

Monitoring Avian Productivity and Survivorship on Oak Openings Preserve

PROGRESS REPORT-2011

BSBO-12-3

Draft

Mark C. Shieldcastle, Research Director
Black Swamp Bird Observatory
13551 West State Route 2
Oak Harbor, Ohio 43449
markshieldcastle@bsbo.org

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). While many trends have been downward, none of the 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 are necessary to provide reliable estimates of annual variations in productivity and survivorship.

The MAPS protocol designate target species by 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.

Recent species prioritization of Ohio birds by the Ohio working group of Partners in Flight have identified grasslands and wetlands as the habitats of highest concern (Earnst and Dettmers 1995). With this in mind, the Black Swamp Bird Observatory initiated a project in 1992 that would not only meet national concerns but be able to address state and local questions. The grassland/sand dune field, successional savanna, and burned and unburned oak woodland of the Oak Openings Preserve provides a valuable site to investigate species of grassland and edge on these various geographic levels. The Oak Openings region is recognized as having the greatest concentration of rare and endangered plants and animals in Ohio. 2011 was the 20th year of MAPS data collection at Oak Openings.

METHODS

The banding station was sited in an area with minimal human disturbance known as Ostrich Lane to evaluate avian response to land management actions on four habitat types present at the site: managed grassland, mature oak forest (both control burned and unburned), and a successional area in scrub-shrub. The breeding season (June 01 - August 10 at this latitude) was divided into seven 10-day periods, and field work was conducted during these seven periods at the Ostrich Lane site. Field work was comprised of constant effort mist netting, with additional point counts conducted at the Ostrich Lane site and in the dunes area along Girdham Road.

Mist-netting and banding operations were conducted following established MAPS protocols (DeSante and Burton 1994). Sixteen 12-meter mist nets (mesh size of 30mm) were operated for six hours, one day during each ten-day period with at least six days separating each sample date (DeSante and Burton 1995). 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 and then processed at a centralized banding location and 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.

Point counts were conducted to complement mist-netting operations at Ostrich Lane site, compare the avian community to the primary grassland/dunes area of Girdham/Reed management area, and document species such as larger birds that are not typically captured by mist-nets. Counts were conducted at points spaced a minimum of 100 meters apart throughout the banding station and the Girdham/Reed management area. Twelve points were used on each route. Counts for each point were conducted for five minutes in which all birds seen or heard were recorded. Counts were run three times for each route during June and early July. Point counts were canceled on extremely high wind or high bird activity days.

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; and secondly, an estimation was made of stand characteristics at each point count 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 point. Data on four layers of vegetation (tree canopy, sub-canopy, shrubs, and ground cover) are collected every five years.

RESULTS

Mist Netting

In 2011, banding was conducted on seven days for a total of 672.0 net hours. One hundred ninety-two new birds were banded and a total of 238 birds were handled (Table 1). Birds per 100 net hours

averaged 35.4 for the season. A total of 34 species were captured (Table 2). The most common species captured were Eastern Bluebird (45), Field Sparrow (36), Indigo Bunting (19), House Wren (12), American Goldfinch (12), and Gray Catbird (12). Banding results by habitat showed the scrub-shrub having the highest bird capture rate and diversity in 2011. Fifty-seven individuals of 19 species were captured in the scrub-shrub, 32 birds of 10 species in grassland, 52 individuals of 16 species in burned woodland, and 51 birds of 15 species in the unburned oak woodland. The most common species in the scrub-shrub were Gray Catbird (11), Field Sparrow (9), American Goldfinch (6), Indigo Bunting (6), Common Yellowthroat (6), and House Wren (6). Top species captured in grassland habitat included Field Sparrow (14), Indigo Bunting (8), American Goldfinch (4), and Eastern Bluebird (4). The unburned woodland total captures were Eastern Bluebird (14), Chipping Sparrow (7), Field Sparrow (7), and House Wren (4). The burned oak savanna had Eastern Bluebird (27), Field Sparrow (6), Baltimore Oriole (5), and Indigo Bunting (4) as the most common species captured in that habitat type. Special interest species included Orchard Oriole, White-eyed Vireo, Rose-breasted Grosbeak, Yellow-breasted Chat, and Chestnut-sided Warbler captured in scrub-shrub; Lark Sparrow in grassland, Red-headed Woodpecker, Hairy Woodpecker, and Eastern Towhee in burned woodland; and Hairy Woodpecker, Blue-gray Gnatcatcher, Summer Tanager, and White-breasted Nuthatch in unburned woodland.

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 Gray Catbird, Eastern Bluebird, and Baltimore Oriole. Unusually low age ratios were recorded for Field Sparrow, Chipping Sparrow, and Indigo Bunting in 2011. Confirmed and probable breeders are listed in Table 4 (a total of 32 species). Twenty-one birds of 10 species were captured as returning banded birds in 2011 (Table 5).

Point Counts

Three replicates of point counts were conducted each at the Ostrich Lane banding station and the Girdham/Reed management area in 2011. The Ostrich Lane site counts were conducted between 11 and 28 June and recorded 513 individuals of 45 species. The most commonly recorded species were Field Sparrow, Indigo Bunting, Eastern Towhee, Eastern Wood Pewee, and House Wren (Table 6). Twenty-one species were recorded on all three surveys. The Girdham/Reed area was surveyed between 10 and 29 June and recorded 554 individuals of 40 species. Twenty species were recorded on all three surveys (Table 7). Top species recorded were Field Sparrow, Indigo Bunting, Chipping Sparrow, Lark Sparrow, American Robin, and Eastern Bluebird.

A total of 49 species were recorded between the two routes. The larger woodland tracts associated with Ostrich Lane produced more deep woods associated species while the larger grassland tract of Girdham/Reed indicated larger grassland bird communities.

DISCUSSION

This long-term study has been successful in gathering information about avian productivity at the Ostrich Lane region of the Oak Openings Preserve. Data suggest the variety of habitats represented

on this site has provided for a diverse bird community. Habitat manipulation that has occurred during the study provides some insight on potential affects on the avian community under various management regimes that may be chosen by the MetroParks of the Toledo Area.

The tornado that ripped through the area on 5 June 2010 resulted in considerable canopy loss to the forested portions of the study area. One year is insufficient to analyze for changes to the avian community structure as a result of the storm. Land management operations will also need to be considered for affects. The 192 birds banded represented the third largest total in the 20 years of the study. This was largely driven by a major increase in Eastern Bluebirds (+32% over next highest year) and second highest total for Field Sparrow that were banded. This may have been a result of the more open conditions of the study area which may have attracted additional birds from surrounding habitats. Only additional years of study may tease out this result.

Proposed land management activities in the area of the study site will complicate analyzing avian response to the tornado damage. Ground clearing of the burned woodland habitat will compromise the ability to evaluate avian reaction in the tornado stricken area. Clear cutting immediately north of the study site will most likely have affects on bird movements and species composition in the immediate future.

RECOMMENDATIONS

The long-term responses of the avian community following the 2010 storm will be a priority of the study for the foreseeable future; however, one must be very careful to any temptation to infer landscape effects from this single study site. Ideally, that would require a control site with pre-storm data which isn't possible at this time. To indirectly address that question, we reinstated the point counts that were conducted at Ostrich Lane and the unaffected area of Girdham Road in 2011. This may supply an indirect method of control comparison.

It is strongly recommended that except for situations of safety to visitors, that there be no logging, tree removal, or clearing of the storm area. It is important to take advantage of opportunities like this, when rare events affect an area that already has nearly two decades of pre-event data, and such data are important to understanding more about community changes after such disturbances. Additional human-induced disturbance like tree clearing to the area disturbed by a natural event compromises the ability to learn from this rare opportunity.

A broad based ecological plan for future management of the park is of the utmost need at this time. This plan must include all habitat components and a representative suite of sentinel species. Any plan that only is represented by certain habitat components or interest will not provide the guidance for sound resource stewardship for this important habitat complex.

LITERATURE CITATION

- DeSante, D. F. and K. Burton. 1994. *Instructions for the establishment and operation of stations as a part of the Monitoring Avian productivity and Survivorship program. 1994 M.A.P.S. manual.* Institute for Bird Populations. 55pp.
- Earnst, S. and R. Dettmers. 1995. Conservation priorities for Ohio's breeding birds. Thirty- fifth Ohio Fish & Wildlife conference.
- Ralph, C. J., G.R. Guepel, P. Pyle, T.E. Martin, and D.F. DeSante. 1993. *Handbook of field methods for monitoring landbirds.* USDA Forest Service Gen. Tech. Report.
- Robbins, C.S., J.R. Sauer, R.S. Greenberg, and S. Droege. 1989. Population declines in North American birds that migrate to the Neotropics. *Proc. Nat. Acad. Sci. (USA)* 86:7658-7662.
- SAS Institute, Inc. 1988. SAS/STAT User's Guide, 6th Edition. Cary, N.C. 1028 pp.
- Terborgh, J. 1989. *Where Have all the Birds Gone? Essays on the Biology and Conservation of Birds that Migrate to the American Tropics.* Princeton University Press. Princeton, N.J. 188 pp.

[Recommended Citation for this paper](#)

[Shieldcastle, M.C. 2012. Monitoring Avian Productivity and Survivorship on Oak Openings Preserve, Lucas County, Ohio. Progress Report-2011. Black Swamp Bird Observatory, BSBO-12-3.](#)

Table 1. Daily banding totals for Ostrich Lane, 2011.

| <u>Date</u> | <u>Net hours</u> | <u>#Banded</u> | <u>Birds/Net Hr</u> | Returns | Recaptures | Total Birds | Total birds/Net Hr |
|-------------|------------------|----------------|---------------------|---------|------------|-------------|--------------------|
| June 4 | 96 | 14 | 0.15 | 7 | 0 | 21 | 0.22 |
| June 15 | 96 | 21 | 0.22 | 2 | 3 | 26 | 0.27 |
| June 25 | 96 | 22 | 0.23 | 5 | 3 | 30 | 0.31 |
| July 6 | 96 | 27 | 0.28 | 2 | 7 | 36 | 0.38 |
| July 16 | 96 | 26 | 0.27 | 1 | 3 | 30 | 0.31 |
| July 23 | 96 | 49 | 0.51 | 4 | 5 | 58 | 0.60 |
| Aug. 3 | 96 | 33 | 0.34 | 0 | 4 | 37 | 0.39 |
| Totals | 672 | 192 | 0.29 | 21 | 25 | 238 | 0.35 |

Table 2. Species banded in 2011 at Ostrich Lane MAPS station, sorted by habitat.

| Species | Grassland | Scrub-Shrub | Burned Woodland | Unburned Woodland |
|-------------------------|------------------|--------------------|------------------------|--------------------------|
| Hairy Woodpecker | 0 | 0 | 1 | 2 |
| Downy Woodpecker | 0 | 0 | 0 | 3 |
| Red-headed Woodpecker | 0 | 0 | 0 (1) | 0 |
| Eastern Phoebe | 0 | 0 | 1 | 3 |
| Eastern Wood-Pewee | 0 (1)* | 1 | 1 | 0 (1) |
| Traill's Flycatcher | 0 | 1 | 0 | 1 |
| Orchard Oriole | 0 | 1 | 0 | 0 |
| Baltimore Oriole | 0 | 0 | 5 | 2 |
| House Finch | 0 | 0 | 1 | 0 |
| American Goldfinch | 4 | 5 (1) | 2 | 0 |
| Lark Sparrow | 2 | 0 | 0 | 0 |
| Chipping Sparrow | 0 | 1 | 2 | 6 (1) |
| Field Sparrow | 11 (3) | 7 (2) | 5 (1) | 7 |
| Song Sparrow | 1 | 3 | 0 | 0 |
| Eastern Towhee | (1) | 0 | 1 | 0 |
| Northern Cardinal | 0 | 1 | 0 | 0 |
| Rose-breasted Grosbeak | 0 | 1 | 0 | 0 |
| Indigo Bunting | 7 (1) | 5 (1) | 1 (3) | 0 (1) |
| Summer Tanager | 0 | 0 | 0 | 2 |
| Cedar Waxwing | 1 | 2 | 1 | 0 |
| White-eyed Vireo | 0 | 1 | 0 | 0 |
| Blue-winged Warbler | 0 | 2 | 0 | 0 |
| Yellow Warbler | 0 | 1 | 0 | 0 |
| Chestnut-sided Warbler | 0 | 2 | 0 | 0 |
| Common Yellowthroat | 2 | 5 (1) | 0 | 0 |
| Yellow-breasted Chat | 0 | 1 | 0 | 0 |
| Gray Catbird | 0 | 11 | 1 | 0 |
| House Wren | 0 | 6 | 2 | 3 (1) |
| White-breasted Nuthatch | 0 | 0 | 0 | 1 |
| Tufted Titmouse | 0 | 0 | 0 | 3 |
| Black-capped Chickadee | 0 | 0 | 0 | 1 |
| Blue-gray Gnatcatcher | 0 | 0 | 0 | 1 |
| American Robin | 0 | 0 | 2 | 2 |
| Eastern Bluebird | 4 | 0 | 26 (1) | 14 |

* () Returns captured in addition to new banded birds.

Table 3. Age ratios of selected species captured at Ostrich Lane, 2011.

| <u>Species</u> | <u>Juvenile/Adult ratio</u> |
|-------------------------|-----------------------------|
| Field sparrow (N=36) | 0.38 |
| House wren (N=12) | 0.71 |
| Eastern Bluebird (N=45) | 14.00 |
| Chipping Sparrow (N=10) | 0.25 |
| Baltimore Oriole (N=7) | 2.50 |
| Gray Catbird (N=12) | 1.00 |
| Indigo Bunting (N=19) | 0.06 |

Table 4. Confirmed and probable breeders on study site Ostrich Lane, 2011.

Confirmed breeders

| | | |
|------------------------|-----------------------|-------------------------|
| Downy Woodpecker | Tufted Titmouse | European Starling |
| Field Sparrow | Song Sparrow | Blue Jay |
| Common Yellowthroat | House Wren | American Robin |
| Eastern Phoebe | Eastern Towhee | Chipping Sparrow |
| Hairy Woodpecker | Eastern Bluebird | White-breasted Nuthatch |
| Black-capped Chickadee | Lark Sparrow | Gray Catbird |
| Eastern Wood-Pewee | Indigo Bunting | Carolina Wren |
| American Goldfinch | Red-headed Woodpecker | Baltimore Oriole |
| Northern Cardinal | Willow Flycatcher | Cedar Waxwing |
| Red-eyed Vireo | House Finch | Rose-breasted Grosbeak |
| Summer Tanager | Blue-gray Gnatcatcher | |

Table 5. Returning birds previously banded at Ostrich Lane, 2011.

| <u>Species</u> | <u># return</u> | <u>Species</u> | <u># return</u> |
|-----------------------|-----------------|---------------------|-----------------|
| Red-headed Woodpecker | 1 | Eastern Towhee | 1 |
| Eastern Wood Pewee | 2 | Indigo Bunting | 6 |
| American Goldfinch | 1 | Common Yellowthroat | 1 |
| Chipping Sparrow | 1 | House Wren | 1 |
| Field Sparrow | 6 | Eastern Bluebird | 1 |

Table 6. Breeding bird point counts, Ostrich Lane, 2011.

| Species | 6/11 | 6/18 | 6/28 | Species | 6/11 | 6/18 | 6/28 |
|---------------------------|------|------|------|-------------------------|------|------|------|
| Mourning Dove | 9 | 7 | 16 | Scarlet Tanager | 1 | 1 | 1 |
| Barred Owl | 0 | 0 | 1 | Summer tanager | 1 | 6 | 1 |
| Downy Woodpecker | 2 | 2 | 0 | Barn Swallow | 0 | 2 | 0 |
| Red-headed Woodpecker | 1 | 1 | 4 | Tree Swallow | 0 | 0 | 2 |
| Red-bellied Woodpecker | 5 | 4 | 1 | Cedar Waxwing | 2 | 3 | 1 |
| Yellow-shafted Flicker | 0 | 1 | 0 | Red-eyed Vireo | 4 | 0 | 0 |
| Great-crested Flycatcher | 0 | 0 | 1 | Yellow-throated Vireo | 7 | 0 | 0 |
| Eastern Kingbird | 4 | 2 | 0 | Blue-winged Warbler | 5 | 0 | 0 |
| Ruby-throated Hummingbird | 0 | 0 | 1 | Yellow Warbler | 2 | 0 | 3 |
| Eastern Wood Pewee | 10 | 13 | 12 | Ovenbird | 1 | 0 | 1 |
| Blue Jay | 4 | 6 | 6 | Common Yellowthroat | 1 | 5 | 0 |
| American Crow | 12 | 9 | 4 | Yellow-breasted Chat | 3 | 1 | 5 |
| Brown-headed Cowbird | 10 | 5 | 9 | Gray Catbird | 2 | 1 | 4 |
| Red-winged Blackbird | 3 | 0 | 0 | House Wren | 9 | 11 | 7 |
| Baltimore Oriole | 8 | 1 | 3 | White-breasted Nuthatch | 0 | 3 | 3 |
| American Goldfinch | 2 | 1 | 4 | Tufted Titmouse | 0 | 0 | 2 |
| Lark Sparrow | 0 | 1 | 0 | Black-capped Chickadee | 0 | 1 | 2 |
| Chipping Sparrow | 2 | 12 | 12 | Blue-gray Gnatcatcher | 3 | 0 | 0 |
| Field Sparrow | 11 | 19 | 20 | Veery | 2 | 0 | 0 |
| Eastern Towhee | 8 | 20 | 10 | Wood Thrush | 1 | 0 | 0 |
| Northern Cardinal | 3 | 4 | 2 | American Robin | 5 | 6 | 8 |
| Indigo Bunting | 16 | 18 | 14 | Eastern Bluebird | 0 | 8 | 7 |
| Blue Grosbeak | 0 | 8 | 5 | | | | |

Table 7. Breeding bird point counts, Gridham Road, 2011.

| Species | 6/10 | 6/17 | 6/29 | Species | 6/10 | 6/17 | 6/29 |
|--------------------------|-------------|-------------|-------------|-------------------------|-------------|-------------|-------------|
| Mourning Dove | 4 | 9 | 8 | Northern Cardinal | 2 | 1 | 2 |
| Red-tailed Hawk | 1 | 0 | 0 | Indigo Bunting | 9 | 23 | 23 |
| Red-headed Woodpecker | 0 | 6 | 5 | Blue Grosbeak | 0 | 0 | 2 |
| Pileated Woodpecker | 0 | 0 | 1 | Scarlet Tanager | 3 | 1 | 0 |
| Red-bellied Woodpecker | 2 | 9 | 1 | Summer tanager | 3 | 0 | 3 |
| Yellow-shafted Flicker | 0 | 1 | 1 | Tree Swallow | 3 | 2 | 6 |
| Eastern Kingbird | 5 | 4 | 0 | Cedar Waxwing | 0 | 6 | 1 |
| Great-crested Flycatcher | 0 | 2 | 6 | Red-eyed Vireo | 0 | 2 | 0 |
| Eastern Wood Pewee | 4 | 8 | 0 | Yellow-throated Vireo | 3 | 2 | 4 |
| Blue Jay | 3 | 4 | 8 | Blue-winged Warbler | 1 | 2 | 0 |
| American Crow | 2 | 4 | 6 | Pine Warbler | 0 | 0 | 1 |
| Brown-headed Cowbird | 3 | 7 | 13 | Common Yellowthroat | 2 | 10 | 7 |
| Red-winged Blackbird | 0 | 0 | 1 | Gray Catbird | 0 | 2 | 1 |
| Orchard Oriole | 2 | 7 | 0 | House Wren | 7 | 8 | 7 |
| Baltimore Oriole | 8 | 4 | 3 | White-breasted Nuthatch | 0 | 0 | 3 |
| American Goldfinch | 1 | 13 | 9 | Tufted Titmouse | 0 | 4 | 0 |
| Lark Sparrow | 9 | 9 | 14 | Black-capped Chickadee | 0 | 3 | 0 |
| Chipping Sparrow | 14 | 17 | 15 | Blue-gray Gnatcatcher | 8 | 5 | 8 |
| Field Sparrow | 14 | 24 | 24 | American Robin | 7 | 10 | 8 |
| Eastern Towhee | 3 | 3 | 4 | Eastern Bluebird | 6 | 10 | 9 |