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Rusty Blackbird stopover use in the St. Louis River Estuary

2019 Minnesota Ornithologists' Union Savaloja Grant Report

Submitted by:
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Cover image

Flock of Rusty Blackbirds in the St. Louis River Estuary. Photo credit: Steve Kolbe

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Introduction

Rusty Blackbirds (*Euphagus carolinus*) are one of the most rapidly-declining songbirds in North America, but the reasons for these declines remain unclear (Greenberg and Matsuoka 2010). One untested hypothesis is that factors such as loss of quality stopover habitat may be contributing to this decline. Stopover ecology of Rusty Blackbirds is poorly understood on the continental scale and has not been studied in Minnesota.

Previous surveys in the St. Louis River Estuary conducted by researchers at the Natural Resources Research Institute along with personal observations from experienced birders suggest that large concentrations of Rusty Blackbirds use the area for a relatively long timeframe during their fall migration. Recent data from Ohio show that individual Rusty Blackbirds may spend up to a month at a single staging location during both spring and fall migration (Wright et al. 2018). Thus, it is possible that Rusty Blackbirds utilize spring and fall stopover areas such as those in Minnesota for nearly as long as they use their summer breeding grounds. In songbirds, migration is thought to be the period in the annual cycle when the vast majority of mortality occurs, and it is therefore an important component for long-term conservation plans (Sillert and Holmes 2002). The forested wetlands along the St. Louis River Estuary likely provide imperative stopover habitat and are an important component of the species' migration ecology. Land use plans for this area are in flux, and it is imperative to identify key areas that Rusty Blackbirds use during this important life stage to ensure long-term conservation of these habitats.

The specific objectives of the project were to:

1. Identify the timeframe and duration of fall migration stopover in the St. Louis River Estuary for Rusty Blackbirds,
2. Identify key locations and habitats that are used by Rusty Blackbirds in the St. Louis River Estuary during fall stopover,
3. Determine if Rusty Blackbirds use the St. Louis River Estuary for overnight roosts during fall stopover, and
4. Outline future information needs for studying migration stopover ecology for Rusty Blackbirds.

Methods

Autonomous Recording Units (ARUs) were deployed at eight sites along the St. Louis River Estuary from 9 September to 15 November 2019 (Figure 1). All ARUs were placed in or adjacent to typical Rusty Blackbird stopover habitat: wooded areas with shallow standing water and leaf litter. Very few Rusty Blackbird calls were detected on recordings taken during the middle of the day, so we limited analysis to recordings made in the two hours prior to sunset. Detection of calls was automated with the use of "finders" made with the monitoR package in R (Hafner and Katz 2017; R Core Team 2019). However, because Rusty Blackbird calls are not spectrographically distinct, a moderately high percentage of false positives (such as falling rain, creaking branches, and calls from other blackbird species) made manual inspection of detected calls necessary. This manual classification was done in the audio analysis software Audacity (Audacity Team 2019). Rusty Blackbird calls were tallied by hand and summarized as calls per hour, which was used as a proxy for Rusty Blackbird abundance.

Field surveys were conducted in the St. Louis River Estuary on four dates throughout October. The first two surveys (4 and 14 October) were completed aboard an inflatable zodiac that allowed access to

many areas of the estuary that are not accessible by road (Figures 1 and 2). By the middle of October, however, cold wintery weather prevented safe travel via this method, so roadside surveys were conducted (16 and 29 October) at each of the eight ARU deployment locations. For all surveys, all blackbirds species detected were spatially recorded on paper datasheets. Rusty Blackbirds detected via zodiac surveys were placed into one of the eight previously-defined survey locations.

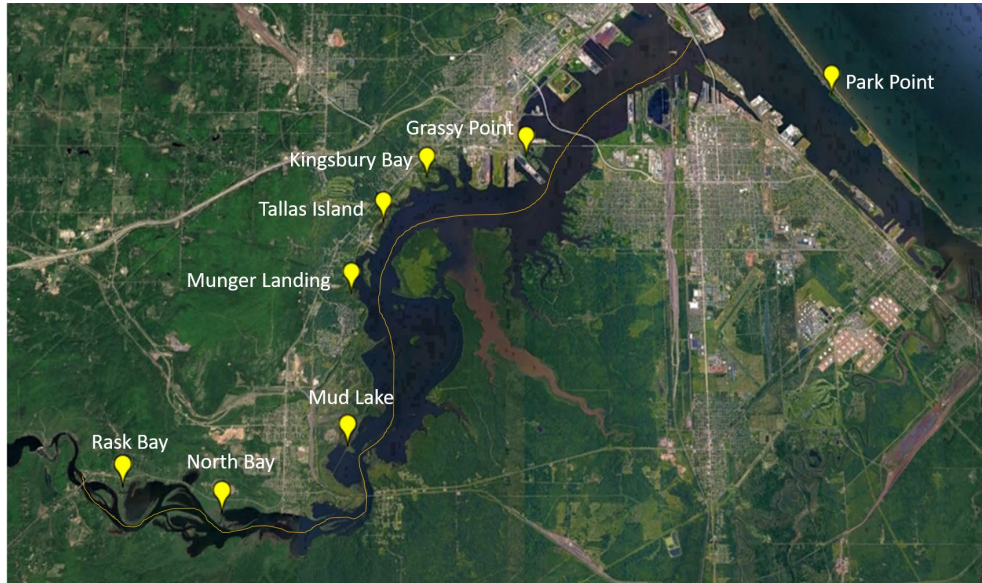


Figure 1. Location of ARU deployments and ground survey locations (yellow points) and approximate zodiac survey track (yellow line).



Figure 2. Steve Kolbe and Ryan Steiner conducting a Rusty Blackbird survey along the St. Louis River aboard an inflatable zodiac.

Results

ARUs detected Rusty Blackbirds at all eight survey locations in 2019. An example of a typical Rusty Blackbird recording is provided below (Figure 3).

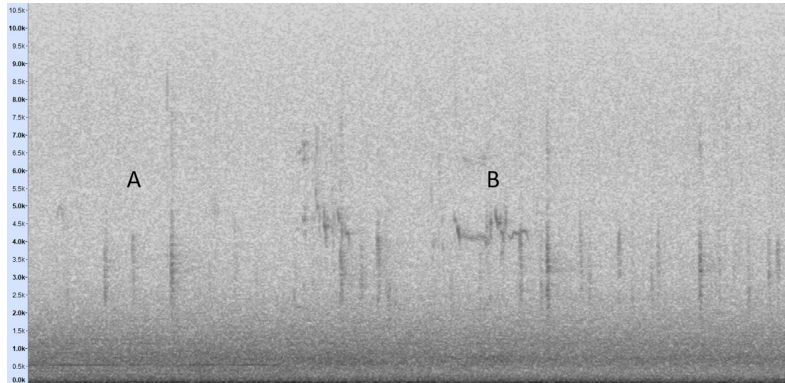


Figure 3. Example spectrogram of Rusty Blackbird calls (A) and songs (B).

The majority of Rusty Blackbirds used the St. Louis River Estuary as stopover habitat from approximately 8 October to 26 October (Figure 4). A smaller proportion of Rusty Blackbirds used the area before and after this timeframe, but at rates that are below our ability to reliably detect them with ARUs. Peak stopover usage in the estuary occurred in the middle of October.

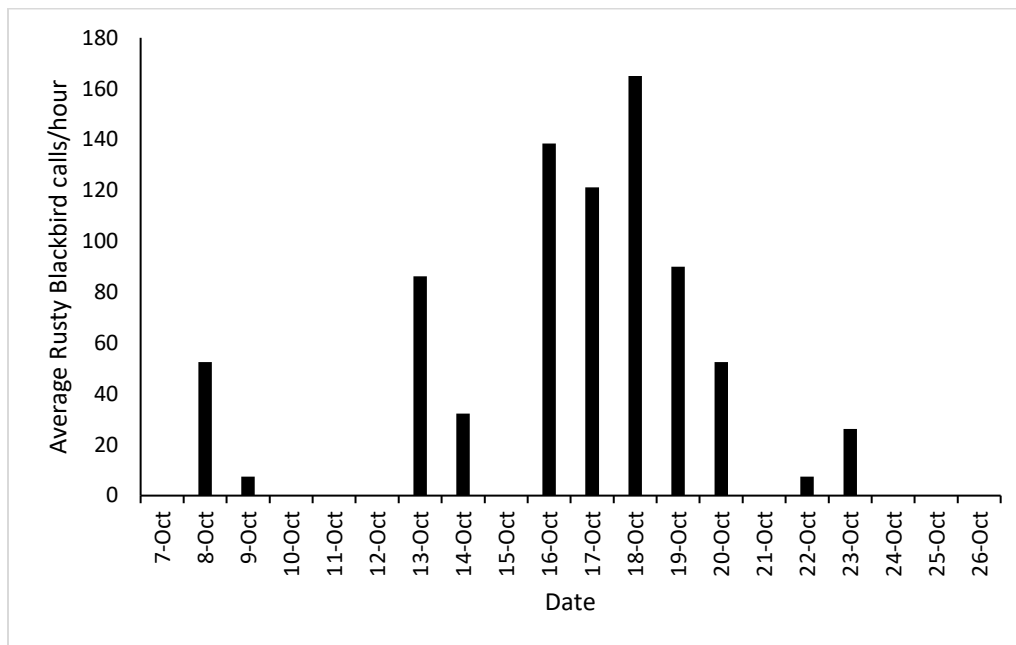


Figure 4. Average number of Rusty Blackbird calls/hour during October 2019 from ARUs deployed at eight sites in the St. Louis River Estuary. Rain events on 10, 12, and 15 October explain the small number of Rusty Blackbird calls detected on these dates.

Although data from the ARUs show all survey sites were used by Rusty Blackbirds, based on both the ARU recordings and roadside/zodiac surveys, Rusty Blackbirds appear more abundant in sites in the upper estuary (Figures 5 and 6).

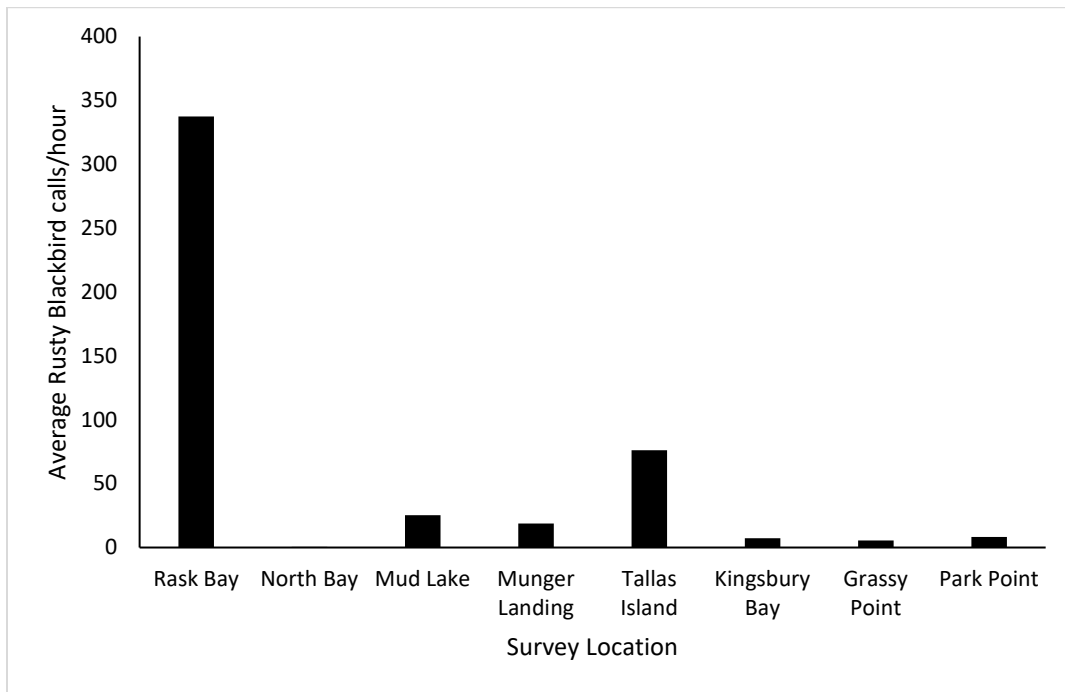


Figure 5. Average number of Rusty Blackbird calls/hour from 7 October to 26 October 2019 from ARUs deployed at eight locations in the St. Louis River Estuary. Sites are plotted from west to east.

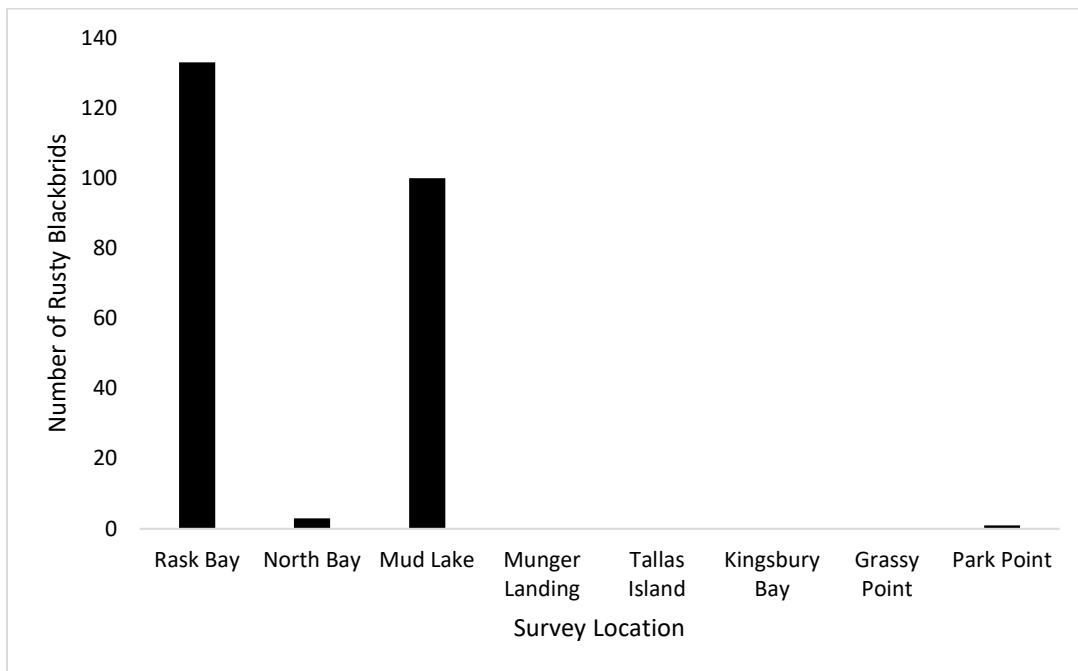


Figure 6. Total number of Rusty Blackbirds observed during four roadside and zodiac surveys from 4 to 29 October 2019. Sites are plotted from west to east.

Discussion

Rusty Blackbirds are late-season migrants that occur at ARU-detectable densities in the St. Louis River Estuary from early to late October. This is the first study that has used ARUs to document spatial and temporal use of stopover habitat by Rusty Blackbirds. The ARUs performed well until cold conditions arrived at the end of October, after which time many stopped recording or only recorded sporadically. However, we are confident that few, if any, Rusty Blackbirds were still present after late October.

The upper (western) portion of the estuary appears to provide much more suitable stopover habitat for Rusty Blackbirds than the lower (eastern) portion of the estuary. Both ARU and roadside/zodiac survey methods detected the highest number of Rusty Blackbirds from Rask Bay to Tallas Island. This portion of the estuary is far less industrially developed and contains more natural wetlands and forested wetland that Rusty Blackbirds prefer during stopover (Grinde et al. 2019). Our results suggest that conservation efforts aimed at Rusty Blackbirds should focus on restoring the lower St. Louis River Estuary to a more natural state, and we strongly encourage the preservation and further restoration of the upper estuary. Ash trees are an important component of the habitats used by Rusty Blackbirds; the future impacts of emerald ash borer (EAB) should be a consideration for management.

Rask Bay appears to be particularly favored by roosting blackbirds; recordings from this site document large numbers of Common Grackles (*Quiscalus quiscula*), Rusty Blackbirds, and small numbers of Red-winged Blackbirds (*Agelaius phoeniceus*) roosting in this area every evening during mid October. The roadside and zodiac surveys also confirm that large numbers of Common Grackles use the upper estuary as roost sites.

While large numbers of Rusty Blackbirds use the St. Louis River Estuary, further investigation is needed to determine stopover duration of individual Rusty Blackbirds in the estuary. Two pieces of anecdotal evidence suggest that Rusty Blackbirds use this area differently in different years. The fall of 2019 was a very good year for Rusty Blackbird passage; many large counts were made at Hawk Ridge Bird Observatory and other locations along the north shore of Lake Superior. However, conversations with landowners along the St. Louis River reveal that, unlike in 2018, there were not large stopover concentrations occurring here in 2019. More investigation is needed to determine interannual variability of stopover use by Rusty Blackbirds in the St. Louis River Estuary.

Acknowledgements

We would like to thank the Minnesota Ornithologists' Union Savaloja Grant for providing funding to complete this project. We would also like to thank the Natural Resources Research Institute for use of the inflatable zodiac.

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Budget

Category	
Supplies	
D Batteries - 96 @ \$0.48/battery. These batteries run the ARUs and need to be changed approximately once a month during cold weather.	\$46
Travel	
Three visits to place ARUs and replace batteries (3 visits x 53 miles x \$0.58/mile)	\$92
Four visits to conduct evening Rusty Blackbird roost surveys (4 visits x 53 miles x \$0.58/mile)	\$123
Personnel	
Primary personnel will be Steve Kolbe, Avian ecologist. Deploy and retrieve ARUs, perform field surveys, analyze audio and survey data, write report.	\$3594
Total Direct costs	\$3855
Indirect costs (54% Total Direct Costs= \$2082) - Waived	\$0
TOTAL	\$3,855