**Monitoring Avian Productivity and Survivorship on Ottawa National Wildlife Refuge, 2022**

PROGRESS REPORT-2022
BSBO-23-2

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INTRODUCTION

Many of the long-term monitoring programs for landbirds indicate negative population trends in migrant species in eastern North America (Robbins et al. 1989, Terborgh 1989, Rosenberg et al. 2019). However, none of these long-term programs provide data on productivity and survivorship that could indicate which parts of birds' annual cycle (breeding, migration, wintering) are responsible for the most drastic changes in their populations.

The Monitoring Avian Productivity and Survivorship (MAPS) program is a cooperative effort established in 1989 to provide critical long-term data on population parameters for landbird species throughout North and Central America (DeSante and Burton 1994). Adult population size and post-fledgling productivity are estimated at regional levels. Standardization from year to year and continuation at a study site for a minimum of five consecutive years is necessary to provide reliable estimates of annual variation in productivity and survivorship.

The MAPS protocol designates target species for each region of the country. Regional target species for Ohio include Downy Woodpecker, Gray Catbird, Red-eyed Vireo, Common Yellowthroat, Rose-breasted Grosbeak, Song Sparrow, and American Goldfinch. At a local level, species habitat associations are clarified, and habitat management can then be assessed by species responses.

Species prioritization of Ohio birds by the Ohio working group of Partners in Flight has identified grasslands and wetlands as the habitats of highest concern (Earnst and Dettmers 1995). Ottawa National Wildlife Refuge (NWR) staff has expressed interest in documenting avian communities associated with management operations of restoring sections of the wet forest known as the Black Swamp. With this in mind, the Black Swamp Bird Observatory initiated a project in 2017 that would not only meet national concerns but would also be able to address state and local questions. The study site was planted with tree species native to the Black Swamp in the early 1990s. This project will follow avian use into the future of this site to assess changes with woodland maturation. Over time, this study site can act as a template for expansion to other restoration sites on the refuge that are newer in their development.

## METHODS

The banding station was sited around the Gallagher Trail of Ottawa NWR adjacent to the Black Swamp Bird Observatory headquarters (Figure 1). This area was planted with trees in the early 1990s and presently is dominated by an understory of Gray Dogwood. Planted trees range in height from 10 to 50 feet. The breeding season (June 01 - August 10 at this latitude) was divided into seven 10-day periods, and field work was conducted at the site on one morning during these seven periods. Field work consisted of constant-effort mist netting.

Mist netting and banding operations were conducted following established MAPS protocols (DeSante and Burton 1994). Ten 12-meter mist nets (mesh size of 30mm) were operated for six hours, on one day during each 10-day period with at least six days separating each sample date (DeSante and Burton 1994). Nets were checked as often as possible for captured birds, typically every 30 minutes to 1 hour. Each bird was removed and placed in a holding bag, processed at a centralized banding location and then released. Data collected on each bird included band number, species, age, age determination technique, sex, sex determination technique, reproductive status, date, time of capture, station, net number, skull pneumatization, adult breeding condition, flight feather molt, and wing chord.

The study site was mapped to determine vegetation type and distribution in the study area. This will detect change in vegetation from year to year which could affect bird populations and demographic parameters as well as be comparable to other MAPS stations. Two levels of vegetation description were conducted. First, a scaled map delineating major habitat types was created. Second, stand characteristics were estimated at each location to provide a quantitative assessment of each habitat's vegetation. The stand characteristics were gathered by placing a 25-meter-radius circle at each location. Data on four layers of vegetation (tree canopy, sub-canopy, shrubs, and ground cover) are collected every five years.

## RESULTS

In 2022, banding was conducted on seven days for a total of 408.3 net hours. One hundred and eighty new birds were banded and a total of 221 birds were handled (Table 1). Total birds per 100 net hours averaged 54 for the season. A total of 24 species were banded (Table 2). The most common species captured were Gray Catbird (60), Yellow Warbler (27), American Robin (20), Cedar Waxwing (6), and Common Yellowthroat (6).

An indicator of nest success is to examine age ratios of captured birds as an annual index for production. Age ratios of the major species are shown in Table 3. The highest ratios were found in American Robin. Unusually low age ratios were recorded for Yellow Warbler and Northern Cardinal. Both banding data and observations indicated an extremely poor production year for Yellow Warblers. This could be a result of summer weather events. Future years will identify if poor production was realistic and examine explanations for it if so. Confirmed and probable breeders are

listed in Table 4 (a total of 27 species). A total of 21 previously banded birds were captured. Gray Catbird had the largest number of returning birds with eight followed by Yellow Warbler with five. The oldest returning birds were one Gray Catbird that was originally banded in 2014 and a Northern Cardinal in 2017.

## DISCUSSION

This long-term study will begin the investigation of bird use of management areas that have as their purpose reestablishment of Black Swamp forest in the Lake Erie Marsh Region. It lays the framework for looking at multiple sites of various ages to assess avian response to woodland establishment on Ottawa NWR.

Ultimately, productivity is the gauge of success in wildlife conservation management regimes. Completion of full banding seasons will allow for examination of staging and of the relationship between the inland habitat patches and the beach ridge habitats which is known to hold considerable fledgling congregations during late summer and early fall.

## RECOMMENDATIONS

It is recommended that this project continue and that Ottawa NWR staff and BSBO research staff discuss identifying additional sites that would assist in documenting management effects of reforestation on refuge properties.

## ACKNOWLEDGEMENTS

## LITERATURE CITATION

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Table 1. Daily banding totals for BSBO, 2022.

| Date | Net Hours | # Banded | Birds/NH | Returns | Recaptures | Total Birds | Total Birds/NH |
|---|---|---|---|---|---|---|---|
| June 6 | 60 | 26 | 0.43 | 5 | 0 | 31 | 0.52 |
| June 14 | 60 | 29 | 0.48 | 7 | 2 | 38 | 0.63 |
| June 22 | 48.3 | 25 | 0.52 | 4 | 1 | 30 | 0.62 |
| July 8 | 60 | 28 | 0.47 | 1 | 6 | 35 | 0.58 |
| Jul 14 | 60 | 22 | 0.37 | 2 | 5 | 29 | 0.48 |
| July 26 | 60 | 31 | 0.52 | 1 | 3 | 35 | 0.58 |
| August 2 | 60 | 19 | 0.32 | 1 | 3 | 23 | 0.38 |
| **Totals** | **408.3** | **180** | **0.44** | **21** | **20** | **221** | **0.54** |

Table 2. Species newly banded in 2022 at BSBO MAPS station, sorted by net.

| Species | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Yellow-billed Cuckoo | | | | 1 | | | | | | | 1 |
| Downy Woodpecker | | | | | | | | | | 1 | 1 |
| Ruby-throat. Hummingbird | | | | 1 | | | 1 | | | | 2 |
| Eastern Wood-Pewee | | | | | | | | 1 | | | 1 |
| Willow Flycatcher | | 1 | | | | | | | | | 1 |
| Blue Jay | | | | 1(1) | | | | 1 | | | 2 (1) |
| Brown-headed Cowbird | | | | | | | 1 | | | | 1 |
| Red-winged Blackbird | 1 | 2 | | 1 | | | | 2 | 1 | | 7 |
| Baltimore Oriole | | | | | | | 1 | | 1 | | 2 |
| Common Grackle | 1 | 2(1) | 1 | | | | | 1 | | | 5 (1) |
| Song Sparrow | | 2 | | | 1 | | | | | | 3 |
| Northern Cardinal | 2 | 4 | 2 | 3 (1) | 4 (1) | | | 2 (1) | | | 17 (3) |
| Indigo Bunting | | | | | (1) | 1 | 1 | | | | 2 (1) |
| Cedar Waxwing | | | | | 6 | | | | | | 6 |
| Warbling Vireo | | | 1 | | 1 | | | | | | 2 |
| Prothonotary Warbler | 1 | | | | | | 1 | | | | 2 |
| Yellow Warbler | 1 | 1 | 1 | 7 (1) | 1 | 3 | 8 (2) | 3 (1) | 1 | 1 (1) | 27 (5) |
| Common Yellowthroat | | 2 | | | 3 | 1 | | | | | 6 * |
| Gray Catbird | 6 | 5 | 6 (1) | 4 | 9 (2) | 5 | 12 | 6 | 6 (3) | 1 (2) | 60 (8) |
| Brown Thrasher | | | 1 | 1 | 1 (1) | | | | | | 3 (1) |
| Carolina Wren | | 3 | | | | | | | | | 3 |
| House Wren | | | | 1 | | | | | | | 1 |
| Black-capped Chickadee | | 3 | | | | | 1 | | | | 4 |
| American Robin | 1 | 6 (1) | 2 | 2 | 1 | 2 | | 4 | | 2 | 20 (1) |
| **Totals** | **13** | **28(2)** | **14(1)** | **21(3)** | **27(5)** | **11** | **26(2)** | **20(2)** | **9(3)** | **5(3)** | **179 *(21)** |

\* Represents additional bird of unknown net

( ) Indicates additional returning birds

Table 3. Age ratios of selected species captured at BSBO, 2022.

| Species | Juvenile/Adult ratio |
|---|---|
| Northern Cardinal (N=20) | 0.18 |
| Yellow Warbler (N=32) | 0.11 |
| Gray Catbird (N=68) | 0.58 |
| American Robin (N=21) | 2.00 |

Table 4. Confirmed and probable breeders on study site BSBO, 2022.

| | | |
|---|---|---|
| American Woodcock | European Starling | Yellow Warbler |
| Mourning Dove | Red-winged Blackbird | Common Yellowthroat |
| Downy Woodpecker | Baltimore Oriole | Gray Catbird |
| Yellow-shafted Flicker | Common Grackle | Brown Thrasher |
| Ruby-throated Hummingbird | Song Sparrow | Carolina Wren |
| Willow Flycatcher | Northern Cardinal | House Wren |
| Blue Jay | Indigo Bunting | Black-capped Chickadee |
| Brown-headed Cowbird | Warbling Vireo | American Robin |
| Yellow-breasted Chat | Prothonotary Warbler | Eastern Screech-Owl |

Table 5. Banding year of returning birds captured at BSBO MAPS study site, 2022.

| Species | 2021 | 2020 | 2019 | 2018 | 2017 | 2016 | 2015 | 2014 | Total* |
|---|---|---|---|---|---|---|---|---|---|
| Blue Jay | 1 | | | | | | | | 1 |
| Common Grackle | 1 | | | | | | | | 1 |
| Northern Cardinal | 2 | | | | 1 | | | | 3 |
| Indigo Bunting | 1 | | | | | | | | 1 |
| Yellow Warbler | 5 | | | | | | | | 5 |
| Gray Catbird | 6 | | | 1 | | | | 1 | 8 |
| Brown Thrasher | | | | 1 | | | | | 1 |
| American Robin | | | 1 | | | | | | 1 |
| Total | 16 | 0 | 1 | 2 | 1 | 0 | 0 | 1 | 21 |

Figure 1. BSBO station map for MAPS project, 2022.



Managed Field

5

4

6

3

2

7

B
S
B
O

Successional Habitat
Dogwood, Young Oak

8

Gallagher Trail

1

10

N

9

Mature Growth
Oak, Cottonwood,
Maple

**Black Swamp Bird Observatory
Station Map**