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A CHECK LIST OF THE LEPIDOPTERA OF FULTON COUNTY, OHIO WITH SPECIAL REFERENCE TO THE MOTHS OF GOLL WOODS STATE NATURE PRESERVE

Roy W. Rings¹, Eric H. Metzler² and David K. Parshall³

ABSTRACT

The results of a comprehensive 1988 – 1989 survey of the Lepidoptera in the 130 hectare Goll Woods State Nature Preserve in Fulton County, Ohio are presented. In addition many records of butterflies and skippers outside the confines of the Preserve are presented for the first time. This is the fifth in a series of papers featuring the current status of lepidopterous fauna in Ohio's recreational areas.

A total of 27 species of skippers, 51 species of butterflies and 394 species of moths was identified and tabulated for the county. Three species on this list are classified as endangered, *Epidemia helloides*, *Lithophane semiusta* and *Ufeus plicatus*, and two are threatened, *Speyeria idalia* and *Clossiana selene*. Although locally abundant, *Lithophane semiusta* Grote is known to occur only at this site in Ohio. A single specimen of *Ufeus plicatus* was taken and is the only known specimen for the state.

This research report is a part of an overall plan designed to conduct a comprehensive survey of the Lepidoptera of Ohio. This survey is sponsored by the Ohio Department of Natural Resources, Division of Wildlife, and implemented, by The Ohio Lepidopterists, a state-wide organization which is dedicated to increasing our knowledge of Lepidoptera in Ohio.

The publication of this information establishes a data base for Fulton County upon which to build a more comprehensive body of knowledge of the non-game wildlife in this county. It also provides a status report on the species taken in the county as of October 1989. The threat of chemical spraying to control the gypsy moth, *Lymantria dispar* (L.), if it is found eventually in this Preserve, was a determining factor in the decision to undertake this project. The Ohio Department of Agriculture reported that the male moth survey numbers in Fulton County more than doubled from 1989 to 1990. The mounting population pressure from the Michigan gypsy moth populations could speed up future infestations in Fulton County. Subsequent studies may show that the survival and abundance status of some lepidopterous species at these sites has changed.

This is the fifth in a series of papers which document the species and present status of Lepidoptera in Ohio's recreational areas and nature preserves. We have previously reported on the Lepidoptera of the Wilderness Center in Stark County, Atwood Lake Park in Carroll and Tuscarawas counties, Mohican State Forest and

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Mohican State Park in Ashland County and Fowler Woods State Nature Preserve in Richland County (Rings et al 1987, Rings and Metzler 1988, 1989, 1990).

The present paper is organized somewhat differently than our previous publications. In addition to providing a check list of the Heterocera (moths) of Goll Woods we have added quite a number of records of skippers and butterflies collected by various lepidopterists outside the Preserve itself.

DESCRIPTION OF THE STUDY SITE

The Goll Woods State Nature Preserve is located in southwestern Fulton County eight km northwest of Archbold. The exact collecting sites were from 41°33'6" to 41°33'33" latitude in German Township.

Fulton County is entirely covered with soils originating from glacial till and deposits in glacial lakes. These deposits range mostly from 15.24 m to 76.20 m in thickness and are over shale bedrock. Five soil types have been mapped in Goll Woods (Stone and Michael, 1984) of which Lenawee silty clay loam is the most prevalent. This soil type is found on former lake plains and is typically deep and very poorly drained. The surface layers are high in silt and clay while the subsoil ranges from silt loam to fine sand. Two other, poorly-drained soil types have been mapped on small out-wash deltas within the Preserve: DelRay silt loam and Fulton clay loam. Fossil beach ridges are underlain by either Seward loamy fine sand or Rimer loamy sand. While these latter four soils cover less than 40 percent of the Preserve, they may influence vegetative composition through their variations in soil moisture levels, aeration, or water table level (Hamilton and Limbard, 1982).

The climate of Fulton County is temperate with an average daily temperature minimum of -9.7°C in January, an average maximum of 28.8°C in July, and an average annual precipitation of 866 mm (Boerner and Cho, 1987).

The land use history is typical of northwestern Ohio. The early European settlers began clearing the virgin forests in the early 1800's for agricultural operations. Today the farmlands surrounding Goll Woods are devoted to the production of corn, soybeans, wheat, vegetables, cattle, hogs, sheep and chickens.

Goll Woods is the last, known, uncut remnant of the Black Swamp forest of northwestern Ohio (Boerner and Cho, 1987). The relatively well-drained fossil beach ridges are dominated by sugar maple (*Acer saccharum*) and beech (*Fagus grandifolia*), with sycamore (*Platanus occidentalis*) and white oak (*Quercus alba*) also common. The forest floor is poorly drained and occupied by silver maple (*Acer saccharinum*), American elm (*Ulmus americana*), bur oak (*Quercus macrocarpa*) and ashes (*Fraxinus*). Basswood (*Tilia americana*), ironwood (*Carpina caroliniana*), northern red oak (*Quercus rubra borealis*), and red maple (*Acer rubrum*) are more abundant on the transitional sites.

An outstanding feature of this forest is the abundance of giant bur oaks, exceptionally large white oaks, and sycamores. Many of these magnificent, old trees are 1.2 m in diameter. One bur oak stands 37.19 m tall, has a diameter of 159.2 cm, and is estimated to be more than 450 years old (Anonymous, 1987).

The forest and roads are bordered by patches of open fields in which various grasses (*Poa* spp.), goldenrods (*Solidago* spp.), milkweeds (*Asclepias* spp.) and sunflowers, (*Helianthus* spp.) are found.

MATERIALS AND METHODS

Reed Watkins of The Ohio Lepidopterists provided printouts of all Fulton County collections of Lepidoptera from the data base which has been accumulated from 1984 to 1989. In addition many unpublished records of material collected by

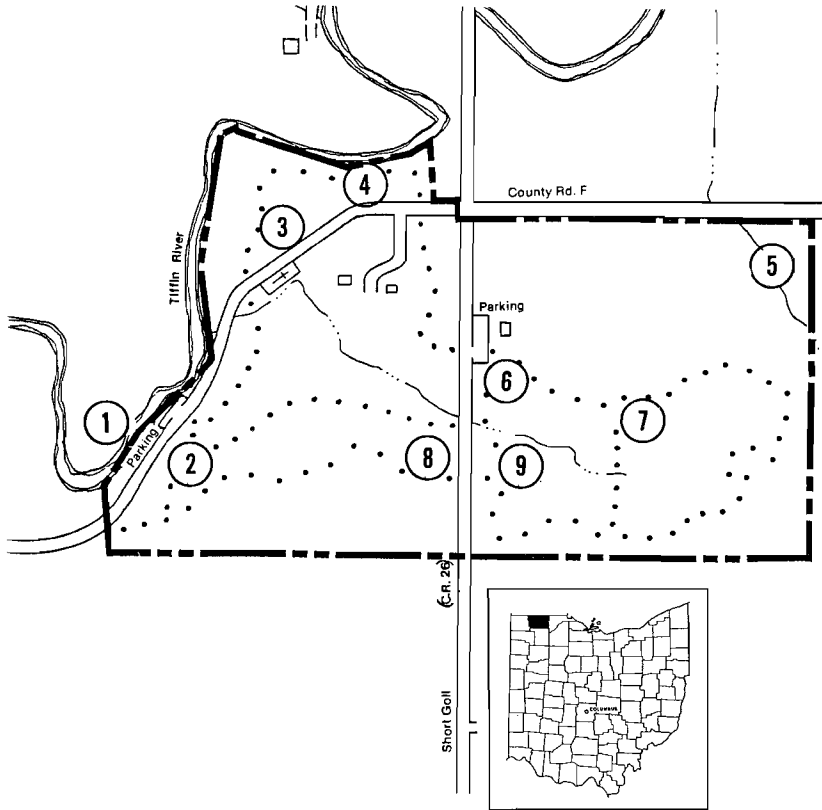


Figure 1. Map of Goll Woods State Nature Preserve showing nine collection sites. The dotted lines represent nature trails. Inset: location of Fulton County in Ohio.

David Parshall have been added. All of the records from these sources were butterfly and skipper collections.

At Goll Woods collecting was done when maximum daily temperatures exceeded 16.9°C . In 1988 a total of eight collecting trips was made to the study site from 8 May to 16 October. The following year 14 collecting trips were made to Goll Woods on 11 and 26 March; 13 and 14 April; 14, 15, 24 and 25 May; 7, 8, 25, and 26 June; 10, 11 and 24 July; 1, 25 and 26 August; and 9, 20 and 21 September.

The collecting techniques at this Preserve were the same as those described previously for the Fowler Woods State Nature Preserve (Rings and Metzler, 1990).

The following sites were regularly sampled in an alternating pattern (see Fig. 1):

- (1) west parking lot on County Road F and banks of the Tiffin River.
- (2) nature trail opposite west parking lot.
- (3) in forest opposite Goll Cemetery on County Road F.
- (4) on County Road F in nature trail opposite Manager's Residence.
- (5) in open field near creek.

- (6) in main parking lot at entrance to Goll Woods.
- (7) deep in forest east of main entrance
- (8) on County Road 20 in western section of forest at service road.
- (9) on County Road 20 in eastern section of forest at service road.

RESULTS AND DISCUSSION

Species and forms collected during this study are listed in Tables 1 and 2 according to the most recent check list for North America (Hodges et al. 1983). Changes in nomenclature since this check list was published follow Ferris (1989), Gall (1990), Kononenko et al (1989), Lafontaine and Kononenko (1986) and Poole (1989). The numbers in the first column are the check list numbers from the Hodges check list. Common names are omitted. Following this number is the scientific name, form if appropriate, author of the species, and date of collection. When more than one collection date is listed, the first is the earliest record of collection, and the second is the latest, in a calendar year. Exceptions to this statement occur in the "winter moths", *Lithophane* and *Eupsilia*, which overwinter as adults and reproduce the following spring. Following the date of collection is the method of collection abbreviated as indicated at the bottom of Table 1. The number following the method of collection is the number of individuals collected by that method.

A total of 472 species of Lepidoptera, representing 25 families, was collected and identified in the course of these studies. This total is composed of 1,338 records and 5,044 specimens. A record may include from one to 151 individuals. Of the total number of species 51 were butterflies, 27 were skippers and 394 were moths. (See Table 1).

The following three species taken in Fulton County are on the Ohio list of endangered species: (*Epidemia helleoides* (Bdv.), *Lithophane semiusta* Grt. and *Ufeus plicatus* Grt.). Two species on this check list are threatened (*Speyeria idalia* (Dru.) and *Clossiana selene* (Cram.)). Two species, *Lithophane semiusta* and *Ufeus plicatus*, are known to occur in Ohio only at Goll Woods. The documentation for the endangerment of the three species listed above is the Ohio Department of Natural Resources, Division of Wildlife Rule Number 1501:-23-01 dated 4 July 1984 and amended 26 January 1990.

Lithophane semiusta was found to be locally abundant in collection sites 7, 8, and 9. This species was collected from 11 March to 25 April 1989. A total of 39 males and 14 females was taken by various methods. *L. semiusta* was attracted to sugar baits much more readily than to ultraviolet light. Only 11.3% of the moths were collected in black light traps while 88.7% of the moths were attracted to sugar baits painted on trees or were captured in bait traps. Very little is known about the larval food plants of this species. Raizenne (1952) reported a single collection consisting of one pupa from basswood in 1940 at Gatineau, Quebec. Prentice (1962) reported a single, late June collection of three larvae from basswood near the southern tip of Georgian Bay in southern Ontario. Basswood was abundant near the collection sites. Repeated attempts to collect larvae from basswood in May failed to yield any *L. semiusta* larvae. Franclemont (personal communication 1989) has reared *L. semiusta* on quaking aspen.

The single specimen of *Ufeus plicatus* was collected at ultraviolet light on 10 July 1989. This is rare species and little is known of its distribution and larval host plants. Prentice (1962) stated that the species was rare in the collections of the Canadian Forest Insect Survey. At Wood Mountain, Saskatchewan an unspecified number of larvae was collected under the bark of a fallen aspen and then reared successfully on aspen foliage. Forbes (1954) reared the species on poplar but does not claim that poplar is the natural food plant.

Three-hundred and fifty-five specimens of *Lithophane* were collected repre-

Table 1.—A check list of butterflies and skippers collected in Fulton County, Ohio (1898 - 1989)

HESPERIIDAE

- 3870 *Epargyreus clarus* (Cram.) 17 Jul 1987 N, Swan Creek Twp., DKP.
 3909 *Thorybes bathyllus* (J. E. Smith) 29 Jul 1970 N, Maumee State Forest, LLM.
 3945 *Erynnis icelus* (Scudder & Burgess) 22 May 1988 N, Swan Creek Twp., Sec. 23, DKP.
 3947 *Erynnis juvenalis* (F.) 17 May 1987 N, Swan Creek Twp., Sec. 23, DKP.
 3952 *Erynnis horatius* (Scudder & Burgess) 20 Aug 1988 N, Swan Creek Twp., DKP. No date, Maumee State Forest, LLM.
 3959 *Erynnis baptisiae* (Fbs.) 20 Aug 1987 N, Swan Creek Twp., Sec. 23, DKP.
 3966 *Pyrgus communis* (Grt.) 5 Jul 1989 N, Swan Creek Twp., DKP.
 3977 *Pholisora catullus* (F.) 29 Jul 1970 N, Maumee State Forest, LLM. 9 May 1984 N, Swan Creek Twp., DCI. 1 Jun 1984 N, Swan Creek Twp., JVC. 11 Jun 1984 N, Oak Openings, JAS. 20 Aug 1988 N, Swan Creek Twp., DKP.
 4004 *Ancyloxypha numitor* (F.) 20 Aug 1987 N, Swan Creek Twp., DKP.
 4012 *Thymelicus lineola* (Ochs.) 26 Jun 1989 N 15, Goll Woods, German Twp. RWR.
 4013 *Hylephila phyleus* (Drury) 20 Aug 1987 N, Swan Creek Twp., DKP.
 4023 *Hesperia leonardus* Harr. 24 Aug 1986 N, Swan Creek Twp., DCI. 20 Aug 1987 N, Swan Creek Twp., DKP.
 4036 *Polites coras* (Cram.) 9 Jun 1984 N, Swan Creek Twp., DCI. 17 Jul & 20 Aug 1987 N, Swan Creek Twp., DKP.
 4041 *Polites themisocles* (Latr.) 17 Jul & 20 Aug 1987 N, Swan Creek Twp., DKP.
 4042 *Polites origenes* (F.) 5 Jul 1989 N, Swan Creek Twp., DKP.
 4043 *Polites mystic* (Edw.) 9 Jun 1946 N, Mill Creek, Franklin Twp. 18 Jun 1969 N, Maumee State Forest, LLM. 9 Jun 1984 N 2, Swan Creek Twp., JVC and DCI. 11 Jun 1984 N, Oak Openings, JAS.
 4047 *Wallengrenia egeremet* (Scudder) 30 Jun 1988 N, Swan Creek Twp., DKP. 7 Jul 1898 N, Wauseon, Clinton Twp. (Voucher specimen in OSUC).
 4048 *Pompeius verna* (Edw.) 30 Jun 1988 N, Swan Creek Twp., DKP. 26 Jun 1989 N 1, Goll Woods, German Twp. RWR.
 4051 *Airytone logan* (Edw.) 30 Jun & 13 Jul 1988; 5 Jul 1989 N, Swan Creek Twp., DKP. 7 Jul 1898 N, Wauson, Clinton Twp. (Voucher specimen in OSUC).
 4058 *Poanes massasoit* (Scudder) 13 Jul 1988 N, Swan Creek Twp., DKP.
 4059 *Poanes hobomok* (Harr.) 9 Jun 1946 N, Harrison Lake, Gorham Twp., HFP. 9 Jun 1984 N, Swan Creek Twp., DCI. 9 Jun 1989 N 1, Goll Woods, German Twp. RWR.
 4064 *Poanes viator* (Edw.) 17 Jul 1987, 13 Jul 1988, 5 Jul 1989 N, Swan Creek Twp., DKP.
 4072 *Euphyes dion* (Edw.) 13 Jul 1988, 5 Jul 1989 N, Swan Creek Twp., DKP.
 4074 *Euphyes dukesi* (Linds.) 7 Jul 1987, 13 Jul 1988, 5 Jul 1989 N, Swan Creek Twp., DKP.
 4075 *Euphyes conspicuus* (Edw.) 5 Jul 1989 N, Swan Creek Twp., DKP.
 4078 *Euphyes vestris* (Bdv.) 5 Jul 1989 N, Swan Creek Twp., DKP. 7 Jul 1898 N, Wauson, Clinton Twp. (Voucher specimen in OSUC).
 4080 *Atrytonopsis hianna* (Scudder) 1–5 Jun 1984 N 2, Swan Creek Twp., JVC. 9 Jun 1985 N, Swan Creek Twp., DCI. 17 May 1987 N, Swan Creek Twp., DKP.

PAPILIONIDAE

- 4157 *Battus philenor* (L.) 17 May 1987 N, Swan Creek Twp., DKP.
 4159 *Papilio polyxenes asterius* Stoll 24 Aug 1986 N, Swan Creek Twp., DCI. 17 Jul 1987 N, Swan Creek Twp., DKP.
 4170 *Heraclides crespontes* Cram. 17 Aug 1989 N, Swan Creek Twp., DKP.
 4176 *Pterourus glaucus* L. 17 Aug 1989 N, Swan Creek Twp., DKP. 8 Sep 1988 L 1; 25 May 1989 N 1, Goll Woods, German Twp., RWR.
 4181 *Pterourus troilus* L. 29 Jul 1970 N, Maumee State Forest, LLM. 17 Jul 1987 N, Swan Creek Twp., DKP. 17 Aug 1988 N 1, German Twp., RWR.

PIERIDAE

- 4193 *Pontia protodice* (Bdv. & Leconte) 30 Jun 1988 N, Swan Creek Twp., DKP.
 4197 *Pieris rapae rapae* (L.) 8 Sep 1988 N 1; 25–26 Jun 1989 N 10, Goll Woods, German Twp. RWR. 6 Aug 1986 N, Oak Openings, JAS. 30 Jun 1988 N, Swan Creek Twp., DKP.
 4209 *Colias philodice* Godt. 2 Oct 1945 N, Harrison Lake, Gorham Twp., Col. H. F. Price. 30 Jun 1988 N, Swan Creek Twp., DKP. 20 Sep 1989 N 4, Goll Woods, German Twp. RWR.
 4210 *Colias eurytheme* Bdv. 26 Aug–21 Sep 1989 N 12, Goll Woods, German Twp., RWR.
 4224 *Zerene cesonia* (Stoll) 9 Jun 1946 N, Mill Creek, Franklin Twp., HFP.
 4237 *Eurema lisa* Bdv. & Leconte 20 Aug 1987 N, DKP.
 4242 *Eurema nicippe* (Cram.) 2 Aug 1896 N, Wauseon, Clinton Twp. (Voucher specimen in OSUC).

LYCAENIDAE

- 4251a. *Lycaena phlaeas americana* Harr. 9 Jun 1984 N, Swan Creek Twp., DCI. 22 May 1988 N, Swan Creek Twp., DKP.
- 4256 *Hylolycaena hylus* (Cram.) 29 Jul 1970 N, Maumee State Forest, LLM. 9 Jun 1984, no Twp. DCI.
- 4262 *Epidemia helloides* (Bdv.) 5 Jun 1984 N, Swan Creek Twp., JVC. 9 Jun 1984 N, Swan Creek Twp., DCI. 17 Jul 1987 N, Swan Creek Twp., DKP. This species is endangered in Ohio.
- 4275 *Harknellenus titus* (F.) 4 Jul 1898 N, Wauseon, Clinton Twp. (Voucher specimen in OSUC). 20 Jul 1924, Swanton, Fulton Twp. (Voucher specimen in UMMZ). 17 Jul 1987 N, Swan Creek Twp., DKP.
- 4278 *Satyrium acadicum* (Edw.) 30 Jun 1988, 5 Jul 1989 N, Swan Creek Twp., DKP.
- 4281 *Satyrium edwardsii* (G. & R.) 17 Jul 1987 N, Swan Creek Twp., DKP.
- 4282a. *Satyrium calanus falacer* (Godt.) 5 Jul 1989 N, Swan Creek Twp., DKP.
- 4283 *Satyrium caryaevorum* (McD.) 4 Jul 1898 N, Wauseon, Clinton Twp. (Voucher specimen in OSUC).
- 4332 *Fixsenia ontario* (Edw.) 4 Jul 1898 N 1, Wauseon, Clinton Twp. (Voucher specimen in OSUC).
- 4336a. *Strymon melinus humuli* (Harr.) 20 Aug. 1987 N, Swan Creek Twp., DKP.
- 4361 *Evers comyntas* (Godt.) 20 Jul 1924, Swanton, Fulton Twp. (Voucher specimen UMMZ).
- 4363 *Celastrina argiolus* (Cram.) 23 Aug 1986, Swan Creek Twp., JVC.

LIBYTHEIDAE

- 4410 *Libytheana bachmanii* (Kirtland) 17 Jul 1987 N, Swan Creek Twp., DKP.

NYMPHALIDAE

- 4420 *Polygonia interrogationis* (F.) 7–25 Jun 1989 BLT, N 3, Goll Woods, German Twp., RWR.
- 4421 *Polygonia comma* (Harr.) 25 Mar–26 Jun 1989 BT 1, N 5, Goll Woods, German Twp., RWR.
- 4430a. *Nymphalis vau-album j-album* (Bdv. & Leconte) 5 Sep 1927 N, Wauseon, Clinton Twp. (Voucher specimen in OSUC)
- 4432 *Nymphalis antiopa* (L.) 24 Apr–9 Sep 1989 BT 3, L 1, Goll Woods, German Twp. RWR.
- 4433 *Aglais milberti* (Godt.) 9 Jun 1984 N, Swan Creek Twp., JVC. 26 Aug 1989 N 1, Goll Woods, German Twp., RWR.
- 4434 *Vanessa virginiensis* (Drury) 20 Aug 1988 N, Swan Creek Twp., DKP.
- 4435 *Vanessa cardui* (L.) 20 Jul 1924 N, Swanton, Fulton Twp. (Voucher specimens in UMMZ).
- 4437 *Vanessa atalanta* (L.) 26 Jun 1989 N 4, Goll Woods, German Twp., RWR.
- 4440 *Junonia coenia* (Hbn.) 24 Aug 1986 N, Swan Creek Twp., DCI. 20 Aug 1989 N, Swan Creek Twp., DKP.
- 4450 *Speyeria cybele* (F.) 17 Aug 1988 N 1, German Twp., RWR. 20 Aug 1988 N, Swan Creek Twp., DKP.
- 4451 *Speyeria aphrodite* (F.) 20 Jul 1924 N, Swanton, Fulton Twp. (Voucher specimen in UMMZ). 24 Aug 1986 N, Maumee State Forest, Swan Creek Twp., JVC. 17 Aug 1989 N, Swan Creek Twp., DKP.
- 4452 *Speyeria idalia* (Drury) 20 Jul 1924 N, Swanton, Fulton Twp., Col. W. J. Clench. (Voucher specimens at Miami University and UMMZ). This species is threatened in Ohio.
- 4464 *Clossiana selene* (Cram.) 1 Jun 1984 N, Swan Creek Twp., JVC. 20 Aug 1987 N, Swan Creek Twp., DKP. This species is threatened in Ohio.
- 4465 *Clossiana bellona* (F.) 17 Jul 1987 N, Swan Creek Twp., DKP.
- 4481 *Phyciodes tharos* (Drury) 5 Jun 1984 N, Swan Creek Twp., JVC. 6 Aug 1986 N, Oak Openings, JAS. 25 May -20 Sep 1989 N 3, Goll Woods, German Twp. RWR.
- 4516 *Euphydryas phaeton* (Drury) 5 Jul 1989 N, Swan Creek Twp., DKP.
- 4522b. *Basilarchia arthemis astyanax* (F.) 17 Aug 1988 N1; 26 Jun 1989 N 2, Goll Woods, German Twp. RWR.
- 4523 *Basilarchia archippus* (Cram.) 18 Jun 1969 N, Maumee State Forest, LLM. 24 Aug 1986 N 2, Swan Creek Twp., JVC & DCI. 30 May 1988 N 1; 20 Sep 1989 N 1, Goll Woods, German Twp., RWR.

APATURIDAE

- 4557 *Asterocampa celtis* (Bdv. & LeConte) 26 Jun 1989 N 2, Goll Woods, German Twp., RWR.
- 4562.1 *Asterocampa clyton* (Bdv. & LeConte) 10 Jul 1989 N 1, Goll Woods, German Twp., RWR.

SATYRIDAE

- 4568.1 *Enodia anthedon* A. H. Clark. 29 Jul 1970 N, Maumee State Forest, LLM.
- 4568.3 *Satyroides eurydice* (Johanssen) 13 Jul 1988, 5 Jul 1989 N, Swan Creek Twp., DKP.
- 4569a. *Satyroides appalachia leeuwi* (Gatrelle & Arbogast) 29 Jul 1970, Maumee State Forest, LLM. 13 Jul 1988, 5 Jul 1989 N, Swan Creek Twp., DKP.
- 4578 *Megisto cymela* (Cram.) 30 May 1988 N 4; 4 Jun 1989 N 2, Goll Woods, German Twp. RWR.
- 4587 *Cercyonis pegala atope* (F.) 8 Sep 1988 N 1, Goll Woods, German Twp., RWR.

DANAIDAE

- 4614 *Danaus plexippus* (L.) 6 Aug 1986 N, Oak Openings, JAS. 8 Sep 1988 L 1, Goll Woods, German Twp., RWR.

Key to Abbreviations: Methods of collection—BT, sugar-baited trap; L, larva; N, net; O, observed. Collections—OSUC = Ohio State University Collection; UMMZ = University of Michigan Museum of Zoology. Collectors—DKP = D. K. Parshall; LLM = L. L. Martin; DCI = D. C. Iftner; JVC = J. V. Calhoun; JAS = J. A. Shuey; RWR = R. W. Rings; HFP = H. F. Price.

Table 2. —A check list of moths collected at Goll Woods State Nature Preserve, Fulton County, Ohio, (1988–1989).

OECOPHORIDAE

- 992 *Ethmia zelleriella* (Cham.) 30 May–13 Jun 1988 BLT 5; 25 Jun–10 Jul 1989 BLT 22, N 1.
1014 *Antaeotricha leucillana* (Zell.) 30 May 1988 BLT 3; 8 Jun 1989 BLT 1.

YPONOMEUTIDAE

- 2401 *Atteva punctella* (Cram.) 16 Aug–8 Sep 1988 BLT 5; 24 May–20 Sep 1989 BLT 4, MVL 1.

COSSIDAE

- 2693 *Prionxystus robiniae* (Peck) 13 Jun 1988 MVL 1.

TORTRICIDAE

- 2906 *Spilonota ocellana* (D. & S.) 30 May 1988 BLT 2.
3503 *Croesia semipurpurana* (Kft.) 13 Jun 1988 MVL 1.
3593 *Pandemis lamprosana* (Rob.) 7–26 Jun 1989 BLT 2, MVL 5.
3622 *Argyrotaenia juglandana* (Fern.) 26 Jun 1989 MVL 1.
3624 *Argyrotaenia alisellana* (Rob.) 13 Jun 1988 MVL 1.
3632 *Choristoneura fractivittana* (Clem.) 7–8 Jun 1989 BLT 4, MVL 2.
3635 *Choristoneura rosaceana* (Harr.) 30 May–16 Aug 1988 BLT 40, MVL 12, H 2.
3650 *Archips rosana* (L.) 26 Jun 1989 MVL 1.
3658 *Archips purpurana* (Clem.) 18 Jul 1988 BLT 1.
3686 *Clepsis melaleucana* (Wlk.) 30 May 1988–13 Jun 1989 BLT 2, MVL 1.
3695 *Sparganothis sulfureana* (Clem.) 18 Jul 1988 BLT 1.
3725 *Sparganothis pettitana* (Rob.) 26 Jun–10 Jul 1989 BLT 2.
3727 *Sparganothis niveana* (Wlsm.) 13 Jun 1988 BLT 1, MVL 2.

LIMACODIDAE

- 4652 *Tortricidia testacea* Pack. 18 Jul 1988 BLT 1.
4654 *Tortricidia flexuosa* (Grt.) 18 Jul 1988 BLT 3; 26 Jun–10 Jul 1989 BLT 10.
4659 *Packardia geminata* (Pack.) 30 May 1988 MVL 1.
4665 *Lithacodes fasciola* (H.-S.) 18 Jul 1988 BLT 1; 24 Jul 1989 MVL 1.
4667 *Apoda y-inversum* (Pack.) 18 Jul 1988 BLT 7; 24 Jul 1989 MVL 1.
4669 *Apoda biguttata* (Pack.) 18 Jul 1988 BLT 2; 26 Jun–24 Jul 1989 BLT 1, MVL 1.
4671 *Prolimacodes badia* (Hbn.) 18 Jul 1988 BL 1, BLT 5.
4681 *Isa textula* (H.-S.) 28 Jul 1988 BLT 1.
4697 *Euclea delphinii* (Bdv.) 18 Jul 1988 BLT 4.

PYRALIDAE

- 4949 *Ostrinia nubilalis* (Hbn.) 30 May–8 Sep 1988 BLT 4, MVL 3; 7 Jun–20 Sep 1989 BLT 17, MVL 3.
4953 *Phlyctaenia coronata* (Hufn.) 30 May 1988 BLT 1, MVL 2.
5040 *Pyrausta bicoloralis* (Gn.) 20 Sep 1989 MVL 1.
5159 *Desmia funeralis* (Hbn.) 13 Jun–18 Jul 1988 BLT 9, MVL 1; 7 Jun–25 1989 BLT 2, MVL 1.
5226 *Palpita magniferalis* (Wlk.) 30 May 1988 MVL 4.
5228 *Polygrammodes flavidalis* (Gn.) 18 Jul 1988 BLT 1.
5241 *Pantographa limata* (G. & R.) 30 May–8 Sep 1988 BLT 15, H 15; 10 Jul 1989 BLT 1.
5343 *Crambus perlellus* (Scop.) 18 Jul 1988 BLT 2.
5365 *Crambus girardellus* Clem. 13 Jun–18 Jul 1988 BLT 4, MVL 1; 10 Jul 1989 MVL 1.
5392 *Arequipa turbatella* Wlk. 30 May 1988 BLT 5; 26 Jun 1989 BLT 1.
5524 *Hyposopygia costalis* (F.) 28 Jul 1988 BLT 1.

DREPANIDAE

- 6253 *Eudeilinia herminiata* (Gn.) 8 May 1989 BLT 1.

GEOMETRIDAE

- 6258 *Alsophila pometaria* (Harr.) 11–26 Mar 1989 BL 15 BLT 1.

- 6273 *Itame pustularia* (Gn.) 13 Jun—28 Jul 1988 BL 2, BLT 4; 25 Jun—18 Jul 1989 BLT 50, MVL 15.
- 6299 *Itame coortaria* (Hulst) 26 Jun 1989 BLT 2.
- 6303 *Itame subcessaria* (Wlk.) 26 Jun—10 Jul 1989 BLT 5, MVL 1.
- 6322 *Mellilla xanthometata* (Wlk.) 28 Jul—15 Aug 1988 BLT 3; 24 May—24 Jul 1989 BLT 3, MVL 3.
- 6326 *Semiothisa aemulataria* (Wlk.) 30 May—13 Jun 1988 BLT 3, MVL 1; 24 May 1989 BLT 2.
- 6335 *Semiothisa aequiferaria* (Wlk.) 16 Aug 1988 BLT 2.
- 6340 *Semiothisa minorata* (Pack.) 30 May—28 Jul 1988 BLT 3, MVL 1.
- 6341 *Semiothisa bicolorata* (F.) 30 May 1989 MVL 1; 10 Jul 1989 MVL 3.
- 6342 *Semiothisa bisignata* (Wlk.) 13 Jun—18 Jul 1988 BLT 5; 25 Jun—10 Jul 1989 MVL 6.
- 6344 *Semiothisa signaria dispuncta* (Wlk.) 24 May 1989 BLT 2.
- 6360 *Semiothisa quadrinotaria* (H.-S.) 30 May 1988 BLT 6; 24 May—7 Jun 1989 BLT 5, MVL 4.
- 6386 *Semiothisa ocellinata* (Gn.) 24 May 1989 BLT 1.
- 6405 *Semiothisa gnophosaria* (Gn.) 26 Jun 1989 MVL 1.
- 6419 *Enconista dislocaria* (Pack.) 24 May 1989 BLT 3.
- 6583 *Anacamptodes ephyraria* (Wlk.) 25 Jun 1989 BLT 1.
- 6590 *Anavitrinella pampinaria* (Gn.) 30 May—8 Sep 1988 BLT 3; 24—30 May 1989 BLT 5, MVL 2.
- 6599 *Epimecis hortaria* (F.) 8—30 May 1988 BLT 3, MVL 1; 24 May—25 Jun 1989 BLT 5, MVL 2.
- 6620 *Melanolepis canadaria* (Gn.) 8 May 1988 BLT 3; 24 May 1989 BLT 3, MVL 4.
- 6640a *Biston betularia cognitaria* (Gn.) 30 May 1988 MVL 1.
- 6654 *Hypagyrtis unipunctata* (Haw.) 30 May 1988 BLT 1, MVL 2; 7 Jun—25 Jun 1989 BLT 4, MVL 5.
- 6658 *Phigalia titea* (Cram.) 26 Mar 1989 BL 3, BLT 1.
- 6662 *Palaearctic vernata* (Peck) 26 Mar—26 Apr 1989 BL 138, BLT 162.
- 6667 *Lomographa vestaliata* (Gn.) 30 May 1988 BLT 4.
- 6668 *Lomographa glomeraria* (Grt.) 24 May 1989 MVL 1.
- 6720 *Lytrosis unitaria* (H.-S.) 13 Jun 1988 BLT 1, MVL 1; 25—26 Jun 1989 BLT 3, MVL 1.
- 6726 *Euchlaena obtusaria* (Hbn.) 30 May 1988 BLT 7, MVL 2; 8 Jun—26 Aug 1989 BLT 7, MVL 1.
- 6733a *Euchlaena amoeneria astylusaria* (Wlk.) 30 May 1988 BLT 1.
- 6739 *Euchlaena irraria* (B. & McD.) 7 Jun 1989 BLT 1.
- 6740 *Xanthotype urticaria* Swett 30 May 1988 BLT 1; 26 Jun 1989 MVL 1.
- 6743 *Xanthotype sospeta* (Drury) 30 May—13 Jun 1988 BLT 2, MVL 2; 8 Jun—25 Aug 1989 BLT 5.
- 6753 *Pero honestaria* (Wlk.) 8 May—30 May 1988 BLT 6; 24 May—7 Jun 1989 BLT 4, MVL 1.
- 6754 *Pero hubneraria* (Gn.) 28 Jul 1988 BL 1.
- 6796 *Campaea perlata* (Gn.) 30 May—8 Sep 1988 BLT 11, MVL 4, N 1; 7 Jun—25 Aug 1989 BLT 3, MVL 3.
- 6798 *Ennomos subsignaria* (Hbn.) 25 Jun—18 Jul 1989 BLT 4.
- 6819 *Metanema inatomaria* Gn. 8 Jun 1989 BLT 1.
- 6825 *Metarranthis indeclinata* (Wlk.) 8 Jun 1989 BLT 1.
- 6826 *Metarranthis hypocharia* (H.-S.) 30 May—13 Jun 1988 BLT 6; 7—25 Jun 1989 MVL 3.
- 6836 *Anagoga occiduaria* (Wlk.) 28 Jul 1988 BL 1.
- 6838 *Probole amicaria* (H.-S.) 18 Jul 1988 BLT 1.
- 6841 *Plagodis keutzingeri* (Grt.) 30 May 1988 MVL 1.
- 6842 *Plagodis phlogosaria* (Gn.) 10—28 Jul 1988 BL 3, BLT 4.
- 6843 *Plagodis fervidaria* (H.-S.) 24 May 1989 BLT 1; 10 Jul 1989 BLT 2.
- 6844 *Plagodis alcoolaria* (Gn.) 8 May—28 Jul 1988 BLT 7.
- 6885 *Besma quercivoraria* (Gn.) 30 May—18 Jul 1988 BLT 4; 7 Jun 1989 MVL 1.
- 6912 *Sicya macularia* (Harr.) 25—26 Jun 1989 BLT 17, MVL 5.
- 6941 *Eusarca confusaria* Hbn. 25 Jun—25 Aug 1989 BLT 22, MVL 12, N 2.
- 6963 *Tetracis crocallata* Gn. 8 Jun 1989 BLT 1.
- 6964 *Tetracis cachexiata* Gn. 30 May—13 Jun 1988 BLT 3, MVL 1; 7 Jun 1989 BLT 1.
- 6965 *Eugonobapta nivosaria* (Gn.) 25 Jun 1989 BLT 2.
- 6966 *Eutrapela clemataria* (J. E. Smith) 8 May—28 Jul 1988 BLT 4.
- 6982 *Prochoerodes transversata* (Drury) 25 Jun—21 Sep 1989 BLT 27, MVL 7, S 5.
- 7009 *Nematocampa limbata* (Haw.) 13 Jun 1988 BLT 1, MVL 2; 25 Jun—10 Jul 1989 BLT 21.
- 7046 *Nemoria bistriaria* Hbn. 30 May—28 Jul 1988 BLT 5.
- 7048 *Nemoria mimosaria* (Gn.) 30 May 1988 BLT 1, MVL 1.
- 7053 *Dichorda iridaria* (Gn.) 30 May—18 Jul 1988 BLT 1, MVL 1; 25 Aug 1989 BLT 1.
- 7132 *Pleuroprucha insulsaria* (Gn.) 8 Sep 1989 BLT 1.
- 7146 *Haematopis grataria* (F.) 10 Jul—20 Sep 1989 BLT 4, MVL 3.
- 7159 *Scopula limboundata* (Haw.) 18 Jul 1988 BLT 1; 25 Jun 1989 MVL 1.
- 7169 *Scopula inductata* (Gn.) 15 Aug—8 Sep 1988 BLT 2.
- 7189 *Dysstroma hersiliata* (Gn.) 13 Jun 1988 BLT 1; 26 Jun 1989 BLT 2.

- 7196 *Eulithis diversilineata* (Hbn.) 13 Jun—28 Jul 1988 BLT 7; 25 Jun—20 Sep 1989 BLT 5, MVL 15, S 1.
- 7197 *Eulithis gracilineata* (Gn.) 13 Jun 1988 BLT 1.
- 7329 *Anticlea vasilata* Gn. 25 Apr 1989 BLT 1.
- 7333 *Stamnodes gibbicostata* (Wlk.) 8 Sep 1988 BLT 1, S 1.
- 7368 *Xanthorhoe labradorensis* (Pack.) 16 Aug—8 Sep 1988 BLT 2.
- 7388 *Xanthorhoe ferrugata* (Cl.) 24 May—16 Aug 1989 BL 1, BLT 2.
- 7390 *Xanthorhoe lacustrata* (Gn.) 30 May 1988 BLT 1.
- 7399a *Euphyia unangulata intermediata* (Gn.) 30 May 1988 BLT 5.
- 7414 *Orthonama obstipata* (F.) 24 May—10 Jul 1989 BLT 4, MVL 1.
- 7416 *Orthonama centrostrigaria* (Woll.) 8 Sep 1988 BLT 4; 24 May—10 Jul 1989 BL 4, MVL 1.
- 7440 *Eubaphe mendica* (Wlk.) 13 Jun 1988 BLT 18; 25—26 Jun 1989 BLT 6, MVL 1.
- 7445 *Horisme intestinata* (Gn.) 28 Jul 1988 BLT 1; 24 May—25 Jun 1989 BLT 3, MVL 1.
- 7639 *Cladara atrolitirata* (Wlk.) 26 Apr 1989 BLT 1.
- 7645 *Heterophleps refusaria* (Wlk.) 30 May—13 Jun 1988 BLT 18, MVL 2, S 2.
- 7647 *Heterophleps triguttaria* H.-S. 30 May—13 Jun 1988 BLT 3, MVL 2, S 1.
- 7648 *Dyspteris abortivaria* (H.-S.) 13 Jun 1988 MVL 1.
- APATELODIDAE**
- 7663 *Apatelodes torrefacta* (J. E. Smith) 25 Jun—10 Jul 1989 BLT 2.
- LASIOCAMPIDAE**
- 7670 *Tolype velleda* (Stoll) 8 Sep 1988 BLT 1; 9—21 Sep 1989 BLT 22, MVL 6.
- 7685 *Heteropacha rileyana* Harv. 13 Jun 1988 MVL 1.
- 7687 *Phylloidesma americana* (Harr.) 8 May 1988 BLT 5; 8 May—10 Jul 1989 BLT 3, MVL 3.
- 7698 *Malacosoma dissiria* Hbn. 13 Jun 1988 BLT 32, MVL 7; 25 Jun—10 Jul 1989 BLT 208, MVL 125.
- 7701 *Malacosoma americanum* (F.) 13 Jun 1988 BLT 3, MVL 2; 25—26 Jun 1989 BLT 7, MVL 2.
- SATURNIIDAE**
- 7704 *Eacles imperialis* (Drury) 18 Jul 1988 BLT 3; 24 Jul 1989 BLT 3, MVL 1.
- 7709 *Sphingicampa bicolor* (Harr.) 24 May 1989 BLT 1.
- 7715 *Dryocampa rubicunda* (F.) 10 Jul 1989 MVL 1.
- 7746 *Automeris io* (F.) 30 May—13 Jun 1988 BLT 14, MVL 6; 7—26 Jun 1989 BLT 7, MVL 1.
- 7757 *Antheraea polyphemus* (Cram.) 13 Jun 1988 BLT 2; 7 Jun -24 Jul 1989 BLT 3, MVL 1.
- 7758 *Actias luna* (L.) 13 Jun 1988 BLT 1; 24 May—26 Jun 1989 BLT 2, MVL 1.
- 7764 *Callosamia promethea* (Drury) 10 Jul 1989 BL 1.
- SPHINGIDAE**
- 7786 *Ceratonia amyntor* (Geyer) 26 Jun 1989 BLT 1.
- 7787 *Ceratonia undulosa* (Wlk.) 24 May 1989 MVL 1.
- 7789 *Ceratonia catalpae* (Bdv.) 10 Jul 1989 MVL 1.
- 7824 *Paonias excaecatus* (J. E. Smith) 18—28 Jul 1988 BLT 4; 10—24 Jul 1989 BLT 9.
- 7825 *Paonias myops* (J. E. Smith) 18 Jul 1988 BLT 1.
- 7827 *Laothoe juglandis* (J. E. Smith) 24 May—10 Jul 1989 BLT 2.
- 7859 *Eumorphia pandorus* (Hbn.) 24 Jul 1989 MVL 2.
- 7870 *Sphecodina abbottii* (Swainson) 7 Jun 1989 MVL 2.
- 7871 *Deidamia inscripta* (Harr.) 8 May 1988 MVL 1.
- 7873 *Amphion floridensis* B. P. Clark 26 Jun—10 Jul 1989 BLT 2.
- 7885 *Darapsa myron* (Cram.) 25 Jun—24 Jul 1989 MVL 9.
- 7886 *Darapsa pholus* (Cram.) 13 Jun 1988 MVL 1; 26 Jun—24 Jul 1989 MVL 3.
- NOTODONTIDAE**
- 7895 *Clostera albosigma* Fitch 16 Aug—8 Sep 1988 BLT 2; 24 May 1989 MVL 1.
- 7896 *Clostera inclusa* (Hbn.) 8—30 May 1988 BLT 3.
- 7898 *Clostera strigosa* (Grt.) 24 May 24 Jul 1989 BLT 3.
- 7902 *Datana ministra* (Drury) 10 Jul 1989 BLT 1.
- 7903 *Datana angusii* G. & R. 28 Jul 1988 BLT 1; 10 Jul 1989 BLT 1.
- 7904 *Datana drexelii* Hy. Edw. 25 Jun 1989 BLT 1.
- 7907 *Datana integerrima* G. & R. 7 Jun—10 Jul 1989 BLT 3.
- 7915 *Nadata gibbosa* (J. E. Smith) 13 Jun—28 Jul 1988 BLT 4; 24 May—25 Aug 1989 BLT 5.
- 7919 *Peridea basitriens* (Wlk.) 7—25 Jun 1989 BLT 1, MVL 1.
- 7922 *Pheosia rimosa* Pack. 30 May 1988 BLT 1.
- 7929 *Nerice bidentata* Wlk. 24 May—10 Jul 1989 BLT 3.
- 7930 *Ellida caniplaga* (Wlk.) 28 Jul 1988 BL 1, BLT 1; 25 Apr—10 Jul 1989 BLT 5, MVL 1.
- 7931 *Gluphisia septentrionis* Wlk. 13 Jun—18 Jul 1988 BLT 1, MVL 1; 24 May—10 Jul 1989 BL 3, BLT 3, MVL 9.
- 7936 *Furcula borealis* (Guer.-Meneville) 10 Jul 1989 MVL 1.

- 7937 *Furcula cinerea* (Wlk.) 8 May 1988 BLT 1; 24 May–7 Jun 1989 MVL 2.
 7974 *Misogada unicolor* (Pack.) 8 Jun 1989 BLT 1; 25–26 Jun 1989 MVL 4.
 7975 *Macrurocampa marthesia* (Cram.) 18 Jul 1988 BLT 9; 10 Jul 1989 BLT 5.
 7983 *Heterocampa obliqua* Pack. 10 Jul 1989 Carrion trap 1.
 7985 *Heterocampa subrotata* Harv. 7 Jun–24 Jul 1989 BLT 4, MVL 3.
 7994 *Heterocampa guttivitta* (Wlk.) 24 May 1989 BLT 1.
 7998 *Lochmaeus manteo* Doubleday 16 Aug 1988 MVL 1.
 7999 *Lochmaeus bilineata* (Pack.) 30 May–24 Jul 1988 MVL 5; 24 Jul 1989 MVL 2.
 8005 *Schizura ipomoeae* Doubleday 18 Jul–16 Aug 1988 BLT 6; 25 Jun 1989 BLT 2.
 8007 *Schizura unicornis* (J. E. Smith) 30 May–13 Jun 1988 MVL 5; 24 May–25 Jun 1989 BLT 3, MVL 2.
 8011 *Schizura leptinoides* (Grt.) 24 May–12 Aug 1989 BLT 3, MVL 1.
 8017 *Oligocentria lignicolor* (Wlk.) 18 Jul 1988 BLT 4; 25 Jun 1989 BLT 1.
- ARCTIIDAE
- 8090 *Hypoprepia fucosa* Hbn. 18 Jul–16 Aug 1988 BLT 61, MVL 1; 10–24 Jul BLT 56, MVL 6.
 8111 *Haploa lecontei* (Guer.-Meneville). 13 Jun 1988 MVL 1; 13–25 Jun 1989 BLT 6.
 8129 *Pyrrharctia isabella* (J. E. Smith) 30 May–13 Jun 1988 BLT 4, MVL 4; 26 Jun 1989 BLT 1, MVL 3.
 8134 *Spilosoma congrua* Wlk. 16 Aug 1988 BLT 2.
 8137 *Spilosoma virginica* (F.) 30 May–13 Jun 1988 BLT 12; 24 May–10 Jul 1989 BLT 9, MVL 1.
 8140 *Hyphantria cunea* (Drury) 13 Jun–18 Jul 1988 BLT 2.
 8156 *Phragmatobia fuliginosa rubricosa* (Harr.) 10 Jul 1989 MVL 1.
 8169 *Apantesis phalerata* (Harr.) 30 May 1988 BLT 1, MVL 1; 7–26 Jun 1989 BLT 14, MVL 2.
 8197 *Grammia virgo* (L.) 26 Jul 1988 BL 1, BLT 2; 24 Jul 1989 BLT 4, MVL 2.
 8199 *Grammia arge* (Drury) 16 Aug 1988 BLT 1.
 8203 *Halysidota tessellaris* (J. E. Smith) 18–28 Jul 1988 BLT 50; 25 Jun–10 Jul 1989 BLT 27, MVL 4.
 8211 *Lophocampa caryae* Harr. 30 May–13 Jun 1988 BLT 1, MVL 4; 24 May 1989 BLT 1, MVL 1.
 8230 *Cycnia tenera* Hbn. 13 Jun–16 Aug 1988 BLT 2; 25 Jun–10 Jul 1989 BLT 4, MVL 1, N 1.
 8231 *Cycnia oregonensis* (Stretch) 16 Aug 1988 MVL 1.
 8238 *Euchaetes egle* (Drury) 25 Jun–24 Jul 1989 BLT 2, MVL 1.
 8262 *Ctenucha virginica* (Esp.) 13 Jun 1988 MVL 1.
 8267 *Cisseps fulvicollis* (Hbn.) 30 May–13 Jun 1988 BLT 4, MVL 1; 7 Jun–20 Sep 1989 BLT 45, MVL 3.
- LYMANTRIIDAE
- 8314 *Orgyia definita* Pack. 20 Sep 1989 MVL 1.
 8316 *Orgyia leucostigma* (J. E. Smith) 20 Sep 1989 MVL 1.
- NOCTUIDAE
- 8322 *Idia americanalis* (Gn.) 24 May–18 Jul 1988 BLT 3; 24 May–18 Jul 1989 BLT 2, MVL 1, S 1.
 8323 *Idia aemula* Hbn. 18 Jul 1988 BLT 1; 8 Jun–20 Sep 1989 BLT 12; MVL 2.
 8334 *Idia lubricalis* (Gey.) 28 Jul–8 Sep 1988 S 8; 10 Jul 1989 S 2.
 8338 *Phalaenophana pyramusalis* (Wlk.) 30 May 1988 BLT 1, MVL 1, S 1.
 8345 *Zanclognatha laevigata* (Grt.) 18 Jul 1988 BLT 1.
 8348 *Zanclognatha pedipilalis* (Gn.) 30 May–13 Jun 1988 BLT 1, MVL 3, S 1; 7 Jun 1989 BLT 2.
 8349 *Zanclognatha protumnusalis* (Wlk.) 16 Jul 1988 BLT 1; 18 Jul 1989 BLT 1.
 8352 *Zanclognatha jacchusalis* (Wlk.) 8 Sep 1988 BLT 1.
 8353 *Zanclognatha ochreipennis* (Grt.) 28 Jul 1988 BLT 1.
 8355 *Chytolita morbidalis* (Gn.) 30 May–24 Jun 1988 MVL 2, S 1; 7–24 Jun 1989 BLT 2, MVL 1.
 8356 *Chytolita petreallis* Grt. 26 Jun 1989 BLT 1.
 8364 *Phalaenostola larentioides* Grt. 13 Jun 1988 MVL 1.
 8370 *Bleptina caradrinalis* Gn. 26 Jun 1989 MVL 1.
 8381 *Renia discoloralis* Gn. 18–28 Jul 1988 BL 2, BLT 1.
 8397 *Palthis angulalis* (Hbn.) 13 Jun 1988 MVL 1; 7 Jun–20 Sep 1989 BLT 3, MVL 2.
 8398 *Palthis asopialis* (Gn.) 20 Sep 1989 BLT 2.
 8427 *Dyspyralis puncticosta* (Sm.) 28 Jul 1988 S 1.
 8442 *Bomolocha baltimoralis* (Gn.) 25 Jun 1989 MVL 1.
 8443 *Bomolocha bijugalis* (Wlk.) 26 Jun 1989 BLT 1.
 8445 *Bomolocha abalienalis* (Wlk.) 13 Jun 1988 MVL 1; 26 Jun 1989 MVL 1.
 8446 *Bomolocha deceptalis* (Wlk.) 8–26 Jun 1989 BLT 3.
 8447 *Bomolocha madefactalis* (Gn.) 7 Jun–10 Jul 1989 MVL 11.
 8448 *Bomolocha sordidula* (Grt.) 30 May 1988 MVL 1.
 8461 *Hypena humuli* Harr. 25 Mar 1989 BT 1; 25 Apr 1989 BLT 1.

- 8465 *Plathypena scabra* (F.) 8 May–16 Oct 1988 BL 4, BLT 58, BT 3, MVL 6; 25 Mar–21 Sep 1989 BL 1, BLT 59, BT 6, S 3.
- 8479 *Spargaloma sexpunctata* Grt. 30 May 1988 BLT 1.
- 8493 *Isogona tenuis* (Grt.) 30 May 1988 MVL 1.
- 8499 *Metalectra discalis* (Grt.) 28 Jul 1988 BLT 1.
- 8514 *Scolecampa liburna* (Gey.) 26 Jun–10 Jul 1989 BLT 2.
- 8534 *Plusiodonta compressipalpis* Gn. 30 May 1988 BLT 1; 10 Jul 1989 BLT 1.
- 8536 *Calyptra canadensis* (Bethune) 16 Aug 1988 BLT 1; 9 Sep 1989 BLT 1.
- 8555 *Scoliopteryx libatrix* (L.) 25 Apr–20 Sep 1989 S 10.
- 8587 *Panopoda rufimargo* (Hbn.) 26 Jun–10 Jul 1989 BLT 6.
- 8591 *Phoberia atomaris* Hbn. 14 Apr–26 Apr 1989 BL 1, BLT 8, MVL 1.
- 8689 *Zale lunata* (Drury) 13 Jun–8 Sep 1988 BLT 1, S 2; 7 Jun–21 Sep 1989 BT 2, MVL 1, S 13.
- 8692 *Zale galbanata* (Morr.) 30 May 1988 MVL 1; 11 Mar–10 Jul 1989 BLT 5, BT 1, MVL 1, S 2.
- 8697 *Zale minerea* (Gn.) 30 May 1988 MVL 1, S 1; 7–13 Jun 1989 BLT 1, MVL 1.
- 8703 *Zale duplicata* (Bethune) 8 May–13 Jun 1988 BLT 2, MVL 1.
- 8704 *Zale helata* (Sm.) 30 May 1988 BLT 1; 14–24 May 1989 BLT 4.
- 8705 *Zale bethunei* (Sm.) 8 May 1988 BLT 1.
- 8709 *Zale cuxema* (Sm.) 30 May 1988 S 1.
- 8716 *Zale unilineata* (Grt.) 28 Jul 1988 BLT 1.
- 8727 *Parallelia bistriaris* Hbn. 30 May–16 Aug 1988 BLT 5, MVL 2; 13 Jun–24 Jul 1989 BLT 2, MVL 2, S 1.
- 8738 *Caenurgina crassiuscula* (Haw.) 8 May–16 Aug 1988 BLT 5, MVL 2; 25 Apr–20 Sep 1989 BL 1, BLT 1, MVL 4.
- 8739 *Caenurgina erectea* (Cram.) 8 May 16 Oct 1988 BLT 2.
- 8764 *Argyrostromis anilis* (Drury) 10 Jul 1989 BLT 1.
- 8770 *Catocala innubens* Gn. 16 Aug 1988 S 1.
- 8771 *Catocala piatrix* Grt. 24 Jul 1989 BLT 1.
- 8778 *Catocala habilis* Grt. 12 Aug 1989 BLT 1.
- 8779 *Catocala serena* Edw. 26 Aug–20 Sep 1989 MVL 2.
- 8781 *Catocala judith* Stkr. 16 Aug 1988 MVL 1; 24 Jul 1989 BLT 1, MVL 1.
- 8784 *Catocala obscura* Stkr. 16 Aug 1988 BLT 2; 12–25 Aug 1989 BLT 2.
- 8785 *Catocala residua* Grt. 28 Jul 1988 BLT 2.
- 8788 *Catocala resecta* Grt. 16 Aug 1988 BLT 2; 9 Sep 1989 BLT 5.
- 8791 *Catocala insolabilis* Gn. 18 Jul–16 Aug 1988 BLT 2.
- 8795 *Catocala palaeogama* Gn. 16 Aug 1988 MVL 1. 25 Aug–20 Sep 1989 BLT 3, MVL 2.
- 8796 *Catocala nebulosa* Edw. 26 Aug–21 Sep 1989 MVL 2.
- 8797 *Catocala subnata* Grt. 28 Jul 1988 S 1; 26 Aug 1989 S 1.
- 8798 *Catocala neogama* (J. E. Smith) 16 Aug 1988 BLT 1.
- 8801 *Catocala ilia* (Cram.) 10 Jul 1989 BLT 1.
- 8802 *Catocala cerogama* Gn. 16–28 Jul 1988 BLT 1, S 26; 12 Aug–20 Sep 1989 BLT 2, S 6.
- 8805 *Catocala unijuga* Wlk. 26 Aug 1989 MVL 1.
- 8832 *Catocala cara* Gn. 28 Jul 1988 S 1; 12–26 Aug 1989 S 5.
- 8834 *Catocala amatrix* (Hbn.) 20 Sep 1989 BLT 1, S 2.
- 8857 *Catocala ultronia* (Hbn.) 18–28 Jul 1988 BLT 5, S 1; 25 Aug 1989 BLT 2.
- 8874 *Catocala minuta* Edw. 10 Jul 1989 S 1.
- 8878 *Catocala amica* (Hbn.) 18 Jul 1988 BLT 2.
- 8887 *Trichoplusia ni* (Hbn.) 16 Oct 1988 BLT 2.
- 8890 *Pseudoplusia includens* (Wlk.) 9–20 Sep 1989 BLT 1.
- 8898 *Allagrapha aerea* (Hbn.) 8 Sep 1988 BLT 1; 9–20 Sep 1989 BLT 17, MVL 1.
- 8899 *Pseudeva purpurigera* (Wlk.) 25 Jun 1989 BLT 1.
- 8905 *Eosphropteryx thyatroides* (Gn.) 20 Sep 1989 BLT 1.
- 8908 *Autographa precationis* (Gn.) 16 Aug–8 Sep 1988 BL 1, BLT 5, S 1; 24 May–21 Sep 1989 BLT 34, BT 2, MVL 20, N 1.
- 8924 *Anagrapha falcifera* (Kby.) 13 Jun 1988 BLT 1; 24 May–25 Jun 1989 BLT 3, MVL 2.
- 8955 *Marathyssa inficita* (Wlk.) 16 Aug 1988 BLT 1.
- 8956 *Marathyssa basalis* Wlk. 24 May 1989 BLT 3.
- 8957 *Paectes oculatrix* (Gn.) 13 Jun 1988 MVL 1; 26 Jun 1989 MVL 1.
- 8970 *Baileya ophthalmica* (Gn.) 13 Jun 1988 MVL 2; 24 May 1989 BLT 1.
- 8971 *Baileya dormitans* (Gn.) 13 Jun 1988 BLT 2; 24 May–7 Jun 1989 BLT 1, MVL 2.
- 8972 *Baileya levitans* (Sm.) 24 May 1989 MVL 1.
- 9044 *Thioptera nigrofimbria* (Gn.) 7 Jun 1989 BLT 1, MVL 1.
- 9049 *Lithacodia synochitis* (G. & R.) 30 May–13 Jun 1988 BLT 2, MVL 1.
- 9051 *Lithacodia musta* (G. & R.) 30 May 1988 MVL 2; 28 Jul 1988 BLT 1.

- 9053 *Pseudostrotria carneola* (Gn.) 30 May–8 Sep 1988 BLT 32, MVL 10; 26 Jun–20 Sep 1989 BLT 5.
- 9057 *Homophoberia apicosa* (Haw.) 10 Jul 1989 BLT 1.
- 9062 *Cerma cerintha* (Tr.) 26 Jun 1989 BLT 1.
- 9065 *Leuconycta diphterooides* (Gn.) 30 May–13 Jun 1988 BLT 1, MVL 3; 7 Jun–10 Jul 1989 BLT 8, MVL 1.
- 9066 *Leuconycta lepidula* (Grt.) 30 May 1988 BLT 1, MVL 1, S 1; 24 Jul 1989 MVL 1.
- 9090 *Tarachidia candefacta* (Hbn.) 30 May–16 Aug 1988 BLT 4; 24 Jul 1989 BLT 1.
- 9095 *Tarachidia erastrioides* (Gn.) 13 Jun–16 Aug 1988 BLT 4, MVL 1; 25 Aug 1989 BLT 1.
- 9185 *Colocasia propinquilinea* (Grt.) 30 May 1988 BLT 1; 25 Apr–8 Jun 1988 BLT 1, MVL 1.
- 9193 *Raphia frater* Grt. 30 May–13 Jun 1988 MVL 2; 24 May–10 Jul 1989 BLT 11, MVL 2.
- 9199 *Acronicta rubricoma* Gn. 24 May 1989 BL 2.
- 9200 *Acronicta americana* (Harr.) 13 Jun 1988 MVL 2; 25 Jun 1989 BLT 4.
- 9205 *Acronicta lepusculina* Gn. 7 Jun 1989 MVL 1.
- 9229 *Acronicta hasta* Gn. 24 May 1989 BLT 1, MVL 1.
- 9236 *Acronicta morula* G. & R. 24 May 1989 BLT 2.
- 9237 *Acronicta interrupta* Gn. 8 May 1988 BLT 1; 24 May 1989 MVL 2, BLT 1.
- 9238 *Acronicta lobeliae* Gn. 8 Jun 1989 BLT 1.
- 9245 *Acronicta haesitata* (Grt.) 26 Jun 1989 MVL 1.
- 9249 *Acronicta increta* Morr. 30 May 1988 BLT 1.
- 9272 *Acronicta oblinita* (J. E. Smith) 8 May 1988 BLT 2; 24 May 1989 BLT 3.
- 9280 *Stimyra henrici* (Grt.) 25 Aug 1989 BLT 1.
- 9281 *Agriopodes fallax* (H.-S.) 24 May–8 Jun 1989 BL 1, MVL 2.
- 9286 *Harrisimemna trisignata* (Wlk.) 28 Jul 1988 BL 1; 25 Jun 1989 BLT 1.
- 9301 *Eudryas grata* (F.) 13 Jun 1988 BLT 1; 13 Jun–10 Jul 1989 BLT 5, MVL 4.
- 9314 *Alypia octomaculata* (F.) 26 Jun 1989 N 1.
- 9367 *Apamea dubitans* (Wlk.) 16 Jun 1988 BLT 1; 25 Aug 1989 BLT 1.
- 9373 *Apamea helva* (Grt.) 25 Aug 1989 BLT 1.
- 9419 *Oligia mactata* (Gn.) 16 Oct 1988 BT 1.
- 9456 *Amphipoea interoceanica* (Sm.) 14 Jul 1989 BLT 1.
- 9457 *Amphipoea americana* (Speyer) 18 Jul 1988 BLT 3.
- 9471 *Papaipema arctivorens* Hamp. 8 Sep 1988 BLT 3; 20 Sep 1989 BLT 2.
- 9473 *Papaipema impecuniosa* (Grt.) 16 Oct 1988 BLT 2.
- 9485 *Papaipema baptisiae* (Bird) 8 Sep 1988 BLT 2; 20 Sep 1989 BLT 4.
- 9495 *Papaipema furcata* (Sm.) 9 Sep 1989 BLT 1; 20 Sep 1989 BLT 3.
- 9496 *Papaipema nebris* (Gn.) 6 Sep 1988 BLT 1; 20 Sep 1989 BLT 4.
- 9501 *Papaipema eupatorii* (Lyman) 8 Sep 1988 BLT 1.
- 9509 *Papaipema unimoda* (Sm.) 15 Aug 1988 BLT 1.
- 9578 *Hyppa xylinoides* (Gn.) 18 Jul 1988 BLT 1.
- 9582 *Nedra ramosula* (Gn.) 8 May 1988 BLT 1.
- 9626 *Trachea delicata* (Grt.) 30 May 1988 S 1.
- 9638 *Amphipyra pyramidoides* Gn. 18 Jul–16 Oct 1988 BLT 9, S 3; 20–21 Sep 1988 BLT 10, BT 1, MVL 3.
- 9640 *Amphipyra glabella* (Morr.) 28 Jul 1988 BLT 2; 24 Jul 1989 BLT 1.
- 9650 *Anorthodes tarda* (Gn.) 24 May 1989 BLT 2; 24 May–8 Jun 1989 BLT 3.
- 9661 *Crambodes talidiformis* Gn. 30 May 1988 BLT 1.
- 9666 *Spodoptera frugiperda* (J. E. Smith) 16 Oct 1988 BLT 1; 8 Jun 1989 BLT 1.
- 9669 *Spodoptera ornithogalli* (Gn.) 25 Aug–20 Sep 1989 BLT 4, MVL 2.
- 9689 *Perigea xanthioides* Gn. 18 Jul–8 Sep 1988 BLT 5; 7 Jun–10 Jul 1989 BLT 6.
- 9696 *Platysenta vecors* (Gn.) 8 Sep 1988 BLT 1.
- 9720 *Ogdoconta cinereola* (Gn.) 30 May–30 Sep 1988 BLT 16, MVL 3; 7 Jun–26 1989 BLT 2.
- 9725 *Stiriodes obtusa* (H.-S.) 16 Aug 1988 BLT 1; 6–10 Jul 1989 BLT 2.
- 9815 *Cosmia calami* (Harv.) 10 Jul–26 Aug 1989 BLT 1, MVL 1.
- 9874 *Xylena curvimacula* (Morr.) 25 Apr 1989 BT 1.
- 9885 *Lithophane semiusta* Grt. 11 Mar–26 April 1989 BLT 5, BT 45, S 2; 9 Sep 1989 BLT 1.
- 9886 *Lithophane patefacta* (Wlk.) 11–25 Mar 1989 BT 4, S 2.
- 9887 *Lithophane bethunei* (G. & R.) 11 Mar–25 Apr 1989 BLT 2, BT 15, S 7.
- 9888 *Lithophane innominata* (Sm.) 11–25 Mar 1989 BT 5, S 7.
- 9889 *Lithophane petulca* Grt. 11 Mar–13 Apr 1989 BLT 1, BT 3, S 9.
- 9893 *Lithophane hemina* Grt. 11–25 Mar 1989 BLT 1, BT 2, S 9.
- 9895 *Lithophane signosa* (Wlk.) 11 Mar–25 Apr 1989 BT 6, S 3.
- 9910 *Lithophane antennata* (Wlk.) 11 Mar–25 Apr 1989 BLT 7, BT 16, S 27.
- 9914 *Lithophane laticinerea* Grt. 26 Apr 1989 BLT 2.

- 9915 *Lithophane grotei* Riley 11 Mar 1989 BLT 2.
 9916 *Lithophane unimoda* (Lint.) 11 Mar–25 Apr 1989 BLT 4, BT 54, S 15.
 9929 *Pyreferra hesperidago* (Gn.) 11 Mar–14 Apr 1989 BL 1, S 2.
 9930 *Pyreferra citrombra* Franc. 11 Mar–14 Apr 1989 BL 2, BLT 1, BT 1, S 9.
 9932 *Pyreferra pettiti* (Grt.) 11 Mar–14 Apr 1989 BL 2, BT 1, S 7.
 9933 *Eupsilia vinulenta* (Grt.) 11 Mar–26 Apr 1989 BLT 4, BT 118, S 33.
 9933.1 *Eupsilia sidus* (Gn.) 16 Oct 1988 BLT 3; 11 Mar 26 Apr 1989 BLT 4, BT 44, S 45.
 9935 *Eupsilia tristigmata* (Grt.) 14 Apr 1989 BT 3, S 2.
 9936 *Eupsilia morrisoni* (Grt.) 16 Oct 1988 BLT 5; 11 Mar–26 Apr 1989 BLT 13, BT 356, S 158.
 9939 *Eupsilia devia* (Grt.) 16 Oct 1988 BLT 1; 11 Mar–26 Apr 1989 BLT 5, BT 6, S 6.
 9941 *Sericaglaea signata* (French) 22–25 Mar 1989 BLT 1, BT 2, S 1.
 9946 *Epiglaea decliva* (Grt.) 16 Oct 1988 BLT 1.
 9952 *Eucirroedia pampina* (Gn.) 16 Oct 1988 BLT 1; 20 Sep 1989 BLT 1.
 9957 *Sunira bicolorago* (Gn.) 16 Oct 1988 BLT 13, BT 64; 25 Aug–21 Sep 1989 BLT 5, BT 1.
 9961 *Anathix ralla* (G. & R.) 16 Aug–8 Sep 1988 BLT 34; 20 Sep 1989 BLT 4, MVL 1.
 10012 *Eutotype electilis* (Morr.) 25 Apr 1989 BLT 1.
 10021 *Copivaleria grotei* (Morr.) 14–26 Apr 1989 BLT 6.
 10223 *Dicestra trifolii* (Hufn.) 16 Aug 1988 MVL 2.
 10288 *Polia detracta* (Wlk.) 13 Jun 1988 MVL 2; 25 Jun 1989 MVL II.
 10289 *Polia goodelli* (Grt.) 16 Aug 1988 BLT 1; 7 Jun 1989 MVL 1.
 10292 *Melanchnra adjuncta* (Gn.) 13 Jun 1988 BLT 1; 12 Aug 1989 MVL 1.
 10293 *Melanchnra picta* (Harr.) 30 May–16 Aug 1988 BLT 1, MVL 2.
 10299 *Lacanobia subjuncta* (G. & R.) 13 Jun 1988 BLT 1, MVL 5.
 10304 *Trichordestra legitima* (Grt.) 13 Jun 1988 MVL 1.
 10397 *Lacinipolia renigera* (Steph.) 30 May–8 Sep 1988 BLT 9, MVL 6; 7 Jun–20 Sep 1989 BLT 1, MVL 5.
 10405 *Lacinipolia lorea* (Gn.) 23 Jun 1988 MVL 1; 7–26 Jun 1989 BLT 35, MVL 1.
 10438 *Pseudaletia unipuncta* (Haw.) 8 May–16 Oct 1988 BLT 13, BT 2, MVL 1; 13 Apr–20 Sep 1989 BL 1, BLT 5, BT 30, MVL 24, S 30.
 10440 *Leucania linita* Gn. 8 May 1988 BLT 1.
 10444 *Leucania phragmitidicola* Gn. 25 Jun 1989 MVL 1.
 10446 *Leucania multilinea* Wlk. 13 Jun 1988 BLT 1, MVL 1; 7 Jun–10 Jul 1989 MVL 2.
 10447 *Leucania commoides* Gn. 24 Jul 1989 MVL 5.
 10461 *Leucania ursula* (Fbs.) 30 May–13 Jun 1988 MVL 2.
 10462 *Leucania pseudargyria* Gn. 10 Jul 1989 BLT 1, MVL 3.
 10487 *Orthosia rubescens* (Wlk.) 8 May 1988 BLT 1; 14–26 Apr 1989 BLT 1, MVL 1, S 2.
 10491 *Orthosia alurina* (Sm.) 14–25 Apr 1989 BT 1, S 2.
 10495 *Orthosia hibisci* (Gn.) 8 May 1988 BLT 3; 26 Mar–26 Apr 1989 BL 9, BLT 34, BT 82, 1, S 68.
 10501 *Crocigrapa normani* (Grt.) 26 Apr–24 May 1989 BLT 3.
 10520 *Morrisonia evicta* (Grt.) 8 May 1988 BLT 1.
 10521 *Morrisonia confusa* (Hbn.) 8 May–13 Jun 1988 BLT 1, MVL 2; 24 May 1989 BLT 1.
 10524 *Nephelodes minians* Gn. 20–21 Sep 1989 BLT 5, S 1.
 10563 *Protorthodes oviduca* (Gn.) 8 May 1988 BLT 1.
 10578 *Pseudorthodes vecors* (Gn.) 7 Jun 1989 MVL 1.
 10585 *Orthodes crenulata* (Butler) 13 Jun–28 Jul 1988 BLT 11.
 10587 *Orthodes cynica* Gn. 30 May–13 Jun 1988 BLT 11; 24 May–25 Jun 1989 BLT 1, MVL 4.
 10627 *Tricholita signata* (Wlk.) 18–28 Jul 1988 BLT 3; 24 Jul 1989 MVL 1.
 10663 *Agrotis ipsilon* (Hufn.) 30 May–16 Oct 1988 BLT 18, MVL 4, S 1; 25 Apr–10 Jul 1989 BLT 6, BT 1, MVL 2.
 10670 *Feltia jaculifera* (Gn.) 28 Jul 1988 BLT 11.
 10674 *Feltia subgothica* (Haw.) 25 Aug 1989 BLT 2.
 10675 *Feltia tricolora* (Lint.) 16 Aug 1988 MVL 1.
 10676 *Feltia herilis* (Grt.) 18 Jul–8 Sep 1988 BLT 5; 10–24 Jul 1989 BLT 4.
 10891 *Ochropleura plecta* (L.) 30 May–13 Jun 1988 BLT 2, MVL 1.
 10915 *Peridroma saucia* (Hbn.) 13 Jun–16 Oct 1988 BLT 3, BT 1; 14 Apr–24 Jul 1989 BLT 3, BT 2, MVL 2, S 3.
 10942 *Xestia c-nigrum adela* Franc. 13 Jun 1988 BLT 2; 25 Jun–20 Sep 1989 BLT 6, MVL 1.
 10942.1 *Xestia dolosa* Franc. 30 May–8 Sep 1988 BLT 77, MVL 3; 25 Jun–21 Sep 1989 BLT 2, MVL 2, S 1.
 10943 *Xestia normaniana* (Grt.) 8 Sep 1988 BLT 4.
 10944 *Xestia smithii* (Snell.) 16 Aug–8 Sep 1988 BLT 3, S 1.
 10950 *Xestia bicarnea* (Gn.) 16 Aug–8 Sep 1988 BLT 13, BT 1; 20 Sep 1989 MVL 1; 25 Sep 1989 BLT 1.

10951	<i>Xestia tenuicula</i> (Morr.)	8 Sep 1988	BLT 4.	
10955	<i>Xestia badinodis</i> (Grt.)	21 Sep 1989	BT 5.	
10994	<i>Cerastis tenebrifera</i> (Wlk.)	14–26 Apr 1989	BL 9, BLT 25.	
11006	<i>Protolampra bruneicollis</i> (Grt.)	16 Aug 1988	BLT 1; 25 Jun–20 Sep 1989	BLT 4.
11029	<i>Abagrotis alternata</i> (Grt.)	18 Jul–8 Sep 1988	BLT 4; 10 Jul–20 Sep 1989	BLT 6, MVL 3.
11052	<i>Ufeus plicatus</i> Grt.	10 Jul 1989	BL 1.	
11063	<i>Pyrrhia umbra</i> (Hufn.)	30 May 1988	MVL 1.	
11068	<i>Heliothis zea</i> (Boddie)	9–20 Sep 1989	BLT 1, MVL 193.	
11141	<i>Schinia thoreau</i> (G. & R.)	26 Aug 1989	MVL 1.	

Abbreviations: BL black light and sheet; BLT black light trap; BT bait trap; MVL mercury vapor light and sheet; N net; S sugaring.

senting 11 species. *Lithophane antennata* was the predominate species with 42.2% of the total number collected. Other species of *Lithophane* and the percent of the total were in, decreasing abundance, *unimoda* 20.6, *semiusta* 14.9, *bethunei* 6.8, *petulca* 3.7, *hemina* 3.4, *innominata* 3.4, *signosa* 2.5, *patefacta* 1.7, *grotei* 0.5 and *laticinerea* 0.3. A comparison of the methods used to collect *Lithophane* spp. showed that bait traps were far superior to either sugaring or ultraviolet light. The percentages of all species of *Lithophane* by method of collection was: bait trap, 72.4%, sugaring 20.9% and ultraviolet light (BL, BLT and MVL) 6.7%.

During this study 91 individuals of *Catocala*, the underwing moths, were taken representing 21 species. *Catocala cerogama* was the most abundant species and represented 38.4% of the total number of underwing moths taken. Other species of *Catocala* and the percentage of the total were: *ultronia* 8.8%, *resecta* 7.7%, *palaeogama* 6.6%, *cara* 6.6%, *obscura* 4.4%, *judith* 3.3%, *amatrix* 3.3%, *amica* 2.2%, *insolabilis* 2.2%, *residua* 2.2%, *serena* 2.2%, *nebulosa* 2.2, *subnata* 2.2%, *habilis* 1.8%, *ilia* 1.1%, *innubens* 1.1%, *neogama* 1.1%, *minuta* 1.1%, *piatrix* 1.1%, and *unijuga* 1.1%. The percentage of all species of *Catocala* by method of collection was: black light trap 54.5%, sugaring 27.3% and mercury vapor light 18.1%.

During the field collections it was noted that there was a decided seasonal influence on the number of moths collected by various methods. A summary of these data appears in Table 3. It is obvious that bait traps and sugaring, which both employ the same fermented bait, were most effective from January to March. During April, May and June the most effective methods for collecting moths were black light traps. About one-fourth of the individuals were still collected in bait traps and most of these were taken in April before a large number of plants were blooming. Black light traps and mercury vapor lamps were the most effective methods of collection from July to September. Only 122 moths were collected from October to December so these data are inconclusive.

The list of Lepidoptera collected over the two year period could have been much larger if an effort had been made to collect micro-lepidoptera. Only a few of these were collected and some of these species were not identified for over a year because of a lack of specialists for determining them.

Although several species were collected, which have been serious defoliators of hardwood forests, populations were not sufficiently high to cause concern. Some of these were the fall cankerworm, spring cankerworm, elm spanworm, forest tent caterpillar, eastern tent caterpillar, catalpa sphinx, walnut caterpillar, variable oak-leaf caterpillar, fall webworm, and the white-marked tussock moth.

The following conclusions can be drawn from the results and discussion above:

- (1) Two of the species collected at Goll Woods, *Lithophane semiusta* and *Ufeus plicatus*, have been designated as endangered. In the event that this forest is treated for gypsy moth both of these species might be eradicated from the State of Ohio.
- (2) Bait traps were superior to either sugaring or black light for the collection of

Table 3. — Relative effectiveness of various methods of collection at different times of the year. Percent of total number of individuals collected by each method.

	Collection method*					
	BL	BLT	BT	MVL	N	S
Jan—Mar	4.5	10.0	44.6	0.0	0.0	40.9
Apr—Jun	1.3	43.5	25.5	17.7	1.9	10.1
Jul—Sep	0.7	74.9	1.4	16.1	2.1	4.8
Oct—Dec	-	43.4	-	56.6	-	-

Abbreviations: BL black light and sheet; BLT black light trap; BT bait trap; MVL mercury vapor light and sheet; N net; S sugaring.

moths in the genus *Lithophane*. The bait traps catch moths almost every night as long as the bait remains attractive. Sugaring is effective only as long as the collector is active—usually one night.

(3) Black light traps were more effective in collecting underwing moths (*Catocala*) than sugaring or mercury vapor lights.

(4) Bait traps and sugaring were the most effective methods of collecting moths in general from 1 January to 31 March. During April, May and June black light traps were the most effective means of collecting moths in general.

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