

# AVIAN HABITAT PREFERENCES AND IMPLICATIONS FOR MANAGEMENT OF THE MAUMEE BAY STATE PARK WETLAND, Y2K

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## ABSTRACT

Avian species utilizing wetland habitats at Maumee Bay State Park were studied in 2000 with constant-effort mist netting and vegetation surveys to determine their distribution, population status, breeding success and habitat preference. Habitat types sampled included swamp-forest, beach-ridge, cattail marsh and Phragmites stands.

Data was collected utilizing the protocol for the Monitoring Avian Productivity and Survivorship (MAPS) program. Data indicated that individual species showed preferences for particular habitats, but additional study is needed to look for indicator species that could represent habitat management goals.

## INTRODUCTION

Of special concern in Ohio are avian species dependant upon various wetland habitats, much of which has been destroyed and/or converted to agriculture, marinas, condominiums, and urban/suburban sprawl. 95% of Ohio's wetlands have been lost since historic times. This in-depth study was undertaken to obtain a better understanding of the bird use in this little known part of the Maumee Bay State Park and to assess that use in an attempt to manage for its wetland potential.

Equally important to acquiring knowledge for management of rare species on public lands is the need to educate the public about wetlands-dependant species and efforts to restore their habitat. The knowledge acquired from this study will be used to develop new programs designed to inform the public about the importance of Ohio's remaining wetlands, and the species who reside in them.

## MATERIALS AND METHODS

**Mist Netting** - Constant effort mist netting was utilized, patterned after the Monitoring Avian Productivity and Survivorship (MAPS) program. The project utilized twelve nets, operated on a schedule of one every ten-day period from early June through the middle of August. This method was chosen to reduce net bias and interference with the breeding birds, while providing an indication of possible breeding and productivity.

Four (12 X 6m, 30 mm mesh) nets were placed in each of four distinct habitat types. These habitat types consisted of swamp-forest, beach-ridge, cattail marsh, and Phragmites stands. Data collected on the captured birds included species, age, sex, fat, mass, molt, breeding status, time and net of capture.

**Site Descriptions** - The Maumee Bay State Park wetland area consists of approximately 80 acres of marsh - swamp forest habitat. The area which is today Maumee Bay was once part of a much larger ecosystem known as The Great Black Swamp, which was systematically drained in the late 1800's and early 1900's by pioneers and settlers in northwest Ohio. The residual wetland at Maumee Bay State Park consists of several overlapping habitat types, four of which were sampled through the mist-netting efforts. Little habitat management has occurred in this area since the time it was acquired by the State, and much of the area is being invaded by exotic invasive species, such as *Phragmites australis* (phragmites or giant reed) and *Lythrum salicaria* (purple loosestrife).

## RESULTS

Bird use based on mist netting results in the four habitats was compared. Banding dates and capture rates are shown in Table 1. A total of 102 birds of 20 species were banded. Another 33 birds were recaptured, having been previously banded and released. Table 2 lists the confirmed breeding bird species of 2000. Bird species as habitat preference indicators within each sampled habitat were based on mist net data and are shown in Table 3. A listing of species captured by net location (habitat type) appears in Table 5. Indicator species showed a fairly strong fidelity to certain habitats and their presence as breeders might serve as indicators of a habitat preference. Table 4 gives comparative data for habitat type for the past three years of data. Summary of this data will appear in the discussion. It must be recognized that there are factors other than habitat type that effect presence or absence of species, but additional years of data should fine-tune the use of these indicator species for land management.

The cattail marsh habitat had the greatest numbers of birds captured and banded: 49 birds. The habitat with the next largest number of birds captured was the beach-ridge: 47 birds. 20 birds were captured this year in the *Phragmites* habitat, and only 16 birds were captured within the area of swamp forest.

The habitat with the greatest number of species captured was the beach ridge (16 species), followed closely by the cattail marsh locations (15 species), *Phragmites* and swamp forest both had 7 species of birds captured.

While three years is inadequate to assess productivity at this scale, banding did provide confirmation of twenty breeding species (Table 2).

## DISCUSSION

As Table 4 clearly shows, the areas consisting of cattail marsh and beach-ridge habitats have consistently showed greater number of both numbers of birds captured, and number of different species of birds present. It should be noted that a systematic point count has not been undertaken in these areas, but might allow researchers to confirm the presence of additional birds that may be able to avoid or escape the nets. As indicated earlier, many species showed a preference for individual habitat types. The beach-ridge habitat was predicted to show the greatest number and diversity of birds, and the data has thus far confirmed this hypothesis.

The original theory was that *phragmites* habitat would show the least species diversity and richness, and the data also seem to confirm this. These conclusions cannot be deemed absolute, however, and management recommendations must be made carefully. It will be important to continue the monitoring initiated here to eliminate short-term bias, establish trends, and to evaluate habitat manipulation.

Habitat manipulation, such as prescribed burning and spraying of exotic vegetation, which was scheduled to begin in the spring of 1998, was delayed due to adverse weather conditions. Additionally, the summer of 1999 experienced a severe drought for most of the growing season, which may have had some impact on breeding bird densities and species usage of the various marsh habitats. Limited spraying of Phragmites from a few areas on the boardwalk was done in 2000, but most likely will have little impact in controlling the spread of this invasive plant. To be truly effective, a much more aggressive program of biological and chemical control is needed. Regardless of the underlying causes, the banding season of 2000 continued to show declines in capture rates, compared to previous years. In 1998 a total of 312 birds were captured, compared to 164 in 1999, and 135 in 2000. Also, total numbers of bird species recorded was 20 % less in 1999 and 2000 compared to 1998: 20 species compared to 25 species. Individual species densities showed remarkable changes as well. For instance, in 1998, 20 yellow warblers were captured, compared to 2 in 1999, and 9 in 2000. Other Neotropical migrant species were also missing or found in reduced numbers, including orchard oriole, Carolina wren, Prothonotary warbler, and indigo bunting. Whether these short-term changes were due to adverse weather conditions, or are a result of globally declining numbers of Neotropical migratory songbirds, or are due to increasing percentages of exotic and invasive plant species, can only be borne out through additional study and banding data collection.

### **Conclusion**

With little or no effort put forth to improve habitat conditions in the wetland areas of Maumee Bay State Park, the species richness and diversity of songbirds and of all creatures will undoubtedly continue to decline. Songbirds are not the only fauna who suffer from loss of suitable habitat. As Phragmites and other exotics continue to spread, entire guilds of insects, amphibians, reptiles, and mammals will also be adversely impacted. As the plants go, so too go the animals that depend upon them for food and shelter. Unfortunately there are few other surveys underway to document the loss of these other groups which antidotal evidence suggests were once so abundant in this wetland complex. Harold Mayfield (local naturalist) recalls in the 1960's that no fewer than six species of orchids were abundant in the wetland here, but today only a single species exists, and is state listed as endangered. Casual observations by this researcher have witnessed the disappearance over the last three years of several once-common flowers, including Canada anemone, tall bellflower, and cardinal flower. Without documentation, many other native species of plants and animals may slip away unnoticed, their plight ignored. Once again, my stated goal in undertaking this long-term project is to provide indisputable scientific evidence that neglect and lack of habitat restoration may be detrimental to the long-term health and well-being of the wetland jewel that is Maumee Bay.

### **Acknowledgements**

I would like to thank the Ohio Lake Erie Office's Lake Erie Protection Fund for their continuing support of this research, including funding of the initial grant and researchers. Thanks to the Ohio Biological Survey for funding the assistant researcher position in the summer of 2000. I would also like to thank my assistants and volunteers, who without the dedication and desire to help preserve this wetland would never have shown up in the marsh at 5:30 am to actually do the survey work.

**TABLE 1 Maumee Bay Banding Station Capture Rates by Date, Y2K**

Date	Net Hours	# Birds Banded	# Recaps	Total Birds	Birds/100 Net Hours		
					1998	1999	2000
June 19	72	23	8	31	111	34	43.06
June 26	72	20	7	27	72	38	37.50
July 4	72	9	6	15	78	36	20.83
July 11	72	11	8	19	44	38	26.39
July 21	72	17	2	19	36	31	26.39
August 1	72	15	1	16	121	28	22.22
August 11	72	7	1	8	38	17	11.11
<b>Totals:</b>		<b>102</b>	<b>33</b>	<b>135</b>	<b>Avg: 71.4</b>	<b>31.7</b>	<b>26.78</b>

**TABLE 2 Confirmed Breeding Bird Species, Y2K**

**HATCHING YEAR BIRDS:**

AMWO    AMGO    WEVI  
COYE    GRCA    YWAR  
HOWR    AMRO    SOSP  
COGR    ETTI  
DOWO    YSFL

**BREEDING CONDITION ADULTS:**

REVI    BAOR  
ALFL    NOCA  
CEDW    RWBL  
INBU

**13 - HY SPECIES**

**7 AHY / SY SPECIES**

**TOTAL CONFIRMED BREEDING BIRD SPECIES - 20**

Missing from last year's list: BCCH, WIFL, RTHU, FISP

New since last year's list: ALFL, YSFL, WEVI, ETTI, CEDW, AMGO

**TABLE 3 Bird Species as Indicators of Habitats Sampled, Y2K**

**SWAMP FOREST** Nets 1, 11, 12

Total number of birds captured: Net 1 – 7 Net 11 – 2 Net 12 – 7

TOTAL – 16 birds, 7 species

Dominant species captured: **AMRO, COGR**

**BEACH RIDGE** Nets 2, 3, 4

Total number of birds captured: Net 2 – 17 Net 3 – 10 Net 4 – 20

TOTAL – 47 birds, 16 species

Dominant species captured: **HOWR, GRCA, AMRO**

**PHRAGMITES STAND** Nets 5, 6, 10

Total number of birds captured: Net 5 – 4 Net 6 – 14 Net 10 – 2

TOTAL – 20 birds, 7 species

Dominant species captured: **COYE, AMGO, YWAR**

**CATTAIL MARSH** Nets 7, 8, 9

Total number of birds captured: Net 7 – 22 Net 8 – 11 Net 9 – 16

TOTAL – 49 birds, 15 species

Dominant species captured: **COYE, YWAR, AMGO**

**Table 4 Comparative Data for Habitat Type**

	<u>1998</u>	<u>1999</u>	<u>2000</u>
<b><u>Swamp Forest</u></b> – Nets 1, 11, 12			
# Birds Captured:	86	55	16
# Species:	13	9	7
<b><u>Beach Ridge</u></b> – Nets 2, 3, 4			
# Birds Captured:	98	46	47
# Species:	22	11	16
<b><u>Phragmites Stand</u></b> - Nets 5, 6, 10			
# Birds Captured:	48	16	20
# Species:	13	4	7
<b><u>Cattail Marsh</u></b> – Nets 7, 8, 9			
# Birds Captured:	80	39	49
# Species:	14	10	15
<b><u>Total # Birds</u></b>	<u>312</u>	<u>159</u>	<u>135</u>
<b><u>Avg. # birds per net hrs:</u></b>	<u>71.4</u>	<u>31.7</u>	<u>26.78</u>
<b><u>Total # Species Captured:</u></b>	<u>25</u>	<u>20</u>	<u>20</u>
<b><u>Total # Confirmed Breeders:</u></b>	<u>21</u>	<u>18</u>	<u>20</u>

**TABLE 5: Species Captured and Net Location by Habitat, Y2K**

**Net 1 Swamp-Forest**  
 YWAR 1  
 AMRO 2  
 COGR 2  
 GRCA 1  
 RWBL 1  
**RECAPS: 0**  
**7 birds, 5 species**

**Net 2 Beach Ridge**  
 HOWR 2  
 GRCA 4  
 YWAR 1  
 AMRO 1  
 WEVI 1  
 DOWO 1  
 ETTI 2  
 NOCA 1  
 YSFL 1  
**RECAPS:**  
 GRCA 3  
**17 Birds, 9 species**

**Net 3 Beach Ridge**  
 HOWR 2  
 GRCA 2  
 NOCA 1  
 AMRO 1  
**RECAPS:**  
 COYE 1  
 REVI 1  
 GRCA 2  
**10 birds, 6 species**

**Net 4 Beach Ridge**  
 HOWR 3  
 COYE 1  
 LEFL 1  
 REVI 1  
 SOSP 1  
 GRCA 4  
 RWBL 2  
 NOCA 1  
 COGR 1  
**RECAPS:**  
 GRCA 3  
 BAOR 1  
 AMRO 1  
**20 birds, 11 species**

**Net 5 Phragmites**  
 HOWR 1  
 COYE 1  
 AMGO 1  
**RECAPS:**  
 YWAR 1  
**4 birds, 4 species**

**Net 6 Phragmites**  
 COYE 5  
 YWAR 3  
 AMGO 2  
 DOWO 1  
 CEDW 2  
 GRCA 1  
**RECAPS 0**  
**14 birds, 6 species**

**Net 7 Cattail Marsh**  
 HOWR 1  
 COYE 5  
 YWAR 1  
 AMGO 1  
 INBU 1  
 SOSP 2  
 RWBL 2  
 BAOR 1  
 AMRO 1  
**RECAPS:**  
 COYE 2  
 GRCA 1  
 RWBL 1  
 NOCA 1  
 AMRO 2  
**22 birds, 11 species**

**Net 8 Cattail Marsh**  
 COYE 1  
 YWAR 2  
 AMGO 1  
 SOSP 2  
 NOCA 1  
**RECAPS:**  
 COYE 3  
 REVI 1  
**11 birds, 6 species**

**Net 9 Cattail Marsh**  
 HOWR 1  
 COYE 3  
 YWAR 1  
 AMGO 2  
 ALFL 1  
 INBU 1  
 COGR 1  
**RECAPS:**  
 COYE 3  
 INBU 1  
 REVI 1  
 RWBL 1  
**16 birds, 9 species**

**Net 10 Phragmites**  
 COYE 2  
**RECAPS: 0**  
**2 birds, 1 species**

**Net 11 Swamp-Forest**  
 AMRO 2  
**RECAPS: 0**  
**2 birds, 1 species**

**Net 12 Swamp-Forest**  
 AMRO 4  
**RECAPS:**  
 AMRO 1  
 NOCA 1  
 HOWR 1  
**7 birds, 3 species**

**TABLE 6 Maumee Bay Banding Station****Summary of Species Captured, 1998-2000**

<b>Total Number Birds Captured:</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2000 recaps</b>	<b>Grand Total</b>
COYE (common yellowthroat)	36	19	18	10	83
AMGO (American goldfinch)	14	5	8	0	27
YWAR (yellow warbler)	20	2	9	1	32
ALFL (Alder flycatcher)	1	0	1	0	2
WIFL (willow flycatcher)	0	1	0	0	1
LEFL (least flycatcher)	0	0	1	0	1
HOWR (house wren)	4	4	10	0	18
WEVI (white-eyed vireo)	0	0	1	0	1
RWBL (red-winged blackbird, F)	44	19	3	2	68
RWBL (red-winged blackbird, M)	25	12	2	0	39
ETTI (tufted titmouse)	4	0	2	0	6
GRCA (gray catbird)	27	6	12	9	54
NOCA (Northern cardinal)	17	4	5	2	28
BAOR (Baltimore oriole)	4	1	1	1	7
SOSP (song sparrow)	25	1	5	0	31
DOWD (downy woodpecker)	16	2	2	0	20
INBU (indigo bunting)	12	3	2	1	18
REVI (red-eyed vireo)	2	3	1	3	9
CEDW (cedar waxwing)	0	0	2	0	2
AMRO (American robin)	20	14	12	4	50
COGR (common grackle)	18	18	4	0	40
YSFL (yellow-shafted flicker)	0	0	1	0	1
TRES (tree sparrow)	2	0	0		2
BCCH (black-capped chickadee)	0	3	0		3
MOWA (mourning warbler)	1	0	0		1
PROW (Prothonotary warbler)	1	0	0		1
CARW (Carolina wren)	8	0	0		5
OROR (orchard oriole)	2	0	0		2
SWSP (swamp sparrow)	2	0	0		2
NOWA (Northern waterthrush)	1	0	0		1
BLJA (blue jay)	2	0	0		2
AMWO (American woodcock)	4	1	0		5
FISP (field sparrow)	1	0	0		1
RTHU (ruby-throated hummingbird)	0	8	0		8
OVEN (ovenbird)	0	1	0		1

	<b>1998</b>	<b>1999</b>	<b>2000</b>
<b>Total # Birds Banded:</b>	271	133	102
<b>Total # Recaptures:</b>	41	31	33
<b>Total # Birds Captured:</b>	312	164	135
<b>Total # Species:</b>	25	20	20

**506 birds + 105 recaptures = 611 total birds captured**

Label Number	Description
001	Black (black)
002	White (white)
003	Red (red)
004	Blue (blue)
005	Green (green)
006	Yellow (yellow)
007	Purple (purple)
008	Pink (pink)
009	Orange (orange)
010	Grey (grey)
011	Light Blue (light blue)
012	Light Green (light green)
013	Light Yellow (light yellow)
014	Light Purple (light purple)
015	Light Pink (light pink)
016	Light Orange (light orange)
017	Light Grey (light grey)
018	Light Blue-Green (light blue-green)
019	Light Green-Yellow (light green-yellow)
020	Light Yellow-Orange (light yellow-orange)
021	Light Orange-Pink (light orange-pink)
022	Light Pink-Red (light pink-red)
023	Light Red-White (light red-white)
024	Light White-Blue (light white-blue)
025	Light Blue-Black (light blue-black)
026	Light Black-White (light black-white)
027	Light White-Red (light white-red)
028	Light Red-Blue (light red-blue)
029	Light Blue-Green (light blue-green)
030	Light Green-Yellow (light green-yellow)
031	Light Yellow-Orange (light yellow-orange)
032	Light Orange-Pink (light orange-pink)
033	Light Pink-Red (light pink-red)
034	Light Red-White (light red-white)
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