

Monitoring Avian Productivity and Survivorship in Oak Openings Preserve

PROGRESS REPORT-2019 BSBO-20-2

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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). 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 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. 2019 was the 28th 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 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, compare the avian community to that of 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.

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 2019, banding was conducted on seven days for a total of 626.9 net hours. Three hundred and nine new birds were banded and a total of 378 birds were handled (Table 1). Total birds per 100 net hours averaged 60.0 for the season. Thirty-four species were captured (Table 2). The most common species captured were Gray Catbird (61), Field Sparrow (36), House Wren (32), American Robin (28), and Song Sparrow (27). Banding results by habitat showed the Burned Woodland having the highest bird capture rate in 2019. One hundred and ten individuals of 21 species were captured in the Burned Woodland, 107 birds of 18 species in Grassland, 79 individuals of 15 species in Scrub-shrub, and 35 birds of 16 species in the Unburned Oak Woodland. The most common species in the Scrub-shrub were Gray Catbird (25), Song Sparrow (10), House Wren (9), Field Sparrow (7), and Common Yellowthroat (7). Top species captured in Grassland habitat were House Wren (19), Field Sparrow (15), Song Sparrow (13), Indigo Bunting (12), and Common Yellowthroat (9). The Unburned Woodland top captures were Gray Catbird (6), Field Sparrow (4), American Robin (4), Red-headed Woodpecker (3), Tufted Titmouse (3), and Eastern Bluebird (3). The Burned oak savanna had Gray Catbird (26), American Robin (18), Field Sparrow (9), Indigo Bunting (8), and Baltimore Oriole (6) as the most common species captured in that habitat type. Special interest species included Rose-breasted Grosbeak and Tennessee Warbler captured in Scrub-shrub; Lark Sparrow and Ruby-throated Hummingbird in Grassland; Red-headed Woodpecker, Chestnut-sided Warbler, and Blue-winged Warbler in Burned Woodland; and Summer Tanager, Red-headed Woodpecker, and Yellow-breasted Chat in Unburned Woodland. One Golden-winged Warbler was heard at the study site during preparation and prior to mist-netting efforts. However, none were captured in 2019 or recorded following this single encounter, nor were Golden-winged Warblers reported by other observers at the site during 2019.

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 for Baltimore Oriole, Song Sparrow, House Wren, and Eastern Bluebird. Unusually low age ratios were recorded for Indigo Bunting and Field Sparrow in 2019. Confirmed and probable breeders are listed in Table 4 (a total of 42 species). Twenty-eight birds of 9 species were captured as returning banded birds in 2019 (Table 5). Significant returns included an Indigo Bunting banded in 2013.

Point Counts

Three replicates of point counts were conducted at the Girdham/Reed management area and one replicate at the Ostrich Lane banding station in 2019. Weather precluded two of the planned surveys at Ostrich Lane and they could not be rescheduled. The Ostrich Lane site count was conducted on 19 June and recorded 194 individuals of 36 species. The most commonly recorded species were American Robin, Red-headed Woodpecker, Eastern Towhee, Eastern Wood-Pewee, Indigo Bunting, and Field Sparrow (Table 6). The Girdham/Reed area was surveyed between 7 and 21 June and recorded 559 individuals of 56 species. Twenty-six species were recorded on all three surveys (Table 7). Top species recorded were

Mourning Dove, Field Sparrow, Brown-headed Cowbird, Chipping Sparrow, Indigo Bunting, Eastern Towhee, Gray Catbird, American Goldfinch, House Wren, and American Crow.

A total of 58 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 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.

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 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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Table 1. Daily banding totals for Ostrich Lane, 2019.

Date	Net Hours	# Banded	Birds/NH	Returns	Recaptures	Total Birds	Total birds/NH
June 8	98.72	35	0.35	5	0	40	0.41
June 17	96.00	24	0.25	4	7	35	0.36
June 27	77.30	31	0.40	5	5	41	0.53
July 4	82.72	25	0.30	4	9	38	0.46
Jul 15	90.72	56	0.62	4	4	64	0.71
July 25	90.72	82	0.90	2	7	91	1.00
August 1	90.72	56	0.62	4	9	69	0.76
Totals	626.9	309	0.49	28	41	378	0.60

Table 2. Species banded in 2019 at Ostrich Lane MAPS station, sorted by habitat.

Species	Grassland	Scrub-Shrub	Burned Woodland	Unburned Woodland
Downy Woodpecker				1
Red-headed Woodpecker			1 (2)	3
Red-bellied Woodpecker		1		
Ruby-throat. Hummingbird	2		2	
Eastern Phoebe	4			
Eastern Wood Pewee			4	
Blue Jay	1			
Brown-headed Cowbird	1		1	1
Baltimore Oriole	5		6	1
American Goldfinch	3 (1)	1	5	
Lark Sparrow	2			
Chipping Sparrow	4	2	2	1
Field Sparrow	12 (3)	5 (2)	6 (3)	4
Song Sparrow	13	10	4	
Eastern Towhee		2 (1)	2	1
Northern Cardinal		3	3	
Rose-breasted Grosbeak		1		
Indigo Bunting	9 (3)	2 (1)	6 (2)	2
Summer Tanager				(1)
Cedar Waxwing			2	
Blue-winged Warbler			1	
Tennessee Warbler		1		
Chestnut-sided Warbler			2	
Common Yellowthroat	7 (2)	7	3	
Yellow-breasted Chat				1
Gray Catbird	3	23 (2)	24 (2)	6
Brown Thrasher	1			
Carolina Wren		1		
House Wren	18 (1)	9	2 (2)	
White-breasted Nuthatch				1
Tufted Titmouse		5		3
Black-capped Chickadee	3		3	2
American Robin	3		18	4
Eastern Bluebird	6		2	3

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

1 each of Field Sparrow, Indigo Bunting, Gray Catbird, and American Robin unknown net of capture

Table 3. Age ratios of selected species captured at Ostrich Lane, 2019.

<u>Species</u>	<u>Juvenile/Adult ratio</u>
Baltimore Oriole (N=10)	9.00
Field sparrow (N=36)	0.16
Song Sparrow (N=27)	2.86
Indigo Bunting (N=27)	0.59
Common Yellowthroat (N=19)	0.73
Gray Catbird (N=61)	0.97
House wren (N=32)	2.56
American Robin (N=26)	1.17
Eastern Bluebird (N=11)	10.00

Table 4. Confirmed and probable breeders on study site Ostrich Lane, 2019.

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, 2019.

Species	2018	2017	2016	2015	2014	2013	Total
Red-headed Woodpecker	2						2
American Goldfinch	1						1
Field Sparrow	6		1	1			8
Eastern Towhee		1					1
Indigo Bunting	2	2			1	1	4
Summer Tanager			1				1
Common Yellowthroat	1	1					2
Gray Catbird	4						4
House Wren	3						3
Total	19	4	2	1	1	1	28

Table 6. Breeding bird point counts, Ostrich Lane, 2019.

Species	6/19			Species	6/19		
Great Blue Heron	1			Field Sparrow	12		
Mourning Dove	7			Song Sparrow	1		
Red-shouldered Hawk	1			Eastern Towhee	12		
Hairy Woodpecker	3			Northern Cardinal	7		
Downy Woodpecker	5			Indigo Bunting	12		
Red-headed Woodpecker	14			Scarlet Tanager	1		
Red-bellied Woodpecker	3			Summer Tanager	5		
Yellow-shafted Flicker	1			Cedar Waxwing	2		
Ruby-throated Hummingbird	1			Red-eyed Vireo	1		
Great-crested Flycatcher	2			Common Yellowthroat	2		
Eastern Wood Pewee	12			Gray Catbird	8		
Blue Jay	8			House Wren	8		
American Crow	6			White-breasted Nuthatch	2		
Brown-headed Cowbird	6			Tufted Titmouse	3		
Baltimore Oriole	3			Black-capped Chickadee	2		
Common Grackle	5			Blue-gray Gnatcatcher	7		
American Goldfinch	5			American Robin	17		
Chipping Sparrow	4			Eastern Bluebird	3		

Table 7. Breeding bird point counts, Gridham Road, 2019.

Species	6/7	6/12	6/21	Species	6/7	6/12	6/21
Mourning Dove	20	10	19	Eastern Towhee	8	11	8
Red-tailed Hawk	0	1	1	Northern Cardinal	2	4	3
Black-billed Cuckoo	0	0	1	Rose-breasted Grosbeak	1	2	0
Hairy Woodpecker	0	1	0	Blue Grosbeak	1	0	0
Downy Woodpecker	8	0	1	Indigo Bunting	12	4	13
Pileated Woodpecker	1	0	3	Scarlet Tanager	3	4	1
Red-headed Woodpecker	2	1	7	Summer Tanager	3	0	3
Red-bellied Woodpecker	4	5	4	Purple Martin	0	0	1
Yellow-shafted Flicker	2	0	3	Tree Swallow	0	3	0
Ruby-throated Hummingbird	1	0	1	Cedar Waxwing	5	3	4
Eastern Kingbird	1	0	2	Red-eyed Vireo	1	0	1
Great-crested Flycatcher	0	1	0	Warbling Vireo	0	0	1
Eastern Wood Pewee	0	4	3	Yellow-throated Vireo	0	1	0
Willow Flycatcher	0	0	1	Blue-winged Warbler	0	2	2
Blue Jay	2	3	7	Yellow Warbler	0	1	0
American Crow	3	4	11	Chestnut-sided Warbler	2	0	0
Brown-headed Cowbird	19	12	11	Common Yellowthroat	3	4	4
Red-winged Blackbird	0	1	0	Yellow-breasted Chat	0	1	0
Orchard Oriole	1	1	0	Gray Catbird	5	9	7
Baltimore Oriole	2	6	4	Brown Thrasher	1	0	2
Common Grackle	0	1	5	House Wren	7	5	8
American Goldfinch	3	9	8	White-breasted Nuthatch	4	1	3
Grasshopper Sparrow	0	2	0	Tufted Titmouse	4	6	4
Henslow's Sparrow	2	2	2	Black-capped Chickadee	1	0	0
Lark Sparrow	4	5	2	Blue-gray Gnatcatcher	3	8	5
Chipping Sparrow	8	16	12	Wood Thrush	0	2	0
Field Sparrow	20	10	13	American Robin	4	3	4
Song Sparrow	1	3	2	Eastern Bluebird	6	3	7