



Origins of Northern Shrikes (*Lanius borealis*) Wintering in the Western Great Lakes Region

2021 Minnesota Ornithologists' Union Savaloja Grant Report

Grant Amount: \$2,085

Submitted November 14, 2023



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Introduction

Despite its extensive range across most of the continental United States and Canada, relatively few studies have been conducted on the northern shrike (*Lanius borealis*). Some studies have focused on subjects such as breeding biology, hunting techniques, and winter diet, but many questions remain yet unanswered, particularly relating to movement and connectivity.

Since so few studies have focused on northern shrikes, one burning question that remains is whether North America is home to one breeding subspecies of northern shrike or two. While some (Ridgeway, 1904; Pyle, 1997) recognize only one subspecies (*L. b. borealis*), others (Miller, 1931) recognize two (*L. b. borealis* and *L. b. invictus*). Regardless of whether they are distinct enough to be considered separate subspecies, two distinct breeding populations are believed to occur east and west of Hudson Bay. Western shrikes are said to be paler than their eastern counterparts, although there can be significant overlap between the two (Paruk et. al, 2020). The eastern and western shrike populations are believed to mix in their wintering range in the western Great Lakes region (Miller, 1931), although this is difficult to prove through plumage and morphometric data alone.

In this project, we hoped to investigate the breeding origins of the shrikes that winter in the western Great Lakes region to determine if they are indeed coming from two distinct populations. Since shrikes are relatively small songbirds (weighing around 70 grams), the most feasible technology to accomplish the goal was light-level geolocation. Researchers have found that northern shrikes have high wintering site fidelity across their range (Rimmer and Darmstadt, 1996), a fact that makes the species an excellent candidate for geolocator technology. Light-level geolocators collect and store ambient light data which can be used to calculate a rough latitude and longitude based on day length and solar noon, respectively. Geolocators have been used relatively successfully on other shrike species, including loggerhead shrike (*Lanius ludovicianus*; Steiner et. al, 2013) and red-backed shrike (*Lanius collurio*; Korner-Nievergelt et. al, 2012). While geolocators are small enough to have very little impact on a bird as large as a shrike and cheap enough to be relatively cost-effective in larger numbers, the downside to this technology is that the geolocator must be removed from the bird in order to access the data (meaning that the bird must survive a full year, return to the same location, and then be recaptured). Geolocators are typically used on small migratory passerines with high breeding site fidelity in order to assess their wintering range; however, the high wintering site fidelity of northern shrikes means that geolocators could be used in “reverse” to map out the species’ breeding range.



Juvenile northern shrike after being banded and fitted with a geolocator. The geolocator sits on the lower back like a backpack but is so small it essentially disappears under the feathers. Photo by Hannah Toutonghi

Methods

This project started in January of 2021, when 10 geolocators (funded by Friends of Sax-Zim Bog) were deployed on wintering shrikes in the Sax-Zim Bog area of St. Louis County. Thanks to a 2021 Savaloja Grant in the amount of \$2,085, 15 more geolocators were purchased to be deployed across St. Louis, Carlton, and Aitkin Counties in the winter of 2021-2022. A total of 31 geolocators were deployed across both winter seasons. Of these 31 shrikes, 10 were first-year birds and 21 were adults. Of the adults, 10 were males and 11 were females. These birds were also color-banded with a unique combination of colored plastic leg bands to allow for identification of individuals at a distance.



Adult northern shrike. Photo by Hannah Toutonghi

Results and Discussion

The winter of 2022-2023 was spent attempting to recapture any of the 31 tagged birds from previous years to remove the geolocators and retrieve the stored data. Unfortunately, however, these plans were foiled in several ways. Firstly, it appears that northern shrikes do not have as high wintering site fidelity as previous studies indicated, or at least not in this region. Out of 31 banded shrikes, only two were redetected in the same areas where they were first captured. In an interesting turn of events, one adult female banded near Palisade in Aitkin County in January 2022 was found dead from an apparent window collision in February 2023 in Isle in Mille Lacs County. Rather than returning to the same site where she spent the 2021-2022 winter (a site that appeared to be lovely shrike habitat, at least to the human eye), this bird chose a new wintering location about 40 miles south for the following winter. While just a singular data point, this incidence of poor site fidelity suggests that other shrikes that were not detected in following winters may have simply moved to other wintering locations.



Juvenile northern shrike released with a geolocator, which can be seen on its lower back. Photo by Hannah Toutonghi

Secondly, while we were able to relocate two tagged shrikes in the same locations where they were originally banded (thanks to their unique color bands), these two proved to be uncapturable. A real risk of using geolocators is that the birds will become trap shy and will not allow themselves to be captured again, and this proved to be the case for these individuals. Despite trying countless times throughout multiple winters and designing new trap types that the birds would be unfamiliar with, these two shrikes were simply too smart to be recaptured.

Since no geolocators were recovered during the course of the project, we were not able to fulfil our goal of determining the breeding origins of wintering northern shrikes. However, the encounter data and banding data collected throughout the project are still valuable in furthering our understanding of the species' movements and site fidelity. Though we did not learn exactly what we hoped to learn through this project, we still gathered useful data that sheds more light on these enigmatic and understudied butcherbirds.



Adult northern shrike. Photo by Hannah Toutonghi

Accounting (January 2022-January 2023)

<i>Item</i>	<i>Anticipated Cost</i>	<i>Actual Cost</i>
15 geolocators	\$1850	\$1442
Color bands	\$85	\$215
Transportation	\$150	\$500
<i>Total:</i>	\$2085	\$2157

Acknowledgements

We would like to extend a hearty thanks to all who assisted with and supported this project, including but not limited to David Alexander, Frank Nicoletti, Hannah Toutonghi, Sparky Stensaas, Dave Valine, Halle Lambeau, Miranda Durbin, and Eric Atkinson. Additional thanks to the Minnesota Ornithologists' Union, Friends of Sax-Zim Bog, and Hawk Ridge Bird Observatory for funding and project equipment.

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