**PROJECT TITLE: Archiving Unreported Band Recoveries of Minnesota Birds**

**I. PROJECT STATEMENT**

Since 1950, Minnesotans have banded more than 2 million birds, but these data are only useful if recovered bands are properly reported to the federal Bird Banding Laboratory. For non-hunted species like songbirds, hawks, and owls where most band recoveries occur from recapturing previously banded birds, the vast majority of band recovery data currently resides in dusty 3-ring binders where it is in danger of being lost forever (this is not the fault of Minnesota banders, but rather the fault of the US Fish & Wildlife Service, which only recently recognized the value of live recapture data). Working with Minnesota-based nature centers that have conducted long-term volunteer banding programs, we have identified >30,000 unreported band recoveries, which represents a more than 8-fold increase in the amount of band-recovery data currently available for nongame birds. Our project will work with Minnesota-based banding organizations to electronically archive band-recovery data and make them available for future conservationists to assess the health of Minnesota bird populations. We will also work with current banding programs to implement best-management practices for data submission to make sure that all future data are properly archived.

After completing Activity 1, we will utilize these newly archived data to conduct analyses of survival and reproductive success in Minnesota-banded birds. Banding data from late summer and early fall can be used to estimate annual reproductive success from age ratios at capture, and our analysis has identified more than 100 species that would contribute sufficient data for this analysis. Many of these species also have enough data for estimating survival rates, and this number should increase dramatically after we complete the data summary for Activity 1. From our analysis, we can identify bird species for which survival and reproductive success are deteriorating through time, and also identify potential causes of these declines to assist wildlife professionals in developing more effective management strategies.

**II. PROJECT ACTIVITIES AND OUTCOMES**

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| **Activity 1 Title: Electronic archival of Minnesota band-recapture data**  **Description:**Through informal surveys, we have identified >30,000 undocumented recapture records of birds banded at three nature centers in Minnesota (Carpenter Nature Center, Hastings; Warner Nature Center, Marine on St. Croix; Lowry Nature Center, Victoria) and we would survey other organizations to identify additional unarchived banding data. We would hire data interns at each nature center to summarize and verify data records, and allocate additional staff time to supervise these activities. At completion, summarized data would be electronically archived at the U.S. Bird Banding Laboratory where they would be publically accessible to current and future analysts.  **ENRTF BUDGET: $50,908** |  |

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| **Outcome** | **Completion Date** |
| 1. Survey MN organizations to identify additional undocumented recovery records. | August, 2020 |
| 2. Develop protocol for electronically recording and archiving records. | Sept, 2020 |
| 3. Work with individual organizations to complete data archival and implement data archival strategies going forward. | July, 2021 |

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| **Activity 2 Title: Estimate survival and reproductive success of MN nongame birds**  **Description:**Understanding the health of Minnesota’s bird populations requires better information on **survival**, a measure of how many birds die each year through natural and human caused mortality, and **reproductive success**, a measure of how many offspring are produced during each nesting season. We will estimate survival and reproductive success for all bird species with sufficient data (>1,000 bandings or >100 recoveries). Patterns observed within these data could help identify where Minnesota birds face problems (for example, if South American migrants are declining relative to year-round residents), specific habitat types that might be limiting (for example, if grassland birds are declining relative to forest birds), or climate and weather patterns that create hardships for birds (i.e., if early spring migrants suffer declines during years with late spring snow storms). Hence, this analysis would provide important guidance for delivery of future conservation programs to benefit Minnesota birds, and will also provide professional training to increase capacity for future projects.  **ENRTF BUDGET: $90,792** |  |

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| **Outcome** | **Completion Date** |
| 1. Summarize historical banding data for analysis. | July 2021 |
| 2. Incorporate newly archived recapture data from Activity 1. | Oct 2021 |
| 3. Statistical analysis of reproductive success from banding data. | July 2022 |
| 4. Statistical analysis of survival from banding data | Jan 2023 |
| 5. Disseminate results and submit for publication. | June 2023 |

**III. PROJECT PARTNERS AND COLLABORATORS:**

Activity 1 will be implemented by Minnesota nature centers that have known banding data in need of archiving (Carpenter Nature Center, Hastings; Lowry Nature Center, Victoria; Warner Nature Center, Marine on St. Croix). Additional partners are possible based on Activity 1, Outcome 1.

Activity 2 will be implemented by a PhD student in the Conservation Sciences Graduate Program at the University of Minnesota, under the supervision of Dr. Todd Arnold.

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:**

Participating organizations will complete Activity 1 involving data archival within one year, as outlined above. Additional organizations that begin Activity 1 after the project start date may have later completion dates. In addition to eliminating the backlog of unreported band recoveries, we will implement “best data management practices’ at each banding station so that future data is electronically archived as soon as it is collected.

Activity 2 would begin near the end of year one and continue through year three, with all elements except formal publication being completed within this time frame. PhD students typically require 4 years to complete their degree. Additional funding to support the graduate student working on this project would come from competitive fellowships or teaching assistantship support through the University of Minnesota.