

**Species Survey  
NASA Lewis Research Center  
Plum Brook Station**

February, 1995

*Prepared for:*

*Office of Environmental Programs  
NASA/Lewis Research Center  
Cleveland, Ohio*

*Prepared by:*

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# ODNR

OHIO DEPARTMENT OF  
NATURAL RESOURCES

Fountain Square  
Columbus, Ohio 43224

February 2, 1995

Theodore J. Thomas, Project Manager  
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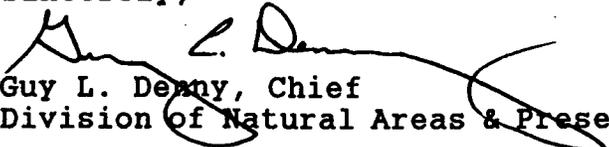
Dear Mr. Thomas:

This report documents investigations done by my staff and contracted researchers at the NASA Plum Brook Station, Erie County, Ohio, during 1994. The 6 sections of this document highlight the survey work done by experts in the flora and fauna of Ohio.

An overview at the beginning of the report includes a listing of all federal and state listed species found at Plum Brook Station during the survey. Following the overview are the 6 sections which detail information about the survey work completed, lists and tables highlighting results, and generalized management recommendations for the group reported on. The investigator's name and address can be found on the title page of the individual sections.

Thank you for giving us the opportunity to conduct these surveys and provide you with this information. There are many plant and animal species present on the station grounds worthy of management considerations. We hope this report will be useful when planning your future management activities for this facility. If we can provide any additional information or be of service to you in the future please feel free to contact myself or any of my staff.

Sincerely,

  
Guy L. Denny, Chief  
Division of Natural Areas & Preserves

**BIOLOGICAL INVENTORY  
OF  
THE NASA PLUMBROOK STATION  
1994**

**OHIO DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF NATURAL AREAS & PRESERVES  
1889 FOUNTAIN SQUARE COURT  
COLUMBUS, OHIO 43224**

## PROJECT OVERVIEW

The following report details the result of floristic and faunal surveys conducted at the NASA Plum Brook Research Station in 1994 by biologists working for the Ohio Department of Natural Resources, Division of Natural Areas and Preserves. Funding for these surveys was provided through a contract with The Bionetics Corporation, Brook Park, Ohio, which manages the area under a contract with NASA.

Inventory efforts in this study focused on the following:

PLANT SPECIES  
BREEDING BIRDS  
REPTILES & AMPHIBIANS  
FISH  
LEPIDOPTERA: MOTHS & BUTTERFLIES

While the primary emphasis was on the identification of any federal or state-listed species occurring on the station, all species encountered in the course of the surveys were identified. This data forms the basis for the reports found in this document. Included in each report are discussions of any listed species found, the overall findings of the particular survey, an annotated list of all the species identified, and any management recommendations that the particular researcher felt were germane to the plant or animal group under discussion.

The only federally listed species observed during these studies was the bald eagle (*Haliaeetus leucocephalus*). An adult was observed on one occasion in early June near one of the reservoirs. While this species does not currently nest on the Plum Brook Station, it is likely that the species is a sporadic visitor to the area as nesting adults are located in close proximity to the station.

A number of state-listed species were also identified during the course of these surveys and are listed below. Specific data and other remarks for each of these species can be found in the appropriate sections of this report.

State-listed species found at the NASA Plum Brook Station:

### Endangered

Least St. John's-wort, *Hypericum gymnanthum*  
sedge wren, *Cistothorus platensis*  
Thin-leaf sedge, *Carex cephaloidea*

### Threatened

grove sandwort, *Arenaria laterifolia*  
field sedge, *Carex conoidea*  
ashy sunflower, *Helianthus mollis*  
upland sandpiper, *Bartramia longicauda*

### Potentially Threatened (plants)

prairie false indigo, *Baptisia lactea*  
broad-winged sedge, *Carex alata*  
round-fruited hedge-hyssop, *Gratiola virginiana*  
Tall St. John's-wort, *Hypericum majus*  
Virginia meadow-beauty, *Rhexia virginiana*  
lance-leaved violet, *Viola lanceolata*

### Special Concern (animals)

Blanding's turtle, *Emydoidea blandingii*  
eastern fox snake, *Elaphe vulpina gloydi*  
smooth green snake, *Opheodrys vernalis*

it should be emphasized here that this survey represents the data collected for a single collecting (survey) season only. For several of the groups under discussion a single year is not an adequate length of time to provide a comprehensive survey on an area as large as Plum Brook. The drought which affected this area during the study also likely affected the survey results for many species. Data collection over several years on the Lepidoptera would be needed to gain a clear picture of the moth populations present on the area if that were desirable.

## DESCRIPTION OF THE AREA

### LOCATION

The NASA Plum Brook Station is located in Oxford and Perkins townships in west central Erie County, Ohio. The Station's approximate east and west boundaries are west longitude 82 38'30" and 82 43'00", respectively, and the north to south boundaries, north latitudes 41 23'35" and 41 20'00", respectively. The total area encompassed by Plum Brook Station is approximately 5,400 acres.

### PHYSICAL SETTING

The NASA Plum Brook Station is situated in Oxford and Perkins townships, Erie County, Ohio, in the physiographic region known as the Ohio Lake Plain. The soils of this area are derived from lacustrine sediments deposited by post-glacial lakes. The soil is light-textured and often sandy and of moderate or slightly acid pH. Plum Brook Station is underlain by Silurian limestone and Devonian shale. These formations are exposed at

scattered places where the overlying soil has been removed. Climate is moderated by the close proximity of Lake Erie. The growing season is approximately 130 days (Braun 1961, Bolsenga and Herdendorf 1993).

Braun, E. L. 1961. The woody plants of Ohio. The Ohio State Univ. Press, Columbus. 362 pp.  
Bolsenga, S. J. and C. E. Herdendorf (eds.). 1993. Lake Erie and Lake St. Clair handbook. Wayne State Univ. Press, Detroit, MI. 467 pp.

**SECTION A**  
**VASCULAR PLANT COMMUNITIES AND FLORA**

**Allison W. Cusick**  
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**Division of Natural Areas and Preserves**  
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## INTRODUCTION

Plum Brook station lies in an area of the Ohio Lake Plain known for its historic prairies. These prairies were studied in the late nineteenth century by E. L. Moseley of Sandusky, Ohio, who published his results in Sandusky Flora, 1899. Moseley stated that prairie grasslands at that time covered much of Oxford and Perkins townships. The original prairie flora can be reconstructed from a careful reading of his book plus his voucher specimens now in the herbarium at Bowling Green State University, Bowling Green, Ohio. These grasslands evidently were a mosaic of tall-grass and short-grass prairies dominated by big bluestem (Andropogon gerardii) and little bluestem (Schizachyrium scoparium), respectively. The short-grass community probably was established on well-drained sites, such as the highest sand ridges; the tall-grass community occupied more mesic situations. Poorly-drained openings probably were dominated by wetland grasses such as bluejoint (Calamagrostis canadensis) and prairie cord-grass (Spartina pectinata). Moseley reported few wetland species from the Oxford and Perkins prairies, however.

There is less historic evidence as to the composition of the original forest communities of this area. Judging from forests in comparable settings on the Ohio Lake Plain, however, we may assume that poorly-drained sites were occupied by pin oak (Quercus palustris), swamp white oak (Quercus bicolor) and bur oak (Quercus macrocarpa). The drier areas probably were dominated by other species of oaks, particularly white oak (Quercus alba) and shingle oak (Quercus imbricaria).

## METHODS

Botanical surveys were conducted at Plum Brook Station from 11 May to 20 October 1994. Plum Brook was visited 18 times during these six months by either this writer or James McCormac of DNAP. The initial surveys fanned out over the entire area in search of clusters of rare plant species or intact communities. Later efforts concentrated on the floristic clusters so located. The following areas at Plum Brook had the greatest diversity of plant species:

- 1) The grassy fields south and southwest of the junction of Fox and Patrol Rds, Perkins Township.
- 2) Seasonally-moist openings in the bunker area bordered by North and Center Magazine roads and west of Columbus Avenue, Perkins Township.
- 3) The area of the artificial pond north of Patrol Road and southeast of Taft Rd, Oxford Township.

- 4) Open ground and thickets at the crossing of Patrol Road and Olemacher Ditch, Oxford Township.
- 5) The area about the artificial pond west of Snake Road and south of North Magazine Road, Perkins Township.
- 6) A grassy depression and a white oak grove on both sides of Taft Road south of South Magazine Road, Oxford Township.
- 7) Young oak woods and moist, semishaded ground on both sides of the angling road northwest of the junction of Patrol and Taylor roads, Perkins Township.

The Division prepared voucher specimens documenting many of the species listed in this report. A set of these specimens will be deposited in the herbarium of The Ohio State University, Columbus, Ohio. Duplicate specimens were collected when population size permitted. The duplicates will be deposited in the herbarium of Kent State University, Kent, Ohio.

## RESULTS

### Plant Communities

No significant plant communities were discovered in 1994 on the Plum Brook Station. The woodlands and grasslands have been altered by a variety of causes. The historic prairies of the area were drained and plowed prior to the establishment of the station. Older trees are absent from the property, reflecting the clearing of the forests. The disturbance continued with the construction of the facilities at Plum Brook. Soil was removed and ditches were dug to create the present-day roadbeds and building sites. In many cases the prairie soils were scraped away to the shale and limestone bedrock. As a result of this disturbance, many prairie species recorded by Moseley in 1899 are no longer present. These include such Ohio rarities as arrowfeather (*Aristida purpurascens*), prairie rattlesnake-root (*Prenanthes racemosa*) and prairie ironweed (*Vernonia fasciculata*).

### Native Plant Diversity

A total of 327 vascular plant species were collected or observed at Plum Brook during the 1994 survey, 251 of which are considered indigenous to the area. The number is rather low because of the previous history of disturbance and the predation of deer. Many common wildflowers such as lilies, trilliums and gentians which occur elsewhere in Erie County are absent from Plum Brook because of the excessive browsing.

## Non-Native Species

The Ohio vascular flora has been estimated at approximately 2350 species (Cooperrider 1992). About 24% of these are not indigenous to the state (Stuckey 1992). Alien species have spread into Ohio in many ways and from many sources. A few were purposely introduced into our flora as ornamentals (Norway maple, Acer platanoides) or as potential crop plants (white sweet-clover, Melilotus alba). Many more were inadvertently introduced, including some of our most significant weed species such as Canada thistle (Cirsium arvense). Non-native species at Plum Brook include plants originally from Europe (downy chess, Bromus tectorum), Asia (tatarian honeysuckle, Lonicera tatarica) and the southern United States (Andropogon virginicus), to give only a few examples.

Seventy-six (76) non-native species are included in our annotated catalog. This number is typical for large blocks of land in Ohio. Most of the alien species at Plum Brook Station are innocuous plants which occur primarily on roadsides and old agricultural land. These species, such as chicory (Cichorium intybus) and Deptford pink (Dianthus armeria), pose little threat to the natural vegetation. Other non-indigenous plants are major competitors with native species, however. At Plum Brook these include garlic mustard (Alliaria petiolata), multiflora rose (Rosa multiflora, autumn-olive (Eleagnus umbellata) and crown-vetch (Coronilla varia). These aggressive aliens displace native species and prevent eventual re-establishment of the natural flora. Non-native species are marked with an asterisk (\*) in the annotated species list.

## Rare and Endangered Species

The 1994 survey located populations of twelve species of vascular plants listed by the Division of Natural Areas and Preserves as Ohio rarities (ODNAP 1994). These twelve species are ranked by ODNAP as: Endangered(E)--2; Threatened(T)--3; and Potentially Threatened(P)--7. Species locational forms and map locations for state-listed plant species are found in Appendix A at the end of this section. Abstracts detailing information on these species are found in Appendix B.

<u>Species</u>	<u>Rank</u>
<u>Arenaria lateriflora</u> (grove sandwort)	T
<u>Baptisia lactea</u> (prairie false indigo)	P
<u>Carex cephaloidea</u> (thin-leaf sedge)	E
<u>Carex alata</u> (broad-winged sedge)	P
<u>Carex conoidea</u> (field sedge)	T
<u>Gratiola virginiana</u> (round-fruited hedge-hyssop)	P
<u>Helianthus mollis</u> (ashy sunflower)	T
<u>Hypericum gymnanthum</u> (Least St. John's-wort)	E

<u>Hypericum majus</u> (Tall St. John's-wort)	P
<u>Rhexia virginiana</u> (Virginia meadow-beauty)	P
<u>Scleria triglomerata</u> (tall nut-rush)	P
<u>Viola lanceolata</u> (lance-leaved violet)	P

The rare plant species at Plum Brook occur as individual populations rather than in intact communities. This pattern reflects the fragmented nature of the area and its history of disturbance.

The ashy sunflower at Plum Brook provides a cautionary tale as to how a once-common plant may be reduced to a rarity. This species was so abundant in Moseley's time that he stated that the population on the Oxford prairie was "enough to supply the botanists of the world" (1899, p. 158). Today, a few hundred plants struggle to survive in the field south of the junction of Fox and Patrol roads. Plowing and ditching were the former forces reducing the formerly enormous population. Excessive predation of the young shoots by deer in recent years has wreaked further havoc. The plants now are dwarfed individuals only a few centimeters in height. None of the plants were able to flower and fruit in 1994 and thus have the chance to reproduce. That the ashy sunflower yet persists at Plum Brook is a tribute to the ability of prairie species to survive if their root systems remain intact. It is uncertain how long, however, the ashy sunflower can withstand the onslaught of continued browsing.

The lance-leaved violet at Plum Brook deserves special mention. Plum Brook undoubtedly has the finest population of this species known in Ohio. The exact number of individuals is uncertain, but possibly exceeds 10,000. It was difficult to arrive at an exact number in our 1994 survey since by mid May many individuals already had flowered. We could have been more accurate in this regard if the survey had started earlier in the spring. Moseley stated that this species was "rather frequent" on the "Oxford and Perkins prairies" (1899, p. 116). Lance-leaved violet has withstood the generations of disturbance far better than other native rarities at Plum Brook.

Two state-listed species collected by this writer at Plum Brook Station in 1982 were not relocated in the 1994 survey:

<u>Species</u>	<u>Rank</u>
<u>Linum sulcatum</u> (grooved flax)	P
<u>Xyris torta</u> (twisted yellow-eyed-grass)	T

The fate of these species is unknown. Suitable habitat exists for them and was thoroughly searched in 1994. Grazing by deer might have impacted the twisted yellow-eyed-grass. If the plants were reduced by browsing to tufts of basal leaves, they would be difficult to find among taller vegetation. The grooved flax

should resist grazing, however, since the stems are rather wiry. Searches for these species should be continued in future years.

## RECOMMENDATIONS

- 1) It is essential that the deer population at Plum Brook be drastically reduced. The deer are decimating the herbaceous flora, destroying the natural diversity of the area. The re-establishment of native vegetation can not occur so long as the deer predation remains at such an extreme level.
- 2) The present policies on burning of open fields should be continued and formalized. Periodic spring or fall burnings retard the spread of woody species into openings and permit prairie species to reproduce.
- 3) The mowing of roadsides and openings should be reduced to the absolute minimum required for safety. Many prairie and wetland species presently can not flower and fruit, and thus increase in number, because of the mowing of open land far away from roadberms. This excessive mowing is especially evident along the Patrol Road south from the junction of Fox Road to the station boundary. The temporary cessation of mowing in the summer of 1994, at our request, allowed species to be recognized which otherwise might have been overlooked in our survey. This includes the rarest species at Plum Brook, the endangered least St. John's-wort (Hypericum gymnanthum). At the crossing of Patrol Road by Olemacher Ditch, prairie-dock (Silphium terebinthinaceum) and northern blazing-star (Liatris scariosa) benefited from the suspension of mowing. Unfortunately, the mowing of that area recommenced in late August, preventing those species from shedding seeds and thus increasing the potential for their spread beyond that site.
- 4) Non-native species should not be planted at Plum Brook for any reason. Alien species not only threaten the native plants present at Plum Brook, but prevent re-establishment of the native vegetation. Crown-vetch (Coronilla varia), for example, has been introduced into the prairie field south and southwest of the junction of Fox and Patrol roads. The persistence and spread of crown-vetch compromise the natural qualities of that prairie opening. Similar plantings of non-native species should be prohibited in future planning.

## LITERATURE CITED

- Cooperrider, T. S. 1992. Changes in knowledge of the vascular plant flora of Ohio, 1860-1991. *Ohio J. Sci.* 92:73-76.
- Gleason, H. A. and A. Cronquist. 1991. *Manual of vascular plants of northeastern United States and Canada*. The New York Botanical Garden, Bronx, NY. 910 pp.
- Moseley, E. L. 1899. Sandusky Flora. *Ohio Acad. Sci. Spec. Paper No 1*: 1-165..
- Ohio Division of Natural Areas and Preserves (ODNAP). 1992. Rare native Ohio plants: 1994-95 status list. Ohio Department of Natural Resources, Columbus, OH. 26 pp.
- Stuckey, R. L. 1992. The invasion of foreign species "weeds" as indicators of 100 years of floristic change. *Ohio J. Sci.* 92:1 (abstract).

ANNOTATED VASCULAR PLANT SPECIES LIST  
PLUM BROOK STATION, ERIE CO, OHIO

EXPLANATION OF CATALOG

Species are listed alphabetically by genus and epithet. An English name is provided except in those cases where none is known for the species. Non-native species are marked with an asterisk (\*). The relative frequency of occurrence is estimated as:

- common--species which occur in large numbers throughout;  
frequent--species regularly encountered, but occurring in lesser numbers than common ones;  
occasional--species found in several places, but never present in large numbers;  
rare--species found in few places and in low numbers.

- Acer negundo*, box-elder maple  
frequent, streambanks, ditches and moist woods  
\**Acer platanoides*, Norway maple  
occasional, disturbed woods  
*Acer rubrum*, red maple  
common, dry to moist woods  
*Achillea millefolium*, yarrow  
frequent, dry fields, roadsides and about buildings  
*Agalinis purpurea*, purple false-foxglove  
frequent, moist openings and ditches  
*Agrimonia parviflora*, southern agrimony  
frequent, moist fields and ditches  
*Agrostis hyemalis*, ticklegrass  
occasional, dry, grassy fields and shallow openings  
\**Agrostis gigantea*, redtop  
common; moist fields, ditches and roadsides  
*Agrostis perennans*, autumn bent-grass  
frequent; dry woods and borders on shale  
*Alisma subcordatum*, water-plantain  
occasional, ponds and ditches  
\**Alliaria petiolata*, garlic mustard  
frequent, dry to moist woodlots  
*Ambrosia artemisiifolia*, common ragweed  
frequent, dry fields and roadsides  
*Ambrosia trifida*, giant ragweed  
occasional, dry fields and roadsides  
*Andropogon gerardii*, big bluestem  
frequent, dry to moist fields and roadsides  
\**Andropogon virginicus*, broom-sedge  
occasional, dry fields and roadsides  
*Antennaria parlinii*, pussy-toes  
occasional, dry fields and openings, especially on shale  
\**Anthoxanthum odoratum*, vernal-grass  
occasional, dry fields and openings, especially on shale

*Apocynum cannabinum*, dogbane  
 frequent, dry to moist fields and roadsides  
 \**Arabidopsis thaliana*, mouse-ear cress  
 occasional, roadberms and about buildings  
 \**Arctium minus*, burdock  
 occasional, disturbed fields and about buildings  
*Arenaria lateriflora*, grove sandwort (OHIO THREATENED SPECIES)  
 rare, woods along Ransom Brook north of reactor  
*Aristida dichotoma*, churchmouse grass  
 occasional, dry fields and openings  
*Aristida longespica*, slimspike triple-awned grass  
 common, dry fields and openings  
*Aristida oligantha*, prairie triple-awned grass  
 occasional, dry openings and roadsides  
 \**Artemisia ludoviciana* var. *gnaphaloides*, white sage  
 occasional, grassy roadsides  
*Asclepias hirtella*, prairie milkweed  
 common, dry to moist openings  
*Asclepias sullivantii*, Sullivant's milkweed  
 rare, moist field along Patrol Road south of Scheid Road  
*Asclepias syriaca*, common milkweed  
 frequent, dry to moist fields and roadsides  
*Asclepias tuberosa*, butterfly-weed  
 occasional, dry openings and roadsides  
*Aster ericoides*, white heath aster  
 rare, grassy strip along Patrol Road southeast of Taft Road  
*Aster laevis*, smooth aster  
 rare, white oak grove on Taft Road  
*Aster lateriflorus*, calico aster  
 common, moist woods and thickets  
*Aster novae-angliae*, New England aster  
 occasional, dry fields and roadsides  
*Aster pilosus*, common white aster  
 common, dry fields, roadsides and about buildings  
*Aster umbellatus*, flat-top aster  
 frequent, dry to moist fields and roadsides  
*Baptisia lactea*, prairie false indigo (OHIO POTENTIALLY  
 THREATENED SPECIES) occasional, dry openings in bunker area  
*Baptisia tinctoria*, yellow false indigo  
 occasional dry openings in bunker area  
 \**Berberis thunbergii*, Japanese barberry  
 occasional, woodland borders  
*Bidens coronata*, northern tickseed-sunflower  
 common, moist fields and ditches  
*Boehmeria cylindrica*, false nettle  
 occasional, ponds and ditches  
 \**Brassica nigra*, black mustard  
 occasional, roadsides  
 \**Bromus inermis*, smooth brome  
 frequent, dry to moist fields and roadsides  
 \**Bromus tectorum*, downy chess  
 occasional, dry openings and roadsides on shale

*Cacalia atriplicifolia*, pale Indian-plantain  
 occasional, dry fields and roadsides  
*Calamagrostis canadensis*, blue-joint  
 occasional, moist fields and ditches  
*Callitriche heterophylla*, water-starwort  
 occasional, pond margins and seasonally-moist depressions  
 \**Campsis radicans*, trumpet-vine  
 occasional, disturbed openings and roadsides  
 \**Capsella bursa-pastoris*, shepherd's-purse  
 occasional, roadsides and about buildings  
 \**Cardamine hirsuta*, bitter-cress  
 occasional, roadsides and about buildings  
 \**Carduus nutans*, musk-thistle  
 occasional, dry fields and roadsides  
*Carex alata*, broad-winged sedge (OHIO POTENTIALLY THREATENED SPECIES) rare, grassy field along Patrol Road south of Scheid Road, also in grassy strip between Patrol Road and artificial pond southeast of Taft Road  
*Carex amphibola*  
 occasional, thickets and woods borders  
*Carex annectens* var. *annectens*  
 occasional, moist, grassy fields  
*Carex annectens* var. *xanthocarpa*, yellow-fruited sedge  
 occasional, moist, grassy fields  
*Carex blanda*  
 frequent, moist woods  
*Carex cephaloidea*, thin-leaf sedge (OHIO ENDANGERED SPECIES) rare, woods border along Pentolite Road west of reactor  
*Carex complanata* var. *hirsutella*  
 frequent, dry fields and woods borders  
*Carex conoidea*, field sedge (OHIO THREATENED SPECIES) rare, grassy depression along Taft Road south of North Magazine Road  
*Carex cristatella*  
 occasional, moist fields and ditches  
*Carex festucacea*, fescue sedge  
 occasional, moist, grassy fields  
*Carex gracillima*  
 occasional, moist woods  
*Carex granularis*, meadow sedge  
 common, moist, grassy fields and ditches  
*Carex hirtifolia*  
 rare, disturbed oak woods along angling road  
*Carex hystericina*, bottlebrush sedge  
 rare, moist depression along Taft Road  
*Carex pennsylvanica*, Pennsylvania sedge  
 common, dry woods  
*Carex rosea*  
 frequent, dry to moist woods  
*Carex scoparia*  
 frequent, moist, grassy fields

*Carex stipata*  
 frequent, moist fields and ditches  
*Carex stricta*, tussock sedge  
 occasional, moist fields and ditches  
*Carex swanii*, Swan's sedge  
 occasional, dry, grassy fields  
*Carex tribuloides*  
 occasional, moist, grassy fields and ditches  
*Carex umbellata*  
 occasional, well-drained, grassy fields on sandy soil  
*Carex vulpinoidea*, fox sedge  
 common, moist fields, ditches and about ponds  
*Carya ovata*, shagbark hickory  
 rare, sandy soil along fence at far southeast boundary  
*Celtis occidentalis*, hackberry  
 occasional, dry to moist woods and borders  
*Cephalanthus occidentalis*, buttonbush  
 occasional, moist depressions and ditches  
*Cerastium arvense*, field chickweed  
 rare, white oak grove along Taft Rd  
 \**Cerastium semidecandrum*  
 occasional, roadberms and about buildings  
 \**Cerastium fontanum*, mouse-ear chickweed  
 frequent, roadberms and about buildings  
 \**Chaenorrhinum minus*, dwarf snapdragon  
 occasional, roadberms and about buildings  
*Chamaecrista fasciculata*, partridge-pea  
 occasional, dry openings on shale  
 \**Chrysanthemum leucanthemum*, ox-eye daisy  
 frequent, dry to moist fields and roadsides  
 \**Cichorium intybus*, chicory  
 occasional, roadsides  
 \**Cirsium arvense*, Canada thistle  
 common, disturbed fields and roadsides  
*Cirsium discolor*, prairie thistle  
 frequent, grassy fields and roadsides  
 \**Cirsium vulgare*, bull thistle  
 frequent, disturbed fields and roadsides  
*Clinopodium vulgare*, wild basil  
 occasional, dry roadsides and openings  
 \**Convallaria majalis*, lily-of-the-valley  
 rare, grassy field along Columbus Avenue  
 \**Convolvulus arvensis*, field bindweed  
 occasional, disturbed fields and roadsides  
*Coryza canadensis*, horseweed  
 frequent, dry fields and roadsides  
*Cornus amomum*, swamp dogwood  
 frequent, moist fields and thickets  
*Cornus drummondii*, rough-leaved dogwood  
 frequent moist borders, thickets and roadsides  
*Cornus florida*, flowering dogwood  
 occasional, woodland borders and roadsides

*Cornus racemosa*, gray dogwood  
 frequent, dry fields and roadsides  
 \**Coronilla varia*, crown-vetch  
 occasional, grassy fields and roadsides  
*Crataegus mollis*, downy hawthorn  
 frequent, thickets and woodland borders  
*Crataegus punctata*, dotted hawthorn  
 frequent, thickets and woodland borders  
*Cryptotaenia canadensis*, honewort  
 occasional, dry to moist woods  
*Cuscuta gronovii*, dodder  
 frequent, moist fields and ditches  
 \**Cyperus esculentus*, yellow nutgrass  
 occasional, moist, disturbed openings  
*Cyperus strigosus*, umbrella-sedge  
 frequent, moist openings, ponds and ditches  
 \**Dactylis glomerata*, orchard-grass  
 occasional, dry to moist fields and roadsides  
*Danthonia spicata*, poverty-grass  
 occasional, dry openings over shale  
*Datura stramonium*, jimson-weed  
 occasional, disturbed openings and roadsides  
 \**Daucus carota*, wild carrot  
 frequent, dry fields and roadsides  
 \**Dianthus armeria*, Deptford pink  
 occasional, dry openings and roadsides on shale  
*Diodia teres*, buttonweed  
 occasional, dry openings over shale  
 \**Dipsacus fullonum*, common teasel  
 frequent, dry, disturbed openings and roadsides  
 \**Draba verna*, early whitlow-wort  
 occasional, dry roadsides and about buildings  
*Dryopteris carthusiana*, spinulose woodfern  
 frequent, moist woods and shaded borders  
 \**Eleagnus umbellata*, autumn-olive  
 occasional, roadsides and woodland borders  
*Eleocharis acicularis*, needle spikerush  
 frequent, margins of artificial pond  
*Eleocharis erythropoda*, red-footed spikerush  
 occasional, moist openings and ditches  
*Eleocharis obtusa*  
 common, moist openings and ditches  
*Eleocharis smallii*, Small's spikerush  
 frequent, margins of artificial ponds  
*Eleocharis tenuis*  
 frequent, moist openings and ditches  
 \**Elytrigia repens*, quack-grass  
 frequent, dry fields and roadsides  
*Equisetum arvense*, horsetail  
 frequent; moist openings, roadsides and ditches  
*Equisetum hyemale*, scouring-rush  
 occasional, moist roadsides and ditches

*Eragrostis frankii*  
 occasional, moist openings and ditches  
*Eragrostis spectabilis*, showy lovegrass  
 occasional, dry to moist fields  
*Erechtites hieracifolia*, pilewort  
 common, disturbed woods, borders and roadsides  
*Erigeron philadelphicus*, Philadelphia fleabane  
 frequent, roadsides and borders  
*Erigeron strigosus*, smooth fleabane  
 occasional, dry openings and roadsides  
*Eupatorium perfoliatum*, boneset  
 occasional, moist fields, ponds and ditches  
*Eupatorium purpureum*, purple joe-pye-weed  
 occasional, borders of moist woods  
*Euphorbia corollata*, flowering spurge  
 occasional, dry fields  
*Euphorbia maculata*, prostrate spurge  
 occasional, dry openings, roadberms and about buildings  
*Euthamia graminifolia*, grass-leaved goldenrod  
 common, dry to moist fields and roadsides  
 \**Festuca elatior*, tall fescue  
 occasional, roadsides and grassy fields  
*Fragaria virginiana*, wild strawberry  
 frequent, dry to moist fields and roadsides  
*Fraxinus americana*, white ash  
 frequent, dry to moist woods and borders  
*Fraxinus pensylvanica*, green ash  
 frequent, moist woods and streambanks  
*Gnaphalium obtusifolium*, cudweed  
 frequent, dry openings on shale  
*Galine aparine*, cleavers  
 occasional, moist woods and borders  
*Galium circaezans*, wild licorice  
 rare, dry woods along angling road  
*Galium tinctorium*, southern bedstraw  
 rare, moist depression along Taft Road  
*Geum virginianum*, white avens  
 occasional, woods borders and roadsides  
*Geum vernum*, spring avens  
 occasional, moist woods and borders  
 \**Glechoma hederacea*, ground-ivy  
 frequent, moist openings, roadsides and about buildings  
*Gleditsia triacanthos*, honey-locust  
 occasional, dry to moist woods and borders  
*Glyceria striata*, manna-grass  
 occasional, moist woods and about ponds  
*Gratiola virginiana*, round-fruited hedge-hyssop (OHIO POTENTIALLY  
 THREATENED SPECIES) rare, ca 20 plants, moist, shaded ground  
 by pond west of Snake Road. Moseley stated that this  
 species was "rather frequent" in the area (1899, p. 140).  
 This is the only population of this species known to be  
 extant on the Ohio Lake Plain.

*Hedyotis caerulea*, bluets  
 occasional, dry openings and roadsides on shale  
*Helianthus mollis*, ashy sunflower (OHIO THREATENED SPECIES)  
 rare, ca 200 plants in grassy field south and southwest of  
 junction of Fox and Patrol roads. The exact number of  
 individuals in this population is uncertain since  
 excessive browsing by deer has reduced the plants to leafy  
 tufts.  
*Helenium flexuosum*, southern sneezeweed  
 occasional, moist, open ground and ditches  
 \**Hieracium piloselloides*, king-devil  
 frequent, dry openings on shale  
*Hibiscus moscheutos*, rose-mallow  
 rare, moist swale along Ransom Road  
*Hypericum gentianoides*, orange-grass  
 frequent, dry openings  
*Hypericum gymnanthum*, least St. John's-wort (OHIO ENDANGERED  
 SPECIES) rare, ca 50 plants, moist, open ground along Patrol  
 Road south of Fox Road  
*Hypericum majus*, tall St. John's-wort (OHIO POTENTIALLY  
 THREATENED SPECIES) rare, moist, shaded ground by pond west  
 of Snake Road  
*Hypericum mutilum*, little St. John's-wort  
 frequent, moist openings, ponds and ditches  
 \**Hypericum perforatum*, dotted St. John's-wort  
 frequent, disturbed fields and roadsides  
*Hypoxis hirsuta*, yellow-eyed-grass  
 occasional, grassy fields  
*Ipomoea pandurata*, wild sweet-potato  
 occasional, dry openings over shale  
 \**Inula helenium*, elecampane  
 rare, moist roadside along Taft Road  
*Iris versicolor*, northern blue flag  
 occasional, moist woods and ditches  
*Isanthus brachiatus*, false pennyroyal  
 rare, moist opening on limestone, west of Snake Road and  
 south of North Magazine Road  
*Juglans nigra*, black walnut  
 rare, a few young trees at edge of grassy field southwest of  
 junction of Fox and Patrol roads  
*Juncus acuminatus*  
 common, moist openings and ditches  
*Juncus biflorus*  
 occasional, moist openings and ditches  
*Juncus brachycarpus*  
 occasional, moist openings  
*Juncus canadensis*, Canada rush  
 frequent, moist openings  
*Juncus dudleyi*, Dudley's rush  
 frequent, moist openings  
*Juncus effusus*, common rush  
 frequent, moist openings, ponds and ditches

*Juncus marginatus*  
 occasional, moist openings  
*Juncus tenuis*, path rush  
 frequent, dry openings, roadberms and about buildings  
 \**Lamium purpureum*, dead-nettle  
 frequent, disturbed fields, roadsides and about buildings  
*Leersia oryzoides*, rice cutgrass  
 occasional, moist fields and ditches  
*Lemna minor*, little duckweed  
 occasional, ponds and standing water  
 \**Lepidium campestre*, field-cress  
 occasional, roadsides and about buildings  
*Lepidium virginicum*, poor man's pepper  
 frequent, roadsides, disturbed openings and about buildings  
*Lespedeza capitata*, bush-clover  
 occasional, dry fields  
*Leucospora multifida*  
 rare, moist opening on limestone, west of Snake Road and  
 south of North Magazine Road  
*Liatris scariosa* var. *novae-angliae*, northern blazing-star  
 rare, dry ground along Patrol Road at Olemacher Ditch  
*Liatris spicata*, spiked blazing-star  
 occasional, moist openings  
 \**Linaria vulgaris*, butter-and-eggs  
 occasional, roadsides and about buildings  
*Lindernia dubia*, false pimpernel  
 occasional, moist openings, ditches and pond margins  
*Linum medium*, wild flax  
 frequent, dry to moist openings  
*Linum virginianum*, Virginia flax  
 rare, about pond in northern bunker area  
 \**Lonicera maackii*, Amur honeysuckle  
 rare, roadsides and thickets along Columbus Avenue near  
 Scheid Ditch  
 \**Lonicera morrowii*, Asiatic honeysuckle  
 frequent, thickets, borders and roadsides  
 \**Lonicera tatarica*, Tatarian honeysuckle  
 frequent, thickets, borders and roadsides  
 \**Lotus corniculatus*, bird's-foot trefoil  
 occasional, grassy fields and roadberms  
*Ludwigia alternifolia*, rattlebox  
 occasional, ponds and ditches  
*Ludwigia palustris*, water-purslane  
 frequent, ponds and ditches  
*Ludwigia polycarpa*  
 rare, moist, shaded ground by pond on Snake Road  
*Lycopus americanus*, American water-horehound  
 frequent, ponds and ditches  
*Lycopus uniflorus*, northern water-horehound  
 frequent, moist woods and shaded borders  
*Lysimachia terrestris*, swamp loosestrife  
 occasional, moist openings

*Lythrum alatum*, prairie loosestrife  
 occasional, moist openings  
 \**Maclura pomifera*, osage-orange  
 occasional, disturbed woods and borders  
 \**Matricaria matricarioides*, pineapple-weed  
 occasional, roadsides and about buildings  
 \**Melilotus alba*, white sweet-clover  
 occasional, disturbed fields and roadsides  
 \**Melilotus officinalis*, yellow sweet-clover  
 occasional, disturbed fields and roadsides  
*Mimulus ringens*, monkey-flower  
 occasional, moist openings and ditches  
*Monarda fistulosa*, bergamont  
 occasional, grassy fields  
*Muhlenbergia frondosa*, muhly grass  
 frequent, moist fields and ditches  
*Najas flexilis*, northern naiad  
 occasional, artificial ponds  
 \**Najas minor*, Eurasian naiad  
 frequent, artificial ponds  
 \**Nepeta cataria*, catnip  
 occasional, roadsides and weedy openings  
*Nyssa sylvatica*, blackgum  
 occasional, thickets and woods borders  
*Oenothera biennis*, evening-primrose  
 frequent, dry fields, roadsides and about buildings  
*Oenothera tetragona*, northern sundrops  
 frequent, moist, grassy fields  
*Osmunda cinnamomea*, cinnamon fern  
 rare, depressions in moist woods along angling road  
*Osmunda regalis*, royal fern  
 occasional, depressions in moist woods  
*Oxalis violacea*, purple wood-sorrel  
 occasional, drier oak woods and borders on shale  
*Panicum flexile*, wiry witch-grass  
 rare, moist opening on limestone, west of Snake Road and  
 south of North Magazine Road  
*Panicum lanuginosum*, hairy panic-grass  
 frequent, dry, grassy fields and roadsides  
*Panicum oligosanthos*, sand panic-grass  
 occasional, dry, grassy fields  
*Panicum rigidulum*, stiff panic-grass  
 frequent, moist openings and ditches  
*Panicum virgatum*, switch-grass  
 occasional, dry fields  
*Parietaria pensylvanica*, pellitory  
 occasional, dry, disturbed woodlots and borders  
*Paronychia fastigata*, forked chickweed  
 occasional, dry woods and borders on shale  
*Parthenocissus quinquefolia*, Virginia-creeper  
 occasional, dry to moist woods borders and thickets

*Parthenocissus vitacea*, grape-woodbine  
 rare, dry opening north of Center Magazine Road  
 \**Pastinaca sativa*, wild parsnip  
 occasional, roadsides  
*Penstemon digitalis*, tall white beard-tongue  
 frequent, grassy fields and roadsides  
*Phalaris arundinacea*, reed canary-grass  
 common, moist fields and ditches  
 \**Phleum pratense*, timothy  
 frequent, disturbed fields and roadsides  
*Phragmites australis*, reed-grass  
 occasional, moist openings and ditches  
*Phytolacca americana*, pokeberry  
 occasional, moist woods and borders  
*Phryma leptostachya*, lopseed  
 rare, edge of woods along Scheid Ditch near Columbus Avenue  
 \**Plantago lanceolata*, English plantain  
 frequent, disturbed openings and about buildings  
 \**Plantago major*, broad-leaved plantain  
 frequent, roadberms and about buildings  
*Platanthera lacera*, ragged fringe-orchid  
 rare, ditch along south Patrol Road  
*Platanus occidentalis*, sycamore  
 occasional, moist woods and streambanks  
 \**Poa annua*, early bluegrass  
 common, roadberms and about buildings  
 \**Poa compressa*, Canada bluegrass  
 frequent, dry openings, especially on shale, and roadsides  
*Podophyllum peltatum*, may-apple  
 occasional, dry to moist woods  
*Polygala sanguinea*, blood milkwort  
 frequent, moist openings  
*Polygala verticillata*, whorled milkwort  
 occasional, moist openings  
 \**Polygonum caespitosum*  
 rare, moist, shaded ground in bunker area  
 \**Polygonum hydropiper*, water-pepper  
 occasional, margins of ponds  
*Polygonum hydropiperoides*, false water-pepper  
 occasional, wet ditches and pond margins  
*Polygonum sagittatum*, arrow-leaved tearthumb  
 occasional, moist thickets and ditches  
*Polygonum scandens*, climbing false buckwheat  
 occasional, thickets and roadsides  
*Populus deltoides*, cottonwood  
 frequent, moist woods, borders and streambanks  
*Potamogeton diversifolius*, snailseed pondweed  
 frequent, artificial ponds  
*Potamogeton foliosus*, leafy pondweed  
 occasional, artificial ponds  
*Potamogeton nodosus*, longleaf pondweed  
 occasional, artificial ponds

*Potentilla simplex*, cinquefoil  
 frequent, dry openings and roadsides on shale  
*Prunella vulgaris*, self-heal  
 occasional, roadsides and about buildings  
*Prunus americana*, wild plum  
 occasional, thickets and roadsides  
*Prunus serotina*, wild black cherry  
 frequent, dry to moist woods and borders  
*Pycnanthemum tenuifolium*, narrow-leaved mountain-mint  
 frequent, moist openings, especially on shale  
*Pycnanthemum virginianum*, Virginia mountain-mint  
 occasional, moist openings and ditches  
*Pyrus coronaria*, crab-apple  
 frequent, thickets and borders  
*Quercus alba*, white oak  
 occasional, dry woods and sandy ridges. A small grove on  
 Taft Road has an unusually pure stand of this species  
*Quercus bicolor*, swamp white oak  
 frequent, moist woodlands  
*Quercus imbricaria*, shingle oak  
 frequent, moist to dry woodlands  
*Quercus macrocarpa*, bur oak  
 rare, ca 5 trees on sandy ridge in bunker area south of  
 North Magazine Road  
*Quercus palustris*, pin oak  
 common, moist woods  
*Ratibida pinnata*, green-headed coneflower  
 occasional, roadsides and dry fields  
*Rhexia virginica*, Virginia meadow-beauty (OHIO POTENTIALLY  
 THREATENED SPECIES) occasional, moist openings and pond  
 margins, south of North Magazine Road and along the angling  
 road  
*Rosa carolina*, pasture rose  
 occasional, dry fields  
 \**Rosa multiflora*, multiflora rose  
 occasional, disturbed openings, borders and thickets  
*Rosa setigera*, prairie rose  
 rare, grassy roadside and thickets along Patrol Road at  
 Olemacher Ditch  
*Rotala ramosior*, toothcup  
 occasional, moist openings and about ponds  
*Rubus flagellaris*, dewberry  
 frequent, dry openings and roadsides on shale  
*Rudbeckia hirta*, black-eyed susan  
 frequent, dry fields and roadsides  
 \**Rumex acetosella*, red sorrel  
 occasional, dry openings over shale  
 \**Rumex crispus*, curly dock  
 occasional, roadsides and about buildings  
*Sagittaria latifolia*, broad-leaved arrowhead  
 occasional, ponds and ditches

*Salix amygdaloides*, peachleaf willow  
 occasional, ditches and about ponds  
*Salix discolor*, pussy willow  
 occasional, moist openings, ponds and ditches  
*Salix exigua*, sandbar willow  
 frequent, moist openings, streambanks and ditches  
*Salix nigra*, black willow  
 common, moist woods, streambanks and ditches  
*Sambucus canadensis* elder-berry  
 frequent, moist openings, streambanks and ditches  
 \**Saponaria officinalis*, soapwort  
 frequent, dry fields, roadsides and about buildings  
*Sassafras albidum*, sassafras  
 occasional, dry woods and borders  
*Schizachyrium scoparium*, little bluestem  
 frequent, dry fields and roadsides  
*Scirpus acutus*, hardstem bulrush  
 rare, moist depression west of Taft Road  
*Scirpus atrovirens*, dark green bulrush  
 common, moist openings, roadsides and ditches  
*Scirpus cyperinus*, woolgrass  
 occasional, about artificial ponds  
*Scirpus fluviatilis*, river bulrush  
 rare, moist depression west of Taft Road  
*Scirpus pendulus*  
 occasional, moist openings  
*Scirpus validus*, softstem bulrush  
 occasional, moist openings, ponds and ditches  
*Scleria triglomerata*, tall nut-rush (OHIO POTENTIALLY THREATENED SPECIES) rare, moist swale in northern bunker area  
*Scutellaria lateriflora*, mad-dog skullcap  
 occasional, moist depressions and ditches  
*Senecio aureus*, golden ragwort  
 occasional, moist woods borders  
 \**Setaria faberi*, nodding foxtail-grass  
 occasional, grassy roadsides in the bunker area  
 \**Setaria viridis*, green foxtail-grass  
 frequent, dry roadsides and about buildings  
*Silphium terebinthinaceum*, prairie-dock  
 rare, dry openings at crossing of Patrol Road and Olemacher Ditch. Moseley stated this species was "common on the prairies" (1899, p. 160).  
*Sisyrinchium albidum*, prairie blue-eyed-grass  
 frequent, grassy fields  
*Sisyrinchium angustifolium*, common blue-eyed-grass  
 frequent, grassy fields  
 \**Solanum carolinense*, horse-nettle  
 occasional, dry openings and roadsides  
 \**Solanum dulcamara*, bitter-sweet-nightshade  
 occasional, roadsides, thickets and about buildings  
*Solidago canadensis*, Canada goldenrod  
 common, grassy fields

*Solidago juncea*, early goldenrod  
 frequent, dry to moist fields and roadsides  
*Solidago nemoralis*, gray goldenrod  
 common, dry fields and roadsides  
*Solidago riddellii*, Riddell's goldenrod  
 rare, moist opening over limestone, west of Snake Road and  
 south of North Magazine Road  
*Sparganium eurycarpum*, giant bur-reed  
 rare, wet ditch along Ransom Road  
*Spartina pectinata*, prairie cord-grass  
 frequent, moist depressions, fields and ditches  
*Spiranthes ochroleuca*, creamy ladies'-tresses  
 occasional, ditches and moist openings.  
*Sporobolus asper*, tall dropseed  
 rare, a single stand in dry opening along angling road  
*Sporobolus neglectus*  
 frequent, dry openings and roadberms  
*Stellaria longifolia*, long-leaved stitchwort  
 occasional, moist, grassy fields  
 \**Stellaria media*, chickweed  
 common, roadberms and about buildings  
*Symphoricarpos orbiculatus*, coralberry  
 occasional, thickets, woods borders and roadsides  
 \**Taraxacum officinalis*, dandelion  
 frequent, roadsides and about buildings  
*Teucrium canadense*, American germander  
 occasional, moist openings  
*Thelypteris palustris*, marsh fern  
 occasional, moist depressions and roadsides  
*Triadenum virginianum*, pink St. John's-wort  
 rare, moist swale in northern bunker area  
*Tridens flavus*, purpletop  
 occasional, moist fields and roadsides  
 \**Trifolium pratense*, red clover  
 occasional, grassy fields and roadsides  
 \**Trifolium repens*, common white clover  
 common, grassy roadsides and about buildings  
*Typha latifolia*, broad-leaved cat-tail  
 frequent, moist openings, ponds and ditches  
*Ulmus americana*, American elm  
 occasional, moist woods and streambanks  
*Ulmus rubra*, slippery elm  
 occasional, moist woods and streambanks  
*Urtica dioica* var. *procera*, American stinging nettle  
 occasional, moist fields and openings  
 \**Verbascum blattaria*, moth-mullein  
 occasional, disturbed fields and roadsides  
 \**Verbascum thapsus*, common mullein  
 frequent, disturbed fields  
*Verbena hastata*, purple vervain  
 frequent, moist fields, streambanks and ditches

*Verbena simplex*, prairie vervain  
 rare, a single stand in dry opening along angling road  
*Verbena urticifolia*, white vervain  
 occasional, moist woods borders and roadsides  
*Verbesina alternifolia*, wingstem  
 frequent, moist woods borders, streambanks and ditches  
*Vernonia gigantea*, tall ironweed  
 occasional, dry to moist fields  
 \**Veronica officinalis*, common speedwell  
 occasional, dry openings on shale  
 \**Veronica serpyllifolia*, thyme-leaved speedwell  
 occasional, roadsides and about buildings  
*Viburnum lentago*, nannyberry  
 frequent, moist thickets and borders  
*Viola lanceolata*, lance-leaved violet (OHIO POTENTIALLY  
 THREATENED SPECIES) frequent, ditches and moist openings;  
 the largest population of this species known in Ohio  
*Viola sagittata*, arrow-leaved violet  
 frequent, grassy fields and dry banks  
*Viola sororia*, common blue violet  
 common, grassy fields, roadsides and about buildings  
*Vitis riparia*, riverbank grape  
 frequent, woods borders, thickets and streambanks  
*Vitis vulpina*, fox grape  
 occasional, woods borders and thickets  
*Zanichellia palustris*, horned pondweed  
 rare, artificial pond west of Snake Road

**APPENDIX A. SPECIES LOCATIONAL FORMS AND MAP LOCATIONS FOR STATE LISTED PLANT SPECIES ON THE NASA PLUM BROOK STATION.**

*Baptisia lepta*  
ELEMENT NAME

*update of 011*

*SP LD X59*  
CLASS SUBCL. ELEM.

OCC. QUAD CODE

LAT/LONG N O W O H STATE CO. CODE

*Erie*  
COUNTY NAME(S)

*Kimball*  
QUAD NAME(S)

*DNAP Plum Brook Survey, Cinch, A.W., right record*  
SOURCE OF LEAD

*19940524 NASA Plum Brook Station*  
YEAR MO. DAY MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR. & PHONE IF AVAILABLE)

*Prairie False Indigo*  
ELEMENT COMMON NAME

*ca 800 total plants, very thinly scattered*  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

*full sun; well-drained ridges, mostly 1/2 elevated above surrounding swales*  
HABITAT/COMMUNITY DATA

*both sides of Rd 14, 1/2 way between North Magazine & Center*  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

*Magazine rds, Perkins Twp., Erie Co.*

S E I  
QUAL. QUAN. INTENSIVE  
PC SURVEY

ALTERNATE PC NAME  
PC ACREAGE

THOROUGH CURSORY  
ADEQUATE GUESS  
SPECIES SURVEY

SITE CODE  
C  
N  
U  
G  
ACC.

ALT. PC W PC SIZE

FED. OHIO DNAP  
STATUS STATUS STATUS

R. WS. BND. SUR. OWN. REF.

BU

*Baptisia lucida -  
scattered throughout  
circled area*

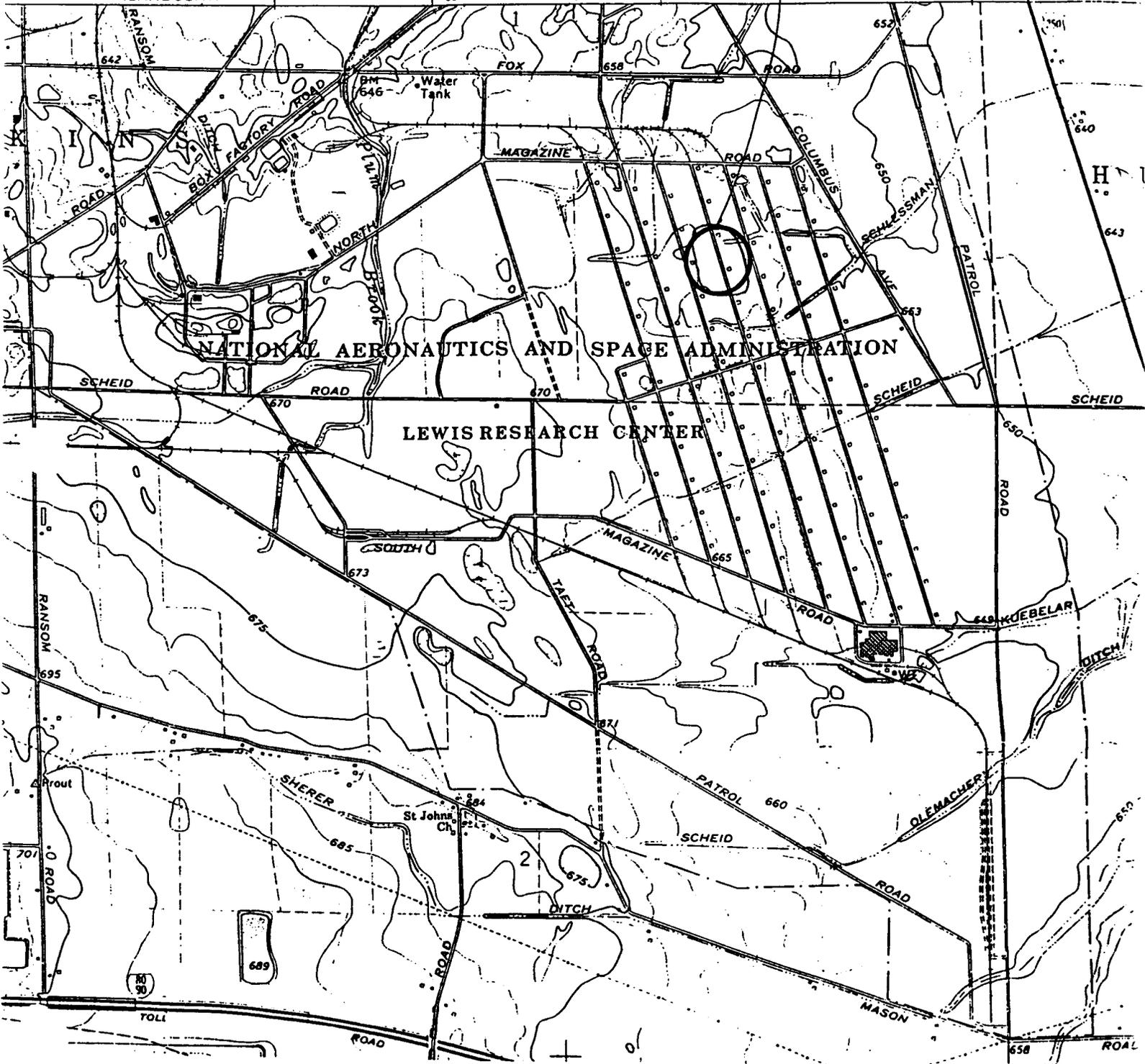
DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL SURVEY

7.5 MINUTE SE

4466 1 NW  
(SANDUSKY)

360 40' 361 R 21 W

1 960 000 FEET



Cast alata  
ELEMENT NAME

SP GT J03  
CLASS SUBCL. ELEM.

0  
OCC.# QUAD CODE

LAT/LONG N 0 W O H STATE CO.CODE

Erie  
COUNTY NAME(S)

Kimball  
QUAD NAME(S)

DNAP Plum Brook Survey, Canal, A.W., #31,250 of G. Schreider, Kent State Univ. Herb.  
SOURCE OF LEAD

19 9406 14 NASA Plum Brook Station  
YEAR MO. DAY MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

Broad-winged Sedge  
ELEMENT COMMON NAME

ca 75 change in ca 3m<sup>2</sup>  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

Full sun, moist, grassy field  
HABITAT/COMMUNITY DATA

SSW, just at Patrol + Scheid Rds, Oxford Twp, Erie Cr.  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

S E I  
QUAL. QUAN. INTENSIVE  
PC SURVEY

THOROUGH CURSORY  
ADEQUATE GUESS  
ALTERNATE PC NAME  
PC ACREAGE  
SPECIES SURVEY

SITE CODE  
C  
N  
U  
G  
ACC.

ALT. PC W PC SIZE

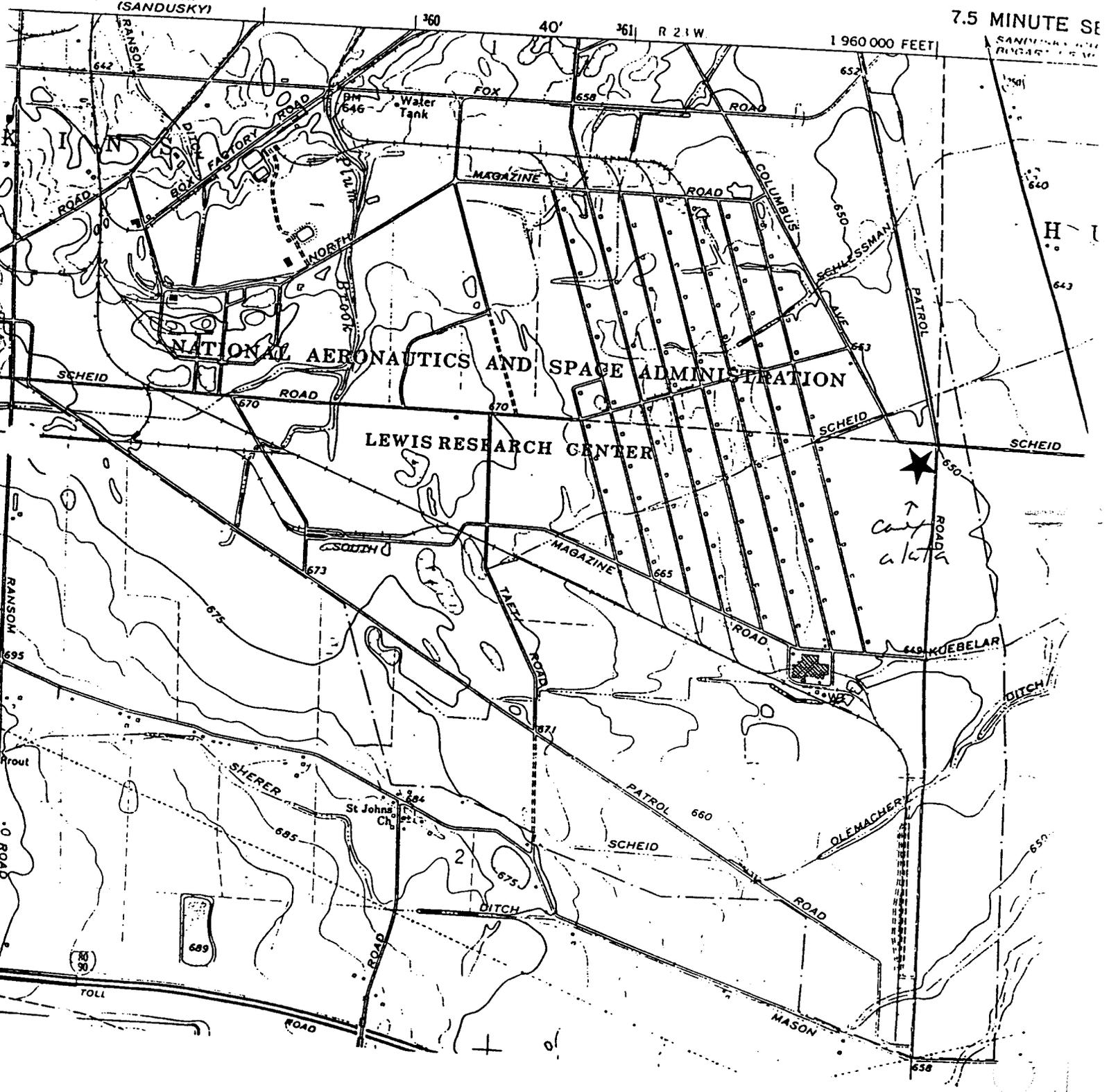
FED. OHIO DNAP  
STATUS STATUS STATUS

R. WS. BND. SUR. OWN. REF.

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCES  
VISION OF GEOLOGICAL SURVEY

4465 1 NW  
(SANDUSKY)

7.5 MINUTE SE



update: 044

ELEMENT NAME

CLASS SP SUBCL. ELEM. GAT J03

OCC.# QUAD CODE

LAT/LONG N O W O H STATE CO.CODE

COUNTY NAME(S) Erie

QUAD NAME(S) Kimball

SOURCE OF LEAD DNA P Plum Brook Survey, Curish, A.W., #31,747, G. Schneider, ~~Herbin~~ Herbin

YEAR MO. DAY MANAGED AREA 1994 06 14 NASA Plum Brook Station

# OWN. PROT. SPECIAL STATUS SIZE-ACRES

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

ELEMENT COMMON NAME Broad-winged Sedge

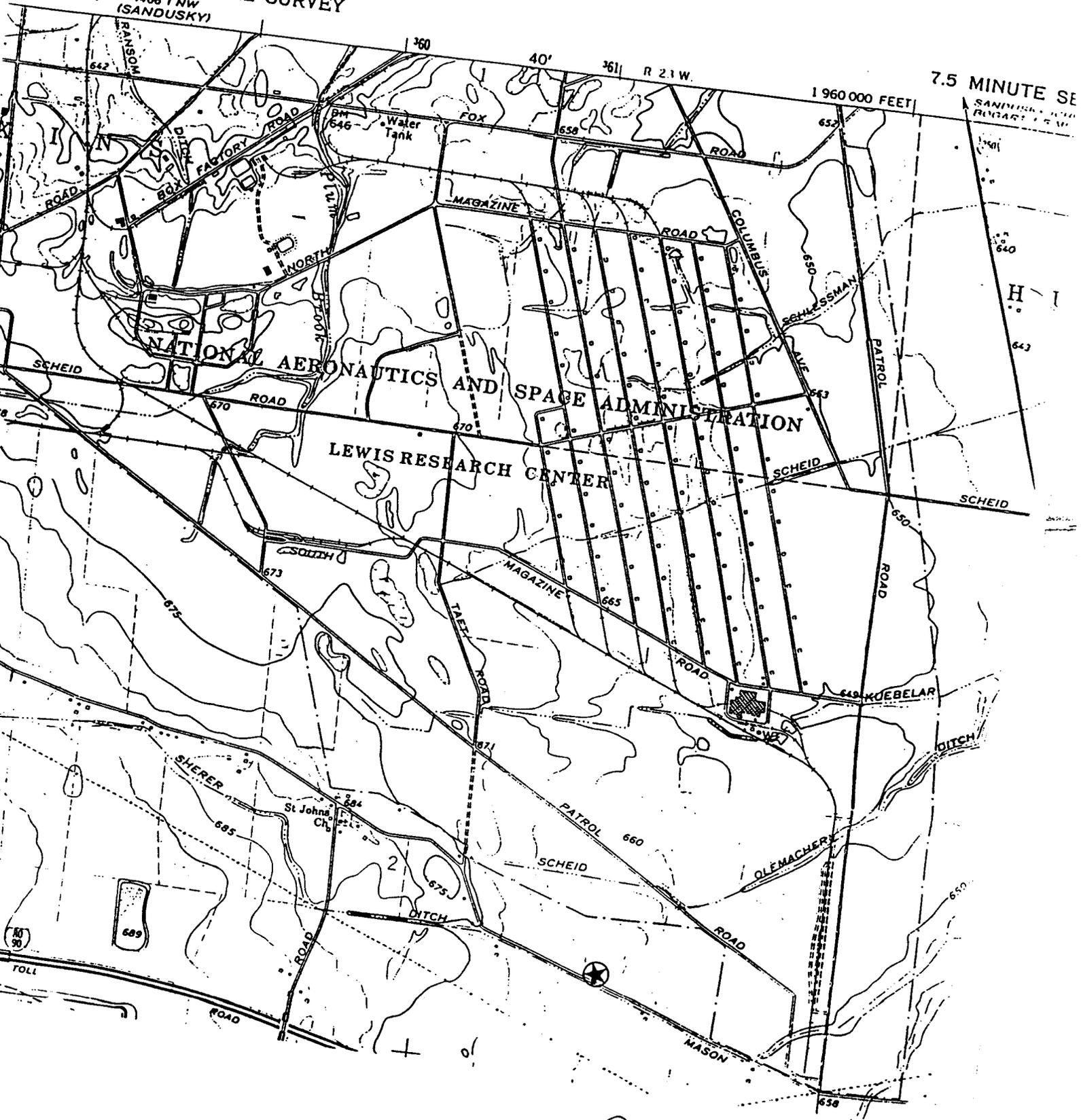
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED) ca 7 clumps in ca ~~1000~~ 2 m<sup>2</sup>

HABITAT/COMMUNITY DATA Full sun, moist grassy strip between wooded & road

LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE) N side of Patrol Rd, 0.45 mi SE, jct. Taft Rd, Oxford Twp., Erie Co

S	E	I	ALTERNATE PC NAME	THOROUGH	CURSORY	SITE CODE	C N U G A C C					
QUAL.	QUAN.	INTENSIVE	PC ACREAGE	ADEQUATE	GUESS							
PC SURVEY				SPECIES SURVEY								
ALT. PC	W	PC SIZE	FED. STATUS	OHIO STATUS	DNAP STATUS	.R.	WS.	BND.	SUR.	OWN.	REF.	L.

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL SURVEY  
4466 1 NW  
(SANDUSKY)



T  
C 100 10

Cratiola virginiana  
ELEMENT NAME

SP CLASS NP SUBCL. 981 ELEM.

OCC.# QUAD CODE

LAT/LONG N O W O H STATE CO. CODE

Eric COUNTY NAME(S)

Kimball QUAD NAME(S)

SOURCE OF LEAD DNAP Plum Brook Project, Curick, A.W., #32,068, OSA Herb.

19940907 YEAR MO. DAY NASA Plum Brook Station MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

Round-Fruited Hedge-hyssop  
ELEMENT COMMON NAME

ca 20 plants  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

muddy ground on E side of pond  
HABITAT/COMMUNITY DATA

0.3 mi. SE of North Magazine Rd  
artificial pond, W of Snake Rd, Perkins Trg, Erie Co.  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

S	E	I	ALTERNATE PC NAME		<u>THOROUGH</u>	CURSORY	SITE CODE	C N U G A C C.				
QUAL.	QUAN.	INTENSIVE	PC ACREAGE		ADEQUATE	GUESS						
PC SURVEY			PC ACREAGE		SPECIES SURVEY							
ALT. PC	W	PC SIZE	FED. STATUS	OHIO STATUS	DNAP STATUS	R.	WS.	BND.	SUR.	OWN.	REF.	I

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCE  
DIVISION OF GEOLOGICAL SURVEY

4466 1 NW  
(SANDUSKY)

*Cratichne virginiana*

7.5 MINUTE SECTION

357 42' 30"

358

360

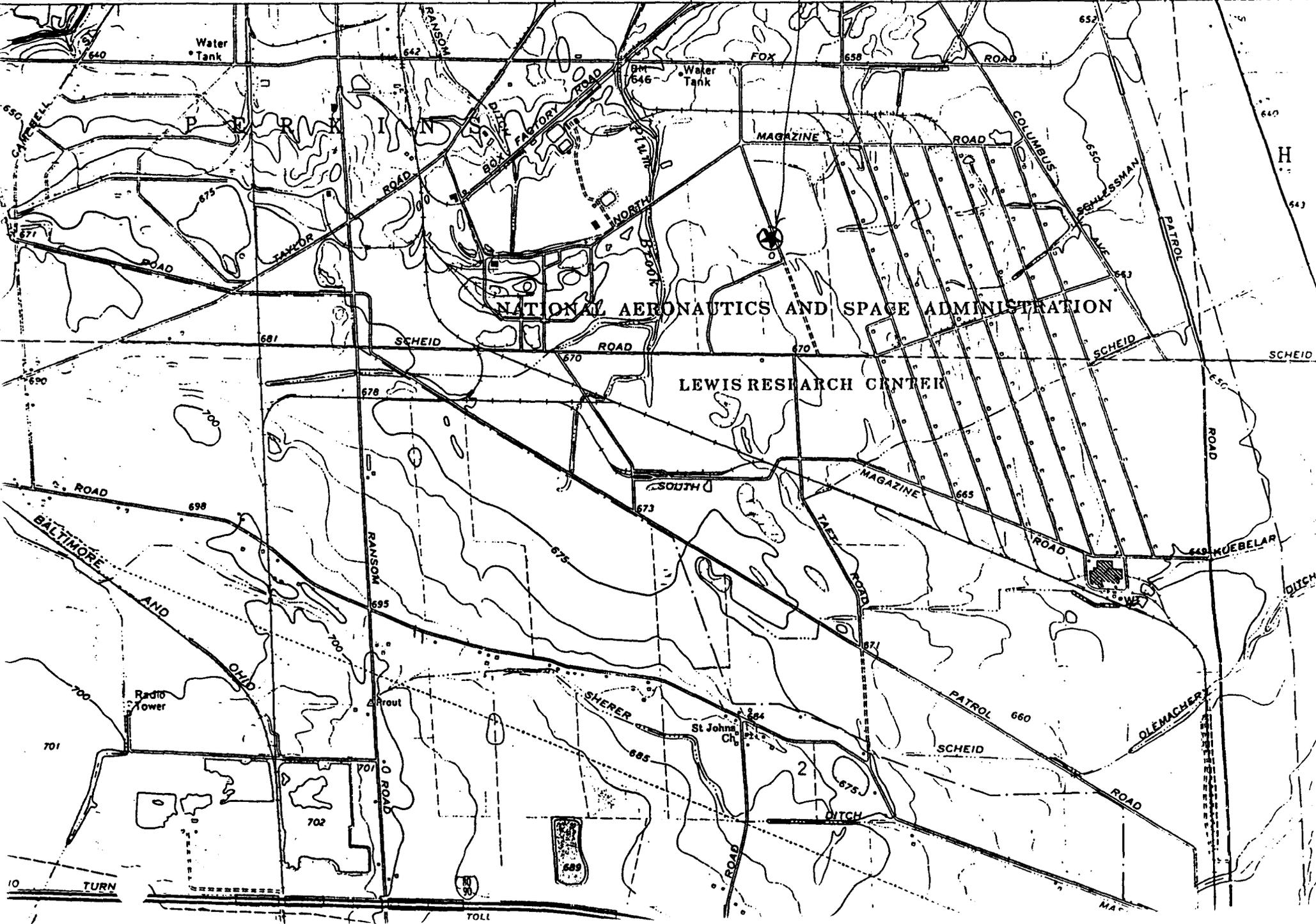
40'

361

R 21 W.

1 960 000 FEET

SANDUSKY COUNTY  
MICHIGAN



carex conoidea  
ELEMENT NAME

SP CLASS GJ SUBCL. 118 ELEM.

0 QUAD CODE

LAT/LONG N 0 W 0 H STATE CO. CODE

Eric COUNTY NAME(S)

Kimball QUAD NAME(S)

SOURCE OF LEAD ADNAP Plum Brook Project, Cusick, A.V. #31,662, OSU Habitat in duffl., KSU Hab.

19 YEAR 05 MO. 24 DAY NASA Plum Brook Station MANAGED AREA

1 # OWN. 2 PROT. 3 SPECIAL STATUS A SIZE-ACRES

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

Field Sedge ELEMENT COMMON NAME

ca 200 clumps, scattered  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

moist, grassy depression  
HABITAT/COMMUNITY DATA

W side of Tap St Rd, 0.15 mi S, South Magazine Rd, Oxford Tp; Erie Co.  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

S E I  
QUAL. QUAN. INTENSIVE  
PC SURVEY

ALTERNATE PC NAME

THOROUGH

CURSORY

ADEQUATE

GUESS

PC ACREAGE

SPECIES SURVEY

SITE CODE

C  
N  
U  
G  
ACC.

ALT. PC W PC FED. OHIO DNAP STATUS STATUS STATUS

R. WS. BND. SUR. OWN. REF.

RANK



H. lianther mollis  
ELEMENT NAME

SP NX A63  
CLASS SUBCL. ELEM.

0  
OCC.# QUAD CODE

LAT/LONG --- N 0 --- W --- O H  
STATE CO.CODE

Erie  
COUNTY NAME(S)

Kimball  
QUAD NAME(S)

DNAP Plum Brush Survey, Corish, A.W., right record  
SOURCE OF LEAD

19 05 24 NASA Plum Brush Station  
YEAR MO. DAY MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES <sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

Ashy Sunflower  
ELEMENT COMMON NAME

ca 200 plants; actual # difficult to guess, since plants grazed nearly to ground  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

full sun, drier portion of grassy field  
HABITAT/COMMUNITY DATA

SSW of jct of Fox & Patrol Rds, Perkins Twp, Erie Co.  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

S E I  
QUAL. QUAN. INTENSIVE  
PC SURVEY

ALTERNATE PC NAME  
PC ACREAGE

THOROUGH CURSORY  
ADEQUATE GUESS  
SPECIES SURVEY

SITE CODE  
C  
N  
G  
U  
A  
C  
C.

ALT. PC W PC  
SIZE

FED. OHIO DNAP  
STATUS STATUS STATUS

R. WS. BND. SUR. OWN. REF. EU ACC.

DEPARTMENT OF HIGHWAYS  
ARTMENT OF NATURAL RESOURCES  
IVISION OF GEOLOGICAL SURVEY

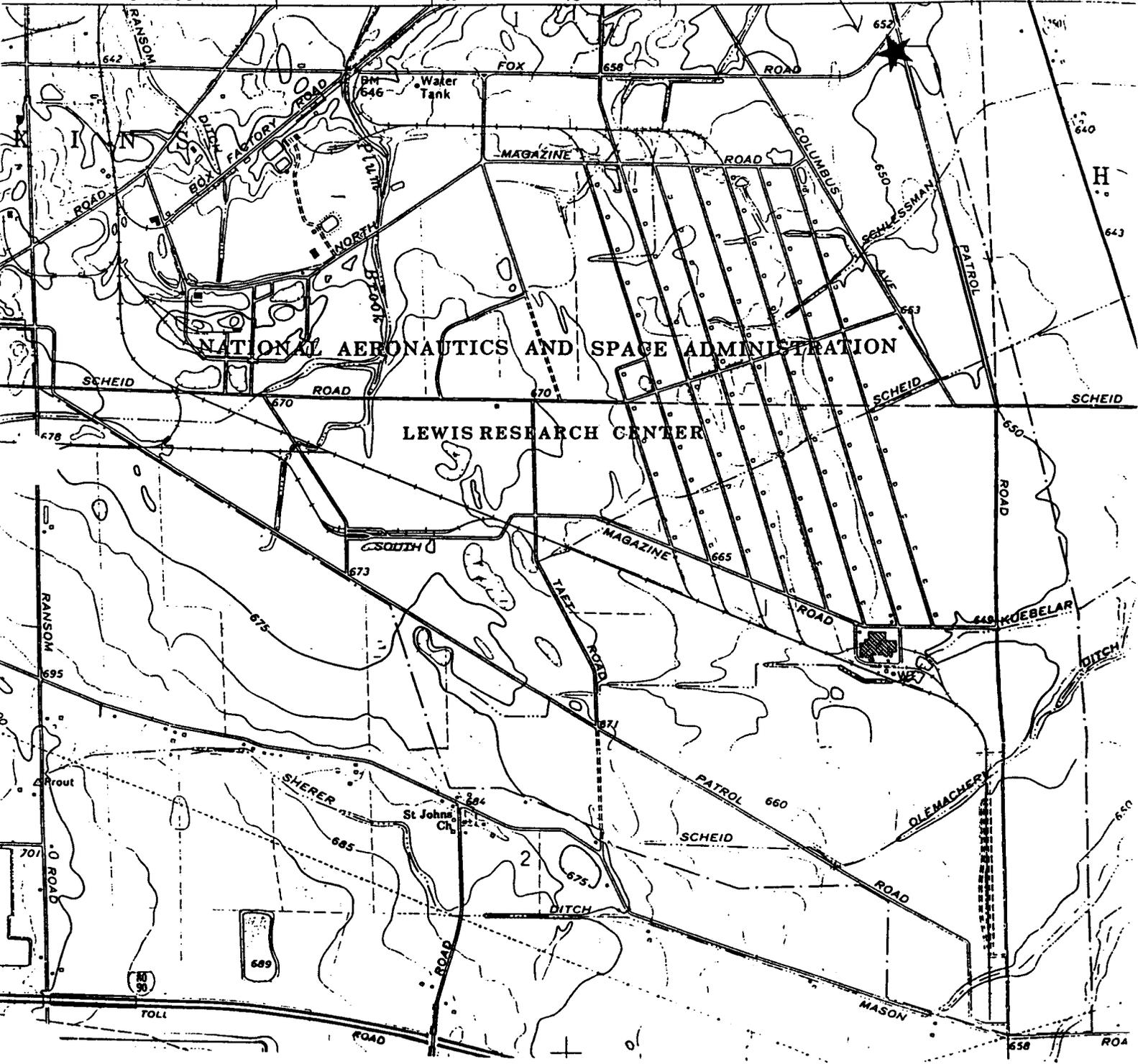
*Helianthus mollis* 7.5 MINUTE SE

4466 1 NW  
(SANDUSKY)

R 23 W

1 960 000 FEET

SANDUSKY  
ROGART



He. sericum gymnanthum  
ELEMENT NAME

SP KC 904  
CLASS SUBCL. ELEM.

OC. # QUAD CODE

LAT/LONG N O W O H STATE CO. CODE

Eric  
COUNTY NAME(S)

Kimball  
QUAD NAME(S)

SOURCE OF LEAD DNA P Plum Brook Project, Curish, A.W.C., # 31846, OSU Herbarium

1 9 94 0 2 14  
YEAR MO. DAY MANAGED AREA NAH Plum Brook Station

1 2 3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR. & PHONE IF AVAILABLE)

Leant St. John's-wort  
ELEMENT COMMON NAME

EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)  
ca 40-50 plants, thinly scattered over ca 0.05 mi.

HABITAT/COMMUNITY DATA  
Full sun; low, moist ground directly adjacent to roadbed; area had been

mowed in June

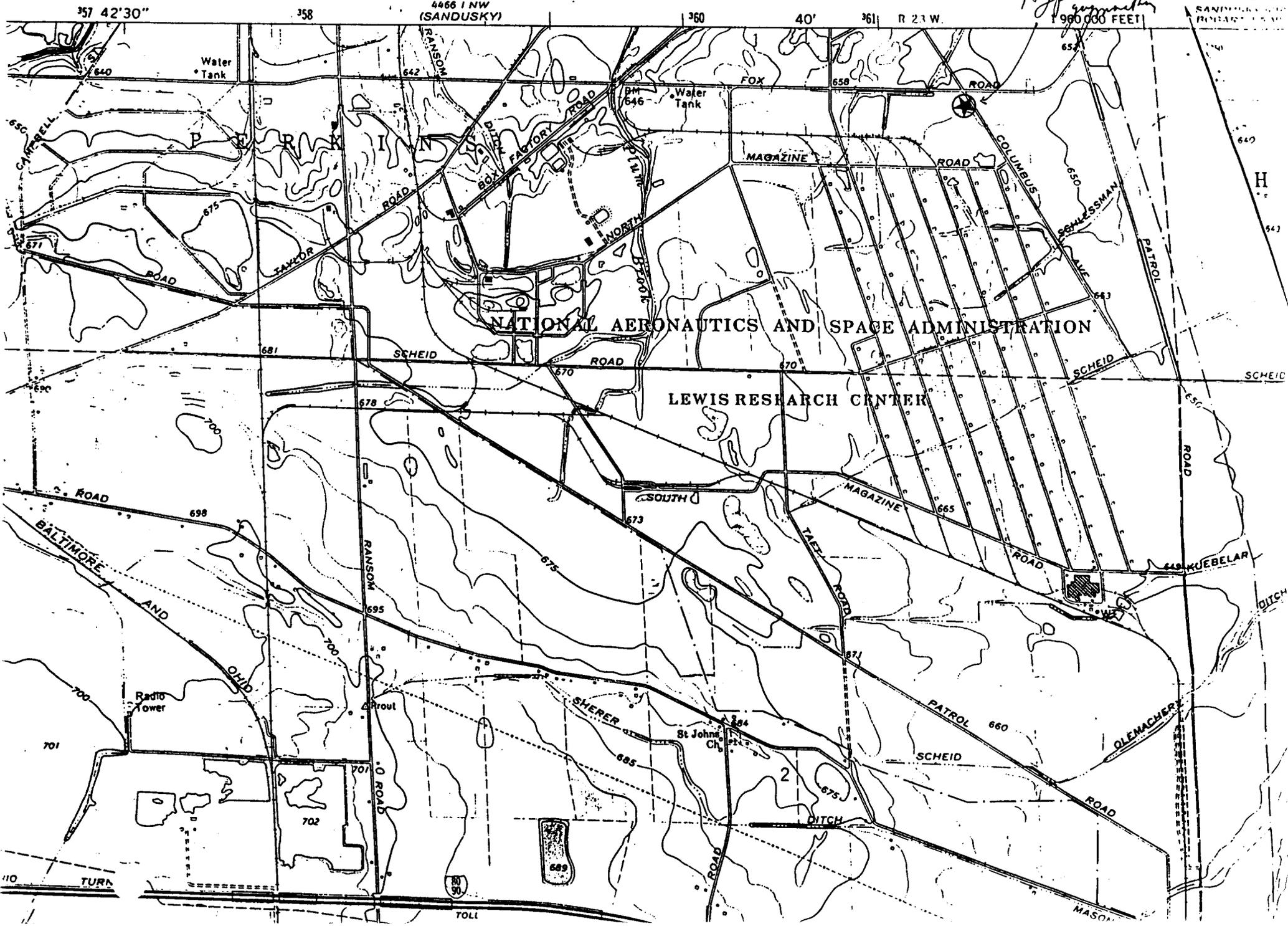
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)  
Wide, Patrol Rd, 0.05-0.1 mi. S, just off Fox Rd, Perkins Twp, ~~Eric~~

Eric Cr.

S	E	I	ALTERNATE PC NAME	<u>THOROUGH</u>	CURSORY	SITE CODE	C N U G ACC.			
QUAL.	QUAN.	INTENSIVE	PC ACREAGE	ADEQUATE	GUESS					
PC SURVEY				SPECIES SURVEY						
ALT. PC	W	PC SIZE	FED. STATUS	OHIO STATUS	DNA P STATUS	R.	WS.	BND.	SUR. OWN. REF.	DANV

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCE  
DIVISION OF GEOLOGICAL SURVEY

*Hyperion* 7.5 MINUTE SE  
1960 000 FEET



He. vicum majus  
ELEMENT NAME

SP KC 906  
CLASS SUBCL. ELEM.

OCC.# QUAD CODE

LAT/LONG N O W O H STATE CO. CODE

Erle  
COUNTY NAME(S)

Kimball  
QUAD NAME(S)

SOURCE OF LEAD  
DNAP Plum Brook Project, Cusick, A.W., #32,063, OSU Herb.

19940907  
YEAR MO. DAY  
NASA Plum Brook Station  
MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

Tall St. John's-wort  
ELEMENT COMMON NAME

ca 100 plants - scattered  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

moist, shaded ground at edge of artificial pond  
HABITAT/COMMUNITY DATA

S side of pond, W of Snake Rd, 0.3 mi. SE of North Magazine Rd,  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

Perkins Twp, Erie Co.

S E I  
QUAL. QUAN. INTENSIVE  
PC SURVEY

ALTERNATE PC NAME  
PC ACREAGE

THOROUGH CURSORY  
ADEQUATE GUESS  
SPECIES SURVEY

SITE CODE  
C  
N  
U  
G  
ACC.  
RANK

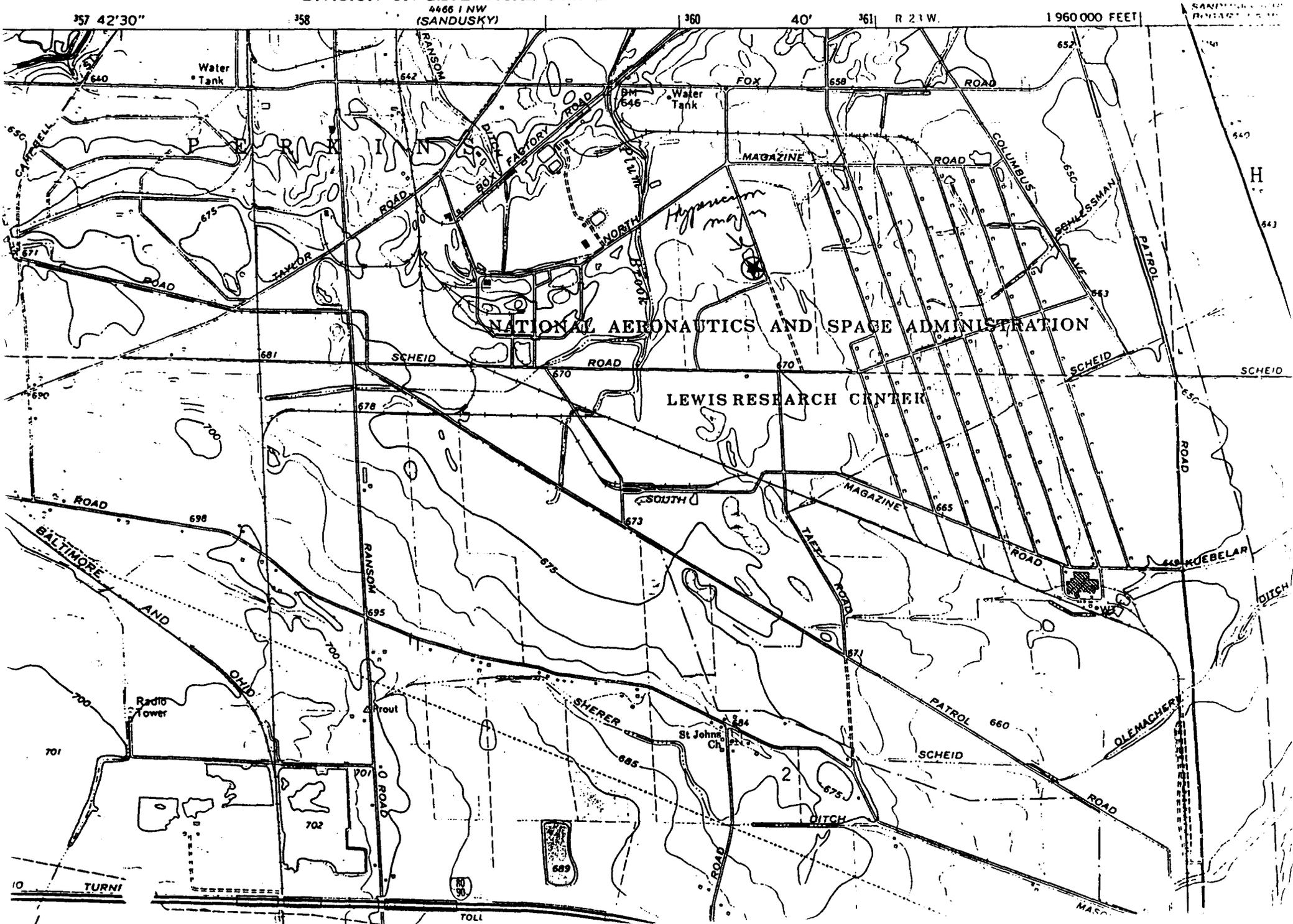
ALT. PC W PC SIZE

FED. OHIO DNAP  
STATUS STATUS STATUS

R. WS. BND. SUR. OWN. REF.

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL SURVEY

7.5 MINUTE SECTION



ELEMEN NAME Rhexia virginica

CLASS SP SUBCL. LK ELEM. 581

OCC.# QUAD CODE

LAT/LONG N W O H STATE CO. CODE

COUNTY NAME(S) Eric

QUAD NAME(S) Kimball

SOURCE OF LEAD DNAP Plum Brook Survey, Curish, A.W., #31979, Kent State Univ.

YEAR MO. DAY MANAGED AREA 19940822 NASA Plum Brook Station

# OWN. PROT. SPECIAL STATUS SIZE-ACRES

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE) Virginia Meadow-beauty  
ELEMENT COMMON NAME

EO DATA (FOR EXAMPLE ca 100 plants SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

HABITAT/COMMUNITY DATA Full sun, moist s.wale

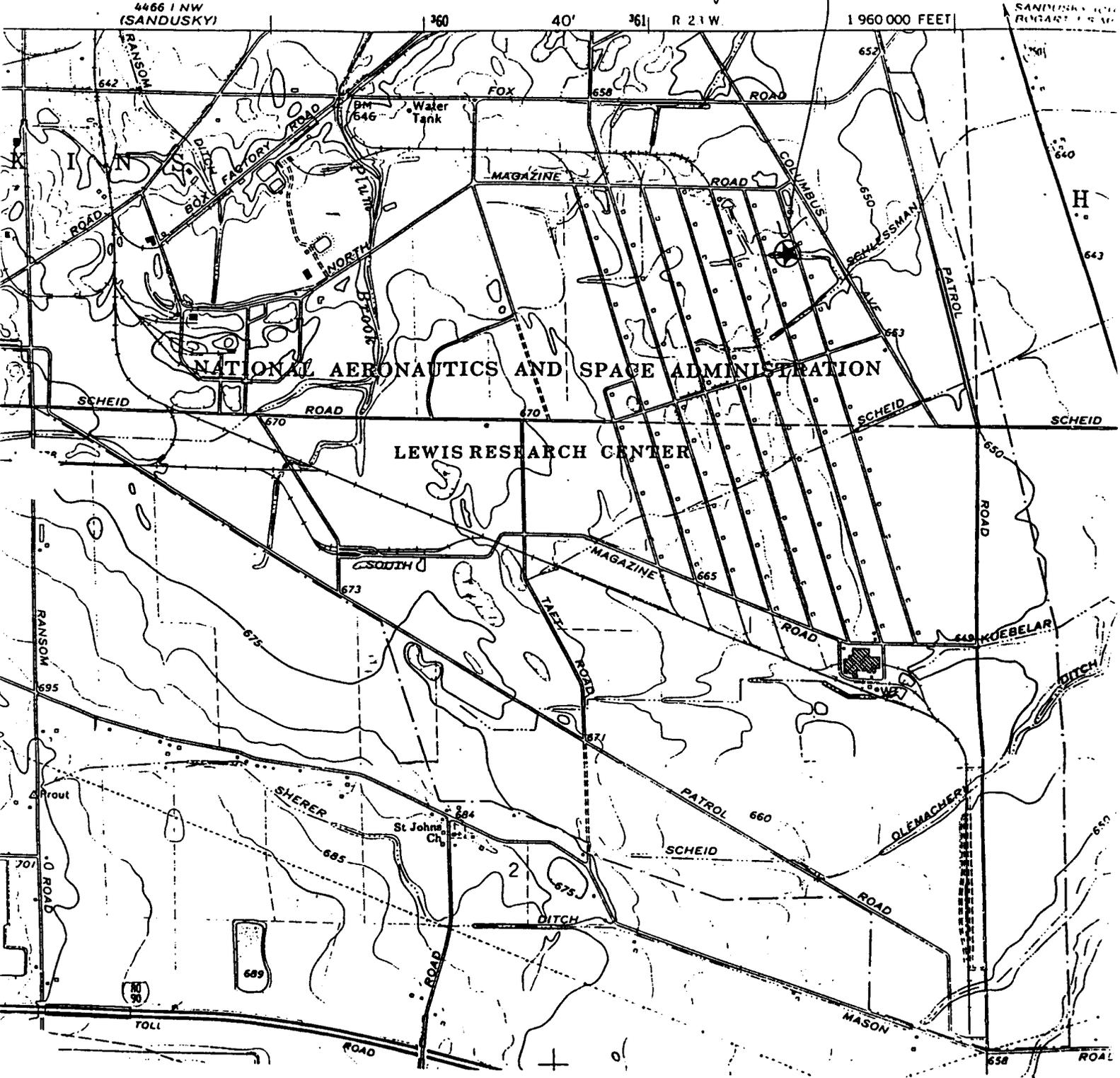
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE) W of bunker 1113, rd 11, S of North Magazine Rd, @ Perinton Twp, Eric Co

S E I THOROUGH CURSORY  
QUAL. QUAN. INTENSIVE ADEQUATE GUESS  
PC SURVEY PC ACREAGE SPECIES SURVEY  
ALT. PC W PC FED. OHIO DNAP SITE CODE C N U G ACC.  
STATUS STATUS STATUS SUR. OWN. REF.

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL SURVEY

*Rhexia virginica*

7.5 MINUTE SE



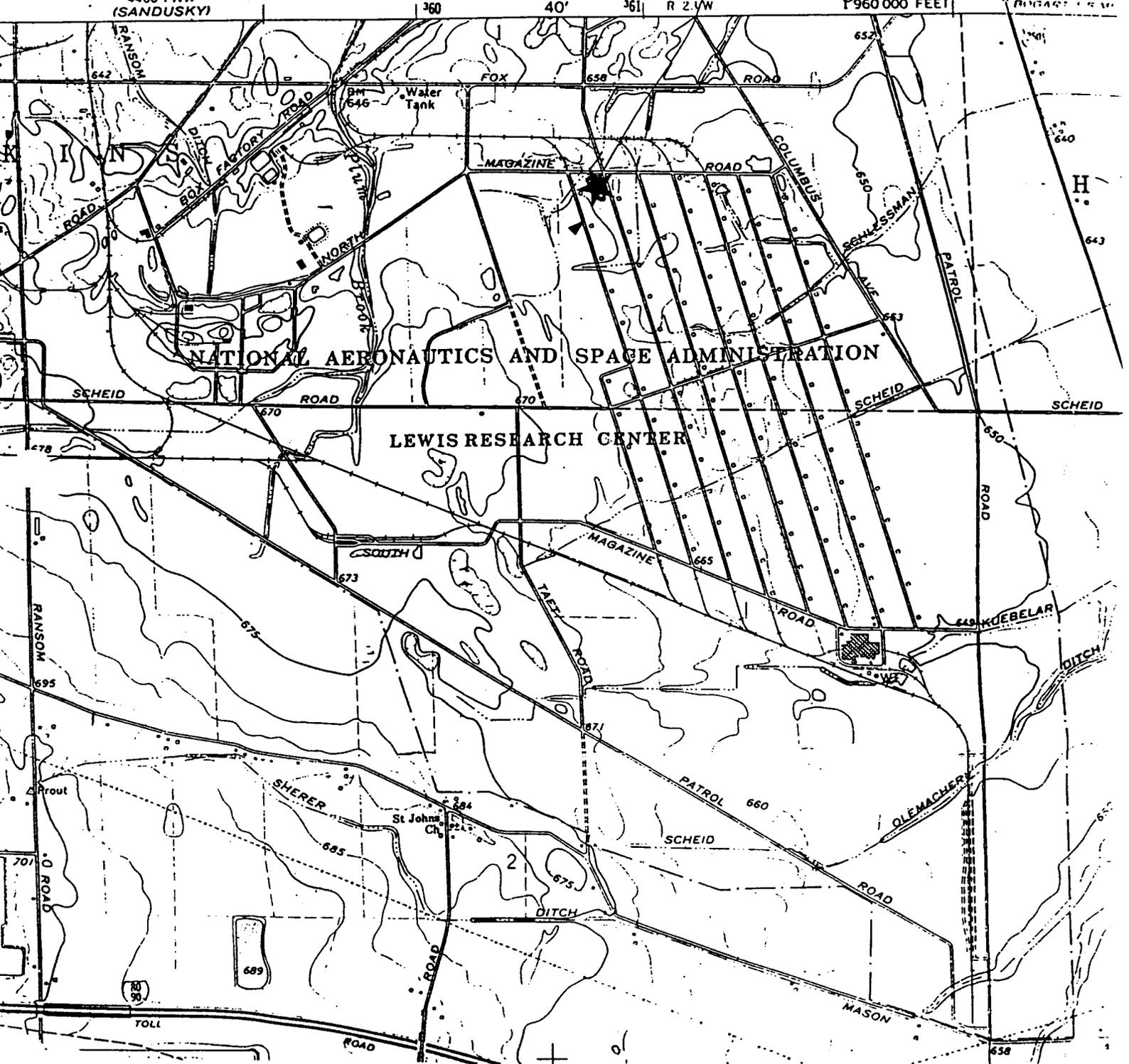


DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL SURVEY

4466 1 NW  
(SANDUSKY)

*Rhexia virginica* 7.5 MINUTE SE

SANDUSKY COUNTY  
RANGE 1 E



Rhe. ic virginica  
ELEMENT NAME

5P LK 581  
CLASS SUBCL. ELEM.

OC. # QUAD CODE

LAT/LONG N O W O H STATE CO. CODE

Erie  
COUNTY NAME(S)

Kimball  
QUAD NAME(S)

NASA Plum Brook Survey, Curich, A.W., #32077, OSU Herbarium  
SOURCE OF LEAD

19940209 NASA Plum Brook Station  
YEAR MO. DAY MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR. & PHONE IF AVAILABLE)

Virginic Meadow-beauty  
ELEMENT COMMON NAME

ca 200 plants  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

moist, shaly ground in opening created for parking & for storage tanks  
HABITAT/COMMUNITY DATA

W 7 angling road, 1/2 mi NW, just 7 Patrol & Taylor Rds, Perkins Twp, Erie Co.  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

S E I THOROUGH CURSORY  
ALTERNATE PC NAME ADEQUATE GUESS  
QUAL. QUAN. INTENSIVE PC SURVEY PC ACREAGE SPECIES SURVEY SITE CODE C N U G ACC.  
ALT. PC W PC SIZE FED. OHIO DNAP STATUS STATUS STATUS .R. WS. BND. SUR. OWN. REF. EU

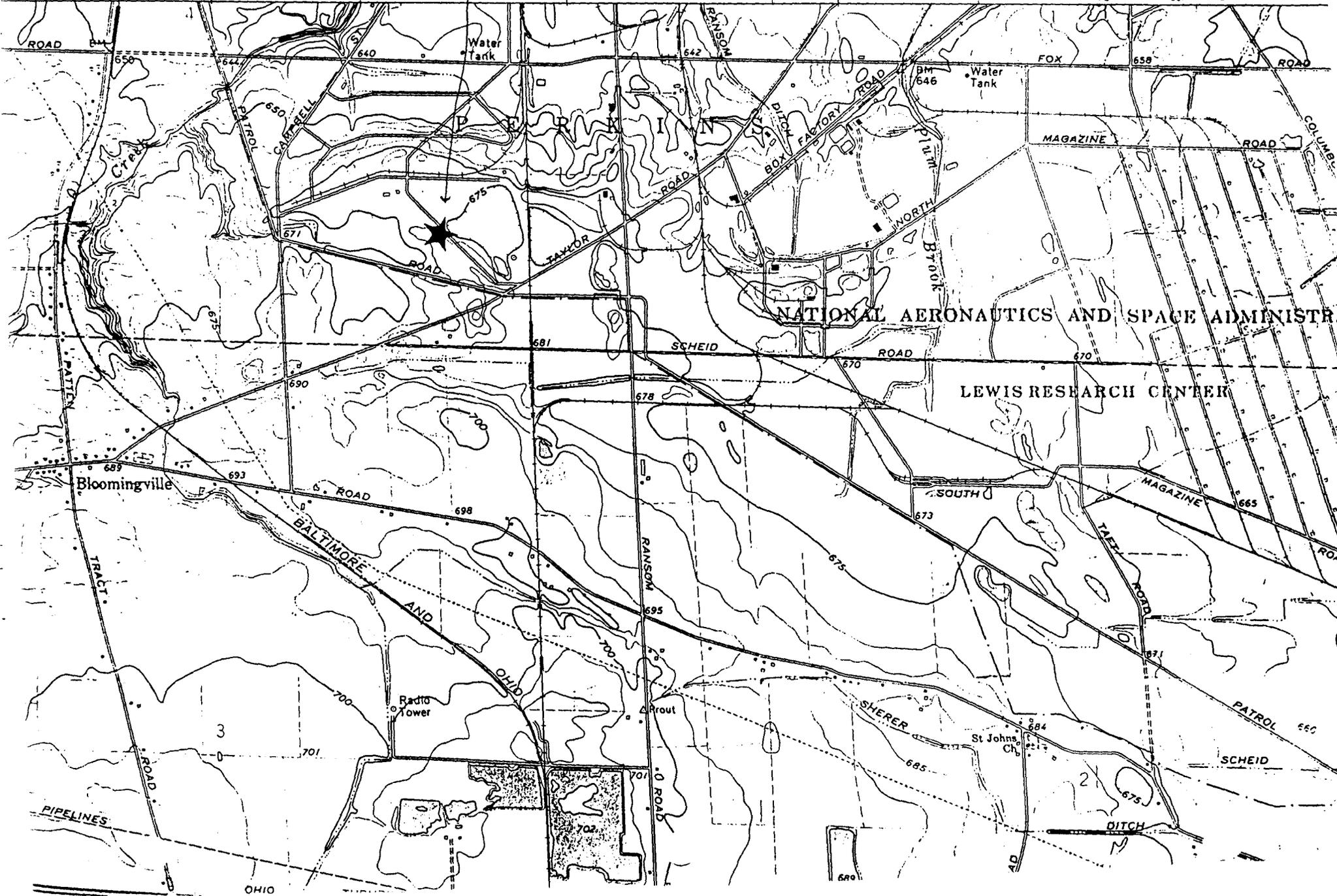
RIOR

*Alexis Virginia*

STATE OF OHIO  
DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL SURVEY

4466 1 NW  
(SANDUSKY)

356 357 42'30" 358 360 40' 361 R 23 W



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

LEWIS RESEARCH CENTER

Bloomingville

Radio Tower

St John's Ch

OHIO

Vi lanceolata  
ELEMENT NAME

up dat. of 017

SP KH 913  
CLASS SUBCL. ELEM.

OCC.# QUAD CODE

LAT/LONG N W O H STATE CO. CODE

Erie  
COUNTY NAME(S)

Kimball  
QUAD NAME(S)

DNAP Plum Brook Project, Casich, A.W., sight record  
SOURCE OF LEAD

199405 11 NASA Plum Brook Station  
YEAR MO. DAY MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

Lance-leaved Violet  
ELEMENT COMMON NAME

500-700 plants  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

Full sun, low moist ground & ditches  
HABITAT/COMMUNITY DATA

W side of Petrol Rd, to 0.2 mi S, jct of Fox Rd, Perkins Twp., Erie Co.  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

S E I ALTERNATE PC NAME THOROUGH CURSORY  
ADEQUATE GUESS  
QUAL. QUAN. INTENSIVE PC SURVEY PC ACREAGE SPECIES SURVEY SITE CODE C N U G ACC.  
ALT. PC W PC FED. OHIO DNAP WS. BND. SUR. OWN. REF. E.D.A.M.V.

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL SURVEY

4466 1 NW  
(SANDUSKY)

VIOLA  
*laevis*

7.5 MINUTE SE

196000 FEET

357 42'30"

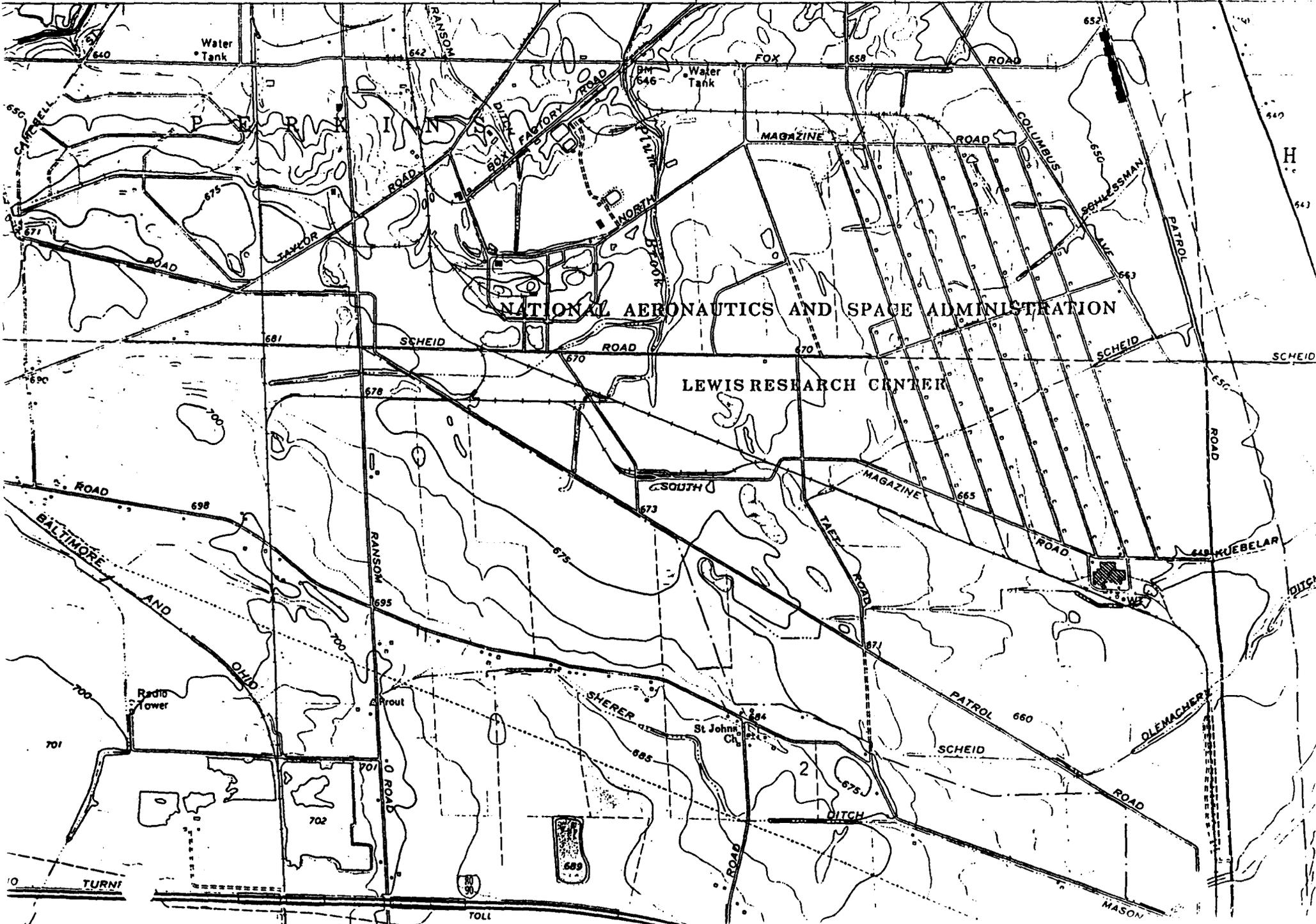
358

360

40'

361

R 21 W



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

LEWIS RESEARCH CENTER

TURN

TOLL

ELEMENT NAME

sp. of O/b

OCC.#	QUAD CODE
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LAT/LONG	N	W	O H STATE	CO. CODE
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SP CLASS KH 913  
SUBCL. ELEM.

Erie COUNTY NAME(S)  
Kimball QUAD NAME(S)

DNAP Plum Brook Project, Casich, A. W.; Miami Univ. Herbarium

19940511 YEAR MO. DAY  
NASA Plum Brook Station MANAGED AREA

# OWN.	PROT.	SPECIAL STATUS	SIZE-ACRES <sup>A</sup>
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PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR. & PHONE IF AVAILABLE)

Lance-leaved Violet  
ELEMENT COMMON NAME

ca 500 plants, scattered  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

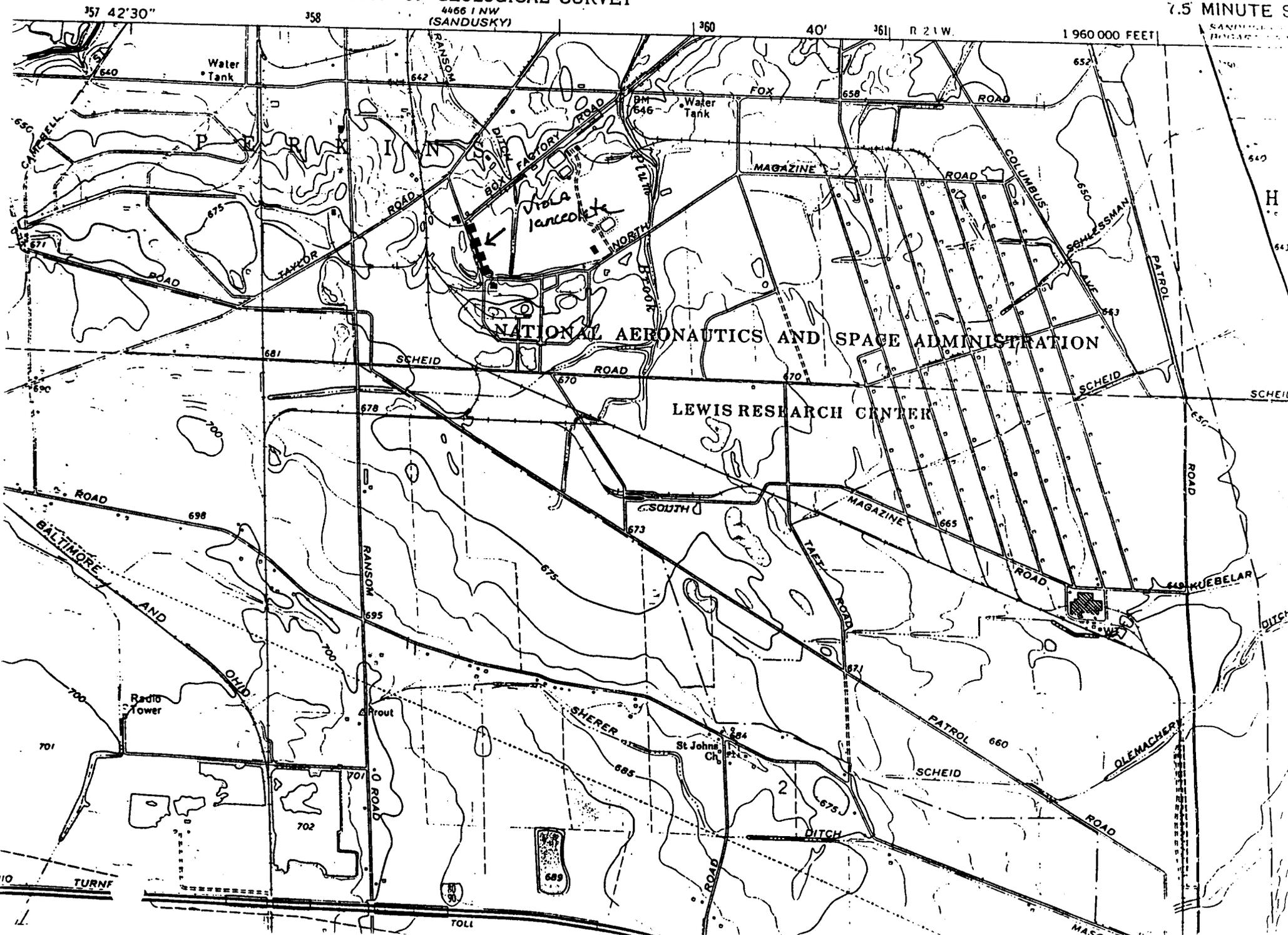
full sun, edges of wet ditches  
HABITAT/COMMUNITY DATA

E side of North Magazine Rd, S of Box Factory Rd, Perkins Twp,  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)  
Erie Co.

S	E	I	ALTERNATE PC NAME	THOROUGH	CURSORY	SITE CODE	C N U G A C C.			
QUAL.	QUAN.	INTENSIVE	PC ACREAGE	ADEQUATE	GUESS					
PC SURVEY				SPECIES SURVEY						
ALT. PC	W	PC SIZE	FED. STATUS	OHIO STATUS	DNAP STATUS	WS.	BND.	SUR. OWN.	REF.	EC

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL SURVEY

7.5 MINUTE SECTION



Vi lanceolata  
ELEMENT NAME

SP KH 913  
CLASS SUBCL. ELEM.

0  
OCC.# QUAD CODE

LAT/LONG --- N 0 --- W O H  
STATE CO.CODE

Erie  
COUNTY NAME(S)  
#31,620

Kimball  
QUAD NAME(S)

DNAP Plum Brook Project, Cusick, A.W., KSU Herb.  
SOURCE OF LEAD

19940512 NASA Plum Brook Station  
YEAR MO. DAY MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

Lance-leaved Violet  
ELEMENT COMMON NAME

> 1000 plants

EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

ditcher + moist, open ground; full sun  
HABITAT/COMMUNITY DATA

directly N of bunker 9113, Rd 11, 0.15 mi. S of North Magazine Rd,  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

Perkins Trg, Erie Co

S E I

ALTERNATE PC NAME

THOROUGH CURSORY

ADEQUATE GUESS

QUAL. QUAN. INTENSIVE  
PC SURVEY

PC ACREAGE

SPECIES SURVEY

SITE CODE

C  
N  
U  
G  
ACC.

ALT.PC- W PC  
SIZE

FED. OHIO DNAP  
STATUS STATUS STATUS

WS. BND. SUR. OWN. REF.

E  
DANV

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURC  
DIVISION OF GEOLOGICAL SURVEY

7.5' MINUTE SE

4466 1 NW  
(SANDUSKY)

357 42'30"

358

360

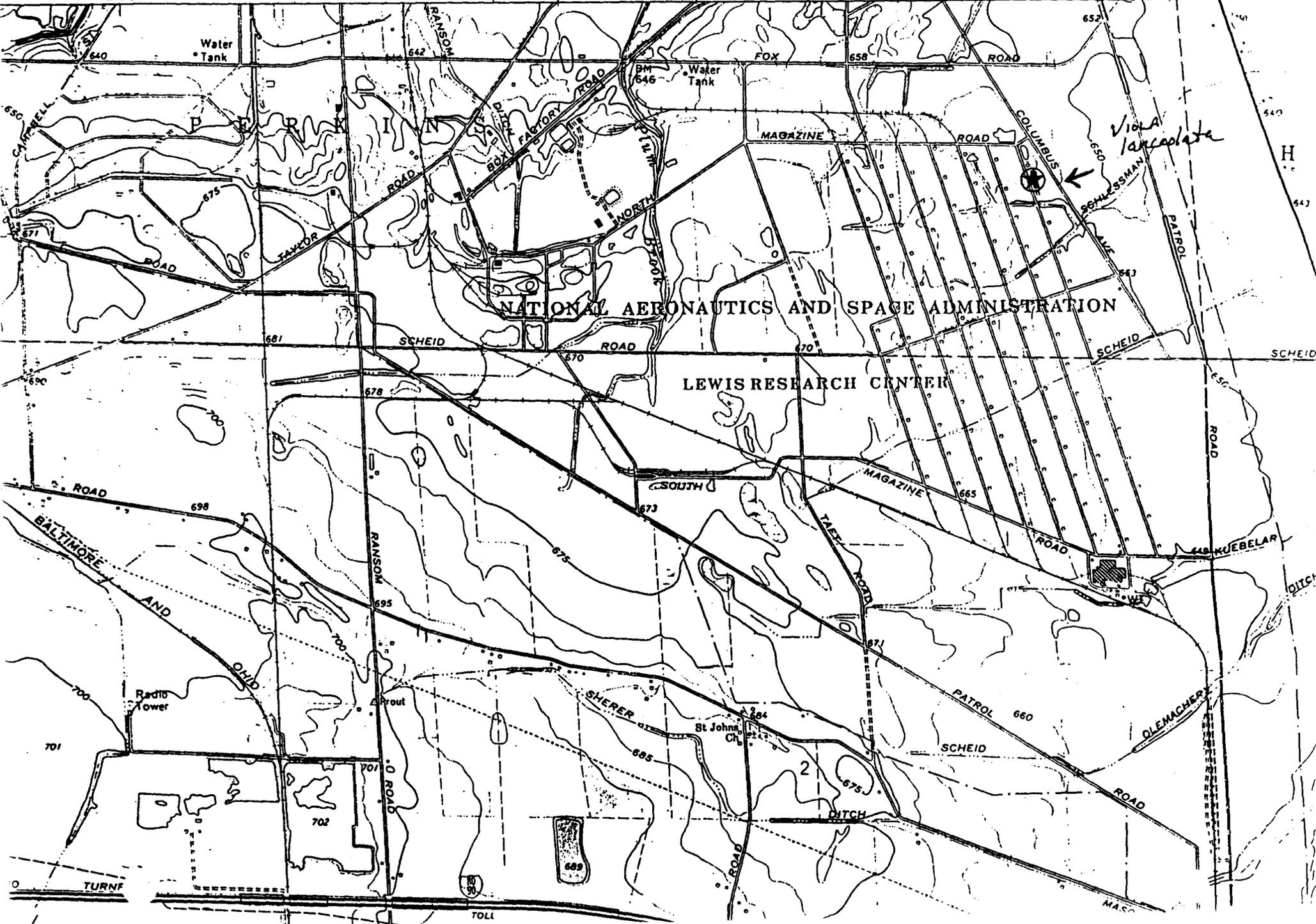
40'

361

R 21 W

1 960 000 FEET

SANDUSKY COUNTY  
DEPARTMENT OF HIGHWAYS



H

643

SCHEID

Violet lanceolata  
ELEMENT NAME

SP KH 913  
CLASS SUBCL. ELEM.

0  
OCC.# QUAD CODE

--- N 0 --- W OH  
LAT/LONG STATE CO.CODE

Erie  
COUNTY NAME(S)

Kimball  
QUAD NAME(S)

DNAP Plum Brook Project, Cusick, A.W., #31,605 Ohio State Univ. Herb.  
SOURCE OF LEAD

19940511 NASA Plum Brook Station  
YEAR MO. DAY MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

Lance-leaved Violet  
ELEMENT COMMON NAME

ca 100-150 plants  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

moist, low ground; full sun  
HABITAT/COMMUNITY DATA

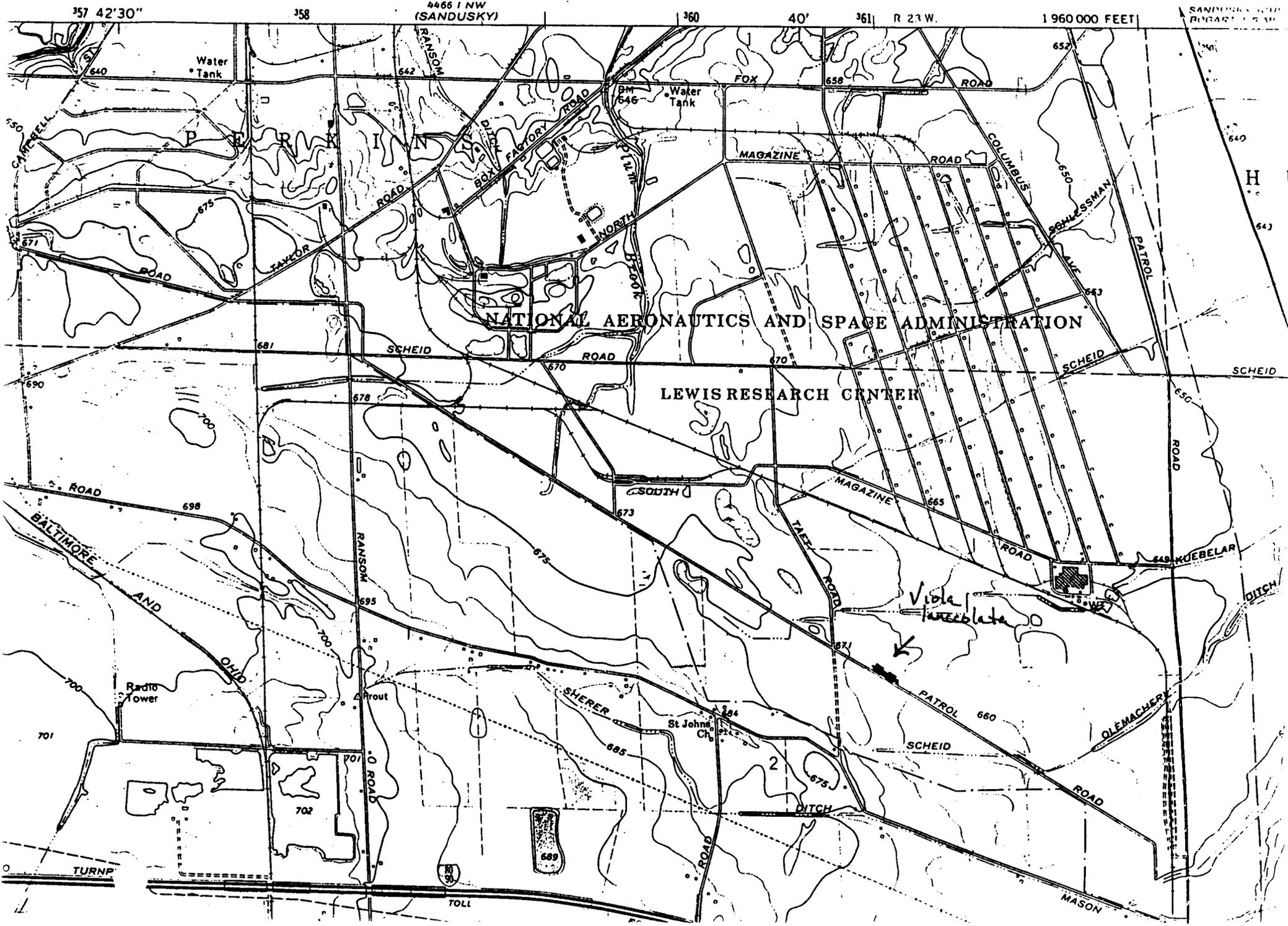
grassy strip on N side of Patrol Rd, 0.15-0.2 mi SE of Taft Rd, Oxford Twp,  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

Erie Co.

S	E	I	ALTERNATE PC NAME			<u>THOROUGH</u>	CURSORY	SITE CODE	C N U G ACC.				
QUAL.	QUAN.	INTENSIVE	PC ACREAGE			ADEQUATE	GUESS						
PC SURVEY			SPECIES SURVEY										
ALT. PC	W	PC SIZE	FED. STATUS	OHIO STATUS	DNAP STATUS	R.	WS.	BND.	SUR.	OWN.	REF.	I	

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCE  
DIVISION OF GEOLOGICAL SURVEY

MINUTE SECTION



4466 1 NW  
(SANDUSKY)

R 23 W.

196000 FEET

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

LEWIS RESEARCH CENTER

*Violet trace plate*

357 42'30"

358

360

40'

361

MINUTE SECTION

Water Tank

Water Tank

P R R I N

MAGAZINE ROAD

COLUMBUS ROAD

TANKOR ROAD

NORTH

SCHLESSMAN

681

SCHEID ROAD

ROAD

670

SCHEID

SCHEID

700

ROAD

698

SOUTH

673

MAGAZINE ROAD

665

BALTIMORE AND OHIO

RANSOM ROAD

695

TAFF ROAD

675

KUEBELAR

Radio Tower

Prout

SHERER

St Johns Ch

PATROL

660

OLEMACHERY ROAD

701

702

689

2

675

TURNP

TOLL

MASON

Vi lanceolata  
ELEMENT NAME

SP KH 913  
CLASS SUBCL. ELEM.

OCC.# QUAD CODE

LAT/LONG N W O H STATE CO. CODE

Erie  
COUNTY NAME(S)

Kimball  
QUAD NAME(S)

DNAP Plum Brook Project, Casich, A. W., sight record  
SOURCE OF LEAD

1 9 94 05 11 NASA Plum Brook Station  
YEAR MO. DAY MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

Lance-leaved Violet  
ELEMENT COMMON NAME

>1000 plants, scattered thinly  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

ditcher & low, open ground, full sun  
HABITAT/COMMUNITY DATA

both sides of Rd 12 to 0.2 mi. SSE of North Magazine Rd, Persim Top,  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

Erie Co.

S E I  
QUAL. QUAN. INTENSIVE  
PC SURVEY

ALTERNATE PC NAME

PC ACREAGE

THOROUGH CURSORY

ADEQUATE GUESS

SPECIES SURVEY

SITE CODE

C  
N  
U  
G  
ACC.

ALT. PC W PC  
SIZE

FED. OHIO DNAP  
STATUS STATUS STATUS

I. WS. BND. SUR. OWN. REF.

EU  
DAMP

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCE  
DIVISION OF GEOLOGICAL SURVEY

*Viola lanceolata*

7.5 MINUTE SE

1960 000 FEET

357 42'30"

358

4466 1 NW  
(SANDUSKY)

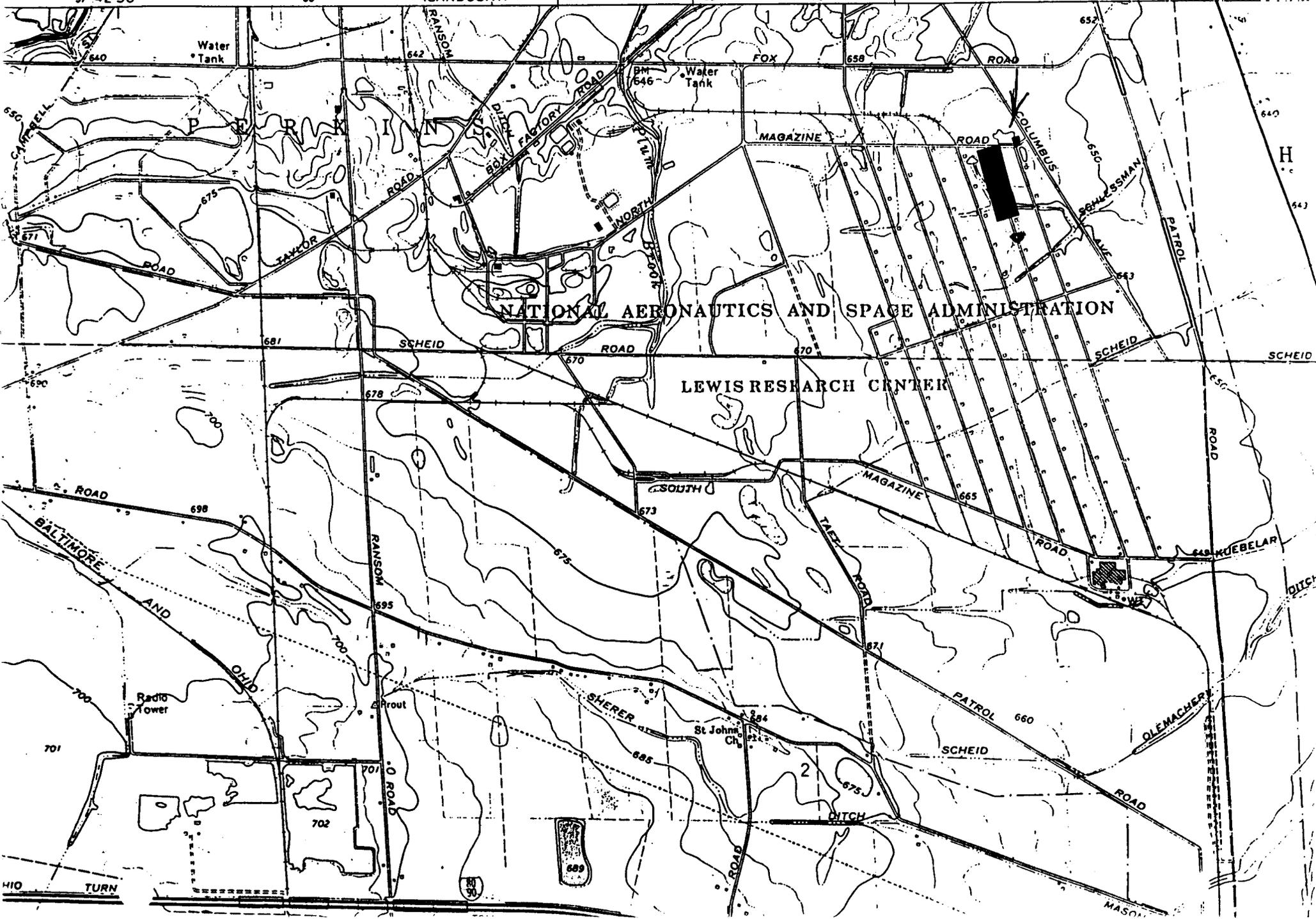
360

40'

361

R 21 W

1960 000 FEET



HIO TURN

RD 30

MASON

16 lanceolated  
ELEMENT NAME

SP CLASS KH SUBCL. 913 ELEM.

OCC.# QUAD CODE

LAT/LONG N W O H STATE CO. CODE

Erie  
COUNTY NAME(S)

Kimball  
QUAD NAME(S)

DNAP Plum Brook Project, Curick, A.W., right record  
SOURCE OF LEAD

19940511 YEAR MO. DAY NASA Plum Brook Station MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

Lance-leaved Violet  
ELEMENT COMMON NAME

ca 700 plants, scattered  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

low, on ground about artificial pond, full sun  
HABITAT/COMMUNITY DATA

sw, jct of Rd 16 + North Magazine Rd, @ Pembina Twp, Erie Co.  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

S E I  
QUAL. QUAN. INTENSIVE  
PC SURVEY

ALTERNATE PC NAME

THOROUGH CURSORY

ADEQUATE GUESS

PC ACREAGE

SPECIES SURVEY

SITE CODE

C  
N  
U  
G  
A  
C  
C.

ALT. PC-CO W PC SIZE

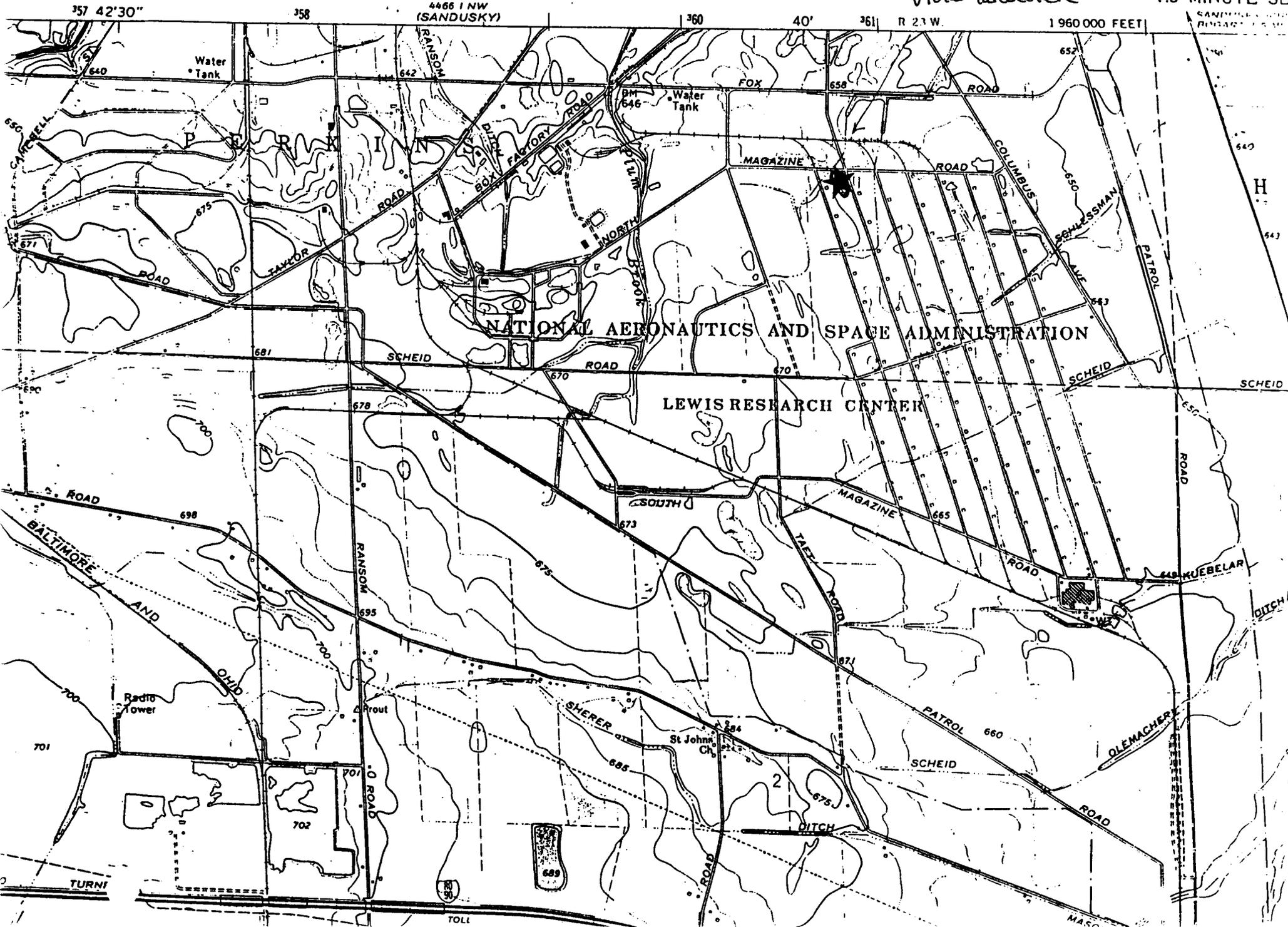
FED. OHIO DNAP  
STATUS STATUS STATUS

WS. BND. SUR. OWN. REF. EC

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCE  
DIVISION OF GEOLOGICAL SURVEY

*Viola lanceolata*

7.5 MINUTE SECTION



Wic lanceolata  
ELEMENT NAME

SP CLASS KH SUBCL. 913 ELEM.

OC. # 0 QUAD CODE ---

LAT/LONG --- N 0 --- W O H STATE CO. CODE

Erie  
COUNTY NAME(S)

Kimball  
QUAD NAME(S)

DNAP Plum Brook Project, Curick, A. W., sight record  
SOURCE OF LEAD

19940511 YEAR MO. DAY NASA Plum Brook Project MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS --- SIZE-ACRES <sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR. & PHONE IF AVAILABLE)

Lance-leaved Violet  
ELEMENT COMMON NAME

>1000 plants  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

moist, nearly barren depression, full sun  
HABITAT/COMMUNITY DATA

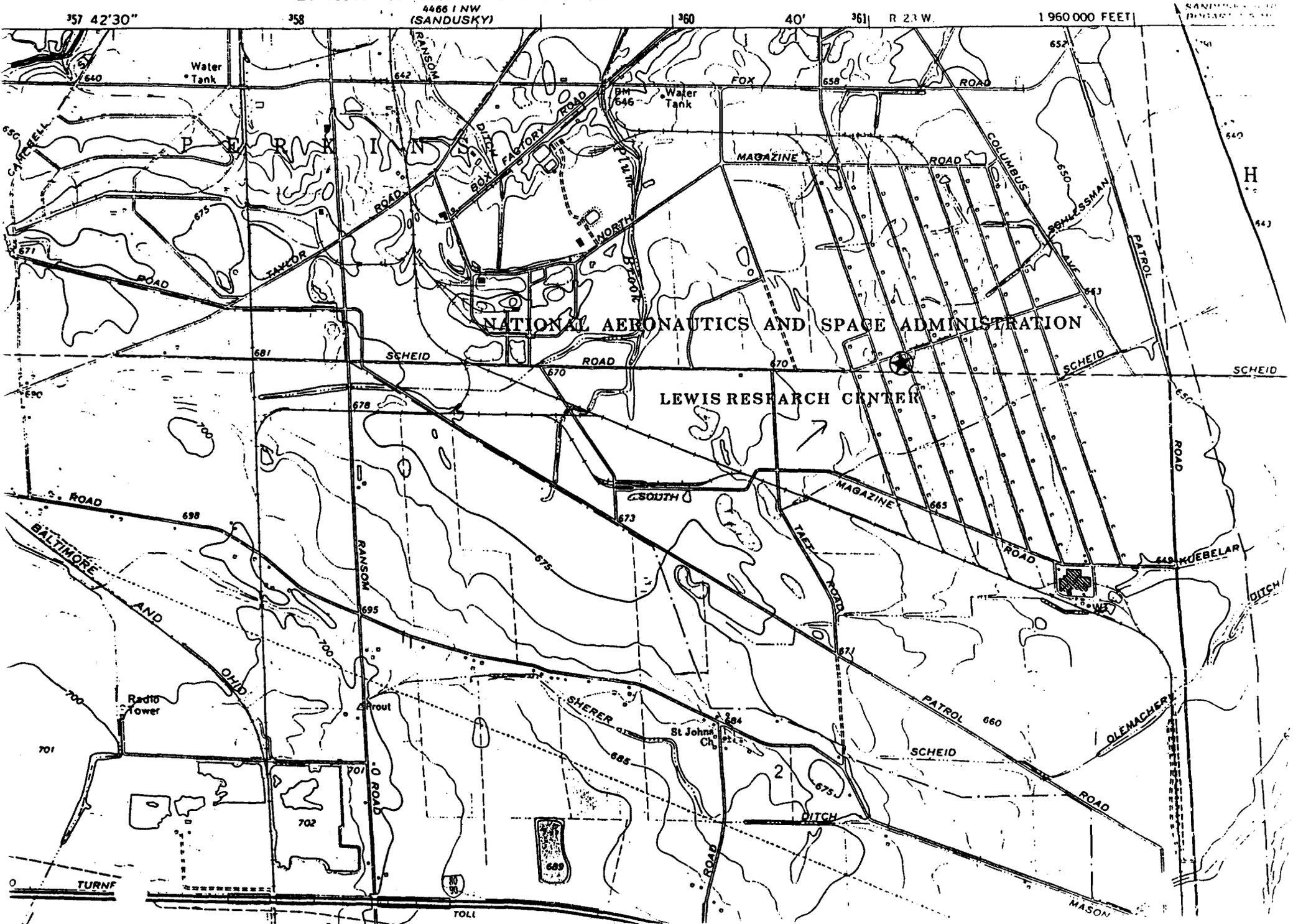
sw, jct of Rd 16 & Center Magazine Rd, just N of Perkins Trg line,  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)  
Erie Co.

S E I THOROUGH CURSORY  
QUAL. QUAN. INTENSIVE ADEQUATE GUESS  
PC SURVEY PC ACREAGE SPECIES SURVEY SITE CODE C N U G ACC.  
ALT. PC --- W PC FED. OHIO DNAP WS. BND. SUR. OWN. REF. EC PANV

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCE  
DIVISION OF GEOLOGICAL SURVEY

*Viola lanceolata*

7.5 MINUTE SECTION



ELEMENT NAME

*Vicia lanceolata*

SP CLASS KH SUBCL. 913 ELEM.

OCC.# QUAD CODE

LAT/LONG N O W O H STATE CO. CODE

Erie COUNTY NAME(S)

Kimball QUAD NAME(S)

DNAP Plum Brook Project, Curick, A. W., right record

19940511 NASA Plum Brook Station  
YEAR MO. DAY MANAGED AREA

1  
2  
3  
# OWN. PROT. SPECIAL STATUS SIZE-ACRES<sup>A</sup>

PRINCIPAL OWNER (FOR PRIVATE OWNERS, ADDR.&PHONE IF AVAILABLE)

*Lance-leaved Violet*  
ELEMENT COMMON NAME

ca 150 plants  
EO DATA (FOR EXAMPLE: SIZE, QUANTITY, FREQUENCY, DENSITY, EXTENT--SPECIFY WHAT UNITS ARE COUNTED)

*On edges of wet ditch, full sun*  
HABITAT/COMMUNITY DATA

*both sides of Scheid Ditch lined by SW, Rd 18, Oxford Twp.,  
Erie Co.*  
LOCATION DESCRIPTION (ATTACH MAP IF POSSIBLE)

S E I  
QUAL. QUAN. INTENSIVE  
PC SURVEY

ALTERNATE PC NAME  
PC ACREAGE

THOROUGH CURSORY  
ADEQUATE GUESS  
SPECIES SURVEY

SITE CODE  
C  
N  
U  
G  
ACC.

ALT. PC- W PC SIZE

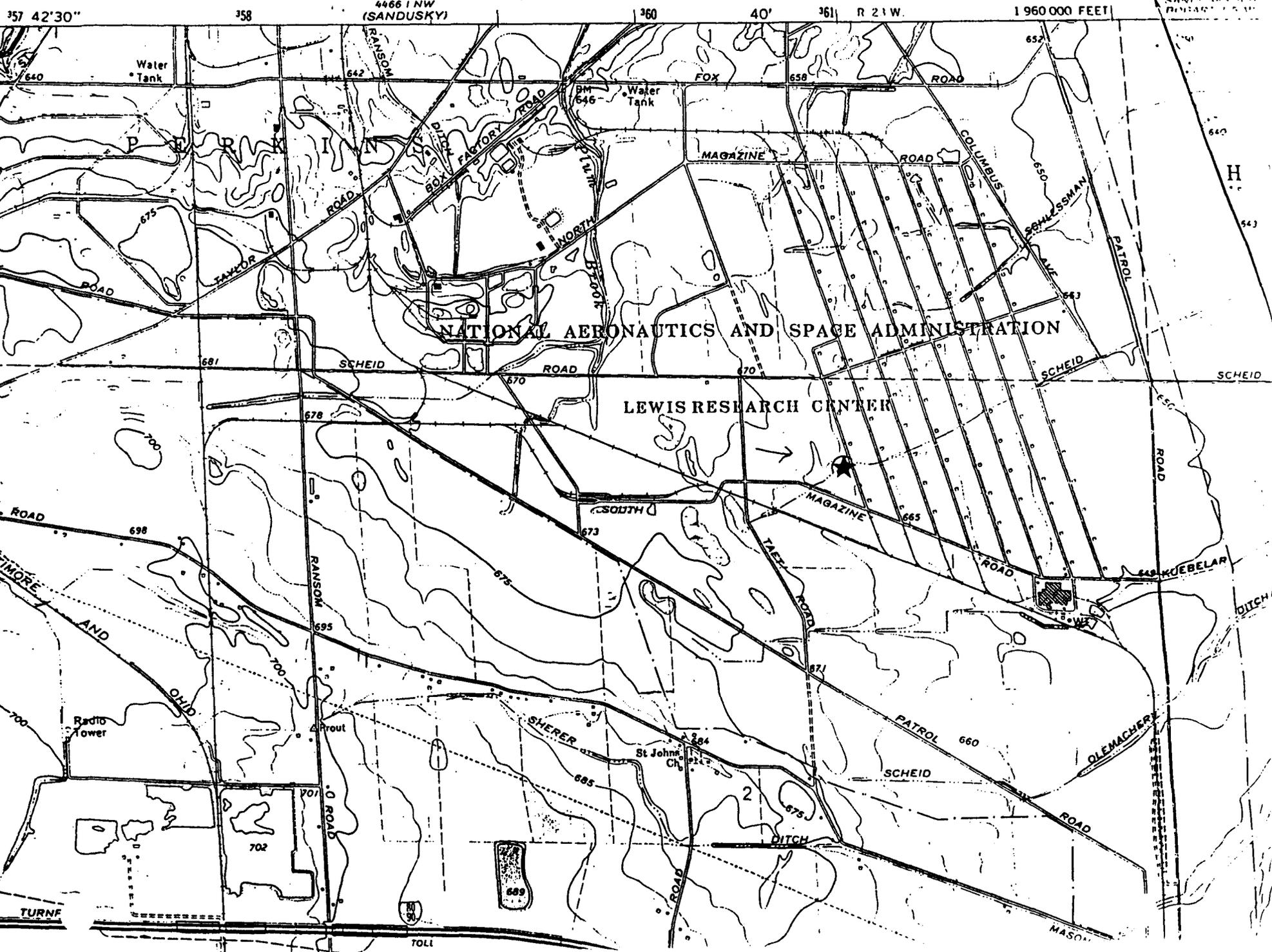
FED. OHIO DNAP  
STATUS STATUS STATUS

WS. BND. SUR. OWN. REF.

EC

DEPARTMENT OF HIGHWAYS  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF GEOLOGICAL SURVEY

*Viola lanceolata* 7.5 MINUTE SE



**APPENDIX B. ABSTRACTS OF STATE LISTED PLANT SPECIES FOUND ON THE  
NASA PLUM BROOK STATION.**

## ARENARIA LATERIFLORA L.

## Grove Sandwort

FAMILY: Caryophyllaceae

SYNONYMS: Moehringia lateriflora (L.) Fenzl.

HABIT: Slender-stemmed annual herb from creeping filiform rhizome; to 4 dm.; flowering late April to mid-August; fruiting May through August.

SIMILAR SPECIES: Somewhat resembles *Stellaria* or *Cerastium*, but *A. lateriflora* is easily distinguished from these genera by its entire petals; separated from other Ohio species of *Arenaria* by presence of strophiole at the hilum of seeds.

TOTAL RANGE: Lab. to Alaska, s. to Nfld., N.S., N.E., Md., O., Ind., ne. Ill., Mo., S.D., and N.M.

STATE RANGE: There are post-1970 specimens from 5 counties in western Ohio: Auglaize, Defiance, Darke, Hardin, and Van Wert. There are pre-1970 collections from 17 other counties: Adams, Allen, Ashtabula, Clinton, Delaware, Franklin, Lake, Marion, Mercer, Morrow, Ottawa, Paulding, Perry, Putnam, Trumbull, Union, and Wood.

STATE STATUS: Undetermined.

HABITAT: In Ohio, this species shows a preference for damp, open woods. However, label data from a few collections indicate habitat as dry woods, and roadsides.

HAZARDS: Destruction of habitat, overgrowth by woody species through succession.

RECOVERY POTENTIAL: Unknown, but apparently poor; however, one vigorous population in Hardin County, extant as of 1990, occurs in an actively grazed woodland.

INVENTORY GUIDELINES: Collect complete, mature specimens; avoid over-collecting.

COMMENTS: The habitat in which *Arenaria lateriflora* occurs is not uncommon in Ohio, blooming period is at a time when activity by botanists is heavy, and this is a rather showy plant which should be prone to collection. Therefore, the lack of recent records is inexplicable. Furthermore, this species has been actively sought after in recent years in northeastern Ohio, to no avail. *Arenaria lateriflora* is on the southern periphery of its range in Ohio, and may be exhibiting a shrinking back from the edges of this part of its range, due to unknown causes.



*lactea* (Raf.) Thieret  
BAPTISIA LEUCANTHA T. & G.  
Prairie False Indigo

A-229

FAMILY: Leguminosae (Fabaceae).

SYNONYM: Baptisia lactea (Raf.) Thieret *leucantha* T. & G.

HABIT: Perennial herb to 1.5 m.; flowering May-July; fruiting July-September.

SIMILAR SPECIES: This is the only Ohio Baptisia with white flowers. The other Ohio species of this genus have yellow or blue flowers.

TOTAL RANGE: MS to TX, n. to sw. Ont., OH, MI, WI, MN, and NE.

STATE RANGE: There are post-1960 records from 6 counties: Adams, Erie, Franklin, Madison, Marion, and Medina. There are pre-1960 records from 12 other counties: Brown, Clark, Clinton, Crawford, Defiance, Delaware, Fairfield, Highland, Lucas, Pickaway, Ross, and Wyandot.

STATE STATUS: 1980-Threatened, 1982-T, 1984-T.

HABITAT: Occurs in wet to dry, open to semi-shaded situations: open upland woods, rocky open slopes, prairies, and alluvial soil along streams; also in waste fields and along railroad tracks.

HAZARDS: Overshading by woody species as a result of succession.

RECOVERY POTENTIAL: Probably excellent due to its variety of habitat and tolerance of disturbance. Steyermark (1963) states that it is easily grown from seed.

INVENTORY GUIDELINES: Mature flowering or fruiting material is needed for positive identification.

COMMENTS: Deam (1940) states that this plant is infrequent in its habitat throughout Indiana and that usually only a few plants are found at a place. It should be sought throughout the western half of Ohio.

A hybrid of this species with the frequent, yellow-flowered Baptisia tinctoria has been reported from Indiana (Larisey, 1940). This hybrid should be sought in northwestern Ohio.

Kartesz and Kartesz (1980) treat this plant as Baptisia lactea (Raf.) Thieret and place B. leucantha in synonymy. This treatment has not yet been generally accepted, however.

CAREX ALATA T. & G.  
Broad-winged Sedge

FAMILY: Cyperaceae.

HABIT: Tufted perennial form a short, blackish, fibrillose rootstalk, fertile culms 2-12 dm.; fruiting June-July.

SIMILAR SPECIES: This species is one of a series of sedges, the section Ovales, the members of which are extremely difficult to identify accurately. Species are distinguished largely by careful measurements and critical examination of the perigynia and pistillate scales.

TOTAL RANGE: Along the Atlantic and Gulf Coastal Plains from MA to FL to TX, with scattered interior stations in NY, OH, MI, IN, and MO.

STATE RANGE: There are post-1950 collections from Ashtabula, Lucas and Williams counties. There are 19th century collections from 5 other counties: Cuyahoga, Lake, Stark, Summit, and Wayne.

HABITAT: Moist situations in sun to semi-shade, often in neutral substrates; meadows, woods borders, lake margins, bogs, fens, clearings in woods.

HAZARDS: Overgrowth by woody species through succession.

RECOVERY POTENTIAL: Unknown.

INVENTORY GUIDELINES: Collect complete, mature specimens; all reports should be checked carefully.

COMMENTS: The members of this group of sedges are notoriously difficult to identify. This species easily may be overlooked and/or misidentified. It should be sought throughout the state, and particularly in the northern counties.

SELECTED REFERENCES:

Mackenzie, K.K. 1940. North American Cariceae. N.Y. Bot. Gard., pl. 185.

Voss, E.G. 1972. Michigan flora, Part I, Gymnosperms and monocots. Cranbrook Inst. of Sci. Bull. 55, Bloomfield Hills, MI. 488 p.

3/81 AWC  
SP GJ J03

CAREX CONOIDEA Willd.  
Field Sedge

- FAMILY: Cyperaceae.
- HABIT: Loosely tufted perennial from a short, stout rootstalk, fertile culms mostly solitary 1-7 dm.; fruiting mid May-June.
- SIMILAR SPECIES: Similar to Carex crawei and C. tetanica, both of which occur in similar habitats. These two species differ from C. conoidea in having elongate rootstalks and awnless or short-awned pistillate scales. C. amphibola is somewhat like C. conoidea, but differs in having a sessile or short-peduncled staminate spike. All these distinctions between species are less certain in immature specimens.
- TOTAL RANGE: Nfld. to MN, s. to DE, NC, OH, and MO.
- STATE RANGE: There are post-1950 collections from Henry and Wood counties. There are pre-1950 records from 4 other counties: Erie, Lake, Lucas, and Stark.
- HABITAT: A variety of moist, open situations, usually in calcareous or neutral substrates; fens, wet prairies, meadows, borders.
- HAZARDS: Overgrowth by woody species through succession.
- RECOVERY POTENTIAL: Unknown, but possibly good; known to occur in somewhat disturbed situations.
- INVENTORY GUIDELINES: Collect complete, mature specimens with underground parts; all reports should be checked carefully.
- COMMENTS: This sedge is not very obvious and easily could be overlooked and/or misidentified. It should be sought throughout northern Ohio. Probably it is more frequent than the few records indicate.
- SELECTED REFERENCES:
- Mackenzie, K.K. 1940. North American Cariceae. N.Y. Bot. Gard., pl. 311.
- Voss, E.G. 1972. Michigan flora, Part I, Gymnosperms and monocots. Cranbrook Inst. of Sci. Bull. 55, Bloomfield Hills, MI. 488 p.

2/25/81 AWC  
SP GJ 118

GRATIOLA VIRGINIANA L.  
Round-fruited Hedge-hyssop

FAMILY: Scrophulariaceae.

HABIT: Herbaceous weak-stemmed annual, 104 dm., flowering May-October.

SIMILAR SPECIES: This species is confused with Lindernia dubia, Gratiola viscidula, and Gratiola neglecta. The genus Gratiola has flowers subtended by bracts. Lindernia lacks these bracts. Counting the "sepals", 5 or 7, will distinguish these genera. Gratiola virginiana has narrow based leaves in contrast to the broad-based leaves of G. viscidula. G. virginiana has shorter pedicels than G. neglecta.

TOTAL RANGE: FL to TX, n. to NJ, MD, WV, OH, IN, IL, IA and KS.

STATE RANGE: There are post-1960 records from Ashtabula, Erie, Gallia, Jackson, Lawrence, Scioto, and Vinton Counties. There are pre-1960 records from Clermont and Hamilton Counties.

STATE STATUS: 1980-Threatened, 1982-T, 1984-Potentially Threatened, 1986-P, 1988-T, 1990-T, 1992-P, 1994-P.

HABITAT: Wet places of many types: stream margins, pools, ditches, swamps; generally in shade or semi-shade.

HAZARDS: Drainage of the habitat.

RECOVERY POTENTIAL: Unknown.

INVENTORY GUIDELINES: Collect complete, mature, flowering or fruiting material.

COMMENTS: Pennell (1935) divides the typical variety, which occurs in Ohio, from the var. aestuvariorum on the basis of leaf, pedicel and flower characters. The variety aestuvariorum occupies tidal habitats from NH to VA. However, Ferren and Schuyler (1980) do not believe that this variety warrants taxonomic status. This plant has two blooming periods, one in the spring and one later in the year from seedlings of the current year. There are very likely more records of this plant to be obtained in either southern Ohio or the Lake Plains of northern Ohio.

SELECTED REFERENCES:

Cooperrider, T.S. 1976. Notes on Ohio Scrophulariaceae. *Castanea* 41: 223-226.

Ferren, W.R. Jr. and A.E. Schuyler. 1980. Intertidal vascular plants of river systems near Philadelphia. *Proc. Acad. Nat. Sci., Phil.* 132: 86-120.

Pennell, F.W. 1935. The Scrophulariaceae of eastern temperate North America. Monograph, No. 1, *Acad. of Nat. Sci., Phil.* xiv + 650 p.

HELIANTHUS MOLLIS Lam.  
Ashy Sunflower

FAMILY: Compositae (Asteraceae)

HABIT: Herbaceous perennial 0.5-1.0 m.; flowering August-September.

SIMILAR SPECIES: The cinereous pubescence and sessile, clasping leaves are unique among Ohio's sunflowers. Hybrids between this species and other sunflowers have been reported from other states.

TOTAL RANGE: OH, MI, and IA, s. to GA, AL, LA, and TX; occasionally adventive to the north and east of this range.

STATE RANGE: Formerly widely distributed over the state with pre-1950 records from 8 counties: Ashtabula, Butler, Franklin, Jackson, Lake, Meigs, Ross, and Scioto. There are post-1950 collections from only Adams and Erie counties. Known Ohio populations consist of few individuals.

HABITAT: A variety of well-drained, sunny openings; dry prairies, railroad embankments; roadsides; woods borders and clearings; usually in neutral substrates.

HAZARDS: Overgrowth by woody species; digging by wildflower gardeners.

RECOVERY POTENTIAL: This species transplants readily and grows well in cultivation. However, its disappearance from large parts of its former range indicates that it is sensitive to disturbance.

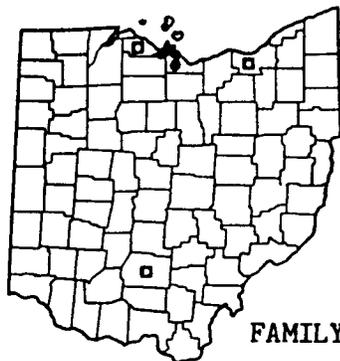
INVENTORY GUIDELINES: This species is unlikely to be misidentified.

COMMENTS: The present-day range of this species probably is known accurately, as the species is distinctive and easily recognized. With its recovery potential, this species could be used in prairie restoration projects.

SELECTED REFERENCES:

Heiser, C.B., Jr., 1969. The North American sunflowers (Helianthus).  
Mem. Torr. Bot. Club 22: 1-218.

3/10/80 AWC  
SP NX K28



HYPERICUM GYMNANTHUM Engelm. & Gray  
Least St. John's-wort

FAMILY: Hypericaceae (Guttiferae).

HABIT: Perennial herb to 9 dm.; flowering late June-September; fruiting July-September.

SIMILAR SPECIES: Hypericum gymnanthum resembles H. majus and H. canadense. H. gymnanthum often has wider leaves and a more loose and open inflorescence, with cymes on long peduncles. However, technical characters are required for positive determination.

TOTAL RANGE: FL to TX, n. locally to L.I., NJ, PA, WV, OH, IL, MO, and e. KS.

STATE RANGE: There is a post-1960 record from Erie County. Pre-1960 specimens exist from Cuyahoga and Ross counties. Thompson (1939) maps this species from Ottawa County.

STATE STATUS: 1980-Endangered, 1982-E, 1984-E.

HABITAT: Moist to wet sandy, muddy or peaty low grounds, in full sun.

HAZARDS: Overgrowth by woody species through succession.

RECOVERY POTENTIAL: Unknown, but probably poor.

INVENTORY GUIDELINES: Mature flowering or fruiting material is needed for positive identification.

COMMENTS: Thompson (1939) states that this is an Atlantic Coastal Plain species limited in Ohio to the lake plains and adjacent areas in the northern part of the state. The existence of the Ross County specimen demonstrates that it can occur in other areas of the state as well. This species is easily overlooked or misidentified. It should be sought throughout the state.

Steyermark (1963) states that the leaves of this species sometimes turn a rose-orange or copper color. He also states that apparent hybrids have been reported between this species and the closely-related and more common H. mutilum. Should this be the case in Ohio, it could exacerbate identification problems.

SELECTED REFERENCES:

Steyermark, J.A. 1963. Flora of Missouri. The Iowa State University Press, Ames, IA. 1728 p.

Thompson, I. 1939. Geographical affinities of the flora of Ohio. Am. Midl. Nat. 21: 731-751

HYPERICUM MAJUS (Gray) Britt.  
Tall St. John's-wort

FAMILY: Clusiaceae (Guttiferae)

HABIT: Perennial herb, often with small leafy basal offshoots, 8-32 cm; flowers and fruits July-Sept.

SIMILAR SPECIES: This species is most similar to H. canadense. However, H. majus has rhizomes, and leaves obtuse or rounded at the base with 5-7 nerves, whereas H. canadense has only short, leafy stolons and leaves tapering to base with 1-3 nerves.

TOTAL RANGE: Nfdl. and Que. to B.C., s. to NJ, OH, IL, KS and CO.

STATE RANGE: There are post-1960 records from Ashland, Champaign, Defiance, Erie, Geauga, Henry, Logan, Lucas, Ottawa, Portage, Trumbull, Wood, Williams and Wyandot Counties. There are pre-1960 records Fulton, Greene, Lorain and Sandusky Counties.

STATE STATUS: 1980-Threatened, 1982-Potentially Threatened, 1984-P, 1986-P, 1988-P, 1990-P, 1992-P.

HABITAT: Sandy or mucky shores of lakes or streams, meadows and marshes.

HAZARDS: Overgrowth by woody species as a result of succession.

RECOVERY POTENTIAL: Unknown, probably good. The species appears to remain in the seedbank and respond to disturbance.

INVENTORY GUIDELINES: Collect complete specimens with fruits and underground parts.

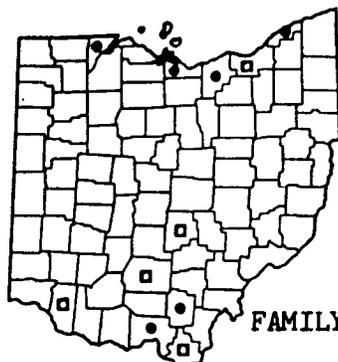
COMMENTS: This species hybridizes with H. boreale and H. canadense. Young plants of H. majus may flower when still very small. These young plants may be especially easily confused with H. canadense (Gillett and Robson 1981).

SELECTED REFERENCES:

Gillett, J.M. and N.K.B. Robson. 1981. The St. John's-worts of Canada (Guttiferae). National Museum of Natural Sciences Publications in Botany, No. 11. National Museum of Canada, Ottawa. 40 pp.

Utech, F.H. and H.H. Iltis. 1970. Preliminary reports of the flora of Wisconsin No. 61. Hypericaceae - St. John's-wort Family. Trans. Wis. Acad. Sci., Arts and Letters. 58: 325-351.

Voss, E.G. 1985. Michigan Flora, Part II. Dicots (Saururaceae-Cornaceae). Cranbrook Inst. Sci. Bull. 59, Bloomfield Hills, MI. 724 pp.



VIOLA LANCEOLATA L.  
Lance-leaved Violet

FAMILY: Violaceae.

SYNONYM: Viola lanceolata L. ssp. lanceolata

HABIT: Stemless perennial herb to 1.5 dm.; flowering early May-early June; fruiting May-July.

SIMILAR SPECIES: Viola lanceolata is very similar and closely related to V. primulifolia. V. lanceolata can generally be distinguished by its lanceolate to linear leaf blades, whereas the leaf blades of V. primulifolia are usually ovate. However, leaf shape in both species exhibits considerable variation, so that this single character should not be relied upon exclusively for identification. Fernald (1949) states that after the spring flowering season, V. lanceolata is easily distinguished by its habit of sending out well-developed leafy prostrate stolons bearing many cleistogamous flowers. The stolons of V. primulifolia are essentially leafless and sterile, the cleistogamous flowers being on erect peduncles borne chiefly from the rhizomes or the first nodes of the stolons.

TOTAL RANGE: FL to e. TX, n. to N.B., s. Que., s. Ont., OH, MI, WI, MN, and NE.

STATE RANGE: There are post-1960 records from Erie, Jackson, Lake, Lorain, Lucas, and Scioto counties. There are pre-1960 records from 5 counties: Clermont, Cuyahoga, Fairfield, Lawrence, and Ross.

STATE STATUS: 1980-Endangered, 1982-E, 1984-Threatened.

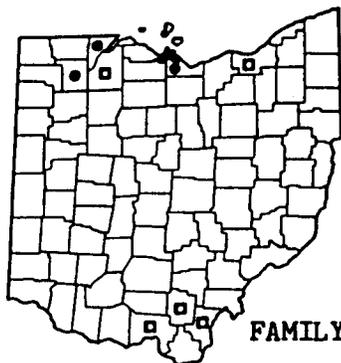
HABITAT: Open, moist sandy areas in pastures, meadows, and prairie remnants; margins of bog ponds; usually in acidic substrates.

HAZARDS: Overshading by woody species as a result of succession.

RECOVERY POTENTIAL: Presumed good due to its variety of habitat and apparent tolerance of disturbance.

INVENTORY GUIDELINES: Mature flowering or fruiting material is needed for positive identification; avoid over-collecting.

COMMENTS: V. lanceolata may be more frequent in Ohio than current records indicate. It could easily be overlooked due to its small size and brief blooming period. It should be sought in suitable habitats throughout the state.



**XYRIS TORTA Sm.**  
Twisted Yellow-eyed-grass

**FAMILY:** Xyridaceae.

**HABIT:** Rosette-forming, herbaceous perennial from a bulbous base, flowering scape 15-100 cm.; flowering July, August.

**SIMILAR SPECIES:** Very similar to Xyris difformis. X. torta has a hard, bulbous base, while X. difformis has a soft base. Non-flowering rosettes are not identifiable with any certainty.

**TOTAL RANGE:** Cent. NH and MA, w. through Great Lakes region of Ont., NY, OH, MI, IN, WI, and MN, s. to GA and TX.

**STATE RANGE:** There are post-1960 collections from Erie, Henry, and Lucas counties. There are pre-1960 records from Cuyahoga and Wood counties. Also listed from Gallia, Jackson, and Scioto counties by Braun (1967).

**STATE STATUS:** 1980-Endangered, 1982-E, 1984-Threatened.

**HABITAT:** Dry to moist openings on sandy or clayey substrates; fields, ditches, seepage banks, pond margins; often on freshly exposed soil.

**HAZARDS:** Overgrowth by woody species through succession; compaction of loose soil.

**RECOVERY POTENTIAL:** Probably good; it is known to thrive in recently disturbed situations.

**INVENTORY GUIDELINES:** Collect flowering material; note the bulbous base.

**COMMENTS:** Even when in flower, it is easy to overlook this species, particularly when it is overtopped by grasses in moist fields. Non-flowering individuals are virtually impossible to locate. Intensive searching should locate additional populations of this species in Ohio.

**SELECTED REFERENCES:**

Braun, E.L. 1967. The Monocotyledoneae [of Ohio]: Cat-tails to orchids. The Ohio State Univ. Press, Columbus, OH. 464 p.

Hellquist, C.B. and G.E. Crow. 1982. Aquatic vascular plants of New England: Part 5. Araceae, Lemnaceae, Xyridaceae, Eriocaulaceae, and Pontederiaceae. New Hampshire Agr. Exp. Sta. Bull. 523. 46 p.

Kral, R. 1966. Xyris (Xyridaceae) of the continental United States and Canada. Sida 2: 177-260.

**SECTION B  
BIRDS**

**H. Thomas Bartlett  
1833 South Winfield Dr.  
Tiffin, Ohio 44883**

## INTRODUCTION

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.

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 birdlife 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 are reviewed in the discussion section of this report.

## SURVEY METHODOLOGY

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 which 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 and must be accompanied with other qualitative surveys if this goal is to be met. The inventory techniques employed in this study are detailed below.

1. Breeding Bird Survey Route - 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 U.S. Fish and Wildlife Service and Canadian Wildlife Service. The route is run starting 1/2 hour before sunrise and ending before 10:30 AM. 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. Figure 1 shows the location of the BBS route established on the station for this study. Appendix A is a description of the stops for future use.

In August, the biologist received a copy of Specification C-73180-C-PB dated October 1, 1976. This included information and data on a Breeding Bird Survey route which had been established in 1975 and run during June of 1975 and 1977. Also included was a map of the route. In early November, the biologist received a copy of Specification C-25167D - PB dated October 1, 1979. It contained data from routes which were run in 1977, 1978, 1979, and 1980. Ideally, it would have been better to have run the same route. However, for comparison this data will be hard to analyze because the route is only 14.9 miles long and contains 25 stops. Discussion and results of this data will follow.

2. Breeding Bird Atlas - A methodology used to determining 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 Plum Brook Station was arbitrarily divided into 6 study blocks (Fig. 2). Each block was censused for species and nesting status. Ideally, it has been determined that 15-20 hours of censusing in a block will find the majority of the nesting

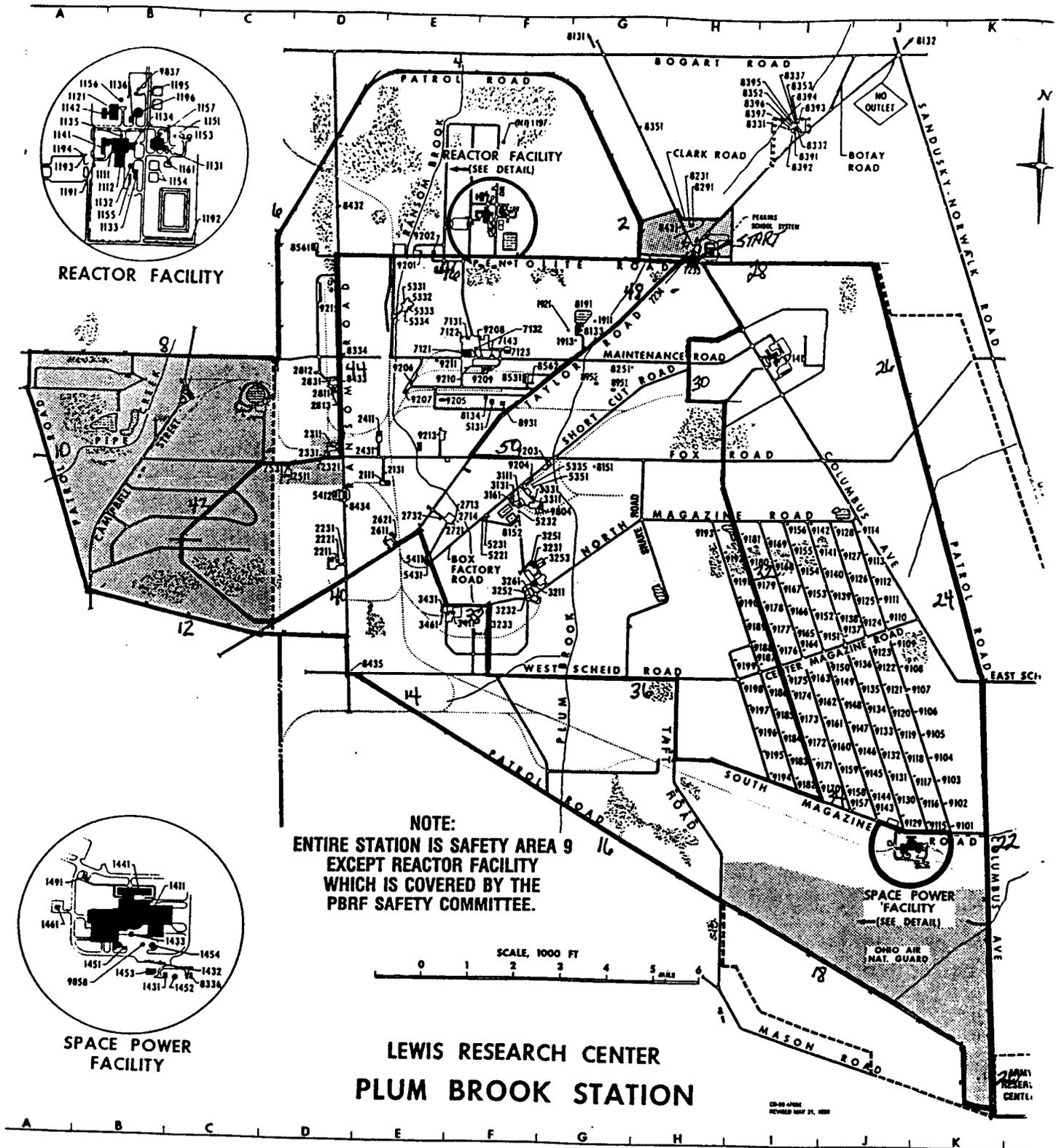


Figure 1. Breeding bird survey route established for 1994 survey at NASA Plum Brook Station.

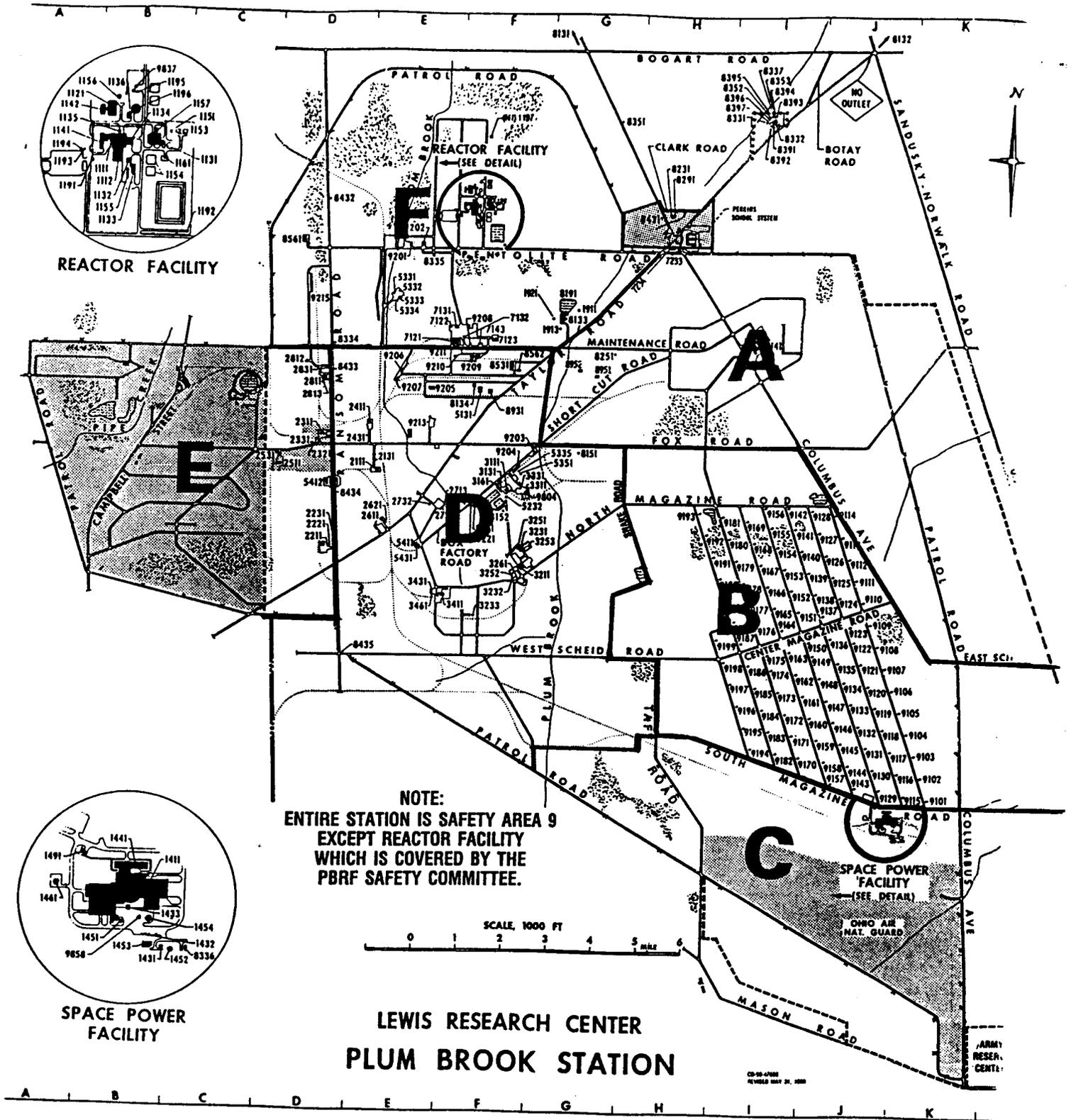


Figure 2. Survey blocks used for breeding bird censuses at the NASA Plum Brook Station, 1994.

species. In this study 20+ hours were spent in each of the 6 study blocks. 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. The status codes used for this study are listed in below:

#### Breeding Criteria Codes

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

#### 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

3. Territorial Males - Using the above Atlas blocks records of the total number of singing males for each species were kept. 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 not made. Total number per block were recorded. This data should be viewed as minimum numbers of singing males on the station.

## Rare and Endangered Species

Distribution maps for the following species can be found in Appendix B at the end of this section.

### Cooper's Hawk

A minimum of 7 territorial pair were found on station. Five nests were located at various sites and two pair had territories in which a nest was not found. Up until the last 5 to 10 years, the Cooper's Hawk has been a fairly rare nesting species in Ohio. It seems to be on the recovery road statewide. The concentration at the Plum Brook Station seems to be high. However, the habitat of open fields, much secondary growth, and mature forest is very good for the species and it shows. This habitat is also very conducive to small passerines which makeup the bulk of its diet.

### Upland Sandpiper

Only one nest of this species was found and it had been run over by a mower. The site was in the Ohio Air National Guard section to the south. This species is endangered in Ohio and regionwide. During the 1960's and 1970's its habitat disappeared and its numbers declined greatly in Ohio. It prefers open fields which are found at the station. Historially, Plum Brook has had a very good population of as many as 10 or more pair. It was one of the few populations to remain in the area. In the early 1980's I observed at least 6 birds sitting on the fence around the southern boundary along Mason Road. During the 1980's Bernhardt found nesting birds in this same area. He also found nesting birds south of the intersection of Snake Road and North Maintance Road and also between Patrol Road and Columbus Avenue to the east. These areas appear to still be good habitat but no individual were found during this study in those areas. The station's population needs to be monitored. It may be too late now.

Two things may be affecting this species at the station. The mowing schedule seems to be in the middle of the species nesting season. Mowing should not be going on in May or June which is the middle of this species nesting season. This nesting season produced no young. If this schedule has been going on for the last few years it may have wiped out this population. The Ohio Division of Wildlife recommends that fields not be mowed between April 15 and July 15 as these are the prime dates for nesting by graasland species. The second factor which may have affected the stations numbers is the increase in appropriate habitat outside the station. The increase in CRP fields around the area has added 100's of acres of new habitat for this species. Studies need to be conducted to see if this new habitat is being used by this species.

### Alder Flycatcher

This flycatcher is a species which nests in the north with a stable population in northeastern Ohio. It has sporadic nesting

sites in northwestern Ohio. It is also a fairly late migrant so it is hard to decide if you have a migrant or a bird on territory. Three individuals appeared to be on territory at the station. However, only one was observed after July 15. No nests were located but the habitat is here.

#### **Least Flycatcher**

This flycatcher is a species which nests in the north with a stable population in northeastern Ohio. It has sporadic nesting sites in northwestern Ohio. One of the few confirmed nesting sites for this area of Ohio is just a few miles south of the station. Three territories were found on the station in typical habitat. However, no nests were located and these may have been late migrants or wandering second-year birds.

#### **Sedge Wren**

This is a rare species for Ohio. Its populations can be very erratic. Twenty-four territorial birds and several fledglings were located on the station. This is probably Ohio's largest concentration of this species. The old fields are excellent habitat and need to be maintained. This population needs to be monitored.

#### **Marsh Wren**

This listed species is usually found in marshy areas. One territorial bird was found in a cattail area south of Pentolite Road. No nest was found and the habitat is marginal on the station.

#### **Brewster's Warbler**

This hybrid between the Blue-winged Warbler and the Golden-winged Warbler is very rare in Ohio but most records are from the northern part of the state. A few of the recent summer records are from just east in Lorain County. This individual appeared to be mated with a female Blue-winged Warbler. No nest was found.

#### **Black-throated Green Warbler**

This species nests further north, in northeast Ohio, and a few records in southern Ohio. It prefers mature hardwood forest. This individual was probably a straggler which summered over at the station.

#### **Henslow's Sparrow**

This is an uncommon and erratic species for Ohio. Most nesting records are for southern Ohio. At least 7 territorial males were located but no nests were found. They seem to prefer old field habitat and are frequently found with Sedge Wrens. This is a good population for northern Ohio and needs to be monitored.

## RESULTS

A total of 116 species were identified during the summer birding season at the Plum Brook Station. This total includes 5 species which were considered to be late migrants through the area and 9 species who were classified as visitors only. These summer visitors did not nest on the property but utilized the areas for feeding and resting. With the exception of the osprey and the trumpeter swan these summer visitors are known to nest elsewhere in the Sandusky Bay region. Ospreys do not currently nest in Ohio, but younger or unmated birds summer in the state on a regular basis.

Of the 116 species observed on the station, 92 species were either confirmed (81 species) or were considered to be likely nesters (11 species) on the property based on the breeding criteria codes used in the study. Another 10 species were considered to be possible nesters under atlasing guidelines. While one or more of these 10 species could have nested during the study period the majority of these observations likely represented unmated males who did not stay long or were very late migrants moving through the area.

As discussed under survey methodology, breeding birds were censused using a combination of quantitative (BBS route) and qualitative (general censusing on foot) survey methods. The results of these different surveys are presented below.

### Breeding Bird Survey Route

This route (see Fig.1) was run four times; June 6, 15, 22, and 30 between the hours of 0525 and 1027 EST. The weather conditions were:

June 6	Temp. - 70 to 77 degrees F Wind - W, 5-12 mph Sky - overcast to partly cloudy
June 15	Temp. - 71 to 82 degrees F Wind - S-SW, 3- 8 mph Sky - hazy to partly cloudy
June 22	Temp. - 62 to 75 degrees F Wind - W, 0-5 mph Sky - clear
June 30	Temp. - 60 to 72 degrees F Wind - W-SW, 5-12 mph Sky - partly cloudy

The results of the 4 repetitions of the BBS route established for this study are summarized in Table 1. A cumulative total of 94 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 71 and 76. Of the 94 species, 56 were recorded on all four runs,

TABLE 1. BREEDING BIRD SURVEY RESULTS FOR THE NASA PLUM BROOK BBS ROUTE, 1994.

Species/Date	6/6/94	Stops	6/15/94	Stops	6/22/94	Stops	6/30/94	Stops	Average/Day	Aver. # stps/Day
Great Egret	2	1	2	2	3	2	2	2	2.25	2
Green Heron			1	1					0.25	+
Black-crowned Night Heron							1	1	0.25	+
Trumpeter Swan			2	1					0.5	+
Canada Goose	2	1							0.5	+
Wood Duck	1	1							0.25	+
American Black Duck					1	1			0.25	+
Mallard			9	2	2	1			2.75	1
Turkey Vulture	16	7	15	4	28	8	8	5	16.75	6
Cooper's Hawk	2	2	1	1			1	1	1	1
Red-tailed Hawk	13	10	20	17	17	12	17	11	16.75	12
American Kestrel	2	2	6	6	4	3	3	3	3.75	4
Ring-necked Pheasant	3	3	4	4	2	2	4	4	3.25	3
Northern Bobwhite			1	1					0.25	+
Killdeer	11	7	19	11	12	9	14	8	14	9
Ring-billed Gull	4	3			2	1	5	3	2.75	2
Herring Gull	5	4	2	1	2	2	4	4	3.25	3
Rock Dove	10	2	8	1			1	1	4.75	1
Mourning Dove	18	15	20	16	28	18	30	17	24	16
Black-billed Cuckoo			2	2					0.5	+
Yellow-billed Cuckoo	2	2							0.5	+
Great Horned Owl	2	2							0.5	+
Chimney Swift	1	1	4	3	3	2			2	2
Ruby-throated Hummingbird	1	1	1	1					0.5	+
Belted Kingfisher					1	1			0.25	+
Red-headed Woodpecker	2	2	3	2	4	3	3	2	3	2
Red-bellied Woodpecker	1	1	1	1	4	3	2	2	2	2
Downy Woodpecker	3	3	11	9	10	9	7	6	7.75	7

TABLE 1. CON'T.

Species/Date	6/6/94	Stops	6/15/94	Stops	6/22/94	Stops	6/30/94	Stops	Aver./Route	Aver. # stps/Day
Hairy Woodpecker					1	1			0.25	+
Northern Flicker	7	7	12	10	15	11	16	14	12.5	10
Eastern Wood-Pewee	6	6	5	5	9	8	6	6	6.5	6
Acadian Flycatcher					1	1	1	1	0.5	+
Alder Flycatcher	1	1							0.25	+
Willow Flycatcher	23	15	25	17	14	11	18	11	20	14
Least Flycatcher					1	1			0.25	+
Eastern Phoebe	6	5	2	2	1	1	3	3	3	3
Great Crested Flycatcher	6	6	15	14	6	5	5	5	8	8
Eastern Kingbird	9	8	15	13	11	9	11	9	11.5	10
Horned Lark			1	1	2	1	2	2	1.25	1
Purple Martin	1	1	1	1	2	1			1	1
Tree Swallow	6	3	6	3	4	3	1	1	4.25	2
Northern Rough-winged Swallow			3	3	2	2	1	1	1.5	2
Barn Swallow	8	4	9	4	12	6	8	4	9.25	4
Blue Jay	33	20	42	26	39	25	44	29	39.5	25
American Crow	24	13	15	10	17	10	16	8	18	10
Black-capped Chickadee	3	3			2	1			1.25	1
Tufted Titmouse	10	9	17	15	15	13	13	7	13.75	11
White-breasted Nuthatch					2	2	1	1	0.75	1
House Wren	28	23	37	28	32	24	33	24	32.5	25
Sedge Wren			2	2	2	1	3	2	1.75	1
Blue-gray Gnatcatcher	3	2	1	1			1	1	1.25	1
Eastern Bluebird	14	11	17	12	16	9	10	8	14.25	10
Veery	3	2	4	3	2	2			2.25	2
Wood Thrush	12	11	28	19	21	14	19	16	20	15
American Robin	84	40	103	46	115	43	126	45	107	44
Gray Catbird	14	11	37	25	34	22	35	23	30	20

TABLE 1. CON'T.

Species/Date	6/6/94	Stops	6/15/94	Stops	6/22/94	Stops	6/30/94	Stops	Aver./Route	Aver. # stps/Day
Northern Mockingbird					2	2			0.5	+
Brown Thrasher	1	1	6	6	6	5	5	5	4.5	4
Cedar Waxwing	42	18	24	16	22	13	25	13	28.25	15
European Starling	53	15	57	14	48	11	98	13	63.5	13
White-eyed Vireo	2	2	3	3	2	2	2	1	2.25	2
Yellow-throated Vireo	2	2	2	2	3	3			1.75	2
Warbling Vireo	8	8	8	8	6	5	3	3	6.25	6
Red-eyed Vireo	13	10	22	16	13	10	15	11	15.75	12
Blue-winged Warbler			4	4	1	1	1	1	1.5	2
Yellow Warbler	22	15	30	17	22	18	15	8	22.25	14
American Redstart	1	1							0.25	+
Ovenbird	1	1							0.25	+
Common Yellowthroat	28	22	45	28	42	28	40	27	38.75	26
Yellow-breasted Chat	4	4	2	2	1	1	2	2	2.25	2
Scarlet Tanager	7	6	10	9	2	2	3	3	5.5	5
Northern Cardinal	25	20	32	25	29	23	28	18	28.5	22
Rose-breasted Grosbeak	3	3	3	3	5	5	6	6	4.25	4
Indigo Bunting	44	34	43	30	34	27	42	30	40.75	30
Rufous-sided Towhee	10	9	14	11	8	8	13	9	11.25	9
Chipping Sparrow	9	5	12	9	9	7	8	7	9.5	7
Field Sparrow	43	29	49	33	48	31	54	36	48.5	32
Vesper Sparrow	5	5	8	8	10	10	7	6	7.5	7
Savannah Sparrow	8	4	4	3	3	2	5	5	5	4
Grasshopper Sparrow	3	3	4	4	6	5	4	2	4.25	4
Henslow's Sparrow					1	1	1	1	0.5	+
Song Sparrow	59	33	45	33	69	43	74	43	61.75	38
Swamp Sparrow							1	1	0.25	+
White-throated Sparrow							1	1	0.25	+

TABLE 1. CON'T.

Species/Date	6/6/94	Stops	6/15/94	Stops	6/22/94	Stops	6/30/94	Stops	Aver./Route	Aver. # stps/Day
Bobolink					2	2	1	1	0.75	1
Red-winged Blackbird	69	20	58	20	77	22	90	25	73.5	22
Eastern Meadowlark	16	14	21	14	14	9	13	10	16	12
Common Grackle	41	26	30	13	55	21	72	20	49.5	20
Brown-headed Cowbird	28	16	48	21	37	19	40	21	38.25	19
Orchard Oriole	15	14	23	19	16	11	10	8	16	13
Northern Oriole	10	8	5	5	13	12	5	4	8.25	7
House Finch	15	12	27	11	13	11	42	17	24.25	13
American Goldfinch	43	22	52	23	30	18	69	33	48.5	24
House Sparrow	7	2	4	2	6	2	3	1	5	2

12 on three of the four runs, 7 on two of the four runs, and 19 on only one of the four runs. Of the 94 species, 4 were believed to be visitors and 2 were believed to be late migrants. The four visitors were great egret, black-crowned night heron, 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 trumpeter swans and white-throated sparrow are believed to be late migrants. There are no modern nesting records for either species in northwest Ohio.

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 recorded at) based on an average of the 4 repetitions are given in Table 2.

Table 2. The Top 15 Species Recorded for the Plum Brook BBS Route Based on Abundance and Frequency.

<u>Most Abundant Species</u>		<u>Most Frequent Species</u>	
Species	Abundance (Average #/Day)	Species	Frequency (Average #stops/Day)
1. American Robin	107.00	1. American Robin	44
2. Red-winged Blackbird	73.50	2. Song Sparrow	38
3. European Starling	63.50	3. Field Sparrow	32
4. Song Sparrow	61.75	4. Indigo Bunting	30
5. Common Grackle	49.50	5. Common Yellowthroat	26
6. Field Sparrow	48.50	6. Blue Jay	25
American Goldfinch		House Wren	
8. Indigo Bunting	40.75	8. American Goldfinch	24
9. Blue Jay	39.50	9. Red-winged Blackbird	22
10. Common Yellowthroat	38.50	Northern Cardinal	
11. Brown-headed Cowbird	38.25	11. Gray Catbird	20
12. House Wren	32.50	Common Grackle	
13. Gray Catbird	30.00	13. Brown-headed Cowbird	19
14. Northern Cardinal	28.50	14. Mourning Dove	16
15. Cedar Waxwing	28.25	15. Wood Thrush	15
		Cedar Waxwing	

#### Atlasing for Breeding Birds

A total of 138 hours were spent atlasing species on the station. Of this time, 20.5 hours were in Block A, 23.25 hours in Block B, 22.0 hours in Block C, 24.25 hours in Block D, 27.0 hours in Block E, and 21.0 hours in Block F. Block A was visited 14 days, Block B was visited 13 days, Block C was visited 12 days, Block D was visited 13 days, Block E was visited 13 days, and Block F was visited 11 days. Frequently, 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.

Breeding Bird Atlas data was also collected by Ellen Johnson in 1982 and Glen Bernhardt in 1986. Their data and the results of the 1994 survey are shown in Table 3. A total of 112 species were observed in the three years of collecting data. 73 species were observed by all three observers, 15 species were observed by two of the observers, and 24 by one observer. Of these 24, 14 were by Bartlett in 1994 and considered to be migrants or visitor which the other observers would not have record. The remaining 10 species included 1 by Johnson and none by Bernhardt.

#### 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 Table 4. The total recorded territorial males for each Atlas Block are listed and a total for the station is compiled. Table 5 lists the total territorial males by most common down to least. 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.

## DISCUSSION

#### 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 13 species of the top 15 species appear in each list. Only seven species stand out as being unusual for the region. The Trumpeter Swans observed on June 15 were vagrants at best. There are no modern nesting records for Ohio. However, several northern states and the province of Ontario have reintroduction programs. These two birds were probably from those areas. 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 but it is suspected that these bird were 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. The other problem with this species is that it is known to be a late migrant and frequently moves through Ohio on its way north during the first two weeks of June. It is hard to say if these were migrants or territorial birds. They were found on a territory for more than 7 days. Sedge Wrens are fairly rare in Ohio but seem to be increasing with the

TABLE 3. SUMMARY OF ATLAS DATA COLLECTED AT NASA PLUM BROOK STATION  
FOR 1982, 1986, AND 1994.

Species/Year	1982	1986	1994
Great Blue Heron			V
Great Egret			V
Cattle Egret			V
Green Heron	10 - PO	10 - PO	39 - CO
Black-crowned Night-Heron			V
Trumpeter Swan			V
Canada Goose		34 - CO	34 - CO
Wood Duck	21 - PR	10 - PO	34 - CO
American Black Duck			10 - PO
Mallard	38 - CO	21 - PR	34 - CO
Turkey Vulture	21 - PR	10 - PO	30 - CO
Osprey			V
Bald Eagle			V
Cooper's Hawk	36 - CO	10 - PO	37 - CO
Broad-winged Hawk			M
Red-tailed Hawk	38 - CO	10 - PO	39 - CO
American Kestrel	37 - CO	39 - CO	36 - CO
Ring-necked Pheasant	23 - PR	38 - CO	30 - CO
Northern Bobwhite			10 - PO
Killdeer	34 - CO	34 - CO	38 - CO
Upland Sandpiper	24 - PR	34 - CO	38 - CO
American Woodcock	24 - PR	34 - CO	34 - CO
Ring-billed Gull			V
Herring Gull			V
Rock Dove	25 - PR	39 - CO	39 - CO
Mourning Dove	23 - PR	10 - PO	30 - CO
Black-billed Cuckoo	22 - PR	10 - PO	22 - PR
Yellow-billed Cuckoo	22 - PR	22 - PR	30 - CO
Eastern Screech Owl			30 - CO
Great Horned Owl	10 - PO	10 - PO	34 - CO
Common Nighthawk	10 - PO	10 - PO	10 - PO
Chimney Swift	10 - PO	10 - PO	34 - CO
Ruby-throated Hummingbird	10 - PO	10 - PO	30 - CO
Belted Kingfisher	10 - PO	10 - PO	22 - PR
Red-headed Woodpecker	21 - PR	21 - PR	39 - CO
Red-bellied Woodpecker	10 - PO	22 - PR	39 - CO
Downy Woodpecker	10 - PO	21 - PR	39 - CO
Hairy Woodpecker	10 - PO		39 - CO
Northern Flicker	24 - PR	30 - CO	34 - CO
Eastern Wood-Pewee	22 - PR	22 - PR	35 - CO
Acadian Flycatcher		10 - PO	30 - CO
Willow Flycatcher	23 - PR	30 - CO	37 - CO

TABLE 3. CON'T.

Species/Block	1982	1986	1994
Alder Flycatcher			22 - PR
Least Flycatcher		23 - PR	22 - PR
Eastern Phoebe	39 - CO	39 - CO	39 - CO
Great Crested Flycatcher	22 - PR	23 - PR	37 - CO
Eastern Kingbird	23 - PR	23 - PR	36 - CO
Horned Lark		10 - PO	22 - PR
Purple Martin		10 - PO	22 - PR
Tree Swallow	10 - PO	10 - PO	39 - CO
Northern Rough-winged Swallow		10 - PO	37 - CO
Bank Swallow			M
Barn Swallow	21 - PR	10 - PO	39 - CO
Blue Jay	38 - CO	23 - PR	39 - CO
Common Crow	10 - PO	32 - CO	34 - CO
Black-capped Chickadee	10 - PO	10 - PO	36 - CO
Tufted Titmouse	22 - PR	22 - PR	36 - CO
White-breasted Nuthatch		10 - PO	34 - CO
Carolina Wren			22 - PR
House Wren	39 - CO	30 - CO	39 - CO
Winter Wren			M
Marsh Wren			10 - PO
Sedge Wren			34 - CO
Ruby-crowned Kinglet			M
Blue-gray Gnatcatcher			34 - CO
Eastern Bluebird	39 - CO	39 - CO	37 - CO
Veery	22 - PR	22 - PR	36 - CO
Wood Thrush	22 - PR	30 - CO	31 - CO
American Robin	39 - CO	30 - CO	39 - CO
Gray Catbird	39 - CO	30 - CO	36 - CO
Northern Mockingbird			31 - CO
Brown Thrasher	39 - CO	30 - CO	36 - CO
Cedar Waxwing	25 - PR	23 - PR	37 - CO
European Starling	37 - CO	36 - CO	39 - CO
White-eyed Vireo	22 - PR	30 - CO	30 - CO
Yellow-throated Vireo		10 - PO	30 - CO
Warbling Vireo	22 - PR	22 - PR	30 - CO
Red-eyed Vireo	22 - PR	30 - CO	36 - CO
Blue-winged Warbler	22 - PR	23 - PR	36 - CO
Brewster's Warbler			10 - PO
Nashville Warbler	10 - PO		
Yellow Warbler	39 - CO	30 - CO	36 - CO
Chestnut-sided Warbler	22 - PR	10 - PO	23 - PR
Black-throated Green Warbler			10 - PO

TABLE 3. CON'T.

Species/YEAR	1982	1986	1994
Blackpoll Warbler			M
Cerulean Warbler			10 - PO
Black-and-white Warbler			10 - PO
American Redstart	10 - PO		22 - PR
Ovenbird	22 - PR	10 - PO	22 - PR
Kentucky Warbler			10 - PO
Common Yellowthroat	36 - CO	30 - CO	39 - CO
Yellow-breasted Chat	38 - CO	30 - CO	31 - CO
Summer Tanager			22 - PR
Scarlet Tanager	10 - PO	22 - PR	36 - CO
Northern Cardinal	22 - PR	30 - CO	36 - CO
Rose-breasted Grosbeak	22 - PR	36 - CO	36 - CO
Indigo Bunting	24 - PR	30 - CO	36 - CO
Rufous-sided Towhee	23 - PR	30 - CO	37 - CO
Chipping Sparrow	22 - PR	10 - PO	37 - CO
Field Sparrow	39 - CO	30 - CO	37 - CO
Vesper Sparrow		10 - PO	30 - CO
Savannah Sparrow	10 - PO	21 - PR	38 - CO
Grasshopper Sparrow	36 - CO		38 - CO
Henslow's Sparrow	22 - PR		30 - CO
Song Sparrow	39 - CO	30 - CO	38 - CO
Swamp Sparrow	22 - PR	22 - PR	36 - CO
White-throated Sparrow			10 - PO
Bobolink	24 - PR	23 - PR	34 - CO
Red-winged Blackbird	39 - CO	23 - PR	39 - CO
Eastern Meadowlark	38 - CO	30 - CO	38 - CO
Common Grackle	25 - PR	10 - PO	39 - CO
Brown-headed Cowbird	39 - CO	24 - PR	36 - CO
Orchard Oriole	39 - CO	37 - CO	39 - CO
Northern Oriole	22 - PR	36 - CO	39 - CO
House Finch		21 - PR	37 - CO
American Goldfinch	24 - PR	22 - PR	37 - CO
House Sparrow	34 - CO	10 - PO	37 - CO
Total hours atlasing	60+	20+	138

TABLE 4. SPECIES AND NUMBERS OF TERRITORIAL MALES RECORDED BY BLOCK FOR THE NASA PLUM BROOK STATION.

Species/Block	A	B	C	D	E	F	Station
Green Heron		1	1	1		1	4
Canada Goose	2	1	3	2	7	2	17
Wood Duck		1	1	1	8		11
American Black Duck				1	1		2
Mallard	2			2	5	1	10
Turkey Vulture	3	3	2	34	11	4	57
Cooper's Hawk	1		1	2	2	1	7
Red-tailed Hawk	2	2	5	4	3	4	20
American Kestrel	2	1	2	2	3	2	12
Ring-necked Pheasant	4		2	2	2	5	15
Northern Bobwhite						2	2
Killdeer	2	1	3	9	2	11	28
Upland Sandpiper			*				*
American Woodcock	1	1	1	1	3	2	9
Rock Dove	2	2	8	13	23	4	52
Mourning Dove	5	6	12	9	16	8	56
Black-billed Cuckoo	1	1	1	2		1	6
Yellow-billed Cuckoo	1	2	3	3	5	3	17
Eastern Screech Owl	3	2	3	3	5	4	20
Great Horned Owl	2	1	2	2	2	2	11
Common Nighthawk		1					1
Chimney Swift	2	1	2	2	2	1	10
Ruby-throated Hummingbird	1	1	1	1	1	2	7
Belted Kingfisher	1	1		1	2		5
Red-headed Woodpecker	2	3	2	2	3	3	15
Red-bellied Woodpecker	3	2	5	3	5	5	23
Downy Woodpecker	5	7	8	6	13	8	47
Hairy Woodpecker	2	1	3	1	3	2	12
Northern Flicker	6	4	7	7	9	6	39
Eastern Wood-Pewee	9	12	8	5	14	7	55
Acadian Flycatcher		2			9	3	14
Willow Flycatcher	8	2	16	16	5	8	55
Alder Flycatcher			2			1	3
Least Flycatcher	1	1		1			3
Eastern Phoebe	4	2	3	4	6	3	22
Great Crested Flycatcher	4	5	6	5	7	4	31
Eastern Kingbird	12	13	12	14	5	6	62
Horned Lark		1	2	1	2		6
Purple Martin						2	2
Tree Swallow	1	2	2	5	2	3	15
Northern Rough-winged Swallow			1	3	1	2	7
Barn Swallow		2	5	5	23	4	39

TABLE 4. CON'T.

Species/Block	A	B	C	D	E	F	Station
Blue Jay	13	22	21	9	25	13	103
Common Crow	3	3	6	3	9	3	27
Black-capped Chickadee	3	10	4	3	11	3	34
Tufted Titmouse	9	9	8	4	13	6	49
White-breasted Nuthatch	4	2	3	3	2	4	18
Carolina Wren		1	2		1		4
House Wren	26	32	20	31	33	22	164
Marsh Wren						1	1
Sedge Wren	14				2	8	24
Blue-gray Gnatcatcher	3	2	2	2	4	2	15
Eastern Bluebird	6	8	5	6	6	8	39
Veery	2		3	2	4	3	14
Wood Thrush	11	12	15	11	36	14	99
American Robin	49	89	53	64	63	61	379
Gray Catbird	13	16	36	19	25	12	121
Northern Mockingbird	1	1	5		1		8
Brown Thrasher	3	5	13	7	4	2	34
Cedar Waxwing	9	16	18	8	13	8	72
European Starling	30	22	45	21	15	33	166
White-eyed Vireo	4	3	5	2	4		18
Yellow-throated Vireo	2	4	4	2	3	2	17
Warbling Vireo	6	2	4	4	3	7	26
Red-eyed Vireo	9	9	6	5	29	17	75
Blue-winged Warbler	1	2	3	5	10	2	23
Brewster's Warbler				1			1
Yellow Warbler	14	9	36	14	16	11	100
Chestnut-sided Warbler	1		2		3		6
Black-throated Green Warbler					1		1
Cerulean Warbler					1		1
Black-and-white Warbler			1				1
American Redstart			2	2			4
Ovenbird					1	1	2
Kentucky Warbler					1	1	2
Common Yellowthroat	41	28	18	35	21	23	166
Yellow-breasted Chat	3	1	3	4	2	2	15
Summer Tanager				1			1
Scarlet Tanager	4	6	4	5	6	5	30
Northern Cardinal	14	19	23	13	28	16	103
Rose-breasted Grosbeak	4	3	6	3	9	3	28
Indigo Bunting	21	31	17	20	29	19	137
Rufous-sided Towhee	9	15	16	9	13	6	68
Chipping Sparrow	9		2	2	4	8	25

TABLE 4. CON'T.

Species/Block	A	B	C	D	E	F	Station
Field Sparrow	31	47	27	47	32	24	208
Vesper Sparrow	2	2	3	2	2	1	12
Savannah Sparrow	2	1	17	2	1	3	26
Grasshopper Sparrow		2	12	3	2	2	21
Henslow's Sparrow	3		2	1		1	7
Song Sparrow	26	36	38	62	16	22	190
Swamp Sparrow	3	1	2	1		1	8
White-throated Sparrow				1			1
Bobolink	13		2	3			18
Red-winged Blackbird	32	24	27	56	14	36	189
Eastern Meadowlark	8	3	9	9	3	13	45
Common Grackle	7	13	23	31	10	11	95
Brown-headed Cowbird	10	18	32	23	9	11	103
Orchard Oriole	14	7	13	14	5	9	62
Northern Oriole	5	7	9	8	9	7	45
House Finch	5	4	3	9	3	16	40
American Goldfinch	18	20	37	21	10	23	129
House Sparrow	3		2	1	1	8	15

\* = No male was observed but female w/nest found

TABLE 5. BREEDING BIRDS RECORDED AT NASA PLUM BROOK STATION IN ORDER OF NUMERICAL ABUNDANCE.

Species	Station Total
American Robin	379
Field Sparrow	208
Song Sparrow	190
Red-winged Blackbird	189
European Starling	166
Common Yellowthroat	166
House Wren	164
Indigo Bunting	137
American Goldfinch	129
Gray Catbird	121
Blue Jay	103
Northern Cardinal	103
Brown-headed Cowbird	103
Yellow Warbler	100
Wood Thrush	99
Common Grackle	95
Red-eyed Vireo	75
Cedar Waxwing	72
Rufous-sided Towhee	68
Eastern Kingbird	62
Orchard Oriole	62
Turkey Vulture	57
Mourning Dove	56
Eastern Wood-Pewee	55
Willow Flycatcher	55
Rock Dove	52
Tufted Titmouse	49
Downy Woodpecker	47
Eastern Meadowlark	45
Northern Oriole	45
House Finch	40
Northern Flicker	39
Barn Swallow	39
Eastern Bluebird	39
Black-capped Chickadee	34
Brown Thrasher	34
Great Crested Flycatcher	31
Scarlet Tanager	30
Killdeer	28
Rose-breasted Grosbeak	28
Common Crow	27
Warbling Vireo	26
Savannah Sparrow	26

TABLE 5. CON'T.

<b>Species</b>	<b>Station Total</b>
Chipping Sparrow	25
Sedge Wren	24
Red-bellied Woodpecker	23
Blue-winged Warbler	23
Eastern Phoebe	22
Grasshopper Sparrow	21
Red-tailed Hawk	20
Eastern Screech Owl	20
White-breasted Nuthatch	18
White-eyed Vireo	18
Bobolink	18
Canada Goose	17
Yellow-billed Cuckoo	17
Yellow-throated Vireo	17
Ring-necked Pheasant	15
Red-headed Woodpecker	15
Tree Swallow	15
Blue-gray Gnatcatcher	15
Yellow-breasted Chat	15
House Sparrow	15
Acadian Flycatcher	14
Veery	14
American Kestrel	12
Hairy Woodpecker	12
Vesper Sparrow	12
Wood Duck	11
Great Horned Owl	11
Mallard	10
Chimney Swift	10
American Woodcock	9
Northern Mockingbird	8
Swamp Sparrow	8
Cooper's Hawk	7
Ruby-throated Hummingbird	7
Northern Rough-winged Swallow	7
Henslow's Sparrow	7
Black-billed Cuckoo	6
Horned Lark	6
Chestnut-sided Warbler	6
Belted Kingfisher	5
Green Heron	4
Carolina Wren	4
American Redstart	4

TABLE 5. CON'T.

Species	Station Total
Alder Flycatcher	3
Least Flycatcher	3
American Black Duck	2
Northern Bobwhite	2
Purple Martin	2
Ovenbird	2
Kentucky Warbler	2
Common Nighthawk	1
Marsh Wren	1
Brewster's Warbler	1
Black-throated Green Warbler	1
Cerulean Warbler	1
Black-and-white Warbler	1
Summer Tanager	1
White-throated Sparrow	1
Upland Sandpiper	*

\* = no male observed but active nest found

increase in Conservation Reserve Plots which have increased the grassland habitat which they require. The Northern Mockingbird is at its northern limit in northern Ohio. It is not unexpected but was a surprise. Its habitat is found on 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. Even though these last three species were a surprise, their expected habitat is common and somewhat abundant on the station. If that habitat is maintained, these populations should survive and even increase. The last species, White-throated Sparrow, was probably a late migrant or summering bird. There are no recent nesting records for it in northern Ohio but there are several summering records.

In comparing the data from the historical BBS routes with data collected in this survey, it must be remembered that the former routes were only 14.9 miles long with 25 stops. This will help to account for some of the disparities in the results. However, the results of these earlier routes when compared against the June 15th run of the 1994 route are fairly similar (see Table 6). There are some trends which seem to be showing up. Four species show definite increases over the time periods. These are Wood Thrush, Yellow Warbler, Brown-headed Cowbird, and Orchard Oriole. These increased populations are reflected in other counts in Ohio.

There are 5 historical records which are suspect. Four are in the data from the 1977 route. Swainson's Thrush, Hermit Thrush, White-throated Sparrow, and White-crowned Sparrow are listed in the results. There are no nesting records for Swainson's Thrush in Ohio. This recorded would be very significant. There are several late migrant records which this could also be. Hermit Thrush nesting records are rare for Ohio and all are in Hemlock gorges, mainly in northeast Ohio, Mohican State Forest, and the Hocking Hills area. 11 records in one area of the state would be highly significant. It is suspected that the counter mistook the songs of Wood Thrush and Veery for these species. Both of the latter species are common in northern Ohio but are noticeably missing or scarce in the data given. The White-throated Sparrow and White-crowned Sparrow are probably late migrants. The White-crowned Sparrow records are significant as there are very few summer records for Ohio. The last record comes from the 1979 route. That is of a Carolina Chickadee. This species is very common in southern Ohio but is very rare north of U.S. Route 30. A summer record for northern Ohio is highly significant. The more likely species for this area is the Black-capped Chickadee which is fairly common. 34 territorial Black-capped Chickadees were found on the station during this study.

#### **Atlasing for Breeding Birds**

Analysis of the Atlas data shows few unexpected results. With the number of adult Turkey Vultures on the station, a nest

TABLE 6. SUMMARIES OF BBS DATA COLLECTED AT NASA PLUM BROOK STATION  
BETWEEN 1975 AND 1994.

Species/Date	6/25/75	6/14/77	6/14/78	6/13/79	6/12/80	6/15/94
Great Blue Heron	2 / 1	1 / 1	2 / 2		2 / 2	
Great Egret						2 / 2
Green Heron	1 / 1				1 / 1	1 / 1
Trumpeter Swan						2 / 1
Mallard						9 / 2
Turkey Vulture			1 / 1		7 / 1	15 / 4
Cooper's Hawk						1 / 1
Red-tailed Hawk	1 / 1	7 / 6	4 / 3		2 / 2	20 / 17
American Kestrel		1 / 1		4 / 2	1 / 1	6 / 6
Ring-necked Pheasant	3 / 3	1 / 1	2 / 2	3 / 3	8 / 6	4 / 4
Northern Bobwhite		2 / 1	1 / 1			1 / 1
Killdeer	13 / 8	4 / 1	6 / 4	4 / 2	3 / 2	19 / 11
Upland Sandpiper				1 / 1		
Herring Gull						2 / 1
Rock Dove	1 / 1					8 / 1
Mourning Dove	34 / 21	11 / 3	9 / 7	7 / 6	14 / 10	20 / 16
Black-billed Cuckoo						2 / 2
Yellow-billed Cuckoo			11 / 10	4 / 3	1 / 1	
Common Nighthawk		1 / 1				
Chimney Swift				1 / 1	4 / 1	4 / 3
Ruby-throated Hummingbird						1 / 1
Red-headed Woodpecker					1 / 1	3 / 2
Red-bellied Woodpecker				1 / 1		1 / 1
Downy Woodpecker			1 / 1	1 / 1		11 / 9
Northern Flicker	9 / 7	1 / 1	5 / 4	7 / 6	4 / 3	12 / 10
Eastern Wood-Pewee	2 / 2	6 / 3	4 / 4	1 / 1	4 / 4	5 / 5
Willow Flycatcher	6 / 6		10 / 8	10 / 8	15 / 12	25 / 17
Least Flycatcher				1 / 1	1 / 1	
Eastern Phoebe						2 / 2
Great Crested Flycatcher			2 / 2		2 / 2	15 / 14
Eastern Kingbird	5 / 5	6 / 6	1 / 1	2 / 2		15 / 13
Horned Lark	1 / 1					1 / 1
Purple Martin	1 / 1	3 / 2				1 / 1
Tree Swallow			1 / 1			6 / 3
Northern Rough-winged Swallow				1 / 1		3 / 3
Bank Swallow	11 / 2					
Barn Swallow			1 / 1	1 / 1	1 / 1	9 / 4
Blue Jay	10 / 6	12 / 3	7 / 5	3 / 3	7 / 5	42 / 26
Common Crow	8 / 7	10 / 4	4 / 4			15 / 10
Carolina Chickadee				1 / 1		
Tufted Titmouse	2 / 2			1 / 1		17 / 15

TABLE 6. CON'T.

<b>Species/Date</b>	<b>6/25/75</b>	<b>6/14/77</b>	<b>6/14/78</b>	<b>6/13/79</b>	<b>6/12/80</b>	<b>6/15/94</b>
Brown-headed Cowbird	1 / 1	2 / 1	5 / 3	24 / 9	17 / 8	48 / 21
Orchard Oriole				1 / 1	1 / 1	23 / 19
Northern Oriole		4 / 3	4 / 4	3 / 3	5 / 5	5 / 5
House Finch						27 / 11
American Goldfinch	7 / 3	15 / 3	10 / 7	13 / 7	18 / 9	52 / 23
House Sparrow	81 / 12	1 / 1	6 / 1	2 / 1	3 / 1	4 / 2

TABLE 6. CON'T.

Species/Date	6/25/75	6/14/77	6/14/78	6/13/79	6/12/80	6/15/94
House Wren	10 / 9	12 / 5	14 / 11	7 / 7	5 / 5	37 / 28
Sedge Wren						2 / 2
Blue-gray Gnatcatcher		1 / 1				1 / 1
Eastern Bluebird	1 / 1	2 / 1 (?)				17 / 12
Veery						4 / 3
Swainson's Thrush		1 / 1				
Hermit Thrush		11 / 5				
Wood Thrush	4 / 4	2 / 1 (?)	5 / 5	10 / 7	15 / 12	28 / 19
American Robin	47 / 27	78 / 19	30 / 18	18 / 13	26 / 18	103 / 46
Gray Catbird	13 / 10	3 / 2	13 / 9	17 / 12	12 / 10	37 / 25
Brown Thrasher	3 / 3		7 / 7	2 / 2	2 / 1	6 / 6
Cedar Waxwing						24 / 16
European Starling	16 / 5	11 / 3	61 / 10	17 / 5	30 / 5	57 / 14
White-eyed Vireo		1 / 1		1 / 1		3 / 3
Yellow-throated Vireo				1 / 1		2 / 2
Warbling Vireo		1 / 1	1 / 1	1 / 1	2 / 2	8 / 8
Red-eyed Vireo	1 / 1	2 / 2	8 / 8	5 / 5	2 / 2	22 / 16
Blue-winged Warbler				1 / 1		4 / 4
Yellow Warbler	4 / 4		6 / 4	8 / 6	11 / 9	30 / 17
Chestnut-sided Warbler	1 / 1					
American Redstart				2 / 1		
Common Yellowthroat	3 / 3	13 / 9	16 / 14	15 / 14	18 / 16	45 / 28
Yellow-breasted Chat		12 / 8	5 / 5	4 / 3	3 / 3	2 / 2
Scarlet Tanager			2 / 2	3 / 3		10 / 9
Northern Cardinal	14 / 12	20 / 8		4 / 4	4 / 4	32 / 25
Rose-breasted Grosbeak			1 / 1		1 / 1	3 / 3
Indigo Bunting	43 / 23	10 / 5	20 / 13	11 / 7	13 / 11	43 / 30
Rufous-sided Towhee	7 / 6	7 / 5	5 / 4	3 / 3	5 / 5	14 / 11
Chipping Sparrow	4 / 4					12 / 9
Field Sparrow	22 / 15		18 / 15	23 / 17	19 / 13	49 / 33
Vesper Sparrow			3 / 2		2 / 2	8 / 8
Savannah Sparrow	5 / 2	13 / 3	1 / 1			4 / 3
Grasshopper Sparrow	17 / 8	24 / 4	1 / 1			4 / 4
Song Sparrow	26 / 21	9 / 5	10 / 9	14 / 12	30 / 19	45 / 33
Swamp Sparrow			1 / 1	3 / 2	2 / 2	
White-throated Sparrow		3 / 2				
White-crowned Sparrow		1 / 1				
Bobolink	1 / 1	17 / 3	6 / 4	4 / 3	3 / 2	
Red-winged Blackbird	81 / 23	72 / 9	104 / 18	75 / 18	46 / 16	58 / 20
Eastern Meadowlark	32 / 13	3 / 3	10 / 9	13 / 8	10 / 9	21 / 14
Common Grackle	31 / 8	5 / 4	30 / 9	7 / 5	1 / 1	30 / 13

should have been located. I believe that a nest may have been found in one of the two taller buildings on station but access was denied for safety reasons. The relative abundance of Cooper's Hawk is discussed elsewhere in this report. It does appear to be significant. One of the disappointing results concerned the Upland Sandpiper. Plum Brook has been known as one of the few stable populations in northern Ohio over the last 20 years. That appears to no longer be the case. Only one bird was found and that record is discussed elsewhere in the report. The habitat for this species still appears to be present so the reason for the decline is baffling. The nest was found to be run over by a mower. If mowing of this habitat has been conducted during May or June over the last few years, this is likely the reason for the decline. The lack of Common Nighthawk is also unexplained. The habitat is present. Since they are a ground nester, they may be affected by the large deer population and associated coyote population. This topic will be discussed at the end of this section. The Ruby-throated Hummingbird population appears to be somewhat below similar areas of northern Ohio. Although it was found in all atlas blocks, only one territorial male was regular and no nests were located. The habitat of the station could easily hold several dozen pair. 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 and may just be recovering. The Veery, Black-and-white Warbler, Ovenbird, and Kentucky Warbler numbers are very much below expected numbers. The habitat appears to be excellent for all of these species but their numbers are not what is expected. These are all ground nesters and I believe are being affected by the deer/coyote populations. The low numbers of Cerulean Warbler and American Redstart are also unexplainable. They are tree nesters and appear to have excellent habitat. They may be affected by squirrels.

It is believed that two major factors are having a negative affect on certain bird species. These are size of the White-tailed Deer population and the burning of habitat. The burns on the station can and do have a positive affect on the grasslands. However, it appears that they are allowed to burn into the forested areas and this has a negative affect on the ground cover in those forested areas. This, coupled with the large deer population which is also feeding on much of that ground cover is limiting the amount of ground cover for ground nesting birds. The deer population has brought with it a large coyote population which will also feed on birds. With limited ground nesting habitat, coyotes find nests more easily.

#### 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. Significant numbers included Yellow Warbler with 100 territorial males. Some areas of the northern U.S. considered this species to be in trouble. It is doing very well at Plum Brook. The Wood Thrush is another species considered to be in trouble nationwide but appears to be healthy at Plum Brook. Its populations need to be monitored. Many of the neotropical migrants appear to be doing well at the station. Of the top 50 species, 22 are neotropical migrants which shows that the habitat at Plum Brook is very critical. A total of 101 species and one hybrid were recorded for the station. Of these 49 were neotropical migrants. Of the top 50 species, only six are ground nesters and three others occasionally nest on the ground. 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.

#### Problems and Recommendations

##### Problems:

1. Deer Population - Based on censuses by this biologist, there are close to 1500 head of White-tailed Deer on the station. The habitat cannot support this number and it is showing in declining ground cover of the forest areas and increased browse line.

2. Coyote population - This population also appears to be significantly higher than the surrounding area. 10+ individuals were frequently observed in a day which is most unusual. These animals feed mainly on small mammals and birds. I believe that the large deer population is also a food source. With this high population and lack of ground cover, they can find ground nests more easily.

3. Fox Squirrel population - Next to White-tailed Deer, Fox Squirrel was the most frequently observed mammal. They are omnivorous and will feed on bird eggs or young. With the declining ground cover, they can find nests more easily.

4. Burning habitat - The burning of grasslands and open areas can have a very positive effect on grassland nesting species. This appears to be the case at Plum Brook, for most grassland species. However, these burns are allowed to move into the forested areas where they are destroying important ground cover. This destruction of ground cover coupled with over grazing of ground cover in forested areas by deer, leaves little area for forest ground nesting birds.

5. Mowing schedule - I understand the need to mow some areas of the station. However, May, June, and July are not the times to do this. This is maximum nest time for most grassland nesting species. Mowing at this time destroys many of their nests or exposes them to predators more easily. On the day that I found the Upland Sandpiper nest which had been crushed by the mower, I also found two destroyed Grasshopper Sparrow nests and one destroyed Savannah Sparrow nest within 50 yards of each other. All were destroyed by the mower.

6. Woodland Diversity - The diversity of the woodland species was much lower than that of other woodland areas in northwest Ohio. The reasons for this are related to some of the problems discussed above. It needs to be studied more.

#### Recommendations:

1. Deer Populations - The deer population needs to be greatly reduced. For an area the size of Plum Brook, a herd of 2-300 should be maximum. The current herd needs to be reduced by 80%. 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 will be controlled at a natural level.

3. Squirrel Populations - If the deer population is reduced and forest ground cover is restored, this population will 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. 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.

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## Birds of Plum Brook Station

Status - breeding status; see Atlas section of paper.  
Visitor; nests in area but not on station.  
Migrant; passing through area.

Frequency -      100+ males      =      Abundant  
                    50-99 males      =      Very common  
                    20-49 males      =      Common  
                    10-19              =      Uncommon  
                    Less than 10      =      Rare

<u>Species</u>	<u>Status, frequency, and notes</u>
Great Blue Heron	Regular visitor at ponds, streams, ditches, and wet areas.
Great Egret	Regular visitor at ponds, streams, ditches, and wet areas.
Cattle Egret	Rare visitor but frequently observed in area around the station of short grasses.
Green Heron	Confirmed breeder; Rare at ponds, streams, ditches, and wet areas.
Black-crowned Night Heron	Regular visitor at ponds, streams ditches and wet areas
Trumpeter Swan	Rare migrant; this species is very rare east of the Rocky Mountains but Ontario, Michigan, and several other midwest states have started reintroduction programs and some of their birds have shown up in Ohio. These two birds were adults observed flying together from the direction of the Erie Sand Barrens area over the station to the northeast towards the lake. They were only observed on June 15.
Canada Goose	Confirmed breeder; Uncommon around ponds.
Wood Duck	Confirmed breeder; Uncommon around ponds, streams, and ditches.
American Black Duck	Possible breeder; Rare at ponds, streams, ditches, and wet areas.
Mallard	Confirmed breeder; Uncommon at ponds, streams, ditches, and wet areas.

Upland Sandpiper	Confirmed breeder; 1 nest with 4 eggs found but it had been mowed over and destroyed; a female was observed but no male. Rare in grasslands.
American Woodcock	Confirmed breeder; 9 territorial birds were found and one nest; seem low for the habitat but they can be earlier to find in March and early April. Uncommon in moist woodlots.
Ring-billed Gull	Regular visitor, mainly flying over the station.
Herring Gull	Regular visitor, mainly flying over the station.
Rock Dove	Confirmed breeder; Very common.
Mourning Dove	Confirmed breeder; Very common.
Black-billed Cuckoo	Probable breeder; Rare in woodlots and shrubby areas.
Yellow-billed Cuckoo	Confirmed breeder; Uncommon in woodlots and shrubby areas.
Eastern Screech Owl	Confirmed breeder; common in woodlots and shrubby areas.
Great Horned Owl	Confirmed breeder; Uncommon in woodlots.
Common Nighthawk	Possible breeder; rare - should be more common as habitat is very good and it is very common in the local area.
Chimney Swift	Confirmed breeder; Uncommon.
Ruby-throated Hummingbird	Confirmed breeder; Uncommon in woodlots and shrubby areas.
Belted Kingfisher	Confirmed breeder; Rare around ponds, streams, and ditches.
Red-headed Woodpecker	Confirmed breeder; Uncommon in large mature woodlots.
Red-bellied Woodpecker	Confirmed breeder; Common in large mature woodlots.
Downy Woodpecker	Confirmed breeder; Common in woodlots.

Hairy Woodpecker	Confirmed breeder; Uncommon in large woodlots.
Northern Flicker	Confirmed breeder; Common in woodlots.
Eastern Wood-Pewee	Confirmed breeder; Very common in large woodlots.
Acadian Flycatcher	Confirmed breeder; Uncommon in large, mature woodlots.
Willow Flycatcher	Confirmed breeder; Very common in shrubby areas.
Alder Flycatcher	Probable breeder; rare in shrubby, wet areas, and some may have been migrants as they are known to be late migrants.
Least Flycatcher	Probable breeder; Rare in shrubby areas and secondary growth.
Eastern Phoebe	Confirmed breeder; Common along streams and ditches with bridges to nest under.
Great Crested Flycatcher	Confirmed breeder; Common in large woodlots.
Eastern Kingbird	Confirmed breeder; Very common in open shrubby areas.
Horned Lark	Probable breeder; Rare in grasslands and cultivated fields.
Purple Martin	Probable breeder; Rare.
Tree Swallow	Confirmed breeder; Uncommon around ponds.
N. Rough-winged Swallow	Confirmed breeder; Rare along streams and ditches.
Bank Swallow	Rare migrant or visitor as there are colonies in the area.
Barn Swallow	Confirmed breeder; Very common, especially around vacant buildings.
Blue Jay	Confirmed breeder; Abundant in woods.

Common Crow	Confirmed breeder; Very Common in woodlots.
Black-capped Chickadee	Confirmed breeder; Common in woodlots.
Tufted Titmouse	Confirmed breeder; Common in woodlots.
White-breasted Nuthatch	Confirmed breeder; Uncommon in woodlots.
Carolina Wren	Probable breeder; Rare in shrubby areas and woodlots.
House Wren	Confirmed breeder; Abundant in shrubby areas and woodlots.
Winter Wren	Rare migrant, very late date.
Sedge Wren	Confirmed breeder; Common in old grassy fields. This probably the largest concentration in Ohio.
Marsh Wren	Possible breeder; Rare in wetlands with cattails, of which there is minimal habitat on the station.
Ruby-crowned Kinglet	Rare migrant, late date.
Blue-gray Gnatcatcher	Confirmed breeder; Uncommon in woodlots.
Eastern Bluebird	Confirmed breeder; Common in open fields and edges.
Veery	Confirmed breeder; Uncommon in large, woodlots.
Wood Thrush	Confirmed breeder; Very common in large woodlots.
American Robin	Confirmed breeder; Abundant everywhere.
Gray Catbird	Confirmed breeder; Abundant in shrubby areas and edges.
Northern Mockingbird	Confirmed breeder; Rare with most of the bird found in shrubby areas in the National Guard section. This is not a common species in northern Ohio.
Brown Thrasher	Confirmed breeder; Common in shrubby areas and edges.

Cedar Waxwing	Confirmed breeder; Very common everywhere.
European Starling	Confirmed breeder; Abundant everywhere.
White-eyed Vireo	Confirmed breeder; uncommon in shrubby areas.
Yellow-throated Vireo	Confirmed breeder; uncommon in large, mature woodlots and edges.
Warbling Vireo	Confirmed breeder; common in large woodlots and edges.
Red-eyed Vireo	Confirmed breeder; very common in woodlots.
Blue-winged Warbler	Confirmed breeder; common in shrubby areas and edges.
Brewster's Warbler	Possible breeder; rare in shrubby areas and edges. This is a very uncommon hybrid between the Blue-winged Warbler and the Golden-winged Warbler which is rarely found in Ohio.
Yellow Warbler	Confirmed breeder; abundant in shrubby areas and edges.
Chestnut-sided Warbler	Probable breeder; uncommon in shrubby areas and edges.
Black-throated Green Warbler	Possible breeder; rare in large, mature woodlots. This bird was probably a late migrant.
Cerulean Warbler	Possible breeder; rare in large, mature woodlots.
Black-and-white Warbler	Possible breeder; rare in large, mature woodlots.
American Redstart	Probable breeder; rare in shrubby area and large woodlots.
Ovenbird	Probable breeder; rare in large, mature woodlots.
Kentucky Warbler	Possible breeder; rare in large, mature woodlots.

Common Yellowthroat	Confirmed breeder; abundant in shrubby areas, old grassy fields, and edges.
Yellow-breasted Chat	Confirmed breeder; uncommon in shrubby areas.
Summer Tanager	Possible breeder; rare in open wooded areas. This bird was probably an overshoot migrant.
Scarlet Tanager	Confirmed breeder; common in large, mature woodlots.
Northern Cardinal	Confirmed breeder; abundant everywhere.
Rose-breasted Grosbeak	Confirmed breeder; common in woodlots and edges.
Indigo Bunting	Confirmed breeder; abundant everywhere.
Rufous-sided Towhee	Confirmed breeder; very common in woodlots shrubby areas, and edges.
Chipping Sparrow	Confirmed breeder; common in open wooded areas and around buildings with lawns.
Field Sparrow	Confirmed breeder; abundant in grasslands, shrubby areas, and edges.
Vesper Sparrow	Confirmed breeder; uncommon in grasslands and cultivated fields.
Savannah Sparrow	Confirmed breeder; common in grasslands.
Grasshopper Sparrow	Confirmed breeder; common in grasslands.
Henslow's Sparrow	Probable breeder; rare in old fields.
Song Sparrow	Confirmed breeder; abundant everywhere.
Swamp Sparrow	Confirmed breeder; rare in wet fields and ditches with cattails.
White-throated Sparrow	Late migrant; rare.
Bobolink	Confirmed breeder; uncommon in grasslands.
Red-winged Blackbird	Confirmed breeder; abundant in grasslands, edges, along ditches and streams.

Eastern Meadowlark	Confirmed breeder; common in grasslands.
Common Grackle	Confirmed breeder; abundant everywhere.
Brown-headed Cowbird	Confirmed breeder; abundant everywhere.
Orchard Oriole	Confirmed breeder; common in open woods and edges.
Northern Oriole	Confirmed breeder; uncommon in open woods and edges.
House Finch	Confirmed breeder; uncommon around buildings.
American Goldfinch	Confirmed breeder; abundant in shrubby areas and edges.
House Sparrow	Confirmed breeder; uncommon near buildings.

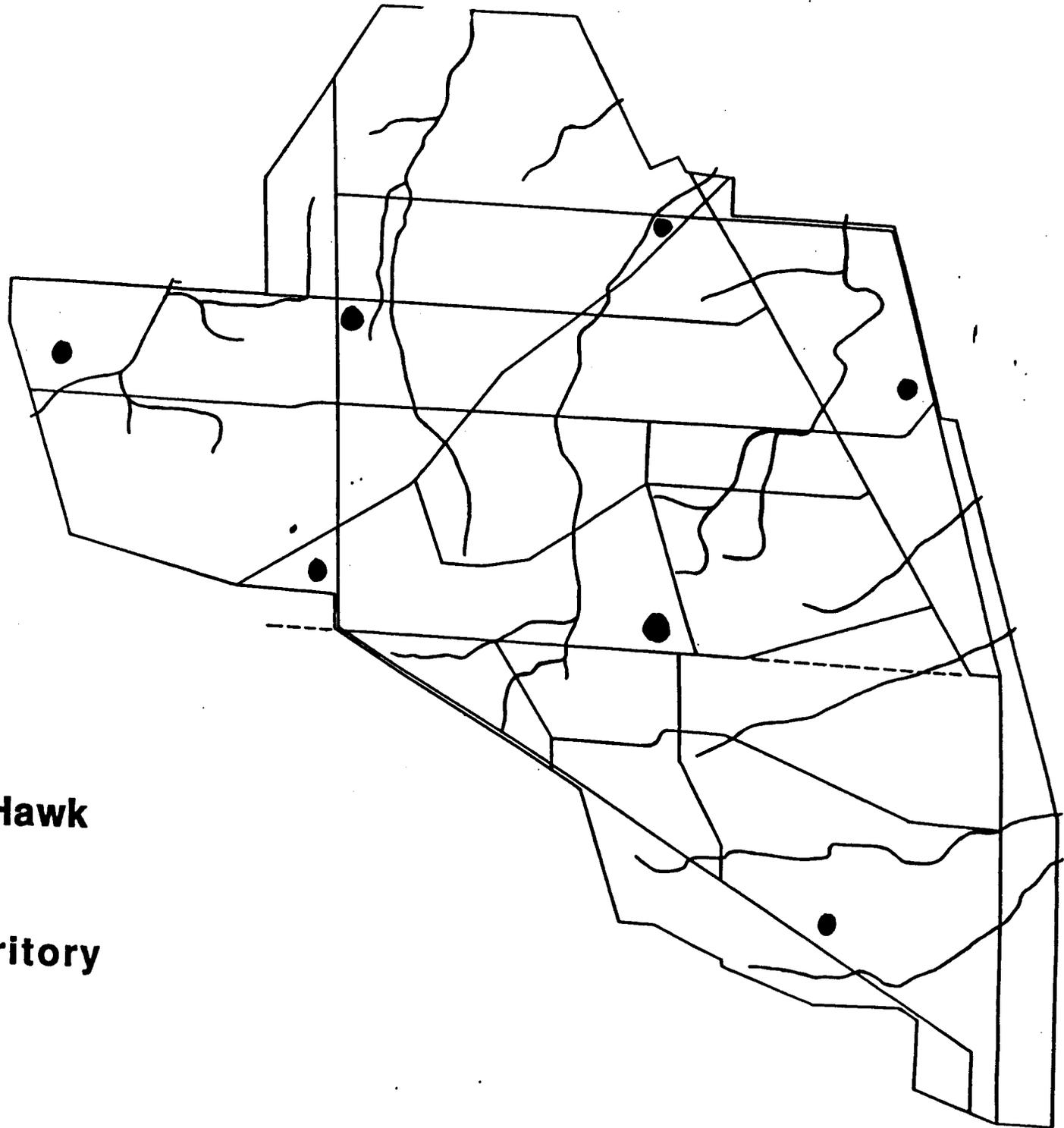
**APPENDIX A. DESCRIPTION OF ROUTE STOPS FOR NASA PLUM BROOK BBS  
ROUTE**

Appendix A. Description of Route Stops for Plum Brook BBS Route.

Stop	Description
1	Visitor parking lot at the Clark Road entrance
2	Curve; wire fence on right a 3-way intersection
3	100 meters before curve near red and white pole barn on right
4	Bridge over Ransom Brook
5	Telephone pole 3412 and tower on left
6	Telephone pole on right; large sycamore tree on left before curve
7	Telephone pole 011A on left
8	15 meters after Pipe Creek bridge
9	50 meters before curve; large cherry tree on left
10	Intersection; gate (to exit) on right
11	Pavement changes; about 50 meters before curve
12	Left - 2 fence posts with yellow paint; right - concrete slab and maple trees
13	Two telephone poles after blackbird trap; about 100 meters before turn
14	20 meters after culvert on right
15	At ditch crossing
16	Left - end of woodlot; large oak trees
17	At gate
18	At ditch crossing
19	Beginning of cottonwoods on left
20	Double telephone poles on the right after turn
21	Double telephone poles on the right
22	One telephone pole before intersection
23	20 meters before road sign
24	Telephone pole on right with aluminum band and bird box

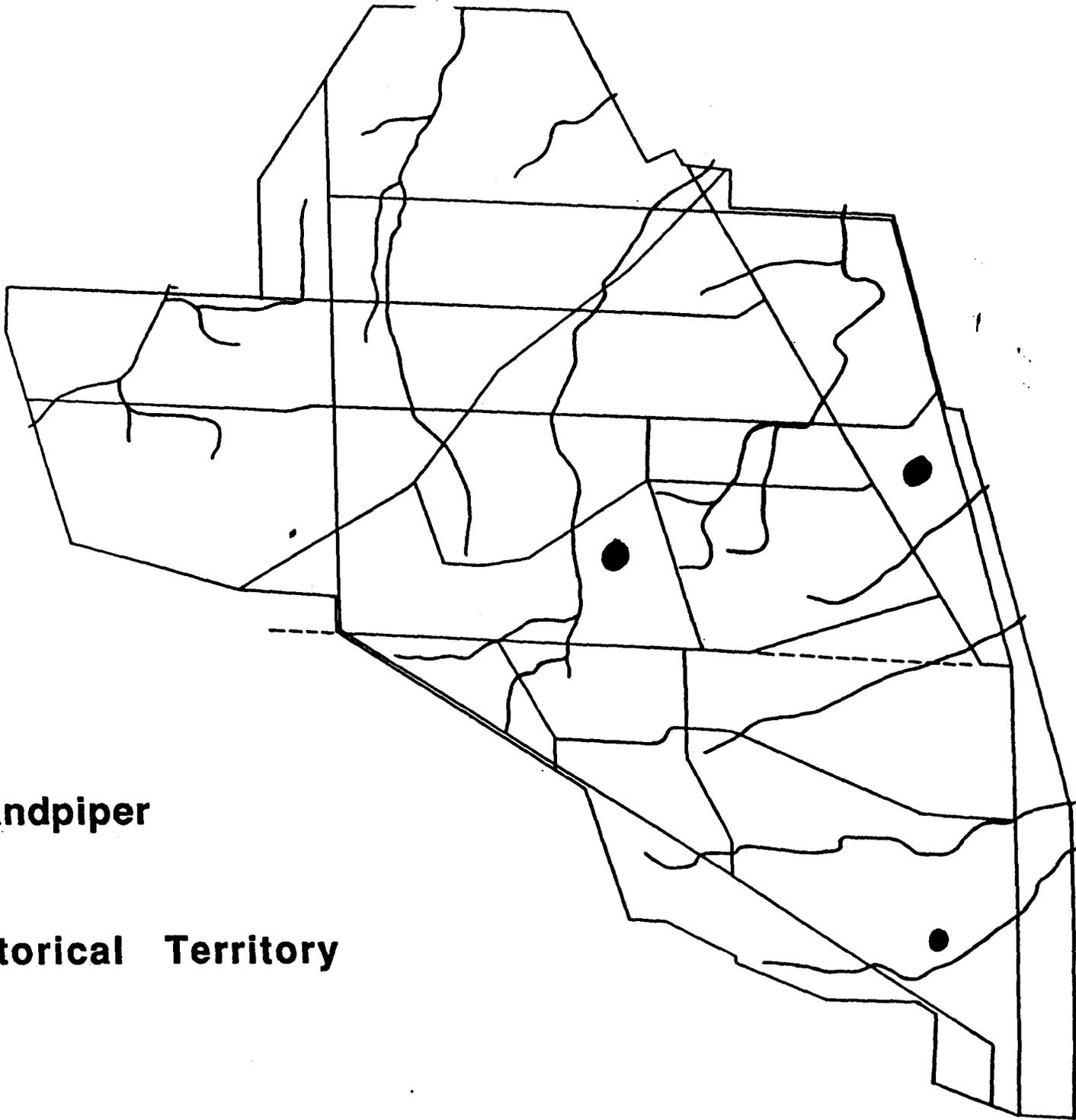
- #10
- 25 Two telephone poles before pole with bird box #16
  - 26 Telephone pole with bird box #19
  - 27 Two telephone poles before pole with bird box #26
  - 28 Telephone pole with bird box #29
  - 29 At drain
  - 30 At old railroad crossing
  - 31 Fox Road intersection
  - 32 Bunker #9179
  - 33 Bunker #9174
  - 34 Intersection with South Magazine Road
  - 35 Curve before Taft Road
  - 36 Telephone pole #6457
  - 37 Telephone pole #6447
  - 38 T - intersection
  - 39 Taylor Road intersection
  - 40 At old railroad crossing
  - 41 Large cottonwood tree on right; large dead elm tree on left
  - 42 Intersection; building off to left
  - 43 Across from building 2331
  - 44 Intersection of Ransom and Maintaince Roads
  - 45 Intersection of Ransom and Pentolite Roads
  - 46 Intersection after building 9202
  - 47 Telephone pole with bird box #74 on left
  - 48 Telephone pole with bird box #34 on left
  - 49 Powerline on left; near building 8562 on right
  - 50 100 meters east of Taylor Road on Fox Road

**APPENDIX B. DISTRIBUTION MAPS FOR RARE AND ENDANGERED SPECIES**



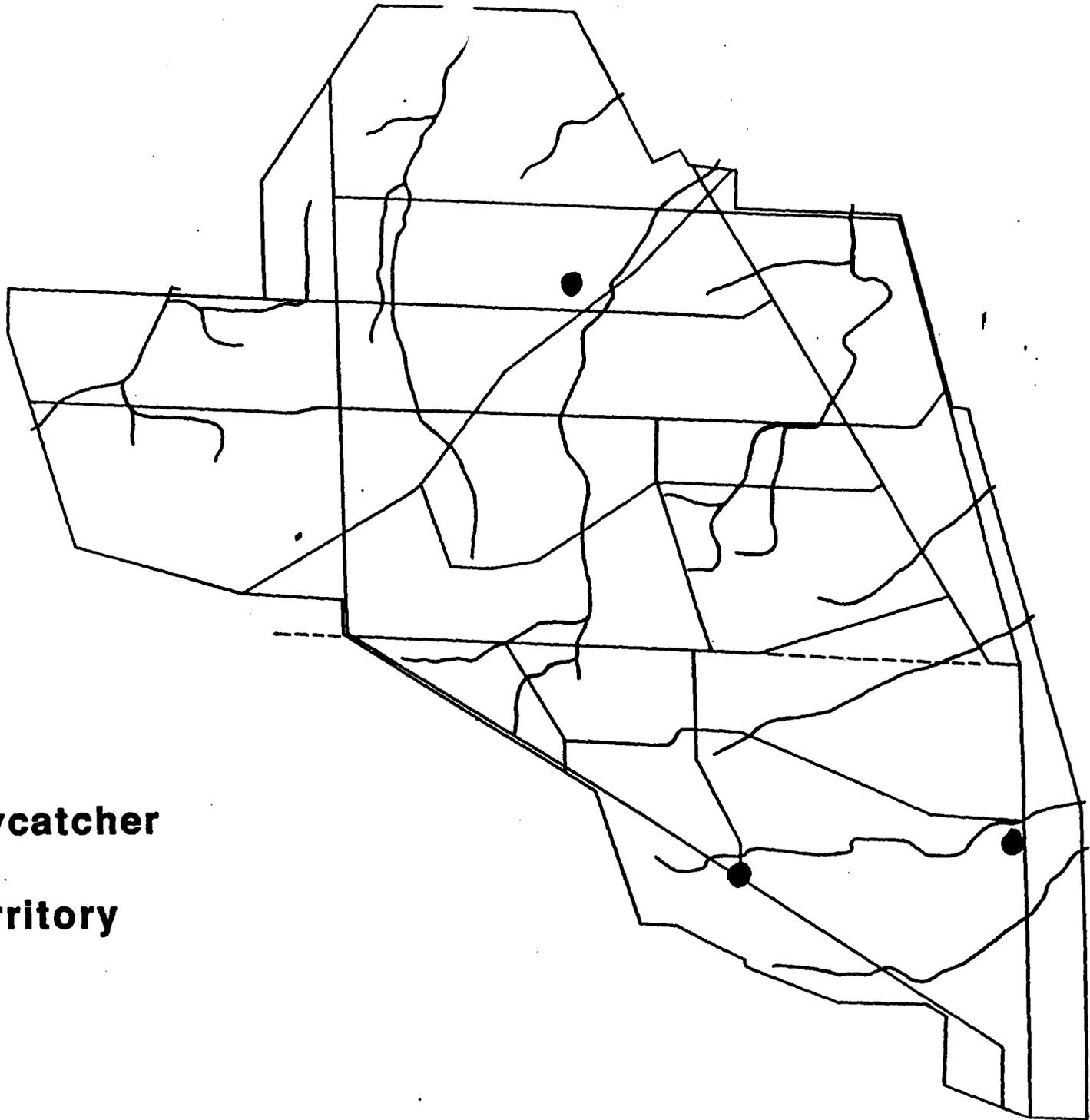
## Copper's Hawk

- = Nest
- = Territory



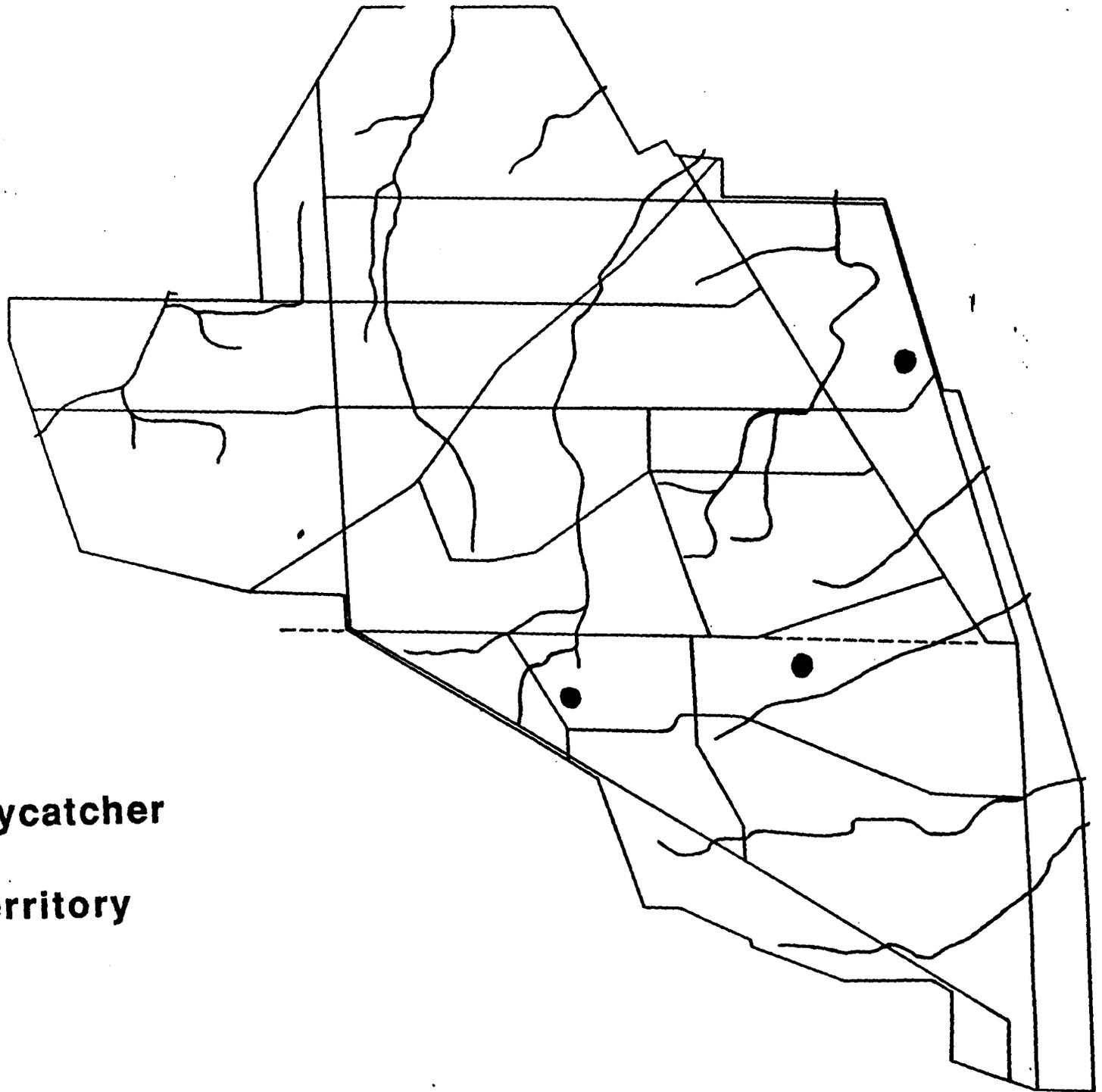
**Upland Sandpiper**

- = Nest
- = Historical Territory



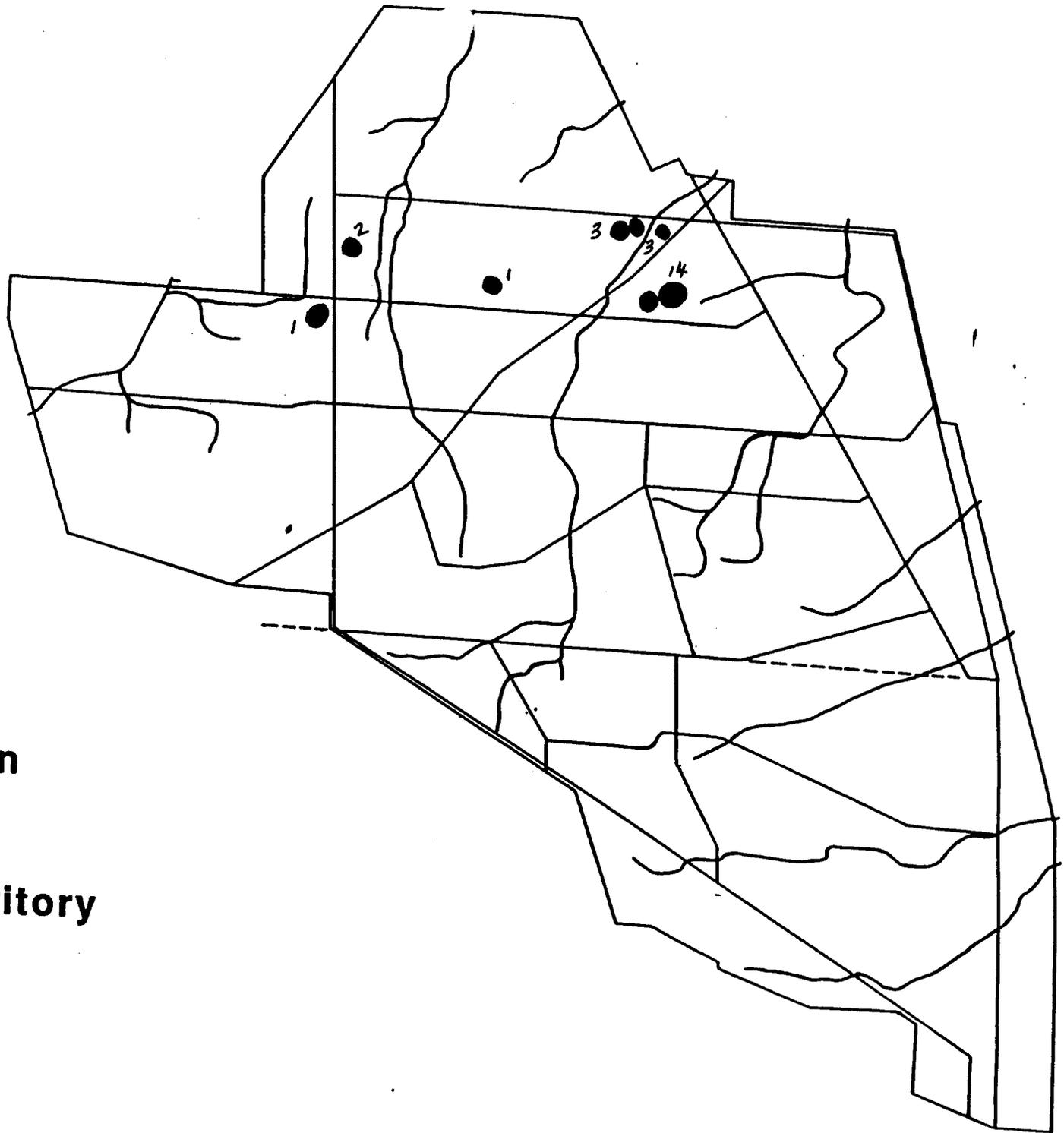
**Alder Flycatcher**

● = **Territory**



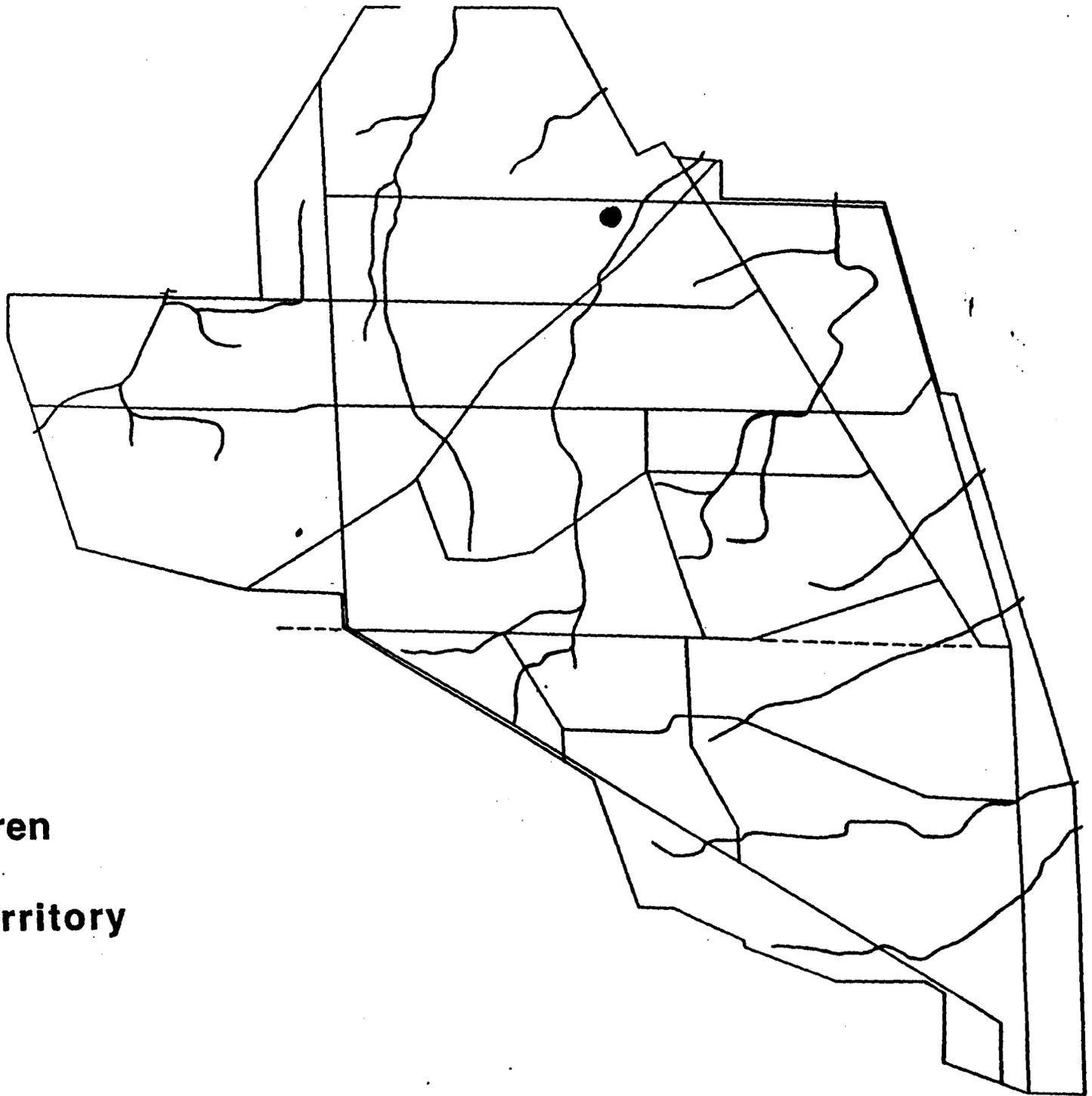
**Least Flycatcher**

● = **Territory**



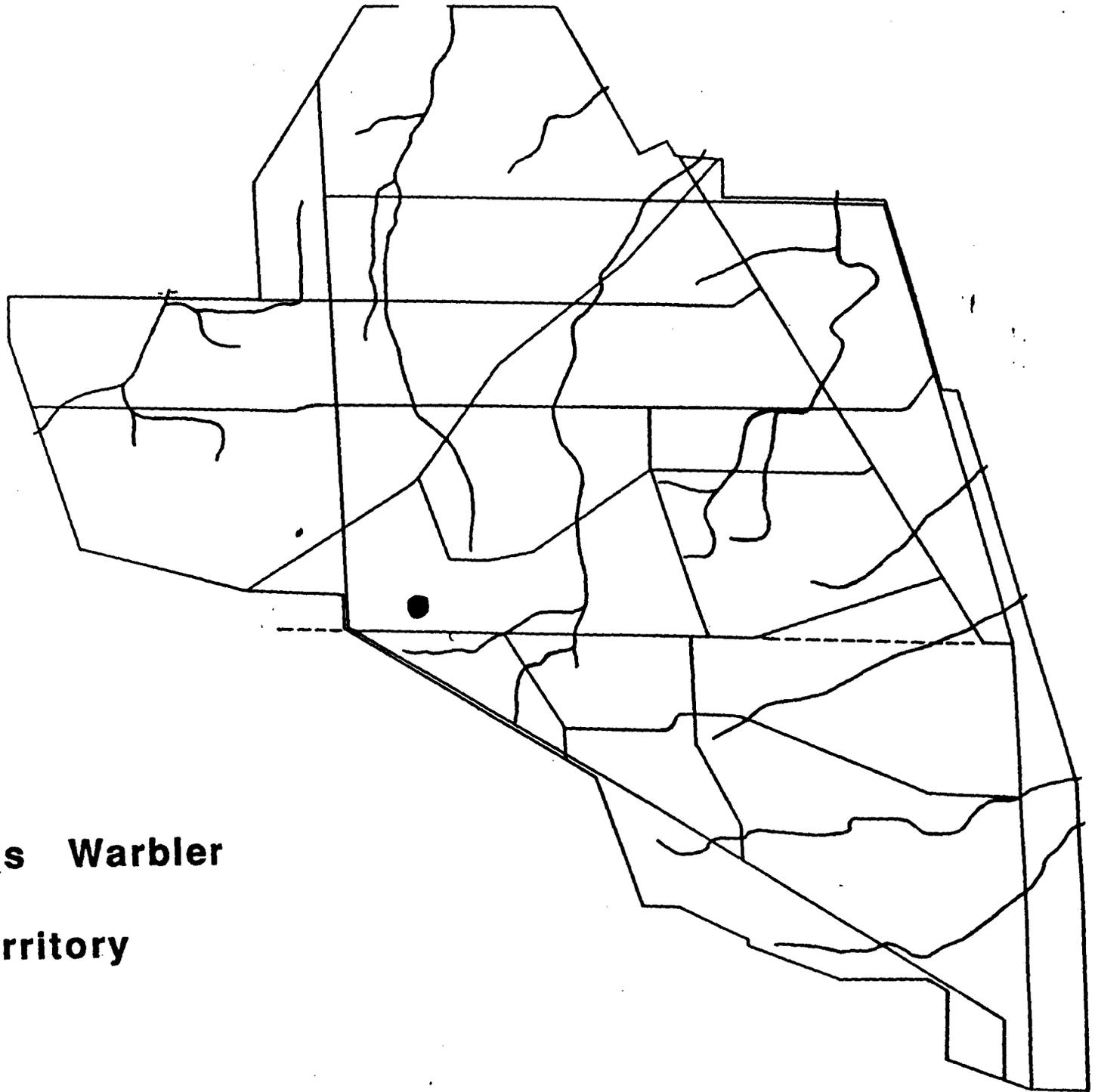
## Sedge Wren

- = Nest
- = Territory



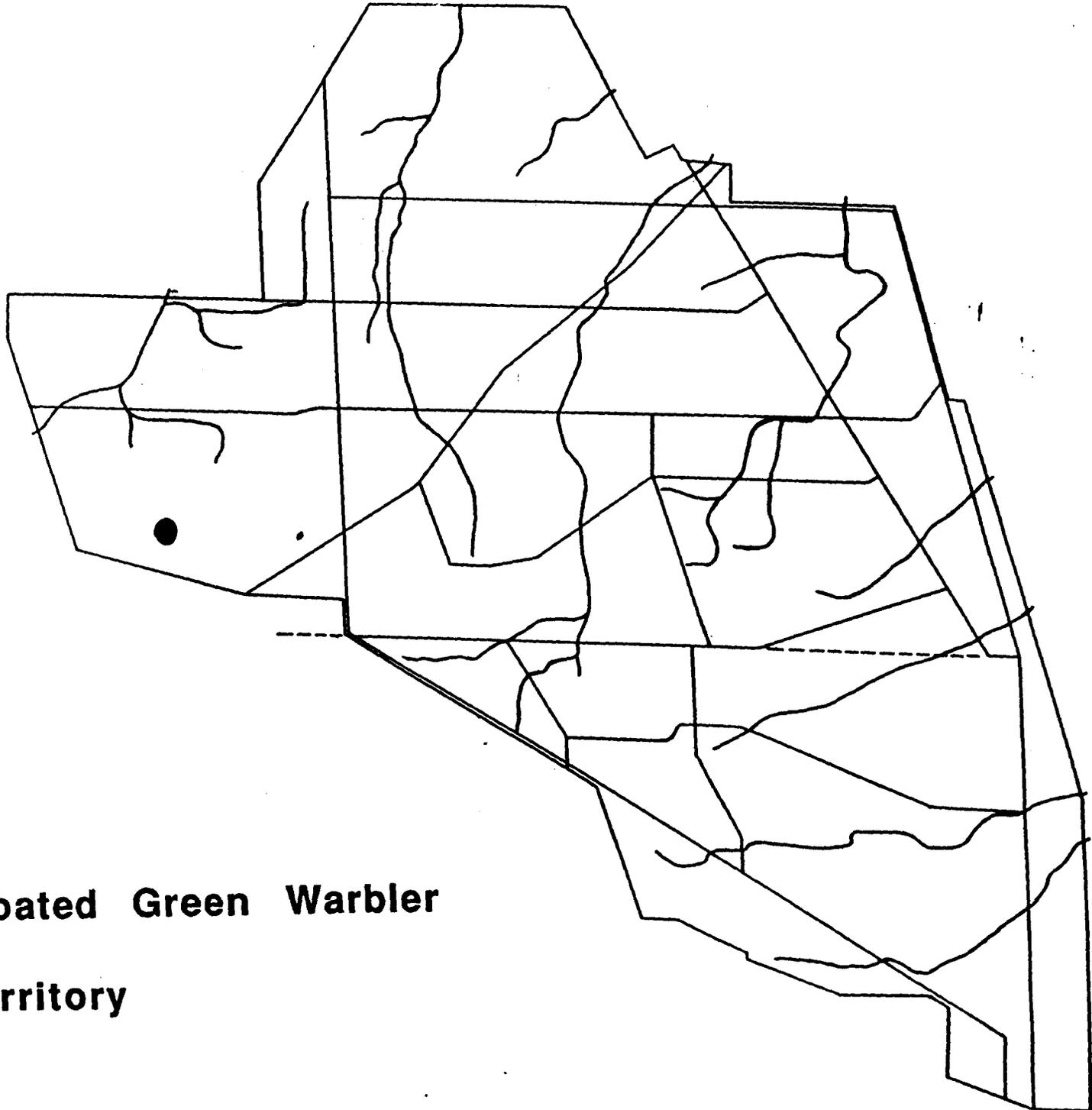
**Marsh Wren**

● = **Territory**



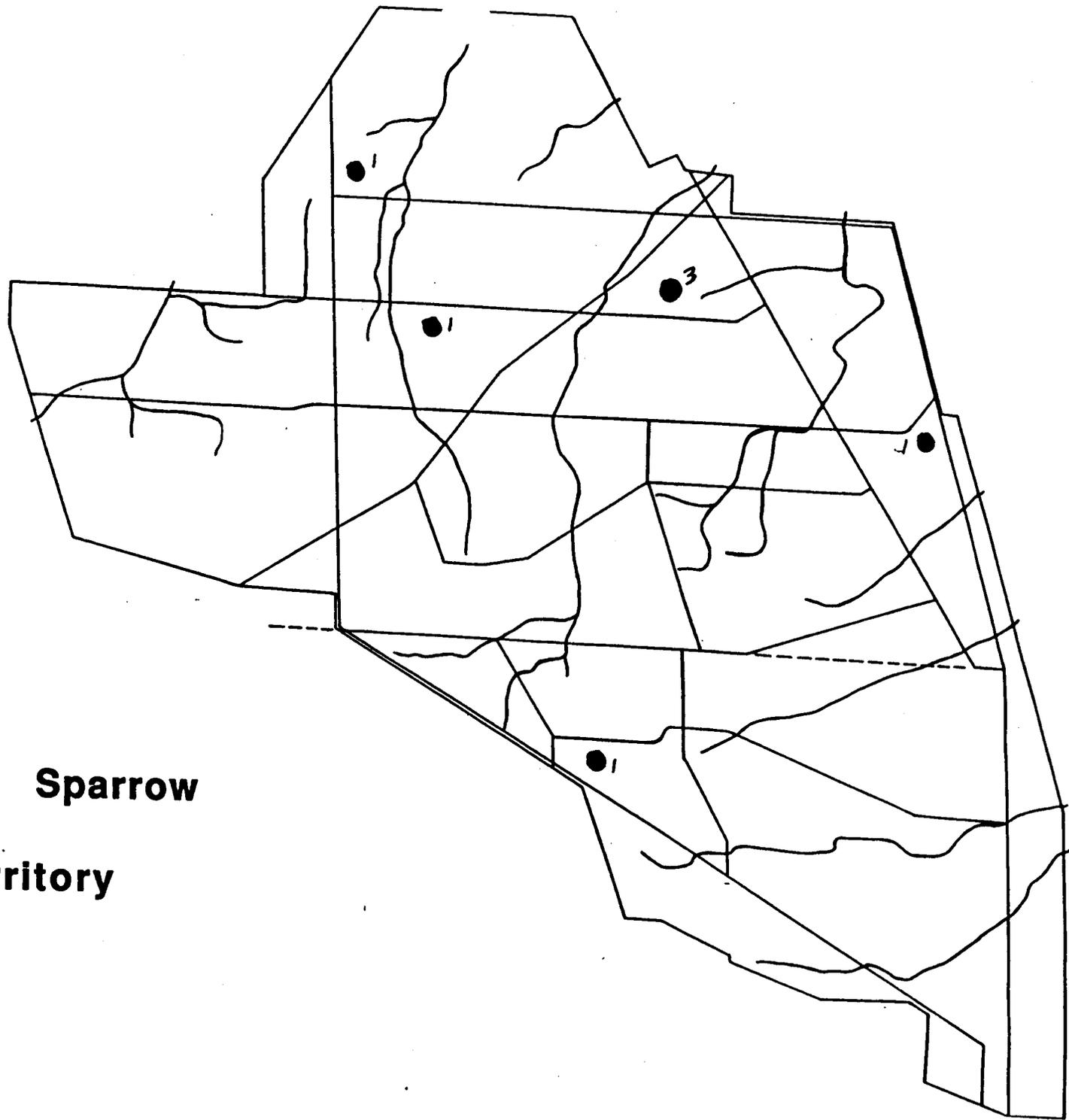
**Brewster's Warbler**

● = Territory



**Black-throated Green Warbler**

● = Territory



**Henslow's Sparrow**

● = Territory

**SECTION C**  
**AMPHIBIANS AND REPTILES**

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## INTRODUCTION

There is no historical information that exists for the amphibians and reptiles that are found in the area which has become Plum Brook Station. Conant (1938) lists 18 species of reptiles found at Sandusky and one at Kimball. Both localities are within five miles of Plum Brook Station. In addition to the reptiles, Walker (1946) listed two frog species from Sandusky. By studying present day distribution maps, a list of 38 species was compiled that probably inhabited the region before the arrival of European settlers (Table 1). It was felt that there was a remote chance that as many as 26 of these species might still exist at Plum Brook.

The entire Station lies within the Lake Plains Physiographic Province and is relatively flat ranging in elevation from about 625' at the exodus of Pipe Creek and Plum Brook to about 680' in the sand hills of the west end. Limestone outcrops in a few roadside ditches at the west end and Ohio Shale outcrops in the center and east end of the property. Concretions, often in excess of three feet in diameter, are found along Plum Brook and flint outcroppings are known along the abandoned B+O right-of-way in the west end. There are some sandy (probably former beach) ridges which run east-west through the west end.

Given the relative flatness of the land, it is not surprising that it was all cleared, ditched and drained for farming long before World War II. Any woodlots that occur on the property are therefore less than 50 years of age and most appear to be younger than that. A few interesting herbaceous prairie plant species struggle to survive in scattered localities throughout the Station.

Pipe Creek passes through the western end of the Station while the southeastern third of the Station forms the headwaters of Sawmill Creek. The remainder of the property makes up the headwater region of Plum Brook. All of these streams drain into the Sandusky Bay of Lake Erie. Most of the area is very well drained and soils at the surface are usually very dry. Compounding the dry conditions, in 1994 this part of the state lagged 7"-10" behind normal rainfall for the entire growing season. Most streams and ditches were either dry or non-flowing for most of the summer, the lone exception is Plum Brook which receives large quantities of water pumped from operations at the Station.

## METHODS AND MATERIALS

Beginning in early May I tried to find all of the vernal ponds on the property. The late start of the project prevented any trapping of adult amphibians during the March-April breeding

TABLE 1. PROBABLE SPECIES OF REPTILES AND AMPHIBIANS FOUND IN THE PLUM BROOK AREA PRIOR TO THE ARRIVAL OF EUROPEAN SETTLERS. (Extrapolated from present day distribution maps)

SALAMANDERS

1. newt
2. smallmouth
3. spotted
4. marbled
5. tiger
6. redback

FROGS AND TOADS

1. American toad
2. Fowler's toad
3. cricket frog
4. chorus frog
5. spring peeper
6. treefrog
7. bullfrog
8. green frog
9. leopard frog

SNAKES

1. ring-necked
2. hognose
3. smooth green
4. racer
5. pilot black
6. fox
7. milk
8. Kirtland's
9. queen
10. water
11. brown
12. Butler's
13. ribbon
14. garter
15. massasauga

TURTLES

1. musk
2. snapper
3. spotted
4. Blanding's
5. box
6. map
7. painted

LIZARD

1. blue-tailed skink

season. Nevertheless, eggs and larva were collected at many of these ponds. Each of these ponds was visited at least once a week until they either dried up (mid-June) or no longer contained any eggs or larva (August). During the heat of the summer turtle traps were placed in many of the permanent ponds. Many of the frog and toad records in this report are based on the calls of males. In the case of peepers and chorus frogs, calls represented the only records for these species.

One of the most effective collecting techniques is to slowly drive roads after dark following or during a shower or thunderstorm in spring and summer. Under these conditions many amphibians and reptiles come out to feed on earthworms, insects and each other. Unfortunately there was only one such evening this year and many of the toad records were secured on this one evening. However, most of the records obtained during this study were found simply by walking and turning rocks, logs, boards, and other debris throughout the Station.

Voucher specimens were preserved for the more significant records. For large or unusual species only photographs were taken. Never was more than one adult of any species taken from any one locality. With larva (tadpoles) less than six were taken from each locality. In addition, any mammal skulls/skeletons that were found were also collected. (This produced the only gray fox record for the Station). Casual mammal sightings were recorded (listed in the mammal section of this report) and single crayfish specimens were collected whenever encountered. All specimens and original photographs have been deposited with the Cleveland Museum of Natural History.

The latitude and longitude was recorded for the center point of each locality. These localities were arbitrarily assigned an area with a diameter of approximately 0.1 mi. Each site was visited several times during each season but work was curtailed during the hottest and driest parts of the summer when many species were difficult to find.

A line map of the Station was drawn which included township borders, major roads and stream systems. This was used to create distribution maps for each species and these in turn form the bulk of this report (Figures 1-19). Each map is accompanied by a distribution map of the species in Ohio which was combined from Walker (1946), Conant (1951) and my own personal records. There are also appropriate comments concerning each species.

## RESULTS

Amphibians and/or reptiles were recorded from 87 localities in Plum Brook Station (Figure 20, Appendix A). Nineteen species were found (Table 2) including two salamanders, seven frogs, six

Table 2. Amphibians and Reptiles found at Plum Brook Station in 1994

Salamanders

1. smallmouth salamander (*Ambystoma texanum*)
2. redback salamander (*Plethodon cinereus*)

Frogs and Toads

1. American toad (*Bufo americanus*)
2. western chorus frog (*Pseudacris triseriata*)
3. spring peeper (*Pseudacris crucifer*)
4. gray treefrog (*Hyla versicolor*)
5. bullfrog (*Rana catesbeiana*)
6. green frog (*Rana clamitans melanota*)
7. northern leopard frog (*Rana pipiens*)

Snakes

1. smooth green snake (*Opheodrys vernalis*)
2. fox snake (*Elaphe vulpina*)
3. northern water snake (*Nerodia sipedon*)
4. brown snake (*Storeria dekayi*)
5. Butler's garter snake (*Thamnophis butleri*)
6. common garter snake (*Thamnophis sirtalis*)

Turtles

1. snapping turtle (*Chelydra serpentina*)
2. Blanding's turtle (*Emys blandingii*)
3. box turtle (*Terrapene carolina*)
4. painted turtle (*Chrysemys picta*)

snakes and four turtles. In addition the area lies within the range of nineteen other species (Appendix B) and it is possible that one or more of these may yet be discovered here. New county records were obtained for three species and there were 29 new township records.

What follows is a brief discussion of each species with reference to the distribution map and a listing of the new township and county records that were found at the station. In describing the abundance of each species at Plum Brook Station, I have used the categories defined by Pfingsten and Downs (1989). Abundant: A species which can almost always be found with ease under normal conditions. Common: A species which may be restricted by season or habitat but usually can be found with some effort. Uncommon: A species which seldom is found in any great numbers or at many locales. It usually is found incidental to something else. Rare/threatened/endangered: A species which is represented by only a few individuals or which occupies a small area and may be in immediate jeopardy.

## DISCUSSION

Unless otherwise noted, salamander, frog, and turtle localities are represented by several specimens while snakes are represented by a single specimen.

### Smallmouth salamander (Ambystoma texanum)

Common (Figure 1). New records: Perkins Tp., Oxford Tp. Adults of this species are rarely encountered outside the early (March) breeding season. Only two adults were found but larva were found at 20 localities and probably occur at several more. Because of the drought conditions this year, all ponds and ditches dried up before larva of this species were able to transform and consequently this years age class was completely lost.

### Redback salamander (Plethodon cinereus)

Rare (Figure 2). Only four adults of northeastern North Americas most common and widespread salamander were found at the Station. This is a woodland species characteristic of the damp deciduous forest and one would therefore not expect it to be common in an area dominated by prairie species. However it should be common in the woodlots on the property. The explanation for their absence seems to lie in the land management practice of burning half of the station every other year. This essentially destroys the leaf and mulch layer on the forest floor reducing humidity and consuming any source of cover such as logs and bark. The result is the production of the herbaceous monocultures seen in most of the woodlots and conditions more like a desert.

**American toad (Bufo americanus)**

Common (Figure 3). New records: Perkins Tp., Oxford Tp. Despite the apparent abundance of this species shown on the map, the "soothing trill of the toads" was an uncommon sound at Plum Brook Station in 1994. Most of the ponds that toads would use for breeding were dried up early in the year. The lone rainy spell of the summer (June 26-28) produced many temporary ponds and puddles in which toads laid eggs. Although not unusual for this species, it was fully two months later than the normal egg laying season. As this is a nocturnal species, it is not surprising that most records were obtained after dark.

**Western chorus frog (Pseuacris triseriata)**

Uncommon (Figure 4). New records: Perkins Tp., Oxford Tp. This elusive frog was heard calling at six widely scattered areas. No adults were captured but tadpoles were picked up at two localities.

**Spring peeper (Pseudacris crucifer)**

Common (Figure 5). New records: Erie Co., Perkins Tp., Oxford Tp. The spring peeper was found only in the southeastern half of the Station. Of the 11 locality records, five were obtained in mid October. Because the project did not begin until May, it is possible that a few early season localities may have been missed.

**Grey treefrog (Hyla versicolor)**

Rare (Figure 6). New records: Erie Co., Perkins Tp. There was one photograph by John Gilligan and two vocal records by Tom Bartlett. All records are relatively close to one another and may be the result of a single breeding population. This new county record fills a gap in the distribution that has puzzled herpetologists as to why there were apparently no treefrogs in this part of Ohio.

**Bullfrog (Rana catesbeiana)**

Common (Figure 7). New records: Erie Co., Perkins Tp., Oxford Tp. The bullfrog is one of those species that is so widespread that no one bothered to document it in this area as most herpetologists have spent their time in the more productive nearby marshlands of Lake Erie.

**Green frog (Rana clamitans)**

Abundant (Figure 8). New records: Perkins Tp., Oxford Tp. The green frog is the most common amphibian at Plum Brook Station. It was found in virtually every pond and stream.

**Northern leopard frog (Rana pipiens)**

Uncommon (Figure 9). New records: Perkins Tp., Oxford Tp., Over the past several years this species has been the focus of a great deal of national attention due to its apparent drastic decline throughout its range. It was therefore encouraging to find four apparently large populations at the station.

**Smooth green snake (Ophedrys vernalis)**

Rare (Figure 10). New record: Perkins Tp. a single specimen was found by Rich Kalynchuk on June 30. This species is state listed as threatened. The last record of this species from this area was in 1907 (in press) and probably represents the best herpetological find during this study.

**Fox snake (Elaphe vulpina)**

Common (Figure 11). New records: Perkins Tp., Oxford Tp., Photographs of this species were taken at four localities and it was seen at three others. One specimen that was killed on the road was preserved. This colorful snake is highly prized by "snake collectors". It has often been confused with rattlesnakes and copperheads and thus killed on sight by the unknowing. Plum Brook Station represents one of the larger sanctuaries for this species in Ohio.

**Northern water snake (Nerodia sipedon)**

Rare (Figure 12). New record: Perkins Tp. The most common snake in all of North America was seen only once at the Station. I am at a complete loss to explain the absence of a species which would normally be expected to be found in every ditch, stream and pond on the property.

**Brown snake (Storeria dekayi)**

Common (Figure 13). New records: Perkins Tp., Oxford Tp. Although known from only eight localities, it was generally found repeatedly at each site.

**Butler's garter snake (Thamnophis butleri)**

Rare (Figure 14) New Record: Perkins Tp. Found by Tom Bartlett on July 5, this gravid female eventually gave birth to six young which were released back into the wild.

**Common garter snake (Thamnophis sirtalis)**

Common (Figure 15). New records: Perkins Tp., Oxford Tp. As expected, this species was found throughout most of the station and was the most common snake seen.

**Snapping turtle (Chelydra serpentina)**

Common (Figure 16). New records: Perkins Tp., Oxford Tp. The snapping turtle is well established in most of the larger streams and ponds. Each locality represents multiple sightings or captures and two nests were found. The species was not found south of the Space Power Facility in Oxford Tp.

**Blandings turtle (Emys blandingii)**

Rare (Figure 17). New record: Perkins Tp. This species has seemingly undergone a considerable decline in numbers in Ohio in recent years so it was gratifying to find an established population of this handsome species in the Snake Road Pond. Several sightings were made and a large individual was trapped and released in July.

**Box turtle (Terrapene carolina)**

Rare (Figure 18). New records: Perkins Tp. It was thought that this would have been a common species at the Station but only two individuals were seen.

**Painted turtle (Chrysemys picta)**

Common (Figure 19). New records: Perkins Tp. This aquatic species was found in just about every permanent body of water at the Station. It was, as expected, the most common turtle species. As many as twenty were seen basking on numerous occasions at the Snake Road Pond.

**RECOMMENDATIONS**

It is difficult to make any recommendations without knowing the objectives of the tenant. Therefore several sets of recommendations are made based on different possible objectives. At present, it does not appear that land managements practices are based on any ecological considerations but merely a matter of convenience or a "that's the way we've always done it" attitude.

- A. If the objective is to control the land for convenience then little change need be made. It may be that some money could be saved by reducing unnecessary burning and mowing.
- B. If the objective is to stay out of trouble with the "Endangered Species Act" (i.e. cause the extirpation of same) then:
  - 1. Reduce the amount of land that is burned and use burning as a tool to promote species rather than "weed reduction".
  - 2. Eliminate all unnecessary mowing.
  - 3. Reduce the deer herd to about one fourth of its present size.
- C. If the objective is to truly manage the land so that it benefits the ecosystem then:
  - 1. Same as one above.
  - 2. Same as two above.
  - 3. Same as three above
  - 4. Hire a full or part time land manager. A comment heard early in this study was that "we feel the deer herd is just about right". This seems to typify the

attitude of the present tenants and their lack of understanding of the problems. A professional land manager could be a great help here.

5. Consider the creation of more diverse habitat. Introduction of beaver for example might be a start.

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- King, Richard B., Michael J. Oldham, Wayne F. Weller and Douglas Wynn. 1995. Historic and current amphibian and reptile distributions in the island region of Lake Erie (in press).
- Pfingsten, Ralph A. and Floyd L. Downs, eds. 1989. Salamanders of Ohio. Ohio Biol. Surv. Bull. New Series Vol. 7 No. 2 xx + 315p. + 29 Pls.

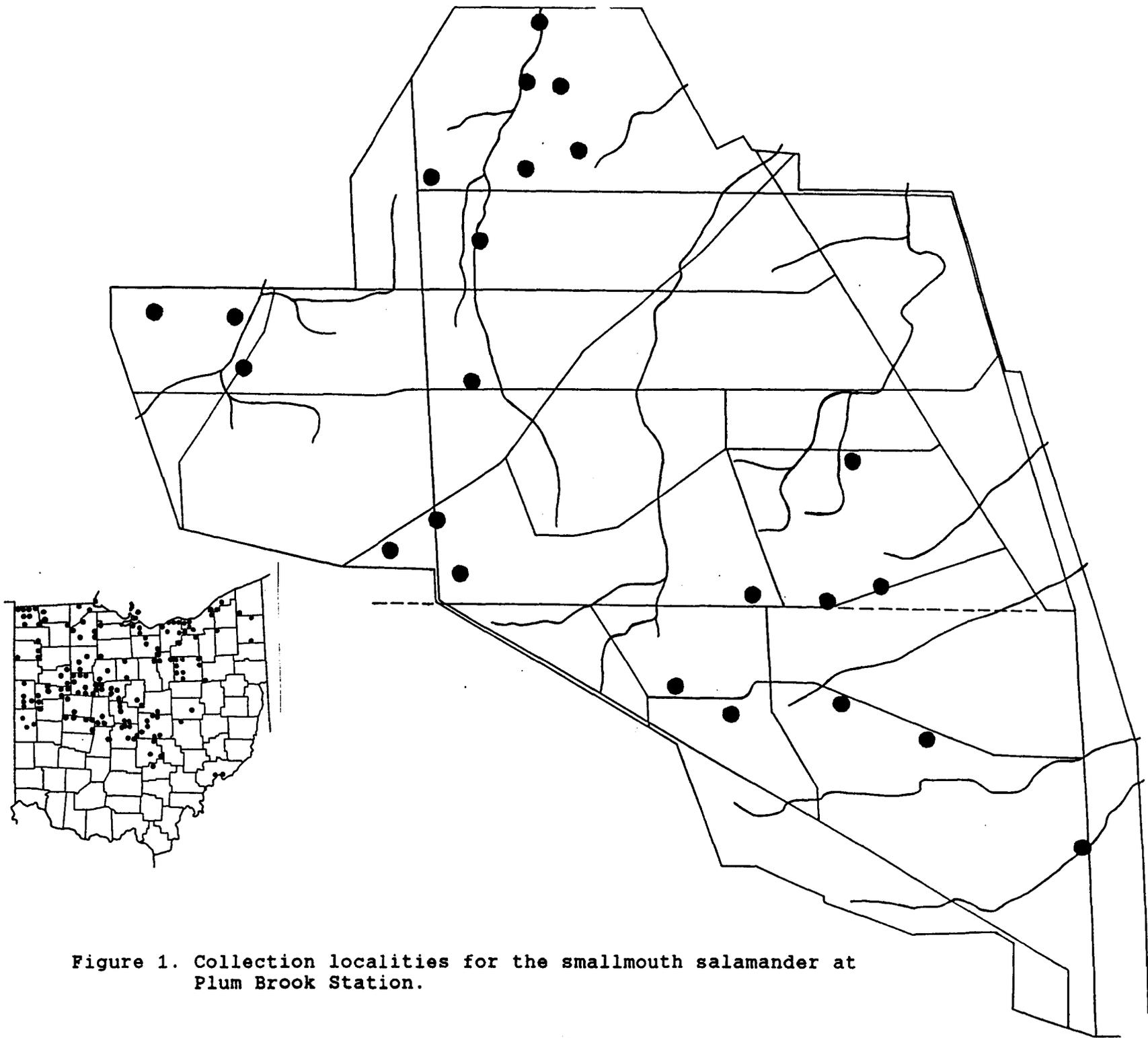


Figure 1. Collection localities for the smallmouth salamander at Plum Brook Station.

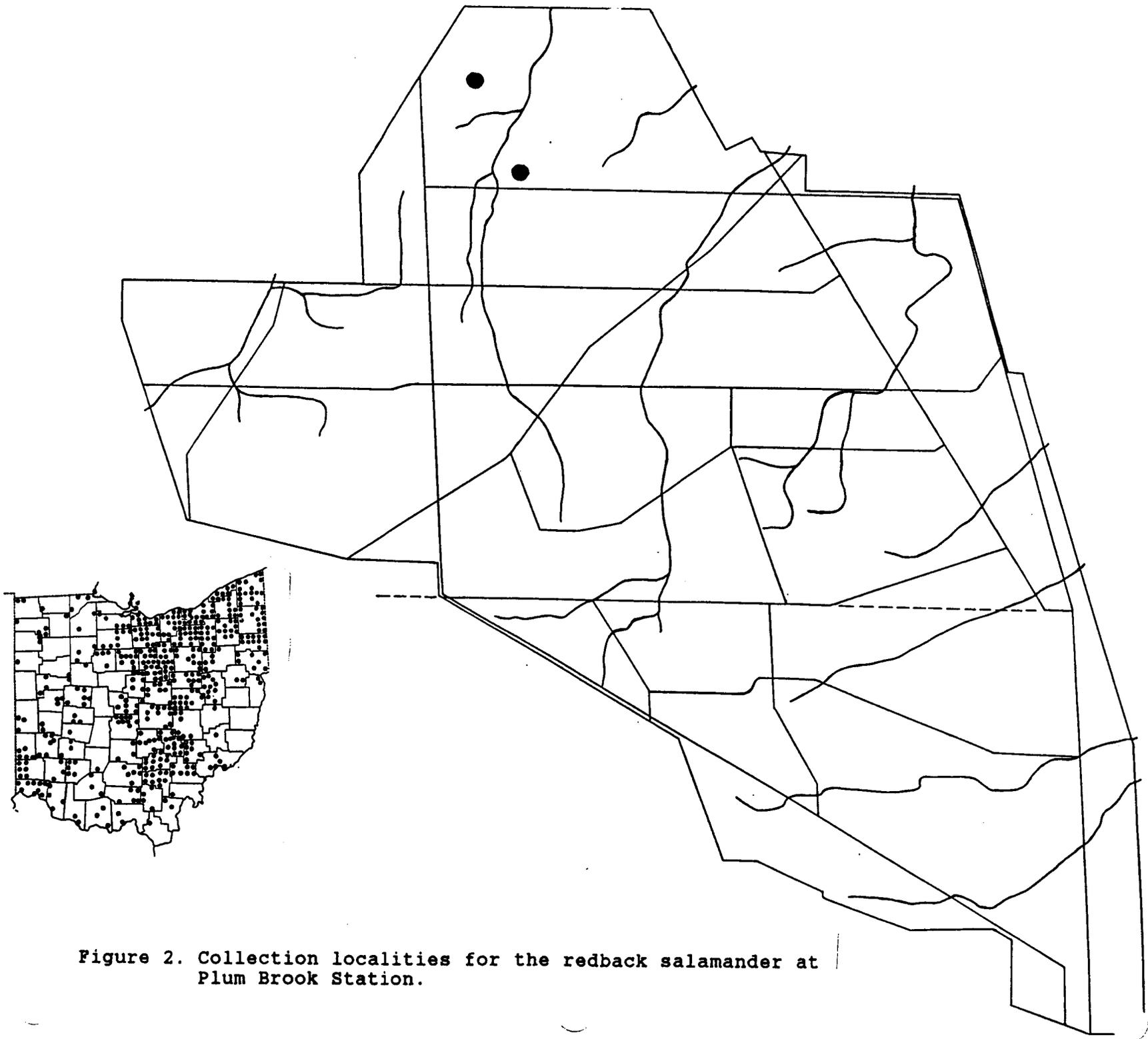


Figure 2. Collection localities for the redback salamander at Plum Brook Station.

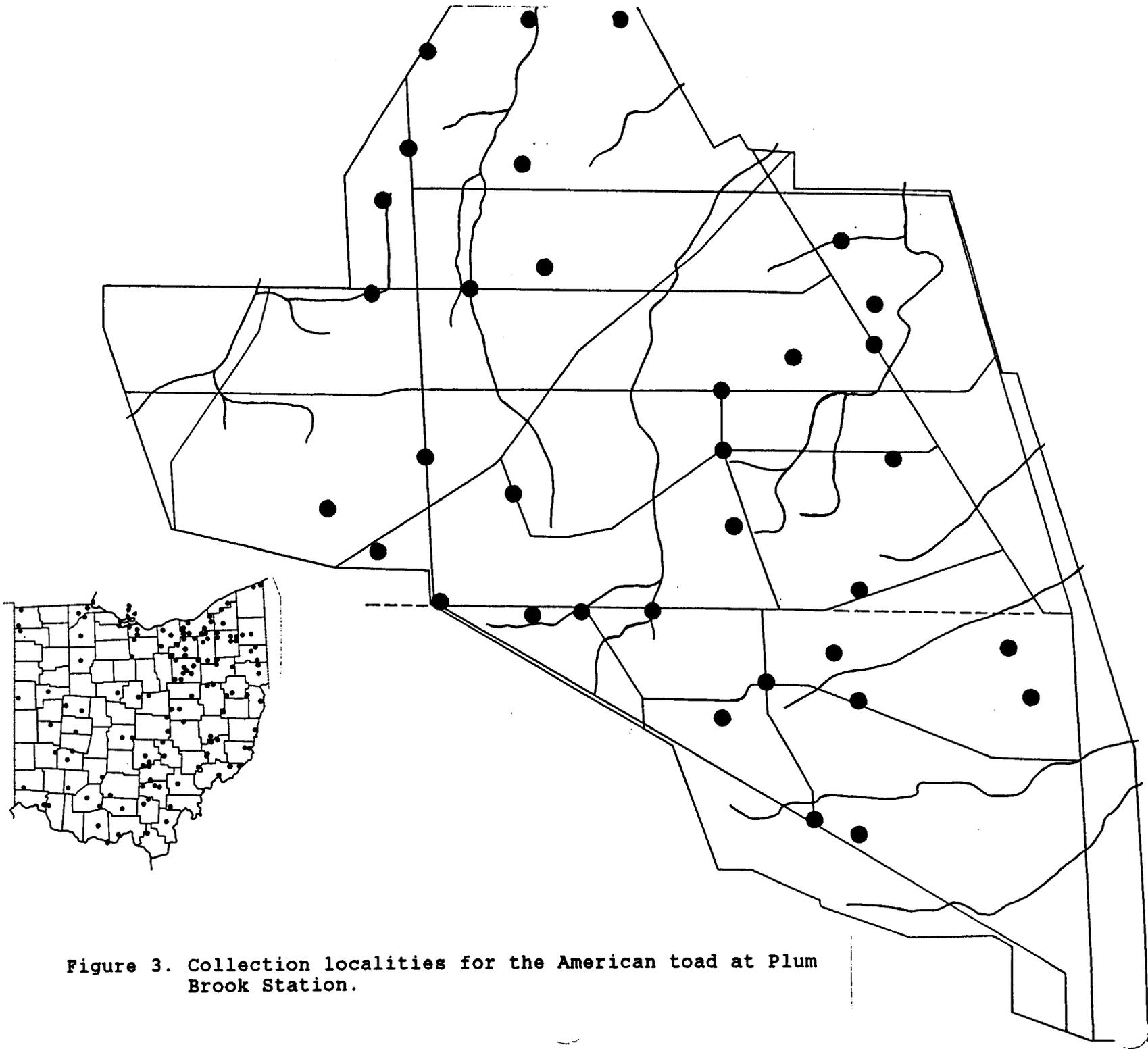


Figure 3. Collection localities for the American toad at Plum Brook Station.

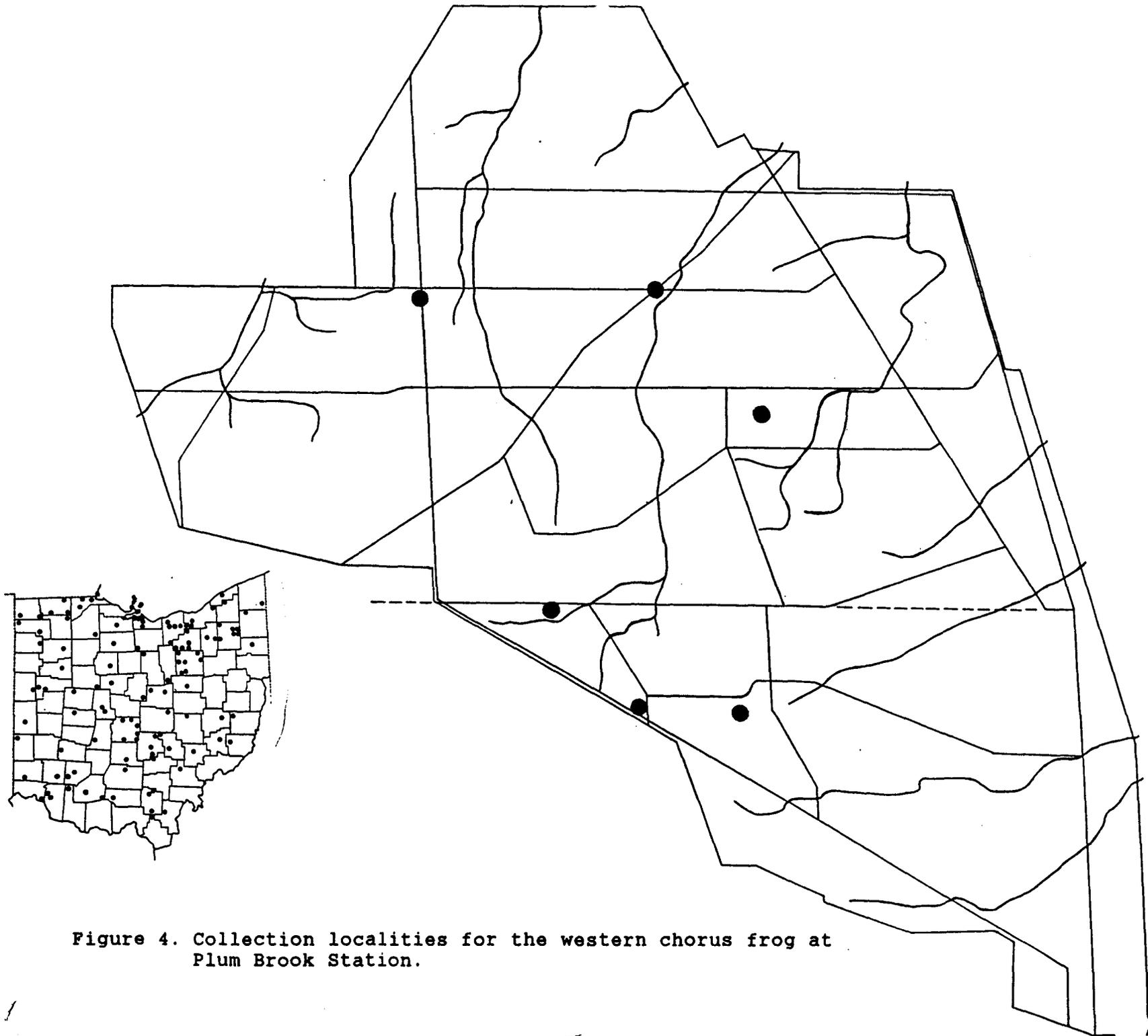


Figure 4. Collection localities for the western chorus frog at Plum Brook Station.

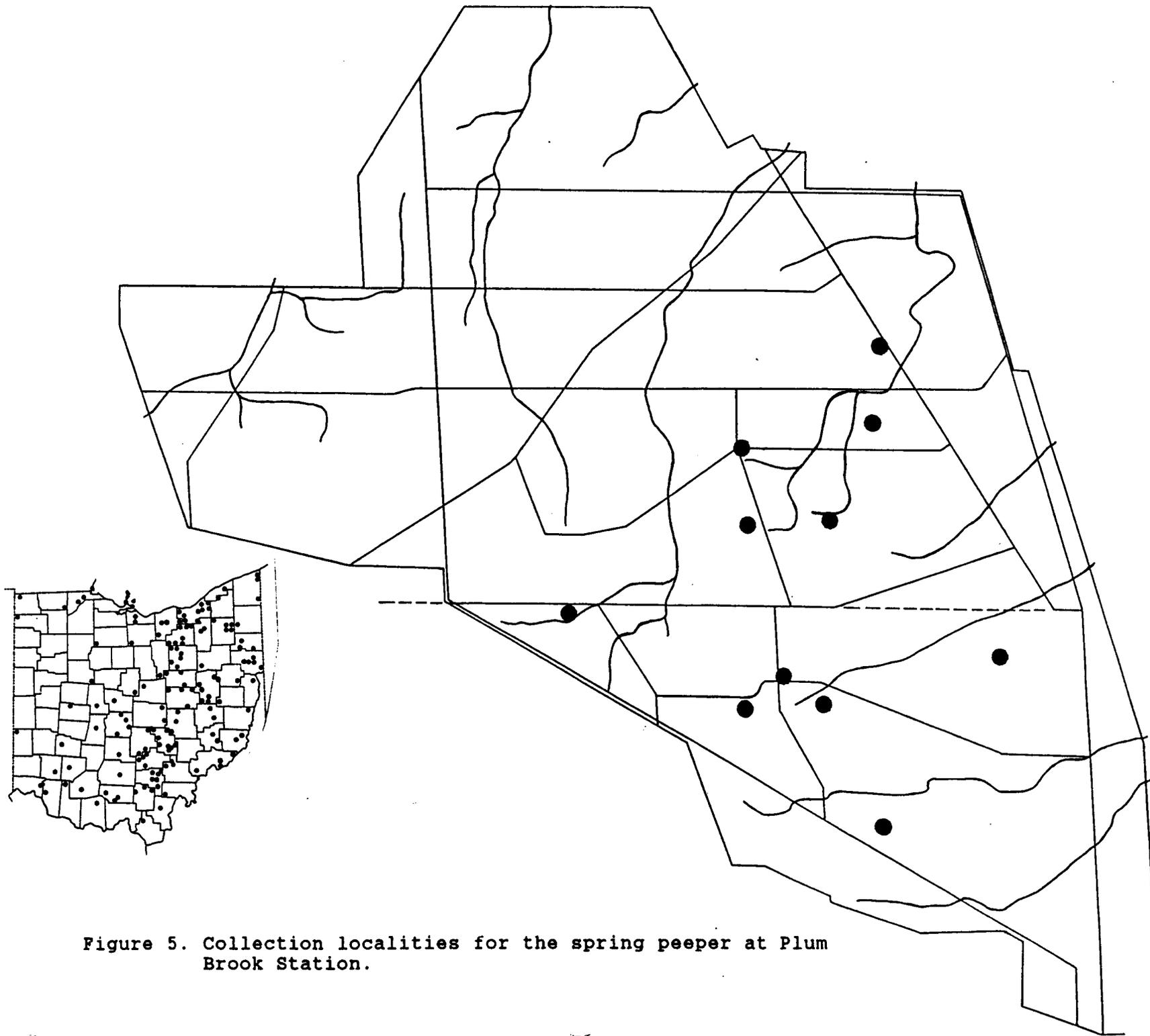


Figure 5. Collection localities for the spring peeper at Plum Brook Station.

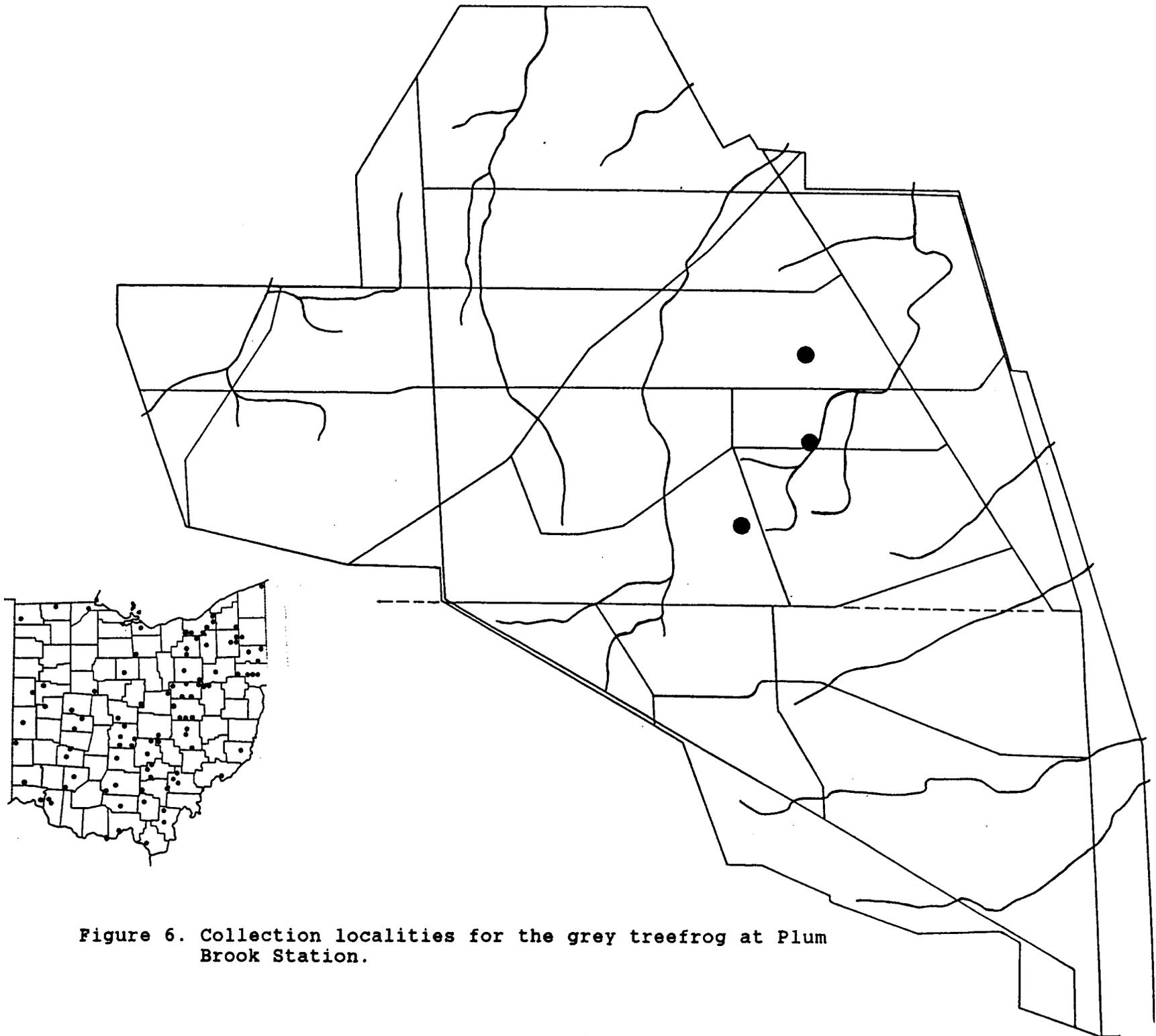


Figure 6. Collection localities for the grey treefrog at Plum Brook Station.

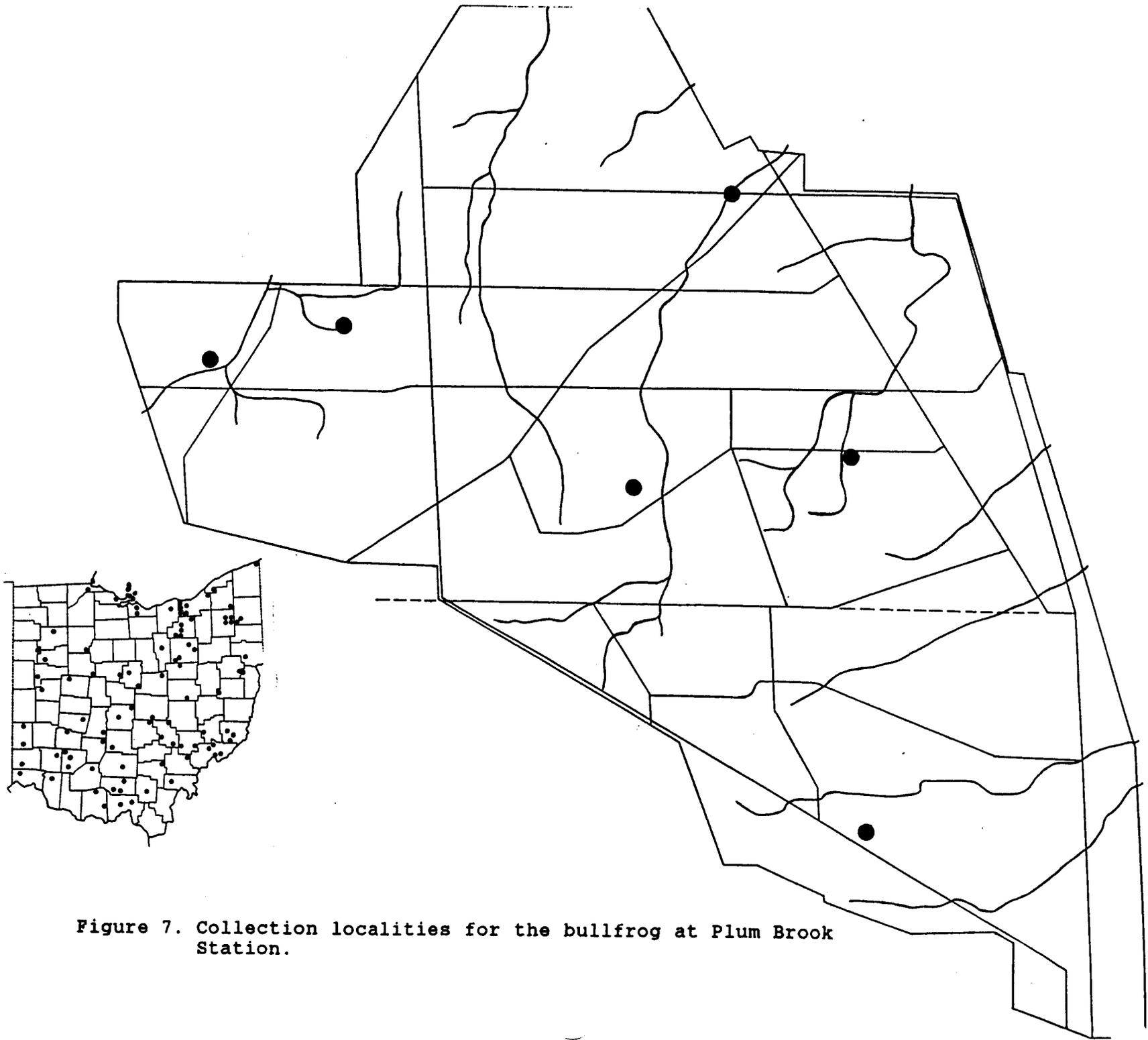


Figure 7. Collection localities for the bullfrog at Plum Brook Station.

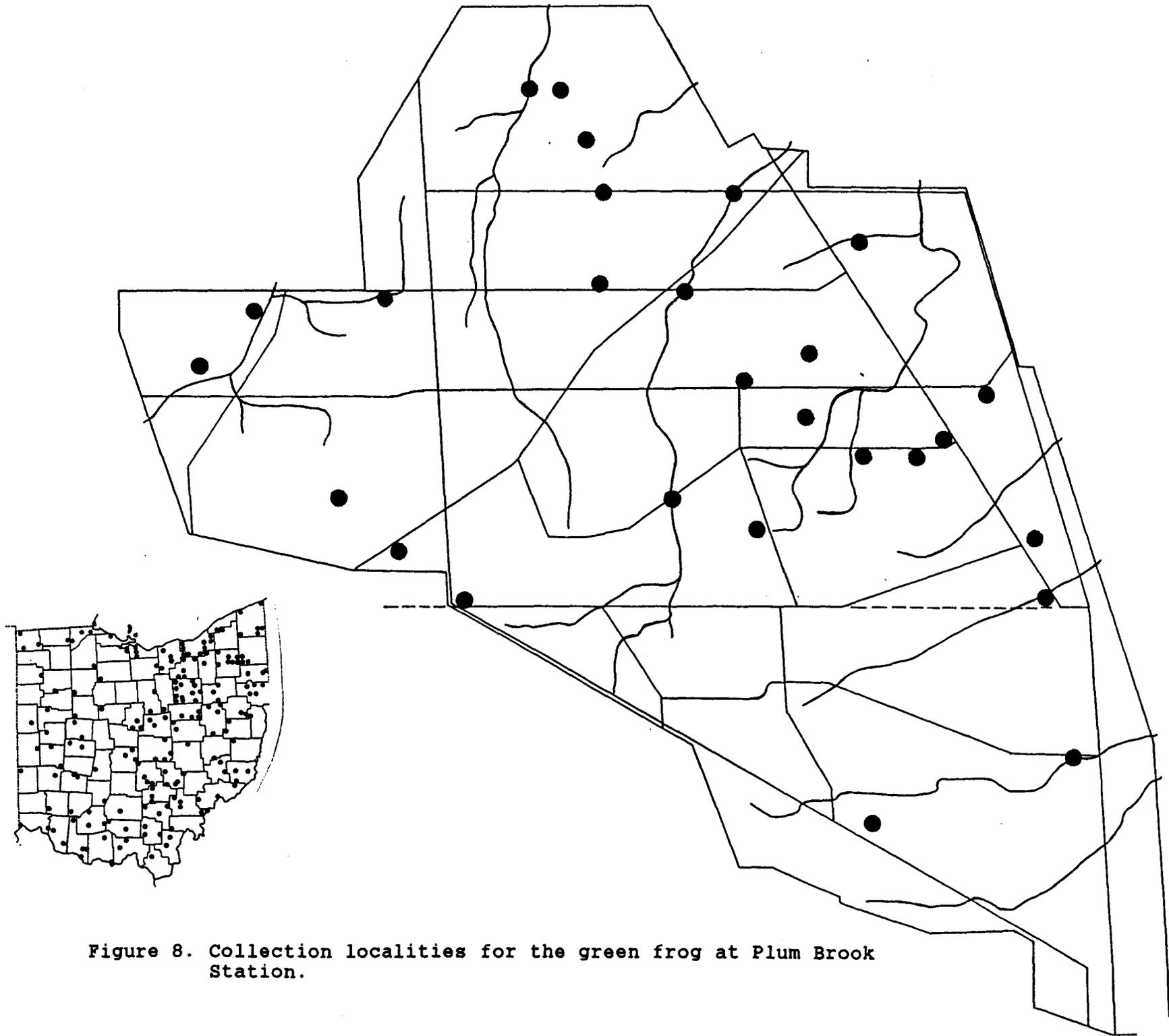


Figure 8. Collection localities for the green frog at Plum Brook Station.

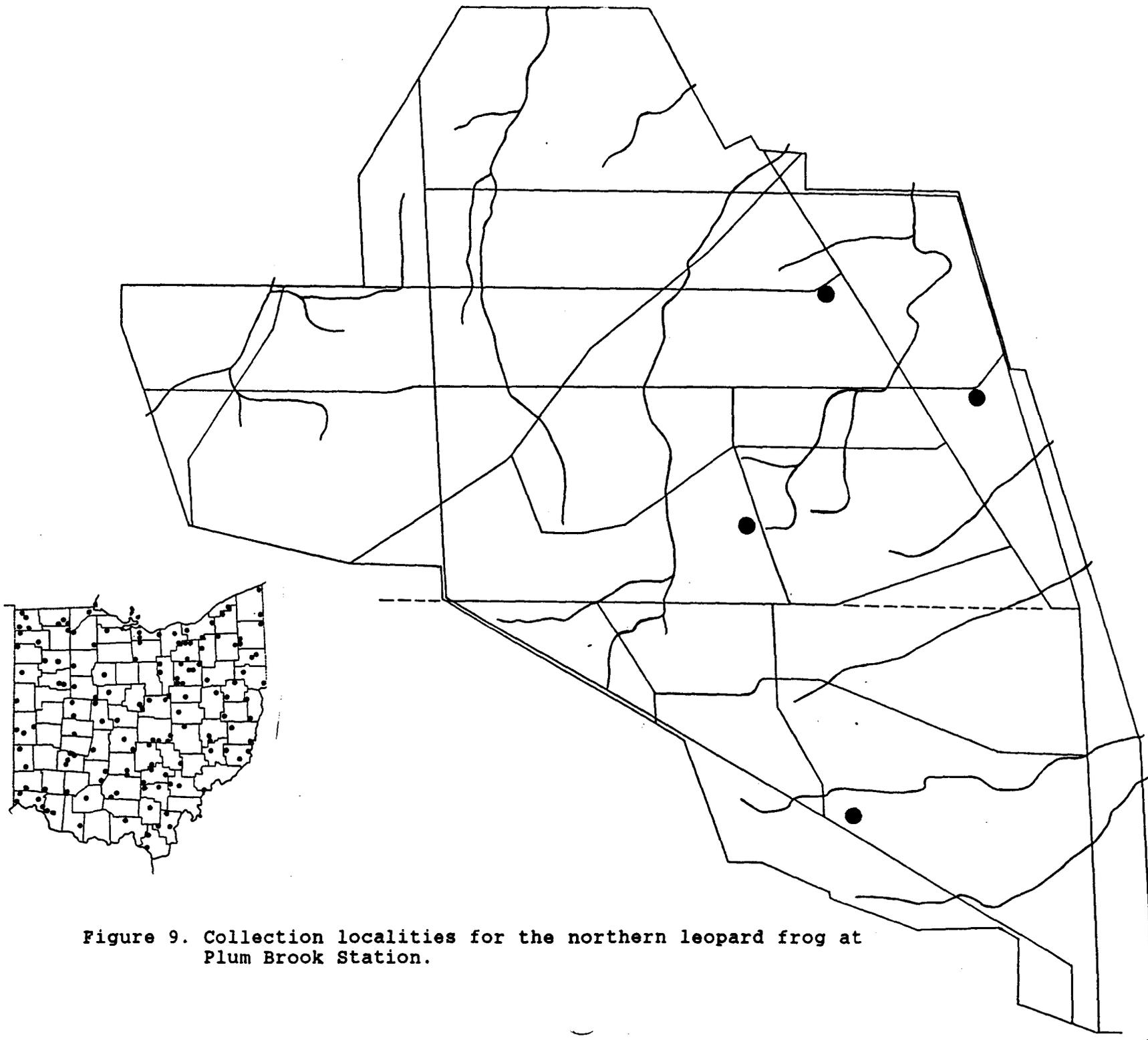


Figure 9. Collection localities for the northern leopard frog at Plum Brook Station.

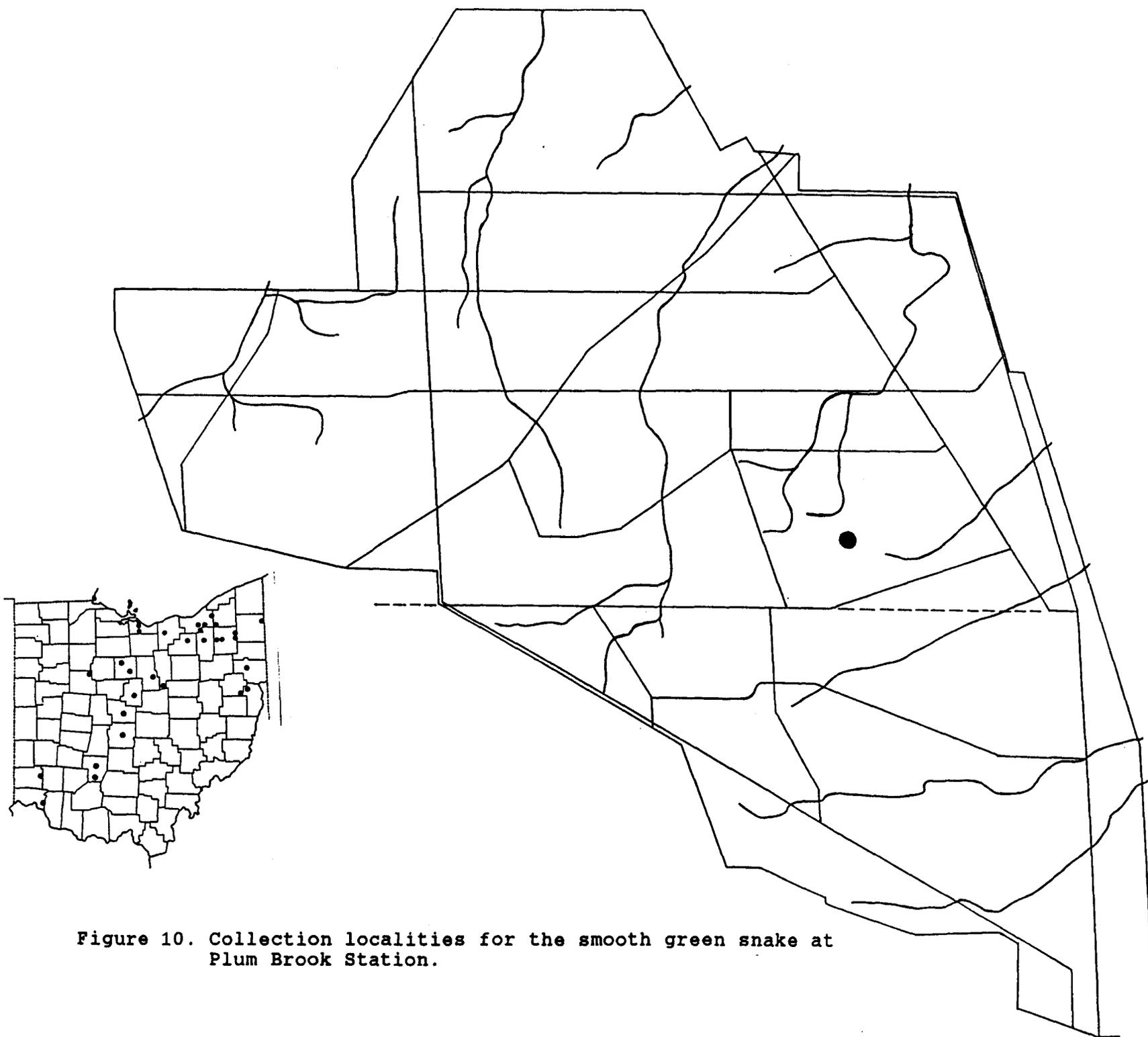


Figure 10. Collection localities for the smooth green snake at Plum Brook Station.

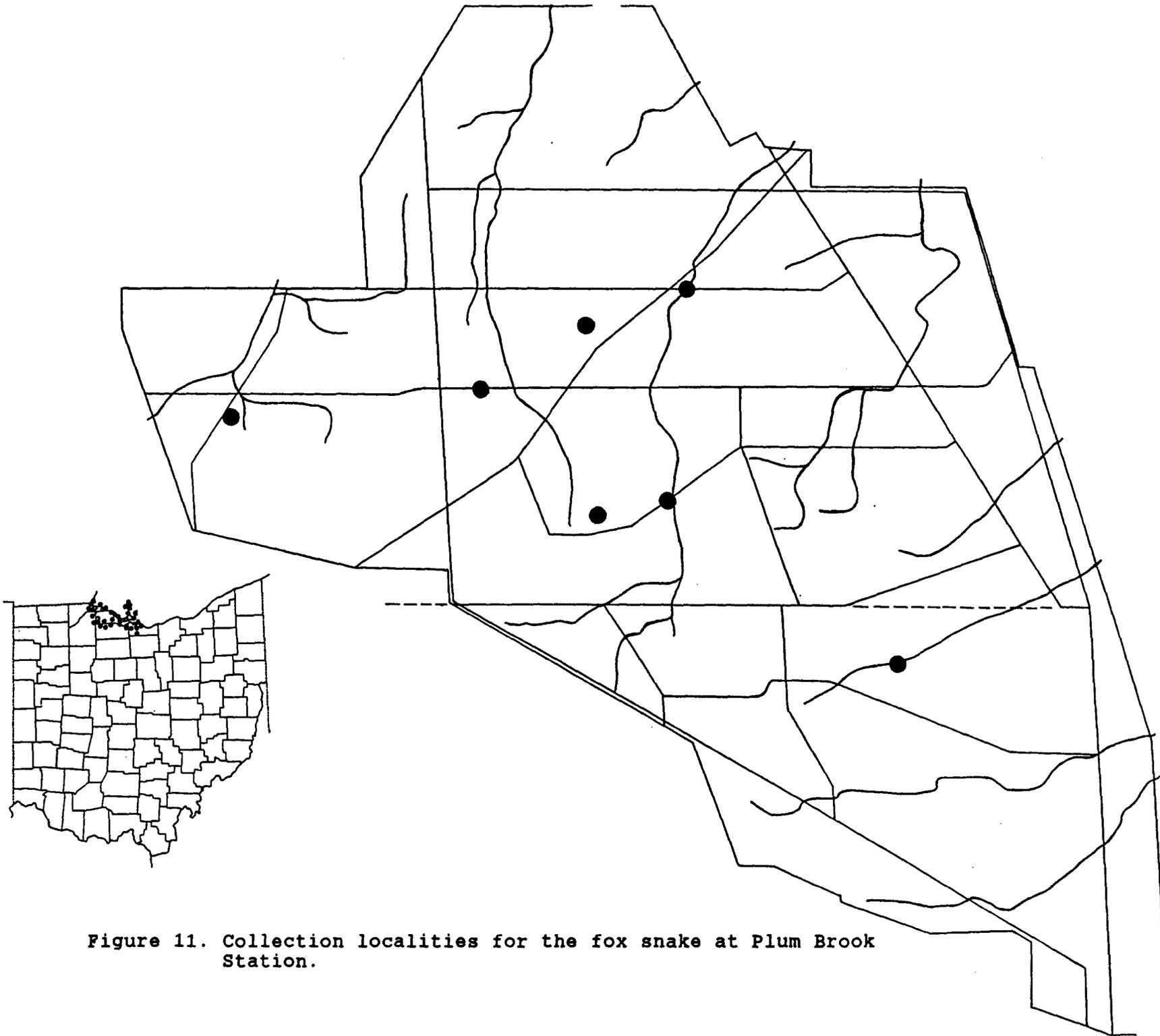


Figure 11. Collection localities for the fox snake at Plum Brook Station.

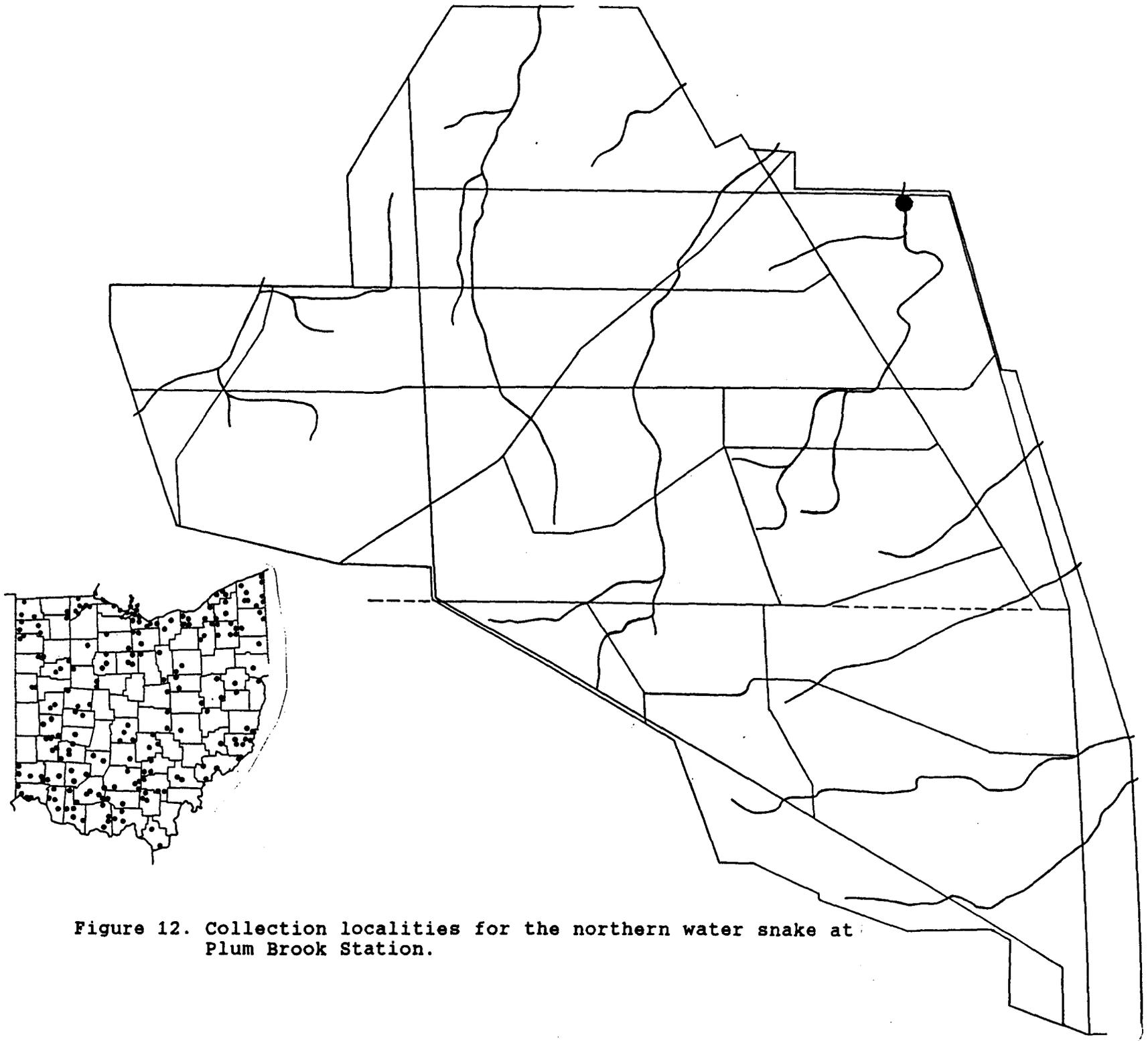


Figure 12. Collection localities for the northern water snake at Plum Brook Station.

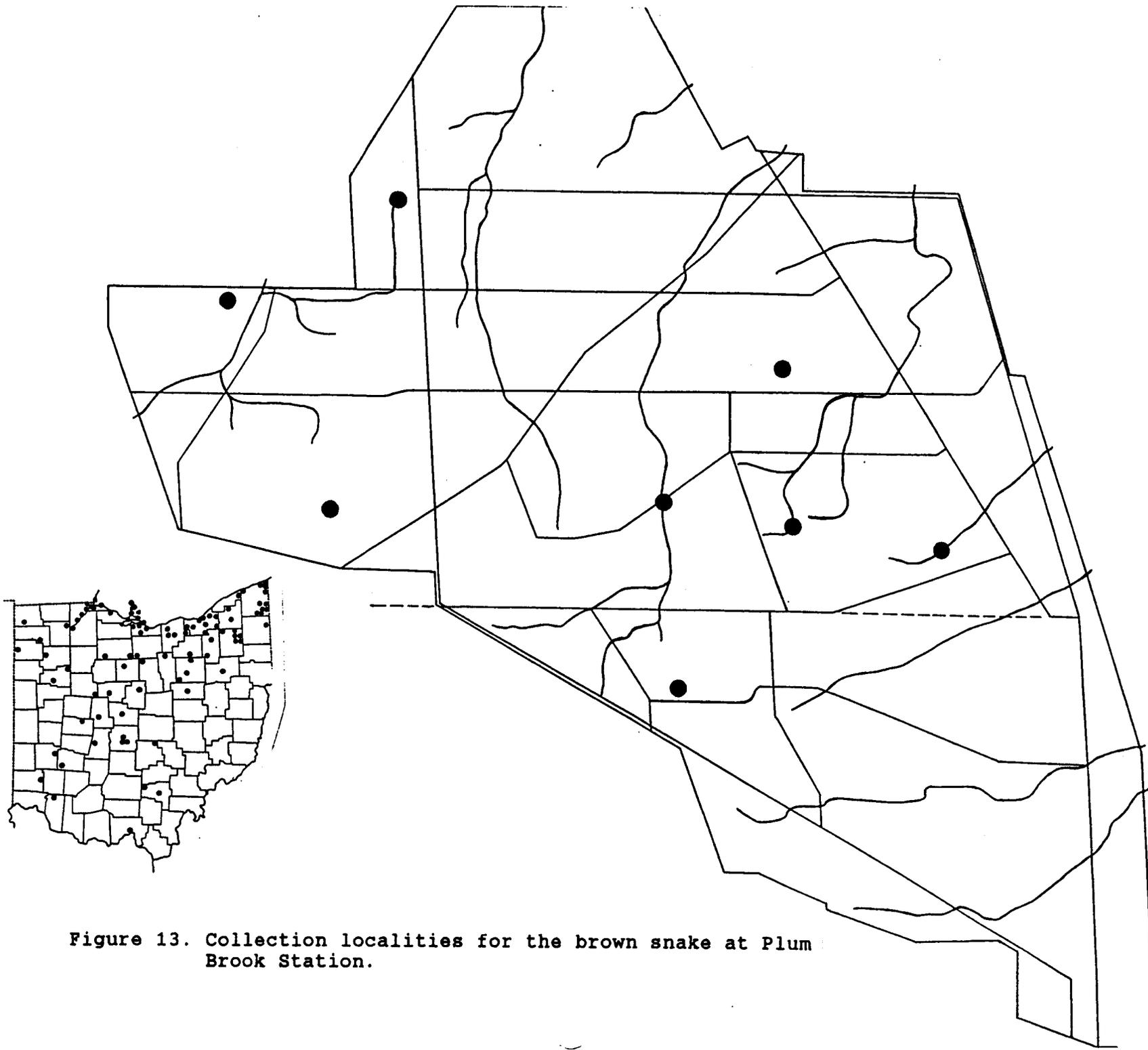


Figure 13. Collection localities for the brown snake at Plum Brook Station.

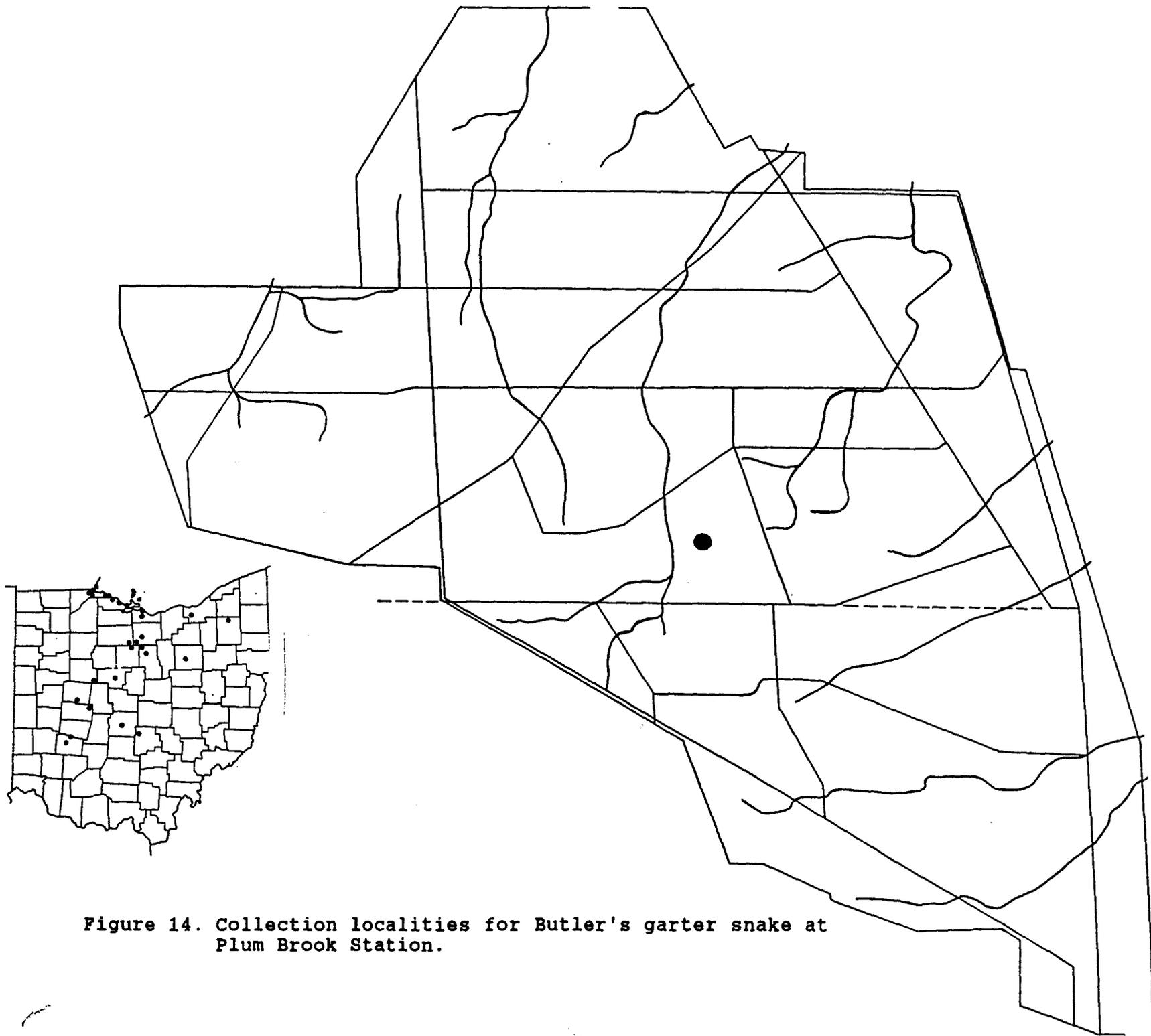


Figure 14. Collection localities for Butler's garter snake at Plum Brook Station.

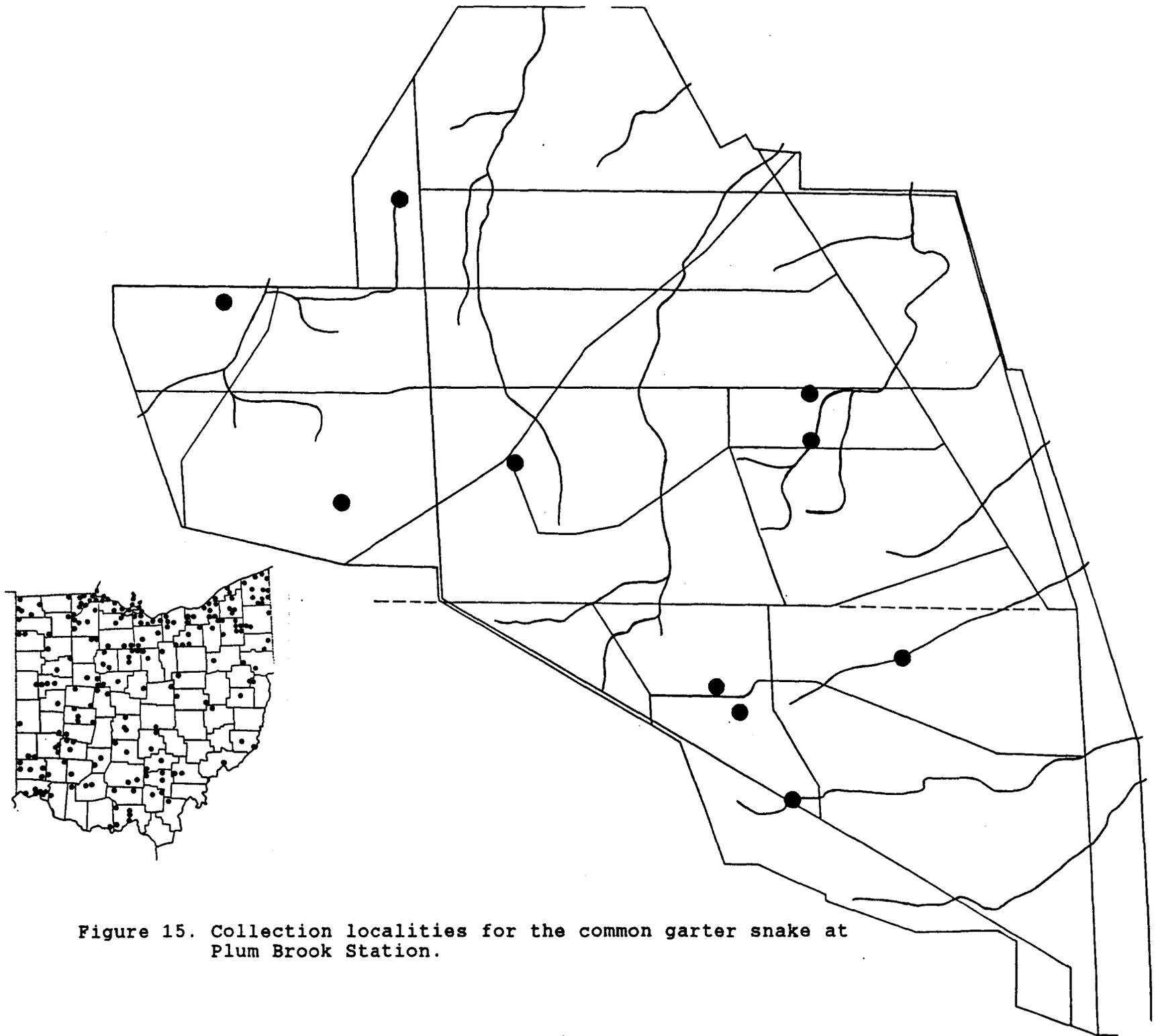


Figure 15. Collection localities for the common garter snake at Plum Brook Station.

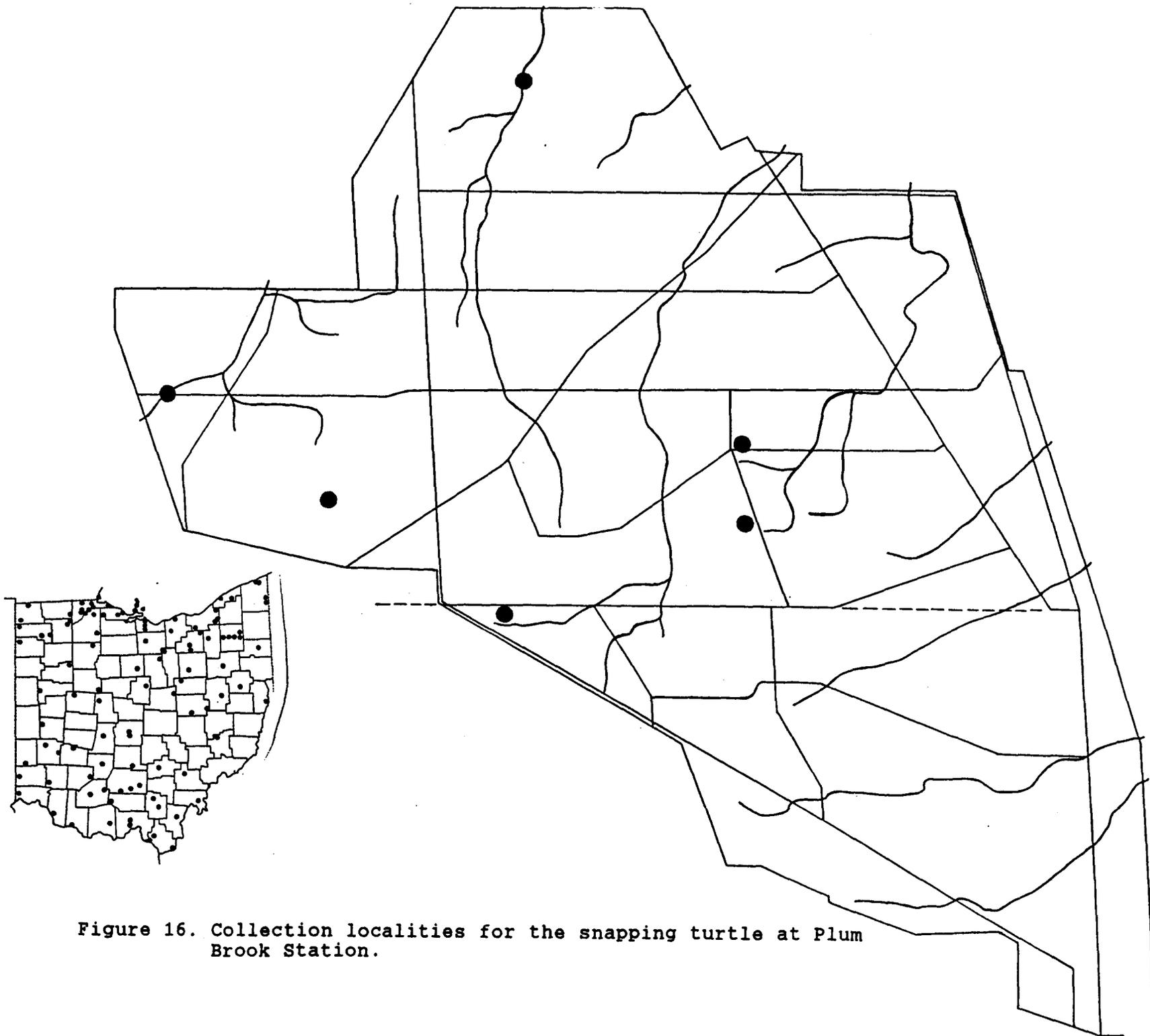


Figure 16. Collection localities for the snapping turtle at Plum Brook Station.

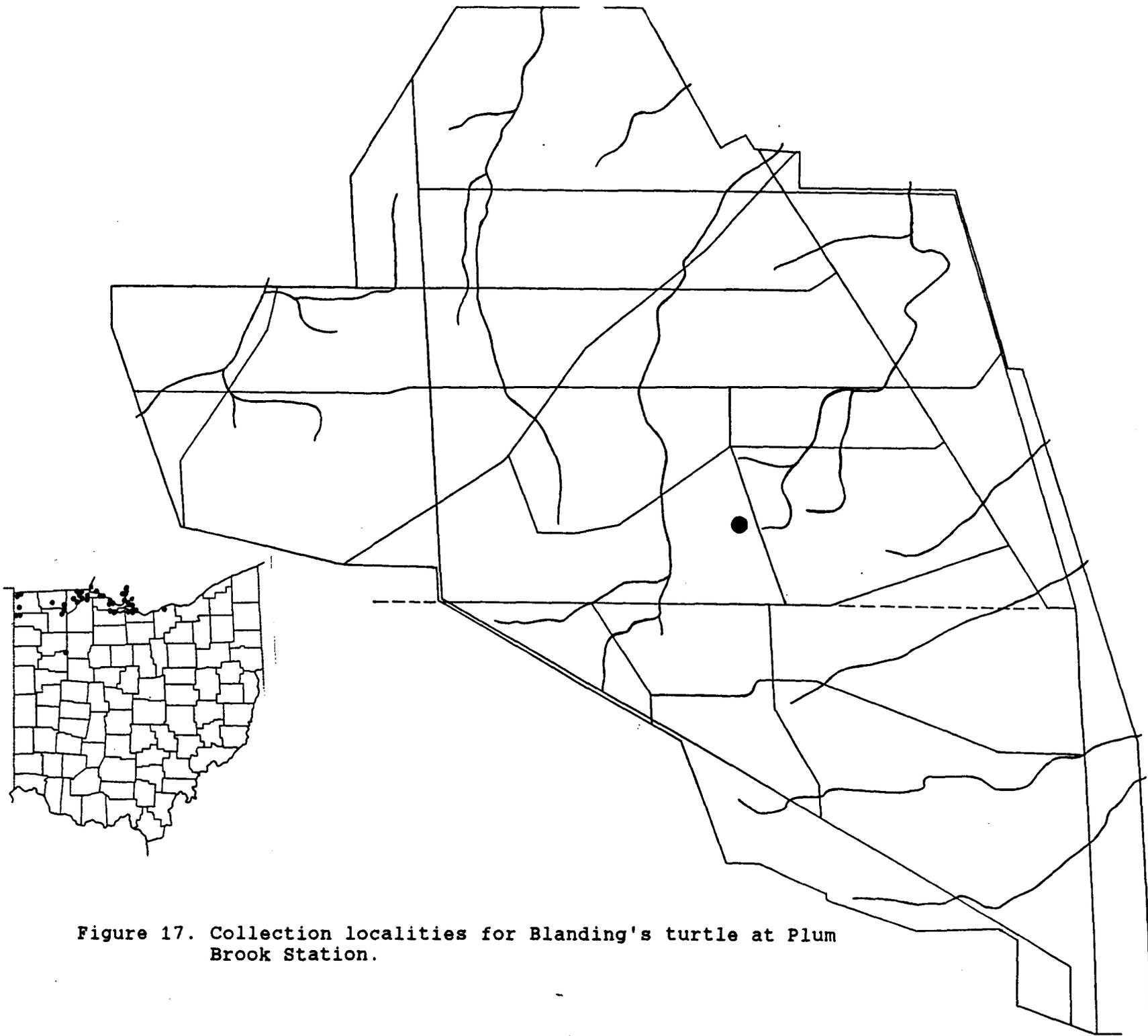


Figure 17. Collection localities for Blanding's turtle at Plum Brook Station.

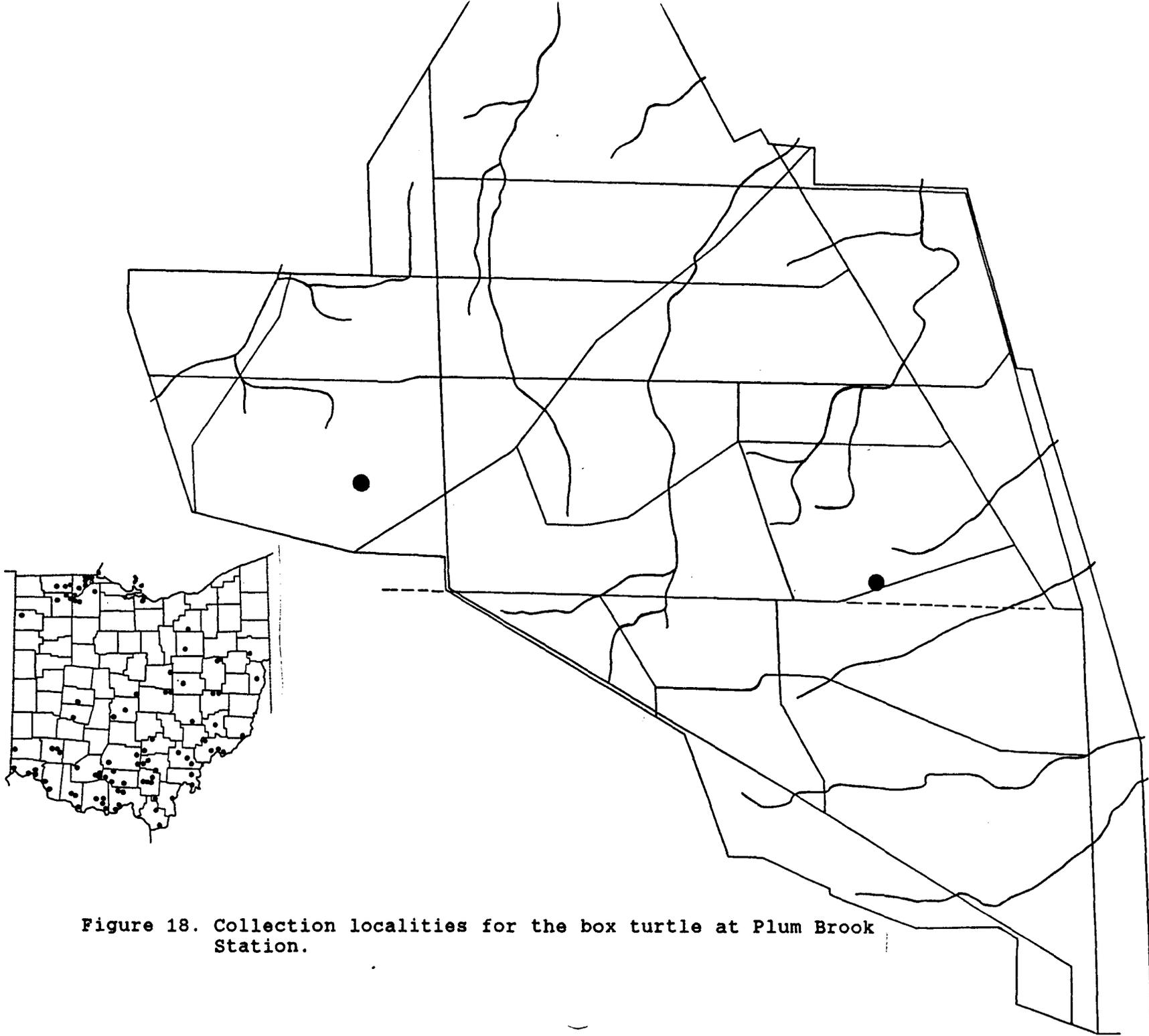


Figure 18. Collection localities for the box turtle at Plum Brook Station.

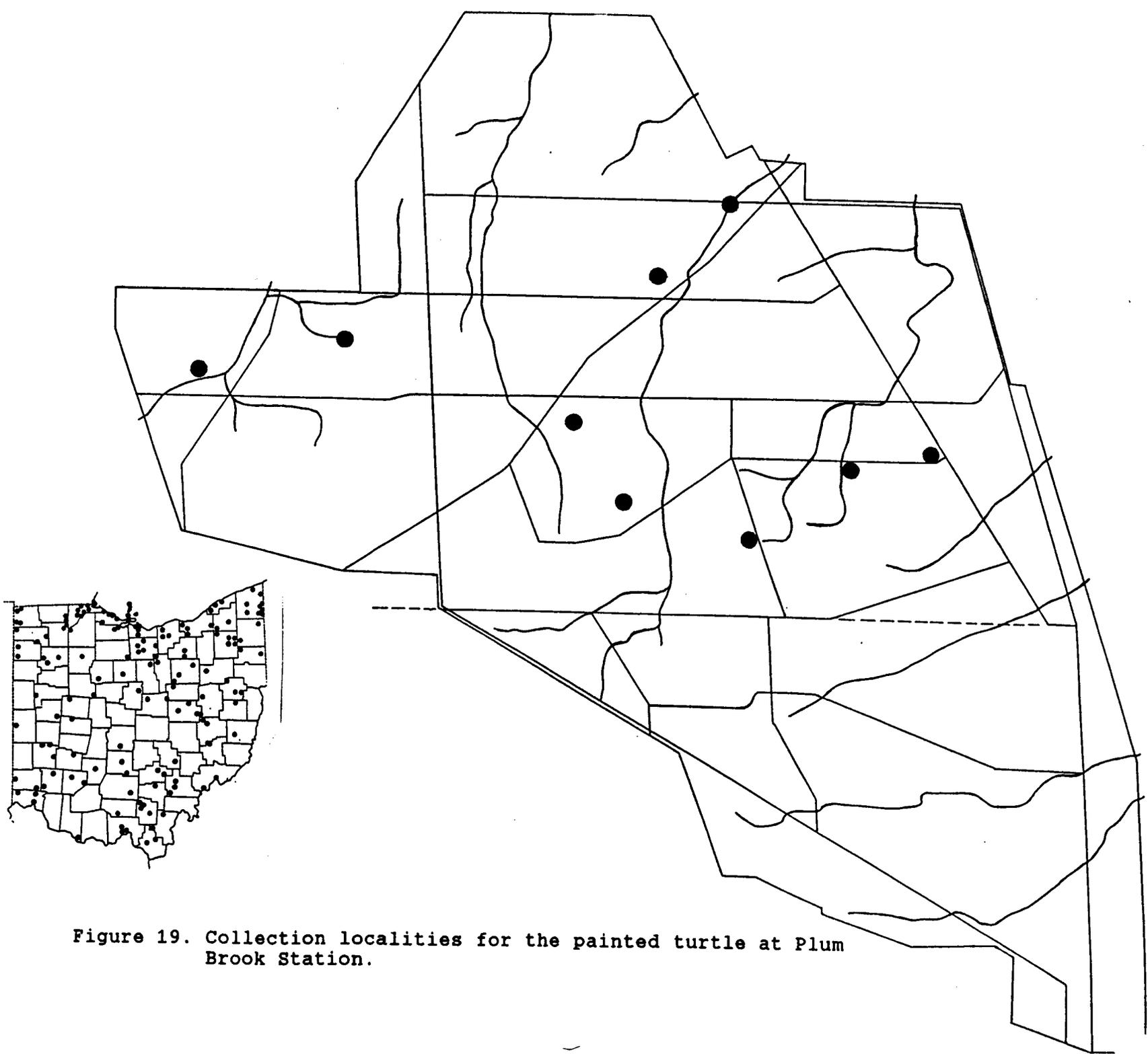


Figure 19. Collection localities for the painted turtle at Plum Brook Station.

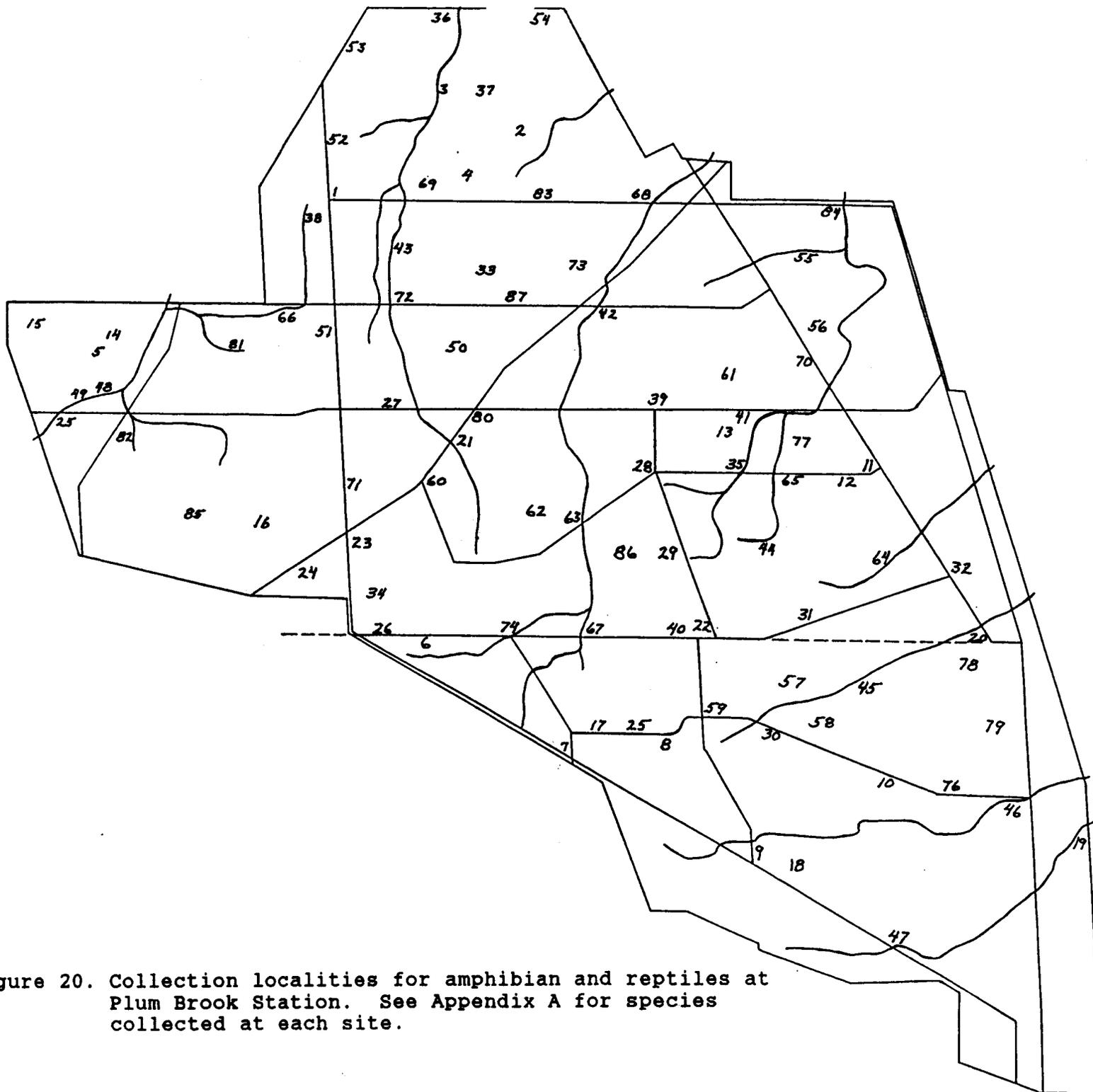


Figure 20. Collection localities for amphibian and reptiles at Plum Brook Station. See Appendix A for species collected at each site.

APPENDIX A. LIST OF LOCALITIES FOR AMPHIBIAN AND REPTILE RECORDS

**Appendix A. List of localities for amphibian and reptile records**

1. Perkins Tp., NE corner jct Pentolite and Ransom Rds.  
(Sandusky) 41 23'08"N, 82 41'42"W. 5/5 smallmouth salamander.
2. Perkins Tp., 0.1 mi. NE reactor. (Sandusky) 41 23'16"N, 82 40'59"W. 5/5 green frog, smallmouth salamander.
3. Perkins Tp., 0.4 mi. NW reactor. (Sandusky) 41 23'27"N, 82 41'15"W. 5/5 green frog, smallmouth salamander. 6/10 snapping turtle. 6/16 crayfish.
4. Perkins Tp., 0.1 mi. W reactor. (Sandusky) 41 23'12"N, 82 41'14"W. 5/5 smallmouth salamander. 6/20 toad.
5. Perkins Tp., 0.3 mi. SW jct Campbell St and N Patrol Rd.  
(Sandusky) 41 22'36"N, 82 42'39"W. 5/31 smallmouth salamander.  
7/5 painted turtle.
6. Oxford Tp., Sheid Rd. at N leg of wye. (Kimball) 41 21'32"N,  
82 41'10"W. 5/5 snapping turtle, chorus frog. 5/12 peeper.  
6/20 toad.
7. Oxford Tp., firing range nr S Patrol Rd. (Kimball) 41  
21'10"N, 82 40'45"W. 5/5 chorus frog.
8. Oxford Tp., S Magazine Rd., nr Taft Rd. (Kimball) 41  
21'12"N, 82 40'17"W. 5/5 chorus frog. 5/24 smallmouth  
salamander, toad. 6/10 garter snake. 10/19 peeper.
9. Oxford Tp., Taft Rd., at S Patrol Rd. (Kimball) 41 20'47"N,  
82 39'54"W. 5/5 toad.
10. Oxford Tp., S. Magazine Rd., nr Igloo 9157. (Kimball) 41  
21'04"N, 82 39'20"W. 5/5 smallmouth salamander.
11. Perkins Tp., N Magazine Rd. at Columbus Rd. (Kimball) 41  
22'08"N, 82 39'21"W. 5/5 painted turtle. 6/24 green frog. 7/27  
leopard frog.
12. Perkins Tp., Lane 3, Igloo 9142. (Kimball) 41 22'05"N, 82  
39'28"W. 5/5 green frog. 6/24 toad.
13. Perkins Tp., SW jct Fox Rd. and Lane 6. (Kimball) 41  
22'45"N, 82 39'55"W. 5/5 chorus frog. 6/24 green frog.
14. Perkins Tp., West end barn. (Sandusky) 41 22'39"N, 82  
42'44"W. 5/6 garter snake. 6/2 brown snake.
15. Perkins Tp., NW corner of West End. (Sandusky) 41 22'41"N,  
82 42'59"W. 5/6 smallmouth salamander. 8/23 garter snake.

16. Perkins Tp., 0.3 mi. N jct Taylor and S Patrol Rds. (Kimball) 41 21'57"N, 82 42'08"W. 5/9 green frog. 6/10 snapping turtle. 6/10 box turtle. 6/29 garter snake, brown snake, toad. 9/15 crayfish.
17. Oxford Tp., east end of rifle range. (Kimball) 41 21'15"N, 82 40'06"W. 5/9 smallmouth salamander. 5/12 brown snake.
18. Oxford Tp., south of Space Power Facility. (Kimball) 41 20'41"N, 82 39'55"W. 5/6 toad. 5/12 bullfrog, peeper. 5/26 green frog. 7/1 leopard frog.
19. Oxford Tp., Olemacher Ditch at East Patrol Rd. (Kimball) 41 20'40"N, 82 38'09"W. 5/6 smallmouth salamander.
20. Perkins Tp., Columbus Ave. at Scheid Ditch. (Kimball) 41 21'34"N, 82 38'51"W. 5/6 Green frog.
21. Perkins Tp., Box Factory Rd. Pond. (Kimball) 41 22'39"N, 82 40'55"W. 5/6 painted turtle.
22. Perkins Tp., Scheid Rd. at Lane 8. (Kimball) 41 21'34"N, 82 39'52"W. 5/6 smallmouth salamander.
23. Perkins Tp., jct of Taylor and Ransom Rds. (Kimball) 41 21'54"N, 82 41'40"W. 5/9 smallmouth salamander.
24. Perkins Tp., Taylor Rd., west of Ransom Rd. (Kimball) 41 21'48"N, 82 41'55"W. 5/9 smallmouth salamander. 6/20 toad. 7/8 green frog.
25. Oxford Tp., east end of rifle range. (Kimball) 41 21'15"N, 82 40'22"W. 5/16 garter snake.
26. Perkins Tp., Patrol Rd. at west end of Scheid Rd. (Kimball) 41 21'36"N, 82 41'37"W. 5/9 toad. 7/8 green frog.
27. Perkins Tp., Fox Rd. 0.25 mi. E Ransom Rd. (Kimball) 41 22'23"N, 82 41'28"W. 5/9 smallmouth salamander. 6/11 fox snake.
28. Perkins Tp., N Magazine Rd. at Snake Rd. (Kimball) 41 22'09"N, 82 40'15"W. 5/9 snapping turtle, chorus frog. 7/5 toad.
29. Perkins Tp., Snake Rd. Ponds. (Kimball) 41 21'52"N, 82 40'12"W. 5/9 painted turtle. 6/9 tree frog. 6/24 toad. 7/1 green frog. 7/5 Blandings turtle. 7/14 snapping turtle. 7/29 leopard frog. 10/19 peeper.
30. Oxford Tp., S Magazine Rd. 0.2 mi. E Taft Rd. (Kimball) 41 21'14"N, 82 39'49"W. 5/12 chorus frog, smallmouth salamander.

31. Perkins Tp., Scheid Rd. at Lane 5. (Kimball) 41 21'38"N, 82 39'35"W. 5/16 smallmouth salamander. 6/14 box turtle. 6/24 toad.
32. Perkins Tp., Center Magazine Rd. at Columbus Rd. (Kimball) 41 21'47"N, 82 38'58"W. 5/16 green frog.
33. Perkins Tp., Reactor Rd., just S Maintenance Center. (Sandusky) 41 22'46"N, 82 41'05"W. 6/20 toad.
34. Perkins Tp., NE corner S Patrol and Scheid Rds. (Kimball) 41 21'44"N, 82 41'38"W. 5/17 smallmouth salamander.
35. Perkins Tp., N Magazine Rd. at Lane 6. (Kimball) 41 22'08"N, 82 39'53"W. 5/17 garter snake. 6/12 treefrog.
36. Perkins Tp., N Patrol Rd ditch on northernmost perimeter. (Sandusky) 41 23'42"N, 82 41'12". 5/31 toad.
37. Perkins Tp., Center Rd. N of reactor nr N end. (Sandusky) 41 23'28"N, 82 41'07"W. 5/19 smallmouth salamander, green frog.
38. Perkins Tp., W end of Pentolite Rd. (Sandusky) 41 23'01"N, 82 41'52"W. 5/19 garter snake. 5/31 toad, brown snake.
39. Perkins Tp., jct Fox and Snake Rds., N side ditch. (Kimball) 41 22'20"N, 82 40'15"W. 5/19 toad. 7/5 green frog.
40. Perkins Tp., Scheid Rd., 0.1 mi. W Taft Rd. (Kimball) 41 21'35"N, 82 40'11"W. 5/19 smallmouth salamander.
41. Perkins Tp., SE corner Fox Rd. and Lane 6. (Kimball) 41 22'20"N, 82 39'55"W. 5/24 garter snake.
42. Perkins Tp., Maintenance Rd. at Plum Brook. (Sandusky) 41 22'41"N, 82 40'32"W. 5/24 green frog.
43. Perkins Tp., Ransom ditch at rail yard. (Sandusky) 41 22'54"N, 82 41'27"W. 5/24 smallmouth salamander.
44. Perkins Tp., Lane 6, Igloo 9179. (Kimball) 41 21'54"N, 82 39'45"W. 5/24 brown snake. 6/30 green snake. 10/19 peeper.
45. Oxford Tp., Lane 6, Igloo 9172. (Kimball) 41 21'21"N, 82 39'31"W. 5/24 garter snake, fox snake.
46. Oxford Tp., S Magazine Rd. at Kuebelar Ditch. (Kimball) 41 21'02"N, 82 38'43"W. 5/26 green frog. 7/1 snapping turtle.
47. Oxford Tp., S Patrol Rd. at Scheid-Olemacher Ditch. (Kimball) 41 20'30"N, 82 39'16"W. 5/26 garter snake. 7/5 painted turtle.

48. Perkins Tp., ditch at entrance to West End TNT Ponds. (Kimball) 41 22'28"N, 82 42'37"W. 5/26 smallmouth salamander.
49. Perkins Tp., West End TNT Ponds. (Kimball) 41 22'27"N, 82 42'44"W. 5/26 crayfish. 5/31 painted turtle. green frog. 7/29 bullfrog.
50. Perkins Tp., Maintenance Area, building 5131. (Sandusky) 41 22'31"N, 82 41'00"W. 5/31 fox snake.
51. Perkins Tp., ditch at K-site. (Sandusky) 41 22'40"N, 82 41'44"W. 5/31 chorus frog.
52. Perkins Tp., Ransom Rd. 0.2 mi. N Pentolite Rd. (Sandusky) 41 23'44"N, 82 41'45"W. 5/31 toad.
53. Perkins Tp., N Patrol Rd. east of Ransom Rd. (Sandusky) 41 23'05"N, 82 41'40"W. 5/31 toad.
54. Perkins Tp., NE corner of North End. (Sandusky) 41 22'42"N, 82 40'45"W. 5/31 toad. 6/15 garter snake.
55. Perkins Tp., 0.2 mi. N Hqds Bldg. (Sandusky) 41 22'52"N, 82 39'53"W. 5/31 toad, green frog.
56. Perkins Tp., 0.2 mi. SW Hqds Bldg. (Sandusky) 41 22'37"N, 82 39'42"W. 5/31 toad.
57. Oxford Tp., Lane 8, Igloo 9196. (Kimball) 41 21'23"N, 82 39'45"W. 5/31 toad.
58. Oxford Tp., Lane 8, Igloo 9194. (Kimball) 41 21'13"N, 82 39'41"W. 5/31 Toad.
59. Oxford Tp., jct S Magazine and Taft Rds. (Kimball) 41 21'18"N, 82 40'06"W. 5/31 toad. 10/19 peeper.
60. Perkins Tp., jct Box Factory and N Magazine Rds. (Kimball) 41 21'58"N, 82 41'15"W. 5/31 toad. 10/20 garter snake.
61. Perkins Tp., 0.5 mi. SW Hqds Bldg. (Kimball) 41 22'29"N, 82 40'00"W. 6/7 toad, green frog. 7/5 brown snake. 8/26 tree frog.
62. Perkins Tp., Reservoir behind B-2 test facility. (Kimball) 41 21'58"N, 82 40'48"W. 6/10 fox snake, bull frog, painted turtle.
63. Perkins Tp., N Magazine Rd. at Plum Brook. (Kimball) 41 21'57"N, 82 40'37"W. 6/10 green frog, crayfish. 9/15 fox snake. 10/19 brown snake.
64. Perkins Tp., Lane 2 between Igloo 9124 and 9125. (Kimball) 41 31'47"N, 82 39'17"W. 6/10 brown snake.

65. Perkins Tp., Lane 5 at N Magazine Rd. (Kimball) 41 22'06"N, 82 39'44"W. 6/12 smallmouth salamander, crayfish. 7/1 painted turtle, green frog, bullfrog.
66. Perkins Tp., Maintenance Rd. ditch just west of K-Site. (Sandusky) 41 22'42"N, 82 41'55"W. 6/12 green frog. 7/8 toad. 8/20 leopard frog.
67. Perkins Tp., Scheid Rd. at Plum Brook. (Kimball) 41 21'34"N, 82 40'38"W. 6/15 toad.
68. Perkins Tp., Plum Brook at Pentolite Rd. (Sandusky) 41 23'03"N, 82 40'15"W. 6/16 painted turtle. 6/20 bullfrog, green frog. 6/11 fox snake.
69. Perkins Tp., Pentolite Rd. 0.3 mi. SW reactor. (Sandusky) 41 23'07"N, 82 41'22"W. 6/16 redback salamander.
70. Perkins Tp., Columbus Rd. 0.25 mi. N Fox Rd. (Kimball) 41 22'27"N, 82 39'33"W. 6/20 toad. 10/19 peeper.
71. Perkins Tp., Ransom Rd. at top of hill. (Kimball) 41 22'04"N, 82 41'42"W. 6/20 toad.
72. Perkins Tp., Maintenance Rd. at Ransom Ditch. (Sandusky) 41 22'43"N, 82 41'28"W. 6/20 toad. 9/26 green frog, garter snake.
73. Perkins Tp., Reservoir N jct Maintenance and Taylor Rds. (Sandusky) 41 22'50"N, 82 40'05"W. 6/21 painted turtle.
74. Perkins Tp., Scheid Rd. at west branch of Plum Brook. (Kimball) 41 21'35"N. 82 40'58"W. 6/24 toad, green frog.
75. Perkins Tp., Fox Rd. at Pipe Creek. (Kimball) 41 22'21"N, 82 42'58"W. 6/24 snapping turtle.
76. Oxford Tp., SPF at S Magazine Rd. (Kimball) 41 21'01"N, 82 39'04"W. 6/24 green frog.
77. Perkins Tp., N of N Magazine Rd. at Lane 4. (Kimball) 41 22'12"N, 82 39'40"W. 6/24 chorus frog.
78. Oxford Tp., Igloo 9106 and 9119. (Kimball) 41 21'22"N. 82 39'06"W. 6/24 peeper, toad.
79. Oxford Tp., Igloo 9103. (Kimball) 41 21'11"N, 82 38'55"W. 6/24 toad.
80. Perkins Tp., jct Fox and Taylor Rds. (Kimball) 41 22'20"N, 82 41'05"W. 6/24 peeper, chorus frog.
81. Perkins Tp., Water Intake Reservoir. (Sandusky) 41 22'34"N, 82 42'07"W. 6/28 bullfrog, painted turtle.

82. Perkins Tp., Campbell St. nr Fox Rd. in red barn. (Kimball)  
41 22'22"N, 82 42'40"W. 6/30 fox snake.

83. Perkins Tp., Pentolite Rd. at Reactor Reservoir outlet.  
(Sandusky) 41 23'03"N. 82 40'52"W. 7/1 green frog.

84. Perkins Tp., Patrol Rd., 0.5 mi. E main gate. (Sandusky) 41  
23'03"N, 82 40'52"W. 7/1 water snake.

85. Perkins Tp., 0.5 NW jct Taylor and S Patrol Rds. (Kimball)  
41 22'00"N, 82 42'25"W. 6/28 brown snake, garter snake, toad.

86. Perkins Tp., N Magazine Rd. nr Plum Brook. (Kimball) 41  
21'51"N, 82 40'28"W. 7/5 Butler's garter snake.

87. Perkins Tp., ditch on east side of Maintenance Area.  
(Sandusky) 41 22'42"N, 82 40'32"W. 9/26 green frog.

APPENDIX B. POTENTIAL OCCURRENCES OF AMPHIBIANS AND REPTILES IN  
NASA PLUM BROOK STATION.

## Appendix B: Potential Occurrences

Plum Brook Station lies within the range of many species (Table 1) which for one reason or another were not found during this study. There is a remote possibility that some of these species may yet be discovered. The following is a list of species which appear to have the best chance of future discovery.



Figure 21. Distribution of the cricket frog in Ohio.



Figure 22. Distribution of the hognose snake in Ohio.



Figure 23. Distribution of the queen snake in Ohio.

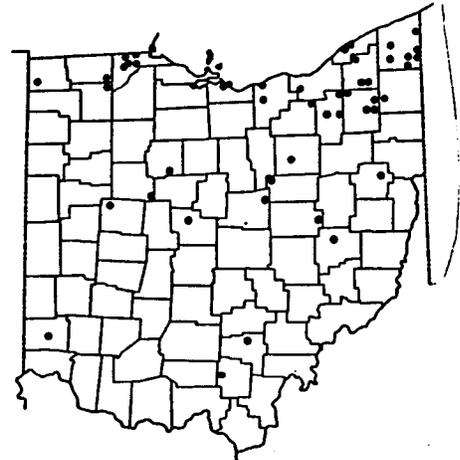


Figure 24. Distribution of the ribbon snake in Ohio.



Figure 25. Distribution of the musk turtle in Ohio.

**SECTION D**  
**FISH**

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## INTRODUCTION

The principle objective of this study was to document the fish species and community compositions present within the various aquatic habitats found on NASA's Plum Brook Station, Erie and Huron counties. Secondary objectives were to ascertain the presence of any federal or state listed species which might warrant specific management considerations.

Plum Brook Station as discussed under the section on physiographic description is drained primarily by several small, often intermittent Lake Plain streams which are direct tributaries to Lake Erie. Plum Brook and Ransom Ditch are the two primary systems draining the area. The headwaters of both of these small streams originate wholly within the facility's boundaries. Pipe Creek traverses the western corner acting as the primary drainage system for most of the station grounds west of Ransom Road. In addition to the three streams discussed above, the headwaters of several other drainage ditches to the north and east of the research station originate within the facility's boundaries.

Few states have been investigated as thoroughly as Ohio with respect to its fish fauna. Fisheries investigations in Ohio date as far back as 1838 with Kirtland's investigations in NE Ohio and the Mahoning River system (Kirtland 1838). Dr. Kirtland reported on 72 species of fish known to him at that point in time for Ohio. The next statewide systematic treatment of Ohio's fishes was that of Jordan (1882) followed shortly thereafter by Osburn (1901). Jordan's list included about 100 species while Osburn listed about 135 species. Starting in 1925 M.B. Trautman picked up where Osburn and others left off and initiated a systematic statewide inventory of the fish inhabiting Ohio's waters. These surveys continued over the next 30 years culminating in Trautman's landmark publication "the fishes of Ohio" published in 1957. Trautman's surveys documented 172 species of fish inhabiting Ohio waters at this time. It is this data base and the author's own investigations throughout Ohio which provide the baseline for the evaluation of the fish communities at the Plum Brook Station.

## METHODS AND MATERIALS

Sampling of fish was conducted between the months of June and August using a combination of electroshocking and seining. Electrofishing gear included a 1750 watt T & J generator wired to a catch net and worked from a 12 foot johnboat. Electrofishing was used to sample as many of the small ponds and water storage basins present on the facility as could be accessed by the investigators. The small size and intermittent nature of the streams on the property coupled with the lack of woody debris or

other obstructions in the channels rendered electrofishing either unfeasible or unnecessary as a sampling technique. The only areas deep enough to allow for electrofishing were several small pools backed up by low concrete water retention dams on Plum Brook and Ransom Brook. Most of the stream sampling was accomplished with the use of seines. Seines used in this study included a 6 foot by 10 foot, 3/16 inch mesh with double weights on the lead line and a 6 foot by 8 foot 1/8 inch mesh with double weights on the lead line.

Fish collected during this survey were identified to species, counted, and released. Fish captured by electrofishing were placed in a large livewell carried in the boat until sampling was completed for the site. Fish captured by seining were identified, counted, and released each time the seine was lifted. The small intermittent nature of the streams generally allowed for entire pools to be swept before the seine was lifted. No voucher specimens were kept as part of this survey due largely to the low species diversity and the commonness of the species present within the study area.

#### **RARE AND ENDANGERED SPECIES**

No federally or state listed species of fish were identified during these surveys.

#### **RESULTS AND DISCUSSION**

A total of 19 collections were made at 19 sites within Plum Brook Station (Fig. 1 and Table 1). Of these 19 sites, 10 represented stream habitats and 9 were from ponds and other artificial water bodies. These sites are identified by habitat type in both Figure 1 and Table 1. For the survey as a whole 13 species and 1 hybrid representing 3,028 individuals were captured and identified (Table 2). An annotated list of all species captured can be found at the end of this section. Survey data is further broken down by habitat type (stream vs lake) in Table 3. At Plum Brook the overall species diversity was not too different between the 2 habitat types (9 vs 7). Normally small lakes and ponds such as exist at Plum Brook Station support a much lower species diversity than would be found in healthy stream situations. The small intermittent nature of the streams in the study area coupled with extensive channel modifications and habitat degradations has resulted in a lower species diversity than would be found in more pristine headwater streams of similar size.

Survey results for specific streams are presented in Table 4. Pipe Creek with 7 species of fish had the highest diversity of the 3 streams sampled. Plum Brook and Ransom Ditch had 5 and

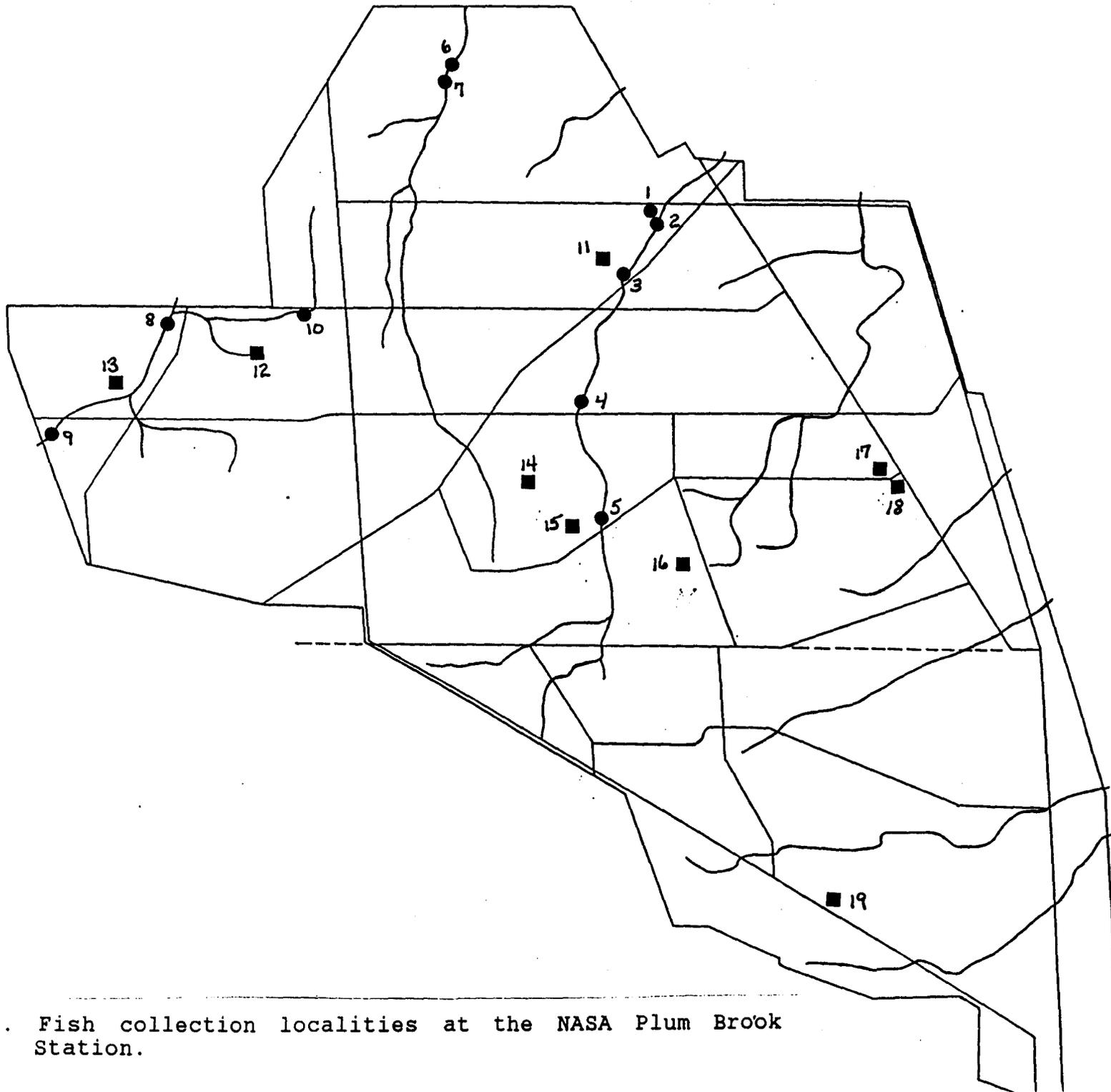


Figure 1. Fish collection localities at the NASA Plum Brook Station.

TABLE 1. FISH COLLECTION SITES ON THE NASA PLUM BROOK STATION.

<u>Station</u>	<u>Locality</u>	<u>STREAM HABITATS</u>
1	Plum Brook tributary upstream of junction with Plum Brook, north side of Penolite Rd. at bridge crossing, Perkins Twp., Erie Co.	
2	Plum Brook above concrete retention dam upstream of bridge on Penolite Rd., Perkins Twp., Erie Co.	
3	Plum Brook downstream from bridge culvert on Taylor Rd., Perkins Twp., Erie Co.	
4	Plum Brook downstream from bridge culvert on Fox Rd., Perkins Twp., Erie Co.	
5	Plum Brook downstream from bridge culvert on North Magazine Rd., Perkins Twp., Erie Co.	
6	Ransom Ditch downstream of concrete retention dam at north end of the western most reactor facility road north of Penolite Rd., Perkins Twp., Erie Co.	
7	Ransom Ditch upstream of concrete retention dam at north end of western most reactor facility road north of Penolite Rd., Perkins Twp., Erie Co.	
8	Pipe Creek upstream from bridge on Patrol Rd. west of Campbell St., Perkins Twp., Erie Co.	
9	Pipe Creek downstream from bridge culvert on Patrol Rd., west edge Plum Brook Station, Perkins Twp. Erie Co.	
10	Tributary to Pipe Creek at culvert on south side of Maintenance Rd. west of Control Rd. at the K Site Control Bldg., Perkins Twp., Erie Co.	
<b>ARTIFICIAL WATER BODIES</b>		
11	Water reservoir #8191 north of Taylor Rd. at Maintenance Rd., Perkins Twp., Erie Co.	
12	Water reservoir at old recreation area north of Fox Rd. and east of Campbell St., Perkins Twp. Erie Co.	
13	Unnamed lake northeast of Pipe Creek on western side of the research station, Perkins Twp., Erie Co.	

Table 1. continued

<u>Station</u>	<u>Locality</u>
14	Water basin at B1 Substation on south side of Box Factory Rd., Perkins Twp., Erie Co.
15	B2 Retention Pond north of North Magazine Rd. ca. 1/4 mile east of bridge over Plum Brook, Perkins Twp., Erie Co.
16	Snake Rd. Pond on west side of Snake Rd. ca. 1/2 mile south of North Magazine Rd., Perkins Twp., Erie Co.
17	Unnamed pond on north side of North Magazine Rd. at junction with Columbus Ave., Perkins Twp., Erie Co.
18	Unnamed pond on south side of North Magazine Rd. at junction with Columbus Rd., Perkins Twp., Erie Co.
19	Unnamed pond on north side of Patrol Rd. east of Taft Rd. on southern edge of research facility, Oxford Twp, Erie Co.

TABLE 2. TOTAL SPECIES AND NUMBERS OF FISH COLLECTED ON THE NASA PLUM BROOK STATION.

<u>SPECIES</u>	<u>NO.</u>
1 White Sucker ( <i>Catostomus commersoni</i> )	66
2 Goldfish ( <i>Carassius auratus</i> )	4
3 Creek Chub ( <i>Semotilus atromaculatus</i> )	390
4 Striped Shiner ( <i>Luxilus chrysocephalus</i> )	4
5 Fathead Minnow ( <i>Pimephales promelas</i> )	559
6 Bluntnose Minnow ( <i>Pimephales notatus</i> )	13
7 Central Stoneroller ( <i>Campostoma anomalum</i> )	214
8 Black Bullhead ( <i>Ameiurus melas</i> )	17
9 Largemouth Bass ( <i>Micropterus salmoides</i> )	87
10 Green Sunfish ( <i>Lepomis cyanellus</i> )	865
11 Bluegill ( <i>Lepomis macrochirus</i> )	692
12 Pumpkinseed Sunfish ( <i>Lepomis gibbosus</i> )	9
13 Green Sunfish X Hybrid (HYBRID)	107
14 Brook Stickleback ( <i>Culaea inconstans</i> )	<u>1</u>
Total Individuals:	3,028

TABLE 3. FISH COMMUNITIES OF THE NASA PLUM BROOK STATION.

<u>SPECIES</u>	<u>STREAMS</u>	<u>LAKES/PONDS</u>
White Sucker	66	-
Goldfish	-	4
Creek Chub	390	-
Striped Shiner	4	-
Fathead Minnow	559	-
Bluntnose Minnow	13	-
Central Stoneroller	214	-
Black Bullhead	-	17
Largemouth Bass	-	87
Green Sunfish	599	266
Bluegill	2	690
Pumpkinseed Sunfish	-	9
Green Sunfish X Hybrid	-	107
Brook Stickleback	<u>1</u>	<u>-</u>
Total Individuals	1,848	1,180
Total Species	9	6+ hybrids

4 species respectively. The relatively short section of Pipe Creek found within the boundaries of the study area appears to be less impacted from channel modifications than either Plum Brook or Ransom Ditch and retains a more natural riffle/pool development. Substrates were a mixture of sand, gravel, and fractured shales. The presence of a wooded riparian zone on this section of Pipe Creek also improved habitat conditions and helped reduce siltation. This stream was reduced to shallow intermittent pools by early summer.

Both Plum Brook and Ransom Ditch within the study area have been intensively modified for drainage. These two streams are characterized by rather steep banks (2 to 1 slope) vegetated with a mixture of grasses, herbaceous weeds, and shrubs (primarily willows and dogwoods) which overhang the stream channels. The stream channels themselves are relatively straight as a result of past dredging activities. Riffle/pool development is very poor and water depths are fairly uniform. Both streams become intermittent in the summer and fall with small isolated pools associated with bridges, culverts, and the small retention dams found in the lower section of each stream. Stream substrates in both Plum Brook and Ransom Brook are primarily a mixture of fine gravels with some silt. In the pools behind the retention dams, particularly on Plum Brook, the bottom substrates were composed of a thick layer of silt and organic debris as much as 2-3 feet in depth. On Ransom Ditch the only pools found and subsequently sampled were those associated with one of these retention dams and an old road culvert immediately downstream from the dam. In both Plum Brook and Ransom Ditch the fish communities were dominated and comprised almost entirely of creek chubs, fathead minnows, green sunfish and in the case of Plum Brook also central stonerollers.

With the exception of the brook stickleback, all the species captured in this study are common species statewide exhibiting a high degree of tolerance to habitat and water quality degradations. Species requiring specialized habitats and excellent water qualities are absent from these streams as would be expected given the past landuse and channel modifications that have taken place. The brook stickleback represents the only habitat specialist found in the survey. Sticklebacks inhabit small springs, brooks, and other small water bodies characterized by clear, cool waters and beds of submersed aquatic vegetation. A small population of sticklebacks was discovered by Ralph Pfingsten in a small shallow pool below a culvert in one of the tributary ditches feeding into Pipe Creek.

Sampling of the small lakes, ponds, and other water storage basins on the Plum Brook Station resulted in the capture of 1,180 individuals representing 6 species of fish plus 1 hybrid. Site specific collection data is presented in Table 5. Fish communities in these ponds as a whole appear to be primarily the result of inadvertent or haphazard introductions. Two of the

TABLE 4. TOTAL SPECIES BY STREAM SYSTEM ON THE NASA PLUM BROOK STATION.

<u>SPECIES</u>	<u>Plum Brook</u>	<u>Ransom Ditch</u>	<u>Pipe Creek</u>
White Sucker	-	-	66
Creek Chub	294	45	51
Striped Shiner	4	-	-
Fathead Minnow	262	293	4
Bluntnose Minnow	-	-	13
Central Stoneroller	211	-	3
Green Sunfish	241	354	4
Bluegill	-	2	-
Brook Stickleback	-	-	<u>1</u>
Total Individuals	1,012	694	142
Total Species	5	4	7

TABLE 5. FISH CAPTURED IN PONDS/LAKES ON THE NASA PLUM BROOK STATION.

<u>Species</u>	<u>Station</u>								
	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>
Goldfish	1	3	-	-	-	-	-	-	-
Black Bullhead	-	-	-	-	-	-	-	17	-
Largemouth Bass	55	-	-	6	-	17	9	-	-
Green Sunfish	1	231	-	-	2	-	3	29	-
Bluegill	134	93	-	14	121	-	328	-	-
Pumpkinseed	-	-	-	-	-	-	9	-	-
Green SF Hybrid	<u>1</u>	<u>103</u>	-	-	<u>1</u>	-	<u>2</u>	-	-
Total Individuals	192	430	-	20	124	17	351	46	-
Total Species	5	4	0	2	3	1	5	2	0

ponds sampled (the lake northeast of Pipe Creek and the small pond off S. Patrol Rd. in the National Guard area) had no fish in them. Surprisingly, the pond on Snake Rd. which offered excellent fish habitat (clear water, submersed aquatics, woody debris, a mixture of substrates) was populated entirely by largemouth bass. Species diversity in the remaining 6 ponds sampled ranged from 5 to 2 species including hybrids. In 4 of these 6 ponds the fish communities were dominated by bluegill, green sunfish, and their hybrids. The fish community in water reservoir #8191 north of Taylor Rd. was dominated by largemouth bass and bluegill with incidental occurrences of goldfish, green sunfish, and one hybrid. This reservoir owing to its larger size, greater water depths, influx of fresh water, and physical habitat structure (root wads, woody debris, and rip-rap along the shoreline) had the best population of largemouth bass.

### RECOMMENDATIONS

The small intermittent nature of the streams in the study area coupled with past channel modifications of Plum Brook and Ransom Ditch both on and off the study site severely limit the options available for improving the fish communities in these streams. Given enough time and the return of a wooded riparian corridor such as exists on Pipe Creek, the instream habitats (pools, riffle/runs, root wads & woody debris) might recover to the point where a more balanced and diverse fish community could exist. Establishment of such a community would be dependent on source populations from outside the area of other species which utilize these types of habitats and their ability to recolonize these streams should conditions change over time. The intermittent nature of these streams will always limit their diversity however to those species adapted to this type of a flow regime.

With regards to the ponds on the property, unless the goal is to improve/manage them for recreational fishing, I would not do anything in the way of management. The species present are all common species and do not warrent special considerations with regards to the management of the Plum Brook Station.

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## AN ANNOTATED LIST OF THE FISH OF THE NASA PLUM BROOK STATION

### White Sucker, *Catostomus commersoni*

This is one of the commonest and widespread of the suckers in Ohio. It occurs statewide inhabiting a variety of streams, natural lakes, and other water bodies. While the larger adults are more typically found in the larger and medium-sized streams of the state, spawning occurs in the smaller streams and young white suckers are commonly found in smaller headwater tributaries. At Plum Brook Station, white suckers were found only in Pipe Creek which is the least modified of the 3 streams sampled. The water retention dams on Ransom Ditch and Plum Brook would block potential spawning runs of this species to stream sections above the dams. White Suckers are more tolerant to increased water turbidities and siltation of habitats than other species of suckers found in Ohio.

### Goldfish, *Carassius auratus*

Like the common carp, goldfish were introduced into Ohio waters in the late 1800's by fish culturist and owners of aquaria. Distributed statewide in a variety of aquatic habitats, goldfish reached their greatest abundance in the western basin of Lake Erie where they were commercially harvested. Goldfish and carp frequently hybridize with each other. Goldfish were present in two of the water storage reservoirs at NASA Plum Brook Station. As both of these reservoirs get their water pumped in from Lake Erie it is likely that the goldfish came in from Lake Erie.

### Creek Chub, *Semotilus atromaculatus*

This is one of the most common and widespread stream fish in Ohio. Moderately tolerant of turbid waters and other types of pollution, it is found in a wide range of streams, ponds, and lakes. It is most common in the smaller streams and brooks of the state and is one of the characteristic species in these headwater systems. They are often used as bait by fisherman. This was the third most abundant species in the stream communities at Plum Brook Station.

### Striped Shiner, *Luxilus chrysocephalus*

This is one of the common and widespread species of shiners found in Ohio. It is statewide in its distribution inhabiting streams of all sizes. A pool dwelling species, the largest populations are often found in the smaller streams in Ohio, particularly during the spring spawning period. The adults tend to drop downstream into the larger pools as summer progresses. At Plum Brook Station 4 individuals were captured in the pool above the retention dam on Plum Brook.

Fathead Minnow, *Pimephales promelas*

This is one of the more tolerant species of fish found in the state. It can survive under conditions of pollution, increased water turbidities, and even low pH's that are often not conducive to most of the other species. Fathead populations tend to flourish only in the absence of competition from the other species it often associates with such as the bluntnose minnow. This species is normally found in small streams, ponds, and lakes. It is frequently raised and sold as a bait minnow for fisherman and many populations may be the result of "bait bucket" introductions. This was the second most abundant species in the streams at Plum Brook Station comprising 30% of all the individuals collected.

Bluntnose Minnow, *Pimephales notatus*

This is probably the most common fish in Ohio. Bluntnose utilize and tolerate a wide variety of habitat conditions. They are found in every waterbody capable of supporting fishlife and thrive in turbid, nutrient rich waters. They are equally at home in small streams and brooks as they are in the largest rivers and lakes. At Plum Brook Station this species was recorded only from Pipe Creek where it was the third most common member of that stream's fish community.

Central Stoneroller, *Compostoma anomalum*

This species is common and abundant in streams throughout much of Ohio. It is found primarily in the riffles and runs of the smaller to medium-sized streams but also occurs in the larger rivers of the state. Stonerollers are bottom feeders utilizing a variety of plant and animal matter. While this was the fourth most abundant stream fish at Plum Brook Station, all but 3 individuals were captured in Plum Brook. The species was not recorded in Ransom Ditch and was incidental in Pipe Creek (3 individ.).

Black Bullhead, *Ameiurus melas*

This species is found statewide in small numbers inhabiting oxbows, overflow ponds, lakes, and the base gradient sections of small to medium-sized streams. Black bullheads show a preference for turbid waters with muddy bottoms and will tolerate high levels of pollutants and high water temperatures. The largest populations were found in the shallow waters of Sandusky Bay and other areas in western Lake Erie. At Plum Brook Station this species was found in a small, shallow, turbid pond ringed with cattails located on the south side of North Magazine Rd. at Columbus Rd.

Largemouth Bass, *Micropterus salmoides*

An inhabitant of lakes, estuaries, and slackwater pools of the larger streams throughout Ohio, this species has probably been stocked into every suitable body of water in the state. The largest populations were originally found in those habitats

characterized by clear waters, silt-free substrates, and beds of submersed aquatic vegetation. This species was found in 4 of the 9 "ponds" sampled at Plum Brook Station. The largest population was found in the raw water storage reservoir north of Taylor Rd. at Maintenance Rd.

*Green Sunfish, Lepomis cyanellus*

This is one of the common fish found throughout Ohio. It is tolerant to a variety of habitat conditions and will thrive under conditions of habitat degradations not suitable for other members of its genus in Ohio. An inhabitant of pools and other areas of base gradients, it is found in streams, lakes, ponds, and wetlands of all sizes. It often hybridizes with other species of sunfishes. This was the most abundant fish species recorded at Plum Brook Station accounting for 29% of all individuals captured. It was the most common species in the streams and ranked second only to the bluegill in the lakes and ponds within the study area.

*Bluegill, Lepomis macrochirus*

A species of ponds and lakes, this is one of the most common and widespread species in Ohio, thanks primarily to intensive stocking efforts over the last 50 or so years. Prior to these stocking efforts, the largest populations were found in the glacial and canal lakes of the state and in the shallow bays, estuaries, and harbor areas of western Lake Erie. At Plum Brook Station this species was found almost exclusively in the ponds and lakes where it accounted for 58% of all the individuals recorded at these stations. Only 2 individuals were captured in the stream surveys where the fish communities were dominated in part by the green sunfish.

*Pumpkinseed Sunfish, Lepomis gibbosus*

The pumpkinseed is one of the characteristic species of the glacial lakes of northern Ohio and other wetlands identified by their clear waters, silt-free substrates, and submersed beds of aquatic vegetation. The majority of the populations are found in northern Ohio, but extensive stocking efforts in past years succeeded in establishing populations in other areas of the state. At Plum Brook Station, a small population of this species was identified in the pond on the north side of North Magazine Rd. at its junction with Columbus Rd.

*Brook Stickleback, Culaea inconstans*

This northern species of cold, clear waters reaches the southern edge of its range in Ohio where it is primarily found in smaller streams characterized by clear waters and beds of submerged aquatic vegetation. Populations in Ohio are extremely local in nature with the primary center of distribution occurring in NE Ohio and the Mad River drainage in west central Ohio. The small headwater habitats of this species are easily destroyed by ditching, dredging, and filling, and many populations have been

extirpated. At Plum Brook Station a small population of sticklebacks was found in a small, shallow pool below a culvert in one of the tributary ditches feeding into Pipe Creek.

**SECTION E  
BUTTERFLIES**

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## INTRODUCTION

The principle objective of this study was to document the species of butterflies and skippers present during the late spring, summer, and early fall on the grounds of the NASA Plum Brook Station. Secondary objectives were to ascertain the presence of any federal or state listed species which might warrant specific management considerations.

Plum Brook Station represents a large area of relatively undisturbed habitats in an area subjected to intensive agricultural practices. The area encompassed by Plum Brook Station was historically an area of prairie openings and sand ridges interspersed with the deciduous forests. It was hoped that the study area might support one or more populations of listed or unusual species as a result of these historic prairie habitats and the relative inaccessibility of the area since the establishment of the research station.

Butterfly collecting in Ohio has a long history, dating back to the 1830's when Jared P Kirtland a physician naturalist living in Poland, Mahoning County, Ohio, started making collections of northeastern Ohio butterflies. A procession of both professional and amateur collectors have followed in Kirtland's footsteps providing a wealth of data on the occurrences, distributions, and life histories of Ohio butterflies. Beginning in 1983 the Ohio Lepidopterist Society initiated a statewide collecting effort to document the current status of Ohio butterflies. This project coupled with the historic collections provides the basis for the 1992 publication by The Ohio Biological Survey entitled Butterflies and Skippers of Ohio by D. Itner, J. Shuey, and J. Calhoun.

The Butterflies and Skippers of Ohio, (Itner et al, 1992), documents 144 species of butterflies and skippers as having occurred at one time or another in Ohio. Of those 144 species 59 have been recorded from Erie Co., Ohio. In Huron County just to the south, a total of 69 species have been recorded.

## SURVEY METHODS

From 14 May through September, 21 different visits were made to survey Plum Brook Station for butterflies. Almost every section of the Station was observed. Repeated visits were made during the summer to many areas that:

- a) had a changing plant flowering population
- b) had a particular habitat interest
- c) or appeared to be the least altered in the last few years.

The species recorded were with 2 exceptions, all captured using a standard butterfly net (BioQuip). Two species were captured in a

bait trap for moths.

Due to the size of the area being surveyed, the area was subdivided into a series of smaller blocks by the investigators for data recording purposes. This grid system was primarily employed for the moth surveys, but observations of some of the more uncommon butterflies on the area were also recorded in this way. This grid system is shown in Figure 1.

#### Rare and endangered species

No state or federally listed species were identified in this survey.

#### RESULTS

During the summer of 1994, a total of 41 species of butterflies were recorded at the NASA Plum Brook Station, Erie County, Ohio. Five of the 41 species (*Thorybes bathyllus*, *Erynnis baptisiae*, *Poanes hobomok*, *Satyrium calanus*, and *Strymon melinus*) had not been recorded previously for Erie County and hence represent new county records. A list of the species found and their observed flight periods at the Plum Brook Station may be found in Appendix A at the end of this report.

Following is a list of the species recorded and their relative abundance. Since it is very difficult to make a meaningful estimate of butterfly numbers at any given location on any given day, the number of days recorded out of the total days surveyed, the areas observed, and a general comment as to the relative abundance is given for each species. Distribution maps for each species based upon observed occurrences within the grid system established for the study are found in Appendix B. An illustration of the adult butterflies for all 41 species listed may be found in Iftner et al (1992).

Annotations for each species recorded in the survey include the following information:

**Hodges Number Common Name and Latin Name**

- A) Reference where an illustration of the larva may be found, if available.
- B) Habitat associations and larval food plants.
- C) Reported records for Erie County prior to this survey.
- D) Comments on the relative abundance of each species within the study area.
- E) Ohio Status

Superfamilies are listed in **BOLD CAPS**.  
Families are listed in **Bold**.

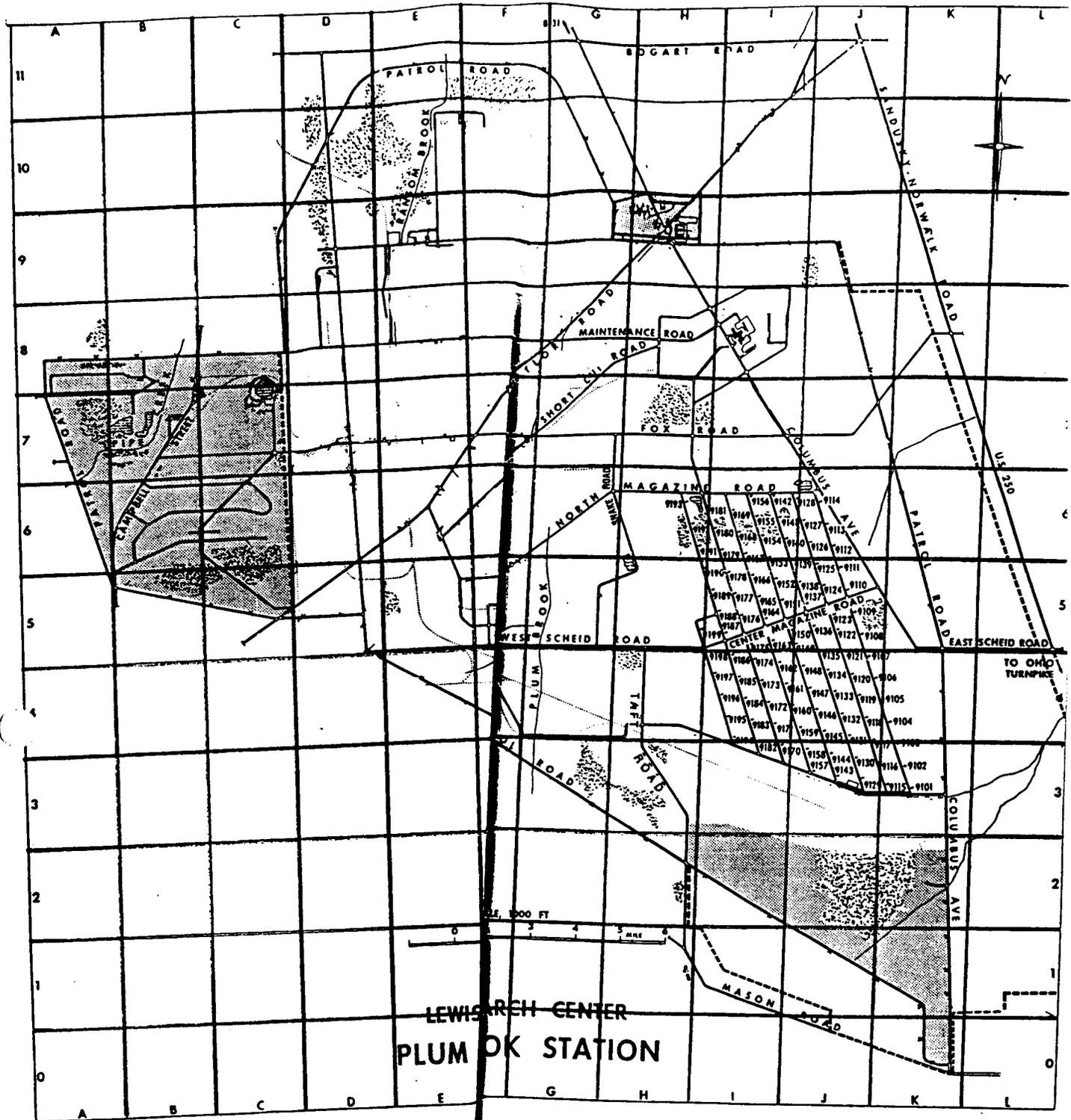


Figure 1. Grid system used to

occurrences of Lepidoptera at

NASA Plum Brook Sta

## HESPERIOIDEA

### Hesperiidae The Skippers

03870 Silver-spotted Skipper, *Epargyreus clarus clarus* (Cramer, 1775).

- A) Opler (1992) Pl. 3 (8)
- B) Adults are frequently encountered along forested edges and a variety of open, successional habitats. Larval food plants: false indigo (*Amorpha fruticosa*), black locust (*Robinia*), wild senna (*Cassia*).
- C) Erie Co. Status: One record from Margaretta twp., 1988. One record from Oxford twp., 1988.
- D) Plum Brook: Recorded on six visits throughout the summer. Observed only a few individuals in a few areas on each visit.
- E) Ohio Status: resident; common statewide.

03909 Southern Cloudy Wing, *Thorybes bathyllus* (J.E. Smith, 1797).

- B) Adults are frequently encountered along forested edge habitats, in dry upland fields, and in a variety of other open successional habitats. Larval food plants: a variety of legumes.
- C) Erie Co. Status: No previous records
- D) Plum Brook: Recorded on three visits during May in areas K-2, E-6, and E-9. Several individuals were observed during each visit.
- E) Ohio Status: resident; common in S Ohio, uncommon in N Ohio.

03959 Wild Indigo Dusky Wing, *Erynnis baptisiae* (Forbes, 1936).

- B) Most frequently encountered in prairie openings and along roadsides planted with crown vetch (*Coronilla caria*). Larval food plants: Crown vetch (*Coronilla*), Wild Indigo (*Baptisia tinctoria*).
- C) Erie Co. Status: No previous records.
- D) Plum Brook: Recorded on three visits during September in many areas. Many individuals were found in any area that had Joe-Pye Weed patches.
- E) Ohio Status: resident; common to uncommon

03977 Common Sooty Wing *Pholisora catullus* (Fabricius, 1793).

- A) Mitchell/Zim (1987) p. 77
- B) Adults are associated with a variety of open, disturbed habitats. Larval food plants: various members of the Mint family.
- C) Erie Co. Status: Four records from Erie County, 1978 to 1988
- D) Plum Brook: Recorded on two visits during June in area I-2. Only a few individuals observed.
- E) Ohio Status: resident; common

- 04004 Least Skipper, *Ancyloxypha numitor* (Fabricius, 1793).
- B) An inhabitant of wet, open grass dominated habitats including wet meadows, fields, pastures and edge habitats along streams and ponds. Larval food plants: various grasses.
  - C) Erie Co. Status: Three records from Resthaven, 1967, 1971 and 1986. One record from Kelleys Island, 1988.
  - D) Plum Brook: Recorded on four visits in June and September. Several individuals observed each time throughout the station.
  - E) Ohio Status: resident; common.
- 04012 European Skipper, *Thymelicus lineola* (Ochsenheimer, 1808).
- B) Adults can be found in a variety of open, wet grassy habitats. Larval food plants: timothy (*Phleum*), various other grasses.
  - C) Erie Co. Status: One record from Castalia, 1961.
  - D) Plum Brook: Recorded on two visits during June and July. Only a few individuals observed.
  - E) Ohio Status: naturalized resident; common.
- 04036 Peck's Skipper, *Polites coras* (Cramer, 1775).
- B) Adults associated with a variety of open grassy habitats. Larval food plants: various grasses.
  - C) Erie Co. Status: One record from Milan, 1988. Two records from Margaretta twp., 1988.
  - D) Plum Brook: Recorded on seven visits during June and one visit during September. Several individuals found in many areas throughout the station on each visit.
  - E) Ohio Status: resident; common.
- 04041 Tawny-edged Skipper, *Polites themistocles* (Latreille, 1824).
- B) Adults are found in a variety of open grassy habitats. Larval food plants: *Panicum* and various other grasses.
  - C) Erie Co. Status: One record from Erie Co., 1988.
  - D) Plum Brook: Recorded on twelve visits in many areas throughout the summer. This species was very common during the entire survey. Many individuals, too numerous to count, were found during June nectaring on dogbane.
  - E) Ohio Status: resident; common.
- 04048 Little Glassy Wing, *Pompeius verna* (W.H. Edwards, 1862).
- B) Adults are inhabitants of a variety of open successional habitats including brushy fields, pastures, and wooded margins. Larval food plants: purpletop (*Triodia*) and other grasses.
  - C) Erie Co. Status: One record from Resthaven, 1988.
  - D) Plum Brook: Recorded on one visit in areas I-7 and J-7, on June 22.
  - E) Ohio Status: resident; uncommon, may be locally common in S Ohio.

04059 Northern Golden Skipper, *Poanes hobomok hobomok* (Harris, 1862).

- B) Adults inhabit a variety of open forested habitats and woodland margins. Larval food plants: various grasses.
- C) Erie Co. Status: No previous records
- D) Plum Brook: Recorded on four visits during June. Many individuals were observed in many areas of the station.
- E) Ohio Status: resident; uncommon to common.

04078 Dun Skipper, *Euphyes vestris metacomet* (Harris, 1862).

- B) This species is associated with a variety of open habitats, including pastures, roadsides, fens, and woodland edges. Larval food plants: sedges (*Carex* spp.).
- C) Erie Co. Status: Earliest record from Sandusky in 1899. Four records from Resthaven, 1988.
- D) Plum Brook: Recorded on three visits during June. Only a few individuals were observed.
- E) Ohio Status: resident; common.

## PAPILIONOIDEA

### Papilionidae The Swallowtails

04176 Tiger Swallowtail, *Papilio glaucus glaucus* (Linnaeus, 1758).

- A) Opler (1992) Pl. 2 (5,6), Pyle (1981) (49), Stokes (1991) p. 35
- B) Adults are primarily associated with deciduous woods, but are often observed nectaring in a variety of open habitats. Larval food plants: tulip tree (*Liriodendron tulipifera*), wild cherry (*Prunus serotina*), Ash (*Fraxinus* spp.).
- C) Erie Co. Status: One record from Resthaven, 1973. One record from Kelleys Island, 1987. One record from Birmingham, 1933.
- D) Plum Brook: Recorded on eight visits throughout the summer. Would observe one or two individuals nectaring on the thistle, swamp milkweed, wild bergamont, or butterfly weed throughout the station.
- E) Ohio Status: resident; common.

04184a Black Swallowtail, *Papilio polyxenes asterius* (Stoll, 1782).

- A) Opler (1992) Pl. 2 (3,4), Stokes (1991) p.35
- B) Adults can be found in almost any kind of habitat. Larval food plants: many members of the Parsely family (*Umbelliferae*), including wild carrot (*Daucus carota*).
- C) Erie Co. Status: Nine records from Resthaven, 1971, 1974, 1975, 1978 and 1986. One record from Kelleys Island in 1987.
- D) Plum Brook: Recorded on ten visits throughout the summer. Found nectaring or flying in many areas from early June to early September. Observed a female ovipositing on wild carrot in area E-8 on 19 July.

E) Ohio Status: resident; common.

#### Pieridae Whites and Sulfurs

04197 European Cabbage White, *Pieris rapae* (Linnaeus, 1758).

- A) Opler (1992) Pl. 2 (8), Pyle (1981) (46), Stokes (1991) p. 35
- B) Adults can be found in almost any open habitat, often venture into woods in the spring. Larval food plants: peppergrass (*Lepidium*), mustards (*Brassica*) and many others.
- C) Erie Co. Status: One record from Castalia, 1961. One record from Resthaven, 1971. One record from Kelleys Island, 1972.
- D) Plum Brook: Recorded on all visits in many areas of the station. Probably the most common species present.
- E) Ohio Status: naturalized resident, common.

04209 Common Sulphur, *Colias philodice philodice* Godart, 1819.

- B) Adults can be found in almost any open area. They are particularly common in alfalfa and clover fields. Larval food plants: many members of the pea family (Fabaceae).
- C) Erie Co. Status: One record from Mind, 1988. One record from Margaretta twp., 1988.
- D) Plum Brook: Recorded on all 21 visits in many areas of the station. A very common species.
- E) Ohio Status: resident; common.

04210 Orange Sulphur, *Colias eurytheme* Boisduval, 1852.

- A) Opler (1992) Pl. 2 (9)
- B) As with other sulphurs, adults can be found in almost any open area. Larval food plants: many members of the pea family (Fabaceae).
- C) Erie Co. Status: Fifteen records from 1969 to 1988, mostly from Resthaven.
- D) Plum Brook: Recorded on all 21 visits in many areas of the station. A very common species.
- E) Ohio Status: naturalized resident; common.

04237 Little Sulphur, *Eurema lisa lisa* (Boisduval and LeConte, 1829).

- B) Adults inhabit a variety of open habitats including old fields, forest clearings, pastures and roadsides. Larval food plants: partridge-pea (*Cassia fasciculata*) and related species.
- C) Erie Co. Status: One record from Venice, 1946. One record from Bay Point, 1931.
- D) Plum Brook: Recorded on four visits. A single individual was observed on 6 July. Many individuals were observed on 18 August, 26 August, and 1 September in many areas around the bunkers. Observed pairs mating.
- E) Ohio Status: immigrant; rare to common; locally common in S Ohio and Lucas County, rare elsewhere in N Ohio.

Lycaenidae The Coppers, Hairstreaks and Blues

04251a American Copper, *Lycaena phlaeas americana* Harris, 1862.

- A) Mitchell/Zim (1987), Wright (1993) p. 68
- B) Adults inhabit a variety of open areas including pastures, brushy successional areas, oak savannahs, and farm yards. Larval food plants: sheep sorrel, garden sorrel and yellow dock (all *Rumex* spp.).
- C) Erie Co. Status: Two records from Oxford twp., 1982. One record from Oxford twp., 1988.
- D) Plum Brook: Observed on seven visits to the station. First observed on 21 May in areas G-7 and J-8, nectaring on Bluet, Spring Beauty, and Wintercress. A few individuals were observed on 6 July and several more in August.
- E) Ohio Status: resident, possibly naturalized; uncommon to common.

04278 Acadian Hairstreak, *Satyrium acadica acadica* (W.H. Edwards, 1862).

- B) Adults inhabit a variety of wetland habitats supporting populations of willows (*Salix* spp.). Larval food plants: members of the genus *Salix*.
- C) Erie Co. Status: Two records from Resthaven, 1973 and 1979.
- D) Plum Brook: Two individuals were captured on 6 July and one more recorded on 19 July in area E-7.
- E) Ohio Status: resident; rare to uncommon; most frequent in N Ohio.

04282a Banded Hairstreak, *Satyrium calanus falacer* (Godart, 1824).

- B) Adults most often found in oak-hickory forests but occasionally occur in adjacent open areas. Larval food plants: walnuts (*Juglans* spp.), hickories (*Carya* spp.), and various oaks (*Quercus* spp.).
- C) Erie Co. Status: No previous records.
- D) Plum Brook: Recorded on six visits from 14 June to 19 July. Many individuals, too numerous to count, were found on patches of dogbane, butterfly weed, or milkweed throughout the station. A very abundant species.
- E) Ohio Status: resident; uncommon to common.

04336a Gray Hairstreak, *Strymon melinus humuli* (Harris, 1841).

- A) Opler (1992) Pl. 3 (3)
- B) Adults inhabit a variety of open habitats including woodland trails and edges as well as old fields, pastures, and vacant lots. Larval food plants: mallow (*Mallow* sp.), cultivated beans, and many other plants
- C) Erie Co. Status: No previous records.
- D) Plum Brook: One individual was captured on 18 August in area I-4.
- E) Ohio Status: resident; common in S Ohio, uncommon in N Ohio.

04361 Eastern Tailed Blue, *Everes comyntas comyntas* (Godart, 1824).

- A) Mitchell/Zim (1987) p. 70, Wright (1993) p. 81
- B) Adults can be found in any open habitat supporting the larval host plants, including urban lawns and gardens. Larval food plants: clovers and other members of the Fabaceae
- C) Erie Co. Status: One record from Resthaven, 1980. One record from Resthaven, 1988. One record from Erie, 1986.
- D) Plum Brook: Recorded on five visits throughout the summer. Generally many individuals were observed each time in many areas of the station.
- E) Ohio Status: resident; common.

04363 Spring Azure, *Celastrina ladon ladon* (Cramer, 1780).

- A) Wright (1993) p. 8, Mitchell/Zim (1987) p. 71
- B) Adults are most frequently found in association with deciduous forests and adjacent openings. They may also be found in urban parks and gardens as well as old field habitats. Larval food plants: a variety of plants and trees, depending on the brood.
- C) Erie Co. Status: One record Cedar Point, 1934. One record Kelleys Island, 1962 and 1988. One record Castalia, 1961. One record Resthaven, 1967.
- D) Plum Brook: Recorded on six visits from 10 June through 19 July. Generally, many individuals were observed on each visit throughout the station.
- E) Ohio Status: resident; common.

#### Libytheidae Snout Butterflies

04410 Eastern Snout Butterfly, *Libytheana bachmanii bachmanii* (Kirtland, 1851).

- A) Mitchell/Zim (1987) p. 62
- B) an inhabitant of mesic woodlands, riparian corridors, brushy fields and other habitats in the vicinity of its host plant. Larval food plant: hackberry (*Celtis occidentalis*.)
- C) Erie Co. Status: Five records in Erie County from 1970 to 1986.
- D) Plum Brook: One individual was recorded in area I-7 on 16 June.
- E) Ohio Status: resident or regular immigrant; infrequent in W Ohio, rare in E Ohio.

#### Nymphalidae Brushfooted Butterflies

04420 Question Mark, *Polygonia interrogationis* (Fabricius, 1798).

- A) Pyle (1981) (15), Mitchell/Zim (1987) p. , Wright (1993) p. 111
- B) Adults are usually found in and adjacent to deciduous woodlands, but can utilize a variety of other open, disturbed habitats when nectar sources and larval food

plants are present. Larval food plants: elms (*Ulmus spp.*), hackberry (*Celtis occidentalis*), nettles (*Urtica spp.*) and others.

- C) Erie Co. status: Seven records from Resthaven, 1970 to 1977.
- D) Plum Brook: Recorded several individuals in many areas of the station on every visit.
- E) Ohio Status: resident; uncommon to common.

04421 Comma, *Polygonia comma* (Harris, 1842).

- A) Mitchell/Zim (1987) p. 51, Stokes (1991) p. 34, Wright (1993) p. 111
- B) Adults are usually found in and adjacent to deciduous woods but can utilize a variety of other open disturbed habitats including residential areas, parks, and old fields. Larval food plants: elm (*Ulmus*), hackberry (*Celtis*), nettles (*Urtica*) and others.
- C) Erie Co. Status: Two records from Milan, 1966 and 1968. Three records from Resthaven, 1970 and 1987.
- D) Plum Brook: Recorded only a few individuals throughout the summer. Captured one individual in a bait trap, area B-6, on 7 September.
- E) Ohio Status: resident; uncommon to common.

04432 Mourning Cloak, *Nymphalis antiopa antiopa* (Linnaeus, 1758).

- A) Pyle (1981) (24), Mitchell/Zim (1987) p. 55, Stokes (1991) p. 34, Wright (1993) p. 107
- B) Adults are usually found in or near deciduous woodlands and along streamd and rivers, but occasionally occur in other open habitats. Larval food plants: willows (*Salix*), elms (*Ulmus*), and poplars (*Populus*)
- C) Erie Co. Status: One record from Resthaven, 1971.
- D) Plum Brook: Recorded a few individuals on seven visits to the station. Generally found in areas B-6, B-7, C-6, and C-7 while nectaring on milkweed.
- E) Ohio Status: resident; uncommon.

04433 Milbert's Tortoise Shell, *Nymphalis milberti milberti* (Godart, 1819).

- A) Stokes (1991) p. 34, Wright (1993) p. 109
- B) Adults inhabit open areas near mesic woodlands, often found in wet pastures, old fields, roadsides and streambanks. Larval food plants: nettles (*Urtica*).
- C) Erie Co. Status: Four records from Resthaven, 1967, 1971 and 1988. One record from Bay Bridge, 1925.
- D) Plum Brook: Recorded on seven visits to the station throughout the summer. Many individuals were observed in many areas.
- E) Ohio Status: resident; common in N Ohio, absent from SE Ohio.

04434 American Painted Lady, *Vanessa virginiensis* (Drury, 1773).

- A) Pyle (1981) (13), Scott (1986) Pl. 2 (187), Stokes (1991)

- p. 34, Wright (1993) p. 105
- B) Adults inhabit a variety of open, disturbed habitats including roadsides, old fields, river and stream banks, and forest edges. Larval food plants: everlasting (Asteraceae) and various others.
  - C) Erie Co. Status: One record from Castalia, 1961. One record from Erie County, 1976.
  - D) Plum Brook: Recorded on twelve visits, mostly during May, June, and July. Very common with many individuals found nectaring or flying in most areas of the station.
  - E) Ohio Status: resident; uncommon to common.
- 04435 Painted Lady, *Vanessa cardui* (Linnaeus, 1758).
- A) Opler (1992) Pl. 3 (5), Pyle (1981) (18), Wright (1993) p. 105
  - B) Adults can be found in any type of open habitats containing nectar sources. Larval food plants: a wide variety of plants, including thistles (*Cirsium spp.*).
  - C) Erie Co. Status: Two records from Resthaven, 1981.
  - D) Plum Brook: Recorded on nine visits from 17 June to 26 August. A very common species with many individuals observed in many areas.
  - E) Ohio Status: irregular immigrant; rare to common depending on annual influx of females.
- 04437a Red Admiral, *Vanessa atalanta rubria* (Fruhstorfer, 1909).
- A) Mitchell/Zim (1987) p. 54, Scott (1986) Pl. 2 (184), Stokes (1991) p. 34 Wright (1993) p. 103
  - B) Adults are most closely associated with open areas and edge habitats adjacent to mesic deciduous woods, including shrubby wetlands, old fields, and roadsides. It can also be found in residential areas in parks, gardens, and orchards. Larval food plants: nettles (*Urtica spp.*), hops (*Humulus sp.*), and false nettles (*Boehmeria sp.*).
  - C) Erie Co. Status: One record from Margaretta twp., 1988. Six records from Resthaven, 1967 to 1988.
  - D) Plum Brook: Recorded on ten visits in May, June, July, and September. Many individuals were observed in many areas of the station.
  - E) Ohio Status: resident; uncommon to common.
- 04440 Buckeye, *Junonia coenia* Hubner, 1822.
- A) Pyle (1981) (23), Mitchell/Zim (1987) p.52, Wright (1993) p.107
  - B) Adults inhabit a variety of open, disturbed habitats characterized by low vegetation and exposed areas of soil. Larval food plants: members of the Plantain family (*Plantago spp.*).
  - C) Erie Co. Status: Two records from Kelleys Island, 1946 and 1948.
  - D) Plum Brook: Recorded one individual on 18 July, area B-6, and one individual on 4 September, area A-7.

E) Ohio Status: regular immigrant; rare to uncommon; most frequent in S Ohio.

04450 Great Spangled Fritillary, *Speyeria cybele cybele* (Fabricius, 1775).

- A) Mitchell/Zim (1987) p. 45, Stokes (1991) p. 34
- B) Adults are most frequently found in open woodlands and in adjacent open areas including fields, roadsides, and gardens when searching for nectar. Larval food plants: violets (*Viola spp.*).
- C) Erie Co. Status: Earliest record in 1934 and latest record in 1988.
- D) Plum Brook: Recorded on 14 visits from 10 June through September. Very numerous and found in the entire station. One of the most common species present.
- E) Ohio Status: resident; common.

04465 Meadow Fritillary, *Boloria bellona bellona* (Fabricius, 1775).

- B) Adults are found in a variety of open, mesic habitats including wet meadows, fields, ditches, and margins of streams and ponds. Larval food plants: violets (*Viola spp.*).
- C) Erie Co Status: Two records from Resthaven, 1988.
- D) Plum Brook: Recorded on 10 visits to the station. Many individuals were found in areas I-7, J-7, H-6, and C-7 in May and June. A few individuals were observed in July with an increase in numbers again in August.
- E) Ohio Status: resident; common.

04481 Pearl Crescent, *Phyciodes tharos tharos* (Drury, 1773).

- A) Mitchell/Zim (1987) p. 49, Wright (1993) p.113
- B) Adults inhabit a wide variety of open habitats including urban lawns, vacant lots, fields, pastures, wetlands, and open woodlands. Larval food plants: asters (*Aster spp.*).
- C) Erie Co. Status: Six records from Margaretta twp., 1932 to 1987.
- D) Plum Brook: Recorded on all 21 visits and found in large numbers throughout the station.
- E) Ohio Status: resident; common.

04522b Red-Spotted Purple, *Limenitis arthemis astyanax* (Fabricius, 1775).

- A) Stokes (1991) p. 34
- B) Adults are most often found in deciduous forests and adjacent edge habitats including powerline cuts and RR right-of-ways. Larval food plants: wild cherry (*Prunus*), poplar (*Populus*), and aspen (*Populus*).
- C) Erie Co. Status: Six records from Resthaven, 1967 to 1973. One record from Kelleys Island, 1987. One record from Milan, 1988.
- D) Plum Brook: Recorded on six visits. Found mostly in areas

B-7, B-6, C-7, and C-6. Only a few individuals were observed.

E) Ohio Status: resident; uncommon to common.

04523 Viceroy, *Limenitis archippus archippus* (Cramer, 1776).

A) Opler (1992) Pl. 3 (6), Stokes (1991) p. 34, Pyle (1981) (26), Mitchell/Zim (1987) p. 56

B) Adults inhabit a variety of open, wet habitats characterized by the presence of small willows. Larval food plants: willows (*Salix spp.*), poplar (*Populus spp.*) and wild cherry (*Prunus serotina*).

C) Erie Co. Status: Ten records from Resthaven and Kelleys Island, 1949 to 1987.

D) Plum Brook: Recorded on eight visits in late June, July and August. Many individuals were observed nectaring on Milkweed and Joe-Pye weed near the willow patches throughout the station.

E) Ohio Status: resident; uncommon to common.

#### Apaturidae Hackberry Butterflies

04557 Hackberry Butterfly, *Asterocampa celtis celtis* (Boisduval and LeConte, 1835).

A) Pyle (1981) (45), Mitchell/Zim (1987) p. 59

B) Adults are found anywhere their larval food plant, Hackberry (*Celtis spp.*), is found.

C) Erie Co. Status: Eleven records from Resthaven, 1925 to 1982.

D) Plum Brook: Recorded on two visits, 26 July and 1 September. Only three individuals were observed.

E) Ohio Status: resident; uncommon to common; most frequent in W Ohio.

#### Satyridae Wood Nymphs and Satyrs

04578 Little Wood Satyr, *Megisto cymela cymela* (Cramer, 1777).

B) Adults inhabit a variety of shaded habitats including woodland edges, shrubby fields, and weedy pastures and meadows. Larval food plants: grasses and sedges (*Poaceae* and *Cyperaceae*).

C) Erie Co. Status: One Record from Castalia 1961.

D) Plum Brook: Recorded on eight visits from 9 June through July. Generally very common and found in many areas of the station.

E) Ohio Status: resident; common.

04587 Common Wood Nymph, *Cercyonis pegala* (W. Kirby, 1837).

A) Mitchell/Zim (1987) p. 42

B) Adults inhabit a wide range of open and forested habitats. Larval food plants: various grasses.

C) Erie Co. Status: Eight records from Margaretta twp., 1904 - 1987.

- D) Recorded on every visit from 17 June through September.  
Found in large numbers in any grassy area of the station.
- E) Ohio Status: resident; uncommon to common.

#### Danaidae Milkweed Butterflies

04614 Monarch, *Danaus plexippus plexippus* (Linnaeus, 1758).

- A) Opler (1992) Pl. 3 (7), Pyle (1981) (35)
- B) This species occurs in virtually any open habitat including old fields, roadsides, prairie remnants, gardens, and urban yards. Larval food plants: milkweeds (*Asclepias spp.*).
- C) Erie Co. Status: Seven records from Erie County, 1964 to 1988.
- D) Plum Brook: Recorded on 16 visits from 4 June through September. Number of individuals increased from a few in early June to many in late July and early August. Found mature larva on Whorled Milkweed.
- E) Ohio Status: regular immigrant; common. Ohio populations of this species overwinter in central Mexico migrating back to Ohio each year. The first arrivals usually appear in May in Ohio.

#### DISCUSSION

Although as many as 41 species of butterflies were observed at Plum Brook Station during the 1994 season it is probable that other species are present at the facility. The drought conditions which prevailed throughout much of the summer could have had an impact on some species. There are an additional 23 species known to have occurred in Erie County alone. Of these 23 species, 8 species have not been observed in Erie County for many years or were recorded only once. Species in these categories include the Broad-winged Skipper, *Poanes viator* (1900); Dion Skipper, *Euphyes dion* (1906); Mountain Silver-spot, *Speyeria atlantis* (1931); Long Dash, *Polites mystic* (1932); Northern Cloudy Wing, *Thorybes pylades* (1938); Southern Sooty Wing, *Staphylus hayhurstii* (1948); Giant Swallowtail, *Papilio cresphontes* (1962 only); and Regal Fritillary, *Speyeria idalia* (1974).

Other species previously recorded (Iftner et al 1992) from Erie County which were not observed at Plum Brook Station in the 1994 season along with their Ohio status are listed below.

- Checkered Skipper, *Pyrgus communis* (Grote, 1872) - regular immigrant; uncommon to rare, locally common in S Ohio.
- Cross Line Skipper, *Polites origenes origenes* (Fabricius, 1793) - resident; common.
- Northern Broken Dash, *Wallengrenia egeremet* (Scudder, 1864) -

resident; uncommon to common.

Delaware Skipper, *Atrytone logan logan* (W.H. Edwards, 1863) - resident; uncommon.

Southern Golden Skipper, *Poanes zabulon* (Boisduval & LeConte, 1834) - resident; common to uncommon.

Black Dash, *Euphyes conspicua conspicua* (Edwards, 1863) - resident; uncommon, primarily in N Ohio.

Pipevine Swallowtail, *Battus philenor philenor* (Linnaeus, 1771) - resident; uncommon to common.

Spicebush Swallowtail, *Papilio troilus troilus* Linnaeus, 1758 - resident; uncommon to common.

Checkered White, *Pontia protodice* (Boisduval & LeConte, 1829) - immigrant; locally common in S Ohio, rare elsewhere.

Bronze Copper, *Lycaena hyllus* (Cramer, 1775) - resident; uncommon, most frequent in N Ohio.

Coral Hairstreak, *Harkenclenus titus titus* (Fabricius, 1793) - resident; uncommon to common.

Aphrodite Fritillary, *Speyeria aphrodite aphrodite* (Fabricius, 1787) - resident; rare to common, rare in W Ohio.

Silvery Checkerspot, *Chlosyne nycteis nycteis* (Doubleday & Hewitson, 1847) - resident; uncommon and local in N Ohio, locally common in S Ohio.

Tawny Emperor, *Asterocampa clyton clyton* (Boisduval & LeConte, 1835) - resident; rare to uncommon, most frequent in SW Ohio.

Northern Eyed Brown, *Satyroides eurydice eurydice* (Johansson, 1763) - resident; uncommon, most frequent in NE Ohio.

Twenty-five species of the 41 observed were common during their normal flight periods. These were: Wild Indigo Dusty Wing, Peck's Skipper, Tawny-edged Skipper, Tiger Swallowtail, Black Swallowtail, European Cabbage White, Common Sulphur, Orange Sulfur, Little Sulfur, American Copper, Banded Hairstreak, Spring Azure, Question Mark, Comma, Milbert's Tortoise Shell, American Painted Lady, Painted Lady, Red Admiral, Great Spangled Fritillary, Meadow Fritillary, Pearl Crescent, Viceroy, Little Wood Satyr, Common Wood Nymph, and the Monarch.

The station supports a very large population of the Great

Spangled Fritillary. This species was present throughout the station from June 10 through September 11. Adults were found on almost every patch of dogbane, thistle, common milkweed, swamp milkweed, butterfly weed, Joe-Pye weed, or on the wing in every part of the station. In area E-9 on June 14 10 adults were counted taking flight from a dogbane patch at the same time. It is very important to protect the violets from destruction by burning since this is the larval food source for this species.

Larva of 31 of the species observed feed on grasses, sedges, or other ground level plants. Throughout the station there are large areas of ideal habitat for these species. These areas include patches of milkweeds, thistles, dogbane, Joe-Pye weed, grasses, sedges and a variety of other plants. The common milkweed provided an excellent nectar source for many adult species of butterflies in addition to the Monarch. However, many Monarch larva were found on the whorled milkweeds scattered throughout the bunker area and not on the common milkweed as might have been expected. The dogbane patches were very heavily populated by the various species of skippers during their entire flowering period.

#### RECOMMENDATIONS

Throughout the station there are large areas of ideal habitat for the species observed. These areas include large patches of milkweeds, thistles, dogbane, Joe-Pye weed, butterfly weed, many grasses and many other plants. Damage to these areas should be prevented. It is recommended mowing and burning be reduced to a minimum. The area J-8 where a large population of *Lycaena phlaeas americana* was observed on 21 May had been mowed by 15 Jun. This is the area between the Patrol Road and the fence. Perhaps there is good reason, but why some areas were mowed and to the extent they were mowed is questionable.

On the first visit to the station, 7 May, it was surprising to see how much of the ground cover had been burned. It is understood that one-half of the Station is burned each year. If this is true then the areas where large patches of nectaring and larval plants were found this summer will probably be burned this coming spring (1995).

If this burning can not be prevented, it would be very interesting to evaluate its effect next summer on the species observed. Skippers are especially affected by burning since many of their larval plants are grasses or ground plants. This may account for the absence of some of the species listed for Erie county but not found at the station. If burning can not be stopped completely, perhaps a four year cycle, or such, could be used. This would give the area that is burned every fourth year a chance to be repopulated by surrounding areas.

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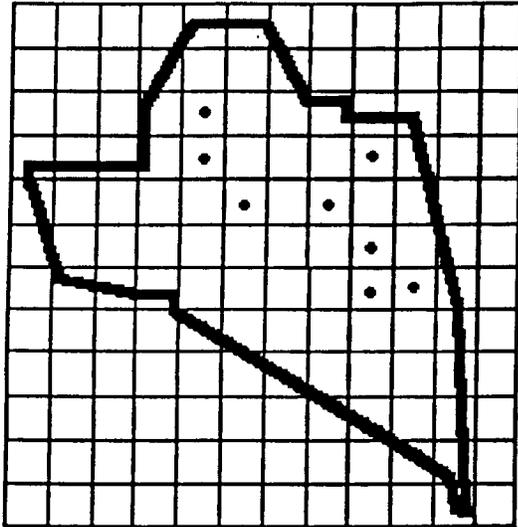
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**APPENDIX A. FLIGHT PERIODS OF BUTTERFLIES AT NASA PLUM BROOK  
STATION DURING SUMMER 1994.**

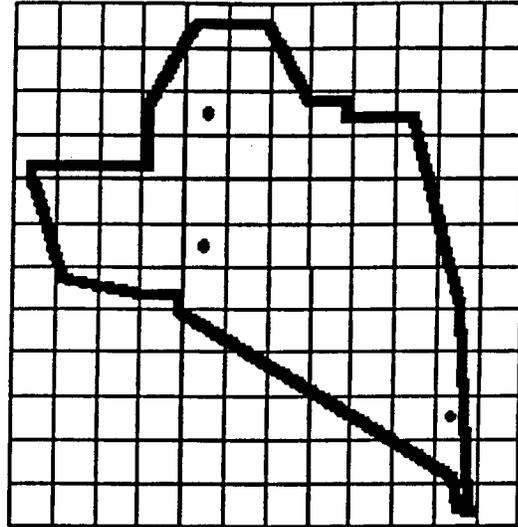


**APPENDIX B. DISTRIBUTION MAPS FOR BUTTERFLIES OBSERVED AT PLUM  
BROOK STATION DURING SUMMER 1994.**

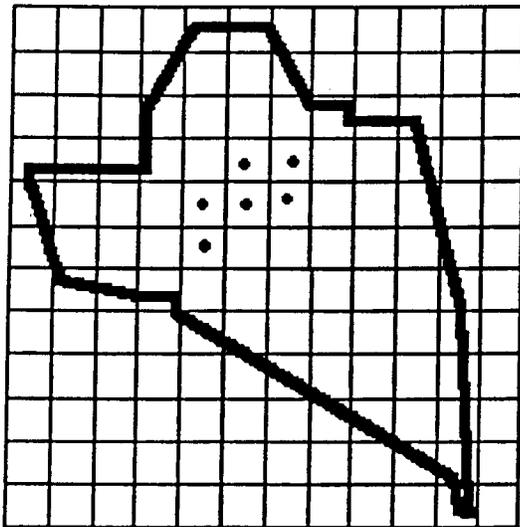
Distribution Maps For Butterflies Observed At Plum Brook Station During Summer 1994



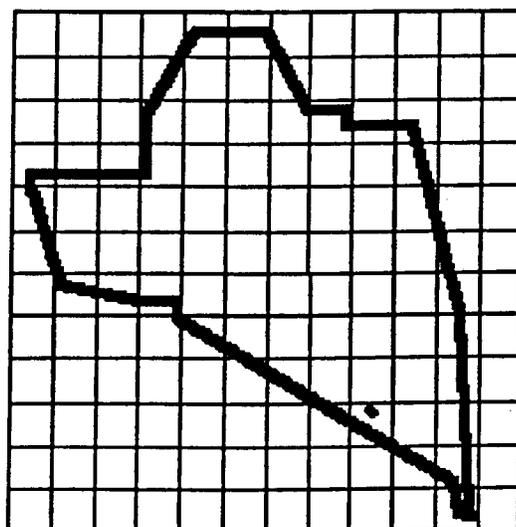
*Epargyreus clarus clarus*



*Thorybes bathyllus*

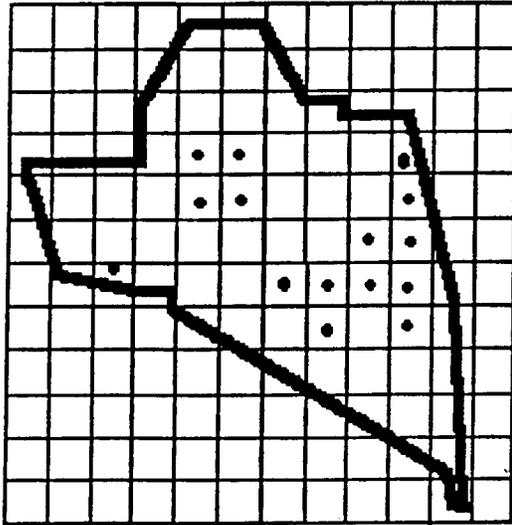


*Erynnis baptisiae*

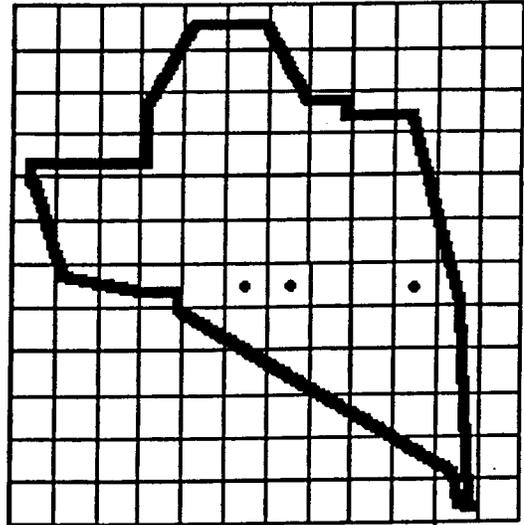


*Phoebastria catullus*

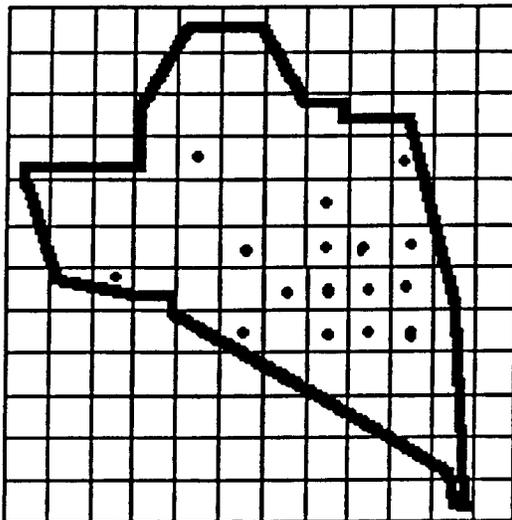
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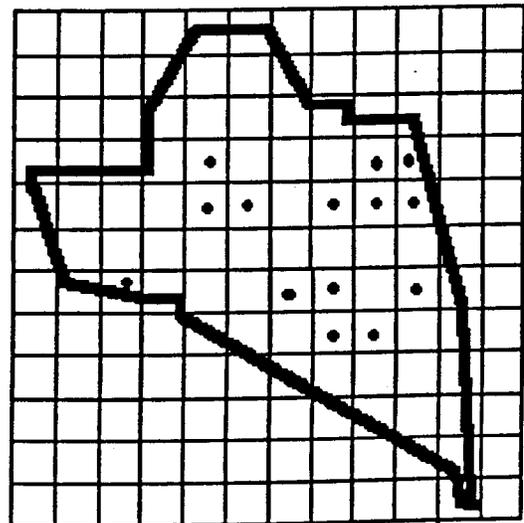
*Ancyloxypha numitor*



*Thymelicus lineola*

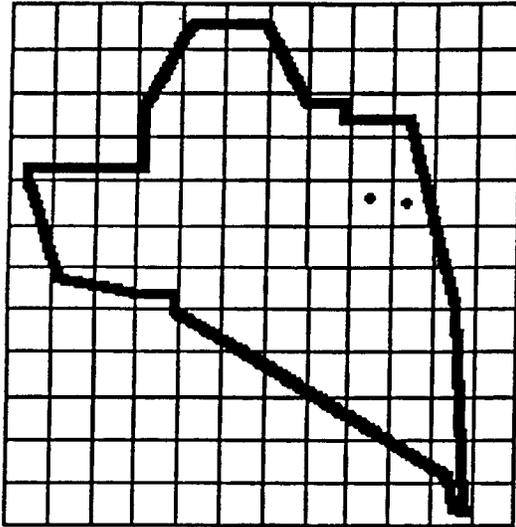


*Polites coras*

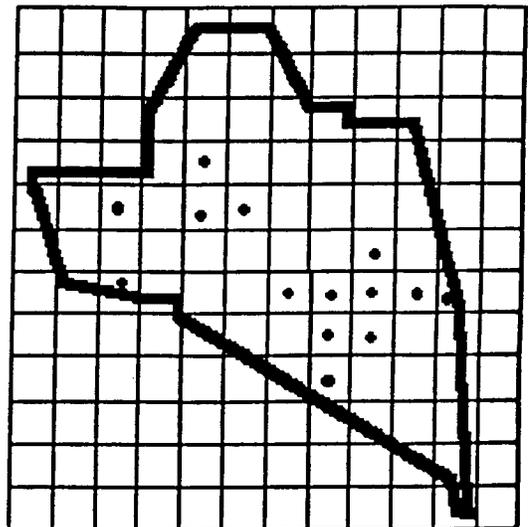


*Polites themistocles*

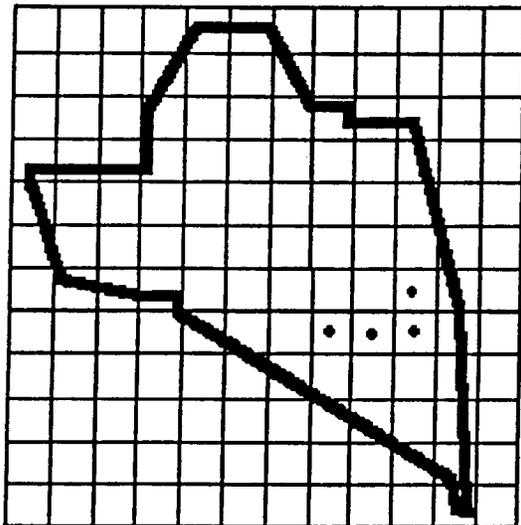
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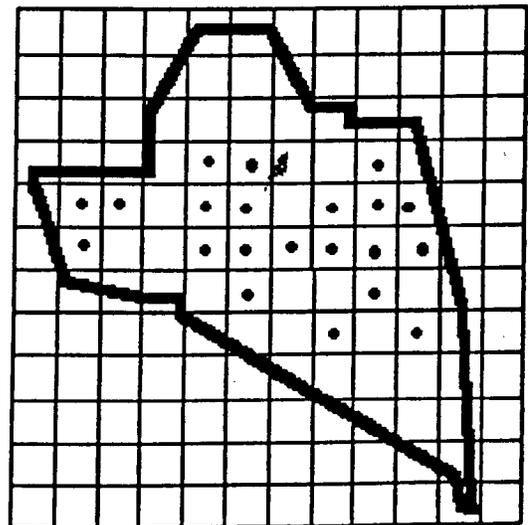
*Pompeius verna*



*Poanes hobomok hobomok*



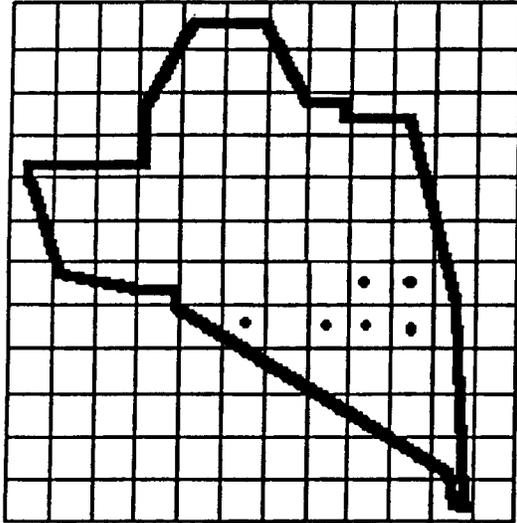
*Euphyes vestris metacomet*



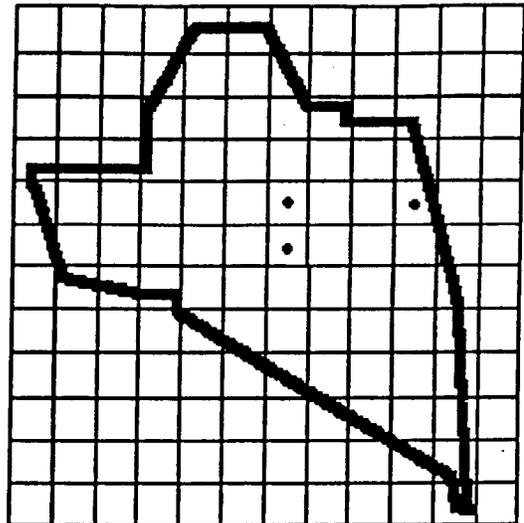
*Papilio glaucus glaucus*



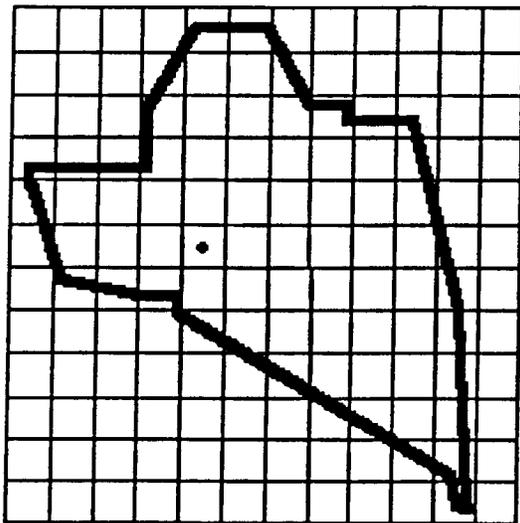
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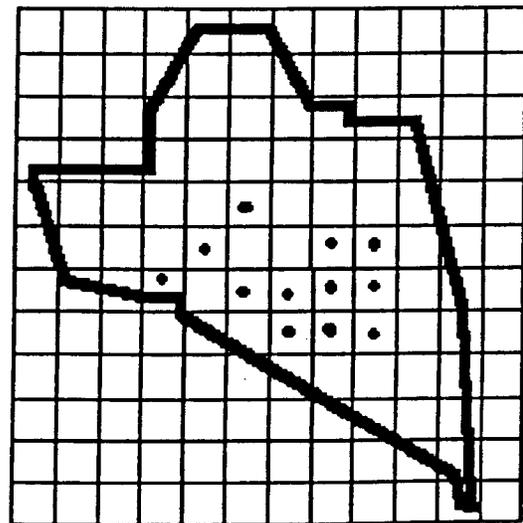
*Eureka lisa lisa*



*Lycaena phlaeas americana*

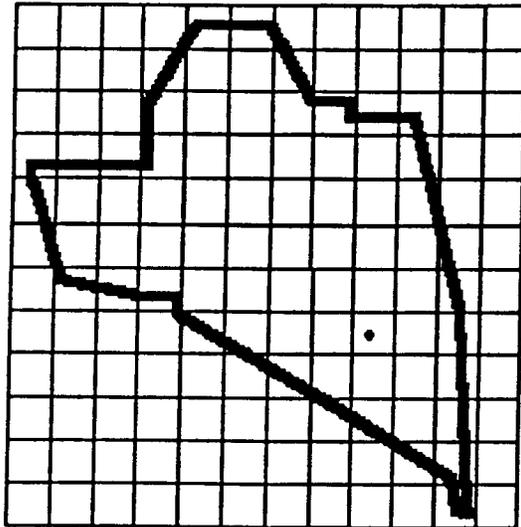


*Satyrium acadica acadica*

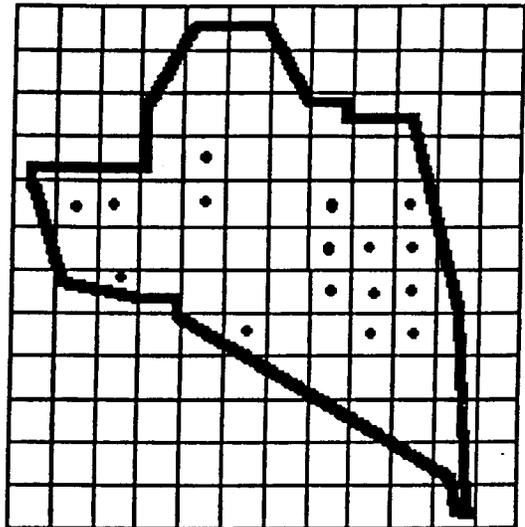


*Satyrium calanus falacer*

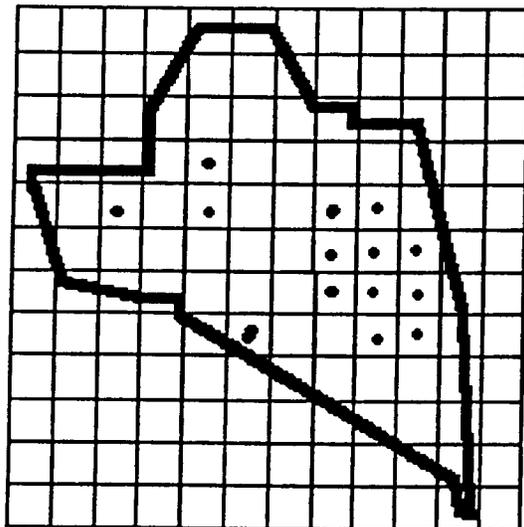
**Distribution Maps For Butterflies Observed At Plum Brook Station During Summer 1994**



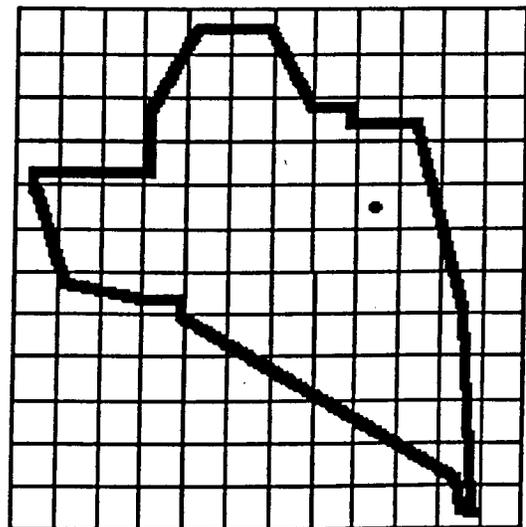
*Strymon melinus humuli*



*Everes comyntas comyntas*

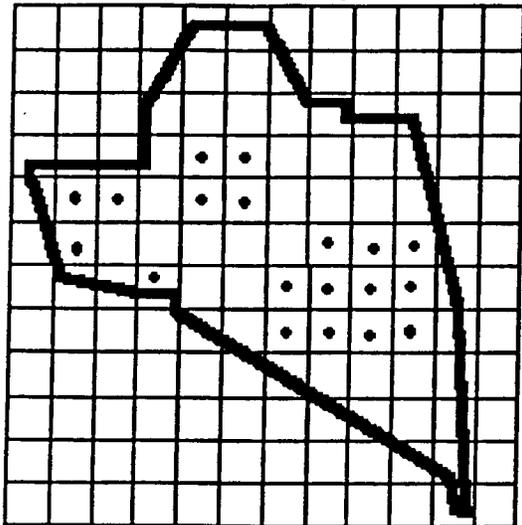


*Celastrina ladon ladon*

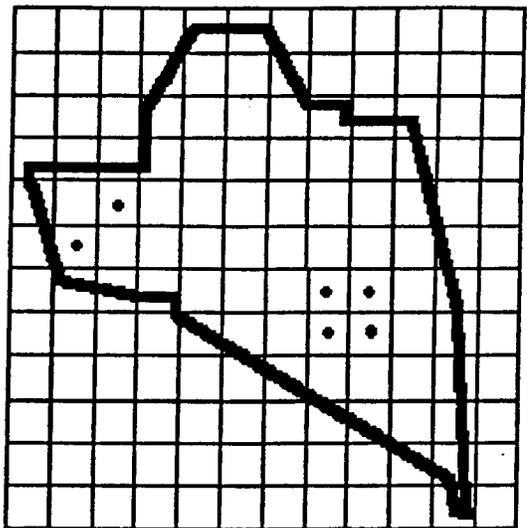


*Libytheana bachmanii bachmanii*

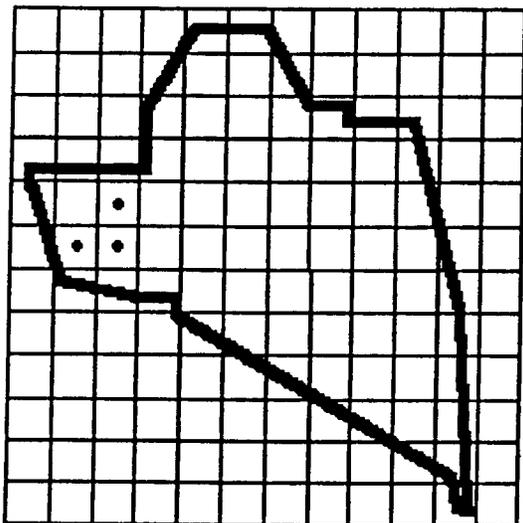
**Distribution Maps For Butterflies Observed At Plum Brook Station During Summer 1994**



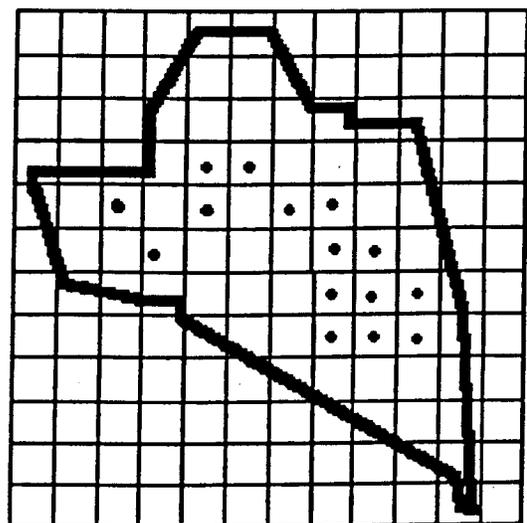
*Polygonia interrogationis*



*Polygonia comma*

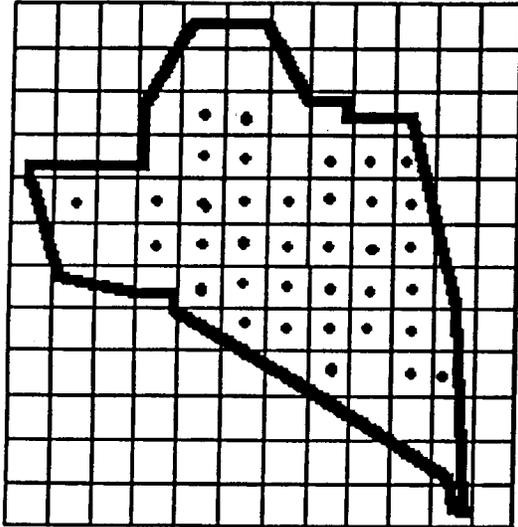


*Nymphalis antiopa antiopa*

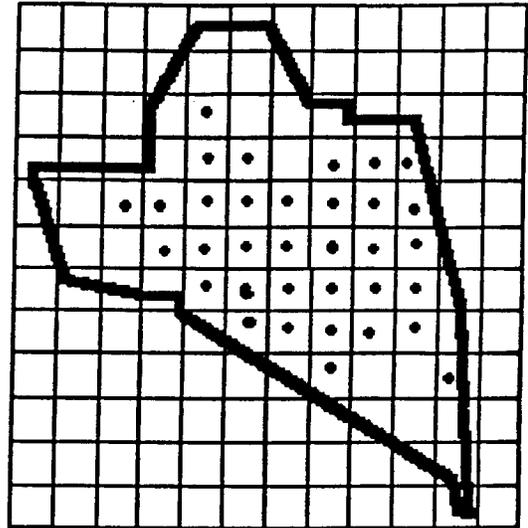


*Nymphalis milberti milberti*

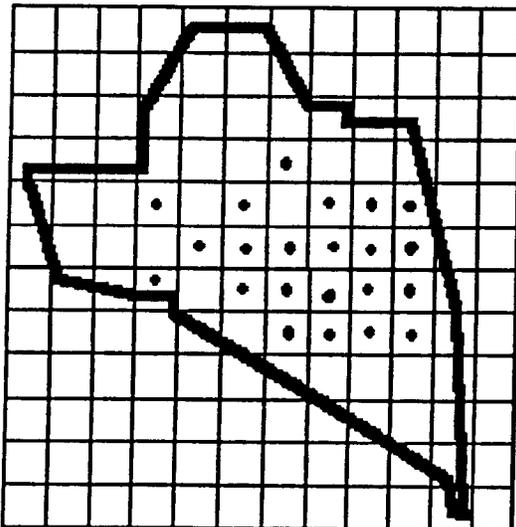
**Distribution Maps For Butterflies Observed At Plum Brook Station During Summer 1994**



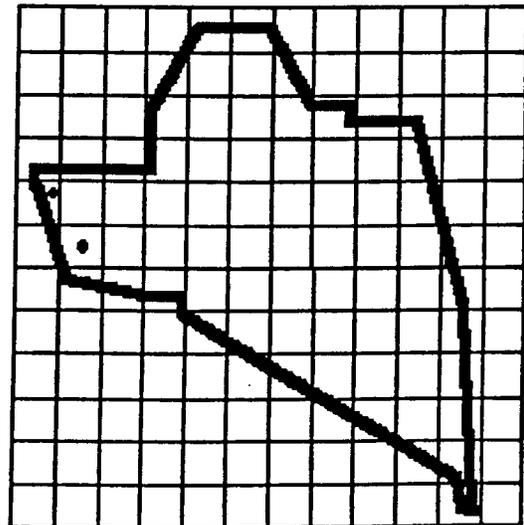
*Vanessa virginiensis*



*Vanessa cardui*

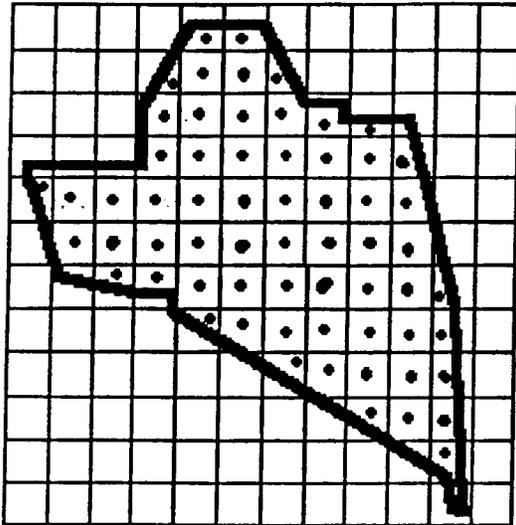


*Vanessa atalanta rubria*

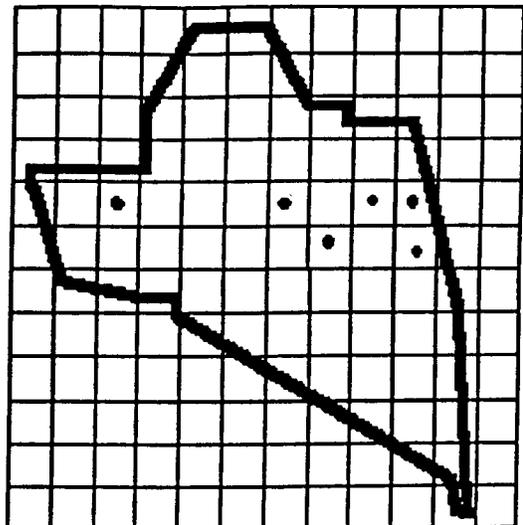


*Junonia coenia*

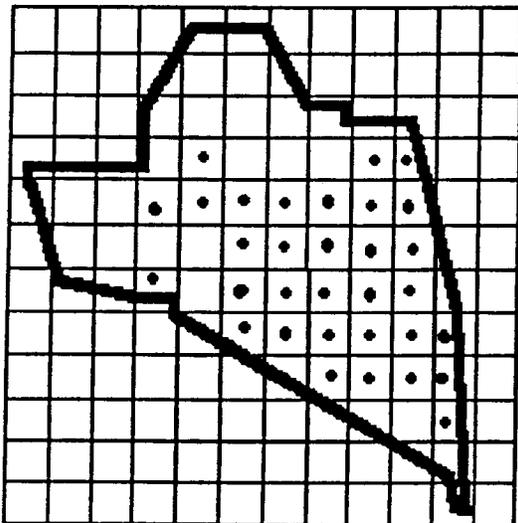
**Distribution Maps For Butterflies Observed At Plum Brook Station During Summer 1994**



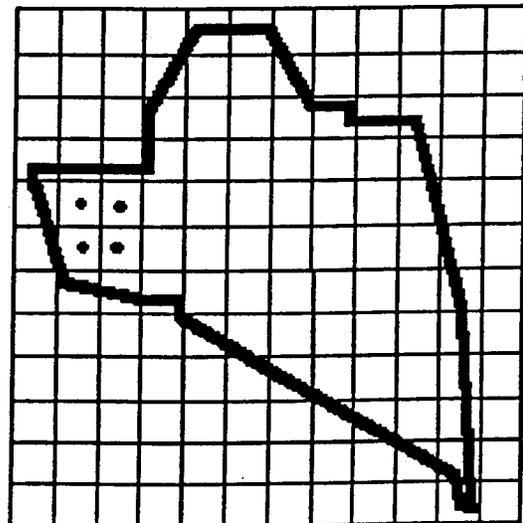
*Speyeria cybele cybele*



*Boloria bellona bellona*

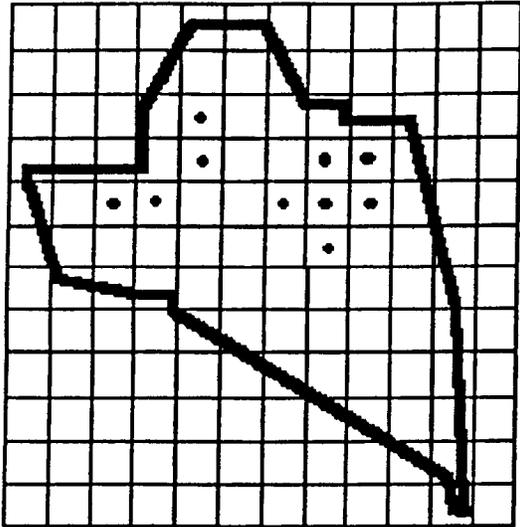


*Phyciodes tharos tharos*

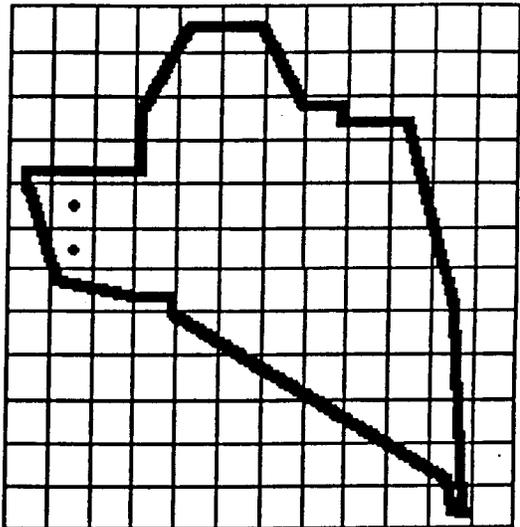


*Limenitis arthemis astyanax*

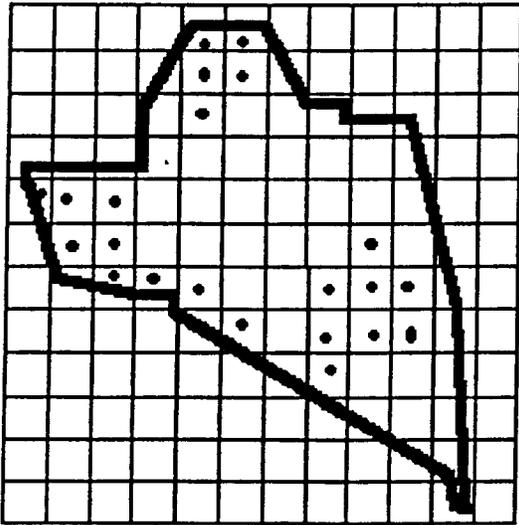
**Distribution Maps For Butterflies Observed At Plum Brook Station During Summer 1994**



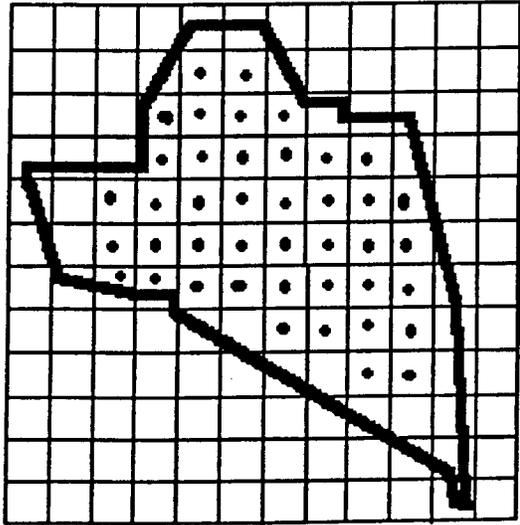
*Limenitis archippus archippus*



*Asterocampa cellis*



*Megisto cymela cymela*



*Cercyonis pegala*



**SECTION F  
MOTHS**

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## INTRODUCTION

From May 7 through October 8, 1994, a moth survey was conducted at the NASA Lewis Research Center Plum Brook Station, Erie County, Sandusky, Ohio. The survey was performed using 15 watt, 12 volt D.C. blacklight traps, which were run from dusk to dawn by means of a photoelectric control. Also, a sheet using an ultraviolet light (BioQuip Model 2804) and a sun lamp was setup on seven separate nights. A bait trap was used in three areas a few nights in late August to early September.

A total of 52 areas were surveyed using the traps and eight areas using the sheet/blacklight technique (one night two sheets were employed). Most areas of significant habitat were sampled more than once during the summer. On any given night, three light traps were set up in widely separated areas of the station. A map of the survey sites are shown in Figure 1.

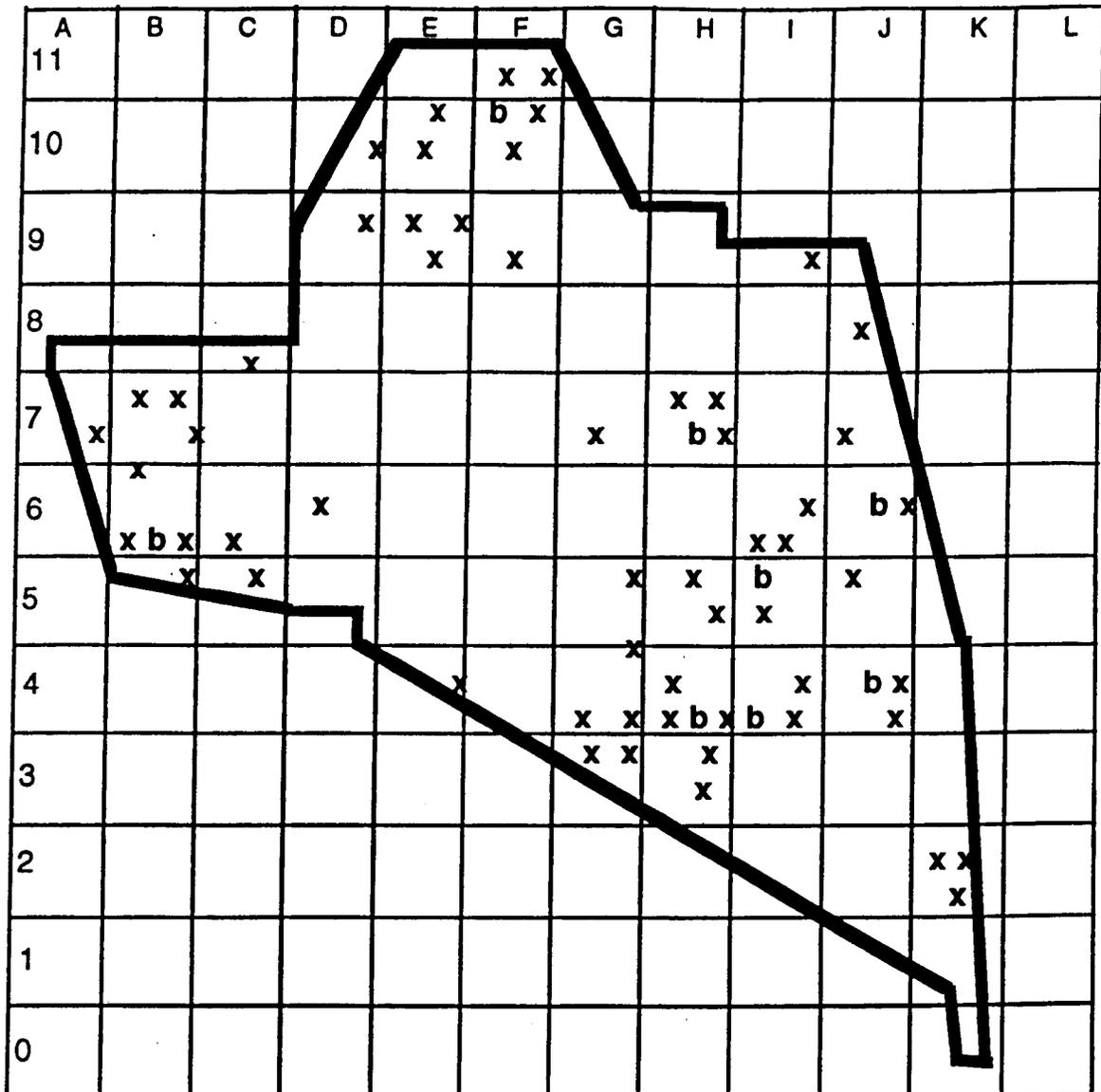
## RESULTS

During this survey, 6643 specimens were collected. A total of 385 species were identified. Of these species, approximately half had not been officially recorded from Erie County, Ohio prior to this survey. Many of the micro moths were identifiable only to genus, and many were undescribed species. Only a few such records are included in the species list. A total of 1422 identified records were tabulated.

The following species are of special interest because only a few specimens of each have been reported from Ohio.

- 09344      *Apamea plutonia*  
Uncommon: Collected in only seven counties in Ohio. The only previous record from Erie County is from Berlin Twp., Old Woman's Creek National Estuarine Sanctuary, 1985.
- 09372      *Apamea lutos*  
Rare: Two old specimens from Montgomery, Co., 1882 and Franklin Co., 1900; a literature record from Auglaize Co., 1905; one record from Resthaven Wildlife Area, Erie Co., 1986 and Killdeer Plains Wildlife area, Wyandot Co. (Rings, 1992) were the only records prior to this survey.
- 09950      *Chaetagnaea sericea*  
Rare: Only recorded from four counties in Ohio; most recently in 1975 (Rings, 1992). No records from Erie County prior to this survey.

**Map Of Plum Brook Station Showing Locations of Light Traps (x) and Black Lighting Sites(b).**



- 09963 *Anathix aggressa*  
 Rare: The only year recorded from Ohio prior to this survey was in 1991 at Resthaven Wildlife Area in Erie Co. (Rings, 1992).
- 10838 *Euxoa defersa*  
 Uncommon: This species was previously known only from Oak Openings, Lucas Co.; Old Woman Creek National Estuarine Sanctuary, Erie Co.; and Mud Lake Nature Preserve, Williams Co. (Rings, 1992). Known as the Sand-hill cutworm, it is economically important since it is destructive to tobacco and garden crops. Rockburne/Lafontaine (1976) report this species is common in sandy soil regions in Ontario and Quebec.
- 10929 *Eurois occulta*  
 Rare: Only one specimen from Cuyahoga County, in 1948, had been reported prior to this survey. This species is common in Ontario and Quebec (Rockburne/Lafontaine, 1976).

The following is a list of the 385 species recorded. For each species, the following information is included:

- Hodges Number Genus species
- A) Common name (if available)
  - B) Food (if available)
  - C) Reference to illustration of larva (if available)
  - D) Reference to illustration of adult (if available)
  - E) Known records for Erie Co. prior to this survey
  - F) Records for each species collected during this survey which include:  
 (Day, Month, Area(s), Number of specimens per area)

Superfamilies are listed in BOLD CAPS  
 Families are listed in BOLD  
 Subfamilies are listed in Standard Font

## TINEOIDEA

### Gracillariidae

- 00595 *Caloptilia bimaculatella* (Ely)  
 E) None  
 F) (30 May, E-9, 4) (19 Jul, H-7, 1)  
 G) Number of individuals = 5

GELECHIOIDRA

Oecophoridae

00955 *Psilocorsis quercicella* Clemens

- B) Beech, Chestnut, Oaks
- D) Covell (1984) Pl. 64 (23)
- E) None
- F) (6 Jul, J-4, 1)
- G) Number of individuals = 1

01011 *Antaeotricha schlaegeri* (Zeller)

- B) White Oaks, White Birch
- D) Covell (1984) Pl. 62 (20)
- E) None
- F) (30 May, E-9, 2) (4 Jun, H-4, 1) (26 Aug, H-4, 3)
- G) Number of individuals = 6

01014 *Antaeotricha leucillana* (Zeller)

- B) Ashes, Basswood, Birch, Elms, Maples
- D) Covell (1984) Pl. 62 (18)
- E) None
- F) (10 Jun, H-4, 1) (15 Jun, C-6, I-6, 3, 1) (26 Jul, E-9, 1)
- G) Number of individuals = 6

01032 *Gonioterma mistrella* (Busck)

- E) One record from Resthaven, 1991
- F) (6 Jul, K-2, 2)
- G) Number of individuals = 2

01046 *Callima argenticinctella* Clemens

- B) Corn, Elms
- D) Covell (1984) Pl. 61 (16)
- E) None
- F) (29 Jun, I-4, 1) (6 Jul, K-2, J-4, 2, 5)
- G) Number of individuals = 8

Coleophoridae

01388 *Coleophora trifolii* (Curtis)

- E) One record from Resthaven, 1991
- F) (8 Jun, E-4, 1) (10 Jun, H-4, 3)
- G) Number of individuals = 4

Momphidae

01443 *Mompha eloisella* (Clemens)

- B) Evening primrose stems
- D) Covell (1984) Pl. 61 (28)
- E) One record from Resthaven, 1991
- F) (22 Jun, K-2, 1)
- G) Number of individuals = 1

**Cosmopterigidae**

**01467 *Euclementia bassetella* (Clemens)**

- B) *Panicum dichotomum* mines
- D) Covell (1984) Pl. 63 (8)
- E) None
- F) (6 Jul, J-4, 2)
- G) Number of individuals = 2

**Gelechiidae**

**01685 *Metzneria lappella* (Linnaeus)**

- B) Burs of burdock
- D) Covell (1984) Pl. 62 (16)
- E) None
- F) (19 Jul, H-7, 1) (31 Jul, K-2, 1)
- G) Number of individuals = 2

**01986 *Gnorimoschema gallaesolidaginis* (Riley)**

- A) Goldenrod Gall Moth
- B) Goldenrods
- D) Covell (1984) Pl. 62 (11)
- E) None
- F) (26 Aug, I-6, 1)
- G) Number of individuals = 1

**02093 *Chionodes mediofuscella* (Clemens)**

- B) Great ragweed seeds
- D) Covell (1984) Pl. 62 (10)
- E) One record from Sheldon's Marsh, 1982
- F) (30 May, E-9, 8)
- G) Number of individuals = 8

**02110 *Chionodes pseudofondella* (Busck)**

- E) One record from Resthaven, 1988
- F) (22 Jun, F-10, 2) (29 Jun, I-4, 1) (30 Jun, B-7, 1) (12 Jul, H-4, 1)
- G) Number of individuals = 5

**02230 *Anacamptis agrimoniella* (Clemens)**

- B) *Agrimonia eupatoria*
- D) Covell (1984) Pl. 62 (4)
- E) None
- F) (8 Sep, H-5, 1)
- G) Number of individuals = 1

**02291 *Trichotaphe bilobella* (Zeller)**

- E) None
- F) (12 Jul, H-4, 1)
- G) Number of individuals = 1

- 02295 *Trichotaphe flavocostella* (Clemens)  
 B) Goldenrods and sunflowers  
 D) Covell (1984) Pl. 64 (4)  
 E) None  
 F) (8 Jun, E-9, 3) (10 Jun, H-4, 1) (12 Jun, I-5, 1) (15 Jun, C-6, 1)  
 (6 Jul, K-2, J-4, 2, 3) (12 Jul, H-4, 2)  
 G) Number of individuals = 13

YPONOMEUTOIDEA

Plutellidae

- 02366 *Plutella xylostella* (Linnaeus)  
 A) Diamondback Moth  
 B) Mustard family  
 D) Covell (1984) Pl. 60 (25)  
 E) One record from Resthaven, 1988  
 F) (30 May, E-9, 2)  
 G) Number of individuals = 2

Yponomeutidae

- 02420 *Yponomeuta multipunctella* Clemens  
 A) American ermine moth  
 B) Euonymous  
 D) Covell (1984) Pl. 62 (2)  
 E) None  
 F) (29 Jun, I-4, 1)  
 G) Number of individuals = 1

- 02401 *Atteva punctella* (Cramer)  
 A) Ailanthus Webworm Moth  
 B) Ailanthus and paradise tree  
 D) Covell (1984) Pl. 61 (13), Heitzman (1987) p. 359  
 E) One record from Cedar Point, 1908.  
 F) (14 May, H-6, 3) (30 Jun, B-7, 10) (6 Jul, K-2, 1) (13 Aug, J-6, 1) (18 Aug, D-6, 4) (26 Aug, H-4, 4) (1 Sep, A-7, 1) (8 Sep, A-6, 6) (23 Sep, D-9, 2)  
 G) Number of individuals = 32

COSSOIDEA

Cossoidae

- 02693 *Prionoxystus robinine* (Peck, 1818)  
 A) Carpenterworm Moth  
 B) Ash, locust, oak, poplar, willow, cottonwood  
 D) Heitzman (1987) p. 352, Covell (1984) Pl. 7 (6)  
 E) One record Castalia, 1966.  
 F) (15 Jun, I-6, 1)  
 G) Number of individuals = 1

02694 *Prionoxystus macmurtrei* (Guerin, 1829)

- A) Little Carpenterworm Moth
- B) Ash, maple, oak
- D) Covell (1984) Pl. 7 (7)
- E) None
- F) (15 Jun, C-6, 1)
- G) Number of individuals = 1

**TORTRICOIDEA**

**Tortricidae**

**Olethreutinae**

02738 *Endothenia hebesana* (Walker)

- A) Verbena bud moth
- B) *Verbascum*, *Verbena*, *Sarracenia*
- D) Miller (1987) p. 18
- E) None
- F) (29 Jun, H-4, 3) (30 Jun, E-7, 1) (6 Jul, J-4, K-20, 4, 5)  
(12 Jul, B-7, I-5, 1, 2) (19 Jul, H-7, 1) (31 Jul, K-2, 1)  
(13 Aug, G-4, 1) (18 Aug, D-6, 1) (26 Aug, G-4, 2) (29 Aug,  
H-4, 9) (1 Sep, D-9, I-5, A-7, 5, 1, 3)
- G) Number of individuals = 40

02743 *Endothenia quadrimaculana* (Haworth)

- E) None
- F) (18 Aug, D-6, 1) (1 Sep, A-7, 1)
- G) Number of individuals = 2

02748 *Aterpia approximana* (Heinrich)

- B) *Lysimachia* leaves
- D) Miller (1987) p. 19
- E) None
- F) (18 Aug, B-5, D-6, 1, 1)
- G) Number of individuals = 2

02769 *Pseudosciaphila duplex* (Walsingham)

- B) *Populus*, *Betula*, *Salix*
- D) Miller (1987) p. 23
- E) None
- F) (22 Jun, K-2, 1)
- G) Number of individuals = 1

02771 *Phaecasiophora confixana* (Walker)

- D) Miller (1987) p. 24
- E) None
- F) (18 Aug, B-5, 1) (1 Sep, A-7, 1)
- G) Number of individuals = 2

- 02772 *Phaecasiophora niveiguttana* A.R. Grote  
 B) *Sassafras albidum* leaves  
 D) Miller (1987) p. 24  
 E) None  
 F) (11 Jul, J-6, 1)  
 G) Number of individuals = 1
- 02787 *Olethreutes connectus* (McDunnough)  
 B) *Cornus* leaves  
 D) Miller (1987) p. 27  
 E) Four records from Resthaven, 1988 and 1991  
 F) (6 Jul, J-4, 1) (26 Jul, J-5, 2) (31 Jul, K-2, F-10, 2, 1)  
 G) Number of individuals = 6
- 02814 *Olethreutes versicolorana* (Clemens)  
 B) *Cornus*  
 D) Miller (1987) p. 30  
 E) Four records from Resthaven, 1988 and 1991  
 F) (22 Jun, K-2, 1)  
 G) Number of individuals = 1
- 02822 *Olethreutes concinnana* (Clemens)  
 D) Miller (1987) p. 32  
 E) None  
 F) (13 Aug, G-4, 1)  
 G) Number of individuals = 1
- 02823 *Olethreutes fasciatana* (Clemens)  
 B) *Salix, Populus*  
 D) Miller (1987) p. 32  
 E) None  
 F) (8 Jun, I-4, 2) (10 Jun, H-4, 1) (15 Jun, C-6, I-6, 1, 1)  
 (22 Jun, K-2, 5) (29 Jun, I-4, 1)  
 G) Number of individuals = 7
- 02837 *Olethreutes astrologana* (Zeller)  
 D) Miller (1987) p. 34  
 E) None  
 F) (15 Jun, C-6, 6)  
 G) Number of individuals = 6
- 02859 *Olethreutes cespitana* (Hubner)  
 B) *Trifolium, Fragaria, Populus*  
 D) Miller (1987) p. 35  
 E) Two records from Resthaven, 1987  
 F) (8 Jun, E-9, 6) (15 Jun, C-6, 1) (29 Jun, H-6, B-7, 7, 1)  
 (26 Jul, J-5, 1) (31 Jul, F-10, 2) (18 Aug, D-6, 11) (26  
 Aug, H-4, I-6, 5, 3) (1 Sep, D-9, A-7, 1, 1)  
 G) Number of individuals = 39

- 02864 *Hedya cyanana* (Murtfeldt)  
 B) *Cirsium, Rosa*  
 D) Miller (1987) p. 37  
 E) Three records from Resthaven, 1990 and 1991  
 F) (6 Jul, J-4, 1) (21 Jul, I-5, 1)  
 G) Number of individuals = 2
- 02866 *Evora hemidesma* (Zeller)  
 B) *Spiraea*  
 D) Miller (1987) p. 37  
 E) None  
 F) (29 Jun, H-4, 2) (26 Aug, H-4, 2)  
 G) Number of individuals = 4
- 02910 *Phaneta essexana* (Kearfott)  
 B) *Aster* stems  
 D) Miller (1987) p. 42  
 E) None  
 F) (8 Jun, E-9, 6)  
 G) Number of individuals = 6
- 02916 *Phaneta formosana* (Clemens)  
 B) *Solidago*  
 D) Miller (1987) p. 43  
 E) One record from Resthaven, 1991  
 F) (8 Jun, I-4, 1)  
 G) Number of individuals = 1
- 02927 *Phaneta ochrocephala* (Walsingham)  
 B) *Xanthium* seeds  
 D) Miller (1987) p. 47  
 E) None  
 F) (18 Aug, D-6, 1) (26 Aug, G-4, H-4, 2, 1) (31 Aug, I-5, 4)  
 G) Number of individuals = 8
- 02928 *Phaneta raracana* (Kearfott)  
 B) *Solidago*  
 D) Miller (1987) p. 43  
 E) One record from Resthaven, 1991  
 F) (26 Aug, H-4, G-4, 1, 6) (31 Aug, I-5, 1) (1 Sep, I-5, 1)  
 G) Number of individuals = 9
- 02929 *Phaneta ochroterminana* (Kearfott)  
 B) *Solidago*  
 D) Miller (1987) p. 44  
 E) None  
 F) (13 Aug, G-4, 2) (26 Aug, H-4, I-6, 2, 14)  
 G) Number of individuals = 18

- 02936 *Phaneta tomonana* (Kearfott)  
 B) Aster  
 D) Miller (1987) p. 44  
 E) None  
 F) (31 Aug, I-5, 1) (1 Sep, D-9, 1)  
 G) Number of individuals = 2
- 02937 *Phaneta parmatana* (Clemens)  
 B) Aster  
 D) Miller (1987) p. 44  
 E) Two records from Resthaven, 1987  
 F) (31 Jul, I-9, 1) (18 Aug, D-6, B-5, 1, 1) (26 Aug, G-4, H-4, 2, 4)  
 (1 Sep, D-9, 3)  
 G) Number of individuals = 12
- 02973 *Phaneta striatana* (Clemens)  
 D) Miller (1987) p. 46  
 E) None  
 F) (29 Jun, I-4, 3)  
 G) Number of individuals = 3
- 02998 *Phaneta olivaceana* (Riley)  
 B) *Solidago*  
 D) Miller (1987) p. 47  
 E) Five records from Resthaven, 1990 and 1991  
 F) (29 Jun, I-4, 2)  
 G) Number of individuals = 2
- 03037 *Eucosma agricolana* (Walsingham)  
 B) *Artemisia*  
 D) Miller (1987) p. 49  
 E) None  
 F) (8 Jun, I-4, 4) (10 Jun, H-8, 1)  
 G) Number of individuals = 5
- 03042.1 *Eucosma pediasios* Miller  
 E) One record from Resthaven, 1991  
 F) (26 Jul, J-5, 15) (31 Jul, F-10, 1)  
 G) Number of individuals = 16
- 03051 *Eucosma glomerana* (Walsingham)  
 E) None  
 F) (18 Aug, B-5, 1) (25 Aug, B-6, 2)  
 G) Number of individuals = 3
- 03091 *Eucosma matutina* (A.R. Grote)  
 D) Miller (1987) p. 51  
 E) Three records from Resthaven, 1990 and 1991  
 F) (19 Jul, H-7, 1) (31 Jul, I-9, 1)  
 G) Number of individuals = 2

03116.1 *Eucosma similiana* (Clemens)

- B) *Solidago* rootstalks
- D) Miller (1987) p. 53
- E) Two records from Resthaven, 1991
- F) (25 Aug, B-6, 1) (1 Sep, D-9, 3)
- G) Number of individuals = 4

03120 *Eucosma derelicta* Heinrich

- B) *Solidago* rootstalks
- D) Miller (1987) p. 53
- E) Four records from Resthaven, 1990 and 1991
- F) (12 Jul, I-5, 1) (13 Aug, J-6, 1) (26 Aug, G-4, H-4, J-6, 2, 1, 6)
- G) Number of individuals = 11

03142 *Eucosma cataclystiana* (Walker)

- B) *Solidago* rootstalks
- D) Miller (1987) p. 54
- E) Five records from Resthaven, 1988, 1990 and 1991
- F) (9 Jun, H-4, 4) (22 Jun, K-2, 1) (29 Jun, I-4, 1) (6 Jul, J-4, 1) (6 Jul, K-2, 2) (11 Jul, J-6, 3) (12 Jul, H-4, 5) (19 Jul, H-7, 3) (26 Jul, G-7, J-5, 9, 1) (26 Aug, I-6, G-4, 8, 2) (1 Sep, I-5, 3)
- G) Number of individuals = 48

03151 *Pelochrista scintillana* (Clemens)

- B) *Helianthus*
- D) Miller (1987) p. 55
- E) Two records from Resthaven, 1990
- F) (19 Jul, H-7, 1) (6 Jul, K-2, 1) (15 Jun, I-6, 1) (6 Jul, J-4, 1)
- G) Number of individuals = 4

03168 *Pelochrista zomonana* (Kearfott)

- B) *Chrysanthemum* roots and stems
- D) Miller (1987) p. 55
- E) None
- F) (26 Aug, G-4, 1)
- G) Number of individuals = 1

03172 *Epiblema strenuana* (Walker)

- A) Ragweed borer
- B) *Ambrosia*, *Xanthium*, *Chenopodium*
- D) Miller (1987) p. 56
- E) Two records from Resthaven, 1991
- F) (15 Jun, C-6, 1) (13 Aug, J-6, 1) (26 Aug, I-6, H-4, K-4, G-4, 1, 1, 1, 5)
- G) Number of individuals = 10

*Epiblema* undescribed species (near *walsinghami*)

- F) (29 Jun, I-4, 1) (6 Jul, J-4, 2) (31 Jul, K-2, 2)
- G) Number of individuals = 5

03203 *Epiblema brightonana* (Kearfott)  
D) Miller (1987) p. 59  
E) One record from Resthaven, 1991  
F) (31 Jul, F-10, 1) (13 Aug, J-6, 1)  
G) Number of individuals = 2

*Sonia* species (undescribed)  
F) (22 Jun, K-2, 6) (26 Aug, I-6, 6)  
G) Number of individuals = 12

03226 *Gypsonoma haimbachiana* (Kearfott)  
A) Cottonwood twig borer  
B) *Populus deltoides*  
D) Miller (1987) p. 63  
E) Two records from Resthaven, 1991  
F) (6 Jul, K-2, 1) (12 Jul, B-7, 2) (26 Jul, J-5, 1) (13 Aug,  
J-6, 1) (18 Aug, D-6, 3)  
G) Number of individuals = 8

03230 *Proteoteras aesculana* Riley  
B) *Acer negundo*, *Aesculus*  
D) Miller (1987) p. 64  
E) Two records from Resthaven, 1986 and 1988  
F) (6 Jul, K-2, 6) (12 Jul, I-5, 1) (31 Jul, F-10, K-2, 1, 1)  
G) Number of individuals = 9

03233 *Proteoteras crescentana* Kearfott  
B) *Acer negundo* shoots  
D) Miller (1987) p. 64  
E) One record from Resthaven, 1991  
F) (29 Jun, I-4, 1)  
G) Number of individuals = 1

03335 *Epinotia nonana* (Kearfott)  
D) Miller (1987) p. 76  
E) Four records from Resthaven, 1991  
F) (31 Jul, F-10, 4) (13 Aug, J-6, 1) (18 Aug, B-5, D-6, 2, 2)  
(25 Aug, B-6, 1) (26 Aug, H-4, 2) (8 Sep, A-6, 3)  
G) Number of individuals = 15

03351 *Epinotia lindana* (C.H. Fernald)  
B) *Cornus*  
D) Miller (1987) p. 77  
E) Two records from Resthaven, 1991  
F) (8 Sep, A-6, 3)  
G) Number of individuals = 3

- 03359 *Ancylis metamelana* (Walker)  
 B) *Trifolium repens*, *T. pratense*, *T. hybridum*  
 D) Miller (1987) p. 80  
 E) None  
 F) (6 Jul, K-2, J-4, 1, 1) (26 Aug, I-6, G-4, 1, 1)  
 G) Number of individuals = 4
- 03367 *Ancylis burgessiana* (Zeller)  
 B) *Quercus*, *Corylus*, *Prunus*  
 D) Miller (1987) p. 80  
 E) None  
 F) (30 May, E-9, 2) (8 Jun, E-9, 1) (10 Jun, H-8, H-5, 1, 1)  
 G) Number of individuals = 5
- 03374 *Ancylis comptana* (Frolich)  
 A) Strawberry leafroller  
 B) *Fragaria*, *Rubus*  
 D) Miller (1987) p. 81  
 E) Two records from Resthaven, 1990  
 F) (12 Jul, I-5, 1) (31 Aug, I-5, 2)  
 G) Number of individuals = 3
- 03375 *Ancylis divisana* (Walker)  
 B) *Quercus*, *Platanus occidentalis*  
 D) Miller (1987) p. 81  
 E) None  
 F) (26 Aug, H-4, 1)  
 G) Number of individuals = 1
- 03419 *Pammene felicitana* Heinrich  
 D) Miller (1987) p. 85  
 E) None  
 F) (22 Jun, K-2, 1)  
 G) Number of individuals = 1
- 03428 *Grapholita packardi* Zeller  
 A) Cherry fruitworm  
 B) *Pyrus*, *Prunus*, *Crataegus*  
 D) Miller (1987) p. 89  
 E) Two records from Resthaven, 1991  
 F) (8 Jun, E-9, 1) (22 Jun, K-2, 1) (11 Jul, J-6, 1)  
 G) Number of individuals = 3
- 03429 *Grapholita prunivora* (Walsh)  
 A) Lesser appleworm  
 B) *Pyrus*, *Prunus*, *Crataegus*  
 D) Miller (1987) p. 89  
 E) None  
 F) (22 Jun, K-2, 1)  
 G) Number of individuals = 1

03434 *Grapholita fana* (Kearfott)

- B) *Desmodium* buds
- D) Miller (1987) p. 89
- E) None
- F) (8 Jun, E-9, 1)
- G) Number of individuals = 1

03471 *Cydia caryana* (Fitch)

- A) Hickory shuckworm
- B) *Carya*
- D) Miller (1987) p. 94
- E) None
- F) (1 Sep, D-9, 1)
- G) Number of individuals = 1

03492 *Cydia pomonella* (Linnaeus)

- A) Codling moth
- B) *Pyrus* seeds and fruit
- D) Miller (1987) p. 94
- E) One record from Resthaven, 1991
- F) (13 Jun, J-6, 6) (22 Jun, K-2, 1) (29 Jun, I-4, 1)
- G) Number of individuals = 8

03494 *Cydia latiferreana* (Walsingham)

- A) Filbertworm
- B) *Quercus* acorns
- D) Miller (1987) p. 94
- E) None
- F) (26 Jul, G-7, 2) (13 Aug, J-6, G-4, 2, 2) (26 Aug, I-6, H-4, 22, 4) (1 Sep, D-9, 1)
- G) Number of individuals = 33

03495 *Ecdytolopa punctidiscana* (Dyar)

- D) Covell (1984) Pl. 60 (5)
- E) None
- F) (15 Jun, C-6, 1) (29 Jun, I-4, 2) (31 Aug, I-5, 1)
- G) Number of individuals = 4

03497 *Ecdytolopa insiticiiana* Zeller

- A) Locust twig borer
- B) Locust trees
- D) Covell (1984) Pl. 60 (6)
- E) None
- F) (29 Jun, I-4, 1) (6 Jul, J-4, 1) (19 Jul, J-4, 2)
- G) Number of individuals = 4

## Tortricinae

### 03503 *Croesia semipurpurana* (Kearfott)

- A) Oak Leaf-tier moth
- B) Oaks
- D) Covell (1984) Pl. 59 (26)
- E) None
- F) (15 Jun, C-6, I-6, 21, 50) (6 Jul, J-4, 1)
- G) Number of individuals = 72

### 03594 *Pandemis limitata* (Robinson)

- A) Three-lined leafroller moth
- B) Alder, apple, birch, elm, maple, oak
- D) Covell (1984) Pl. 59 (17)
- E) None
- F) (10 Jun, H-5, 2) (15 Jun, C-6, 1) (25 Aug, B-6, 1) (26 Aug, I-6, 2)  
(1 Sep, A-7, 4)
- G) Number of individuals = 10

### 03597 *Argyrotaenia velutinana* (Walker)

- A) Red-banded Leafroller moth
- B) Apple, many others
- D) Covell (1984) Pl. 61 (1, 2)
- E) None
- F) (22 Jun, K-2, 1) (29 Jun, I-4, B-7, 1, 1) (6 Jul, K-2, J-4, 4, 5) (12 Jul, I-5, 5) (1 Sep, D-9, 2)
- G) Number of individuals = 19

### 03623 *Argyrotaenia quercifoliana* (Fitch)

- B) Oaks
- D) Covell (1984) Pl. 61 (4)
- E) None
- F) (10 Jun, H-5, 1) (11 Jul, J-6, 2) (12 Jul, H-4, 1)
- G) Number of individuals = 4

### 03635 *Choristoneura rosaceana* (Harris)

- A) Oblique-banded leafroller
- B) Apple, many others
- D) Covell (1984) Pl. 59 (23, 24)
- E) None
- F) (8 Jun, E-9, 1) (15 Jun, C-6, I-6, 50, 20) (6 Jul, K-2, J-4, 2, 5) (12 Jul, H-5, 1) (26 Aug, H-4, 2)
- G) Number of individuals = 81

### 03637 *Choristoneura conflictana* (Walker)

- E) None
- F) (29 Jun, B-7, 2)
- G) Number of individuals = 2

- 03648 *Archips argyrospila* (Walker)  
 A) Fruit tree leafroller moth  
 B) Apple, pear, others  
 D) Covell (1984) Pl. 59 (19)  
 E) None  
 F) (29 Jun, I-4, H-4, 3, 1)  
 G) Number of individuals = 4
- 03653 *Archips semifera* (Walker)  
 E) None  
 F) (29 Jun, I-4, 1) (30 Jun, E-7, 1)  
 G) Number of individuals = 2
- 03689 *Ptycholoma virescana* (Clemens)  
 E) None  
 F) (6 Jul, K-2, J-4, 1, 1)  
 G) Number of individuals = 2
- 03693 *Xenotemna pallorana* (Robinson)  
 E) Two records from Resthaven, 1987 and 1991  
 F) (8 Jun, E-9, 4) (10 Jun, H-8, 5) (12 Jul, B-7, 1) (26 Aug, H-4, I-6, 1, 5) (1 Sep, D-9, I-5, 12, 3)  
 G) Number of individuals = 31
- 03695 *Sparganothis sulfureana* (Clemens)  
 A) Sparganothis fruitworm moth  
 B) Alfalfa, apple, carrots, cherry, many others  
 D) Covell (1984) Pl. 59 (12)  
 E) None  
 F) (15 Jun, C-6, I-6, 2, 2) (29 Jun, B-7, 1) (6 Jul, K-2, J-4, 8, 10) (12 Jul, I-5, 1) (26 Jul, G-7, 2) (18 Aug, D-6, 1) (26 Aug, H-4, I-6, G-4, 2, 6, 1) (1 Sep, D-9, 5)  
 G) Number of individuals = 41
- 03706 *Sparganothis xanthoides* (Walker)  
 E) Two records from Resthaven, 1991  
 F) (6 Jul, J-4, 1)  
 G) Number of individuals = 1
- 03732 *Platynota flavedana* Clemens  
 B) Apple, clover, maple, sassafras, many others  
 D) Covell (1984) Pl. 59 (14, 15)  
 E) None  
 F) (13 Aug, J-6, 1) (1 Sep, D-9, 2)  
 G) Number of individuals = 3
- 03747 *Coelostathma discopunctana* Clemens  
 E) None  
 F) (8 Jun, E-9, 4)  
 G) Number of individuals = 4

## Cochylidae

### 03801 *Trachysmia birdana* (Busck)

- B) Sunflower roots
- D) Covell (1984) Pl. 60 (13)
- E) None
- F) (26 Jun, E-9, 1) (30 Jun, B-7, 4) (26 Aug, G-4, 1) (1 Sep, A-7, 3)
- G) Number of individuals = 9

### *Aethes* species (undescribed)

- F) (26 Jul, E-9, 2) (18 Aug, C-8, 1) (1 Sep, A-7, 2) (8 Sep, H-5, A-6, 1, 1)
- G) Number of individuals = 7

### 03846 *Aethes rana* (Busck)

- E) None
- F) (31 Jul, K-2, 1)
- G) Number of individuals = 1

## ZYGAENOIDEA

### Limacodidae

### 04652 *Tortricidia testacea* Packard

- B) Beech, birch, black cherry, oaks
- D) Covell (1984) Pl. 55 (24)
- E) None
- F) (15 Jun, C-6, I-6, 21, 5)
- G) Number of individuals = 26

### 04665 *Lithacodes fasciola* (Herrich-Schaffer)

- B) Apple, beech, elms, hickory, oaks
- D) Covell (1984) Pl. 55 (23)
- E) One record from Resthaven, 1988
- F) (8 Jun, E-9, 2) (15 Jun, C-6, 1) (29 Jun, B-7, 2) (6 Jul, K-2, 3)
- G) Number of individuals = 8

### 04667 *Apoda y-inversum* (Packard)

- B) Beech, hickory, oaks
- D) Covell (1984) Pl. 55 (21)
- E) None
- F) (6 Jul, J-4, 1)
- G) Number of individuals = 1

### 04669 *Apoda biguttata* (Packard)

- B) Oaks
- D) Covell (1984) Pl. 55 (25)
- E) None
- F) (6 Jul, J-4, 2)
- G) Number of individuals = 2

04671 *Prolimacodes badia* (Hubner)

- A) Skiff Moth
- B) Birch, hornbeam, oak, poplar, willow
- C) Mitchell/Zim (1987) p. 145
- D) Heitzman (1987) p. 328, Covell (1984) Pl. 56 (5)
- E) None
- F) (29 Jun, I-4, 1)
- G) Number of individuals = 1

04681 *Isa textula* (Herrich-Schaffer)

- B) Elm, hickory, maples, oaks
- D) Covell (1984) Pl. 55 (17)
- E) None
- F) (6 Jul, J-4, 1)
- G) Number of individuals = 1

04697 *Euclea delphinii* (Boisduval)

- A) Spiny Oak-Slug Moth
- B) Apple, maple, oak, sycamore, willow
- C) Mitchell/Zim (1987) p. 145
- D) Heitzman (1987) p. 327, Covell (1984) Pl. 55 (10,14)
- E) None
- F) (8 Jun, I-4, 1) (22 Jun, K-2, 1) (11 Jul, J-6, 1)
- G) Number of individuals = 3

04698 *Parasa chloris* (Herrich-Schaffer)

- A) Smaller Parash
- B) Apple, dogwood, oak, elm
- D) Covell (1984) Pl. 55 (11)
- E) None
- F) (29 Jun, I-4, 1)
- G) Number of individuals = 1

## PYRALOIDEA

### Pyralidae

#### Nymphulinae

04748 *Munroessa icciusalis* (Walker)

- B) Aquatic plants (duckweed, sedges, etc)
- D) Covell (1984) Pl. 57 (25)
- E) One record from Resthaven, 1984
- F) (11 Jul, J-6, 2)
- G) Number of individuals = 2

04755 *Synclita oblitalis* (Walker)

- B) Duckweed, waterlilies, other aquatic plants
- D) Covell (1984) Pl. 57 (27)
- E) None
- F) (1 Sep, D-9, A-7, 1, 1)
- G) Number of individuals = 2

04779 *Petrophila canadensis* (Munroe)

E) None

F) (19 Jul, J-4, 1)

G) Number of individuals = 1

#### Glaphyriinae

04870 *Glaphyria sequistrialis* Hubner

E) One record from Resthaven, 1990

F) (12 Jul, I-5, 2)

G) Number of individuals = 2

04877 *Aethiophysa lentiflualis* (Zeller)

D) Munroe (1972) Pl. 12 (5-7)

E) None

F) (19 Jul, J-4, 1)

G) Number of individuals = 1

04895 *Chalcoela iphitalis* (Walker)

B) *Polistes*, *Mischocyttarus*

D) Munroe (1972) Pl. 12 (45, 46)

E) None

F) (26 Aug, I-6, 1)

G) Number of individuals = 1

#### Pyraustinae

04943 *Crocidophora pustuliferalis* Lederer

B) *Arundinaria*

D) Munroe (1976) Pl. 2 (7-9)

E) None

F) (10 Jun, H-4, 3)

G) Number of individuals = 3

04949 *Ostrinia nubilalis* (Hubner, 1796)

A) European Corn Borer Moth

B) Corn, aster, beans, potatoes, dahlias

C) Mitchell/Zim (1987) p. 148

D) Heitzman (1987) p. 336, Covell (1984) Pl. 57 (20, 21)

E) None

F) (15 Jun, C-6, 81) (31 Jul, K-2, 4) (13 Aug, G-4, J-6, 16, 3)  
(18 Aug, D-6, 16) (26 Aug, H-4, I-6, 8, 3) (1 Sep, D-9, A-7,  
8, 5)

G) Number of individuals = 144

- 04980 *Helvibotys helvialis* (Walker, 1859)  
 B) Amaranth, beets  
 D) Covell (1984) Pl. 57 (12)  
 E) None  
 F) (10 Jun, H-4, H-5, 1, 3)  
 G) Number of individuals = 4
- 05040 *Pyrausta bicoloralis* (Guenee)  
 D) Munroe (1976) Pl. 5 (26-30)  
 E) None  
 F) (15 Jun, C-6, 1)  
 G) Number of individuals = 1
- 05079 *Udea rubigalis* (Guenee)  
 A) Celery leaf-tier moth  
 B) Beans, pest on celery, many others  
 D) Covell (1984) Pl. 56 (25)  
 E) One record from Resthaven, 1987  
 F) (4 Jun, H-4, 1)  
 G) Number of individuals = 1
- 05156 *Nomophila nearctica* Munroe, 1973  
 B) Clover, grasses  
 D) Covell (1984) Pl. 56 (20)  
 E) None  
 F) (23 Sep, D-9, 3)  
 G) Number of individuals = 3
- 05159 *Desmia funeralis* (Hubner, 1796)  
 A) Grape Leaf-folding Moth  
 B) Grape, redbud, Virginia Creeper, evening-primrose  
 C) Mitchell/Zim (1987) p. 148  
 D) Heitzman (1987) p. 331, Covell (1984) Pl. 56 (11)  
 E) None  
 F) (30 May, E-9, 1) (15 Jun, C-6, 3) (30 Jun, B-7, 1) (6 Jul, K-2, 1)  
 (12 Jul, I-5, H-4, 1, 1) (19 Jul, H-7, 1) (26 Jul, J-5, G-7, 1, 1) (31 Jul, K-2, 2) (13 Aug, J-6, 3) (18 Aug, D-6, B-5, 5, 1) (26 Aug, H-4, I-6, 4, 3) (1 Sep, D-9, A-7, 2, 2) (8 Sep, A-6, 2) (23 Sep, D-9, 2)  
 G) Number of individuals = 37
- 05160 *Desmia maculalis* Westwood, 1831  
 B) Grapes  
 D) Covell (1984) Pl. 56 (14)  
 E) None  
 F) (13 Aug, J-6, 1)  
 G) Number of individuals = 1

05226 *Palita magniferalis* (Walker, 1861)

- B) Ash
- D) Covell (1984) Pl. 58 (1)
- E) None
- F) (30 May, J-6, 1)
- G) Number of individuals = 1

#### Ancylolomiinae

05413 *Pediasia trisecta* (Walker, 1856)

- A) Sod Webworm Moth
- B) Grasses
- D) Covell (1984) Pl. 58 (11)
- E) None
- F) (22 Jun, F-10, 1)
- G) Number of individuals = 1

05420 *Microcrambus elegans* (Clemens)

- E) None
  - F) (6 Jul, K-2, J-4, 1, 2) (12 Jul, I-5, H-4, 10, 1) (19 Jul, B-6, H-7, 2, 5) (26 Jul, G-7, J-5, 1, 1) (26 Aug, H-4, 1) (1 Sep, D-9, 4)
  - G) Number of individuals = 28
- 05465 *Vaxi auratella* (Clemens)
- D) Covell (1984) Pl. 59 (7)
  - E) None
  - F) (22 Jun, K-2, 1) (6 Jul, J-4, K-2, 1, 5)
  - G) Number of individuals = 7

#### Chrysauginae

05566 *Arta statalis* A.R. Grote

- E) One record from Resthaven, 1988
- F) (12 Jul, H-4, 1)
- G) Number of individuals = 1

#### Epipaschiinae

05622 *Galleria mellonella* (Linnaeus, 1758)

- A) Greater Wax Moth
- B) Beeswax
- C) Mitchell/Zim (1987) p. 149
- D) Covell (1984) Pl. 58 (13, 16)
- E) One record from Margaretta twp. 1985.
- F) (26 Aug, H-4, 1)
- G) Number of individuals = 1

Phycitinae

- 05651 *Acrobasis indigenella* (Zeller)  
A) Leaf crumpler  
B) *Crataegus, Malus, Prunus, Cydania*  
D) Neunzig (1986) Pl. 2 (18-33)  
E) None  
F) (6 Jul, K-2, 4) (31 Jul, I-9, 1)  
G) Number of individuals = 5

- 05674 *Acrobasis demotella* A. R. Grote  
A) Walnut Shoot Moth  
B) *Carya, Juglans*  
D) Neunzig (1986) Pl. 4 (30-34)  
E) None  
F) (30 May, E-9, 1)  
G) Number of individuals = 1

- 05773 *Salebriaria engeli* (Dyar)  
E) None  
F) (26 Aug, I-6, 2)  
G) Number of individuals = 2

- 05999 *Eulogia ochrifrontella* (Zeller)  
E) None  
F) (8 Jun, E-9, 2)  
G) Number of individuals = 2

Peoriinae

- 06053 *Peoria approximella* (Walker)  
E) None  
F) (8 Jun, I-4, 3) (12 Jul, I-5, 1)  
G) Number of individuals = 4

PTEROPHOROIDEA

Pterophoridae

- 06092 *Geina tenuidactyla* (Fitch)  
E) None  
F) (29 Jun, I-4, 1)  
G) Number of individuals = 1

- 06107 *Platyptilia pallidactyla* (Haworth, 1811)  
E) None  
F) (14 Jun, E-6, 1) (22 Jun, F-10, 2) (19 Jul, H-7, 2)  
G) Number of individuals = 5

DREPANOIDEA

Thyatiridae

06235 *Habrosyne scripta* (Gosse,1840)

- A) Lettered Habrosyne
- B) Birch, blackberry
- D) Covell (1984) Pl. 45 (14)
- E) None
- F) (22 Jun, F-10, 1)
- G) Number of individuals = 1

06237 *Pseudothyatira cymatophoroides* (Guenee,1852)

- A) Tufted Thyatirid
- B) Maple, oak, poplar, willow, roses
- D) Covell (1984) Pl. 45 (11,15)
- E) None
- F) (11 Jul, J-6, 2)
- G) Number of individuals = 2

GEOMETROIDEA

Geometridae

Ennominae

06261 *Heliomata cycladata* Grote & Robinson,1866

- A) Common Spring Moth
- B) Locust
- D) Covell (1984) Pl. 49 (23)
- E) None
- F) (8 Jun, I-4, 2)(15 Jun, C-6, I-6, 10, 1)
- G) Number of individuals = 13

06299 *Itame coortaria* (Hulst,1887)

- A) Four-Spotted Itame
- B) Apple, hawthorn
- D) Covell (1984) Pl. 50 (17)
- E) None
- F) (15 Jun, C-6, 1) (22 Jun, F-10, 32) (29 Jun, I-4, 1)
- G) Number of individuals = 34

06322 *Mellilla xanthometata* (Walker,1862)

- A) Orange Wing
- B) Locust
- D) Heitzman (1987) p. 312, Covell (1984) Pl. 49 (25)
- E) None
- F) (15 Jun, C-6, 4)
- G) Number of individuals = 4

- 06331 *Semiothisa promiscuata* (Ferguson, 1974)  
 A) Promiscuous Angle  
 B) Unknown  
 D) Covell (1984) Pl. 49 (19)  
 E) None  
 F) (30 May, E-9, 1) (15 Jun, C-6, 2) (30 Jun, B-7, 1) (26 Aug, H-4, 2)  
 G) Number of individuals = 6
- 06486 *Tornos scolopacinarius* (Guenee, 1857)  
 A) Dimorphic Gray  
 B) Aster  
 D) Covell (1984) Pl. 50 (22,23)  
 E) None  
 F) (6 Jul, J-4, 1)  
 G) Number of individuals = 1
- 06584 *Anacomptodes humaria* (Guenee, 1857)  
 A) Small Purplish Gray  
 B) Alfalfa, birch, clover, hickory, soybeans  
 D) Covell (1984) Pl. 52 (18)  
 E) None  
 F) (12 Jul, H-4, 1)  
 G) Number of individuals = 1
- 06586 *Anacamptodes defectaria* (Guenee, 1857)  
 A) Brown-Shaded Gray  
 B) Oak, cherry, poplar, willow  
 D) Covell (1984) Pl. 52 (14)  
 E) None  
 F) (10 Jun, H-5, 1) (26 Jul, G-7, 20) (31 Jul, K-2, 1) (26 Aug, I-6, 4)  
 (1 Sep, A-7, D-9, 8, 6) (8 Sep, A-6, 4) (18 Sep, J-7, E-4, 1, 1)  
 G) Number of individuals = 46
- 06588 *Iridopsis larvaria* (Guenee, 1857)  
 A) Bent-Line Gray  
 B) Birch, cherry, maple, poplar, willow  
 D) Covell (1984) Pl. 52 (9)  
 E) None  
 F) (21 May, I-4, 1) (30 May, E-9, 1) (26 Jul, J-5, 1)  
 G) Number of individuals = 3
- 06590 *Anavitrinella pampinaria* (Guenee, 1857)  
 A) Common Gray  
 B) Apple, ash, clover, elm, pear, poplar, willow  
 D) Covell (1984) Pl. 52 (8)  
 E) None  
 F) (12 Jul, H-4, 1)  
 G) Number of individuals = 1

- 06597 *Ectropis crepuscularia* (Denis & Schiffermuller, 1775)  
 A) The Small Engrailed  
 B) Apple, birch, elm, maple, oak, poplar, willow  
 D) Covell (1984) Pl. 52 (15)  
 E) None  
 F) (30 Jun, B-7, 14)  
 G) Number of individuals = 14
- 06621 *Melanolophia signataria* (Walker, 1860)  
 A) Signate Melanolophia  
 B) Elm, alder, birch, maple, oak, poplar, spruce  
 D) Covell (1984) Pl. 52 (2)  
 E) None  
 F) (30 May, E-9, 1)  
 G) Number of individuals = 1
- 06640a *Biston betularia cognataria* (Guenee, 1857)  
 A) Pepper-and-Salt Geometer  
 B) Birch, elm, hackberry, walnut, willow  
 C) Mitchell/Zim (1987) p. 142  
 D) Covell (1984) Pl. 54 (11)  
 E) None  
 F) (30 May, H-4, 1) (15 Jun, I-6, 1) (26 Jul, E-9, 1) (31 Jul, F-10, 1) (13 Aug, G-4, 2) (26 Aug, I-6, 1)  
 G) Number of individuals = 7
- 06654 *Hypagurtis unipunctata* (Haworth, 1809)  
 A) One-Spotted Variet  
 B) Birch, hickory, oak, pine, willow  
 D) Covell (1984) Pl. 51 (9,12)  
 E) None  
 F) (4 Jun, H-4, 1)  
 G) Number of individuals = 1
- 06720 *Lytrosis unitaria* (Herrich-Schaeffer, 1854)  
 A) Common Lytrosis  
 B) Oak, maple, hawthorn  
 D) Covell (1984) Pl. 52 (10)  
 E) None  
 F) (15 Jun, C-6, 1) (22 Jun, K-2, F-10, 3, 3) (30 Jun, B-7, 4)  
 G) Number of individuals = 11
- 06724 *Euchlaena serrata* (Drury, 1770)  
 A) The Saw-Wing  
 B) Aple, maple  
 D) Heitzman (1987) p. 319, Covell (1984) Pl. 51 (15)  
 E) One record Resthaven 1991.  
 F) (22 Jun, K-2, F-10, 1, 1) (30 Jun, B-7, 3) (6 Jul, J-4, 1)  
 G) Number of individuals = 6

- 06726 *Euchlaena obtusaria* (Hubner, 1809-13)  
 A) Obtuse Euchlaena  
 B) Roses and impatiens  
 D) Covell (1984) Pl. 51 (16)  
 E) None  
 F) (4 Jun, H-4, 2) (15 Jun, I-6, C-6, 7, 1)  
 G) Number of individuals = 10
- 06729 *Euchlaena johnsonaria* (Fitch, 1869)  
 A) Johnson's Euchlaena  
 B) Oak, hawthorn, ash, elm, willow  
 D) Covell (1984) Pl. 51 (11)  
 E) None  
 F) (10 Jun, H-5, 2) (15 Jun, C-6, 11) (22 Jun, K-2, 2) (30 Jun, H-4, 2)  
 (31 Jul, K-2, 1) (13 Aug, G-4, J-6, 4, 5) (18 Aug, C-8, D-6, 1, 13)  
 (26 Aug, I-6, H-4, G-4, 3, 17, 3) (1 Sep, I-5, D-9, 1, 14)  
 (8 Sep, H-5, 4)  
 G) Number of individuals = 83
- 06735 *Euchlaena pectinaria* (Denis & Schiffermuller, 1775)  
 A) Forked Euchlaena  
 B) Wild cherry  
 D) Covell (1984) Pl. 51 (14)  
 E) None  
 F) (12 Jul, H-4, 1) (26 Jul, G-7, 1)  
 G) Number of individuals = 2
- 06737 *Euchlaena tigrinaria* (Guenee, 1857)  
 A) Mottled Euchlaena  
 B) Oak, birch  
 D) Covell (1984) Pl. 51 (20)  
 E) None  
 F) (13 Aug, G-4, 1)  
 G) Number of individuals = 1
- 06739 *Euchlaena irraria* (Barnes & McDunnough, 1917)  
 A) Least Marked Euchlaena  
 B) Oak, maple, aspen  
 D) Covell (1984) Pl. 51 (19)  
 E) None  
 F) (10 Jun, H-4, H-5, 2, 14) (15 Jun, C-6, I-6, 12, 3)  
 G) Number of individuals = 31

- 06740 *Xanthotype urticaria* Swett, 1918  
 A) False Crocus Geometer  
 B) Goldenrod, ground-ivy, azalea, dogwood  
 D) Heitzman (1987) p. 321, Covell (1984) Pl. 51 (18)  
 E) None  
 F) (8 Jun, E-9, 2) (10 Jun, H-8, 1) (22 Jun, F-10, 1) (13 Aug, G-4, J-6, 1, 1) (18 Aug, D-6, 2) (26 Aug, H-4, G-4, 1, 1) (1 Sep, D-9, A-7, 1, 3)  
 G) Number of individuals = 14
- 06743 *Xanthotype sospeta* (Drury, 1773)  
 A) Crocus Geometer  
 B) Basswood, dogwood, hickory, red maple, strawberry  
 D) Covell (1984) Pl. 51 (21)  
 E) None  
 F) (4 Jun, H-4, 1)  
 G) Number of individuals = 1
- 06753 *Pero honestaria* (Walker, 1860)  
 A) Honest Pero  
 B) Locust, wild cherry  
 D) Covell (1984) Pl. 54 (17)  
 E) None  
 F) (14 May, H-6, 2) (21 May, I-4, 3) (10 Jun, H-8, 2) (26 Jul, G-7, 2) (31 Jul, I-9, K-2, 1, 3) (13 Aug, G-4, J-6, 3, 10) (18 Aug, D-6, C-8, 8, 1) (26 Aug, I-6, H-4, 2, 1)  
 G) Number of individuals = 38
- 06763 *Nacophora quenaria* (J.E. Smith, 1797)  
 A) Oak Beauty  
 B) Hawthorn, basswood, wild cherry, willow, birch, elm  
 D) Covell (1984) Pl. 54 (2)  
 E) None  
 F) (14 May, I-4, 1) (15 Jun, C-6, 2)  
 G) Number of individuals = 3
- 06796 *Campaea perlata* (Guenee, 1857)  
 A) Pale Beauty  
 B) Alder, birch, elm, maple, oak, poplar, willow  
 D) Covell (1984) Pl. 48 (14)  
 E) None  
 F) (30 May, E-9, 3) (4 Jun, H-4, 3) (8 Jun, E-9, 23) (10 Jun, H-4, H-5, 3, 1) (15 Jun, C-6, I-6, 3, 1) (26 Aug, H-4, 6) (1 Sep, A-7, 5) (8 Sep, H-5, A-6, 3, 5) (23 Sep, C-5, E-9, 2, 3)  
 G) Number of individuals = 61

- 06798 *Ennomos subsignaria* (Hubner, 1823)  
 A) Elm Spanworm Moth  
 B) Apple, birch, elm, oak, maple  
 C) Mitchell/Zim (1987) p. 142  
 D) Covell (1984) Pl. 48 (5)  
 E) None  
 F) (30 Jun, B-7, 4)  
 G) Number of individuals = 4
- 06819 *Metanema inatomaria* Guenee, 1857  
 A) Pale Metanema  
 B) Aspen, birch, poplar, willow, pine  
 D) Covell (1984) Pl. 54 (9)  
 E) None  
 F) (21 May, I-4, 2) (8 Jun, E-9, 2)  
 G) Number of individuals = 4
- 06826 *Metarranthis hypochraria* (Herrich-Schaeffer, 1854)  
 A) Common Metarranthis  
 B) Apple, choke cherry, sassafras, wild cherry  
 D) Covell (1984) Pl. 54 (20)  
 E) None  
 F) (4 Jun, H-4, 2) (10 Jun, H-5, 5) (15 Jun, C-6, 7) (30 Jun, F-9, 1)  
 G) Number of individuals = 15
- 06841 *Plagodis kuetzingi* (Grote, 1876)  
 A) Purple Plagodis  
 B) Ash  
 D) Covell (1984) Pl. 53 (5)  
 E) None  
 F) (26 Jul, E-9, 1)  
 G) Number of individuals = 1
- 06843 *Plagodis fervidaria* (Herrich-Schaeffer, 1854)  
 A) Fervid Plagodis  
 B) Ash, birch, maple, oak, cherry  
 D) Covell (1984) Pl. 53 (3)  
 E) None  
 F) (21 May, I-4, 1)  
 G) Number of individuals = 1
- 06844 *Plagodis alcoolaria* (Guenee, 1857)  
 A) Hollow-Spotted Plagodis  
 B) Basswood, beech, maple, oak  
 D) Covell (1984) Pl. 53 (4,6)  
 E) None  
 F) (15 Jun, C-6, 3) (13 Aug, G-4, 1)  
 G) Number of individuals = 4

- 06885 *Besma quercivoraria* (Walker, 1862)  
 A) Oak Besma  
 B) Oak, elm, poplar, willow  
 D) Covell (1984) Pl. 53 (19, 20)  
 E) None  
 F) (30 May, E-9, 1)  
 G) Number of individuals = 1
- 06912 *Sicya macularia* (Harris, 1850)  
 A) Sharp-Lined Yellow  
 B) Ash, birch, poplar, willow  
 D) Covell (1984) Pl. 53 (14)  
 E) None  
 F) (30 Jun, B-7, 2)  
 G) Number of individuals = 2
- 06941 *Eusarca confusaria* Hubner, 1813  
 A) Confused Eusarca  
 B) Asters, clover, dandelion, goldenrod  
 D) Covell (1984) Pl. 56 (6)  
 E) Two records from Resthaven 1991  
 F) (8 Jun, I-4, 1) (10 Jun, H-8, 2) (15 Jun, C-6, 2) (30 Jun, H-4, 1)  
 (6 Jul, K-2, J-4, 2, 3) (12 Jul, I-5, B-7, H-4, 3, 1, 4) (26 Jul, J-5, G-7, E-9, 1, 14, 1) (31 Jul, I-9, 2) (13 Aug, G-4, 2) (18 Aug, C-8, 2) (26 Aug, H-4, G-4, I-6, 6, 2, 12) (1 Sep, A-7, D-9, I-5, 5, 12, 1) (8 Sep, A-6, H-5, 1, 6) (23 Sep, D-9, 1)  
 G) Number of individuals = 87
- 06963 *Tetracis crocallata* Guenee, 1857  
 A) Yellow Slant-Line  
 B) Sumac, willow  
 D) Covell (1984) Pl. 55 (7)  
 E) One record from Margaretta twp. 1991.  
 F) (30 Jun, E-9, 4) (31 Jul, K-2, 1)  
 G) Number of individuals = 5
- 06966 *Eutrapola clemataria* (J.E. Smith, 1797)  
 A) Curve-Toothed Geometer  
 B) Maple, ash, birch, willow, walnut, poplar  
 D) Heitzman (1987) p. 324, Covell (1984) Pl. 55 (1)  
 E) None  
 F) (14 May, H-6, 1)  
 G) Number of individuals = 1

06982 *Prochoerodes transversata* (Drury, 1770)

- A) Large Maple Spanworm Moth
- B) Apple, cherry, grasses, maple, oak, walnut, soybean
- C) Mitchell/Zim (1987) p. 143, Wright (1993) p. 32
- D) Covell (1984) Pl. 56 (2)
- E) One record from Margaretta twp. 1991.
- F) (30 Jun, B-7, H-4, 9, 2) (6 Jul, J-4, K-2, 2, 1, 2) (1 Sep, A-7, 1) (8 Sep, A-6, 2) (18 Sep, E-4, F-10, J-7, 2, 1, 2) (23 Sep, E-9, D-9, C-5, 13, 3, 15)
- G) Number of individuals = 55

06987 *Antepione thisoaria* (Guenee, 1857)

- A) Variable Antepione
- B) Apple, maple, sumac, many other plants
- D) Covell (1984) Pl. 55 (2,5)
- E) One record Erie Co. 1986.
- F) (21 May, I-4, 1) (31 Jul, K-2, 2)
- G) Number of individuals = 3

Geometrinae

07071 *Chlorochlamys chloroleucaria* (Guenee, 1857)

- A) Blackberry Looper Moth
- B) Blackberry, aster, daisy, sunflower, coneflower
- D) Covell (1984) Pl. 46 (12)
- E) None
- F) (26 Aug, I-6, H-4, 1, 1)
- G) Number of individuals = 2

Sterrhinae

07146 *Haematopis grataria* (Fabricius, 1798)

- A) Chickweed Geometer
- B) Chickweed, clover, smartweed, knotweed
- D) Covell (1984) Pl. 46 (21)
- E) None
- F) (13 Aug, J-6, G-4, 1, 1) (26 Aug, I-6, H-4, 2, 1) (1 Sep, D-9, A-7, 1, 1)
- G) Number of individuals = 7

07147 *Calothyranis amaturaria* (Walker, 1866)

- A) Cross-Lined Wave
- B) Dock
- D) Covell (1984) Pl. 46 (14)
- E) None
- F) (11 Jul, J-6, 1)
- G) Number of individuals = 1

07159 *Scopula limboundata* (Haworth, 1809)  
A) Large Lace-Border  
B) Apple, bedstraw, clover, dandelion, wild cherry  
D) Covell (1984) Pl. 48 (2,3)  
E) One record from Sandusky 1903.  
F) (6 Jul, K-2, 1) (13 Aug, G-4, 1) (8 Sep, A-6, 2)  
G) Number of individuals = 4

07196 *Eulithis diversilineata* (Hubner, 1813)  
A) Lesser Grapevine Looper Moth  
B) Grape, Virginia creeper  
D) Covell (1984) Pl. 49 (5)  
E) None  
F) (22 Jun, K-2, J-8, 2, 1) (30 Jun, B-7, H-4, 4, 3) (6 Jul, K-2, J-4, 22, 2)  
(26 Jul, G-7, 1) (31 Jul, K-2, F-10, 2, 2) (26 Aug, B-6, 1)  
G) Number of individuals = 40

#### Larentiinae

07388 *Xanthorhoe ferrugata* (Clerck, 1759)  
A) Red Twin-Spot  
B) Chickweed, ground ivy, many ground plants  
D) Covell (1984) Pl. 49 (7)  
E) None  
F) (1 Sep, D-9, 5) (8 Sep, H-5, 2)  
G) Number of individuals = 7

07394 *Epirrhoe alternata* (Muller, 1764)  
A) White-Banded Toothed Carpet  
B) Bedstraw  
D) Covell (1984) Pl. 47 (23)  
E) None  
F) (30 May, E-9, 1)  
G) Number of individuals = 1

07399 *Euphyia unangulata intermediata* (Guenee, 1857)  
A) Sharp-Angled Carpet  
B) Elm, mustard, chickweed  
D) Covell (1984) Pl. 47 (22)  
E) None  
F) (15 Jun, C-6, 1)  
G) Number of individuals = 1

07440 *Eubaphe mendica* (Walker, 1854)  
A) The Beggar  
B) Maple, violet  
D) Heitzman (1987) p. 311, Covell (1984) Pl. 49 (17)  
E) Twenty one records from Erie Co. 1986.  
F) (8 Jun, E-9, 1) (15 Jun, C-6, 1) (22 Jun, F-10, 2) (30 Jun, B-7, 2) (6 Jul, K-2, 1) (12 Jul, H-4, 1)  
G) Number of individuals = 8

07687 *Phyllodesma americana* (Harris, 1874)

- A) Lappet Moth
- B) Alder, birch, oak, poplar, willow, roses
- D) Covell (1984) Pl. 8 (5)
- E) One record from Margaretta twp. 1987.
- F) (14 May, I-4, 3) (21 May, I-4, 1) (30 Jun, H-4, 2) (12 Jul, B-7, 3) (26 Jul, G-7, 1) (31 Jul, F-10, 1)
- G) Number of individuals = 11

07701 *Malacosoma americanum* (Harris, 1879)

- A) Eastern Tent Caterpillar Moth
- B) Many trees, cherry, rose family
- C) Mitchell/Zim (1987) p. 138, Wright (1993) p. 85, Covell (1984) Pl. 1 (16)
- D) Heitzman (1987) p. 304, Covell (1984) Pl. 11 (1)
- E) None
- F) (15 Jun, C-6, 1) (22 Jun, F-10, J-8, 1, 1) (30 Jun, B-7, 6)
- G) Number of individuals = 9

Saturniidae

07704 *Eacles imperialis* (Drury, 1773)

- A) Imperial Moth
- B) Birch, oak, pine, walnut, maple, sweetgum
- C) Mitchell/Zim (1987) p. 109, Wright (1993) p. 59
- D) Heitzman (1987) p. 233, Covell (1984) Pl. 9 (5)
- E) None
- F) (6 Jul, J-4, 1) (11 Jul, J-6, 2)
- G) Number of individuals = 3

07709 *Sphingicampa bicolor* (Harris, 1841)

- A) Honey Locust Moth
- B) Honey Locust, Kentucky Coffee Tree
- C) Mitchell/Zim (1987) p. 106
- D) Heitzman (1987) p. 230, Covell (1984) Pl. 8 (6,11,13)
- E) None
- F) (21 May, I-4, 2) (25 Aug, B-6, 1)
- G) Number of individuals = 3

07715 *Dryocampa rubicunda* (Fabricius, 1793)

- A) Rosy Maple Moth
- B) Maple, oak
- C) Mitchell/Zim (1987) p. 106
- D) Heitzman (1987) p. 229, Covell (1984) Pl. 8 (15, 16)
- E) None
- F) (15 Jun, C-6, 3)
- G) Number of individuals = 3

07746 *Automeris io* (Fabricius, 1775)

- A) IO Moth
- B) Birch, oak, maple, willow, raspberry, cherry, grasses and others
- C) Heitzman (1987) p. 370, Mitchell/Zim (1987) p. 103
- D) Heitzman (1987) p. 226, Covell (1984) Pl. 10 (2,4)
- E) One record from Castalia 1932.
- F) (8 Jun, E-9, 1) (15 Jun, I-6, F-10, 2, 1) (22 Jun, F-10, 3) (29 Jun, I-4, 2) (30 Jun, F-9, B-7, 1, 2) (12 Jul, B-7, 3)
- G) Number of individuals = 15

07757 *Antheraea polyphemus* (Cramer, 1776)

- A) Polyphemus Moth
- B) Birch, hickory, maple, oak, pine and many other trees
- C) Mitchell/Zim (1987) p. 99, Heitzman (1987) p. 369, Wright (1993) p.57
- D) Heitzman (1987) p. 225, Covell (1984) Pl. 9 (7)
- E) None
- F) (21 May, I-4, 1) (12 Jul, I-5, 1)
- G) Number of individuals = 2

07758 *Actias luna* (Linnaeus, 1758)

- A) Luna Moth
- B) Walnut, hickory, sweet gum, birch, cherry, willows
- C) Mitchell/Zim (1987) p. 102, Wright (1993) p. 53, Covell (1984) Pl. 1 (6)
- D) Heitzman (1987) p. 224, Covell (1984) Pl. 9 (8)
- E) None
- F) (8 Jun, E-9, 1)
- G) Number of individuals = 1

SPHINGOIDEA

Sphingidae

07775 *Manduca sexta* (Linnaeus, 1763)

- A) Carolina Sphinx
- B) Tomato, potato, tobacco, pepper
- C) Mitchell/Zim (1987) p. 82, Wright (1993) p. 62, Covell (1984) Pl. 1 (1)
- D) Heitzman (1987) p. 202, Covell (1984) Pl. 3 (7)
- E) One record from Margaretta twp. 1986
- F) (13 Aug, G-4, 1)
- G) Number of individuals = 1

07787 *Ceratomia undulosa* (Walker, 1856)  
A) Waved Sphinx  
B) Ash, hawthorn, lilac, oak  
C) Wright (1993) p. 61  
D) Covell (1984) Pl. 4 (10)  
E) None  
F) (15 Jun, F-10, I-6, 2, 1) (29 Jun, I-4, 1) (11 Jul, J-6, 1)  
G) Number of individuals = 5

07821 *Smerinthus jamaicensis* (Drury, 1773)  
A) Twin-Spotted Sphinx  
B) Apple, ash, birch, elm, willow, cottonwood  
D) Heitzman (1987) p. 208, Covell (1984) Pl. 6 (4)  
E) Six records from Margaretta twp. 1986.  
F) (8 Jun, E-9, 1) (26 Jul, G-7, 1) (13 Aug, G-4, J-6, 1, 1)  
G) Number of individuals = 4

07822 *Smerinthus cerisyi* Kirby, 1837  
A) One-Eyed Sphinx  
B) Pear, plum, poplar, willow  
C) Mitchell/Zim (1987) p. 90  
D) Covell (1984) Pl. 6 (1)  
E) One record Erie Co. 1942.  
F) (22 Jun, F-10, 1)  
G) Number of individuals = 1

07824 *Paonias excaecatus* (J. E. Smith, 1797)  
A) Blinded Sphinx  
B) Basswood, birch, oak, cherry, poplar, *Prunus* spp.  
D) Heitzman (1987) p. 209, Covell (1984) Pl. 6 (3)  
E) One record from Erie Co. 1985.  
F) (6 Jul, J-4, 1) (12 Jul, I-5, 1) (19 Jul, J-4, 4)  
G) Number of individuals = 6

07825 *Paonias myops* (J. E. Smith, 1797)  
A) Small-eyed sphinx  
B) Birch, hawthorn, poplar, willow, wild cherry  
C) Mitchell/Zim (1987) p. 90  
D) Heitzman (1987) p. 210, Covell (1984) Pl. 6 (2)  
E) None  
F) (14 May, H-6, 1) ( 21 May, I-4, 1) (30 May, E-9, 2) (4Jun,  
H-4, 1)  
(15 Jun, I-6, 1) (22 Jun, J-8, 1) (26 Jul, J-5, 1) (31 Jul,  
I-9, 1) (13 Aug, G-4, 2) (26 Aug, H-4, I-6, 1, 1)  
G) Number of individuals = 13

- 07827 *Laothoe juglandis* (J. E. Smith, 1797)  
 A) Walnut Sphinx  
 B) Walnut, hickory, butternut  
 C) Heitzman (1987) p. 369, Mitchell/Zim (1987) p. 91  
 D) Heitzman (1987) p. 211, Covell (1984) Pl. 6 (5)  
 E) One record from Margaretta twp. 1986.  
 F) (8 Jun, E-9, 1) (15 Jun, E-9, 1) (22 Jun, F-10, 1)  
 G) Number of individuals = 3
- 07855 *Hemaris diffinis* (Boisduval, 1836)  
 A) Snowberry Clearwing  
 B) Dogbane, honeysuckle  
 C) Mitchell/Zim (1987) p. 94  
 D) Covell (1984) Pl. 6 (19)  
 E) None  
 F) (15 May, H-7, I-6, 1, 1) (6 Jul, F-5, H-4, 1, 2) (26 Aug, I-4, 2)  
 G) Number of individuals = 7
- 07859 *Eumorpha pandorus* (Hubner, 1821)  
 A) Pandorus Sphinx  
 B) Grape, Virginia Creeper  
 C) Mitchell/Zim (1987) p. 93, Wright (1993) p. 69  
 D) Heitzman (1987) p. 215, Covell (1984) Pl. 3 (13)  
 E) One record from Margaretta twp. 1986.  
 F) (18 Jul, J-4, 1)  
 G) Number of individuals = 1
- 07871 *Deidamia inscripta* (Harris, 1839)  
 A) Lettered Sphinx  
 B) Ampolopsis, grape, Virginia Creeper  
 D) Covell (1984) Pl. 6 (14)  
 E) None  
 F) (8 Jun, E-9, 1)  
 G) Number of individuals = 1
- 07885 *Darapsa myron* (Cramer, 1780)  
 A) Hog Sphinx or Virginia Creeper Sphinx  
 B) Virginia Creeper, grape  
 C) Mithcell/Zim (1987) p. 92, Wright (1993) p.65  
 D) Heitzman (1987) p. 216, Covell (1984) Pl. 6 (11)  
 E) One record from Margaretta twp. 1986.  
 F) (22 Jun, K-2, 1) (18 Jul, J-4, 1) (31 Jul, I-9, K-2, 1, 1)  
 (25 Aug, B-6, 1)  
 G) Number of individuals = 5

## NOCTUOIDEA

### Notodontidae

- 07896 *Clostera inclusa* (Hubner, 1829-31)  
A) Angle-Lined Prominent  
B) Poplar, willow, aspen  
C) Mitchell/Zim (1987) p. 132  
D) Covell (1984) Pl. 42 (12)  
E) None  
F) (14 May, H-6, 1)  
G) Number of individuals = 1
- 07902 *Datana ministra* (Drury, 1773)  
A) Yellow-Necked Caterpillar Moth  
B) Apple, walnut, hickory, birch  
C) Mitchell/Zim (1987) p. 133  
D) Covell (1984) Pl. 43 (1)  
E) None  
F) (15 Jun, I-6, F-10, C-6, 1, 1, 3) (22 Jun, F-10, 1) (30 Jun, H-4, F-9, B-7, 1, 1, 2) (6 Jul, J-6, J-4, 1, 1) (12 Jul, B-7, 1) (26 Jul, J-5, 1) (25 Aug, B-6, 1)  
G) Number of individuals = 15
- 07903 *Datana angusii* Grote & Robinson, 1866  
A) Angus's *Datana*  
B) Birch, hickory, walnut, linden  
D) Covell (1984) Pl. 43 (5)  
E) None  
F) (22 Jul, F-10, 5)  
G) Number of individuals = 5
- 07907 *Datana integerrima* Grote & Robinson, 1866  
A) Walnut Caterpillar Moth  
B) Walnut, hickory, oak  
D) Mitchell/Zim (1987) p. 133, Covell (1984) Pl. 43 (10)  
E) None  
F) (15 Jun, C-6, 3) (22 Jun, F-10, 1) (11 Jul, J-6, 1) (26 Jul, E-9, 7) (31 Jul, K-2, 1)  
G) Number of individuals = 13
- 07915 *Nadata gibbosa* (J. E. Smith, 1797)  
A) White-Dotted Prominent  
B) Oak, birch, cherry, maple, plum  
C) Mitchell/Zim (1987) p. 135  
D) Heitzman (1987) p. 295, Covell (1984) Pl. 43 (14)  
E) None  
F) (21 May, I-4, 2) (8 Jun, I-4, 3) (10 Jun, H-5, H-4, 2, 3) (15 Jun, C-6, F-10, I-6, 10, 2, 3) (6 Jul, J-4, 1) (12 Jul, H-4, 1) (19 Jul, J-4, 2) (31 Jul, F-10, 1) (13 Aug, J-6, G-4, 5, 2) (18 Aug, D-6, 1)  
G) Number of individuals = 38

- 07917 *Hyperaeschra georgica* (Herrich-Schaffer, 1855)  
 A) Georgian Prominent  
 B) Oak  
 D) Covell (1984) Pl. 42 (8)  
 E) None  
 F) (21 May, I-4, 1) (4 Jun, H-4, 4) (10 Jun, H-4, H-5, 4, 1)  
 (12 Jul, I-5, 1)  
 G) Number of individuals = 11
- 07920 *Peridea angulosa* (J. E. Smith, 1797)  
 A) Angulose Prominent  
 B) Oak  
 D) Covell (1984) Pl. 43 (16)  
 E) None  
 F) (4 Jun, H-4, 5) (10 Jun, H-4, H-5, 16, 12) (15 Jun, I-6,  
 C-6, 12, 40)  
 (22 Jun, F-10, 5) (30 Jun, H-4, 3) (12 Jul, J-6, I-5, 1, 3)  
 (13 Aug, J-6, G-4, 28, 6) (26 Aug, H-4, 21) (1 Sep, D-9, 1)  
 G) Number of individuals = 153
- 07922 *Pheosia rimosa* Packard, 1864  
 A) Black-Rimmed Prominent  
 B) Poplar, willow  
 D) Heitzmzn (1987) p. 294, Covell (1984) Pl. 42 (15)  
 E) None  
 F) (21 May, I-4, 2) (8 Jun, E-9, 1) (15 Jun, F-10, 1) (30 Jun,  
 H-4, 1) (12 Jul, I-5, 1) (31 Jul, F-10, 1) (18 Aug, D-6, 7)  
 G) Number of individuals = 14
- 07924 *Odontosia elegans* (Stredker, 1885)  
 A) Elegant Prominent  
 B) Poplar  
 D) Covell (1984) Pl. 44 (3)  
 E) None  
 F) (30 Jun, B-7, 5)  
 G) Number of individuals = 5
- 07929 *Nerice bidentata* Walker, 1855  
 A) Double-Toothed Prominent  
 B) Elm  
 C) Holland (1968) Pl. 1 (15)  
 D) Heitzman (1987) p. 296, Covell (1984) Pl. 43 (4)  
 E) None  
 F) (31 Jul, K-2, 1)  
 G) Number of individuals = 1

- 07930 *Ellida caniplaga* (Walker, 1856)  
 A) Linden Prominent  
 B) Linden  
 D) Covell (1984) Pl. 42 (13)  
 E) One record from Margaretta twp. 1987.  
 F) (15 Jun, C-6, 1)  
 G) Number of individuals = 1
- 07931 *Gluphisia septentrionis* Walker, 1855  
 A) Common Gluphisia  
 B) Poplar  
 D) Covell (1984) Pl. 43 (18)  
 E) Two records from Margaretta twp. 1986.  
 F) (12 Jul, H-4, 1) (26 Jul, G-7, 3) (31 Jul, F-10, 2) (18 Aug, C-8, D-6, 1, 2) (26 Aug, G-4, 1)  
 G) Number of individuals = 10
- 07936 *Furcula borealis* (Guerin-Meneville, 1832)  
 A) White Furcula  
 B) Poplar, cherry, willow  
 D) Covell (1984) Pl. 44 (15)  
 E) One record from Huron twp. 1982.  
 F) (15 Jun, C-6, 1)  
 G) Number of individuals = 1
- 07937 *Furcula cinerea* (Walker, 1865)  
 A) Gray Furcula  
 B) Willow, poplar, birch, aspen  
 D) Heitzman (1987) p. 299, Covell (1984) Pl. 44 (14)  
 E) One record from Margaretta twp. 1986.  
 F) (6 Jul, J-4, 1) (31 Jul, K-2, 1)  
 G) Number of individuals = 2
- 07974 *Micogada unicolor* (Packard, 1864)  
 A) Drab Prominent  
 B) Cottonwood, sycamore  
 D) Covell (1984) Pl. 44 (11)  
 E) One record from Margaretta twp. 1986 One record from Huron twp. 1987.  
 F) (25 Aug, B-6, 1)  
 G) Number of individuals = 1
- 07975 *Macrurocampa marthesia* (Cramer, 1780)  
 A) Mottled Prominent  
 B) Maple, oak, poplar  
 D) Covell (1984) Pl. 42 (20)  
 E) None  
 F) (11 Jul, J-6, 1)  
 G) Number of individuals = 1

07983 *Heterocampa obliqua* Packard, 1864

- A) Oblique *Heterocampa*
- B) Oak
- D) Covell (1984) Pl. 43 (17,19)
- E) None
- F) (30 Jun, H-4, 6) (6 Jul, J-4, 5) (11 Jul, J-6, 1) (13 Aug, G-4, J-6, 1, 1)
- G) Number of individuals = 14

07990 *Heterocampa umbrata* Walker, 1855

- A) White-Bloched *Heterocampa*
- B) Oak
- D) Covell (1984) Pl. 44 (1)
- E) None
- F) (11 Jul, J-6, 1)
- G) Number of individuals = 1

07994 *Heterocampa guttivitta* (Walker, 1855)

- A) Saddled Prominent
- B) Apple, beech, birch, maple, sumac
- D) Covell (1984) Pl. 44 (6)
- E) None
- F) (10 Jun, H-5, 4)
- G) Number of individuals = 4

07995 *Heterocampa biundata* Walker, 1855

- A) Wavy-Line *Heterocampa*
- B) Beech, birch, cherry, hickory, maple, willow
- D) Covell (1984) Pl. 44 (4)
- E) One record from Margaretta twp. 1986.
- F) (14 May, H-6, 1) (31 Jul, K-2, 1)
- G) Number of individuals = 2

07999 *Lochmaeus bilineata* (Packard, 1864)

- A) Double-Lined *Heterocampa*
- B) Birch, cherry, hickory, maple, willow
- D) Covell (1984) Pl. 42 (14)
- E) One record from Margaretta twp. --no date.
- F) (26 Jul, E-9, 1)
- G) Number of individuals = 1

08005 *Schizura ipomoeae* Doubleday, 1841

- A) Morning-Glory Prominent
- B) Birch, elm, maple, morning-glory, oak
- D) Covell (1984) Pl. 42 (19,21)
- E) Three records from Margaretta twp. 1986-1987.
- F) (30 May, E-9, 1) (15 Jun, C-6, 1) (30 Jun, C-6, 1)
- G) Number of individuals = 3

- 08007 *Schizura unicornis* (J. E. Smith, 1797)  
A) Unicorn Caterpillar Moth  
B) Birch, cherry, hickory, willow, buckeye, oak, roses  
C) Mitchell/Zim (1987) p. 135  
D) Covell (1984) Pl. 44 (10)  
E) One record from Margaretta twp. 1986.  
F) (26 Jul, D-6, 1) (31 Jul, F-10, I-9, 1, 2)  
G) Number of individuals = 4

- 08017 *Oligocentria lignicolor* (Walker, 1855)  
A) White-Streaked Prominent  
B) Birch, oak  
D) Covell (1984) Pl. 42 (18)  
E) None  
F) (11 Jul, J-6, 1)  
G) Number of individuals = 1

#### Arctiidae

- 08089 *Hypoprepia miniata* (Kirby, 1837)  
A) Scarlet-Winged Lichen Moth  
B) Lichens, mosses on trees  
D) Heitzman (1987) p. 235, Covell (1984) Pl. 12 (5)  
E) One record from Margaretta twp. 1986.  
F) (15 Jun, C-6, 2) (18 Aug, D-6, 9) (26 Aug, H-4, 2) (1 Sep, A-7, 1) (8 Sep, A-6, 2)  
G) Number of individuals = 16

- 08090 *Hypoprepia fucosa* Hubner, 1827-31  
A) Painted Lichen Moth  
B) Lichens  
D) Covell (1984) Pl. 12 (2)  
E) Two records from Margaretta twp. 1986. One record from Margaretta Twp. 1987.  
F) (19 Jul, H-7, 12) (26 Jul, E-9, G-7, 2, 1) (31 Jul, K-2, F-10, 5, 17)  
(13 Aug, G-4, J-6, 4, 2)  
G) Number of individuals = 43

- 08107 *Haploa clymene* (Brown, 1776)  
A) Clymene Moth  
B) Oak, willow, peach  
C) Mitchell/Zim (1987) p. 113  
D) Covell (1984) Pl. 15 (15)  
E) None  
F) (11 Jul, J-6, 3) (26 Jul, E-9, 2)  
G) Number of individuals = 5

08111 *Haploa lecontei* (Guerin-Maneville, 1832)

- A) Leconte's Haploa
- B) Apple, blackberry, spearmint
- D) Covell (1984) Pl. 16 (3,6)
- E) One record from Margaretta twp. 1979.
- F) (15 Jun, C-6, 1) (22 Jun, F-10, 4) (30 Jun, B-7, H-4, 12, 1)
- G) Number of individuals = 18

08112 *Haploa confusa* (Lyman, 1887)

- A) Confused Haploa
- B) Hound's-tongue
- D) Covell (1984) Pl. 16 (8)
- E) Ten records from Margaretta twp. 1978-1987.
- F) (29 Jun, I-4, 1) (30 Jun, B-7, 2) (6 Jul, K-2, J-4, 14, 2)  
(12 Jul, H-4, 1)
- G) Number of individuals = 20

08121 *Holomelina aurantiaca* (Hubner, 1827-31)

- A) Orange Holomelina
- B) Dandelion, pigweed, plantain, corn
- D) Covell (1984) Pl. 14 (8,13)
- E) One record from Margaretta twp. 1991.
- F) (8 Jun, I-4, 6) (13 Aug, G-4, J-6, 9, 9) (26 Aug, H-4, I-6,  
9, 13)
- G) Number of individuals = 46

08129 *Pyrrharctia isabella* (J. E. Smith, 1797)

- A) Isabella Tiger Moth
- B) Birch, clover, corn, maple, almost any herbaceous plant
- C) Covell (1984) Pl. 1 (17), Mitchell/Zim (1987) p. 111,  
Wright (1993) p. 99
- D) Heitzman (1987) p. 246, Covell (1984) Pl. 14 (12)
- E) None
- F) (14 May, H-6, 1) (30 May, E-9, 3) (4 Jun, H-4, 3) (8 Jun,  
E-9, 5) (15 Jun, C-6, 2) (22 Jun, J-8, F-10, 1, 1) (30 Jun,  
H-4, 1) (13 Aug, G-4, 1) (26 Aug, H-4, 1)
- G) Number of individuals = 19

08131 *Estigmene acrea* (Drury, 1773)

- A) Acrea Moth or Salt Marsh Caterpillar Moth
- B) Apple, clover, corn, tobacco, garden plants
- C) Mitchell/Zim (1987) p. 111
- D) Heitzman (1987) p. 247, Covell (1984) Pl. 13 (13,16)
- E) One record Huron twp. 1982. One record Oxford twp. 1985.
- F) (26 Jul, J-5, G-7, 3, 1) (13 Aug, G-4, 2) (23 Sep, C-5, 1)
- G) Number of individuals = 7

- 08133 *Spilosoma latipennis* Stretch, 1872  
 A) Pink-Legged Tiger Moth  
 B) Ash, dandelion, plantain  
 D) Covell (1984) Pl. 13 (3)  
 E) None  
 F) (15 Jun, C-6, 1)  
 G) Number of individuals= 1
- 08137 *Spilosoma virginica* (Fabricius, 1798)  
 A) Virginian Tiger Moth  
 B) Birch, cabbage, corn, maple, walnut, willow, general feeder  
 C) Mithcell/Zim (1987) p. 115  
 D) Heitzman (1987) p. 245, Covell (1984) Pl. 13 (4)  
 E) None  
 F) (14 May, H-6, 2) (21 May, I-4, 2) (4 Jun, H-4, 1) (10 Jun, H-8, H-4, 1, 3) (15 Jun, C-6, 6) (22 Jun, K-2, F-10, J-8, 2, 1, 3) (30 Jun, B-7, 2) (6 Jul, K-2, 1) (19 Jul, H-7, 3) (26 Jul, E-9, J-5, G-7, 3, 3, 6) (31 Jul, F-10, K-2, 1, 4) (13 Aug, J-6, G-4, 2, 9) (18 Aug, D-6, 9) (1 Sep, A-7, 2)  
 G) Number of individuals = 66
- 08157 *Phragmatobia lineata* Newman & Donahue, 1966  
 A) Lined Ruby Tiger Moth  
 B) Eupatorium spp.  
 D) Covell (1984) Pl. 14 (9)  
 E) Five records from Margaretta twp. 1986-1987.  
 F) (22 Jun, K-2, J-8, 1, 1) (30 Jun, F-9, 1) (6 Jul, J-4, 1) (26 Aug, G-4, I-6, 1, 4)  
 G) Number of individuals = 9
- 08169 *Apantesis phalerata* (Harris, 1841)  
 A) Harnessed Moth  
 B) Clover, dandelion, plantain, and other plants  
 D) Covell (1984) Pl. 15 (8)  
 E) None  
 F) (8 Jun, E-9, I-4, 3, 1) (30 Jun, F-9, 1) (26 Jul, G-7, J-5, 1, 5) (31 Jul, K-2, 18) (13 Aug, G-4, J-6, 23, 20) (18 Aug, C-8, D-6, B-5, 18, 14, 7) (26 Aug, G-4, H-4, I-6, 2, 5, 14) (1 Sep, I-5, D-9, 1, 2)  
 G) Number of individuals = 135
- 08197 *Grammia virgo* (Linnaeus, 1758)  
 A) Virgin Tiger Moth  
 B) Clover, plantain, dandelion, general feeder  
 C) Wright (1993) p. 101  
 D) Heitzman (1987) p. 239, Covell (1984) Pl. 14 (14)  
 E) One record from Margaretta twp. 1987.  
 F) (11 Jul, J-6, 1) (19 Jul, B-6, J-4, H-7, 1, 6, 19) (26 Jul, J-5, G-7, 6, 12) (31 Jul, I-9, K-2, F-10, 10, 1, 1)  
 G) Number of individuals = 46

08199 *Grammia arge* (Drury, 1773)

- A) Arge Tiger Moth
- B) General feeder, grape, sunflower
- C) Mitchell/Zim (1987) p. 113
- D) Heitzman (1987) p. 241, Covell (1984) Pl. 14 (20)
- E) One record Erie Co. 1985.
- F) (19 Jul, J-4, 1)
- G) Number of individuals = 1

08203 *Halysidota tessellaris* (J. E. Smith, 1797)

- A) Banded Tussock Moth
- B) Grape, hackberry, oak, walnut, general feeder
- C) Mitchell/Zim (1987) P. 114, Wright (1993) p. 94
- D) Heitzman (1987) p. 236, Covell (1984) Pl. 12 (6)
- E) Two records from Margaretta twp. 1986, 1987.
- F) (8 Jun, E-9, 1) (15 Jun, C-6, I-6, 1, 6) (22 Jun, F-10, 3)  
(30 Jun, H-4, F-9, B-7, 9, 3, 27) (6 Jul, J-4, K-2, 17, 5)  
(12 Jul, B-7, H-4, I-5, 2, 5, 7) (19 Jul, J-4, H-7, B-6, 2,  
2, 2)  
(26 Jul, E-9, 3) (31 Jul, F-10, K-2, 3, 1)
- G) Number of individuals = 99

08211 *Lophocampa caryae* Harris, 1841

- A) Hickory Tussock Moth
- B) Hickory, maple, elm, oak, ash
- C) Mitchell/Zim (1987) p. 114
- D) Covell (1984) Pl. 12 (7)
- E) None
- F) (21 May, I-4, 1) (30 May, H-5, 16) (4 Jun, H-4, 2) (8 Jun,  
I-4, E-9, 6, 163) (10 Jun, H-4, H-5, 4, 16) (15 Jun, I-6,  
C-6, 2, 193) (22 Jun, K-2, J-8, 4, 2)
- G) Number of individuals = 409

08230 *Cycnia tenera* Hubner, 1818

- A) Delicate Cycnia or Orange-Margined Dogbane Moth
- B) Dogbane, milkweed
- C) Mitchell/Zim (1987) p. 115
- D) Heitzman (1987) p. 238, Covell (1984) Pl. 13 (6)
- E) One record from Margaretta twp. 1986.
- F) (4 Jun, H-4, 1) (15 Jun, I-6, C-6, 9, 9) (22 Jun, F-10, K-2,  
J-8, 2, 3, 3) (30 Jun, B-7, F-9, H-4, 7, 6, 30) (6 Jul, J-4,  
K-2, 4, 5) (12 Jul, H-4, I-5, 9, 5) (26 Jul, G-7, J-5, 4, 5)  
(31 Jul, K-2, I-9, 4, 1) (13 Aug, J-6, G-4, 12, 7) (26 Aug,  
H-4, G-4, I-6, 6, 2, 4) (1 Sep, I-5, 1)
- G) Number of individuals = 139

08231 *Cycnia oregonensis* (Stretch, 1873)

- A) Oregon cycnia
- B) Dogbane
- D) Covell (1984) Pl. 12 (10)
- E) None
- F) (14 May, H-6, 1) (8 Jun, I-4, E-9, 8, 17)
- G) Number of individuals = 26

08238 *Euchaetes egle* (Drury, 1773)

- A) Milkweed Tussock Moth
- B) Milkweed
- C) Mitchell/Zim (1987) p. 116
- D) Heitzman (1987) p. 237, Covell (1984) Pl. 12 (17)
- E) One record from Margaretta twp. 1987.
- F) (30 Jun, B-7, 1)
- G) Number of individuals = 1

08262 *Ctenucha virginica* (Esper, 1794)

- A) Virginia Ctenucha
- B) Grasses, sedges
- C) Mithcell/Zim (1987) p.117
- D) Covell (1984) Pl. 12 (1)
- E) One record from Milan 1985.
- F) (3 Jun, G-10, 2) (8 Jun, E-9, I-4, 6, 1) (10 Jun, H-4, 1)  
(15 Jun, C-6, 5) (22 Jun, F-10, J-8, K-2, 4, 2, 12) (30 Jun,  
B-7, H-4, F-9, 2, 3, 1) (6 Jul, J-4, K-2, 2, 5) (12 Jul,  
H-4, 1)
- G) Number of individuals = 47

08267 *Cisseps fulvicollis* (Hubner, 1818)

- A) Yellow-Collared Scape Moth
- B) Grasses, lichens, spike-rushes
- D) Heitzman (1987) p. 253, Covell (1984) Pl. 11 (12)
- E) One record from Margaretta twp. 1986.
- F) (15 Jun, C-6, 2) (19 Jul, H-7, 1) (26 Jul, G-7, 1) (31 Jul,  
I-9, 1)  
(13 Aug, J-6, G-4, 1, 3) (18 Aug, B-5, D-6, 1, 8)  
(26 Aug, I-6, H-4, G-4, 10, 10, 10) (1 Sep, D-9, I-5, 5, 5)  
(18 Sep, I-4, J-7, 1, 1)
- G) Number of individuals = 65

Lymantriidae

08316 *Orgyia leucostigma* (J. E. Smith, 1797)

- A) White-Marked Tussock Moth
- B) Many deciduous trees
- C) Covell (1984) Pl. 1 (11), Mitchell/Zim (1987) p. 137
- D) Heitzman (1987) p. 301, Covell (1984) Pl. 44 (17)
- E) Four records from Margaretta twp. 1986-1987.
- F) (6 Jul, J-4, 2) (11 Jul, J-6, 1) (1 Sep, I-5, 1) (8 Sep, H-5, A-6, 1, 1)  
(18 Sep, E-4, 2) (23 Sep, E-9, 1)
- G) Number of individuals = 9

Noctuidae

Herminiinae

08322 *Idia americalis* (Guenee, 1854)

- A) American Idia
- B) Lichens, scavenger in ant's and bird's nests
- D) Rings (1992) Pl. IX (1), Covell (1984) Pl. 39 (16)
- E) None
- F) (31 Jul, K-2, 1) (23 Sep, C-5, 1)
- G) Number of individuals = 2

08334 *Idia lubricalis* (Geyer, 1832)

- A) Glossy Black Idia
- B) Fungi, lichens, grasses, rotten wood
- C) Mitchell/Zim (1987) p. 127
- D) Rings (1992) Pl. IX (11), Covell (1984) Pl. 41 (15)
- E) One record from Margaretta twp. 1987.
- F) (11 Jul, J-6, 1)
- G) Number of individuals = 1

08357 *Macrochilo absorptalis* (Walker, 1859)

- A) Slant-Lined Owlet
- B) Sedges, grasses
- D) Rings (1992) Pl. IX (33), Covell (1984) Pl. 41 (21)
- E) None
- F) (12 Jul, I-5, 1)
- G) Number of individuals = 1

08397 *Palthis angulalis* (Hubner, 1796)

- A) Dark-spotted Palthis
- B) Adler, birch, cherry, ironwood, maple, willow, white spruce
- D) Rings (1992) Pl. XI (18,19), Covell (1984) Pl. 39 (25)
- E) Four records from Margaretta twp. 1985-1986.
- F) (31 Jul, K-2, F-10, 7, 4)
- G) Number of individuals = 11

## Hypeninae

08441 *Bomolocha manalis* (Walker, 1859)

- A) Flowing-Line Bomolocha
- B) Unknown
- D) Rings (1992) Pl. X (1,2), Covell (1984) Pl. 40 (15)
- E) None
- F) (15 Jun, C-6, 1)
- G) Number of individuals = 1

08465 *Plathypena scabra* (Fabricius, 1798)

- A) Green Cloverworm Moth
- B) Small legumes
- C) Mitchell/Zim (1987) p. 125
- D) Rings (1992) Pl. X (25,26), Covell (1984) Pl. 41 (2)
- E) Four records from Margaretta twp. 1985-1986.
- F) (8 Sep, A-6, H-5, 2, 2) (23 Sep, C-5, E-9, D-9, 3, 14, 7)
- G) Number of individuals = 27

## Catocalinae

08514 *Scolecocampa liburna* (Geyer, 1837)

- A) Dead-wood Borer Moth
- B) Dead wood of oak, hickory and tulip trees
- D) Covell (1984) Pl. 40 (8)
- E) None
- F) (30 Jun, B-7, 1)
- G) Number of individuals = 1

08587 *Panopoda rufimargo* (Hubner, 1818)

- A) Red-Lined Panopoda
- B) Oak
- D) Covell (1984) Pl. 39 (3), Rockburne/Lafontaine (1976) (556)
- E) None
- F) (11 Jul, J-6, 1)
- G) Number of individuals = 1

08689 *Zale lunata* (Drury, 1773)

- A) Lunate Zale
- B) Many trees such as plum, maple, willow
- C) Rings (1992) Pl. IV (1)
- D) Rings (1992) Pl. XII (1), Heitzman (1987) p. 257
- E) None
- F) (15 Jun, C-6, 1) (30 Jun, B-7, H-4, 2, 1) (1 Sep, B-6, 2)
- G) Number of individuals = 6

- 08692 *Zale galbanata* (Morrison, 1876)  
 A) Maple Zale  
 B) Maple, box-elder  
 D) Rings (1992) Pl. XII (3,7,8), Covell (1984) Pl. 37 (17)  
 E) None  
 F) (30 May, E-9, 1) (6 Jul, J-4, 1)  
 G) Number of individuals = 2
- 08695 *Zale undularis* (Drury, 1773)  
 A) Black Zale  
 B) Locust  
 D) Rings (1992) Pl. XII (9,10), Rockburne/Lafontaine (1976)  
 (549)  
 E) None  
 F) (29 Jun, I-4, 1) (6 Jul, J-4, 2)  
 G) Number of individuals = 3
- 08719 *Euparthenos nubilis* (Hubner, 1823)  
 A) Locust Underwing  
 B) Locust  
 C) Mitchell/Zim (1987) p. 130  
 D) Covell (1984) Pl. 37 (5)  
 E) None  
 F) (18 Aug, D-6, 2)  
 G) Number of individuals = 2
- 08727 *Parallelia bistrifaria* Hubner, 1818  
 A) Maple Looper Moth  
 B) Birch, maple, walnut  
 D) Covell (1984) Pl. 31 (21), Rockburne/Lafontaine (1976)  
 (539)  
 E) None  
 F) (15 Jun, C-6, 1)  
 G) Number of individuals = 1
- 08739 *Caenurgina erechtea* (Cramer, 1780)  
 A) Forage Looper Moth  
 B) Alfalfa, clover, ragweed, grasses  
 C) Mitchell/Zim (1987) p. 127  
 D) Covell (1984) Pl. 38 (2,6), Rockburne/Lafontaine (1976)  
 (541)  
 E) One record from Margaretta twp. 1987.  
 F) (15 Jun, C-6, 1) (22 Jun, J-8, K-2, 3, 1) (30 Jun, B-7, H-4,  
 F-9, 4, 3, 25) (6 Jul, K-2, J-4, 35, 22) (12 Jul, H-4, I-5,  
 B-7, 9, 30, 7) (19 Jul, J-4, 10) (26 Jul, J-5, G-7, 6, 11)  
 (31 Jul, K-2, 3) (13 Aug, G-4, J-6, 20, 10) (18 Aug, D-6,  
 49) (26 Aug, H-4, G-4, I-6, 30, 10, 138)  
 (1 Sep, A-7, I-5, D-9, 2, 56, 45) (8 Sep, H-5, 42)  
 G) Nuber of individuals = 570

- 08769 *Spiloloma lunilinea* Grote, 1873  
 A) Moon-Lined Moth  
 B) Honey Locust  
 D) Heitzman (1987) p. 262, Covell (1984) Pl. 40 (4)  
 E) None  
 F) (15 Jun, C-6, 1)  
 G) Number of individuals = 1
- 08771 *Catocala piatrix* Grote, 1864  
 A) The Penitent  
 B) Hickory, walnut  
 D) Sargent (1976) Pl. 1 (14), Covell (1984) Pl. 37 (11)  
 E) None  
 F) (8 Sep, H-5, 1)  
 G) Number of individuals = 1
- 08801 *Catocala ilia* (Cramer, 1776)  
 A) Beloved Underwing  
 B) Oak  
 C) Rings (1992) Pl. IV (2)  
 D) Sargent (1976) Pl. 4 (5,6,7,8), Heitzman (1987) p. 266,  
 Covell (1984) Pl. 37 (4,7)  
 E) None  
 F) (6 Jul, J-4, 1) (11 Jul, J-6, 1)  
 G) Number of individuals = 2
- 08805 *Catocala unijuga* Walker, 1858  
 A) Once-Married Underwing  
 B) Poplar, willow, aspen, cottonwood  
 D) Sargent (1976) Pl. 5 (5,6), Covell (1984) Pl. 37 (9)  
 E) None  
 F) (11 Jul, J-6, 1) (1 Sep, B-6, 1)  
 G) Number of individuals = 2
- 08832 *Catocala cara* Guenee, 1852  
 A) Darling Underwing  
 B) Willow, poplar  
 C) Wright (1993) p. 47  
 D) Sargent (1976) Pl. 6 (2), Heitzman (1987) p. 267  
 E) None  
 F) (1 Sep, A-7, B-6, 1, 1)  
 G) Number of individuals = 2
- 08834 *Catocala amatrix* (Hubner, 1809-13)  
 A) The Sweetheart  
 B) Willow, poplar, cottonwood  
 D) Sargent (1976) Pl. 6 (6), Covell (1984) Pl. 37 (13)  
 E) Four records from Margaretta twp. 1985-1987.  
 F) (8 Aug, H-5, 1) (31 Aug, I-5, B-6, 2, 1) (1 Sep, B-6, 2) (18  
 Sep, E-4, 1) (23 Sep, C-5, 1)  
 G) Number of individuals = 8

- 08857 *Catocala ultronia* (Hubner, 1823)  
 A) Ultronia Underwing  
 B) Apple, cherry, plum, Rosacene spp.  
 C) Rings (1992) Pl. IV (3)  
 D) Sargent (1976) Pl. 6 (9,11,12,13), Covell (1984) Pl. 33 (9)  
 E) One record from Margaretta twp. 1987.  
 F) (6 Jul, J-4, 2) (19 Jul, J-4, 3) (26 Jul, E-9, J-5, 4, 1)  
 (31 Jul, F-10, K-2, 2, 3) (13 Aug, G-4, 4) (18 Aug, D-6, J-6, 1, 1)  
 G) Number of individuals = 21
- 08863 *Catocala mira* Grote, 1876  
 A) Wonderful Underwing  
 B) Hawthorn  
 D) Sargent (1976) Pl. 8 (2), Covell (1984) Pl. 32 (21)  
 E) One record from Margaretta twp. 1985.  
 F) (6 Jul, J-4, 6)  
 G) Number of individuals = 6
- 08864 *Catocala grynea* (Cramer, 1780)  
 A) Woody Underwing  
 B) Apple, hawthorn, plum  
 D) Sargent (1976) Pl. 7 (22), Covell (1984) Pl. 33 (10)  
 E) One record from Margaretta twp. 1986.  
 F) (6 Jul, J-4, 2) (26 Jul, E-9, 1) (31 Jul, K-2, F-10, 2, 2)  
 (13 Aug, G-4, J-6, 2, 3)  
 G) Number of individuals = 12
- 08867 *Catocala blandula* Hulst, 1884  
 A) Charming Underwing  
 B) Apple, hawthorn  
 D) Sargent (1976) Pl. 8 (3,6), Covell (1984) Pl. 33 (16)  
 E) None  
 F) (6 Jul, J-4, K-2, 6, 6)  
 G) Number of individuals = 12
- 08874 *Catocala minuta* W. H. Edwards, 1864  
 A) Little Underwing  
 B) Honey Locust  
 D) Sargent (1976) Pl. 8 (7,10,13,16), Covell (1984) Pl. 33  
 (14)  
 E) None  
 F) (30 Jun, B-7, 1)  
 G) Number of individuals = 1

08877 *Catocala connubialis* Guenee, 1852

- A) Connubial Underwing
- B) Oak
- D) Sargent (1976) Pl. 8 (5,8,11,14,17), Covell (1984) Pl. 33 (17,18)
- E) None
- F) (6 Jul, J-4, 1) (11 Jul, J-6, 1)
- G) Number of individuals = 2

08878.1 *Catocala lineella* Grote, 1872

- B) Oak
- D) Covell (1984) Pl. 32 (14 as *C. amica*)
- E) None
- F) (11 Jul, J-6, 4) (19 Jul, J-4, 1) (26 Jul, J-5, 1) (13 Aug, J-6, 1) (26 Aug, I-6, H-4, 2, 1) (31 Aug, I-5, 3)
- G) Number of individuals = 13

#### Plusiinae

08897 *Diachrysia balluca* Geyer, 1832

- B) Raspberry, wood nettle
- D) Rockburne/Lafontaine (1976) (529)
- E) None
- F) (1 Sep, A-7, 1)
- G) Number of individuals = 1

08898 *Allagrapha aerea* (Hubner, [1803])

- A) Unspotted Looper Moth
- B) Stinging nettle, aster, dandelion
- D) Covell (1984) Pl. 32 (7), Rockburne/Lafontaine (1976) (531)
- E) Two records from Margaretta twp. 1986, 1987.
- F) (23 Sep, C-5, 1)
- G) Number of individuals = 1

08905 *Eosphropteryx thyatyroides* (Guenee, 1852)

- A) Pink-Patched Looper Moth
- B) Meadow-rue, columbine, lousewort
- D) Covell (1984) Pl. 32 (9), Rockburne/Lafontaine (1976) (527)
- E) None
- F) (12 Jul, B-7, 1) (26 Jul, E-9, 1) (23 Sep, C-5, 3)
- G) Number of individuals = 5

08908 *Autographa precatationis* (Guenee, 1852)

- A) Common Looper Moth
- B) Thistle, dandelion, plantain, wild lettuce, general feeder
- D) Rings (1992) Pl. XIII (12), Covell (1984) Pl. 31 (14)
- E) One record from Sandusky 1902. Four records from Margaretta twp., 1985, 1986, and 1987.
- F) (13 Aug, G-4, 1) (31 Aug, I-5, 1) (23 Sep, C-5, 10)
- G) Number of individuals = 12

08924 *Anagrapha falcifera* (Kirby, 1837)

- A) Celery Looper Moth
- B) Clover, corn, lettuce, plantain, celery, tobacco, dandelion
- C) Wright (1993) p. 31
- D) Covell (1984) Pl. 31 (7), Rockburne/Lafontaine (1976) (512)
- E) Two records from Margaretta twp. 1985.
- F) (4 Jun, H-4, 1) (15 Jun, C-6, 2) (22 Jun, J-8, 1) (30 Jun, F-9, H-4, 1, 1) (12 Jul, I-5, 1) (26 Jul, J-5, 1) (31 Jul, K-2, 1) (13 Aug, J-6, 1) (26 Aug, I-6, 1) (1 Sep, I-5, 2) (8 Sep, H-5, 1) (23 Sep, D-9, C-5, E-9, 2, 3, 1)
- G) Number of individuals = 20

Ruteliinae

08955 *Marathyssa inficita* (Walker, 1865)

- A) Dark Marathyssa
- B) Staghorn sumac
- D) Covell (1984) Pl. 28 (23)
- E) Three records from Margaretta twp. 1986-1987.
- F) (14 May, I-6, 1) (13 Aug, G-4, 1)
- G) Number of individuals = 2

08957 *Paectes oculatrix* (Guenee, 1852)

- A) Eyed Paectes
- B) Poison ivy
- D) Covell (1984) Pl. 31 (16), Rockburne/Lafontaine (1976) (493)
- E) None
- F) (15 Jun, C-6, 1)
- G) Number of individuals =

Sarothripinae

08973 *Baileya australis* (Grote, 1881)

- A) Small Baileya
- B) Unknown
- D) Covell (1984) Pl. 31 (20)
- E) Two records from Huron twp. 1982 One record from Margaretta twp. 1986.
- F) (30 May, E-9, 1)
- G) Number of individuals = 1

## Acontiinae

### 09053 *Pseudeustrotia carneola* (Guenee, 1852)

- A) Pink-Barred Lithacodia
- B) Dock, smartweed
- D) Covell (1984) Pl. 30 (7), Rockburne/Lafontaine (1976) (464)
- E) One record from Huron twp. 1982 One record from Margaretta twp. 1987.
- F) (31 Jul, K-2, 1)
- G) Number of individuals = 1

### 09055.1 *Maliattha synochitis* (Grote & Robinson, 1868)

- A) Black-Dotted Lithacodia
- B) Smartweed
- D) Covell (1984) Pl. 30 (4), Rockburne/Lafontaine (1976) (462)
- E) One record from Margaretta twp. 1991.
- F) (30 May, E-9, 4) (8 Jun, I-4, 1)
- G) Number of individuals = 5

### 09062 *Cerma cerintha* (Treitschke, 1826)

- A) Tufted Bird-Dropping Moth
- B) Rose, cherry, hawthorn, plum
- D) Covell (1984) Pl. 30 (8), Rockburne/Lafontaine (1976) (487)
- E) None
- F) (29 Jun, I-4, 1)
- G) Number of individuals = 1

### 09065 *Leuconycta diphteroides* (Guenee, 1852)

- A) Green Leuconycta
- B) Goldenrod, aster
- D) Covell (1984) Pl. 26 (19), Rockburne/Lafontaine (1976) (407)
- E) One record from Margaretta twp. 1987.
- F) (21 May, I-4, 1) (8 Jun, I-4, E-9, 1, 2) (29 Jun, I-4, 1)
- G) Number of individuals = 5

### 09090 *Tarachidia candefacta* (Hubner, 1831)

- A) Olive-Shaded Bird-Dropping Moth
- B) Ragweed
- D) Rings (1992) Pl. XIV (16,17), Covell (1984) Pl. 30 (19)
- E) One record from Margaretta twp. 1986. Two records from Margaretta twp. 1987.
- F) (30 May, E-10, 1) (31 Jul, K-2, 2)
- G) Number of individuals = 3

### 09127 *Spragueia leo* (Guenee)

- A) Common Spragueia
- B) Bindweed
- D) Covell (1984) Pl. 30 (12)
- E) One record from Resthaven, 1988
- F) (15 Jun, C-6, 2) (26 Aug, H-4, 1)
- G) Number of individuals = 3

## Pantheinae

09189 *Charadra deridens* (Guenee, 1852)

- A) The Laugher
- B) Oak, birch, elm, beech
- D) Covell (1984) Pl. 16 (18), Rockburne/Lafontaine (1976) (12)
- E) One record Huron twp. 1982.
- F) (8 Jun, I-4, 1)
- G) Number of individuals = 1

09193 *Raphia frater* Grote, 1864

- A) The Brother
- B) Alder, birch, cottonwood, poplar, willow
- D) Covell (1984) Pl. 16 (16), Rockburne/Lafontaine (1976) (19)
- E) One record from Huron twp. 1982. One record from Margaretta twp. 1984.
- F) (21 May, I-4, 1) (30 May, E-9, 1) (26 Jul, G-7, 3) (31 Jul, F-10, 1)
- G) Number of individuals = 6

## Acronictinae

09221 *Acronicta funeralis* Grote & Robinson, 1866

- A) Funerary Dagger Moth
- B) Hickory, elm, birch, apple, willow
- D) Covell (1984) Pl. 17 (6,9), Rockburne/Lafontaine (1976) (31)
- E) None
- F) (8 Sep, H-5, A-6, 5, 4) (18 Sep, E-4, 2) (23 Sep, E-9, 1)
- G) Number of individuals = 12

09229 *Acronicta hasta* Guenne, 1952

- A) Speared Dagger Moth
- B) Black Cherry
- D) Covell (1984) Pl. 17 (15), Rockburne/Lafontaine (1976) (36,38)
- E) One record from Huron trwp. 1982.
- F) (13 Aug, G-4, 1) (31 Aug, I-5, 1)
- G) Number of individuals = 2

09237 *Acronicta interrupta* Guenee, 1852

- A) Interrupted Dagger Moth
- B) Plum, elm, apple, oaks, maple
- C) Rings (1992) Pl. IV (5)
- D) Covell (1984) Pl. 17 (16), Heitzman (1987) p. 272
- E) Two records from Margaretta twp. 1986 One record from Huron twp. 1982.
- F) (14 May, H-6, 1)
- G) Number of individuals = 1

- 09243 *Acronicta ovata* Grote, 1873  
 A) Ovate Dagger Moth  
 B) Birch, oak  
 D) Rings (1992) Pl. XIII (33,34), Covell (1984) Pl. 18 (2)  
 E) None  
 F) (15 Jun, C-6, 1) (31 Jul, F-10, 1)  
 G) Number of individuals = 2
- 09245 *Acronicta haesitata* (Grote, 1882)  
 A) Hesitant Dagger Moth  
 B) Oak  
 D) Covell (1984) Pl. 17 (19), Rockburne/Lafontaine (1976) (44)  
 E) None  
 F) (15 Jun, C-6, 2)  
 G) Number of individuals = 2
- 09261 *Acronicta impressa* Walker, 1856  
 B) Willow, poplar, plum, birch, blackberry, apple  
 D) Rockburne/Lafontaine (1976) (56)  
 E) None  
 F) (29 Jun, I-4, 1) (12 Jul, I-5, 1)  
 G) Number of individuals = 2
- 09264 *Acronicta longa* Guenee, 1852  
 A) Long-winged Dagger Moth  
 B) Birch, blackberry, cherry, oak, willow, roses  
 D) Rings (1992) Pl. XIV (1,2,3,4), Covell (1984) Pl. 18 (10)  
 E) None  
 F) (26 Aug, G-4, 1)  
 G) Number of individuals = 1
- 09272 *Acronicta oblinita* (J. E. Smith, 1797)  
 A) Smeared Dagger Moth  
 B) Willow, raspberry, willow, smartweed, swamp loosestrife  
 C) Mitchell/Zim (1987) p. 119, Covell (1984) Pl. 1 (14)  
 D) Covell (1984) Pl. 13 (18), Rockburne/Lafontaine (1976) (57)  
 E) One record from Sandusky 1903. One record from Huron twp. 1982.  
 F) (31 Jul, K-2, 1)  
 G) Number of individuals = 1
- 09280 *Simya henrici* (Grote, 1873)  
 A) Henry's Marsh Moth  
 B) Grasses, smartweed, willow  
 C) Mitchell/Zim (1987) p. 131  
 D) Covell (1984) Pl. 18 (14), Rockburne/Lafontaine (1976) (60)  
 E) Two records from Margaretta twp. 1987.  
 F) (31 Jul, I-9, 1)  
 G) Number of individuals = 1

09285 *Polygrammate hebraeicum* Hubner, 1818

- A) The Hebrew Blackgum
- D) Rings (1992) Pl. XIV (40,41), Heitzman (1987) p. 274
- E) None
- F) (15 Jun, C-6, 1)
- G) Number of individuals = 1

#### Agaristinae

09299 *Eudryas unio* (Hubner, 1827-31)

- A) Pearly Wood-Nymph
- B) Evening-primerose, loosestrife, grape
- C) Mitchell/Zim (1987) p. 130
- D) Covell (1984) Pl. 27 (25)
- E) One record Castalia 1932 Two records Margaretta twp., 1986 and 1987.
- F) (21 May, I-4, 2) (15 Jun, F-10, 1)
- G) Number of individuals = 3

09301 *Eudryas grata* (Fabricius, 1793)

- A) Beautiful Wood-Nymph
- B) Grapes, Virginia Creeper
- D) Heitzman (1987) p. 276, Covell (1984) Pl. 27 (23)
- E) One record from Margaretta twp. 1987.
- F) (30 Jun, B-7, 1) (6 Jul, K-2, 1)
- G) Number of individuals = 2

#### Amphipyriinae

09328 *Apamea nigrior* (Smith, 1891)

- B) Unknown
- D) Rockburne/Lafontaine (1976) (328)
- E) One record from Berlin twp. 1985.
- F) (8 Jun, I-4, 2) (15 Jun, C-6, 2) (22 Jun, K-2, 1)
- G) Number of individuals = 5

09344 *Apamea plutonia* (Grote, 1883)

- B) Grasses
- D) Rockburne/Lafontaine (1976) (177)
- E) One record from Berlin twp. 1985.
- F) (30 May, E-9, 1)
- G) Number of individuals = 1

09364 *Apamea finitima* Guenee, 1852

- A) Bordered Apamea
- B) Corn, timothy, sedges, grasses
- D) Covell (1984) Pl. 25 (2)
- E) None
- F) (30 May, E-9, 2) (8 Jun, E-9, 2) (15 Jun, C-6, 1)
- G) Number of individuals = 5

- 09367 *Apamea dubitans* (Walker, 1856)  
 A) Doubtful Agropernia  
 B) Grasses  
 D) Covell (1984) Pl. 25 (3), Rockburne/Lafontaine (1976) (341)  
 E) None  
 F) (13 Aug, G-4, 1) (8 Sep, A-6, 1)  
 G) Number of individuals = 2
- 09372 *Apamea lutosa* (Andrews, 1877)  
 B) Quack grass  
 D) Rings (1992) Pl. XIV (9), Rockburne/Lafontaine (1976) (343)  
 E) One record from Margaretta twp. 1986.  
 F) (30 Jun, F-9, 6)  
 G) Number of individuals = 6
- 09373 *Agroperina helva* (Grote, 1875)  
 A) Yellow Three-Spot  
 B) Sod- infesting caterpillar  
 D) Covell (1984) Pl. 24 (19)  
 E) None  
 F) (18 Aug, D-6, 5) (1 Sep, D-9, A-7, I-5, 4, 3, 1) (8 Sep, H-5, 2)  
 G) Number of individuals = 15
- 09406 *Oligia fractilinea* (Grote, 1874)  
 A) Lined Stalk Borer or Heart Worm  
 B) Timothy, grasses, corn  
 D) Rings (1992) Pl. XIV (19,20,21,25,26,27), Rockburne/Lafontaine (1976) (199)  
 E) One record form Margaretta twp. 1991.  
 F) (25 Aug, B-6, 1)  
 G) Number of individuals = 1
- 09457 *Amphipoea americana* (Speyer, 1875)  
 A) American Ear Moth  
 B) Grasses, sedges, corn  
 D) Covell (1984) Pl. 26 (2), Rockburne/Lafontaine (1976) (369)  
 E) One record from Margaretta twp. 1987.  
 F) (6 Jul, J-4, 2) (11 Jul, J-6, 1) (12 Jul, I-5, 3)  
 G) Number of individuals = 6
- 09471 *Papaipema arctivorens* Hampson, 1910  
 B) Burdock, thistles  
 D) Rings (1992) XV (6), Rockburne/Lafontaine (1976) (388)  
 E) Ten records from Margaretta twp. 1985-1986.  
 F) (13 Aug, J-6, 2) (18 Aug, D-6, 4) (26 Aug, H-4, 1) (1 Sep, D-9, 6)  
 (23 Sep, C-5, 1)  
 G) Number of individuals = 14

- 09483 *Papaipema inquaesita* (Grote & Robinson, 1868)  
 A) Sensitive Fern Borer Moth  
 B) Sensitive fern  
 D) Covell (1984) Pl. 26 (5), Rockburne/Lafontaine (1976) (375)  
 E) None  
 F) (23 Sep, C-5, 21)  
 G) Number of individuals = 21
- 09486 *Papaipema birdii* (Dyar, 1908)  
 B) Water-hemlock, water parsnip, other umbellates  
 D) Rings (1992) Pl. XV(3), Rockburne/Lafontaine (1976) (376)  
 E) None  
 F) (1 Sep, D-9, 1)(23 Sep, E-9, 1)  
 G) Number of individuals = 2
- 09503 *Papaipema rigida* (Grote, 1877)  
 A) Rigid Sunflower Borer Moth  
 B) Sunflowers, burdock, ox-eye, sneezeweed  
 D) Covell (1984) Pl. 26 (9)  
 E) Eight records from Margaretta twp. 1985-1991.  
 F) (18 Sep, E-4, 1)  
 G) Number of individuals = 1
- 09545 *Euplexia benesimilis* McDunnough, 1922  
 A) American Angle Shades  
 B) Dogwood, willow  
 D) Covell (1984) Pl. 26 (22), Rockburne/Lafontaine (1976) (396)  
 E) None  
 F) (26 Jul, E-9, 1)  
 G) Number of individuals = 1
- 09546 *Philogophora iris* Guenee, 1852  
 A) Olive Angle Shades  
 B) Dandelion, dock, thistle  
 D) Covell (1984) Pl. 26 (13), Rockburne/Lafontaine (1976) (397)  
 E) None  
 F) (22 Jun, K-2, 1) (30 Jun, C-6, 1)  
 G) Number of individuals = 2
- 09550 *Enargia infumata* (Grote, 1874)  
 B) Aspen, willow, birch, poplar  
 D) Rockburne/Lafontaine (1976) (434)  
 E) None  
 F) (25 Aug, B-1, 2)  
 G) Number of individuals = 2

- 09578 *Hyppa xylinoides* (Guenee, 1852)  
 A) Common Hyppa  
 B) St. John's Wort, cranberry, roses, alder  
 D) Rockburne/Lafontaine (1976) (424), Covell (1984) Pl. 25 (15)  
 E) One record from Huron twp. 1982. One record from Margaretta twp. 1986.  
 F) (30 May, E-9, 2)  
 G) Number of individuals = 2
- 09582 *Nedra ramosula* (Guenee, 1852)  
 A) Gray Half-Spot  
 B) St. John's Wort  
 D) Covell (1984) Pl. 25 (22), Rockburne/Lafontaine (1976) (423)  
 E) None  
 F) (30 May, E-9, 1) (18 Aug, D-6, 1) (26 Aug, B-4, 1)  
 G) Number of individuals = 3
- 09638 *Amphipyra pyramioides* Guenee, 1852  
 A) Copper Underwing  
 B) Grape, apple, oak, poplar, walnut, maple, willow, elm  
 C) Rings (1992) Pl. V (1), Mitchell/Zim (1987) p. 130  
 D) Covell (1984) Pl. 26 (17), Rockburne/Lafontaine (1976) (411)  
 E) One record from Sandusky 1903.  
 F) (19 Jul, H-7, 1) (31 Jul, F-10, K-2, 1, 1) (1 Sep, A-7, D-9, 1, 1) (4 Sep, B-6, 1) (8 Sep, H-5, A-6, 2, 2) (23 Sep, C-5, E-9, 2, 1)  
 G) Number of individuals = 13
- 09640 *Amphipyra glabella* (Morrison, 1874)  
 B) Poplar  
 D) Rockburne/Lafontaine (1976) (420)  
 E) None  
 F) (12 Jul, I-5, 1) (26 Jul, G-7, 3) (23 Sep, E-9, 3)  
 G) Number of individuals = 7
- 09647 *Proxenus miranda* (Grote, 1873)  
 A) Miranda Moth  
 B) Dandelion  
 D) Covell (1984) Pl. 27 (19), Rockburne/Lafontaine (1976) (430)  
 E) Three records from Margaretta twp. 1986.  
 F) (11 Jul, J-6, 1)  
 G) Number of individuals = 1

09661 *Crambodes talidiformis* Guenee, 1852

- A) Verbena Moth
- B) Vervains
- D) Covell (1984) Pl. 28 (2), Rockburne/Lafontaine (1976) (429)
- E) One record from Sandusky 1903.
- F) (14 May, I-6, 1) (15 Jun, C-6, 2) (22 Jun, F-10, 1) (30 May, E-9, 1)  
(30 Jun, F-9, 2) (6 Jul, K-2, 1) (12 Jul, F-10, I-9, K-2, 1, 1, 3) (13 Aug, G-4, 1) (18 Aug, D-6, 5) (26 Aug, G-4, 3) (8 Sep, H-5, 1)
- G) Number of individuals = 23

09663 *Balsa tristrigella* (Walker, 1866)

- A) Three-Lined Balsa
- B) Hawthorn
- D) Covell (1984) Pl. 28 (4), Rockburne/Lafontaine (1976) (440)
- E) One record from Huron twp. 1982.
- F) (21 May, I-4, 1) (30 May, E-10, 1)
- G) Number of individuals = 2

09669 *Spodoptera ornithogalli* (Guenee, 1852)

- A) Yellow-Stripped Armyworm Moth
- B) Clover, grasses
- C) Rings (1992) Pl. V (3)
- D) Covell (1984) Pl. 28 (7), Rockburne/Lafontaine (1976) (439)
- E) None
- F) (25 Aug, B-6, 1) (26 Aug, H-4, 1) (23 Sep, E-9, 2)
- G) Number of individuals = 4

09688 *Galgula partita* Guenee, 1852

- A) The Wedgling
- B) Wood-sorrel
- D) Covell (1984) Pl. 27 (13,14), Rockburne/Lafontaine (1976) (432)
- E) One record from Margaretta twp. 1986.
- F) (30 Jun, F-9, 7) (12 Jul, I-5, 7) (31 Jul, K-2, 3)
- G) Number of individuals = 17

09689 *Perigea xanthioides* Guenee, 1852

- A) Red Groundling
- B) Ironwood, Joe-Pye Weed
- D) Covell (1984) Pl. 27 (1)
- E) Two records Margaretta twp. 1987.
- F) (11 Jul, J-6, 1) (26 Aug, H-4, 1) (31 Aug, I-5, 1)
- G) Number of individuals = 3

- 09690 *Platysenta videns* (Guenee, 1852)  
 A) White-Dotted Groundling  
 B) Goldenrod, asters  
 D) Covell (1984) Pl. 25 (21), Rockburne/Lafontaine (1976) (425)  
 E) Three records from Margaretta twp. 1986-1987.  
 F) (30 Jun, F-9, 1) (26 Aug, I-6, 5)  
 G) Number of individuals = 6
- 09696 *Platysenta vecors* (Guenee, 1852)  
 A) Ducky Groundling  
 B) Unknown  
 D) Covell (1984) Pl. 27 (2), Rockburne/Lafontaine (1976) (426)  
 E) One record from Huron twp. 1982 One record from Margaretta twp. 1987.  
 F) (14 May, H-6, 1) (6 Jul, J-4, 1)  
 G) Number of individuals = 2
- 09720 *Ogdoconta cinereola* (Guenee, 1852)  
 A) Common Pinkband  
 B) Ragweeds, sunflowers  
 D) Covell (1984) Pl. 27 (20), Rockburne/Lafontaine (1976) (447)  
 E) Two records from Margaretta twp. 1986.  
 F) (1 Sep, A-7, 1)  
 G) Number of individuals = 1
- 09725 *Stiriodes obtusa* (Herrich-Schaffer, 1854)  
 A) Obtuse Yellow  
 B) Unknown  
 D) Covell (1984) Pl. 27 (17)  
 E) One record from Margaretta twp. 1984.  
 F) (6 Jul, J-4, 1) (15 Jun, C-6, 1)  
 G) Number of individuals = 2
- 09766 *Cirrhophanus triangulifer* Grote, 1872  
 A) Goldenrod Stowaway  
 B) Spanish Needles  
 D) Covell (1984) Pl. 27 (8)  
 E) None  
 F) (26 Aug, G-4, 1)  
 G) Number of individuals = 1
- 09781 *Basilodes pepita* Guenee, 1852  
 A) Gold Moth  
 B) Spanish-needles  
 D) Covell (1984) Pl. 27 (18)  
 E) None  
 F) (18 Aug, D-6, 2)  
 G) Number of individuals = 2

09818 *Amolita fessa* Grote, 1874

- A) Feeble Grass Moth
- B) Grasses
- D) Covell (1984) Pl. 27 (16), Rockburne/Lafontaine (1976) (442)
- E) One record from Margaretta twp. 1987.
- F) (29 Jun, I-4, 2) (30 Jun, F-9, B-7, 12, 2) (6 Jul, J-4, 1) (12 Jul, B-7, 1)
- G) Number of individuals = 18

Cuculliinae

09887 *Lithophane bethunei* (Grote & Robinson, 1868)

- A) Beturne's Pinion
- B) Oak, maple, willow, hickory, cherry
- C) Rings (1992) Pl. V (6)
- D) Covell (1984) Pl. 24 (5), Rockburne/Lafontaine (1976) (281)
- E) One record from Berlin twp. 1985.
- F) (23 Sep, E-9, 1)
- G) Number of individuals = 1

09889 *Lithophane petulca* Grote, 1874

- A) Wanton Pinion
- B) Birch, willow, basswood, choke-cherry
- D) Covell (1984) Pl. 24 (6), Rockburne/Lafontaine (1976) (283)
- E) None
- F) (23 Sep, E-9, 1)
- G) Number of individuals = 1

09950 *Chaetagnaea sericea* (Morrison, 1874)

- A) Silky Sallow
- B) Oak, cherry
- D) Rings (1992) Pl. XVI (10), Covell (1984) Pl. 23 (21)
- E) None
- F) (23 Sep, C-5, 1)
- G) Number of individuals = 1

09952 *Eucirroedia pampina* (Guenee, 1852)

- A) Scalloped Sallow
- B) Cherry, poplar, oak, many other plants
- D) Covell (1984) Pl. 24 (15), Rockburne/Lafontaine (1976) (325)
- E) None
- F) (18 Sep, E-4, 1)
- G) Number of individuals = 1

09957 *Sunira bicolorago* (Guenee, 1852)  
A) Bicolored Sallow  
B) Poplar, willow, cherry, grasses  
D) Covell (1984) Pl. 24 (17), Rockburne/Lafontaine (1976) (321)  
E) None  
F) (23 Sep, C-5, E-9, D-9, 2, 72, 9)  
G) Number of individuals = 83

09961 *Anathix ralla* (Grote & Robinson, 1868)  
A) Dotted Swallow  
B) Unrecorded  
D) Covell (1984) Pl. 24 (20), Rockburen/Lafontaine (1976) (323)  
E) None  
F) (1 Sep, A-7, 1)  
G) Number of individuals = 1

09963 *Anathix aggressa* (Smith, 1907)  
B) Poplar  
D) Rings (1992) Pl. XV (35)  
E) One record from Margaretta twp. 1991.  
F) (23 Sep, E-9, 6)  
G) Number of individuals = 6

10033 *Catabena lineolata* Walker, 1865  
A) Fine-Lined Sallow  
B) Goldenrod  
D) Covell (1984) Pl. 28 (10), Rockburne/Lafontaine (1976) (446)  
E) One record from Margaretta twp. 1986.  
F) (30 Jun, F-9, 1) (18 Aug, D-6, 1)  
G) Number of individuals = 2

10200 *Cucullia asteroides* Guenee, 1852  
A) The Asteroid  
B) Aster, goldenrod  
D) Heitzman (1987) p. 283, Covell (1984) Pl. 23 (3)  
E) Two records from Margaretta twp. 1986.  
F) (15 Jun, I-6, 1)  
G) Number of individuals = 1

#### Hadeninae

10288 *Polia detracta* (Walker, 1857)  
A) Disparaged Arches  
B) Oak, hickory, dandelion, acorns  
D) Covell (1984) Pl. 21 (14)  
E) None  
F) (15 Jun, C-6, 1)  
G) Number of individuals = 1

- 10292 *Melanchra adjuncta* (Guenee, 1852)  
 A) Hitched Arches  
 B) Clover, dandelion, elm, willow, plantain, tall meadow-rue  
 D) Covell (1984) Pl. 20 (12), Rockburne/Lafontaine (1976) (185)  
 E) Two records from Margaretta twp. 1986. One record Margaretta twp. 1991. One record from Berlin twp. 1985.  
 F) (30 May, E-10, 1) (25 Aug, B-6, 1)  
 G) Number of individuals = 2
- 10293 *Melanchra picta* (Harris, 1841)  
 A) Zebra Caterpillar Moth  
 B) Willow, clover, dandelion, apple, many other plants  
 C) Rings (1992) Pl. VI (5), Mitchell/Zim (1987) p. 125  
 D) Covell (1984) Pl. 22 (3), Rockburne/Lafontaine (1976) (227)  
 E) None  
 F) (13 Aug, J-6, 1) (26 Aug, G-4, 2)  
 G) Number of individuals = 3
- 10299 *Lacanobia subjuncta* (Grote & Robinson, 1968)  
 A) Speckled Cutworm Moth  
 B) Maple, alder, poplar  
 C) Rings (1992) Pl. VI (6)  
 D) Rockburne/Lafontaine (1976) (176), Covell (1984) Pl. 21 (15)  
 E) One record from Margaretta twp. 1986.  
 F) (8 Jun, I-4, 1)  
 G) Number of individuals = 1
- 10301 *Lacanobia lutra* (Guenee, 1852)  
 B) Maple, birch, oak, poplar, willow  
 D) Rockburne/Lafontaine (1976) (189)  
 E) None  
 F) (10 Jun, H-5, 1)  
 G) Number of individuals = 1
- 10368 *Lacinipolia meditata* (Gote, 1873)  
 A) The Thinker  
 B) Apple, clover, dandelion, other plants  
 D) Rockburne/Lafontaine (1976) (193)  
 E) None  
 F) (1 Sep, I-5, 11) (8 Sep, A-6, H-5, 3, 26)  
 G) Number of individuals = 40
- 10397 *Lacinipolia renigera* (Stephens, 1829)  
 A) Bristly Cutworm Moth  
 B) Clover, corn, tobacco, apple, cabbage, general feeder  
 C) Rings (1992) Pl. VII (1), Mitchell/Zim (1987) p. 123  
 D) Rockburne/Lafontaine (1976) (197), Covell (1984) Pl. 20 (11)  
 E) Seven records from Margaretta twp. 1984-1987.  
 F) (8 Jun, E-9, 48) (10 Jun, H-5, H-4, 2, 6) (15 Jun, C-6, 30)  
 (26 Aug, I-6, H-4, 3, 2) (1 Sep, I-5, 2) (8 Sep, H-5, A-6, 16, 3) (18 Sep, J-7, F-10, 1, 11) (23 Sep, D-9, E-9, 6, 2)  
 G) Number of individuals = 132

- 10405 *Lacinipolia lorea* (Guenee, 1852)  
 A) Bridled Arches  
 B) Alfalfa, clover, dandelion, birch, sweetgum, strawberry  
 D) Rockburne/Lafontaine (1976) (198), Covell (1984) Pl. 20 (21)  
 E) Three records from Margaretta twp. 1984.  
 F) (8 Jun, I-4, 1) (15 Jun, C-6, 5) (22 Jun, K-2, 5)  
 G) Number of individuals = 11
- 10431 *Faronta diffusa* (Walker, 1856)  
 A) Wheat Head Armyworm Moth  
 B) Grasses, cereal crops  
 D) Covell (1984) Pl. 22 (14), Rockburne/Lafontaine (1976) (228)  
 E) One record from Margaretta twp. 1986.  
 F) (18 Aug, D-6, 1)  
 G) Number of individuals = 1
- 10438 *Pseudaletia unipuncta* (Haworth, 1809)  
 A) Armyworm Moth  
 B) Major pest of many plants including corn, alfalfa, grasses, vegetables, fruits  
 C) Mitchell/Zim (1987) p. 124, Wright (1993) p. 38  
 D) Heitzman (1987) p. 284, Covell (1984) Pl. 22 (18)  
 E) None  
 F) (14 May, H-6, 3) (30 May, E-9, 2) (15 Jun, C-6, 16) (22 Jun, J-8, F-10, K-2, 1, 3, 1) (30 Jun, F-9, B-7, H-4, 42, 7, 41) (6 Jul, J-4, 17) (12 Jul, B-7, H-4, I-5, 7, 4, 6) (19 Jul, J-4, 3) (26 Jul, G-7, H-4, 1, 1) (13 Aug, J-6, G-4, 1, 1) (26 Aug, H-4, I-6, 1, 1) (1 Sep, I-5, D-9, 1, 2) (8 Sep, A-6, H-5, 2, 3)  
 G) Number of individuals = 167
- 10444 *Leucania phragmitidicola* Guenee, 1852  
 B) Grasses  
 D) Rings (1992) XVI (22), Rockburne/Lafontaine (1976) (233)  
 E) One record from Margaretta twp. 1984. One record from Margaretta twp. 1985.  
 F) (8 Jun, I-4, E-9, 4, 1) (10 Jun, H-4, H-5, 4, 3) (15 Jun, C-6, I-6, 17, 20) (22 Jun, K-2, J-8, 7, 7) (31 Jul, I-9, 1) (26 Aug, I-6, 3) (8 Sep, H-5, 1)  
 G) Number of individuals = 68
- 10446.1 *Leucania lapidaria* (Grote, 1876)  
 B) Grasses  
 D) Holland (1968) Pl. 24 (39 as *Heliophila multilinea*)  
 E) None  
 F) (30 May, E-9, 65) (8 Jun, E-9, I-4, 107, 7) (10 Jun, H-5, 7) (15 Jun, I-6, C-6, 19, 16) (22 Jun, F-10, J-8, 7, 5) (30 Jun, B-7, F-9, 3, 3) (13 Aug, G-4, 1) (26 Aug, I-6, H-4, 7, 2) (31 Aug, I-5, 1) (1 Sep, D-9, I-5, 3, 5) (8 Sep, A-6, 2)  
 G) Number of individuals = 260

- 10447 *Leucania commoides* Guenee, 1852  
 B) Grasses  
 D) Rockburne/Lafontaine (1976) (232)  
 E) One record from Margaretta twp. 1986. One record from Margaretta twp. 1991.  
 F) (6 Jul, J-4, 4) (12 Jul, B-7, J-4, I-5, 2, 3, 2) (19 Jul, J-4, 3)  
 G) Number of individuals = 14
- 10461 *Leucania ursula* (Forbes, 1936)  
 B) Honeysuckle, crag-grass  
 D) Rockburne/Lafontaine (1976) (230)  
 E) Two records from Margaretta twp. 1986.  
 F) (30 May, E-9, 12) (8 Jun, E-9, 1) (15 Jun, C-6, I-8, 3, 8) (22 Jun, F-10, 2) (26 Jul, G-7, 4)  
 G) Number of individuals = 30
- 10462 *Leucania pseudargyria* Guenee, 1852  
 A) False Wainscot  
 B) Grasses  
 D) Covell (1984) Pl. 22 (21), Rockburne/Lafontaine (1976) (229)  
 E) None  
 F) (6 Jul, J-4, 1)  
 G) Number of individuals = 1
- 10520 *Morrisonia evicta* (Grote, 1873)  
 A) Bicolored Woodgrain  
 B) Wild Cherry  
 D) Rockburne/Lafontaine (1976) (220), Covell (1984) Pl. 22 (12)  
 E) One record from Berlin twp. 1985.  
 F) (14 May, H-6, 1) (26 Aug, G-4, 1)  
 G) Number of individuals = 2
- 10524 *Nephelodes minians* Guenee, 1852  
 A) Bronzed Cutworm Moth  
 B) Turf, pastures, corn  
 C) Rings (1992) Pl. VII (4), Mitchell/Zim (1987) p. 122  
 D) Covell (1984) Pl. 22 (15), Rockburne/Lafontaine (1976) (219)  
 E) One record from Margaretta twp. 1985.  
 F) (13 Aug, J-6, 1) (8 Sep, H-5, A-6, 16, 13) (18 Sep, E-4, F-10, J-7, 30, 33, 4) (23 Sep, E-9, D-9, C-5, 9, 1, 7)  
 G) Number of individuals = 114
- 10578 *Pseudorthodes vecors* (Guenee, 1852)  
 A) Small Brown Quaker  
 B) Aster, dandelion, grasses, plantain  
 D) Covell (1984) Pl. 22 (5), Rockburne/Lafontaine (1976) (215)  
 E) Two records from Berlin twp. 1982.  
 F) (30 May, E-10, 46)  
 G) Number of individuals = 46

10585 *Orthodes crenulata* (Butler, 1890)

- A) Rustic Quaker
- B) Dandelion, grasses, willow, plantain
- D) Covell (1984) Pl. 22 (1)
- E) Three records from Margaretta twp. 1985-1986.
- F) (30 May, E-9, 1)
- G) Number of individuals = 1

10587 *Orthodes cynica* Guenee, 1852

- A) Cynical Quaker
- B) Plantain, dandelion, goldenrod
- D) Covell (1984) Pl. 22 (8), Rockburne/Lafontaine (1976) (217)
- E) Three records from Margaretta twp. 1984. One record from Huron twp. 1982. One record from Margaretta twp. 1987. One record from Margaretta twp. 1991.
- F) (22 Jun, K-2, 3)
- G) Number of individuals = 3

10589.1 *Orthodes goodelli* Grote, 1865

- A) Goodell's Arches
- B) Unknown
- D) Covell (1984) Pl. 21 (17)
- E) Eight records from Margaretta twp. 1984-1987.
- F) (14 May, H-6, 1) (30 May, E-9, 4)
- G) Number of individuals = 5

10627 *Tricholita signata* (Walker, 1860)

- A) Signate Quaker
- B) Dandelion, plantain, goldenrod
- D) Rockburne/Lafontaine (1976) (210), Covell (1984) Pl. 21 (20)
- E) Five records from Margaretta twp. 1982, 1986, 1991.
- F) (26 Jul, E-9, 1) (31 Jul, K-2, 2) (26 Aug, H-4, 1)
- G) Number of individuals = 4

Noctuinae

10648 *Agrotis gladiaria* Morrison, 1874

- A) Swordsman Dart
- B) Grass, general feeder
- D) Covell (1984) Pl. 19 (2), Rockburne/Lafontaine (1976) (95)
- E) One record from Huron twp. 1982. Three records from Margaretta twp., 1984-1986.
- F) (18 Sep, F-10, 1)
- G) Number of individuals = 1

- 10651 *Agrotis venerabilis* Walker, 1857  
 A) Venerable Dart  
 B) Clover, alfalfa, chickweed, other plants  
 C) Rings (1992) Pl. II (6)  
 D) Covell (1984) Pl. 19 (6), Rockburne/Lafontaine (1976) (96)  
 E) Eleven records from Margaretta twp. 1984-1987.  
 F) (18 Sep, E-4, J-7, 3, 1) (23 Sep, C-5, 2)  
 G) Number of individuals = 6
- 10663 *Agrotis ipsilon* (Hufnagel, 1766)  
 A) Ipsilon Dart  
 B) Corn, lawns, gardens, many farm crops  
 C) Rings (1992) Pl. III (1), Mitchell/Zim (1987) p. 120  
 D) Heitzman (1987) p. 285, Covell (1984) Pl. 19 (9)  
 E) None  
 F) (22 Jun, K-2, F-10, 3, 2) (6 Jul, K-2, J-4, 6, 4) (12 Jul, I-5, H-4, B-7, 3, 2, 4) (19 Jul, J-4, B-6, 1, 1) (26 Jul, G-7, J-5, 1, 3) (18 Aug, B-5, D-6, 1, 1) (26 Aug, G-4, H-4, 1, 3) (1 Sep, D-9, 2) (8 Sep, A-6, H-5, 2, 3) (18 Sep, F-10, 1) (23 Sep, E-9, I-9, C-5, 1, 1, 2)  
 G) Number of individuals = 48
- 10670 *Feltia jaculifera* (Guenee, 1852)  
 A) Dingy Cutworm Moth  
 B) Grasses, goldenrod, clover, plantain, dock, aster, garden crops  
 C) Rings (1992) Pl. VII (5)  
 D) Heitzman (1987) p. 286, Covell (1984) Pl. 19 (8), Rockburne/Lafontaine (1976) (100)  
 E) Five records from Margaretta twp. 1982, 1984, 1985, 1986.  
 F) (6 Jul, K-2, 1) (31 Aug, I-5, 3) (1 Sep, A-7, I-5, D-9, 1, 4, 6) (8 Sep, H-5, A-6, 17, 17) (18 Sep, E-4, F-10, 6, 4) (23 Sep, D-9, 1)  
 G) Number of individuals = 60
- 10676 *Feltia herilis* (Grote, 1873)  
 A) Master's Dart  
 B) General feeder  
 D) Rockburne/Lafontaine (1976) p. 102, Covell (1984) Pl. 19 (10)  
 E) None  
 F) (26 Jul, J-5, 4) (31 Jul, K-2, I-9, 5, 2) (13 Aug, G-4, J-6, 7, 4) (18, Aug, D-6, F-10, 27, 15) (26 Aug, I-6, G-4, H-4, 31, 2, 11) (1 Sep, A-7, I-5, D-9, 37, 34, 28) (8 Sep, H-5, A-6, 33, 44) (18 Sep, F-10, C-8, J-7, 15, 6, 17) (23 Sep, E-9, C-5, D-9, 33, 19, 24)  
 G) Number of individuals = 398

- 10705 *Euxoa messoria* (Harris, 1841)  
 A) Reaper Dart  
 B) Pest of cultivated flowers and vegetables, feeds on many wild plants  
 C) Rings (1992) Pl. VII (6), Mitchell/Zim (1987) p. 122  
 D) Covell (1984) Pl. 18 (16)  
 E) One record from Margaretta twp. 1985.  
 F) (8 Sep, H-5, A-6, 1, 4) (23 Sep, C-5, 1)  
 G) Number of individuals = 6
- 10838 *Euxoa detersa* (Walker, 1856)  
 A) Rubbed Dart  
 B) Corn, grasses, garden crops  
 C) Rings (1992) Pl. VIII (2)  
 D) Covell (1984) Pl. 18 (20), Rockburne/Lafontaine (1976) (77)  
 E) Four records from Berlin twp. 1982.  
 F) (30 May, E-9, 1) (8 Sep, A-6, 1) (18 Sep, E-4, 3) (23 Sep, D-9, 1)  
 G) Number of individuals = 6
- 10891 *Ochropleura plecta* (Linnaeus, 1761)  
 A) Flame-Shouldered Dart  
 B) Clover  
 D) Rockburne/Lafontaine (1976) (107), Covell (1984) Pl. 19 (17)  
 E) One record from Margaretta twp. 1986.  
 F) (30 May, E-9, 1) (31 Jul, F-10, 1) (26 Aug, H-4, 1)  
 G) Number of individuals = 3
- 10903 *Euagrotis illapsa* (Walker, 1857)  
 A) Snowy Dart  
 B) Unknown  
 D) Rings (1992) Pl. XIV (42), Covell (1984) Pl. 20 (3)  
 E) One record from Margaretta twp. 1986.  
 F) (15 May, H-7, 1) (18 Aug, D-6, 5) (26 Aug, I-6, 3) (1 Sep, D-9, A-7, 2, 1)  
 G) Number of individuals = 12
- 10915 *Peridroma saucia* (Hubner, 1803-1808)  
 A) Variegated Cutworm Moth  
 B) General feeders on over 100 types of plants  
 C) Rings (1992) Pl. VIII (3), Mitchell/Zim (1987) p. 123, Wright (1993) p. 38  
 D) Covell (1984) Pl. 20 (16), Rockburen/Lafontaine (1976) (114)  
 E) One record Margaretta twp. 1986.  
 F) (15 Jun, C-6, 3) (30 Jun, B-7, 2) (11 Jul, J-6, J-4, K-2, 1, 3, 5)  
 (12 Jul, I-5, 6) (26 Jul, J-5, 1) (18 Aug, D-6, 45) (26 Aug, I-6, G-4, 3, 1) (31 Aug, I-5, 1) (1 Sep, A-7, D-9, 1, 1) (8 Sep, A-6, 4) (18 Sep, J-7, 1) (23 Sep, C-5, E-9, 1,1)  
 G) Number of individuals = 80

- 10929 *Eurois occulta* (Linnaeus, 1758)  
 B) Willow, aspen  
 D) Rockburne/Lafontaine (1976) (111)  
 E) None  
 F) (13 Aug, J-6, 1)  
 G) Number of individuals = 1
- 10942.1 *Xestia dolosa* Franclemont, 1980  
 A) Greater Black-Letter dart  
 B) Apple, clover, corn, maple, many other plants  
 C) Rings (1992) Pl. VIII (4), Mitchell/Zim (1987) p. 120  
 D) Covell (1984) Pl. 20 (4)  
 E) One record from Margaretta twp. 1982. Two records from Margaretta twp. 1985.  
 F) (30 May, F-9, 1) (8 Jun, E-9, 18) (10 Jun, H-4, 1) (15 Jun, C-6, I-6, 43, 11) (22 Jun, J-8, F-10, K-2, 2, 13, 1) (30 Jun, H-4, F-9, 3, 1) (26 Aug, H-4, 2) (31 Aug, I-5, 1) (1 Sep, A-7, 2) (8 Sep, H-5, E-9, 3, 18) (23 Sep, D-9, E-9, 1, 3)  
 G) Number of individuals = 124
- 10944 *Xestia smithii* (Snellen, 1896)  
 A) Smith's Dart  
 B) Birch, raspberry, strawberry, apple, dock, violet, clover  
 D) Covell (1984) Pl. 20 (7), Rockburne/Lafontaine (1976) (125)  
 E) Two records from Margaretta twp. 1985.  
 F) (26 Aug, H-4, I-6, 1, 5) (1 Sep, A-7, D-9, 89, 21) (8 Sep, A-6, H-5, 14, 64) (18 Sep, E-4, F-10, 5, 8) (23 Sep, E-9, C-5, D-9, 188, 29, 109)  
 G) Number of individuals = 533
- 10950 *Xestia bicarnea* (Guenee, 1852)  
 A) Pink-Spotted Dart  
 B) Clover, maple, birch, dandelion  
 D) Covell (1984) Pl. 20 (9), Rockburne/Lafontaine (1976) (129)  
 E) One record from Margaretta twp. 1985.  
 F) (13 Aug, J-6, 1) (18 Aug, E-4, D-6, 1, 7) (26 Aug, H-4, 17) (1 Sep, I-5, D-9, A-7, 2, 32, 38) (8 Sep, A-6, H-5, 24, 22) (18 Sep, E-4, F-10, 1, 1)  
 G) Number of individuals = 146
- 10955 *Xestia badinodis* (Grote, 1874)  
 A) Pale-Banded Dart  
 B) Chickweed, dock, aster, clover  
 C) Mitchell/Zim (1987) p. 121  
 D) Covell (1984) Pl. 19 (18), Rockburen/Lafontaine (1976) (126)  
 E) None  
 F) (18 Sep, F-10, E-4, 2, 6)  
 G) Number of individuals = 8

- 10998 *Choephora fungorum* Grote & Robinson, 1868  
A) Bent-Line Dart  
B) Dandelion, clover  
D) Covell (1984) Pl. 20 (1), Rockburne/Lafontaine (1976) (106)  
E) None  
F) (18 Sep, J-7, F-10, E-4, 1, 1, 2) (23 Sep, C-5, E-9, 1, 3)  
G) Number of individuals = 8

- 11006 *Protolampra brunneicollis* (Grote, 1865)  
A) Brow-Collared Dart  
B) Dandelion, clover, tobacco  
D) Rockburne/Lafontaine (1976) (148), Covell (1984) Pl. 21 (4)  
E) Two records from Margaretta twp. 1986.  
F) (15 Jun, I-6, C-6, 7, 1) (30 Jun, H-4, B-7, 9, 1) (6 Jul, J-4, 14) (8 Jul, K-2, 5) (12 Jul, H-4, 2) (13 Aug, J-6, G-4, 3, 4) (18 Aug, C-8, 1) (26 Aug, I-6, G-4, H-4, 23, 1, 8) (1 Sep, I-5, D-9, 6, 14) (8 Sep, A-6, 5)  
G) Number of individuals = 104

- 11029 *Abagrotis alternata* (Grote, 1864)  
A) Greater Red Dart  
B) Apple, ash, cherry, hickory, oak, walnut  
C) Rings (1992) Pl. VIII (5)  
D) Covell (1984) Pl. 20 (13), Rockburne/Lafontaine (1976) (154)  
E) One record from Berlin twp. 1982.  
F) (6 Jul, J-4, K-2, 4, 1) (13 Aug, J-6, 1) (1 Sep, A-7, 3) (8 Sep, H-5, A-6, 4, 2) (18 Sep, E-4, 2)  
G) Number of individuals = 17

#### Heliothinae

- 11065 *Rhodoecia aurantiago* (Guenee, 1852)  
A) Orange Sallow  
B) Foxgloves  
D) Covell (1984) Pl. 27 (22), Rockburne/Lafontaine (1976) (470)  
E) None  
F) (31 Aug, I-5, 1)  
G) Number of individuals = 1

- 11068 *Heliothis zea* (Boddie, 1850)  
A) Corn Earworm Moth, Bollworm, or Tomato Fruitworm  
B) Corn, cotton, tomato, tobacco  
C) Heitzman (1987) p. 370, Mitchell/Zim (1987) p. 131, Wright (1993) p. 40  
D) Heitzman (1987) p. 288, Covell (1984) Pl. 29 (14)  
E) Two records from Margaretta twp. 1985.  
F) (26 Aug, I-4, 1) (1 Sep, I-5, 1) (8 Sep, A-6, 1) (23 Sep, E-9, D-9, 3, 2)  
G) Number of individuals = 8

11128 *Schinia arcigera* (Guenee, 1852)

- A) Arcigera Flower Moth
- B) Asters
- D) Covell (1984) Pl. 29 (20,21)
- E) One record from Margaretta twp. 1985.
- F) (25 Aug, B-6, 1)
- G) Number of individuals = 1

11149 *Schinia trifascia* Hubner, 1818

- A) Three-Lined Flower Moth
- B) Joe-Pye Weed
- D) Rings (1992) Pl. XVI (34), Covell (1984) Pl. 29 (7)
- E) Three records from Margaretta twp. 1985, 1986.
- F) (18 Aug, D-6, 2)
- G) Number of individuals = 2

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Section G  
Beetles

As a supplement to this study, a recognized Beetle authority volunteered to conduct a Beetle study under the auspices of the other ODNR efforts. The attached report conveys the findings of Mr. Henry Lee, 22646 MacBeth Road, Fairview Park, Ohio.

NASA Plumbrook Beetles; 1994 Field Survey Results

Genus/species	Location, habitat	Notes
Cicindelida, tiger beetles		
Cicindela formosa generosa .....	C6 sandpit, in flight	X A
Cicindela scutellaris .....	C6 sandpit, in flight	X A
Cicindela repanda .....	C6 sandpit, in flight	
Cicindela punctulata .....	C6 sandpit, in flight	
Cicindela sexgutata	C6 sandpit, in flight	
Carabidae, ground beetles		
Sphaeroderus lecontei	D6 sandy woods, under log	
Carabus limbatus	C6 sandy woods, pitfall trap	
Carabus serratus *	D6 sandpit/woods edge, pitfall trap	X
Patrobus longicornis	C6 sandy woods, under log	
Bembidium nitidum	D6 sandpit, under leaf litter	X
Bembidium cordatum	H5 Snake Rd. pond, mud flat	
Myas coracinus	C6 sandy woods, under log	X B
Pterostichus adoxus	C6 sandy woods, under log	
Pterostichus lucublandus	C6 sandy woods, under log	
Pterostichus mutus	C6 sandy woods, under log	x C
Pterostichus stygicus	C6 sandy woods, under log	
Pterostichus leconteianus	C6 sandy woods, under log	
Pterostichus femoralis	C6 sandy woods, under log	
Cyclotrachelus convivus	C6 sandy woods, under log	
Abacidus permundas	C6 sandy woods, under log	
Abacidus atratus	C6 sandy woods, under log	
Calathus opaculus	C6 sandy woods, under log	X
Calathus gregarius	C6 sandy woods, under log	X
Synchus impunctatus	C6 sandy woods, under log	X
Agonum melanarium	C6 sandy woods, under log	
Agonum placidum	C6 sandy woods, under log	
Agonum ferreum	C6 sandy woods, under log	
Agonum decentis	C6 sandy woods, under log	
Agonum hypolithos	D6 sandpit/woods edge, pitfall trap	
Amara exarata	C6 sandy woods, pitfall trap	X
Harpalus pensylvanicus	D6 sandpit/woods edge, pitfall trap	
Harpalus bicolor	D6 sandpit/woods edge, pitfall trap	
Harpalus erraticus	D6 sandpit/woods edge, pitfall trap	X
Trichotichnus vulpeculus	C6 sandy woods, pitfall trap	
Selenophorus opalinus	C6 sandy woods, under log	X
Geopinus incrassatus	D6 sandpit/woods edge, pitfall trap	X
Anisodactylus rusticus	D6 sandpit, under leaf litter	X
Anisoriactylus melanopus	C6 sandy woods, under log	
Anisodactylus sanctaecrucis	C6 sandy woods, under log	

NASA Plumbrook Beetles; 1994 Field Survey Results

Genus/species	Location, habitat	Notes
Cicindelida, tiger beetles		
Cicindela formosa generosa .....	C6 sandpit, in flight	X A
Cicindela scutellaris .....	C6 sandpit, in flight	X A
Cicindela repanda .....	C6 sandpit, in flight	
Cicindela punctulata .....	C6 sandpit, in flight	
Cicindela sexgutata	C6 sandpit, in flight	
Carabidae, ground beetles		
Sphaeroderus lecontei	D6 sandy woods, under log	
Carabus limbatus	C6 sandy woods, pitfall trap	
Carabus serratus *	D6 sandpit/woods edge, pitfall trap	X
Patrobus longicornis	C6 sandy woods, under log	
Bembidium nitidum	D6 sandpit, under leaf litter	X
Bembidium cordatum	H5 Snake Rd. pond, mud flat	
Myas coracinus	C6 sandy woods, under log	X B
Pterostichus adoxus	C6 sandy woods, under log	
Pterostichus lucublandus	C6 sandy woods, under log	
Pterostichus mutus	C6 sandy woods, under log	x C
Pterostichus stygicus	C6 sandy woods, under log	
Pterostichus leconteianus	C6 sandy woods, under log	
Pterostichus femoralis	C6 sandy woods, under log	
Cyclotrachelus convivus	C6 sandy woods, under log	
Abacidus permundas	C6 sandy woods, under log	
Abacidus atratus	C6 sandy woods, under log	
Calathus opaculus	C6 sandy woods, under log	X
Calathus gregarius	C6 sandy woods, under log	X
Synchus impunctatus	C6 sandy woods, under log	X
Agonum melanarium	C6 sandy woods, under log	
Agonum placidum	C6 sandy woods, under log	
Agonum ferreum	C6 sandy woods, under log	
Agonum decentis	C6 sandy woods, under log	
Agonum hypolithos	D6 sandpit/woods edge, pitfall trap	
Amara exarata	C6 sandy woods, pitfall trap	X
Harpalus pensylvanicus	D6 sandpit/woods edge, pitfall trap	
Harpalus bicolor	D6 sandpit/woods edge, pitfall trap	
Harpalus erraticus	D6 sandpit/woods edge, pitfall trap	X
Trichotichnus vulpeculus	C6 sandy woods, pitfall trap	
Selenophorus opalinus	C6 sandy woods, under log	X
Geopinus incrassatus	D6 sandpit/woods edge, pitfall trap	X
Anisodactylus rusticus	D6 sandpit, under leaf litter	X
Anisoriactylus melanopus	C6 sandy woods, under log	
nisodactylus sanctaecrucis	C6 sandy woods, under log	

<i>Anisodactylus interstitialis</i>	C6 sandy woods, under log	
<i>Anisodactylus lugubris</i>	C6 sandy woods, under log	x
<i>Dicaelus politus</i> *	C6 sandy woods, under log	
<i>Dicaelus sculptilis</i> *	C6 sandy woods, under log	
<i>Chlaeinus nemoralis</i>	C6 sandy woods, under log	
<i>Chlaeinus tricolor</i>	C6 sandy woods, under log	
<i>Oodes arnaroides</i>	H6 Sphagnum pond, sphagnum	
<i>Tetragonderus fasciatus</i>	D6 sandpit, under leaf litter	X
<i>Lebia grandis</i>	C6 sandy woods, under log	
<i>Pinacodera platicollis</i>	C6 sandy woods, pitfall trap	
<i>Cymibis americana</i>	C6 sandy woods, under log	X
<i>Galerita janus</i>	D6 sandpit/woods edge, pitfall trap	

\* = First time I have taken this species X = Known xerophile x = Apparent xerophile

Genus species	Location, habitat	Notes
<b>Silphidae, carrion beetles</b>		
Necrophila americana	D6 sandpit/woods edge, pitfall trap	
Nicrophorus tomentosus	D6 sandpit/woods edge, pitfall trap	
Nicrophorus orbicollis	D6 sandpit/woods edge, pitfall trap	
<b>Scarabaeidae, dung beetles</b>		
Onthophagus hegate	D6 sandpit/woods edge, pitfall trap	
Onthophagus pennsylvanicus *	D6 sandpit/woods edge, pitfall trap	
Ateuchus histeroides	D6 sandpit/woods edge, pitfall trap	E
Copris minutus	D6 sandpit/woods edge, pitfall trap	
Geotrupes splendidus	D6 sandpit/woods edge, pitfall trap	
<b>Cerambycidae, longhorn beetles</b>		
Tetraopes melanurus	G4 roadside, common milkweed	
Tetraopes femoratus *	G4 roadside, narrow leaf milkweed	F
<b>Diplopoda:Polyzonidae, millipede</b>		
Pontaria coriacea *	C6 sandy woods, under log	G

\* = First time I have taken this species

## NOTES

- A. *Cicindela formosa generosa* and *C. scutellaris*. These two tiger beetle species I have taken only at Oak Openings, Lucas Co. I did not feel that there were any colonies of these species left in northeast or north central Ohio. Their discovery at Plum Brook was a pleasant surprise. It is quite important to preserve the small sandpit, or perhaps expand it if possible. Also *C. lepida* should be looked for in July, since it is usually associated with the two above species but is even more rare. It also comes to u.v. light.
- B. *Myas coracinus*. This is a beautiful metallic purple species. Only two specimens in my collection from Oak Openings, Lucas Co.
- C. *Pterostichus mutus*. The most abundant species found. Not at all common in other areas.
- D. *Dicaelus sculptilis*. This is a large snail feeding species which I knew occurred in Erie Co., but did not expect to find.
- E. *Ateuchus histeroides*. I have taken only a few specimens of this species previously at Oak Openings, Lucas Co.
- F. *Tetraopes femoratus*. Bob Androw, (Ohio State University), has informed me that this species is, (or was), known in Ohio only from the extreme southeast portion of the state.
- G. *Fontaria coriacea*. According to Williams & Hefner, (The Millipedes and Centipedes of Ohio), the distribution of this species is "general in Ohio; abundant in southeast, rare in north". An interesting bright yellow species.

Comments:

I consider all xerophilous species uncommon to rare in northern Ohio due primarily to the lack of suitable habitat. Those found in relic beach ridge habitats are especially rare.

Since I was only able to study this area 2 & 1/2 months out of a 7 month collecting season the above list is far from complete. I felt that the relic beach ridge community was the most unusual, so therefore concentrated my efforts in this area. A serious search with u.v. light would result in a large amount of additional useful information.

Ultraviolet light trap material:

All species listed are carabids unless noted otherwise.

DATE      COORDINATE

13Aug94    J6

3 *Harpalus pensylvanicus*  
1 *Harpalus erythropus*  
4 *Harpalus bicolor*  
1 *Harpalus puncticeps* (Introduced species spreading east to west)

13Aug94    G4

1 *Harpalus pensylvanicus*  
3 *Harpalus bicolor*  
4 *Harpalus erythropus*  
2 *Notibia terminata*  
1 *Anisodactylus sericeus*  
1 *Pinacodera limbata*

18Aug94

2 *Lebia atriventris*  
1 *Agonum decorum*  
1 *Clivina bipustulata*  
1 *Harpalus erythropus*

25Aug94    B6

1 *Eburia quadrigeminata* (longhorn beetle)

26Aug94    G4

7 *Harpalus bicolor*  
1 *Harpalus erythropus*  
1 *Selenophorus opalinus*  
1 *Chlaenius tricolor*  
1 *Agonum decorum*

2 *Amara musculis*  
26 *Stenolophus comma*  
1 *Notibia terminata*  
2 *Lebia analis*  
1 *Lebia solea*  
4 *Clivina bipustulata*  
1 *Bembidium cordatum*  
1 *Bembidium rupicola*  
1 *Pinacodera limbata*

26Aug94 I6

4 *Harpalus penylvanicus*  
1 *Harpalus bicolor*  
8 *Harpalus erythropus*  
2 *Selenophorus opalinus*  
1 *Trichotichnus vulpeculus*  
2 *Notibia terminata*  
1 *Agonum placidum*  
5 *Amara musculis*  
12 *Lebia atriventris*  
1 *Lebia lobulata*  
1 *Pinacodera limbata*  
2 *Clivina impressifrons*  
1 *Badister neopulchellus*  
1 *Colliuris pensylvanica*  
2 *Bembidium cordatum*  
  
2 *Voxtus brunneipennis* \* (earwig)

26Aug94 H4

2 *Harpalus pensylvanicus*  
5 *Harpalus bicolor*  
7 *Harpalus erythropus*  
2 *Notibia terminata*  
4 *Selenophorus opalinus*  
1 *Gynandropus hylacis*  
5 *Lebia atriventris*  
1 *Lebia solea*  
1 *Chlaenius tricolor*  
1 *Anisodactylus sericeus*  
2 *Agonum decorum*  
1 *Amara musculis*  
2 *Clivina americana*  
  
2 *Bolboceras ?falli* \* (Dung beetle)

Comments:

The members of *Bolboceras* are what's known in the business as "grand rarities". In over 40 years of collecting I have taken only 1 specimen at u.v. light. (Ultraviolet light is a excellent tool for collecting carabids). They are as difficult to determine as they are to obtain. Little is known about them other than they dig vertical burrows in sandy soil, and are very secretive. As far as I'm concerned any location where they are found is very unique.

Harry Lee  
7 March 1995  
Cleveland, OH

