

A Breeding Bird Survey of the Natural Areas at Holden Arboretum¹

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ABSTRACT. Eight routes and 79 stations were sampled on the natural areas at Holden Arboretum during the 2001 breeding season. Birds were identified by song and call and tallied. Eighty-one species were classified as possible, probable, or confirmed breeders. Included in the breeders tally were four state-endangered species and 13 additional species listed as "special interest" by US Fish and Wildlife Service (USFWS), Ohio Department of Natural Resources (ODNR), and/or the National Audubon Society/Partners in Flight (NAS/PIF) because of significant population declines. Specific habitat types such as old growth forests and hemlock ravines were found to be important to several of these species, namely, Winter Wren, Magnolia Warbler, Cerulean Warbler, Canada Warbler, and Dark-eyed Junco. Further, large blocks of appropriate habitat were available for some species intolerant of fragmentation, such as Wood Thrush and Bobolink. Blackburnian Warbler was recorded as a probable breeder, a first for the Arboretum. For forest breeding birds, the natural areas of the Arboretum offer unparalleled reproductive habitat, particularly in northeast Ohio.

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INTRODUCTION

Breeding birds are excellent environmental barometers. The presence or absence of one or more species, or changes in species composition, can often tell us about the quality and health of an area. In temperate climates, a diversity of organisms promotes the transfer of energy and nutrients across trophic levels almost continuously, thus continuing ecosystem function (Patrick 1997). As diversity declines, ecosystem function changes (Naeem and others 1994). As losses in biodiversity proceed across the globe, irreversible changes in the workings of ecosystems may result. Prudence dictates that the preservation of biodiversity is a worthy goal.

Since 1980, 157 bird species have nested in the greater Cleveland region. The purpose of this study was to determine the species and abundance of birds breeding in various habitats within the Arboretum natural areas. Baseline data were collected in a standardized and replicable fashion, and can serve in future as the foundation for seasonal monitoring and research on breeding bird populations. Birds were identified to species, quantified, and classified to resident status (confirmed breeding, probable breeding, possible breeding, and migrant). Breeding habitats for various species were also recorded.

MATERIALS AND METHODS

Sampling was conducted using a standardized variable radius circular-plot technique (Reynolds and others 1980; Jones and others 2000). In October and November 2000, eight non-circular routes were established in the following natural areas of Holden Arboretum: Little Mountain; Baldwin Property (Upper and Lower); Pierson Creek East (including parts of Corning Lake, Highlights, Old Valley, Woodland, and Pierson Creek Trails); Pierson Creek West (along Strong Acres, Old Valley, and Pierson Creek Trails); Stebbins Gulch (North and South

entrances); and Bole Woods/Sugarbush. These routes traversed both established trails and off-trail areas, and included a variety of habitats. Due to the nature of the natural areas, only 4 stations (5%) included no forest habitat and only 11 stations (14%) included habitat other than forest, such as meadow or marsh.

Sampling stations were established no closer than 200 m along each route to minimize double counting of individuals (Hutto and others 1986). Stations varied in number among routes from 8 to 14. A total of 79 points were sampled along the 8 routes. Routes and stations were flagged with surveyor's tape and latitude/longitude coordinates were recorded using a Garmin 38 GPS.

Sampling began 8 May 2001 and ended 14 July 2001. Data were collected on 42 days, between the hours of 5:20 and 9:50 AM. Average start time was 5:43 AM and average stop time was 7:33 AM. Each route was walked 4 times, with no fewer than 7 days between replicates. At each station 2 or 3 observers recorded the species and abundance of all birds seen and/or heard for a 10-minute sampling session. Additional observations were recorded, such as age or sex class, behavior, and species seen or heard between stations.

Tallies were kept of individuals of each species recorded at each station. An attempt was made to avoid double counting. Consequently, a new individual of any species was tallied only if we could be certain that it was not previously counted, such as simultaneous song from different individuals or songs from an obviously different direction than those tallied previously. Very few observations were visual; in most cases birds not singing or calling were not detected. Calls of geese and turkeys frequently did not reflect the total numbers in the group; thus, the data for species such as these are highly conservative. For passerine species in which only the male sings (the usual situation), females, if present, were not likely to be detected. Thus, the tallies of most species represent singing males only. Further, many active and vocal species, such as crows and jays, moved past more than one station on a transect, or could

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be detected past the 100 m station radius. On the occasions when this was judged to occur those individuals were not counted again. The greatest number of individuals recorded on one of the 4 visits to a transect was summed, for that species, over all transects to determine abundance of individuals.

Breeding status of observed species was classified (after Peterjohn and Rice 1991) as follows:

POSSIBLE BREEDING: Species observed once in breeding season in possible nesting habitat, but no other indication of breeding noted.

PROBABLE BREEDING: If one or more of the following conditions was noted:

1. Pair in suitable habitat in breeding season
2. Singing male(s), or breeding calls heard, on more than one date at the same, or an adjacent, station
3. Territorial chasing of conspecifics
4. Courtship and display, copulation, agitated behavior or anxiety calls from adults
5. Individual visiting probable nest site
6. Nest building or nest cavity excavation

CONFIRMED BREEDING: If one or more of the following conditions was noted:

1. Four or more territorial males along one transect during the breeding season
2. Distraction display of adult
3. Adult carrying fecal sac
4. Adult carrying food for young
5. Active nest found
6. Used nest found
7. Young recently out of the nest

MIGRANT: Species observed during its migration to suitable breeding habitat.

RESULTS

I recorded 2,022 birds of 88 species along the transects (Table 1), plus sightings or feathers of 6 additional species noted on the properties during the course of the study, but not while collecting transect data. Two hundred thirty-two individuals of 60 species were found along the Bole Woods/Sugarbush transect. Of these, 23 species were confirmed breeders, 18 were

TABLE 1

Cumulative transect data: largest tally of individuals recorded on any single visit to a transect.

Species	Bole Woods	Upper Baldwin	Lower Baldwin	Stebbins North	Stebbins South	Pierson Creek West	Pierson Creek East	Little Mountain	Grand Total
Great Blue Heron							1		1
Green Heron		1					2		3
Turkey Vulture				3					3
Canada Goose	15	12	7	5	3	12	39		93
Wood Duck	1						44		45
Mallard	1			1		1	1		4
Sharp-shinned Hawk	2								2
Wild Turkey		5		6	2	6	1	2	22
American Woodcock							2		2
Mourning Dove	4	8	1	5	8	1	8	6	41
Yellow-billed Cuckoo					1		2		3
Barred Owl	1								1
Chimney Swift	2			1			2		5
Ruby-throated Hummingbird		1		1			2		4
Belted Kingfisher	1								1
Red-bellied Woodpecker	6	9	4	3	15	7	16	7	67
Downy Woodpecker	2	2	3	3	4	1	2	3	20
Hairy Woodpecker	1	1	2		1	1	1	1	8
Northern Flicker	1		1	2			2	4	10
Pileated Woodpecker	3	2	4	4	3	3	6	3	28
Eastern Wood-Pewee	7	7	4	8	5	7	11	5	54
Acadian Flycatcher	2	2	4	9	5	7	7	7	43
Willow Flycatcher							3		3
Eastern Phoebe	1		1	5			3	5	15

TABLE 1 (Cont.)

Cumulative transect data: largest tally of individuals recorded on any single visit to a transect.

Species	Bole Woods	Upper Baldwin	Lower Baldwin	Stebbins North	Stebbins South	Pierson Creek West	Pierson Creek East	Little Mountain	Grand Total
Hooded Warbler	9	8	15	7	8	7	11	15	80
Canada Warbler		3	6	2	1	1			13
Scarlet Tanager	7	6	9	9	14	2	11	8	66
Eastern Towhee	1	1	1	2	4	4		2	15
Chipping Sparrow	4			2		2	3		11
Field Sparrow	3			1		2	1		7
Vesper Sparrow	1						1		2
Song Sparrow	3			3		1	6		13
Dark-eyed Junco			1	5	2	1	5	6	20
Northern Cardinal	8	10	9	8	7	12	13	14	81
Rose-breasted Grosbeak	2	6	5	2	11	4	8	4	42
Indigo Bunting	3			4	1	2			10
Bobolink	2					1	1		4
Red-winged Blackbird	4			3		1	46+		54
Eastern Meadowlark	3					1	3		7
Common Grackle	5		1	4			14		24
Brown-headed Cowbird	4	2	3	3	1	3	6	2	24
Baltimore Oriole	3	1			8	4	9		25
Purple Finch								1	1
House Finch	2							1	3
American Goldfinch	7	3	5	10	3	4	14	1	47
Total	232	208	205	243	227	184	519	204	2022

probable breeders, 17 were possible breeders, and 2 species were migrants (Table 2a). I found 208 individuals of 41 species along the Upper Baldwin transect. Of these, 19 species were confirmed breeders, 11 were probable breeders, 8 were possible breeders, and 3 species were migrants (Table 2a). Along the Lower Baldwin transect I recorded 205 individuals of 37 species. Of these, 19 species were confirmed breeders, 7 were probable breeders, 10 were possible breeders, and one species was in migration (Table 2a). Two hundred forty-three individuals of 53 species were documented along the Stebbins Gulch North transect. Of these, 26 species were confirmed breeders, 16 were probable breeders, and 11 were possible breeders (Table 2a). I recorded 227 individuals of 41 species along the Stebbins Gulch South transect. Of these, 22 species were confirmed breeders, 9 were probable breeders, 4 were possible breeders, and 6 species were migrants (Table 2b). I recorded 184 individuals of 47 species along the Pierson Creek West transect. Of these, 18 species were confirmed breeders, 17 were probable breeders, and 12 were possible breeders (Table 2b). On the Pierson Creek

East transect I recorded 519 individuals of 63 species. Of these, 39 were confirmed breeders, 9 were probable breeders, 14 were possible breeders, and there was one migrant species. I recorded 204 individuals of 39 species on the Little Mountain transect. Of these, 20 species were confirmed breeding, 6 species were probably breeding, 12 species were possibly breeding, and 1 species was migrating (Table 2b).

A species might be considered "common" if it is found on every transect and/or if its numbers comprise a certain proportion of the total birds recorded. Twenty-three species were found on all 8 transects; 15 species each comprised more than 1% (>20 birds) of all individuals recorded; 12 species each comprised more than 2.5% (>50 birds) of all individuals recorded, and 3 species each comprised more than 5% (>101 birds) of all individuals recorded (Table 3).

No federally endangered or threatened species were observed; however, a feather of a Bald Eagle, a federally threatened species, was found along Stebbins Gulch North, indicating, at minimum, a fly-over. A feather of a Red-shouldered Hawk, a species of special interest to

TABLE 2a (Cont.)

Cumulative transect data: Bole Woods, the Baldwins, Stebbins Gulch North. Numbers represent tallies of individuals for each visit.
CO = confirmed breeding; PB = probable breeding; PS = possible breeding; M = migrant. See METHODS for explanation of status subscripts.

Species	Bole Woods			Upper Baldwin			Lower Baldwin			Stebbins North											
	5/8	5/22	6/14	7/2	Status	5/10	6/1	6/18	7/5	Status	5/25	6/12	6/25	7/12	Status	5/23	6/19	7/4	7/14	Status	
Red-eyed Vireo	2	11	3	11	CO ₁	6	9	5	10	CO ₁	6	3	7	7	CO ₁	8	4	8	9	CO ₁	
Blue Jay	1	9	1	3	CO ₁	5	2	5	8	CO ₁	1	5	9	5	CO ₁		4	2	10	CO ₁	
American Crow	3	8	13	12	CO ₁	5	2	11	5	CO ₁	3	10	11	14	CO ₁	5	5	3	11	CO ₁	
Tree Swallow	1	3	2		PB ₃											3	5	8	3	CO ₁	
Barn Swallow																					
Black-capped Chickadee	2	6	3	6	CO ₇	3	5	5	13	CO ₇	6	17	7	2	CO ₁	3	4	7	21	CO ₂	
Tufted Titmouse	3	5	3	4	CO ₇	6	3	3	4	CO ₁	4	10	5	4	CO ₁	6	3		4	CO ₁	
White-breasted Nuthatch		2	2	7	CO ₂			7	5	CO ₁		3	10	5	CO ₁		4	3	5	CO ₁	
Carolina Wren																					
House Wren	1				PS																
Winter Wren																					
Blue-gray Gnatcatcher			1	3	PB ₂			1	1	PS			2	1	PS	1	1	1		PB ₂	
Eastern Bluebird	2	2	2	2	CO ₃													2	1	2	CO ₅
Veery		1			PS		1	13	5	CO ₁	2		1	3	PB ₂	1	3			PB ₂	
Swainson's Thrush						1				M											
Wood Thrush	6	13	12	6	CO ₁	9	14	11	12	CO ₁	13	14	25	22	CO ₁	6	15	6	7	CO ₁	
American Robin	2	1	2	7	CO ₁	4	4	8	11	CO ₁	3	12	8	5	CO ₁	3	5	4	5	CO ₁	
Gray Catbird	1	3	1	1	PB ₂																
Brown Thrasher																					
European Starling	1	1	4	2	CO ₃																
Cedar Waxwing		4	6	6	CO ₁														2	PS	
Tennessee Warbler																					
Nashville Warbler																					
Northern Parula																					
Yellow Warbler	1				PS														1	PS	
Chestnut-sided Warbler																					
Magnolia Warbler						4		1		PB ₂											
Black-throated Blue Warbler		1			M	1				M											
Yellow-rumped Warbler																					
Black-throated Green Warbler																3	3	3	4	CO ₁	

TABLE 2a (Cont.)

Cumulative transect data: Bole Woods, the Baldwins, Stebbins Gulch North. Numbers represent tallies of individuals for each visit. CO = confirmed breeding; PB = probable breeding; PS = possible breeding; M = migrant. See METHODS for explanation of status subscripts.

Species	Bole Woods			Upper Baldwin			Lower Baldwin			Stebbins North											
	5/8	5/22	6/14	7/2	Status	5/10	6/1	6/18	7/5	Status	5/25	6/12	6/25	7/12	Status	5/23	6/19	7/4	7/14	Status	
Blackburnian Warbler																	1	3		PB _{1,2}	
Blackpoll Warbler																					PS
Cerulean Warbler				1	PS	2	6	6	4	CO ₁	2										M
Black-and-white Warbler						1				PS											
American Redstart	1	4	2	1	CO ₁	1	3	1	2	PB ₂		1	1				3	1	2		PB ₂
Ovenbird		2			PS	1	1	2		PB ₂	2	2	2	1			1				PS
Louisiana Waterthrush									1	PS	2						5	4	2		CO ₁
Common Yellowthroat	1				PS																
Hooded Warbler	4	9	8	7	CO ₁	5	8	4	7	CO ₁	15	11	14	13		5	7	4	6		CO ₁
Canada Warbler								3		PS		6		1			2				PS
Scarlet Tanager	1	7	5	3	CO ₁	4	3	6	5	CO ₁	8	6	9	9		8	9	5	6		CO ₁
Eastern Towhee	1	1	1		PB ₂	1			1	PB ₂			1			1	1	2	1		PB ₂
Chipping Sparrow	1	1	4	2	CO ₁												2				PS
Field Sparrow	1	1	1	3	PB ₂												1	1	1		PB ₂
Vesper Sparrow	1				PB ₂																
Song Sparrow	1	1		3	PB ₂																
Dark-eyed Junco																	3	2	1	2	PB ₂
Northern Cardinal	4	8	8	5	CO ₁	4	10	6	7	CO ₁	5	9	9	9	1	8	5	2	4		CO ₁
Rose-breasted Grosbeak	2	1	2	2	PB ₂	6	2	1	3	CO ₁	3	4	5			2		1	1		PB ₂
Indigo Bunting	1	1	3	3	PB ₂																
Bobolink	1		2		PB _{2,4}																
Red-winged Blackbird	2	2	3	4	CO ₁																
Eastern Meadowlark	1	3	2	1	PB _{2,4}																
Common Grackle			2	5	CO ₁																
Brown-headed Cowbird	3	3	4		CO ₁			2		PS	1	1	3			3	1	2			PB ₂
Baltimore Oriole		3	1		PB ₂	1															
Purple Finch																					
House Finch				2	PS																
American Goldfinch	1	4	7	4	CO ₁	2	3	3	3	PB ₂	1	1	1	5		2	4	7	10		CO ₁

TABLE 2b (Cont.)

Cumulative transect data: Stebbins Gulch South, Pierson Creek East and West, Little Mountain. Numbers represent tallies of individuals for each visit.
CO = confirmed breeding; PB = probable breeding; PS = possible breeding; M = migrant. See METHODS for explanation of status subscripts.

Species	Stebbins South			Pierson Creek West			Pierson Creek East			Little Mountain										
	5/11	6/7	6/23	7/7	Status	5/9	5/30	6/15	7/3	Status	5/16	6/5	6/28	7/11	Status	5/15	5/31	6/26	7/6	Status
Red-eyed Vireo	4	6	10	9	CO ₁	1	6	4	3	CO ₁	10	7	6	8	CO ₁	3	4	9	9	CO ₁
Blue Jay	4	7	6	5	CO ₁	6	11	8	5	CO ₁	8	9	1	11	CO ₁	9	8	7	7	CO ₁
American Crow	2	6	4	4	CO ₁	4	14	19	11	CO ₁	9	7	24+	10	CO ₁	8	15	6	4	CO ₁
Tree Swallow						1	1	1		PB ₂	3	10	7	8	CO ₁					
Barn Swallow											1			9	CO ₁					
Black-capped Chickadee	12	8	5	9	CO ₁	8	5	4	2	CO ₁	11	22	6	7	CO ₁	12	13	14	13	CO ₁
Tufted Titmouse	9	8	6	2	CO ₁	4	3	5	2	CO ₁	7	19	8	6	CO ₁	5	8	4	7	CO ₁
White-breasted Nuthatch	2	1	9	7	CO ₁	1	2	2	3	PB ₂		1	12	6	CO ₁	1	3	14	4	CO ₁
Carolina Wren																			1	PS
House Wren						2		1	3	PB ₂						1				PS
Winter Wren																		1		PS
Blue-gray Gnatcatcher																				PS
Eastern Bluebird							1			PS	3	4	3		CO ₁					
Veery	2	6			CO ₁	1		1	3	PB ₂	5	4	5	1	CO ₁	1	1			PS
Swainson's Thrush																				
Wood Thrush	27	17	23	12	CO ₁	6	5	8	10	CO ₁	16	19	18	11	CO ₁	15	14	14	16	CO ₁
American Robin	4	8	7	2	CO ₁	3	3	3	4	CO ₁	7	5	13	3	CO ₁	2	6	6	5	CO ₁
Gray Catbird						1			1	PB ₂	5	2	6	3	CO ₁					
Brown Thrasher													1		PS					
European Starling											5	6	1		CO ₁					
Cedar Waxwing						1				PS		3	4	5	CO ₁					
Tennessee Warbler											1				M		1			M
Nashville Warbler	3				M															
Northern Parula																				
Yellow Warbler											7	1	1	1	CO ₁					
Chestnut-sided Warbler																				
Magnolia Warbler	3				M															
Black-throated Blue Warbler	2				M															
Yellow-rumped Warbler	1				M															
Black-throated Green Warbler		4	3	3	CO ₁											1	1	1		PS

TABLE 3

Common species represented in the study.

Species	Found on all Transects	Numbers >5% of total	5% > N >2.5% of total	2.5% > N >1% of total
Canada Goose			X	
Wood Duck				X
Wild Turkey				X
Mourning Dove	X			X
Red-bellied Woodpecker	X		X	
Downy Woodpecker	X			X
Pileated Woodpecker	X			X
Eastern Wood-Pewee	X		X	
Acadian Flycatcher	X			X
Great Crested Flycatcher	X			X
Red-eyed Vireo	X		X	
Blue Jay	X		X	
American Crow	X	X		
Tree Swallow				X
Black-capped Chickadee	X	X		
Tufted Titmouse	X		X	
White-breasted Nuthatch	X		X	
Veery	X			X
Wood Thrush	X	X		
American Robin	X		X	
Ovenbird	X			
Hooded Warbler	X		X	
Scarlet Tanager	X		X	
Dark-eyed Junco				X
Northern Cardinal	X		X	
Rose-breasted Grosbeak	X			X
Red-winged Blackbird			X	
Common Grackle				X
Brown-headed Cowbird	X			X
Baltimore Oriole				X
American Goldfinch				X

ODNR, was also found in Stebbins Gulch North. The gulch is not considered appropriate nesting habitat for Bald Eagles, but could be a nesting area for Red-shouldered Hawks.

Four state-endangered species were recorded during the study (Table 4), as well as an additional 13 species which are conservation priorities of the USFWS, ODNR Division of Wildlife/Division of Natural Areas and Preserves, or NAS/PIF because of unknown status or significant population declines (ODNR 1998; National Audubon Society 1999; USFWS 1999). Several of these species were recorded only from 1 or 2 transects, whereas

others were found on all 8.

Exotic species were found in low numbers. No House Sparrows were detected. European Starling, which competes for nest cavities with Eastern Bluebirds and smaller woodpeckers, was found only along Bole Woods/Sugarbush and Pierson Creek East transects. Unfortunately, Brown-headed Cowbird, a nest parasite native to American grasslands but invasive in fragmented forests, was found along all transects, as a possible (3 transects), probable (3 transects), or confirmed (2 transects) breeder. Cowbird numbers comprised slightly more than 1% of total bird abundance.

Several species found during the course of the study are considered to be "uncommon" (expected in small numbers in appropriate habitat) or "rare" (not expected, but usually occurs yearly) in the Greater Cleveland area (Rosche 1988). Often an abundant bird in the spring becomes an uncommon or rare bird in the summer if the majority of spring birds are migrants. Birds encountered in the summer are likely breeders. Records from data collected on stations as well as several incidental sightings on the properties revealed 14 locally uncommon species and 6 locally rare species (Table 5).

DISCUSSION

The predominance of forest species results from the fact that forest habitat was sampled at 95% of all stations. Arboretum natural areas consist mainly of forested tracts.

Of the total species recorded, 20 (23%) were found whose status is under study by a federal or state agency or non-governmental conservation organization (NGO). Seventeen of these (19% of the total species) are considered rare and/or declining. It is interesting to note that 3 of these species are ranked as "common" in this study. Wood Thrush and Veery were recorded from all transects and their numbers comprised >5% and >1% of the total, respectively. Dark-eyed Junco was recorded from 6 of the transects, and its numbers represented >1% of the total.

High numbers of "watch list" species as well as local rarities, coupled with low numbers of exotics, indicate the arboretum natural areas contain sufficient diversity to continue to meet these species' habitat requirements. Those species that commonly breed in cooler, more northerly, mainly coniferous forests, such as Blue-headed Vireo, Winter Wren, Magnolia Warbler, Black-throated Green Warbler, Blackburnian Warbler, Canada Warbler, Dark-eyed Junco, and Purple Finch, were found in pine plantations, mixed pine-deciduous woods, and the hemlock-deciduous forests in the gorges and ravines of the Pierson Creek and Stebbins Run watersheds.

Mature upland and bottomland forests are preferred by Wood Duck (over water), Mallard (near wetlands), Pileated Woodpecker (with large trees), Wood Thrush (with closed canopy), Cerulean Warbler (with open canopy), and Louisiana Waterthrush (with rocky fast-flowing streams). Although few ponds were present, mature forest habitat was common throughout the natural areas, and stands were sufficiently large to attract species that nest in forest interiors. Unfortunately

TABLE 4

Species of concern (endangered, rare or unknown status) recorded on transects.

Species	USFWS Region 3 Great Lakes Basin	ODNR	NAS/PIF Allegheny Plateau
Sharp-shinned Hawk		Special Interest	
American Woodcock	List, High Priority*		
Yellow-billed Cuckoo	List		
Northern Flicker	List		
Winter Wren		Endangered	
Veery	List		
Wood Thrush	List, High Priority		High Priority
Chestnut-sided Warbler	List		
Magnolia Warbler		Endangered	
Black-throated Blue Warbler			High Priority
Cerulean Warbler	List, High Priority	Special Interest	High Priority
Louisiana Waterthrush			High Priority
Canada Warbler		Endangered	High Priority
Field Sparrow	List		
Dark-eyed Junco		Endangered	
Bobolink	List, High Priority		
Eastern Meadowlark	List, High Priority		

*List = US Fish and Wildlife Service *List of Migratory Nongame Birds of Management Concern*; High Priority = species considered specialized, rare, or exhibiting sharp and documented population declines.

TABLE 5

Locally uncommon and rare species recorded in the natural areas.

Species	Spring Frequency	Summer Frequency	Comment
Bald Eagle		U	Feather on Stebbins Gulch North area
Sharp-shinned Hawk		R	2 birds interacting over fields
Red-shouldered Hawk		U	Feather on Stebbins Gulch North area
Wild Turkey	U	U	22 birds; all transects except Bole Woods
American Woodcock		U	Near Upper Baldwin; Corning Lake
Yellow-billed Cuckoo		U	June 2, 5, 7 only; maybe migrants
Pileated Woodpecker	U	U	28 birds; probably breeding on all transects
Blue-headed Vireo	C	U	7 birds; 5 transects
Winter Wren	C	R	Stebbins, Pierson Creek, Little Mountain
Northern Parula		R	Possible breeder, Stebbins Gulch North
Chestnut-sided Warbler	C	U	Thickets; Stebbins North, Lower Baldwin
Magnolia Warbler	C	R	Possible breeders and/or migrants
Black-throated Green Warbler	C	U	8 summer birds
Blackburnian Warbler	C	R	3 summer birds
Blackpoll Warbler	U		Migrant
Cerulean Warbler	C	U	9 summer birds
Canada Warbler		R	14 summer birds; 5 transects
Vesper Sparrow	C	U	1 summer bird in field near Corning Lake
Dark-eyed Junco	C	U	20 summer birds; 6 transects
Purple Finch		U	1 bird at Little Mountain

these stands are not sufficiently large to be impenetrable to Brown-headed Cowbirds, which were found on all transects and are indicators of fragmentation.

Young, moist woodlands with dense understory and early successional forests are preferred habitats for American Woodcock and Veery. Brushy, successional forests and overgrown fields are preferred habitats for Chestnut-sided Warbler and Field Sparrow. Vesper Sparrow, Bobolink, and Eastern Meadowlark prefer large areas of grassy meadow, hayfields, and tall grasses. This succession of habitats occurred along Bole Woods, Upper Baldwin, Pierson Creek East, and Pierson Creek West transects.

During the course of the study it became obvious that several regions along certain transects were “hot properties” for a species. On subsequent visits to these areas we expected to encounter particular species, if not individuals. We were frequently rewarded. Station 3 on Stebbins Gulch North reliably gave us Blackburnian Warblers and a Blue-headed Vireo. Stations 2-6, but especially 2, on Upper Baldwin provided most of the Ceruleans found in the study. Station 0 on Lower Baldwin was THE place for Hooded Warblers—a very common breeding bird overall, but usually only one or two were recorded at a station. We never counted fewer than four at Station 0, and often six Hooded Warblers were singing there on the mornings we visited. Along ravines we expected Winter Wrens and Dark-eyed Juncos, both of which were commonly found in the Pierson Creek valley (West: stations 3-6; East: stations 2,3) and Stebbins Gulch (North: stations 2,3,0,-1; South: Juncos only – stations 7,8). Black-throated Green Warblers regularly hung out in Stebbins Gulch, at stations 2 and 3 on the north transect, and stations 5, 6, 7 and 6A on the south transect. And finally, on every visit to Stebbins Gulch, an Indigo Bunting was advertising territory from a treetop in the parking lot—what a spectacular sight he was on a sunny morning!

The natural habitats of the Arboretum support a good diversity of mainly forest bird species. More than 35% of the species recorded in this study were found in such numbers and/or distribution as to consider them

“common.” Several of these are species considered “uncommon” or “rare” in the Greater Cleveland region; others are considered endangered, threatened, or of concern at the State and Federal levels. The Arboretum also supports smaller numbers of rare breeders and hosts numerous migrants, many of whom are both spring and fall visitors.

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