

Monitoring Avian Productivity and Survivorship in Oak Openings Preserve

PROGRESS REPORT-2020

BSBO-21-1

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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). 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 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. 2020 was the 29th 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.

The global pandemic of Covid-19 greatly affected the ability to conduct field work for this project. A safety protocol was developed that consisted of breaking the field operations into two separate stations where personnel kept social distancing a priority and cleaned banding equipment after each individual bird was handled. Nets were checked by assistants working alone but with the ability to request help in emergency situations, again following social distancing and use of a face mask.

RESULTS

Mist-Netting

In 2020, banding was conducted on seven days for a total of 626.7 net hours. Two hundred and thirty-five new birds were banded and a total of 303 birds were handled (Table 1). Total birds per 100 net hours averaged 48.0 for the season. Thirty-two species were captured (Table 2). The most common species captured were Gray Catbird (43), Field Sparrow (37), House Wren (33), Common Yellowthroat (28), and Indigo Bunting (17). Banding results by habitat showed the Scrub-shrub having the highest bird capture rate in 2020. Eighty-nine individuals of 20 species were captured in the Scrub-shrub, 73 birds of 24 species in Grassland, 51 individuals of 17 species in Burned Woodland, and 30 birds of 16 species in the Unburned Oak Woodland. The most common species in the Scrub-shrub were Gray Catbird (19), House Wren (15), Common Yellowthroat (13), American Goldfinch (8), and Field Sparrow (7). Top species captured in Grassland habitat were House Wren (13), Field Sparrow (12), Song Sparrow (9), Indigo Bunting (7), and Common Yellowthroat (6). The Unburned Woodland top captures were Field Sparrow (7), Indigo Bunting (4), Gray Catbird (3), and Eastern Bluebird (3). The Burned oak savanna had Gray Catbird (18), Field Sparrow (11), Indigo Bunting (5), Northern Cardinal (3), Common Yellowthroat (3), and House Wren (3) as the most common species captured in that habitat type. Special interest species included Blue-winged Warbler and Yellow-breasted Chat captured in Scrub-shrub; Blue-winged Warbler, Yellow-breasted Chat, and White-eyed Vireo in Grassland; Yellow-breasted Chat in Burned Woodland; and Scarlet Tanager and Red-headed Woodpecker in Unburned Woodland.

The age ratios 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 Gray Catbird, Song Sparrow, and House Wren. Unusually low age ratios were recorded for Indigo Bunting and Field Sparrow in 2020. Confirmed and probable breeders are listed in Table 4 (a total of 42 species). Thirty-one birds of 12 species were captured as returning banded birds in 2020 (Table 5). Significant returns included a Gray Catbird banded in 2015 and a Field Sparrow banded in 2016.

Point Counts

Three replicates of point counts were conducted at the Girdham/Reed management area and two replicates at the Ostrich Lane banding station in 2020. Weather precluded one of the planned surveys at Ostrich Lane and it could not be

rescheduled. The Ostrich Lane site counts were conducted on 14 and 25 June and recorded 357 individuals of 44 species. The most commonly recorded species were Field Sparrow, Eastern Towhee, Eastern Wood-Pewee, Cedar Waxwing, and Indigo Bunting (Table 6). Twenty-eight species were recorded on both surveys. The Girdham/Reed area was surveyed between 12 and 29 June and recorded 466 individuals of 51 species. Twenty-seven species were recorded on all three surveys (Table 7). Top species recorded were American Goldfinch, Field Sparrow, American Robin, Mourning Dove, Indigo Bunting, Brown-headed Cowbird, Chipping Sparrow, Baltimore Oriole, and Cedar Waxwing.

A total of 59 species were recorded between the two routes. The larger woodland tracts associated with Ostrich Lane produced more deep woods-associated species while the more open tract of Girdham/Reed hosted bird communities characteristic of larger grasslands.

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.

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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.

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Table 1. Daily banding totals for Ostrich Lane, 2020.

Date	Net Hours	# Banded	Birds/NH	Returns	Recaptures	Total Birds	Total birds/NH
June 8	96.0	26	0.27	6	0	32	0.33
June 16	96.0	27	0.28	9	5	41	0.43
June 24	96.0	30	0.31	2	8	40	0.42
July 6	72.0	16	0.22	1	3	20	0.28
July 15	80.0	32	0.40	6	9	47	0.59
July 23	90.7	64	0.71	5	4	73	0.81
July 30	96.0	40	0.42	2	8	50	0.52
Totals	626.7	235	0.37	31	37	303	0.48

Table 2. Species banded in 2020 at Ostrich Lane MAPS station, sorted by habitat.

Species	Grassland	Scrub-Shrub	Burned Woodland	Unburned Woodland
Mourning Dove	1			
Downy Woodpecker	1			
Red-headed Woodpecker				(1)
Ruby-throat. Hummingbird	1	1		
Eastern Phoebe	1		1	
Eastern Wood Pewee	1		1	1
Willow Flycatcher	1	1		
Traill's Flycatcher		1		
Brown-headed Cowbird	4 (1)	1	1	1
Baltimore Oriole			2	
American Goldfinch	3	6 (2)	1	
Chipping Sparrow	3 (1)			
Field Sparrow	7 (5)	7	8 (3)	6 (1)
Song Sparrow	8 (1)	1	2	1
Eastern Towhee	1	3 (1)	1	
Northern Cardinal		1	2 (1)	2
Indigo Bunting	3 (4)	1	4 (1)	4
Scarlet Tanager				2
Cedar Waxwing	3			
White-eyed Vireo	1			
Blue-winged Warbler	2	3		
Yellow Warbler	1	3		
Common Yellowthroat	6	11 (2)	2 (1)	1
Yellow-breasted Chat	3	3	2	
Gray Catbird	3	16 (3)	17 (1)	2 (1)
Brown Thrasher	2	1	1	1
Carolina Wren		1		
House Wren	12 (1)	15	3	2
Tufted Titmouse				1
Black-capped Chickadee	2	4	1	1
American Robin		1	2	2
Eastern Bluebird	3			3

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

Table 3. Age ratios of selected species captured at Ostrich Lane, 2020.

<u>Species</u>	<u>Juvenile/Adult ratio</u>
Field sparrow (N=37)	0.23
Song Sparrow (N=13)	3.33
Indigo Bunting (N=17)	0.21
Common Yellowthroat (N=24)	0.60
Gray Catbird (N=43)	0.95
House wren (N=33)	3.13

Table 4. Confirmed and probable breeders on study site Ostrich Lane, 2020.

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, 2020.

Species	2019	2018	2017	2016	2015	Total
Red-headed Woodpecker	1					1
Brown-headed Cowbird			1			1
American Goldfinch		2				2
Chipping Sparrow	1					1
Field Sparrow	6	2		1		9
Song Sparrow	1					1
Eastern Towhee	1					1
Northern Cardinal			1			1
Indigo Bunting	2	1	1			4
Common Yellowthroat	3	1				4
Gray Catbird	4				1	5
House Wren	1					1
Total	20	7	3	1	1	32

Table 6. Breeding bird point counts, Ostrich Lane, 2020.

Species	6/14	6/25		Species	6/14	6/25	
Killdeer	0	1		Eastern Towhee	12	11	
Mourning Dove	9	6		Northern Cardinal	3	3	
Red-shouldered Hawk	1	0		Indigo Bunting	12	9	
Hairy Woodpecker	1	0		Scarlet Tanager	2	0	
Downy Woodpecker	2	1		Summer Tanager	3	3	
Red-headed Woodpecker	1	3		Purple Martin	2	0	
Red-bellied Woodpecker	4	1		Cedar Waxwing	15	7	
Ruby-throated Hummingbird	0	1		Yellow-throated Vireo	1	0	
Great-Crested Flycatcher	3	0		White-eyed Vireo	0	2	
Eastern Phoebe	1	1		Yellow Warbler	0	2	
Eastern Wood-Pewee	14	8		Chestnut-sided Warbler	0	2	
Willow Flycatcher	0	1		Ovenbird	1	1	
Blue Jay	12	3		Common Yellowthroat	2	2	
American Crow	0	6		Yellow-breasted Chat	1	1	
Brown-headed Cowbird	0	13		Gray Catbird	6	5	
Red-winged Blackbird	2	0		House Wren	4	2	
Baltimore Oriole	6	4		White-breasted Nuthatch	5	1	
Common Grackle	9	6		Tufted Titmouse	8	3	
American Goldfinch	11	6		Black-capped Chickadee	2	2	
Chipping Sparrow	12	1		Blue-gray Gnatcatcher	7	5	
Field Sparrow	13	20		American Robin	11	6	
Song Sparrow	0	1		Eastern Bluebird	6	3	

Table 7. Breeding bird point counts, Gridham Road, 2020.

Species	6/12	6/19	6/29	Species	6/12	6/19	6/29
Killdeer	0	2	1	Northern Cardinal	3	2	4
Mourning Dove	9	11	12	Rose-breasted Grosbeak	0	1	0
Red-tailed Hawk	0	0	2	Blue Grosbeak	1	0	0
Yellow-billed Cuckoo	3	2	1	Indigo Bunting	7	9	15
Hairy Woodpecker	1	0	0	Scarlet Tanager	0	1	0
Downy Woodpecker	0	1	2	Summer Tanager	0	2	3
Pileated Woodpecker	0	0	1	Tree Swallow	1	0	1
Red-bellied Woodpecker	2	8	2	Cedar Waxwing	9	7	9
Yellow-shafted Flicker	1	1	0	Red-eyed Vireo	1	2	0
Eastern Kingbird	2	4	1	Warbling Vireo	0	0	1
Great-Crested Flycatcher	1	1	2	Yellow-throated Vireo	2	2	0
Eastern Wood-Pewee	7	3	5	Blue-winged Warbler	2	1	0
Blue Jay	6	4	5	Chestnut-sided Warbler	1	1	0
American Crow	5	4	8	Pine Warbler	0	0	1
Brown-headed Cowbird	7	11	10	Common Yellowthroat	5	3	4
Red-winged Blackbird	1	0	0	Yellow-breasted Chat	0	2	1
Orchard Oriole	1	2	1	Gray Catbird	5	3	9
Baltimore Oriole	7	12	7	Brown Thrasher	0	0	2
Common Grackle	3	2	6	House Wren	7	2	6
American Goldfinch	14	19	12	White-breasted Nuthatch	0	2	2
Lark Sparrow	2	1	6	Tufted Titmouse	4	3	4
Chipping Sparrow	13	6	8	Black-capped Chickadee	1	2	0
Field Sparrow	10	15	17	Blue-gray Gnatcatcher	5	4	6
Song Sparrow	1	2	0	American Robin	22	8	7
Eastern Towhee	7	7	6	Eastern Bluebird	7	7	8