

Monitoring Avian Productivity and Survivorship in Oak Openings Preserve 2022

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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 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 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.

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 would also 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 provide a suite of valuable sites to investigate grassland and edge species at these various geographic levels. The Oak Openings Region is recognized as having the greatest concentration of rare and endangered plants and animals in Ohio. 2022 was the 31st 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. These included managed grassland, control burned mature oak forest, unburned mature oak forest, 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 on one morning during each of 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 10-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 during 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 2022, banding was conducted on seven days for a total of 612.1 net hours. Two hundred and fifty-one new birds were banded, and a total of 313 birds were handled (Table 1). Total birds per 100 net hours averaged 51.0 for the season. Thirty-nine species were captured (Table 2). The most common species captured were Gray Catbird (69), Eastern Bluebird (31), House Wren (16), Field Sparrow (14), Common Yellowthroat (11), and Tufted Titmouse (11). Banding results by habitat showed the Burned Oak Woodland having the highest bird capture rate in 2022. Ninety-five individuals of 22 species were captured in the Burned Oak Woodland, 67 individuals of 23 species in Grassland, 50 birds of 16 species in Scrub-shrub, and 35 birds of 17 species in the Unburned Oak Woodland. The most common species in the Scrub-shrub were Gray Catbird (25), Rose-breasted Grosbeak (4), Common Yellowthroat (4), and Tufted Titmouse (3). Top species captured in Grassland habitat were Gray Catbird (11), House Wren (9), Field Sparrow (5), Eastern Towhee (4), and Common Yellowthroat (4). The Unburned Woodland top captures were Gray Catbird (8), Tufted Titmouse (6), Blue Jay (3), and Indigo Bunting (3). The Burned Woodland had Eastern Bluebird (27), Gray Catbird (17), House Wren (7), and Field Sparrow (6) as the most common species captured. Special interest species included Yellow-billed Cuckoo,

Rose-breasted Grosbeak, and White-eyed Vireo captured in Scrub-shrub; American Woodcock, Summer Tanager, White-eyed Vireo, and Northern Mockingbird in Grassland; Red-headed Woodpecker, White-eyed Vireo, and Blue-winged Warbler in Burned Woodland; and Blue-winged Warbler and White-eyed Vireo in Unburned Oak 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 Eastern Bluebird and House Wren. Unusually low age ratios were recorded for Indigo Bunting and Field Sparrow. Confirmed and probable breeders are listed in Table 4 (a total of 46 species). Nineteen birds of 18 species were captured as returning banded birds in 2022 (Table 5). Significant returns included a Field Sparrow banded in 2018.

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 2022. Weather precluded one of the planned surveys at Ostrich Lane and it could not be rescheduled. The Ostrich Lane site count was conducted on 16 June and 04 July and recorded 333 individuals of 38 species. The most commonly recorded species were Blue Jay, Indigo Bunting, Mourning Dove, Eastern Towhee, and Field Sparrow (Table 6). The Girdham/Reed area was surveyed on June 10, 20, and 30 and recorded 568 individuals of 50 species. Twenty-eight species were recorded on all three surveys (Table 7). Top species recorded were Field Sparrow, Brown-headed Cowbird, Blue Jay, American Goldfinch, Eastern Bluebird, Mourning Dove, Indigo Bunting, Baltimore Oriole, Lark Sparrow, and Eastern Towhee.

In total, 54 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 ongoing 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. Avian 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 for 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 when 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, 2022.

Date	Net Hours	# Banded	Birds/NH	Returns	Recaptures	Total Birds	Total Birds/NH
June 8	95.0	31	0.33	2	0	33	0.35
June 15	56.0	18	0.32	0	5	23	0.41
June 23	96.0	53	0.55	8	6	67	0.70
July 6	95.8	29	0.30	3	12	44	0.46
July 13	93.3	40	0.43	5	8	53	0.57
July 27	96.0	41	0.43	1	5	47	0.49
Aug 3	80.0	39	0.49	0	7	46	0.58
Totals	612.1	251	0.41	19	43	313	0.51

Table 2. Species banded in 2022 at Ostrich Lane MAPS station, sorted by habitat.

Species	Grassland	Scrub/shrub	Burned Woodland	Unburned Woodland
American Woodcock	1			
Yellow-billed Cuckoo		1		
Downy Woodpecker		1	3	
Red-headed Woodpecker			1	
Red-bellied Woodpecker	1			
Yellow-shafted Flicker	2			1
Ruby-throat. Hummingbird				1
Eastern Wood-Pewee			2	
Traill's Flycatcher	1			
Blue Jay			1	3
Brown-headed Cowbird			2	
Baltimore Oriole	1		3	
American Goldfinch	1 (1)	1	2	1
Chipping Sparrow	1			
Field Sparrow	5 (2)	1 (1)	6 (1)	2 (1)
Song Sparrow	2	1	4 (1)	
Eastern Towhee	4 (2)		2	
Northern Cardinal		2	1	1
Rose-breasted Grosbeak	2	4		
Indigo Bunting	1 (1)		4	3
Summer Tanager	1			
Cedar Waxwing	1			
Red-eyed Vireo		1		
White-eyed Vireo	1		1	
Blue-winged Warbler	3		1	1
Yellow Warbler		1		
Ovenbird		1		
Common Yellowthroat	4	4	2	1
Northern Mockingbird	1			
Gray Catbird	19	25 (3)	17	8 (2)
Brown Thrasher	3		3	1
House Wren	9		7	
White-breasted Nuthatch			4	1
Tufted Titmouse	1 (1)	3 (1)	1	6 (1)
Black-capped Chickadee		2		1
Wood Thrush		1		
Veery		1		1
American Robin			1	1 (1)
Eastern Bluebird	2		27	2

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

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

<u>Species</u>	<u>Juvenile/Adult ratio</u>
Field Sparrow (N=19)	0.27
Indigo Bunting (N=9)	0.00
Common Yellowthroat (N=12)	0.71
Gray Catbird (N=75)	0.70
House Wren (N=16)	7.00
Tufted Titmouse (N=11)	infinite
Eastern Bluebird (N=31)	9.33

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

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

Table 5. Returning birds previously banded at Ostrich Lane, 2022.

Species	2021	2020	2019	2018	Total
American Goldfinch		1			1
Field Sparrow	2	2		1	5
Song Sparrow	1				1
Eastern Towhee		1	1		2
Indigo Bunting	1				1
Gray Catbird	4		1		5
Tufted Titmouse	1	1	1		3
American Robin			1		1
Total	9	5	4	1	19

Table 6. Breeding bird point count totals, Ostrich Lane, 2022.

Species	6/16	7/4		Species	6/16	7/4	
Mourning Dove	8	16		Rose-breasted Grosbeak	1	0	
Barred Owl	1	0		Eastern Towhee	13	11	
Hairy Woodpecker	0	1		Northern Cardinal	3	7	
Downy Woodpecker	2	10		Blue Grosbeak	1	0	
Pileated Woodpecker	0	2		Indigo Bunting	14	17	
Red-headed Woodpecker	2	7		Cedar Waxwing	3	3	
Red-bellied Woodpecker	0	2		Yellow-throated Vireo	0	1	
Great Crested Flycatcher	4	2		Blue-winged Warbler	0	1	
Eastern Wood-Pewee	3	15		Common Yellowthroat	1	1	
Blue Jay	16	19		Yellow-breasted Chat	2	1	
American Crow	3	11		Hooded Warbler	3	0	
Brown-headed Cowbird	12	6		Gray Catbird	6	9	
Baltimore Oriole	2	4		House Wren	0	1	
Common Grackle	0	3		White-breasted Nuthatch	0	7	
American Goldfinch	7	9		Tufted Titmouse	8	6	
Lark Sparrow	0	3		Black-capped Chickadee	1	2	
Chipping Sparrow	1	5		Blue-gray Gnatcatcher	2	1	
Field Sparrow	7	12		American Robin	5	5	
Song Sparrow	1	1		Eastern Bluebird	6	5	

Table 7. Breeding bird point count totals, Girdham Road, 2022.

Species	6/10	6/20	6/30	Species	6/10	6/20	6/30
Mallard	2	0	0	Northern Cardinal	2	2	6
Mourning Dove	10	10	11	Rose-breasted Grosbeak	5	0	0
Red-shouldered Hawk	0	1	0	Blue Grosbeak	0	3	1
Wild Turkey	0	0	1	Indigo Bunting	7	8	10
Downy Woodpecker	1	8	6	Scarlet Tanager	0	1	0
Pileated Woodpecker	4	0	0	Summer Tanager	2	5	3
Red-headed Woodpecker	3	4	10	Barn Swallow	0	0	1
Red-bellied Woodpecker	5	1	1	Cedar Waxwing	4	2	0
Yellow-shafted Flicker	0	0	1	Red-eyed Vireo	1	0	0
Chimney Swift	0	2	0	Yellow-throated Vireo	1	0	0
Eastern Kingbird	2	6	3	Blue-winged Warbler	3	3	0
Great Crested Flycatcher	2	2	0	Chestnut-sided Warbler	2	2	1
Eastern Wood-Pewee	1	3	4	Pine Warbler	0	0	2
Blue Jay	15	16	6	Kentucky Warbler	1	0	0
American Crow	3	9	3	Common Yellowthroat	5	5	3
Brown-headed Cowbird	9	16	17	Yellow-breasted Chat	2	0	2
Red-winged Blackbird	1	0	0	Gray Catbird	9	6	3
Orchard Oriole	3	1	1	Carolina Wren	0	1	1
Baltimore Oriole	8	8	8	House Wren	1	7	5
Common Grackle	2	3	0	White-breasted Nuthatch	2	5	2
American Goldfinch	11	10	15	Tufted Titmouse	3	1	3
Lark Sparrow	9	8	6	Black-capped Chickadee	1	0	0
Chipping Sparrow	6	4	2	Blue-gray Gnatcatcher	2	2	5
Field Sparrow	13	20	18	American Robin	5	1	1
Eastern Towhee	8	3	8	Eastern Bluebird	12	8	13