequent years.

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