

SECTION B.1
BREEDING BIRDS OF PLUM BROOK STATION



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For

**Ohio Department of Natural Resources
Division of Natural Areas and Preserves**

**NASA Research Center
Plum Brook Station**

**Breeding Bird Study
Breeding Season 2001**

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OBJECTIVES:

The primary objectives of this study were to document the avian communities nesting at the Plum Brook Station and to document the presence of any state or federally listed species which may be utilizing the station grounds for nesting or feeding.

BACKGROUND:

Historically within Ohio there has been a number of both wintering and summer breeding bird counts documenting the diversity and distribution of the state's avian communities. The first report detailing the birds known for the state was Kirtland(1838). This account was necessarily limited to Dr. Kirtland's personal observations in northeastern Ohio and the reports of a few other interested individuals. The next report detailing the bird life of Ohio was by Wheaton (1882). This report, while more complete than the 1838 report by Kirtland, was also limited by the distribution of the observers in the state. While several other bird books were produced around the turn of the century, the first report based on comprehensive data was that of Hicks(1935). Hicks was able to rely on a network of birders representing every county in the state to help fill in the distribution gaps for the state's nesting species. Hicks documented a total of 181 species as having nested in Ohio up to that time. His list for Erie County was 124 species while Huron County just to the south had 116 species documented. The most recent effort to document Ohio's breeding avifauna was the Ohio Breeding Bird Atlas (Peterjohn and Rice 1991). The results of this publication were based on 6 years of field work by hundreds of volunteers and paid professionals who inventoried designated sample blocks within every county in the state. During the atlas project breeding evidence was observed for a total of 193 species plus 2 hybrids. Of the 5 physiographic regions used for the analysis of atlas data the Lake Plain region, in which Plum Brook Station is situated, had the highest total species count with 161 species. The average number of species observed per block in the Lake Plain region at 73.4 was almost identical to that observed in the Till Plains region (73 species/block). This figure is considerably lower than the average of 84.6 species/block attained in the Glaciated Plateau physiographic region.

During the atlas project (1982-1986) the Plum Brook Station was inventoried as one of the 113 "special areas" which were covered in addition to the atlas priority blocks. Breeding bird data was collected on the station grounds for this atlas project in 1982 by Ellen Johnson and again in 1986 by Glen Bernhardt. Their results of these surveys and of other surveys conducted at the station in the mid-1970's were reviewed in the discussion section of the 1995 report by Bartlett of his research during the 1994 breeding season. Breeding bird surveys at Plum Brook Station involved both qualitative and quantitative survey methodologies. Qualitative inventories involved censusing the bird community on foot throughout the station and represented the

majority of the survey work in this study. A quantitative survey of breeding species was achieved by establishing a roadside breeding bird survey route that is run in a controlled manner allowing for annual or seasonal repetitions. A breeding bird route alone will not provide a comprehensive picture of the avian nesting communities. However, it may be accompanied with other qualitative surveys if this goal is to be met. The inventory techniques employed in this study are detailed below. This data is compared with that of the data gathered by Bartlett during the 1994 season and some of the data of the Specification C-73180-C-PB dated October 1, 1976 and Specification C-25167D-PB dated October 1, 1979. This latter included information and data on a Breeding Bird Survey route which had been established in 1975 and run each year through 1980. Discussion and results of this data will follow. Both routes (1975 and 1994) and techniques were repeated during this season for comparison.

METHODS

Breeding Bird Survey Routes

A 24.5 mile route with 50 stops designed to census the birds of an area in a quantitative manner. This type of survey is conducted continent wide by the Patuxent Wildlife Research Center under the U.S. Geological Survey. The route is run starting 1/2 hour before sunrise and ending before 10:30AM. Survey stops are every 1/2 mile. The biologist counts all species of birds seen and heard from the count point within a 1/4 mile radius during a 3 minute period. Normally, these are run only once a year. For this study, the biologist ran it four times during the season and averaged the results. This will give an idea of species and species density in the area. The data can be compared with other routes run locally, regionally, and nationally. It can also be used in the future as baseline data. This route and technique which was established in 1994 by Bartlett was repeated this season. Figure 1 shows the location of the BBS route established by Bartlett in 1994 on the station for this study and Appendix G is a listing of the locations of the stops for this route. The 1975 route was also run for comparison. This route is only 14.9 miles long and contains 25 stops. Because the locations of the stops for this route were not obtained until after the 1994 study, it was not run that year. Refer to Specification C-25167D-PB dated October 1, 1979 for the map and data from this route.

Breeding Bird Atlas

A methodology used to determine the total number of species in the area and their breeding status. This type of survey was used by ODNR/DNAP during the 1980's to determine the nesting species of Ohio and their ranges. The whole Plum Brook Station was an area of special study during the Ohio Breeding Bird Atlas work. Research was conducted by Ellen Johnson during 1982 and Glen Bernhardt during 1986. For this study the Plum Brook Station was arbitrarily divided into 6 study blocks (See Figure 2) by Bartlett in 1994. These same blocks were used in 2001. Each block was censused for species, total territorial males, and nesting status. Ideally, it has been determined that 15-20 hours of censusing in a block will find the majority of the nesting species. In this study 20+ hours were spent in each of the 6 study blocks. The data is also compared to Bartlett's 1994 data using the same methodology. The status codes used for this study are listed in below:

Breeding Criteria Codes

Status

Visitor V not breeding on site

Migrant M not breeding on site

Breeding Birds

Possible Code

10 Species seen in possible nesting habitat, or singing male(s) present

Probable Code

21 Pair in suitable habitat

22 Singing male present on more than one date

23 Bird or pair on territory

24 Courtship and display

25 Visiting probable nesting site, or nest building by wrens or woodpeckers

26 Nest building or excavation of nest hole

Confirmed Code

30 7 or more territorial males

31 Distraction display

32 Used Nest

33 Female with egg in oviduct

34 Recently fledged young, not yet able to fly

35 Adult with fecal sac

36 Adult with food for young

37 Active nest with unidentified contents

38 Nest with eggs or identifiable eggshells beneath nest

39 Nest with young

Territorial Males Survey

Using the above Breeding Bird Atlas blocks, records of the total number of singing males for each species were kept. Singing males are believed to be territorial males and a good indication of breeding birds. This will give a better idea of the density of each species on the station. Data was collected at the same time as atlasing was being done. Locations of singing birds were noted so that duplication was kept to a minimum. Total numbers per block were recorded. This data should be viewed as minimum numbers of singing male on the station. Data is compared with 1994 data from Bartlett's study using the same methodology.

Transect Survey

A transect survey involves surveying a transect through habitat and recording all territorial birds along that line. Because of the abundance of individuals believed present this breeding season, the author felt that running transects through various habitats on the station would better show the diversity and abundance of the season. These were run late in the season after some species had stopped defending territory but can still show the diversity and abundance very well. Nine transects were arbitrarily selected in various habitats on the station (See Figure 3). Each transect was .4 mile long and are located in the central area of the station. The biologist walked the transect both ways and recorded the location of territorial males of each species observed within 100 meters on each side of the transect. Ideally, the station could easily support a minimum of 10 to 15 of these transects in order to cover all of the habitat types. In future years it is recommended that at least one additional transect be run in the grassy areas of the southeastern part of the

station. This is the area used by the Ohio Air National Guard.

Transect No. and Location

- 1 - North on roadway from the intersection of Maintenance Road and roadway running along west side of Ransom Brook north towards Pentolite Road.
- 2 - Southwest on Taylor Road from the intersection of Taylor Road and Pentolite Road towards Ransom Brook.
- 3 - Northwest on Columbus Avenue from the intersection of Columbus Avenue and Maintenance Road towards the guard house.
- 4 - Southwest on Box Factory Road from intersection with Fox Road towards Ransom Brook.
- 5 - South on a trail from North Magazine Road through field along east side of Plum Brook towards West Scheid Road.
- 6 - North-northwest along bunker road starting north of bunker 9151 (northwest of Center Magazine Road) towards North Magazine Road going just past bunker 9156.
- 7 - Northwest along road running from Taylor Road northeast of Patrol Road to next intersection.
- 8 - West along South Magazine Road starting at second bend and running to intersection with road at old firing range.
- 9 - South on Taft Road starting at the intersection with South Magazine Road to just past the bend.

Transect Run Data:

Transect #	Date	Time
1.	6/28/01	0530 - 0615 EST
2.	7/3/01	0537 - 0621 EST
3.	6/28/01	0620 - 0655 EST
4.	7/3/01	0635 - 0714 EST
5.	6/28/01	0800 - 0845 EST
6.	6/28/01	0700 - 0744 EST
7.	6/28/01	0900 - 0940 EST
8.	7/3/01	0918 - 1008 EST
9.	6/28/01	1005 - 1040 EST

RESULTS

General Overview:

A total of 125 species were identified during the 2001 summer birding season at the Plum Brook Station. This total includes 11 species that were considered to be late migrants through the area and 7 species which were classified as visitors only. These summer visitors did not nest on the property but utilized the areas for feeding and resting. All of these summer visitors are known to nest elsewhere in the Sandusky Bay region. Of the 125 species observed on the station, 101 species were either confirmed (86 species) or were considered to be likely nesters (15 species) on the property based on the breeding criteria codes used in the study. Another 6 species were considered to be possible nesters under atlasing guidelines. While one or more of these 6 species could have nested during the study period it is more likely that they represented unmated males. As discussed under survey methodology, breeding birds were censused using a combination of

quantitative (BBS route and Transect Routes) and qualitative (general censusing on foot) survey methods. The results of these different surveys are presented below. A general analysis of the results shows very little change in the species diversity on the station. The notable changes from the 1994 surveys are in species populations. There are some significant increases and decreases in population and trends within habitat areas. These changes and trends will be dealt with in the Discussion section of this paper.

Breeding Bird Survey Route

This route (see Figure.1) was run four times; June 5, 15, 25, and July 2 between the hours of 0525 and 1035 EST. The weather conditions were in line with USGS Patuxent Wildlife Research Center guidelines. These dates are approximately the same dates as the 1994 runs. The results of the 4 repetitions of the BBS route established for this study are summarized in Appendix A. The 1994 results are also summarized in this table. A cumulative total of 93 species was recorded on this route for the 4 runs made during the breeding season. The total number of species observed on each of the four repetitions ranged between 73 and 75. Of the 93 species, 55 were recorded on all four runs, 13 on three of the four runs, 11 on two of the four runs, and 14 on only one of the four runs. Of the 93 species, 3 were believed to be visitors and 1 was believed to be late migrants. The four visitors were Great Egret, Ring-billed Gull, and Herring gull. All four nest in the area but are not believed to have nested at the Plum Brook Station. The only species believed to be a migrant was a Mourning Warbler which was found to be nesting elsewhere on the station. The 15 most abundant species found on the BBS route along with the 15 most frequently found species (as indicated by total number of stops the species was recorded at) based on an average of the 4 repetitions are given in Table 1. Appendix A1 lists data for the 1977-80 25-stop route and the results of the route from this year. The results of the 1977-80 data were discussed in the 1994 paper, therefore only a comparison with this year's data will be made.

Table 1. The Top 15 Species Recorded for the Plum Brook BBS Route Based on Abundance and Frequency Along BBS Route.

Most Abundant Species		Most Frequent Species	
Species	Average # / Day)	Species	Average # stops / Day)
1. American Robin	95	1. American Robin	40
2. American Goldfinch	85	2. Song Sparrow	38
3. Song Sparrow	80	3. American Goldfinch	33
4. Red-winged Blackbird	72	4. Field Sparrow	32
5. European Starling	64	5. House Wren	30
6. Field Sparrow	58	6. Indigo Bunting	29
Indigo Bunting		Northern Cardinal	
8. Common Yellowthroat	53	8. Common Yellowthroat	28
9. House Wren	50	9. Gray Catbird	25
Northern Cardinal		10. Red-winged Blackbird	23
11. Yellow Warbler	45	11. Blue Jay	22
12. Gray Catbird	42	European Starling	
13. Blue Jay	37	13. Yellow Warbler	20
14. Common Grackle	36	14. Cedar Waxwing	16
15. Cedar Waxwing	31	Eastern Towhee	
Common Grackle			

Atlasing for Breeding Birds

A total of 155 hours were spent atlasing species on the station. This is a 12% increase in the time surveying over the 1994 surveys. Of this time, 22.5 hours were in Block A, 29.25 hours in Block B, 22.0 hours in Block C, 28.25 hours in Block D, 27.0 hours in Block E, and 27.0 hours in Block F. Block A was visited 12 days, Block B was visited 13 days, Block C was visited 12 days, Block D was visited 14 days, Block E was visited 14 days, and Block F was visited 13 days. Normally, more than one block was visited in a day. An area the size of the Plum Brook Station could adequately be covered in 20-30 hours over 5 to 10 days. Appendix B lists the species recorded per block and the highest breeding code attained within each of the 6 blocks for every species. Figures 6a through 6q show maps of the areas of the station where significant species were found. These species are discussed in the section entitled Rare and Endangered Species. This data and the results of the 1994 survey are also shown in Appendix B. A total of 135 species were observed in the two years of collecting data by Bartlett. Of these 105 species were observed both years. Earlier surveys in the 1970's and 1980's add nothing new to the station's breeding bird list. Of the 125 species observed in the 2001 surveys, 11 are considered to be migrants, seven to be visitors, 86 to be confirmed breeders, 15 to be probable breeders, and six to be possible breeders. There were several unexpected finds during the 2001 breeding season. The predicted discovery of a nesting Turkey Vulture was documented in an outbuilding in the northwestern region of the station. A nest with 2 young was found in a storage building in the western end of the station. The discovery of a territorial Broad-winged Hawk was somewhat unusual for this area of Ohio. A male and 2 female Wild Turkey were observed very early in the season by other researchers and station staff. The birds were not relocated during June, July, and August but can be expected to be breeding on the station in future years. The station has appropriate habitat. A pair of Barred Owls was found near the reactor. A singing Whip-poor-will was heard during an owl census in mid-June for a rare Erie County record. Again, there is

habitat for this rare northern Ohio species. Alder Flycatcher numbers were very high for this rare Ohio breeder. The station has to be considered one of the best places in north-central Ohio for this species. The state endangered Sedge Wren numbers are significant also. Warbler numbers and breeders are at higher than expected levels. It is probable that 12 to 13 species of warblers nested on the station during this breeding season. This may be a result of improved habitat and the control of the deer population as four of these species are ground nesters. Eleven species of warblers were confirmed to have nested on the station including the Division of Natural Areas and Preserves Endangered listed Mourning Warbler. Seven territorial males were found and one successful nest was found. A Prairie Warbler was discovered by USDA staff on June 12. This is a southern species for Ohio and was most likely an unmated individual that was wandering. It did not stay on the station for long.

Counts of Territorial Males

The data for this study was collected while running Breeding Bird Surveys or Breeding Bird Atlasing. The results are shown in Appendix C and Appendix D. The total recorded territorial males for each Atlas Block are listed and a total for the station is compiled in Appendix C. Appendix D lists the species in order of abundance. The 1994 rank and abundance data with a comparison of rank and percent difference between 1994 and 2001 are also included in with this information. This data compares very well with results of the Breeding Bird Survey data. Of the top 15 species on this list, 13 are on the top most abundant and top most frequent list of the Breeding Bird Survey. It should be noted that this data is a minimum total as not all the area was covered and so not all territorial birds were found. However, coverage of the blocks was increased by 12% over the 1994 survey times.

Transect Results

Nine transect routes which were four-tenth of a mile were run later in the breeding season. Sixty-six species were recorded on these routes and 789 individuals. See Appendix E. The number of species observed per route varied between 26 and 37. The number of individuals varied between 49 and 115. Of the top 15 species observed, 13 are also on the Breeding Bird Survey top 15 list and 12 are on the top 15 territorial males list. See Table 2.

Table 2. The Top 15 Species Recorded for the Nine Plum Brook Transect Routes Based on Total Abundance on all Transects.

<u>Species</u>	<u>Total</u>
1. Song Sparrow	68
2. Common Yellowthroat	65
3. Red-winged Blackbird	59
4. American Robin	48
Field Sparrow	
6. American Goldfinch	33
7. Willow Flycatcher	27
8. Indigo Bunting	25
9. Northern Cardinal	24
Gray Catbird	
11. Yellow Warbler	22
12. House Wren	21
13. Cedar Waxwing	19
14. Sedge Wren	17
15. Blue Jay	16

RARE AND UNUSUAL SPECIES

Great Blue Heron (*Ardea herodias*)

This species is not a listed species but is a species of concern due to declining habitat. The presence of a nesting colony is very significant. A colony of 4-5 nests was discovered on the edge of a pond in the northwest section of the station. At least 5 young successfully fledged. See Figure 6a.

Great Egret (*Casmerodius albus*)

This species is listed as a Species of Concern by the ODNR Division of Natural Areas and Preserves. A total of six adult birds were observed on the station during the survey period. All birds were observed to be foraging along streams within the station. No evidence of nesting was found. This species does nest in several areas close to the station.

Cattle Egret (*Bubulcus ibis*)

This species is listed as a Threatened Species by the ODNR. Only one adult was observed on the station. It was observed foraging in a USDA study plot off Pentolite Road. No evidence of nesting was found. This species does nest in several areas close to the station.

Black-crowned Night-Heron (*Nycticorax nycticorax*)

This species is listed as a Threatened Species by the ODNR. Three adults were observed on the station. All were observed foraging along streams and ponds. No evidence of nesting was found. This species does nest in several areas close to the station.

Mute Swan (*Cygnus olor*)

This species is not a listed species but an alien species which is of special concern because of its behavior during the breeding season. They are very aggressive towards all other nesting waterfowl within its nesting territory. Most wildlife area managers remove birds from the area. One adult bird spent the summer on pond in the northwestern section of the station. No nesting was observed. See Figure 6b.

Broad-winged Hawk (*Buteo platypterus*)

This species is typically a more northern species with few nesting records for Ohio. Those records which exist are for northeast and northwest Ohio. The Oak Openings area west of Toledo is one of its more likely areas. The presence of a territorial adult is significant. No nest or mate was located. See Figure 6c.

Wild Turkey (*Meleagris gallopavo*)

The reintroduction of this species into all counties of Ohio has been very successful. The presence of three birds on the station in April and May was not unexpected. It was somewhat surprising that nesting was not discovered. It can be expected in the future. See Figure 6d.

Northern Bobwhite (*Colinus virginianus*)

This species has been in steady decline since the 1970's. Only two males were discovered during the 1994 surveys and only one this year. The habitat appears to be here but the birds are not. It is somewhat surprising that it is hanging on this long. The birds may be released birds to the area which have wandered onto the station. See Figure 6e.

Virginia Rail (*Rallus limicola*)

This species is listed as a Species of Concern by the ODNR. There is only marginal habitat on the station. A territorial male was only present for several days in a moist area near the intersection of Columbus Avenue and Maintenance Road. There is a shallow stream running from this area with potential habitat along it but the bird was not relocated after several days. See Figure 6f.

Barred Owl (*Strix varia*)

This species is not typical of this area. It is not uncommon in the southern areas of Erie County and surrounding counties but is fairly uncommon here. However, the habitat, wet, mature woods is present on the station and so the species is not totally unexpected. Two birds were found in April by Ralph Pfingsten while doing amphibian census in the woods north of the reactor. One bird responded to a tape of Barred Owl calls in early June. Nesting success is unknown. The number of Great Horned Owls on the station makes success of this species very slim. See Figure 6g.

Whip-poor-will (*Caprimulgus vociferus*)

This species is very uncommon in north-central Ohio. It is fairly common in southern and northeast Ohio and some birds are found in northwestern Ohio. A single bird was found calling during an owl survey in mid-June. Habitat is present and breeding is possible. See Figure 6h.

Alder Flycatcher (*Empidonax alnorum*)

This is a more northern species of flycatcher. Ohio is at the very southern edge of its breeding territory. The station appears to be one of the prime locations for this species in northern Ohio. This has to be one of the highest densities for this species in Ohio. Twenty-one territorial males were found on the station. One nest was also discovered. It is a species which prefers wet, shrubby areas. See Figure 6i.

Least Flycatcher (*Empidonax minimus*)

Another more northern species of flycatcher, for which Ohio is at the very southern edge of its breeding territory. Only 2 territorial males were found on the station. See Figure 6j.

Bell's Vireo (*Vireo bellii*)

This is a western vireo which shows up in Ohio on an annual basis. However, usually there are only one or two found within the state. This male was defending a territory for 8 days during the season. Nesting success is unknown but the sighting is significant. The station had plenty of appropriate habitat. It has nested successfully at Resthaven Wildlife Area to the west of the station in recent years. See Figure 6k.

Sedge Wren (*Cistothorus platensis*)

This species is listed as an Endangered Species by the ODNR. The station still continues to be one of the strong holds within the state of Ohio. Although this years number of 20 territorial males is down from 1994's 24 territorial males, it is an important breeding area for this species in Ohio. The old field areas of the station are its prime habitat. See Figure 6l.

Black-throated Green Warbler (*Dendroica virens*)

This species is listed as a Species of Concern by the ODNR / Division of Natural Areas and Preserves. An adult male was on territory in the wooded area in the western part of the station. It is appropriate habitat and is the same areas where an individual was found in 1994. See Figure 6m.

Prairie Warbler (*Dendroica discolor*)

This species is typically found in mixed deciduous / coniferous woods during early stages of development. The presence of a singing male on June 12 is probably the result of a wandering bird from southern Ohio where they are much more common or a spring migration overshoot bird which was working its way back south. The station offers minimal habitat. See Figure 6n.

Black-and-white Warbler (*Mniotilta varia*)

This species isn't listed but is an indicator of a health woodlot. Its increased presence on the station shows improvement in ground cover, as it is a ground nester. Five territorial males were found on the station and a pair was observed feeding young which shows that they nested successfully. Only one territorial male was found in 1994. See Figure 6o.

Mourning Warbler (*Oporornis philadelphia*)

This species is listed as an Endangered Species by the ODNR / Division of Natural Areas and Preserves. In a typical year, fewer than 3 territorial males may be found statewide. The presence of 7 territorial males on the station is extremely significant. The discovery of a nest near bunker 9141 was remarkable. This is a species which likes thick, secondary growth of shrubs with a canopy. The area around the

bunkers has become very good for this species. In fact 5 of the 7 territories were within a mile of this nest. See Figure 6p.

Henslow's Sparrow (*Ammodramus henslowii*)

This species isn't listed but is a grassland / pastureland species which is declining nationwide. The population at the station is one of the most significant in northern Ohio and has increased since the 1994 survey. In 1994, seven territorial males were recorded for the station. This year it has increased to 20 territorial males. It is a species of old pasture-type habitat which is fairly abundant at the station. See Figure 6q.

DISCUSSION

General Overview of 2001 Surveys

When compared with the results of the 1994 study, this year's data is very similar. It is necessary to be careful when comparing only 2 years of data as it may be of limited value. When looking at populations it is more important to look at long-term data. However, trends can be shown between the data of two studies which are separated by several years. The species diversity between 1994 and 2001 is not statistically different. On the 1994 surveys, 115 species and one hybrid were observed compared to this year's 125 species. Comparison of the two years species list shows 135 species and one hybrid observed on the station in the two years of breeding bird surveys. 105 species were observed during both years surveys. This represents 78% of the total species observed. Of the 30 species not observed both years, 15 are considered migrants which were still moving north to their normal breeding grounds and are not be expected during the breeding season in Ohio. Of the remaining 15 species, eight are species which the station has marginal habitat for and should not be expected at the station. The last 7 are species that are not unexpected but not common for the area. The station has marginal habitat for these species. Of the 105 species observed both years of surveying, 97 were recorded as potential breeders on the station. Again, the diversity of the station does not seemed to have changed between the years of the survey. However, a look at the number of individuals shows an increase in the populations of many species on the station. A look at the number of territorial males found in this year's survey, shows that of the top 25 species, only one had a decline in the number of territorial males over 1994 and 21 out of the 25 were in the top 25 of both years. The number of individuals found in 1994's top 25 species was 3014 territorial males compared to this years 4245 individual territorial males. That is an increase of 41% in the population of those species. Sixty-four species of the 97 potential breeding species showed an increase while only 29 species showed a decline. There has been a significant increase in the population of birds on the station. Most of this increase appears to be in species favoring woodlands and shrubby habitats. The declines in populations appears to be mainly in species favoring woodlands and grasslands. More on this is discussed in the section on Territorial Male Survey and Breeding Bird Survey. A complete list of the birds found during the 2001 breeding season at the NASA Plum Brook Station with breeding status can be found in Appendix H.

Breeding Bird Survey Route

In looking at the data from the BBS route, most of the results are conducive with other BBS route in northern Ohio of similar habitat. When comparing species abundance with species frequency, there are no unusual records. In fact all 15 species of the top 15 species on each list are the same. Only eight species stand out as being unusual for the region. The Broad-winged Hawk is on the edges of its normal breeding habitat. The closest confirmed nesting areas are the Oak Opening west of Toledo. There is habitat for this species at the station. However, only a territorial male was observed, no actual nesting at this time. The Northern Bobwhite populations in northern Ohio crashed in the winter of 1977 and have never returned. Good habitat for this species is found on the station. However, it is suspected that this bird was released. Alder Flycatcher is a northern species which is occasionally found in northwestern Ohio and fairly regular in northeastern Ohio. There is fairly good habitat for it on the station and so it is not unexpected. There were territorial birds found in the 1994 study. Sedge Wrens are fairly rare in Ohio but seem to be increasing with the increase in Conservation Reserve Plots which have increased the grassland habitat which they require. The Black-throated Green Warbler was found in appropriate habitat and, although it was only recorded on one route, was located frequently during throughout the season in the same area. One of the biggest surprises of the breeding season were the discovery and numbers of Mourning Warblers and Hooded Warblers. The presence of these species shows a significant change in the habitat at the station. The Henslow's Sparrow requires similar habitat to that of the Sedge Wren and so it was not a surprise to find it. If the habitat of these last four species is maintained, these populations should survive and even increase.

A comparison of this Breeding Bird Survey route with the data collected in 1994 shows 101 species recorded during the surveys in both years. Of these 101 species, 86 were observed during surveys in both years. Again, a sign that the diversity of the station has not changed significantly between years. Only 8 species were observed in 1994 but not 2001 and 7 observed in 2001 but not in 1994. Only two of these were not potential breeders on the station. Of the 86 species recorded during both years of the survey, 51 species showed an increase, 30 showed a decrease, and 5 were unchanged. Of the 51 species showing an increase 41% were mainly forest species and 33% were mainly shrubby / secondary growth favoring species. Of those showing a decline, 43% were grassland species and 37% were forest species. Something is going on in the forest areas but what, is unknown. A look at the make-up of the species with increases shows that of the forest species which show an increase, 26 % are cavity nesters, 48 % are canopy nesters, and only 4 % are ground nesters. Of those forest species which showed a decline, 9 % are cavity nesters, 27 % are canopy nesters, and 18 % are ground nesters. The rest are mid-canopy nesters. The only general trend here is that ground nesters are still having a tough time but it has improved some.

In comparing the data from the historical BBS routes with data collected in this survey, it must be remembered that the former route was only 14.9 miles long with 25 stops. This will help to account for some of the disparities in the results between this survey and the 25-mile standard survey route. However, the results of these earlier routes when compared against this year's June 14th run of this historical route are fairly similar (see Appendix A1) as are the 2001 standard Breeding Bird Survey and similar surveys which were run in the area. It should be noted that protocol of the Patuxent Wildlife Research Center under the U.S. Geological Survey would not compare data from a route in which different individuals collected the data. Although the data does show similar trends to that of the standard route, a comparison will not be

attempted here. A discussion of this route and some of its data were presented in the 1994 report. It is recommended that this route and its data not be used in future analysis of the breeding birds of the Plum Brook Station.

Atlasing for Breeding Birds

Analysis of the Atlas data shows few unexpected results. The 1994 data showed 102 potentially breeding species on the station. Of these, 81 were confirmed breeders, 11 were probable breeders, and 10 were possible breeders. During the 2001 season, 107 potentially breeding species were recorded on station. Of these, 86 were confirmed breeders, 15 were probable breeders, and six were possible breeders. Between the two years 113 potentially breeding species were recorded on the station. Of this number, 96 species or 85 % were recorded as potential breeders both seasons. The diversity of the station is very stable, if not increasing. The average number of species recorded for a block in this area during the last Ohio Breeding Bird Atlas project was 73.4 species. The Plum Brook Station is 30+ % above that average which makes it one of the most significant pieces of avian habitat, diversity-wise, in northern Ohio.

A breakdown of the 2001 nesting species by habitat preference looks like this:

12 (11 %)	Generalist - found in various habitat types
45 (42 %)	Forest - prefers mature forest
27 (25 %)	Shrub / Secondary Growth habitat
18 (17 %)	Grassland
5 (5 %)	Water

The majority of the diversity of the station is found in the woodlands. This is up slightly from 1994's 40%. The shrub / secondary growth species are also up from 20 %. The others are down slightly.

Significant species are discussed in the section entitled Rare and Endangered Species. Of note is the decline in the number of grassland sparrows. Also, of note is the absence of Upland Sandpiper. During the 1970's, 1980's, and early 1990's the station was one of the strong holds of this threatened species. No records of this species were recorded this year and station personnel noted that it had been several years since they had observed any. The habitat for this species still appears to be present and so is an explanation for its decline. The only nest found during the 1994 study had been run over by a mower. The current mowing schedule of the best habitat in the Ohio Air National Guard area is responsibly for the decline of this species and other grassland species. These grasslands can not be mowed during the middle of the nesting season and expect to hold viable populations of grassland birds. See the Recommendation section for further discussion of this topic. The lack of Common Nighthawk is also unexplained. The habitat is present. Since they are a ground nester, they may be affected by the deer population and associated coyote population. The Carolina Wren population appears to be somewhat below that of similar habitats of northern Ohio. Again, the reason is baffling. It is a species that is affected by winter weather however, most other northern Ohio populations have recovered.

In general, the diversity of bird species on the Plum Brook Station is excellent and appears to be improving. Many species have increased greatly. The question is which species and habitat does the station wish to manage for? The forest areas are in much better condition than 1994 and those populations are showing the improvement. The grassland areas are succeeding into

shrubby areas or not being managed properly and so grassland species are in decline. However, shrub / secondary growth loving species are increasing greatly. A long-term management plan needs to be setup and decisions need to be made as to which habitats and species does the station want and in which numbers. The Plum Brook Station is still one of the best and most significant breeding bird areas of northern Ohio. Its diversity speaks for it self.

Counts for Territorial Males

The numbers of territorial males correlates very well with the other two studies. It must be remembered that these numbers are minimum numbers as all of the habitat was not covered but a very large percentage was and a greater amount of time was spent covering those areas. Of the 107 species of potential breeders found on the station during the 2001 season, 96 were found during the 1994 season also. Of these species found in both season, 64 showed increases in the number of territorial males, 26 showed declines, and 6 were unchanged. The increases varied from as little as 2% and go as high as 600%. These increases can be misleading as a species with small numbers can show large increases easily. However, some species stand out clearly. In 1994, 100 territorial Yellow Warblers were found, this season that number jumped to 223 which is 123 % increase. This increase is due in large part to the increase in shrub habitat which it prefers. The Eastern Screech Owl numbers went from 20 in 1995 to 64 this season. However, this jump is more likely due to increased coverage and survey for the species. Several evening surveys using tape recordings of the species' call contributed to this increase. In all, 16 species showed 100+ % increase in territorial numbers. Most of these species favor secondary growth or forest habitats. The greatest declines were in mainly grassland species. Savannah Sparrow is down 46 %, Grasshopper Sparrow is down 62 %, Vesper Sparrow is down 58 %, Bobolink is down 83 %, Ring-necked Pheasant is down 87 %, and Northern Bobwhite is down 50 %. Hard to explain is the decline of Veery, down 71 % when most other forest ground nesting species have increased. Also hard to explain are declines by House Finch, Rock Dove, Turkey Vulture, Cooper's Hawk, Brown-headed Cowbird, American Kestrel, and Hairy Woodpecker. It must be noted, again, that it is not ideal to compare just two years of data when looking for trends and some of these increases and declines may just be natural and not permanent. It did not talk with USDA personnel about any of their projects but some of their work may have contributed to the decline of some species, like Brown-headed Cowbird, Rock Dove, and Turkey Vulture.

Many of the neotropical migrants appear to be doing well at the station. Of the top 50 species, 16 are neotropical migrants which shows that the habitat at Plum Brook is very critical. This number is down from the 1994 studies number of 22 neotropical species in the top 50. Of these 107 potential breeders, 42 were neotropical migrants and this is down from 49 in 1994. The number of ground nesting species in the top 50 is only 6 which is the same as 1994. This is another indication that ground nesters are having problems on the station.

Several species were noticeable by their absences. Dickcissel and Western Meadowlark are two that could easily show up on the station. Both are found in northwest Ohio and the habitat exists on the station. They should be looked for in the future.

Transect Analysis

The transect routes were setup as another technique to gather information about the density and diversity of species at the station. Thirteen out of 15 of the top 15 species appear on the Top Territorial Species and Top Breeding Bird Survey lists, further demonstrating the validity of all the survey techniques employed at the station. The advantage of these routes will be

demonstrated in future studies of the station. These routes will serve as baseline data. As mentioned in the Methods section, up to 6 more routes can and should be planned for the station and one of these needs to be in the Ohio Air National Guard area, as that is a unique habitat type on the station.

Problems and Recommendations

Problems:

1. White-tailed Deer Population - This population appears to be down from the 1994 numbers and ground cover is showing the benefits. The browse lines are still evident but the woodlands show much more ground cover and some woodland ground nesters have increased. The deer population needs to continue to be monitored and maintained at at or below present levels in order to maintain a health avian population.
2. Coyote population - This population also appears to be down from the 1994 levels as well. These animals feed mainly on small mammals and birds. Their populations also need to continued to be monitored and maintained at or below present levels in order to maintain a health avian population.
3. Fox Squirrel population - Fox Squirrel was the most frequently observed mammal. They are omnivorous and will feed on bird eggs or young. This population also needs to be monitored and maintained at or below present levels in order to maintain a health avian population. Several Red Squirrels were also observed on the station. These animals are a major predator of young nestlings. Its populations, also, need to be watched.
4. Burning habitat - Too frequent burning of grasslands and woodlands was a problem in the past. A planned control burning program can be beneficial to both plants and avian life at the station. This appears to be the case and should be continued.
5. Mowing schedule - The need to mow some areas of the station on a regular basis is understandable. However, May, June, and July are not the times to do this. This is maximum nest time for most grassland nesting species. Grassland species are among the most threatened species of birds today. Mowing at this time destroys many of their nests or exposes them to predators more easily. This was a problem in cited in the 1994 survey. It appears to continue to be a problem, primarily on the Ohio Air National Guard areas. These areas were mowed during the last two weeks of June which is prime nesting time for most grassland nesting species. In talking with personnel at the station, this has been the practice for the last 7 years. I believe, this practice has wiped out the last Erie County nesting population of Upland Sandpiper, a threatened species in Ohio, and is responsible for the decline in grassland species shown in this year's data. The recommendation of the Ohio Division of Wildlife is that grasslands not be mowed until after July 15. The current mowing schedule makes these lands a death trap for grassland species using these areas. They arrive at a prime nesting habitat, setup a territory, begin to nest, only to have the nest destroyed or exposed by mowing.
6. Mute Swan - An adult Mute Swan was found on territory in the western section of the station. This species is an introduced species which is a threat to other native waterfowl in the immediate area.

Recommendations:

1. Deer Populations - A deer herd of 2-300 should be maximum. The current herd should continue to be reduced until this level is achieved and maintained. This can be done by trapping and removing, herding out by knocking down a fence, hunting, and then controlled at the proper number.
2. Coyote Populations - If the deer population is reduced and forest ground cover is restored, this population may be controlled at a natural level. They can be and are important to the ecosystem of the station.
3. Squirrel Populations - If the deer population is reduced and forest ground cover is restored, this population may be controlled at a natural level.
4. Burning habitat - A habitat master plan needs to be designed and implemented. Included in this plan should be a controlled burning schedule. Burning should be confined to the grassland areas and should not be yearly but every 2 or 3 years. Burns need to be in the fall or early spring. This would be decided in the habitat master plan.
5. Mowing Schedule - A regular mowing schedule needs to be included in the habitat master plan. Open fields should not be mowed from April 15 through August 15. This would allow many grassland species the chance at two broods. This program is especially important on the lands used by the Ohio Air National Guard, as these are unique grassland habitats. Roadsides should only be mowed the width of the mower during the breeding season. If a proper burning schedule is instituted, mowing of open fields will rarely be needed.
6. Woodland diversity - A habitat master plan needs to be designed and implemented. Included in this plan should be a detailed study of the woodlands and recommendations on their use, improvements, and management. A habitat management plan would be a good idea for the whole station to aid in future development, use, and protection of critical areas. The current management of the station favors secondary growth species, as evident by the huge increase in the populations of those species. A decision needs to be made as to which areas will be allowed to succeed into woodlands, which will be grasslands, and which will be maintained in secondary growth. Ideally, a balanced diversity of habitats would be best. A master plan should be devised looking at all areas of the station with a plan for each type of habitat. Several of the key grassland areas have begun to succeed to shrub and will become woodlands. These are lost habitat for grassland species. A decision needs to be made as to which species are desired and habitat managed for those species. Currently, the most abundant species are those which are regularly found in secondary or shrubby growth. This habitat is not a climax community and so will not last. Doing nothing to these areas is doing something. They will change and the species diversity will change with them.
7. Mute Swan - It should be removed from the area. Consult ODNR / Division of Wildlife.

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SECTION B.2
BREEDING BIRDS OF LEWIS FIELD



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For

**Ohio Department of Natural Resources
Division of Natural Areas and Preserves**

**NASA Glenn Research Center
Brook Park, Ohio**

**Breeding Bird Survey
Breeding Season 2001**

**H. Thomas Bartlett
Ohio Department of Natural Resources
Division of Natural Areas & Preserves**

Introduction

The primary objectives of this study were to document the avian community using and nesting at the NASA Glenn Research Center-Brook Park facility and to document the presence of any state or federally listed species nesting on the grounds of the research facility.

Methods

Breeding birds were inventoried using a total count methodology in which the entire area was censused, all species and individuals seen or heard were recorded and a census of territorial males was made. This is a similar method used by Rice in his 1994 study. Species were also studied for nesting activity using the criteria of the Ohio Breeding Bird Atlas. Species were recorded as migrant, visitor, possible breeder, probable breeder, and confirmed breeder. For the purpose of this survey the study was divided into five count areas (Figure 1). These are the same areas used by Rice in the 1994 survey. Each of these count areas were surveyed as separate entities. Each area was surveyed on three dates during late May, mid-June, and early July. Most of the survey time was spent in areas C, D, and E as these areas contained habitat most likely to support a greater diversity nesters. The Abram Creek corridor was an area of concentrated census. Areas A and B were mostly man-made structures, lawns with planted trees and shrubs, or areas under construction and so received less census time.

During the surveys, all count areas were covered on foot, accessing as much of the habitat as possible. The survey route in Area C tended to follow along both sides of the small creek draining from the airport and working back along Abram Creek and Cedar Point Road. In the case of Abram Creek (Area D), the survey route established started at the intersection with Duct Bank Road, followed the stream channel to the bridge site on Cedar Point Road, returning along the west ridge to the beginning point, following the channel down stream to West Area Road and back. The survey route in Area E tended to follow along both sides of the small stream (drainage ditch) that fed into Guerin Pond in the north part of this area. Surveys for breeding birds were conducted in the morning hours when bird song is at its peak. All surveys were begun before sunrise and usually finished by noon. All areas received some survey time on each visit but most time was spend in Areas C, D, and E. Survey data was recorded separately for each area. See Table 1 and Table 2. Table 1 is of total individuals observed and Table 2 is of territorial males observed. The former figure is highest number recorded during one survey and not a cumulative total.

The nesting bird survey used is that of the Ohio Breeding Bird Atlas criteria. This was used to determine breeding status of species using the study site. This type of survey was used by ODNR/DNAP during the 1980's to determine the nesting species of Ohio. The five study areas of the research center were censused independently and then as a whole (See Table 4). Data was collected at the same time as the total count census. The status codes used for this study are listed below:

- V Visitor, not breeding on site
- M Migrant, not breeding on site

Breeding Codes

Possible

- 10 Species seen in possible nesting habitat, or singing male(s) present

Probable

- 21 Pair in suitable habitat
- 22 Singing male present on more than one date
- 23 Bird or pair on territory
- 24 Courtship and display
- 25 Visiting probable nesting site, or nest building by wrens or woodpeckers
- 26 Nest building or excavation of nest hole

Confirmed

- 30 7 or more territorial males
- 31 Distraction display
- 32 Used nest
- 33 Female with egg in oviduct
- 34 Recently fledged young, not yet able to fly
- 35 Adult with fecal sac
- 36 Adult with food for young
- 37 Active nest with unidentified contents
- 38 Nest with eggs or identifiable eggshells beneath nest
- 39 Nest with young

Results and Discussion

Surveys were run on three trips to the Glenn Research facility between late May and early July of 2001. The dates were May 31, June 19, and July 4. This is within the prime nesting season of most Ohio breeding birds. A total of 70 species and 886 individuals were identified on site during these surveys. See Table 1. Of these 70 species, 60 were recorded as potential nesting species, 8 were recorded as visitors to the site, and 2 were recorded as migrants which nest further north of Ohio. These last two, Bay-breasted Warbler and Wilson's Warbler, are common migrants through Ohio in spring and fall. Neither has a nesting history within any of Ohio's habitats. Of the 8 species determined to be visitors to the site, four have the potential to nest on site but appeared to be just visiting from a more potential nesting area of the Rocky River corridor to the west of the

facility. These include the Spotted Sandpiper, Barred Owl, Belted Kingfisher, and Pileated Woodpecker. As with Rice's study, the vast majority of species were found to be species that are easily adapted to urban habitats or are edge oriented species that nest in brushy fence lines or along narrow riparian corridors such as found along Abram Creek. As with Rice's findings, the wooded, successional, and grassland habitats found at the NASA Glenn Research Center are still too small and fragmented to provide suitable habitat for many of the species which require these habitat types.

However, the 70 species recorded at the facility during the 2001 surveys represent a 75% increase in the species diversity over Rice's 1994 study. Rice's report makes no mention of visitors or migrants, so it is assumed that he did not record this data and only recorded territorial species. With visitor and migrant data removed from the 2001 findings, there is still a 50% increase in species diversity. Rice's total count of individuals was 377 compared to 2001's 886 individuals, which is 135% increase. Again, it must be assumed that Rice's data only included territorial males. If this is the case, then the increase is only 37%. This is significant but a much more likely scenario. 1994 was a drought year in northern Ohio and breeding bird numbers were down. The 2001 nesting season appears to have been one of the better years in the last 10 for Ohio breeding birds. Ohio's Monitoring Avian Productivity and Survivorship (MAPS) stations have shown a significant increase in breeding birds and productivity. My own station at Springville Marsh State Nature Preserve in Seneca County showed an increase in 27% over its 7 year average.

As with Rice's findings in 1994, the majority of species found on site are those, which favor urban or edge habitats. Of the 60 territorial species recorded on the facility, 41 favor urban or edge habitats. This represents 68% of the species diversity. 15 species or 25% are primarily woodland or riparian species and 4 or 7% are considered to be grassland species. These are very similar percentages to the findings of Rice in 1994. A further comparison of species diversity with Rice shows that it has changed little since 1994. A comparison of the top ten most abundant species (See Table 3.) on site shows little change. Both lists share seven species and the top three are the same. Only two species found by Rice were not recorded in 2001. These were the American Redstart and Common Yellowthroat. The habitat conditions for both are still present and no explanation can be offered for their absence. The additional 20 species found in 2001 are a significant increase in diversity but are all typical species found in appropriate habitats, which are also present at the Glenn Research Center. The only exception is the Black-throated Green Warbler, which will be discussed later. All of the other 19 species are species that would be expected in habitats as found at the Glenn Research Center.

An effort was also made to determine the nesting status of each of the territorial species on site. See Table 4 and 5. Using the Ohio Breeding Bird Survey criteria on the 60 species believed to nest on the site, 37 species were confirmed nesting, 14 as probable nesters, and 9 as possible nesters. None of the species were unexpected with the exception of the Black-throated Green Warbler. See the Species Account section for further discussion of this species. Of the species determined to be visitors on the site, the Great Blue Heron, Turkey Vulture, Ring-billed Gull, and Herring Gull are clear.

Although the Turkey Vulture has been known to nest in abandoned buildings and has the potential to nest on site. The remaining four species, Spotted Sandpiper, Barred Owl, Belted Kingfisher, and Pileated Woodpecker are not so clear. The habitat for each to nest is present on the grounds. Spotted sandpipers nest on sandbars. Small bars are found on Abram Creek but they are marginal in size at best. Rocky River habitat is much more likely and offers much more ideal habitat. This individual was probably an adult foraging up Abram Creek from Rocky River. Even this is surprising as the water quality of Abram Creek is so poor as to offer very little in the way of food for this species. The Barred Owl was found along the western edge of the facility on the ridge overlooking Rocky River. Habitat on the facility is marginal, at best. This individual was more likely from the better habitat of the Rocky River corridor. The Belted Kingfisher needs an eroded streamside and a clear stream with plenty of small fish as a food source. Abram Creek offers nesting habitat but until mid-June, did not offer any food source. The stream was essentially dead. No organisms other than a slime mold were observed in the creek until mid-June. In mid-June numerous schools of young White Suckers (*Catostomus commersoni*) were found in the creek, along with a few water striders (*Gerris* species?), and a single crayfish (species unknown). The suckers seemed to have migrated up the creek from Rocky River, which is common for this species. These school and the clear waters of Abram Creek at this time of year provide an excellent food source for kingfishers. However, the poor water quality earlier in the nesting season makes this a poor nesting site for kingfishers. The Pileated Woodpecker was found working the Abram Creek corridor in mid-June. This is Ohio's largest woodpecker and requires large mature forests. The Rocky River corridor provides excellent habitat for this species and the Abram Creek corridor provides similar habitat but on a smaller scale. It is not impossible for this species to nest on site but it is unlikely that it would be missed. For that reason, it is believed to be a visitor from the Rocky River corridor.

A classification of the species diversity at the facility based on migratory status shows three major groups of species; resident, short-distance (U.S. migrants) migrants, and neotropical migrants. Resident species are those which tend to stay within the area all year. Short-distance or U.S. migrants are those which migrate to areas of the southern United States in winter. Some of these species may even winter in Ohio depending on the winter weather. Neotropical migrants are those, which migrate to the tropics or southern hemisphere in winter. Of the territorial species recorded on the facility, 24 were resident (40%), 10 U.S. migrants (17%), and 26 were neotropical migrants (43%). This is almost exactly the same as Rice's findings in 1994. His data showed 40% resident, 15% short-distance migrants, and 45% neotropical migrants.

A comparison of species diversity between the count areas (See Tables 1 and 2) shows that areas A and B had the lowest species diversity. This was not unexpected, as to the nature of their primary habitats and is the same as Rice's findings. Count A area was the smallest and most disturbed of the count areas. Much of the area is manicured lawns, ornamental trees and shrubs, man-made structures, or highly disturbed due to construction. Only 22 species were observed in this area. Although count area B is the largest of the five areas, its habitat also consists of manicured lawns, ornamental trees and shrubs, and man-made structures. Much of this area is the heart of the research facility.

It is characterized as an urban habitat and only 24 species were observed in this area.

Count areas C, D, and E had the highest diversity of breeding birds with 49, 40, and 51 species respectively. As in the 1994 study, these three count areas continue to represent those areas of the facility with the largest amounts of natural habitats in the forms of woods, riparian, successional areas, fields, and lawn areas. The avian communities utilizing these areas of the research facility were similar in their species composition. Although count area D was somewhat lower due to man-made structures, construction, and water quality of Abram Creek. Count area D does show a slight decline in species diversity when compared the data from areas C and E. As Rice makes no mention of the water quality of Abram Creek, one has to wonder if the poor water quality and overall health of the stream isn't having an effect on the organisms that would normally use this habitat. Several species, which Rice found in numbers, appear to have declined or disappeared. Rice had six Acadian Flycatchers to one this year, 12 Red-eyed Vireo to four this year, and three American Redstart to zero this year. All of these species are neotropical species. Count areas C and E continue to provide more favorable habitat for those species requiring successional and wooded edge habitats.

The southeastern edge of the count area C that bordered the Cleveland Hopkins Airport and the disturbed weedy area on the western edge of count area E produced two grassland dependent species of interest; Grasshopper Sparrow and Savannah Sparrow. These two species require fairly extensive grasslands, which aren't mowed on a regular basis for successful nesting. It is not believed that neither of these species nested successfully. The habitat was too disturbed and/or small. With the changes being made in count area C and E, it is not likely that grassland species will nest here in the future.

Woodland nesters have a better chance of surviving within the facility's grounds. The woodland and riparian corridor along Abram Creek still supports a fair diversity of species. In addition, it appears, to be a foraging area for several species from nearby areas. Significant species within this area are the Red-shouldered Hawk, Eastern Wood-Pewee, Acadian Flycatcher, Red-eyed Vireo, Black-throated Green Warbler, Louisiana Waterthrush, Scarlet Tanager, and Rose-breasted Grosbeak.

Recommendations

All of the species recorded at NASA's Brook Park facility are common or relatively common species with statewide breeding distributions in Ohio. With the exception of the two grassland sparrows, the Black-throated Green Warbler, and several of the woodland species discussed above, the majority of species at the research facility can utilize fragmented, edge-dominated habitats or are edge adapted species to begin with. Many of the species including the most common ones at the facility are those that thrive in urban environments. For the few species and habitats of interest, the following recommendations are offered:

1. The wooded riparian corridor along Abram Creek should be protected, particularly those areas along the stream terraces. Where possible, the tree cover along the ridges of

this area should be widened and increased. The maintenance of the forest canopy in areas adjacent to the stream is critical for species such as the Acadian Flycatcher, Eastern Phoebe, Yellow-throated Vireo, and Louisiana Waterthrush. The water quality and stream quality of Abram Creek also needs to be addressed, improved, and maintained.

2. While only a small part of the overall habitat needs of the Grasshopper Sparrow and Savannah Sparrow, the grassy fields adjacent to Cleveland Hopkins Airport and in Section E to the west should be maintained and if possible, increased. Mowing should only be done late in the year as necessary to control woody plant growth. The Division of Wildlife recommends that grasslands not be mowed until after July 15.

Species Accounts

Endangered and/or Threatened Species:

None observed on the facility grounds.

Species of Special Concern (ODNR)

Black-throated Green Warbler (Dendroica virens)

Neotropical migrant and summer resident. This species is an uncommon to rare nesting species in Ohio. It is more common in the Canadian forests. ODNR has placed it on its list of Special Concern because of its declining numbers. They normally require large mature forested areas. This individual observed on site was an adult male which appeared to be defending and marking a territory. It was only observed once towards the end of the nesting season, which leads me to believe it was an unmated individual, which had wandered onto the facility from the Rocky River corridor looking for a female. The facility has a very limited and marginal amount of appropriate habitat for this species.

Territorial Species of Interest

Canada Goose (Branta canadensis)

U.S. migrant and resident. This species has become increasingly common throughout Ohio in recent years. It is fast becoming a pest species. Several pairs were observed to nest successfully on the research facility grounds. It needs to be watched before it becomes a problem. The manicured lawns are ideal habitat for it.

Red-shouldered Hawk (Buteo lineatus)

U.S. migrant and resident. This species was a Species of Concern several years ago but has rebounded somewhat. The presence of an adult male in the Abram Creek corridor was somewhat of a surprise and a positive sign. The habitat is here and this is another reason for the maintenance of the corridor.

Common Nighthawk (*Chordeiles minor*)

Neotropical migrant and summer resident. Only one individual of this species was observed. There should be more within the facility. It is a nester of flat, graveled rooftops, which are common at the facility. The reason for so few is unclear. Their main feeding period is dawn and dusk. It is possible that more were not recorded because no surveys were conducted at dusk.

Acadian Flycatcher (*Empidonax virescens*)

Neotropical migrant and summer resident. A fairly common species found statewide in suitable habitats. This flycatcher inhabits mature woodlands where they nest in the interior understories. It avoids edge habitats and normally will not be found in small woodlots of less than 30 acres. The only bird found in this study was located in the woods behind the Management Conference Building in count area E. None were found within the Abram Creek corridor in count area D. Rice found 6 pair there in 1994. The only explanation for this is possibly a decline in the water quality of Abram Creek.

Louisiana Waterthrush (*Seiurus motacilla*)

Neotropical migrant and summer resident. This species is largely confined to the unglaciated portions of Ohio where it inhabits the riparian edges of small, fast flowing streams surrounded by mature woodlands. Small numbers are found in northern Ohio where headwater tributary streams provide similar habitat conditions. This is a ground nesting species which is sensitive to forest fragmentation. At the facility three territorial males were observed. One young bird was observed being fed at the nest and a second adult was observed carrying food for young.