

Monitoring Avian Productivity and Survivorship in Oak Openings Preserve

PROGRESS REPORT-2021

BSBO-22-1

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, Rosenberg et al. 2019). 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 designates 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 has 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 suite of valuable sites 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. 2021 was the 30th year of MAPS data collection at Oak Openings.

METHODS

The BSBO 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 of scrub-shrub. The breeding season (01 June – 10 August) 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 is principally 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 on 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 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, weight, and wing chord.

Point counts were conducted to complement mist-netting operations at the Ostrich Lane site, to compare the avian community to that of the primary grassland/dunes area of Girdham/Reed management area, and to 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.

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 second, stand characteristics at each point count location were estimated to provide a quantitative assessment of each habitat's vegetation. The stand characteristics were determined within 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 2021, banding was conducted on seven days for a total of 650.6 net hours. One hundred and seventy-four new birds were banded and a total of 232 birds were handled (Table 1). Total birds per 100 net hours averaged 36.0 for the season. Thirty-three species were captured (Table 2). The most common species captured were Gray Catbird (48), Field Sparrow (31), House Wren (19), Common Yellowthroat (15), and Indigo Bunting (13). Banding results by habitat showed the Scrub-shrub having the highest bird capture rate in 2021. Sixty-six individuals of 19 species were captured in the Scrub-shrub, 62 individuals of 16 species in Burned Woodland, 60 birds of 18 species in Grassland, and 16 birds of 8 species in the Unburned Oak Woodland. The most common species in the Scrub-shrub were Gray Catbird (28), Tufted Titmouse (5), Black-capped Chickadee (5), Field Sparrow (4), and Common Yellowthroat (4). Top species captured in Grassland habitat were Gray Catbird (11), Field Sparrow (8), Common Yellowthroat (7), House Wren (6), and Song Sparrow (5). The Unburned Woodland top captures were Gray Catbird (6), Blue Jay (2), Field Sparrow (2), and Tufted Titmouse (2). The Burned oak savanna had Field Sparrow (17), House Wren (11), Song Sparrow (7), Indigo Bunting (6), and Common Yellowthroat (4) as the most common species captured in that habitat type. Special interest species included Blue-winged Warbler, White-eyed Vireo, and Yellow-breasted Chat captured in Scrub-shrub; Yellow-breasted Chat and Lark Sparrow in Grassland; Red-headed Woodpecker and Hooded Warbler in Burned Woodland; and Blue-winged Warbler and Chestnut-sided Warbler in Unburned Woodland.

The age ratio of captured birds is an indicator of nest success and an annual index of production. Age ratios of the major species are shown in Table 3. The highest ratios of juvenile to adult birds were found for Song Sparrow and House Wren. Unusually low age ratios were recorded for Indigo Bunting and Field Sparrow in 2021. Confirmed and probable breeders are listed in Table 4 (a total of 42 species). Thirty-two birds of 11 species were captured as returning banded birds in 2021 (Table 5). Significant returns included a Gray Catbird banded in 2015, Common Yellowthroat in 2015, and a Field Sparrow banded in 2013.

Point Counts

Point counts were not completed in 2021 due to weather and other duties of personnel. It is intended they will be conducted in 2022 and will be included here at that time.

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 that 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 impacts on the

avian community under various management regimes that may be chosen by Metroparks Toledo.

The tornado that ripped through the area on 05 June 2010 resulted in considerable canopy loss to the forested portions of the study area. This study represents an on-going analysis of changes to the avian community structure as a result of the storm. Land management operations will also need to be considered for their effects. Woodpeckers have responded favorably to the changes as has the Summer Tanager. Yellow-breasted Chat, Blue Grosbeak, and Blue-gray Gnatcatcher show increased use of the site. The continued recovery of the tornado-damaged area has resulted in a heavy understory layer at this time. More surface sun has accelerated new growth in understory trees and shrubs. Species showing the greatest increase all represent pioneer species of early succession habitats such as the tornado-ravaged area. The heavy understory appears to be very valuable to breeding birds and the rearing of young. It could be expected that the present avian community will continue changing over the short term.

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 avoid the temptation to infer landscape-scale effects from this single study site. Ideally, such an inference 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 2013. This may supply an indirect method of control comparison.

It is strongly recommended that except for providing safety to visitors, 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.

ACKNOWLEDGEMENTS

Field work for this project could not be completed without the dedication of many volunteers who donate their time to assist in mist-net operations and data collection at the study sites. The dedication and expertise of the field site leaders, Ryan Jacob and Asher Gorbet deserve special mention. We also wish to thank the staff of Metroparks Toledo for research permit authorization, site assistance, and for equipment grants.

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.

Rosenberg, K. V. et al. 2019. Decline of the North American Avifauna. *Science* 365(6461). doi: [10.1126/science.aaw1313](https://doi.org/10.1126/science.aaw1313)

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. 2022. Monitoring Avian Productivity and Survivorship on Oak Openings Preserve, Lucas County, Ohio. Progress Report-2021. Black Swamp Bird Observatory, BSBO-22-1.

Table 1. Daily banding totals for Ostrich Lane, 2021.

Date	Net Hours	# Banded	Birds/NH	Returns	Recaptures	Total Birds	Total birds/NH
June 4	96.0	18	0.19	3	0	21	0.22
June 17	93.3	23	0.25	7	3	33	0.35
June 24	96.0	16	0.17	9	2	27	0.28
July 1	96.0	23	0.24	4	6	33	0.34
July 14	88.0	30	0.34	7	5	42	0.48
July 21	96.0	26	0.27	1	6	33	0.34
Aug 5	85.3	38	0.45	0	5	43	0.50
Totals	650.6	174	0.27	31	27	232	0.36

Table 2. Species banded in 2021 at Ostrich Lane MAPS station, sorted by habitat.

Species	Grassland	Scrub-Shrub	Burned Woodland	Unburned Woodland
Downy Woodpecker	1		2	
Red-headed Woodpecker			1	
Ruby-throat. Hummingbird	1	1	1	
Eastern Phoebe			1	
Blue Jay				2
Brown-headed Cowbird	(1)		1	
Baltimore Oriole			1	
American Goldfinch	3 (1)	(1)	1	
Lark Sparrow	1			
Field Sparrow	6 (2)	4	13 (4)	1 (1)
Song Sparrow	5	1	7	
Eastern Towhee	(1)	2		
Northern Cardinal	1			
Indigo Bunting	2 (2)	1 (1)	6	1
Cedar Waxwing		2	2	
Red-eyed Vireo		1		
White-eyed Vireo		1		
Blue-winged Warbler		1		1
Yellow Warbler		(1)		
Chestnut-sided Warbler				1
Common Yellowthroat	5 (2)	1 (3)	3 (1)	
Yellow-breasted Chat	(1)	2 (1)		
Hooded Warbler			1	
Gray Catbird	10 (1)	25 (3)	2 (1)	4 (2)
Brown Thrasher	2	1		
Carolina Wren	1			
House Wren	6	2	10 (1)	
White-breasted Nuthatch				1
Tufted Titmouse	2	5		1 (1)
Black-capped Chickadee		5	3	
Blue-gray Gnatcatcher		1		
Eastern Bluebird	3			

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

Table 3. Age ratios of selected species captured at Ostrich Lane, 2021.

<u>Species</u>	<u>Juvenile/Adult ratio</u>
Field sparrow (N=31)	0.48
Song Sparrow (N=13)	2.25
Indigo Bunting (N=13)	0.08
Common Yellowthroat (N=15)	0.88
Gray Catbird (N=48)	0.71
House wren (N=19)	3.75

Table 4. Confirmed and probable breeders on study site Ostrich Lane, 2021.

Mourning Dove	Lark Sparrow	Chestnut-sided Warbler
Hairy Woodpecker	Chipping Sparrow	Ovenbird
Downy Woodpecker	Field Sparrow	Common Yellowthroat
Red-headed Woodpecker	Song Sparrow	Yellow-breasted Chat
Red-bellied Woodpecker	Eastern Towhee	Gray Catbird
Ruby-throated Hummingbird	Northern Cardinal	Carolina Wren
Eastern Phoebe	Rose-breasted Grosbeak	House Wren
Eastern Wood-Pewee	Blue Grosbeak	White-breasted Nuthatch
Willow Flycatcher	Indigo Bunting	Tufted Titmouse
Blue Jay	Summer Tanager	Black-capped Chickadee
European Starling	Cedar Waxwing	Blue-gray Gnatcatcher
Baltimore Oriole	Red-eyed Vireo	Wood Thrush
House Finch	Blue-winged Warbler	American Robin
American Goldfinch	Yellow Warbler	Eastern Bluebird

Table 5. Returning birds previously banded at Ostrich Lane, 2021.

Species	2020	2019	2018	2017	2016	2015	2014	2013	Total
Brown-headed Cowbird				1					1
American Goldfinch	2								2
Field Sparrow	2	2	2					1	7
Eastern Towhee		1							1
Indigo Bunting	1	1		1					3
Yellow Warbler	1								1
Common Yellowthroat	2	1	1	1		1			6
Yellow-breasted Chat	1		1						2
Gray Catbird	4	2				1			7
House Wren		1							1
Tufted Titmouse	1								1
Total	14	8	4	3	0	2	0	1	32