

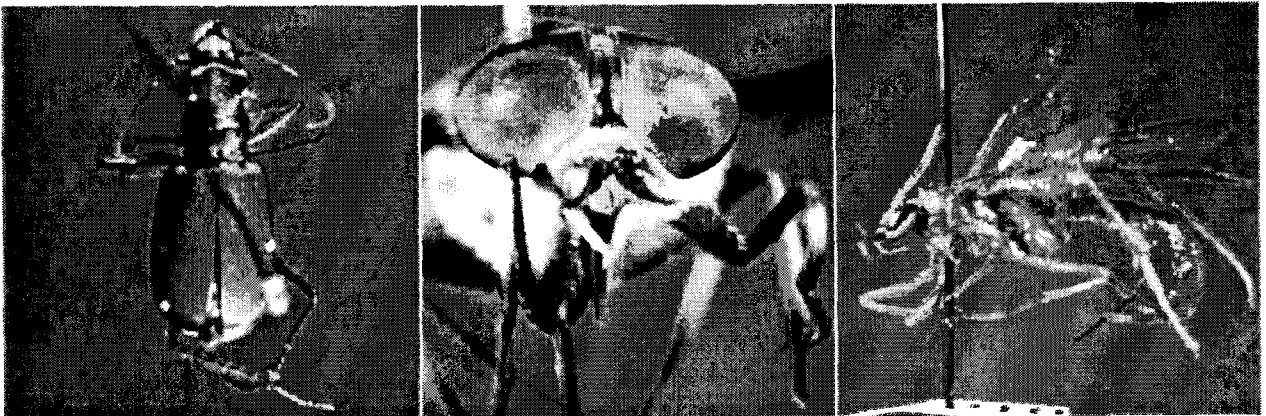
**INVENTORY OF INVERTEBRATES AT  
GETTYSBURG NATIONAL MILITARY PARK AND  
EISENHOWER NATIONAL HISTORIC SITE,  
WITH SPECIAL REFERENCE TO FOREST REMOVAL**

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Interim Technical Report

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## Project Summary

The park management for the Gettysburg National Military Park (GETT) and Eisenhower National Historic Site (EISE) has been charged with restoring the battlefields to their 1863 landscapes. Since this will have significant impacts on the ecological structure of the parks, baseline information on park biodiversity and the locations of critical habitats will be very important for park management in its effort to maintain the diversity of life in the parks. The larger goal of this study is to provide an inventory of invertebrates in the parks. The three more specific goals are to 1) develop a database listing historic and potential occurrences of invertebrates in the parks, 2) inventory and assess invertebrate biodiversity in GETT and EISE, and 3) assess the status of invertebrates and potential effects of tree removal on their communities, while developing management recommendations for ecological monitoring.

In 1999, we collected butterflies from numerous sites at GETT and EISE; we also made two, large, terrestrial arthropod collections from GETT, one in July (Big Round Top) and one in August (Codori-Trostle Thicket). Thirteen trap types were used at Big Round Top, but only 11 were used at Codori-Trostle Thicket. Plant and soil analysis were also conducted at these two sites. In 2000, additional arthropod collecting was done, but these specimens have not yet been examined.

All arthropod specimens collected, about 23,000 in number, were brought to the Frost Entomological Museum (Penn State, University Park campus) for processing, sorting, and identification. They were primarily identified to family, and if possible genus. For species identification, we sent the specimens to specialists. The results were entered into a GETT/EISE Biodiversity Database that provides lists of the arthropod species found at GETT and EISE.

All specimens from all taxa have been identified to either species or morphospecies, except for the insect orders Diptera and Hymenoptera which are 19.49% and 92.78% identified, respectively; currently, the total number of species (and morphospecies) is 1625. Although species identification is incomplete at this time, seven new species and at least one new genus of Diptera have already been discovered in the GETT material; these new taxa are unnamed and undescribed in the scientific literature.

The biodiversity data from the project provides a scientific base for the natural resource management plan of the GETT and EISE sites.



## Acknowledgements

Funding for this project was provided by the National Park Service. We are extremely grateful for the cooperation of National Park Service personnel, especially Bert Frost, John Karish, and Randy Krichten. Tree climbing services were donated by the Erlich Green Team. We especially appreciate the work provided by field and lab assistants Tim Leslie, Valerie Sauter, Mike Hutchinson, Claudia Violette, Miriam Bernardo, and Federico Belisario. We thank Kristi Sullivan, Carolyn Mahan, and Jim Boone for their advice on sampling methods and database design and management.





## Introduction

Several natural resource surveys and research projects have been initiated and completed at Gettysburg National Military Park (GETT) and Eisenhower National Historic Site (EISE) over the past ten years. These projects have resulted in considerable information regarding the presence, abundance, and distribution of various taxa of plants and animals. With this information, the park management staff have been able to make quality decisions on how certain actions might affect biodiversity and specific organisms. Some groups of organisms, however, have been relatively neglected by the research thus far at GETT and EISE. In particular, little is known about GETT and EISE invertebrates as no recent research has encompassed invertebrates in the parks.

A new draft General Management Plan for GETT recommends the restoration of the 1863 landscape to various degrees. The action alternative proposed may involve the removal of trees from between 576 and 1015 acres of forested land to restore the open vistas of the 1863 battle landscape as well as the management of some forested lands as woodlots. This proposed landscape modification likely will have significant impacts on the structure of the ecological communities and the ecosystem at large. Therefore, baseline information on biodiversity at the parks and the locations of critical habitats is important for park management if restoration of the 1863-landscape is initiated. This information also will help determine if additional abundance and distribution data are needed for specific species or guilds in relation to the type of restoration that might be proposed. Thus, the goal of this project is to provide park management with an inventory of invertebrates in biotic communities of forest, grassland, wetland, and riparian areas at the parks.

The specific goals of this project were to 1) review existing literature and documentation of the National Park Service and other sources and develop a database for historic and potential occurrence of terrestrial and aquatic invertebrates in GETT, EISE, Adams County, or Pennsylvania; 2) inventory and assess the terrestrial invertebrate biodiversity, with an emphasis on butterflies, of selected forest, open, and riparian areas; and 3) provide an assessment of the status of invertebrates and the potential effects of tree removal on invertebrate communities in forest, open, and riparian habitats, and develop management recommendations for ecological monitoring.



## Study Areas

GETT and EISE are located in Adams County, Pennsylvania, comprising 1,511 ha and 279 ha, respectively. The topography of the parks is gentle, consisting mainly of rolling hills. The mean elevation in the parks is 168 m, and the highest point is Big Round Top (240 m) (Yahner et al. 1991). There are numerous ponds and wetlands, and four predominant drainages: Rock Creek, Plum Run, Willoughby Run, and Marsh Creek.

Fifty percent (756 ha) of GETT is agricultural land (crop and pasture), and 36% (547 ha) is forested. The remaining 14% is comprised of maintained areas, residential areas, or other types of human-dominated landscapes (Yahner et al. 1991). Eighty-three percent (232 ha) of EISE is agricultural land, 3% is forested, and 14% is maintained areas, residential areas, and other developed land (Yahner et al. 1991). Crop species at the park include barley, corn, hay, sorghum, oats, rye, soybeans, and winter wheat (Yahner et al. 1991). Forested lands are primarily oak (*Quercus* spp.), hickory (*Carya* spp.), and tulip poplar (*Liriodendron tulipifera*) (Yahner et al. 1991; Storm et al. 1995).

Vegetation cover types in GETT and EISE were researched and mapped by Yahner et al. in 1991. This data is included in the Geographic Information Systems (GIS) layers used by the parks, along with data gleaned from recent aerial photos and National Wetland Inventory maps. The park GIS specialist for GETT provided a habitat cover map of the GETT and EISE areas. This map delineated elevations, various forest cover types, grasslands, croplands, and waterbodies. We used this map to distribute sampling sites across appropriate habitats in the parks.

### Butterflies

Sites for collection of butterflies were selected based on availability of suitable habitat and coverage of the parks. Suitable habitat was determined as being those areas providing a range of nectar sources and shelter suitable for the adult butterflies. Most sites are therefore located in areas of diverse vegetation dominated by hayfield, open fields, and other open areas, usually near or adjacent to forests where nectar sources were either present or butterflies were observed in flight. Searches were also made within forested situations and those locations where butterflies were collected became designated site records. New sites were therefore added as needed when new species were encountered. Thirty-one sites were sampled in 1999, and eight additional sites were targeted in 2000 (Fig. 1).

### Terrestrial Arthropods

Invertebrate inventories were conducted in three phases. The first (June 1999) concentrated within the forest stand encompassing the Big Round Top and Plum Run area of GETT (Fig. 2). This is the largest continuous forest in the park, is relatively free of roads, trails, and structures, and is representative of the forest cover types found elsewhere in the park (Yahner et al. 1991; Storm et al. 1995).

The second inventory was conducted in the Codori-Trostle Thicket in August 1999 (Fig. 2). This woodlot was targeted because GETT has plans to remove trees within the next two years. Prior to and during the time of collection, the park was in the process of removing Japanese barberry (*Berberis thunbergii*), an exotic shrub species that was ubiquitous in this woodlot, from the stand. The Codori-Trostle Thicket was grazed by approximately 40 adult cattle.

The third phase of the inventory was conducted in June 2000 as a “snapshot” of multiple sites selected in the parks (Fig. 2). Four sites were selected to target a variety of habitats that had not yet been sampled as well as increasing geographic coverage of the collection. These four sites were:

1. EISE Marsh Creek—riparian forest
2. GETT Valley of Death—open wetland/grassland
3. GETT East of Pennsylvania Monument—old field/forest edge
4. GETT Willoughby Run/Will’s Farm—open riparian grassland

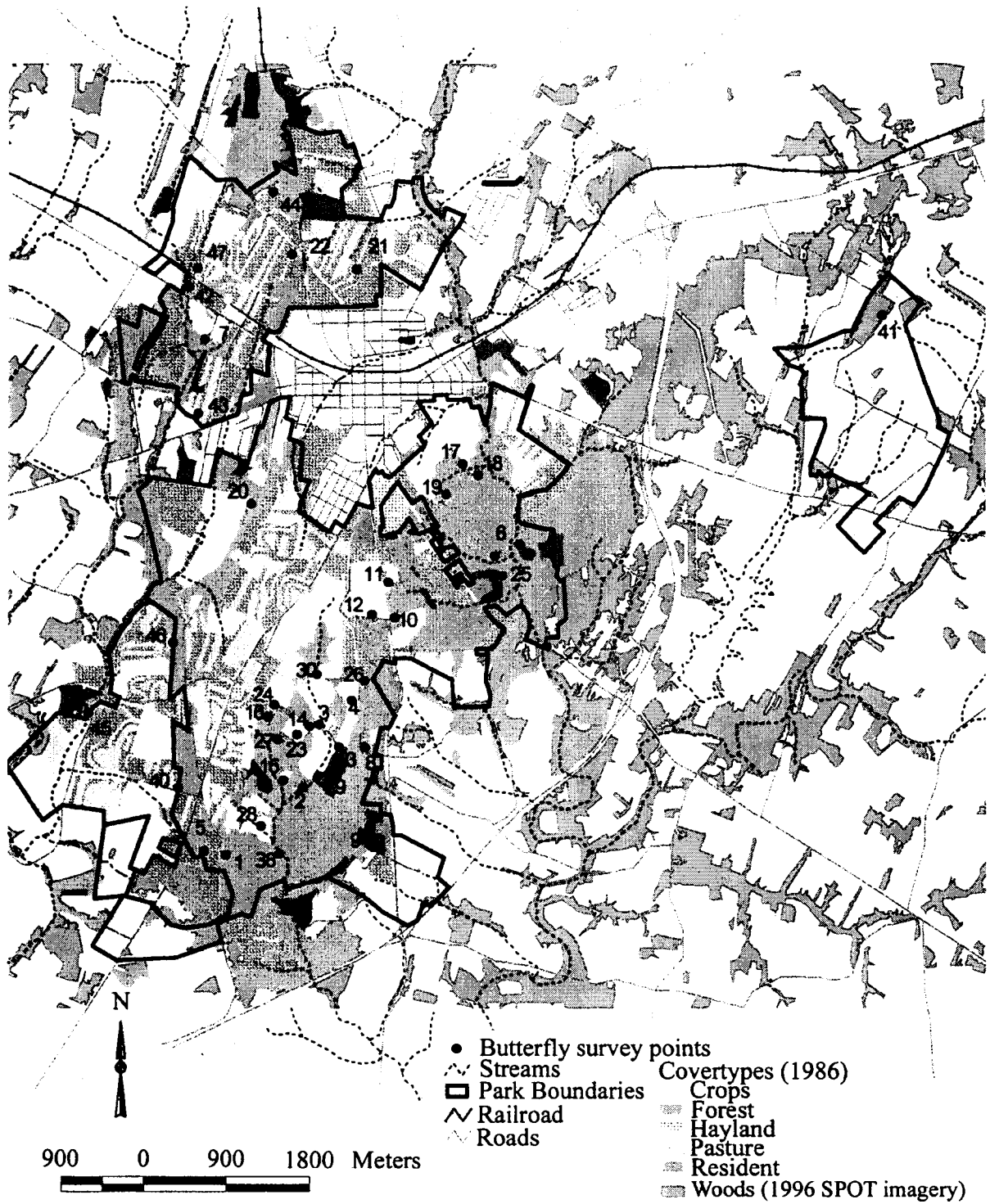


Figure 1. Map of Gettysburg National Military Park and Eisenhower National Historic Site indicating the locations of sites for sampling butterflies. Sites 1-30, 38 were sampled in 1999 and 2000; sites 40-47 were sampled only in 2000.

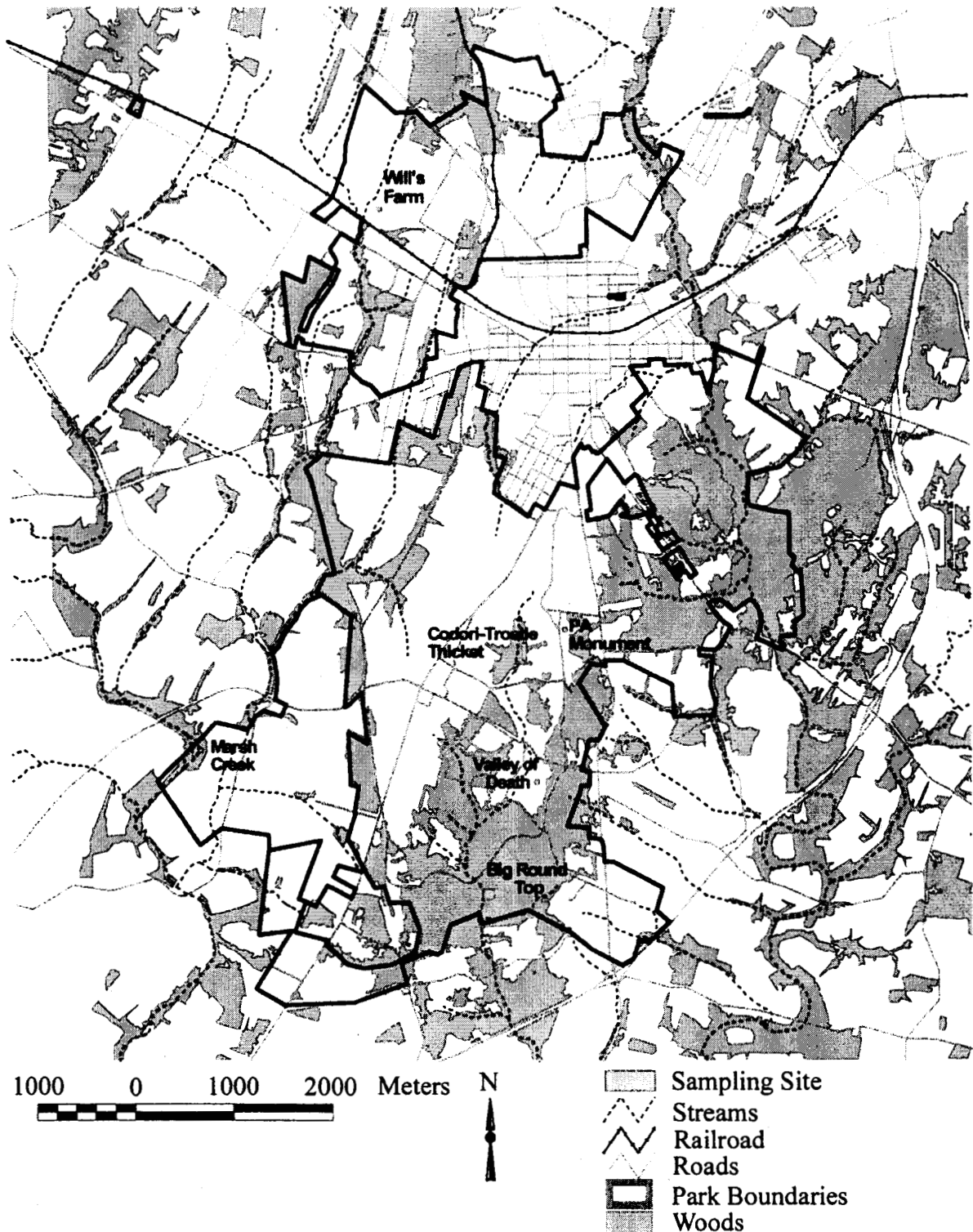


Figure 2. Map of Gettysburg National Military Park and Eisenhower National Historic Site indicating the locations of invertebrate sampling conducted in 1999 and 2000.

## Methods and Procedures

### Biodiversity Database

As the first step in the completion of a biodiversity inventory, we developed a database for historical and potential species occurrence data in GETT and EISE (called the Biodiversity Database). Existing documentation of invertebrate species was searched and entered into a Microsoft Access database. For invertebrates, this consisted primarily of searching published literature and internal reports for evidence of invertebrate species documented in Adams County, the three surrounding counties, or the state.

The Biodiversity Database contains the full taxonomy of each included species along with links from each species to the source of the information and the locations (GETT, EISE, Adams County, state-wide) where the species was known to occur. Lists of species can be output from the database comprehensively or limited by any of the database's fields, such as locality.

### Site Design

#### Butterflies

Point locations of butterfly sampling sites are general reference locations. Sampling was conducted on foot and sites were in close proximity to road access. The area encompassed for each site depended on the area of the individual habitat type and the abundance of butterflies. The majority of sites are therefore located in areas with a combination of habitats including shrub/brush/range and hayland and forest margins, particularly areas adjoining roads between Confederate Avenue and East Confederate Avenue. In the second year the Calvary block was included with sampling along the forest margin and adjacent field along Calvary Avenue. Sampling in EISE was limited to two sites as most of the area was under pasture and cropland. The northwestern block was similarly dominated by pasture and cropland so only a few sampling sites were included where forest margins were accessible. Those locations where butterflies were frequently encountered were more intensively sampled with the minimum amount of time at each location being no less than half an hour. Since the focus of collecting was on the maximization of species records sampling was not restricted to any timetable or transect. The frequency of collecting was dependant on the ability of the collector to observe and capture specimens. Most sites represent a total collecting area of at least 0.10 ha.

#### Terrestrial Arthropods

Site layout and sampling design was originally based on a plot-based ecosystem profile designed by Mahan et al. (1998) and modified for each site as the inventory progressed. Big Round Top and the Codori-Trostle Thicket sampling design most closely resembled the ecosystem profile design. At Big Round Top, we established four, 100-m long parallel sampling transects traversing the stand parallel to Plum Run, each 25 m apart. The first transect was 20 m east from the bank of Plum Run. Transects were kept at least 50 m from the edge of the forest and from the main road bisecting the forest. Twenty sampling stations were established at 25-m intervals

along the transects. One station was randomly chosen as the site for the biodiversity profile plot; GPS coordinates were taken at the center of this plot. Ten stations were randomly selected from the remaining 19 stations to be used for stand-based sampling. A 20 x 20 m plot was marked centered on each selected station (after Mahan et al. 1998; Fig. 3).

The Codori-Trostle Thicket site consisted of a narrow woodlot bisected by Plum Run. We therefore established two, 200-m long parallel sampling transects parallel to Plum Run and otherwise established stations as described above (Fig. 4).

At the four “snapshot” sites sampled in 2000 we established only the biodiversity profile plot, consisting of a 20 x 20 m plot centered on the site position as captured in GPS. For the three sites containing streams, aquatic sampling was conducted outside of the plot boundary.

Additionally, two trees used for trunk trap sampling were outside of the plot boundaries because of the lack of trees found within the plots at Valley of Death and Pennsylvania Monument.

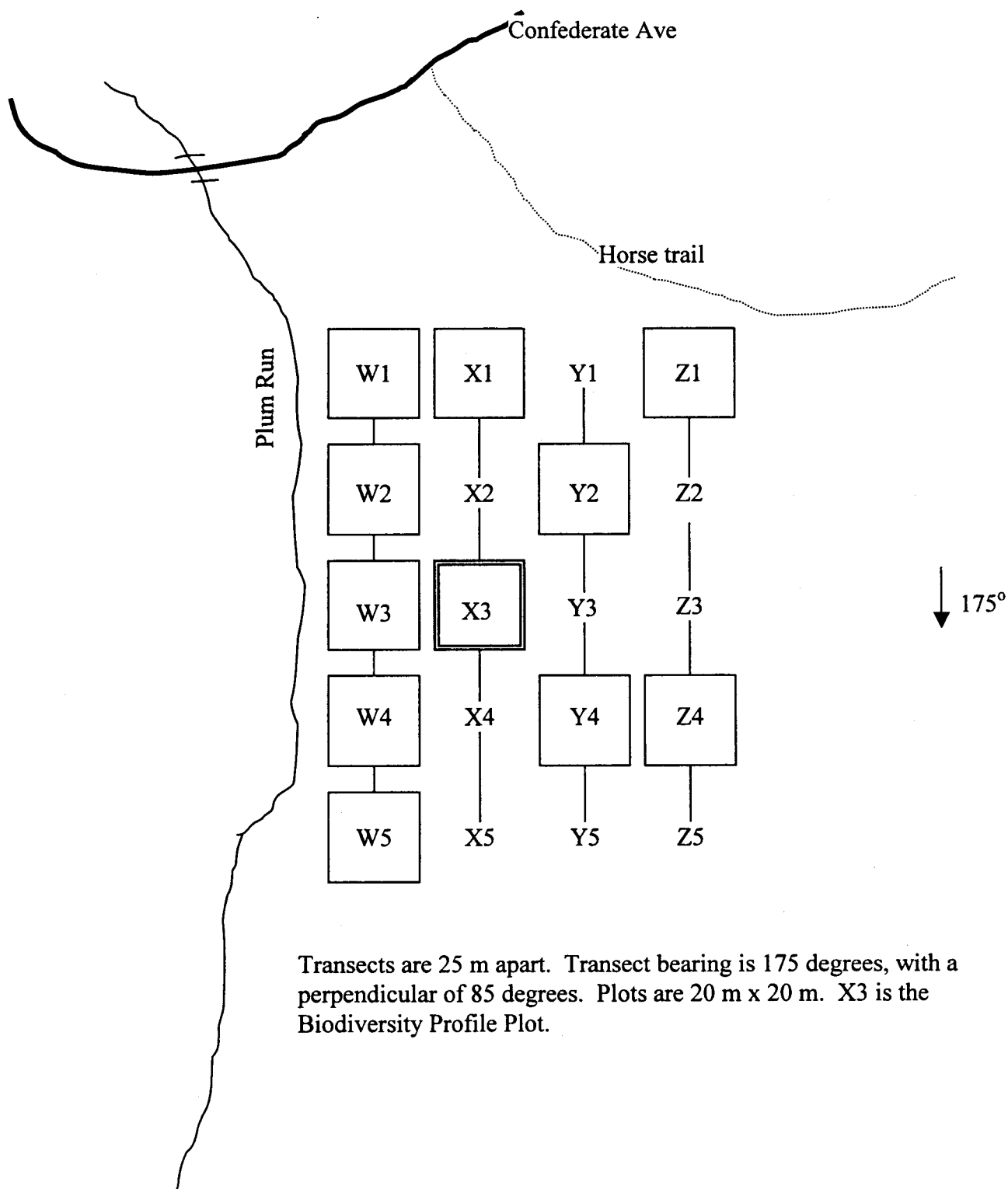
## Sampling Strategy

### Butterflies

Butterflies and skippers are two groups of day-flying lepidopterans; while skippers differ from butterflies in several ways, for the purposes of this paper, they will be reported as butterflies. Butterflies comprise species that are both generalists and specialists. At GETT and EISE, a combination of habitat requirements will be represented among the butterfly fauna according to the host-plant requirements of each species. In general, these habitats involve forest, marsh/wet meadow, meadow (undeveloped), and herb/shrubland.

The predicted composition of the butterfly fauna was established prior to the survey from museum records for Adams County using specimens held at Carnegie Museum of Natural History and the Frost Entomological Museum as well as survey data from The Nature Conservancy. From this list (about 100 species), host plants were documented from the literature, and these were used to predict the probable location of adults.

A preliminary survey was made in fall 1998 to select habitats and sampling sites. This included the identification of probable butterfly flight paths, areas of suitable sunlight within or adjacent to forests, and presence of extensive flowering herbs. Actual sampling took place from April – October, 1999, and from March – August, 2000. Surveys were made on a weekly or biweekly basis with choice of day made according to suitable weather conditions, including temperatures above 10° C, wind less than 16 km/hr, and cloud cover less than 50%.



Transects are 25 m apart. Transect bearing is 175 degrees, with a perpendicular of 85 degrees. Plots are 20 m x 20 m. X3 is the Biodiversity Profile Plot.

Figure 3. Layout of sampling stations for invertebrate collection at the Big Round Top stand at Gettysburg National Military Park in June 1999.

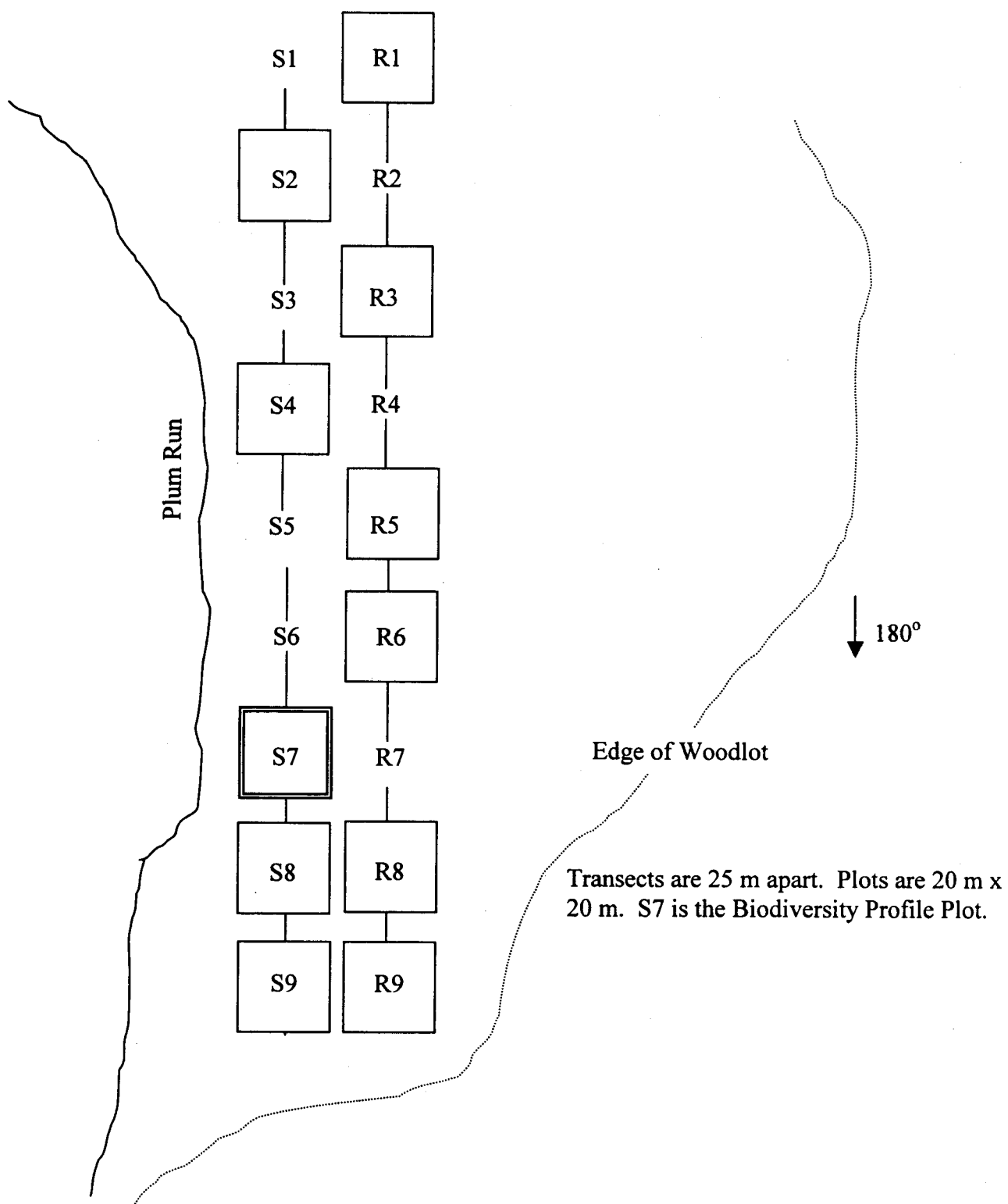


Figure 4. Layout of sampling stations for invertebrate collection at the Codori-Trostle Thicket stand at Gettysburg National Military Park in August 1999.

Each site was examined for at least half an hour to allow sampling of each site within a cohesive time period. The total daily sampling period ranged from 3 to 5 hours. Butterflies were collected by hand netting and transferred to glassine envelopes. Envelopes for each sampling site were coded and stored in a labeled container. Where butterflies were sufficiently distinct to be identified in the field, the number of specimens collected was limited to about five individuals. Where several species may be present, but are distinct, repeated sampling was carried out to obtain a total of 30 specimens. Butterflies not within reach of hand collecting that may represent an uncollected species were examined through binoculars in an effort to estimate identification. Butterflies were temporarily stored in envelopes until relaxed, mounted, labeled, and identified. Specimens will be held in the Frost Entomological Museum Collection. All specimens were coded with a Gettysburg National Park label to allow subsequent location within the collection.

Bait traps with fermenting beer were established in two additional locations along forest margins where sunlight was present and suitable flight routes appeared to be present (survey point 10 on Figure 1 and along Taneytown Rd near the edge of the deciduous forest on Little Round Top). Bait traps were re-baited prior to a visit and checked periodically from April to September, 1999, however they yielded no results.

### Terrestrial Arthropods

All of the sampling methods and protocols for invertebrates followed the details developed for Shenandoah National Park and Delaware Water Gap National Recreation Area in a hemlock biodiversity study (Mahan et al. 1998, pages 45-55, 58-63). In the sample areas one station was randomly chosen for a biodiversity profile. A 20 x 20 m plot was centered on the selected station and termed a biodiversity profile plot. Ten additional trapping stations were established in the surrounding stand (Fig. 3-4). The forested stand at Big Round Top was sampled June 21-25, 1999; the stand at the Codori-Trostle Thicket was sampled August 10-12, 1999; and the four additional profile plots were sampled June 26-28, 2000.

**Invertebrates:** We employed a variety of collecting techniques in order to sample invertebrates from nearly all available habitat levels within the plots (Table 1). Selection of each method and field protocols for the traps were based on Mahan et al. (1998).

*Beating Sheet.* (Figure 5) To sample invertebrates associated with understory vegetation, we used a beating sheet and 10 beats on the above vegetation. Beating sheet collecting was conducted in morning hours (0700-1000 h). At the Big Round Top site, five beating sheet samples were taken within the biodiversity profile plot; whereas at the Codori-Trostle Thicket and the four Snapshot sites, two beating sheet samples were taken within the biodiversity profile plot. One beating sheet sample was collected at each of the ten stand plots at both Big Round Top and Codori-Trostle Thicket.

*Branch Clipping.* To sample invertebrates associated with the forest canopy, we collected branch clippings from two overstory trees within the biodiversity profile plot at both Big Round Top and Codori-Trostle Thicket. Branches were sampled by quickly enclosing a 0.5-m length of a foliage-bearing branch in a plastic bag, clipping the branch, and sealing the bag. Bags were

stored in refrigeration; leaves and branches were examined under a microscope; and any invertebrates were collected with forceps. At Big Round Top, each tree was sampled three times at upper crown level and three times at lower crown level. At Codori-Trostle Thicket, each tree was sampled three times at lower crown level only. No branch clippings were taken from the Snapshot sites because of the low number of invertebrates collected by this method in 1999.

*Canopy Malaise Traps.* (Figure 6) To sample flying insects in the forest canopy, we arranged for a tree climber to place two canopy malaise traps in the two trees that were used for branch clipping in the biodiversity profile plot at Big Round Top. Traps were set on the first day of the collecting period and emptied on the last day (four days). Canopy malaise traps were not used at any of the other sites because of the logistics of arranging for a tree climber and because few insects were captured in the first sample.

*Ground Malaise Traps.* (Figure 7) To sample flying insects at the ground level, we set out ground malaise traps. Two ground malaise traps were set within the biodiversity profile plots of Big Round Top and Codori-Trostle Thicket, and two ground malaise traps were set within each of two randomly selected stand trapping stations at Big Round Top and Codori-Trostle Thicket. One ground malaise trap was set within the sampling plot of each Snapshot site. Traps were set on the first day of the collecting period and emptied on the last day (four days at Big Round Top and two days at all other sites).

*Leaf Litter.* (Figure 8) To sample invertebrates inhabiting the forest floor, we hand-collected leaf litter using a 0.25 x 0.25-m quadrat. Litter was scooped into a plastic bag and stored in refrigeration. Samples were manually sorted and invertebrates were collected within three days of initial collection. At the Big Round Top site, five leaf litter samples were taken within the biodiversity profile plot; whereas at the Codori-Trostle Thicket, two leaf litter samples were taken within the biodiversity profile plot. One leaf litter sample was collected at each of the ten stand plots at both Big Round Top and Codori-Trostle Thicket. No leaf litter was present at the four Snapshot sites.

*Light Traps.* (Figure 9) To sample nocturnal flying insects we used 10-watt black light traps (BioQuip) and tetra-chloroethane (an insect fumigant and preservative). Traps were placed on the ground next to the biodiversity profile plot at each site and opened for one night, from dusk to dawn. Insects were collected, stored in a freezer, and dried and pinned for long-term storage.

*Pitfall Traps.* (Figure 10) To sample invertebrates of the forest floor, we installed 9-cm diameter plastic drinking cups in the ground so that the cup rims were level with the soil surface. We used table salt, placed to a depth of 1 cm and covered with water, as a killing agent and preservative. At the Big Round Top site, six pitfall traps were installed on a grid within the biodiversity profile plot; whereas at the Codori-Trostle Thicket and the four Snapshot sites, two pitfall traps were installed within the biodiversity profile plot. One pitfall trap was installed at each of the ten stand plots at both Big Round Top and Codori-Trostle Thicket. Pitfall traps were installed on the first day of the collecting period and emptied on the last day (four days at Big Round Top and two days at all other sites).

Table 1. Number of invertebrate samples collected at each sampling site, biodiversity profile plot and stand plots combined, at Gettysburg National Military Park and Eisenhower National Historic Site by trap method, 1999 and 2000.

| Trap Method      | Site          |                        |             |                 |             |             |
|------------------|---------------|------------------------|-------------|-----------------|-------------|-------------|
|                  | Big Round Top | Codori-Trostle Thicket | Marsh Creek | Valley of Death | PA Monument | Will's Farm |
| Beating Sheet    | 15            | 12                     | 2           | 2               | 2           | 2           |
| Branch Clipping  | 4             | 2                      | 0           | 0               | 0           | 0           |
| Canopy Malaise   | 2             | 0                      | 0           | 0               | 0           | 0           |
| Ground Malaise   | 4             | 4                      | 1           | 1               | 1           | 1           |
| Leaf Litter      | 15            | 12                     | 0           | 0               | 0           | 0           |
| Light Trap       | 1             | 1                      | 1           | 1               | 1           | 1           |
| Pitfall Trap     | 16            | 12                     | 2           | 2               | 2           | 2           |
| Soil Core        | 16            | 12                     | 2           | 2               | 2           | 2           |
| Substrate Search | 11            | 11                     | 1           | 1               | 1           | 1           |
| Sweep Net        | 15            | 12                     | 2           | 2               | 2           | 2           |
| Trunk Trap       | 20            | 12                     | 2           | 1               | 2           | 2           |



Figure 5. Insects being collected from a beating sheet, collectors using aspirators.

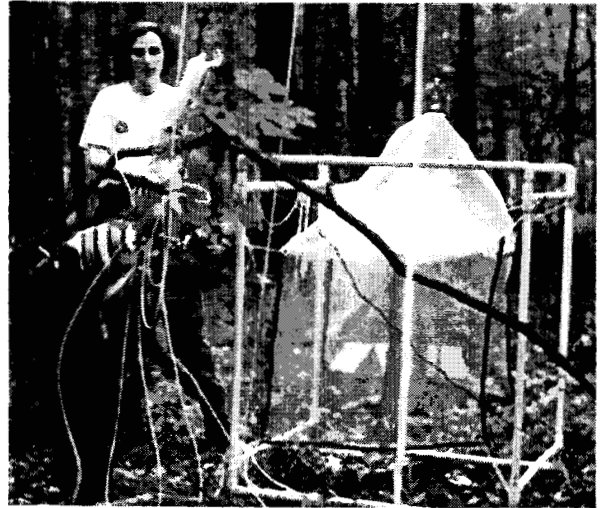


Figure 6. A canopy malaise trap before being raised into the canopy.



Figure 7. A ground malaise trap.



Figure 8. Leaf litter being collected from the study site.



Figure 9. A light trap being assembled.



Figure 10. Specimens being collected from a pitfall trap.



Figure 11. A trunk trap.

*Soil Cores.* To sample invertebrates occupying the soil column, we took soil cores from the center of the quadrat used for leaf litter collection. Soil cores were taken using a golf hole cup cutter to a depth of roughly 5 cm and were kept intact and stored in refrigeration. Within three days of collection, invertebrates were extracted from the soil cores using a modified Tullgren Funnel method. At the Big Round Top site, five soil cores were taken within the biodiversity profile plot; whereas at the Codori-Trostle Thicket and the four Snapshot sites, two soil cores were taken within the biodiversity profile plot. One soil core was collected at each of the ten stand plots at both Big Round Top and Codori-Trostle Thicket.

*Substrate Searches.* To further sample invertebrates of the ground environments, we conducted a plot-based substrate search and collected all invertebrates encountered. Within a 5-m radius circle centered on the trapping station, two observers turned rocks and logs and searched the soil surface for 10 minutes. One substrate search was conducted at all biodiversity profile plots and stand plots.

*Sweep Nets.* To sample invertebrates inhabiting herbaceous and woody vegetation, we collected sweep net samples. Ten sweeps with the net, one taken at each of ten steps, constituted one sample. Sweeps were conducted in the morning (0700 – 1000 h). At the Big Round Top site, five sweep net samples were taken within the biodiversity profile plot; whereas at the Codori-Trostle Thicket and the four Snapshot sites, two sweep net samples were taken within the biodiversity profile plot. One sweep net sample was collected at each of the ten stand plots at both Big Round Top and Codori-Trostle Thicket.

*Trunk Traps.* (Figure 11) To sample invertebrates traveling up or down tree trunks, we attached both ascending and descending trunk traps to tree trunks within the plots. At the Big Round Top site, five ascending and five descending trunk traps were set up within the biodiversity profile plot; whereas at the Codori-Trostle Thicket and the four Snapshot sites, one ascending and one descending trap were set up within the biodiversity profile plot. One trunk trap was set up at each of the ten stand plots at both Big Round Top and Codori-Trostle Thicket, alternating ascending and descending design.

*Preservation and Identification.* Field-collected samples were kept in dry condition or preserved in glass vials containing 70% ethyl alcohol. In the laboratory, samples from Big Round Top and Codori-Trostle Thicket were processed, separated, and sorted into orders and subsequently into families. Specimens have been (and will continue to be) sent to taxonomic specialists (see below) for identification to the genus and species level. Any families that cannot be sent out will be examined in the lab to be separated into identifiable taxa (morphospecies). All specimens will be labeled with identification information and stored with a permanent locality label bearing an accession code number. All specimens will be maintained in the Frost Entomological Museum.

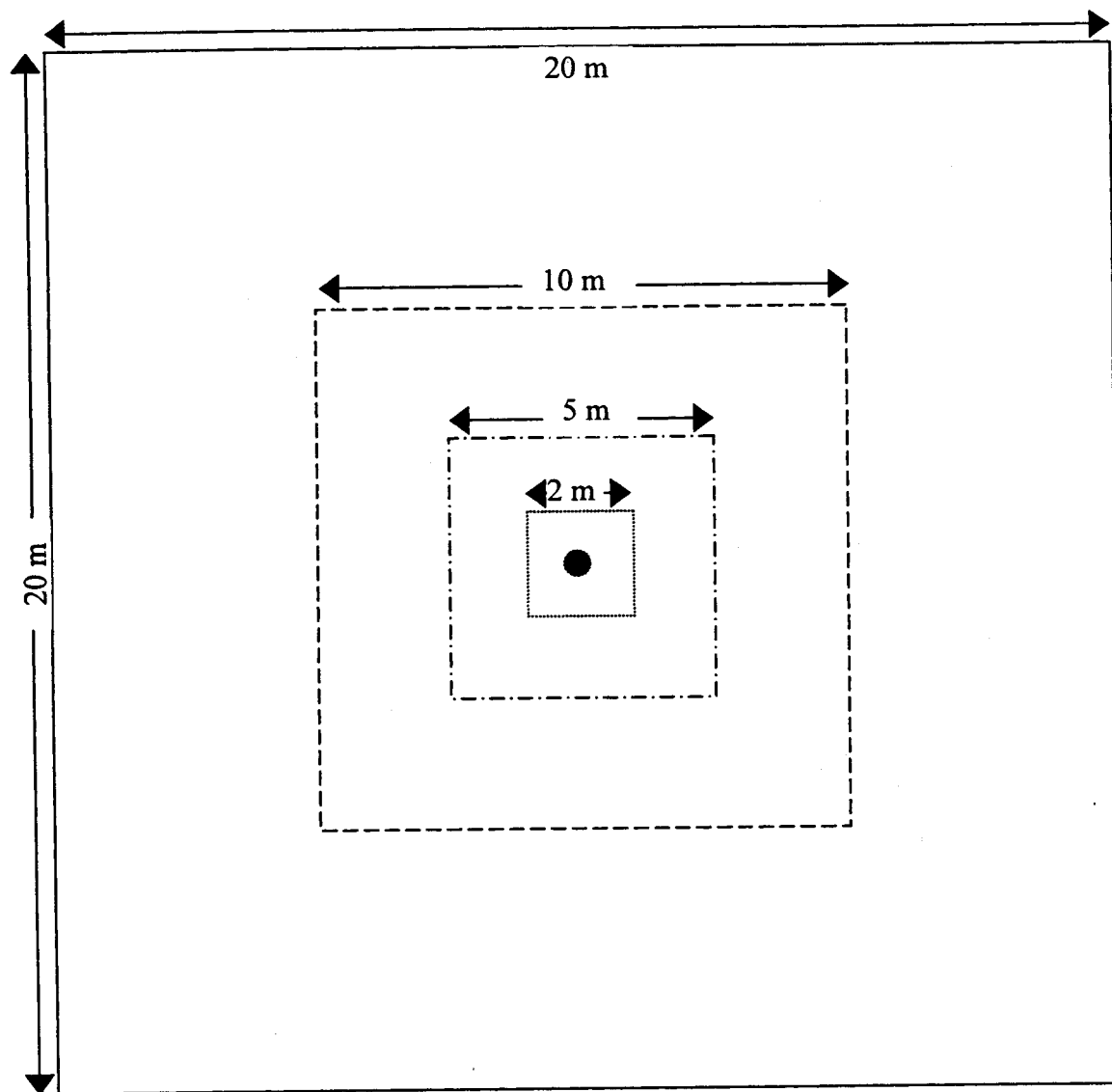
Specimens collected in 2000 will be stored in 70% ethyl alcohol in the collection jars pending additional funding for identification.

*Plants:* Overstory trees, saplings, shrubs, herbaceous plants, and seedlings were sampled within each plot at all of the inventory sites based on methods described by Russel (1996) and Mahan et

al. (1998; Figure 12). Percent canopy cover, average slope, and aspect were recorded from the central sampling point. Species and dbh of each overstory tree (>1.5 m high and  $\geq 11.4$  cm dbh) within the entire 20 x 20 m plot were recorded. Within a 10 x 10 m nested plot, number and species of each sapling (>1.5 m high and <11.4 cm dbh) or shrub (0.5-1.5 m high) were recorded. Within a 5 x 5 m nested plot, number and species of each herbaceous plant were recorded, and the percent cover of herbaceous plants, leaf litter, bare ground, woody debris, and rock was estimated to the nearest 5%. Finally, within a 2 x 2 m nested plot, the number and species of woody seedlings was recorded. For all plots a plant was recorded in the plot if its stem originated on or within the plot boundaries. Identified plant species are located in Appendices A-D.

**Soil:** We collected soil samples from the center of each plot at both Big Round Top and Codori-Trostle Thicket for chemical analysis. All soil samples were examined for soil pH; phosphorous; acidity; exchangeable cations of potassium, magnesium, and calcium; cation exchange capacity; and percent saturation by potassium, magnesium, and calcium. Testing was conducted at the Agricultural Analytical Services Laboratory at The Pennsylvania State University.

**Taxonomic Specialists:** The initial sorting and identification of the arthropod specimens was done at the Frost Entomological Museum by our lab assistants. However, in most cases, for specimen identification to the species level, we sent the specimens to experts. Below is an alphabetical listing of those specialists who helped us and the taxa they worked on: Art Borkent (Diptera: Ceratopogonidae), John Burger (Diptera: Tabanidae), Sidney Camras (Diptera: Conopidae), Edward Coher (Diptera: Mycetophilidae), Greg Dahlem (Diptera: Sarcophagidae), Bob Davidson (Coleoptera: Carabidae), Frank Fee (Diptera: Syrphidae), Benjamin Foote (Diptera: Chloropidae, Ephydriidae, Sciomyzidae), Stephen Gaimari (Diptera: Chamemyiidae, Lauxaniidae, Platystomatidae), Cees Gielis (Lepidoptera: Pterophoridae), Graham Griffiths (Diptera: Antomyiidae), Richard Hurley (Diptera: Dolichopodidae), Laurence Quate (Diptera: Psychodidae), Aubrey Scarbrough (Diptera: Asilidae), Sonja Scheffer (Diptera: Agromyzidae), Gary Steck (Diptera: Tephritidae), Donald Webb (Diptera: Rhagionidae), Norman Woodley (Diptera: Athericidae, Calliphoridae, Stratiomyidae, Tachinidae), Chen Young (Diptera: Tipulidae), Skip Young (Araneae: all families). Robert Cuny (Diptera: Muscidae) and Varuni Kulasekera (Diptera: Culicidae) are currently identifying material for us, so their data is not recorded in the species lists. Contact information for the above taxonomists is listed in Appendix E.



- Overstory tree plot
- Sapling and shrub plot
- ..... Herbaceous plant plot
- . - . - . Seedling plot
- Sampling point

Figure 12. Plot design for vegetation sampling associated with invertebrate sampling at Gettysburg National Military Park and Eisenhower National Historic Site (from Mahan et al. 1998).

## Results and Discussion

### Butterflies

A total of 332 specimens representing 38 butterfly species were recorded from 45 geo-referenced collection sites (Appendix F) during the months April through September in 1999-2000. All specimens were pinned and curated for storage at the Frost Entomological Museum. All specimens except four have been identified to the species level, and we intend to confirm uncertain identifications with a specialist when additional funding has been obtained. Fourteen species were of the Hesperidae (skippers) with the remaining species comprising six species of Lycaenidae (hairstreaks and coppers), 11 species of Nymphalidae (brushfoots), four species of Papilionidae (swallowtails), and three species of Pieridae (whites and sulphurs) (Table 2). Only *Nymphalis antipoo* (Mourning cloak) was recorded by observation alone as the butterflies were not within reach of a collecting net. The large size and distinctive markings allow for a definitive and reliable visual identification of this species. Very limited collecting was made for *Danaus plexippus* (Monarch) because there was concern at the time for the status of this species with respect to its general abundance due to various reports of extensive mortality in its Mexican overwintering range.

Most species (76%) collected required field or meadow habitats that support herbaceous larval host-plants as well as nectar sources for the adults (Table 3). The precise status of most host-plants is unknown with respect to their abundance and distribution within the parks, and their utilization by the butterflies is also unknown. At present there is no determination of which butterflies actually breed within the parks with the possible exception of the Baltimore where a population was specifically associated with a wetland habitat.

In general the best collecting sites in the parks were along forest margins with an abundance of undeveloped fields and meadows or periodically cropped meadow and hayfield. This combination of habitats is particularly extensive along the eastern area of GETT in the vicinity of South Confederate Avenue, Wheatfield Road, Sedgewick Avenue, Taneytown Road, and East Confederate Avenue. The Cavalry Field Block was not extensively surveyed, although most of the area comprises farmland with scattered forest blocks. All collecting in this block was made along the forest margin of Rummel Woods on Confederate Calvary Avenue. Similarly, most of the northwestern block of GETT comprised farmland and about six sites were sampled within this habitat with woodland sampling in Herbst's and McPherson's Woods.

The following descriptions provide general information on each species distribution range, the larval host-plant and habitat requirements, and predicted habitat and host-plant support resources of the parks. Where there is considerable uncertainty about whether the larval host-plants are present the term 'potential' is used or the specific lack of information on the host plant is cited. All maps referenced are located in Appendix G.

Table 2. Butterfly species collected in 1999-2000 from Gettysburg National Military Park and Eisenhower National Historic Site.

| Family       | ScientificName                                    | CommonName                | Collection period     |
|--------------|---------------------------------------------------|---------------------------|-----------------------|
| HESPERIIDAE  | <i>Ancyloxypha numitor</i> (Fabricius 1793)       | Least skipper             | June 8-August 13      |
| HESPERIIDAE  | <i>Atalopedes campestris</i> (Boisduval 1852)     | Sachem                    | July 26               |
| HESPERIIDAE  | <i>Epargyreus clarus</i> (Cramer 1779)            | Silver-spotted skipper    | May 24-August 9       |
| HESPERIIDAE  | <i>Erynnis brizo</i> (Boisduval & LeConte 1834)   | Sleepy dusky wing         | April 30              |
| HESPERIIDAE  | <i>Erynnis juvenalis</i> (Fabricius 1793)         | Juvenal's dusky wing      | April 15-May 17       |
| HESPERIIDAE  | <i>Euphys dion</i> (Edwards 1879)                 | Dion skipper              | August 11             |
| HESPERIIDAE  | <i>Poanes hobomok</i> (Harris 1862)               | Hobomok skipper           | May 24-August 13      |
| HESPERIIDAE  | <i>Polites mystic</i> (Edwards 1863)              | Long dash                 | May 24-June 12        |
| HESPERIIDAE  | <i>Polites peckius</i> (Kirby 1837)               | Peck's skipper            | June 1-August 11      |
| HESPERIIDAE  | <i>Polites thermistocles</i> (Latreille 1824)     | Tawny-edged skipper       | June 4-July 26        |
| HESPERIIDAE  | <i>Pompeius verna</i> (Edwards 1862)              | Little glassy wing        | May 26-August 13      |
| HESPERIIDAE  | <i>Pyrgus communis</i> (Grote 1872)               | Checkered skipper         | September 18          |
| HESPERIIDAE  | <i>Thorybes pylades</i> (Scudder 1870)            | Northern cloudy wing      | June 3-June 24        |
| HESPERIIDAE  | <i>Thymelicus lineola</i> (Ochsenheimer 1808)     | European skipper          | June 1-June 24        |
| LYCAENIDAE   | <i>Calycopis cecrops</i> (Fabricius 1793)         | Red-banded hairstreak     | August 10             |
| LYCAENIDAE   | <i>Celastrina agriolus</i> (Linnaeus 1758)        | Spring azure              | April 15-June 12      |
| LYCAENIDAE   | <i>Everes comyntas</i> (Godart 1824)              | Eastern tailed blue       | May 12-August 13      |
| LYCAENIDAE   | <i>Lycaena phlaeas</i> (Linnaeus 1761)            | Little copper             | June 17               |
| LYCAENIDAE   | <i>Satyrrium calanus</i> (Hübner 1808)            | Banded hairstreak         | June 3-August 13      |
| LYCAENIDAE   | <i>Strymon melinus</i> (Hübner 1818)              | Gray hairstreak           | May 17-August 13      |
| NYMPHALIDAE  | <i>Coenonympha tullia inornata</i> (Müller 1764)  | Common wood nymph         | June 23-August 11     |
| NYMPHALIDAE  | <i>Danaus plexippus</i> (Linnaeus 1758)           | Monarch                   | August 9-September 18 |
| NYMPHALIDAE  | <i>Euphydryas phaeton</i> (Drury 1773)            | Baltimore                 | June 4-June 23        |
| NYMPHALIDAE  | <i>Megisto cymela</i> (Cramer 1777)               | Little wood satyr         | May 24-June 23        |
| NYMPHALIDAE  | <i>Nymphalis antipoo</i> (Linnaeus 1758)          | Mourning cloak            | May 12                |
| NYMPHALIDAE  | <i>Phyciodes tharos</i> (Drury 1773)              | Pearl crescent            | April 30-August 9     |
| NYMPHALIDAE  | <i>Polygonia comma</i> (Harris 1842)              | Comma                     | July 16               |
| NYMPHALIDAE  | <i>Polygonia interrogationis</i> (Fabricius 1798) | Question mark             | June 4-September 18   |
| NYMPHALIDAE  | <i>Speyeria cybele</i> (Fabricius 1775)           | Great spangled fritillary | June 12-August 13     |
| NYMPHALIDAE  | <i>Vanessa atalanta</i> (Linnaeus 1758)           | Red admiral               | July 4                |
| NYMPHALIDAE  | <i>Vanessa virginiensis</i> (Drury 1773)          | American painted lady     | May 12-June 29        |
| PAPILIONIDAE | <i>Battus philenor</i> (Linnaeus 1771)            | Pipevine swallowtail      | May 17-August 9       |
| PAPILIONIDAE | <i>Papilio glaucus</i> (Linnaeus 1758)            | Tiger swallowtail         | June 4-August 13      |
| PAPILIONIDAE | <i>Papilio polyxenes</i> (Fabricius 1775)         | Black swallowtail         | June 4-July 26        |
| PAPILIONIDAE | <i>Papilio troilus</i> (Linnaeus 1758)            | Spicebush swallowtail     | May 12-August 9       |
| PIERIDAE     | <i>Colias eurytheme</i> (Boisduval 1852)          | Alfalfa butterfly         | May 17-September 18   |
| PIERIDAE     | <i>Colias philodice</i> (Godart 1819)             | Clouded sulphur           | April 20-September 18 |
| PIERIDAE     | <i>Pieris rapae</i> (Linnaeus 1758)               | Cabbage white             | April 30-September 18 |

Table 3. General host-plant and habitat relationships of butterfly species collected in 1999-2000 from Gettysburg National Military Park and Eisenhower National Historic Site.

| <u>Butterfly</u>                                | <u>Common name</u>     | <u>Tree and shrub hosts</u>                | <u>Host status</u> |
|-------------------------------------------------|------------------------|--------------------------------------------|--------------------|
| <b>Hesperiidae</b>                              |                        |                                            |                    |
| <i>Epargyreus clarus</i> (Cramer 1779)          | Silver-spotted skipper | black locust, wisteria, other legumes      | ?                  |
| <i>Erynnis brizo</i> (Boisduval & LeConte 1834) | Sleepy dusky wing      | bear oak and other shrubby oaks            | ?                  |
| <i>Erynnis juvenalis</i> (Fabricius 1793)       | Juvenal's dusky wing   | oaks                                       | common             |
| <b>Lycaenidae</b>                               |                        |                                            |                    |
| <i>Calycopis cecrops</i> (Fabricius 1793)       | Red-banded hairstreak  | dead leaves of sumacs, myrtle, oaks        | common             |
| <i>Celastrina agriolus</i> (Linnaeus 1758)      | Spring azure           | flowers of various woody plants            | common             |
| <i>Satyrrium calanus</i> (Hübner 1808)          | Banded hairstreak      | oaks, walnuts, hickories                   | common             |
| <b>Nymphalidae</b>                              |                        |                                            |                    |
| <i>Nymphalis antipoo</i> (Linnaeus 1758)        | Mourning cloak         | willows, birch, cottonwood, elm, hackberry | common?            |
| <b>Papilionidae</b>                             |                        |                                            |                    |
| <i>Battus philenor</i> (Linnaeus 1751)          | Pipevine swallowtail   | pipe vines                                 | ?                  |
| <i>Papilio glaucus</i> (Linnaeus 1758)          | Tiger swallowtail      | trees, poplar, cherry, sweet bay           | ?                  |
| <i>Papilio troilus</i> (Linnaeus 1758)          | Spicebush swallowtail  | Sassafras, spicebush                       | ?                  |
| <u>Meadow/field hosts</u>                       |                        |                                            |                    |
| <b>Hesperiidae</b>                              |                        |                                            |                    |
| <i>Ancyloxypha numitor</i> (Fabricius 1793)     | Least skipper          | grasses                                    | common             |
| <i>Atalopedes campestris</i> (Boisduval 1852)   | Sachem                 | grasses                                    | common             |
| <i>Euphys dion</i> (Edwards 1879)               | Dion skipper           | sedges                                     | restricted         |
| <i>Poanes hobomok</i> (Harris 1862)             | Hobomok skipper        | panic grasses, blue grasses                | common?            |
| <i>Polites mystic</i> (Edwards 1863)            | Long dash              | bluegrasses                                | common?            |
| <i>Polites peckius</i> (Kirby 1837)             | Peck's skipper         | grasses                                    | common             |
| <i>Polites thermistocles</i> (Latreille 1824)   | Tawny-edged skipper    | panic grasses                              | common?            |
| <i>Pompeius verna</i> (Edwards 1862)            | Little glassy wing     | purpletop and other grasses                | common?            |
| <i>Pyrgus communis</i> (Grote 1872)             | Checkered skipper      | mallows, hollyhock                         | common?            |
| <i>Thorybes pylades</i> (Scudder 1870)          | Northern cloudy wing   | clovers, vetches, other legumes            | common             |
| <i>Thymelicus lineola</i> (Ochsenheimer 1808)   | European skipper       | timothy grass                              | common?            |

Table 3. General host-plant and habitat relationships of butterfly species collected in 1999-2000 from Gettysburg National Military Park and Eisenhower National Historic Site (continued).

| <u>Butterfly</u>                                  | <u>Common name</u>        | <u>Meadow/field hosts</u>                     | <u>Host status</u> |
|---------------------------------------------------|---------------------------|-----------------------------------------------|--------------------|
| <b>Lycaenidae</b>                                 |                           |                                               |                    |
| <i>Everes comyntas</i> (Godart 1824)              | Eastern tailed blue       | flowers and seeds of herbaceous legumes       | common             |
| <i>Lycaena phlaeas</i> (Linnaeus 1761)            | Little copper             | sheep sorrel                                  | ?                  |
| <i>Satyrrium calanus</i> (Hübner 1808)            | Banded hairstreak         | oaks, walnuts, hickories                      | common             |
| <i>Strymon melinus</i> (Hübner 1818)              | Gray hairstreak           | flowers and fruits of herbs                   | common             |
| <b>Nymphalidae</b>                                |                           |                                               |                    |
| <i>Coenonympha tullia inornata</i> (Muller 1764)  | Common wood nymph         | grasses and rushes                            |                    |
| <i>Danaus plexippus</i> (Linnaeus 1758)           | Monarch                   | milkweed                                      | common             |
| <i>Euphydryas phaeton</i> (Drury 1773)            | Baltimore                 | turtlehead, beardtongue, false foxglove       | restricted         |
| <i>Megisto cymela</i> (Cramer 1777)               | Little wood satyr         | grasses                                       | common             |
| <i>Phyciodes tharos</i> (Drury 1773)              | Pearl crescent            | asters                                        | common             |
| <i>Polygonia comma</i> (Harris 1842)              | Comma                     | nettle, false nettle, elms, hops              | locally common?    |
| <i>Polygonia interrogationis</i> (Fabricius 1798) | Question mark             | elms, hackberry, nettle, false nettle         | locally common?    |
| <i>Speyeria cybele</i> (Fabricius 1775)           | Great spangled fritillary | violets                                       | common?            |
| <i>Vanessa atalanta</i> (Linnaeus 1758)           | Red admiral               | nettles, false nettle, wood nettle, pellitory | locally common?    |
| <i>Vanessa virginiensis</i> (Drury 1773)          | American painted lady     | Compositae, everlastings, pussy toes          | common             |
| <b>Papilionidae</b>                               |                           |                                               |                    |
| <i>Papilio polyxenes</i> (Fabricius 1775)         | Black swallowtail         | Umbeliferae, Queen Anne's lace                | common             |
| <b>Pieridae</b>                                   |                           |                                               |                    |
| <i>Colias eurytheme</i> (Boisduval 1852)          | Alfalfa butterfly         | legumes                                       | common             |
| <i>Colias philodice</i> (Godart 1819)             | Clouded sulphur           | legumes                                       | common             |
| <i>Pieris rapae</i> (Linnaeus 1758)               | Cabbage white             | Brassicaceae                                  | common             |

## Hesperiidae (Skippers)

*Ancyloxypha numitor* (Fabricius 1793) (Least skipper) Map 1.

This species is widespread in the eastern half of the United States and southern Canada. It may have three generations a year with adults present from May to October. These insects live in wet, open areas and the larvae feed on grasses. The parks' wet meadows provide habitat and food resources for adults and larvae.

*Atalopedes campestris* (Boisduval 1852) (Sachem) Map 2.

This species is widespread in the southern United States south into South America; Pennsylvania, located within the northern range of the species, is inhabited by regular strays and periodic colonists from further south. The larvae feed on grasses and there may be three generations per year in the northern range, with adults present from May through November. They live in open, disturbed areas. The parks' fields provide habitat and food resources for adults and larvae.

*Epargyreus clarus* (Cramer, 1779) (Silver-spotted skipper) Map 3.

This species is found along forest margins, and it frequents disturbed and open forest situations. Larval food includes black locust, wisteria, and other legumes. Hayfields and meadows adjacent to forested areas provide habitat and food resources for adults and larvae.

*Erynnis brizo* (Boisduval & LeConte, 1834) (Sleepy dusky wing) Map 4.

This species is widespread in the US and southern Canada and was collected along forest margins in the parks; it frequents oak forests, often on sandy soils. Larval food comprises species of shrubby oaks, while adults are often found feeding on ground moisture and exudates. The parks' fields provide habitat and food resources for adults and larvae.

*Erynnis juvenalis* (Fabricius, 1793) (Juvenal's dusky wing) Map 5.

This species is widespread in the eastern US and southern Canada, although it was collected at only two discrete sites along forest margins in the parks. It has a single generation each year, with adults appearing April through June. The larvae feed on oaks. The parks' forests provide habitat and food resources for adults and larvae.

*Euphys dion* (Edwards, 1879) (Dion skipper) Map 6.

This species is widespread in the eastern US along the Atlantic, Southern, and Central regions, and are largely absent from the Appalachian region, including most of Pennsylvania. There is only a single record, in a wet meadow, for the parks. Its general habitat is open marshes, bogs and swamps. The larvae feed on sedges. The parks' wet meadows provide habitat and food resources for adults and larvae.

*Poanes hobomok* (Harris, 1862) (Hobomok skipper) Map 7.

This species is widespread in the eastern US and southern Canada. It has one generation per year with adults present April through July. The larvae feed on panic grasses and blue grasses. These insects live on the edges of damp woods or brooks and light gaps along streams. The parks' wet meadows and forests provide habitat and food resources for adults and larvae.

*Polites mystic* (Edwards, 1863) (Long dash) Map 8.

This species is widespread in the northern US and southern Canada, with Pennsylvania located near its southeastern limits. There is a single generation yearly; adults are present from late May through early August. The larvae feed on bluegrasses. These insects live in moist, open areas and forest margins. The parks' wet meadows and forests provide habitat and food resources for adults and larvae.

*Polites peckius* (Kirby, 1837) (Peck's skipper) Map 9.

This species is widespread in the northern US and southern Canada. Two to three generations occur each year with adults present from May through October. The larvae feed on grasses. The species is found in open, grassy areas. The parks' fields, meadows, and hayfields provide habitat and food resources for adults and larvae.

*Polites thermistocles* (Latreille, 1824) (Tawny-edged skipper) Map 10.

This species is widespread in the US and Canada. There are two generations per year with adults present from April through September. The larvae feed on panic grasses. These insects are found in pastures and fields. The parks' fields, meadows, and hayfields provide habitat and food resources for adults and larvae.

*Pompeius verna* (Edwards, 1862) (Little glassy wing) Map 11.

This species is widespread in the eastern US. It may have two generations each year with adults present from May to early September. The larvae feed on purpletop and possibly other grasses. These insects live in moist areas near shaded wood edges. The parks' forests and fields provide habitat and food resources for adults and larvae.

*Pyrgus communis* (Grote, 1872) (Checkered skipper) Map 12.

This species is widespread in the southern US, south to South America, but Pennsylvania is located near the northern limits of occasional strays and colonists. The larvae feed on mallows and hollyhock. The parks' fields provide habitat and food resources for adults.

*Thorybes pylades* (Scudder, 1870) (Northern cloudy wing) Map 13.

This species is widespread through much of North America. It has one, possibly two, generations each year with adults present from about April through September. The larvae feed on various legumes. These insects are found in open woodlands and fields. The parks' forests and fields provide habitat and food resources for adults and larvae.

*Thymelicus lineola* (Ochsenheimer, 1808) (European skipper) Map 14.

This species is an accidental immigrant from Europe (1910) as common name implies. They are widespread in the northeastern US and southeastern Canada. There is a single generation each year with adults present from mid-May to mid-July. The larvae feed on timothy grass. These insects are found in open grassy fields and similar areas. The parks' fields provide habitat and food resources for adults and larvae.

## Lycaenidae (Hairstreaks, Coppers, Blues)

*Calycopis cecrops* (Fabricius, 1793) (Red-banded hairstreak) Map 15.

This species is widespread through the southeastern US with southeastern Pennsylvania at the northern limit of the species' range. Only one specimen was collected, probably due to the species' small size and cryptic coloration. The larvae feed on fallen leaves of trees such as oaks and sumacs. This species is found on deciduous or mixed woods. The parks' fields and forests provide habitat and food resources for adults and larvae.

*Celastrina agriolus* (Linnaeus, 1758) (Spring azure) Map 16.

This species is widespread throughout most of North America, south to Columbia in South America. It feeds on the flowers of various woody plants including dogwoods, viburnums, wild cherry, and occasionally some herbaceous plants. It occupies deciduous woods and adjacent openings or edges. The parks' fields and forests provide habitat and food resources for adults and larvae.

*Everes comyntas* (Godart, 1824) (Eastern tailed blue) Map 17.

This species is widespread in North America south to Costa Rica. It has three generations a year with adults present from about April through November. The larvae feed on flowers and seeds of a wide variety of flowers and seeds of herbaceous legumes. These insects live in open, sunny, and weedy environments. The parks' fields provide habitat and food resources for adults and larvae.

*Lycaena phlaeas* (Linnaeus, 1761) (Little copper) Map 18.

The native range of this species is in the arctic of North America. The eastern US and Canadian populations probably are an introduction from Europe. It was collected only once in the parks. The larvae feed principally on an introduced plant, sheep sorrel. The status of its primary host-plant in the parks not known. The parks' fields provide habitat and potential food resources for adults and larvae.

*Satyrrium calanus* (Hübner, 1808) (Banded hairstreak) Map 19.

This species is widespread in the US and southern Canada. It has a single generation each year with adults present from July through August. The larvae feed on oaks, walnuts, and hickories. These insects live in forests and the adjacent edges and fields. The parks' fields and forests provide habitat and food resources for adults and larvae.

*Strymon melinus* (Hübner, 1818) (Gray hairstreak) Map 20.

This species is widespread in North and South America. It has two generations per year with adults present from May through September. The larvae feed on herbaceous plants, particularly legumes and mallows. This species is found in open, sunny situations where its host plants are located. The parks' fields and forests provide habitat and potential food resources for adults and larvae.

## Nymphalidae (Brushfoot Butterflies)

*Coenonympha tullia inornata* (Müller, 1764) (Common wood nymph) Map 21.

This species is widespread in North America. It has one or two generations per year with adults present from June to September. The larvae feed on grasses and rushes. These insects are found in open, grassy areas. The parks' meadows provide habitat and food resources for adults and larvae.

*Danaus plexippus* (Linnaeus, 1758) (Monarch) Map 22.

This species is widespread in North America. It has about three generations per year with adults present from June through October. The larvae feed on milkweeds. These insects are found in open fields and similar situations. The parks' fields provide habitat and food resources for adults and larvae.

*Euphydryas phaeton* (Drury, 1773) (Baltimore) Map 23.

This species is widespread in the eastern US and Canada. It has a single generation each year with adults present from June to August. The larvae feed on turtlehead, beardtongue, and false foxglove. These insects live in marshes, bogs, and sandy oak barrens. The parks' wet meadow and marsh provide habitat and food resources for adults and larvae.

*Megisto cymela* (Cramer, 1777) (Little wood satyr) Map 24.

This species is widespread in the eastern US and southeastern Canada. It has probably two generations per year with adults present from March or April through September. The larvae feed on grasses. This species lives in woods and old fields. The parks' forests and fields provide habitat and food resources for adults and larvae.

*Nymphalis antipoo* (Linnaeus 1758) (Mourning cloak) Map 25.

This species is found throughout North America; although no specimens were collected in this survey, adults were observed in the parks. The larvae feed on willows, birch, cottonwood, elm, and hackberry. These insects live in woodland glades. The parks' forests and fields provide habitat and food resources for adults and larvae.

*Phyciodes tharos* (Drury, 1773) (Pearl crescent) Map 26.

This species is widespread in North America, from southeastern Canada to southern Mexico. It has several generations every year with adults present from April through October or November. The larvae feed on asters. These insects are found in open weedy areas, fields, and pastures. The parks' fields provide habitat and food resources for adults and larvae.

*Polygonia comma* (Harris, 1842) (Comma) Map 27.

Southeastern Canada and the eastern US comprise the range of this species. It has two generations per year with overwintering adults appearing from September through May, and summer adults from late May through August. The adults do not frequent flowers, however, the larvae feed on nettle, false nettle, elms, and hops. These insects live in woods near moist areas. The parks' fields and forests provide habitat and food resources for adults and larvae.

*Polygonia interrogationis* (Fabricius, 1798) (Question mark) Map 28.

This species is widespread in North America. It has two generations per year with overwintering adults appearing from September through May, and summer adults from late May through August. While the adults do not frequent flowers, the larvae feed on nettle, false nettle, elms, hops, and hackberry. This species lives in woods. The parks' fields and forests provide habitat and food resources for adults and larvae.

*Speyeria cybele* (Fabricius, 1775) (Great spangled fritillary) Map 29.

This species is widespread in the US and Canada. It has a single generation each year with adults appearing from mid-June to mid-August. The larvae feed on violets, although the presence and extent of larval host-plants in the parks is not documented. These insects are found in open fields. The parks' fields and forests provide habitat and food for adults.

*Vanessa atalanta* (Linnaeus, 1758) (Red admiral) Map 30.

This species is widespread, from North America to Central America. These butterflies were observed in GETT only occasionally, and rarely at flowers. The larvae feed on nettles, false nettle, wood nettle, and pelitory. These insects live in forest openings with moist conditions. Parks' fields and forests provide potential habitat and adult food resources.

*Vanessa virginiensis* (Drury, 1773) (American painted lady) Map 31.

This species is widespread in North and South America. It has three to four generations per year with adults present from May through November. The larvae feed on various species of herbaceous Compositae. These insects are found in open areas with low vegetation and meadows. The parks' fields provide habitat and food resources for adults and larvae.

#### Papilionidae (Swallowtails)

*Battus philenor* (Linnaeus, 1771) (Pipevine swallowtail) Map 32.

This species is widespread, from southeastern Canada and eastern US to southern Mexico. It has two generations per year with adults present from April through September. The larvae feed on various pipevines (*Aristolochia* species). This species lives in open areas within woodlands. The parks' fields provide habitat and potential food resources for adults and larvae.

*Papilio glaucus* (Linnaeus, 1758) (Tiger swallowtail) Map 33.

This species is widespread through the eastern US. It has a single generation each year with adults appearing in June and July. The larvae feed on various trees and shrubs including yellow poplar, wild cherry, and sweet bay. These insects are found in deciduous broadleaf forests and forest edges. The parks' fields and forests provide habitat and food resources for adults and larvae. This species is among the most noticeable butterflies in the parks because of its large size, prominent yellow and black markings, and the proclivity of adults to fly along forest margins.

*Papilio polyxenes* (Fabricius, 1775) (Black swallowtail) Map 34.

This species is widespread in North America, south to northern South America. It has two or three generations per year with adults present from April through October. The larvae feed on

various species of Umbelliferae including Queen Anne's lace (*Daucus carota*). These insects live in open areas and fields. The parks' fields provide habitat and potential food resources for adults and larvae.

*Papilio troilus* (Linnaeus, 1758) (Spicebush swallowtail) Map 35.

This species is widespread in the eastern US. It has two generations per year with adults appearing from April through October. The larvae feed on sassafras and spicebush. These insects are found in deciduous woodlands and forest edges. The parks' fields and forests provide habitat and food resources for adults and larvae.

#### Pieridae (Sulphur, White, Orange-tip Butterflies)

*Colias eurytheme* (Boisduval, 1852) (Alfalfa butterfly) Map 36.

This species is widespread through North America. It has about three to four generations per year with adults appearing from March through October. The larvae feed on legumes, particularly alfalfa, clover and vetches. These insects are found in open fields. The parks' fields and crops provide habitat and food resources for adults and larvae.

*Colias philodice* (Godart, 1819) (Clouded sulphur) Map 37.

This species is widespread in North America. It has about three to four generations per year with adults present from April through October. The larvae feed on various legumes including clover and trefoils. This species is found in open fields. The parks' fields and crops provide habitat and food resources for adults and larvae.

*Pieris rapae* (Linnaeus, 1758) (Cabbage white) Map 38.

This species is widespread in North America. It has several generations per year with adults appearing from March through October. The larvae feed on various species of Brassicae, including cabbage, mustard, and cress. These insects are found in open, weedy areas, such as fields, and meadows. The parks' fields and crops provide habitat and food resources for adults and larvae.

#### Terrestrial Arthropods

##### Invertebrates

We collected invertebrates at the Big Round Top forested stand from June 21-25, 1999 according to the methods described. This yielded a collection jar for each trap method, trap location, and date. Specimens in each jar were then separated by class or order by staff at the Frost Entomological Museum from July-September, 1999. A total of 16,207 specimens, representing more than 28 orders of invertebrates, was collected (Table 4). We collected invertebrates at the Codori-Trostle Thicket from August 10-12, 1999 according to the methods described. Staff then separated specimens in each collection jar by class or order from August-October, 1999. A total of 6,734 specimens, representing more than 25 orders, was collected (Table 5).

In September 1999, we began identifying the specimens to the family level. To date we have sorted roughly 90% of the sample to family (Table 6). In June 2000, we began identifying specimens to genus and species level and sending family groups to taxonomic specialists for identification. In those cases where we could not find or afford a specialist for a taxon, we identified the specimens to morphospecies (groups of morphologically similar specimens appearing to be the same species).

We estimate that roughly 8,000 invertebrates were collected from the four Snapshot sites from June 26-28, 2000. These specimens are being stored in the Frost Entomological Museum as they are, until funding can be acquired for identification. All subsequent discussion of specimen results in this report will not include the sample from the Snapshot sites.

Using 10-12 sampling methods, we collected a total of 22,941 invertebrates at both sites combined (Tables 4-5). Diptera (flies) was the most abundant order at both sites. At Big Round Top, Hymenoptera (ants, bees, wasps), Acari (mites), Collembola (springtails), and Coleoptera (beetles) were the next most abundant orders represented in the sample. At Codori-Trostle Thicket, Homoptera (leafhoppers), Hymenoptera, and Acari were the next most abundant orders represented.

Of the sampling methods, the ground malaise traps yielded the highest number of specimens at both sites (Tables 4-5). At Big Round Top, the next highest yielding methods were light trap, sweep net, and soil core. At Codori-Trostle Thicket, the next highest yielding methods were sweep net, soil core, and light trap.

Below are summaries of the invertebrates we captured at GETT; we have not drawn conclusions regarding habitats or biodiversity levels because we do not yet have enough specimens identified to the species level to be accurate. The taxa are listed in taxonomic order and, unless otherwise noted, each is an order and is in the phylum Arthropoda and the class Hexapoda. All table numbers beginning with an "H" (e.g. Table H1) are found in Appendix H.

**Phylum Nematoda (Nematodes):** We collected seven specimens at Big Round Top only; funding and expertise constraints prevented further identification (Table H1).

**Stylomatophora (Snails and Slugs; Phylum Mollusca, Class Gastropoda):** We collected 62 specimens, representing five families; funding and expertise constraints prevented further identification (Table H2). The family Zonitidae was found at both sites, while Arionidae, Endodontidae, Polygyridae, and Succineidae were found only at Big Round Top. Arionidae and Zonitidae were the most common families. Most of the Big Round Top stylomatophorans were found in the leaf litter and those from Codori-Trostle Thicket came from the substrate search.

**Class Oligochaeta (Worms; Phylum Annelida):** We collected 27 specimens from both sites; funding and expertise constraints prevented further identification (Table H3). Soil samples accounted for many of the worms from Big Round Top, but substrate searches did for those at Codori-Trostle Thicket.

Table 4. Number of invertebrate specimens collected at the Big Round Top site in June 1999 at Gettysburg National Military Park.

| ORDER          | Trap Type   |               |                |           |                |         |                   |             |            |         |                  |           |            |                   |
|----------------|-------------|---------------|----------------|-----------|----------------|---------|-------------------|-------------|------------|---------|------------------|-----------|------------|-------------------|
|                | Grand Total | Beating Sheet | Canopy Malaise | Soil Core | Ground Malaise | Pitfall | Lower Branch Clip | Leaf Litter | Light Trap | By Hand | Substrate Search | Sweep Net | Trunk Trap | Upper Branch Clip |
| Acari          | 1388        | 1             | 0              | 752       | 168            | 11      | 7                 | 28          | 71         | 2       | 1                | 290       | 50         | 7                 |
| Araneae        | 311         | 61            | 0              | 4         | 9              | 44      | 1                 | 30          | 2          | 6       | 16               | 108       | 30         | 0                 |
| Blattaria      | 8           | 0             | 0              | 0         | 0              | 0       | 0                 | 0           | 2          | 0       | 6                | 0         | 0          | 0                 |
| Trichoptera    | 55          | 0             | 0              | 0         | 10             | 0       | 0                 | 0           | 44         | 1       | 0                | 0         | 0          | 0                 |
| Chilopoda      | 22          | 0             | 0              | 4         | 0              | 0       | 0                 | 13          | 0          | 0       | 3                | 0         | 2          | 0                 |
| Collembola     | 958         | 1             | 0              | 401       | 5              | 262     | 0                 | 26          | 1          | 0       | 4                | 240       | 18         | 0                 |
| Coleoptera     | 856         | 14            | 12             | 21        | 320            | 47      | 2                 | 29          | 276        | 4       | 30               | 25        | 74         | 2                 |
| Diptera        | 7131        | 4             | 14             | 17        | 6260           | 33      | 10                | 5           | 531        | 1       | 10               | 231       | 15         | 0                 |
| Diplura        | 6           | 0             | 0              | 5         | 0              | 0       | 0                 | 0           | 0          | 0       | 1                | 0         | 0          | 0                 |
| Diplopoda      | 157         | 1             | 0              | 33        | 0              | 32      | 0                 | 69          | 0          | 0       | 19               | 2         | 1          | 0                 |
| Ephemeroptera  | 1           | 0             | 0              | 0         | 0              | 0       | 0                 | 0           | 1          | 0       | 0                | 0         | 0          | 0                 |
| Gastropoda     | 53          | 0             | 0              | 0         | 0              | 0       | 0                 | 30          | 0          | 0       | 17               | 6         | 0          | 0                 |
| Hemiptera      | 126         | 11            | 1              | 1         | 11             | 5       | 1                 | 18          | 9          | 9       | 6                | 36        | 18         | 0                 |
| Homoptera      | 774         | 6             | 4              | 5         | 245            | 9       | 19                | 1           | 216        | 1       | 1                | 185       | 55         | 27                |
| Hymenoptera    | 2654        | 22            | 3              | 94        | 1518           | 202     | 6                 | 385         | 25         | 2       | 83               | 248       | 65         | 1                 |
| Isoptera       | 14          | 0             | 0              | 0         | 0              | 0       | 0                 | 0           | 0          | 0       | 14               | 0         | 0          | 0                 |
| Isopod         | 246         | 0             | 0              | 0         | 0              | 6       | 0                 | 9           | 0          | 0       | 231              | 0         | 0          | 0                 |
| Lepidoptera    | 723         | 4             | 0              | 7         | 181            | 4       | 7                 | 11          | 461        | 5       | 11               | 18        | 4          | 10                |
| Microcoryphia  | 23          | 0             | 0              | 0         | 0              | 13      | 0                 | 0           | 0          | 3       | 6                | 0         | 1          | 0                 |
| Neuroptera     | 9           | 0             | 0              | 0         | 2              | 0       | 1                 | 0           | 1          | 0       | 1                | 4         | 0          | 0                 |
| Opiliones      | 49          | 5             | 0              | 1         | 5              | 24      | 0                 | 1           | 1          | 0       | 7                | 1         | 4          | 0                 |
| Orthoptera     | 70          | 24            | 1              | 0         | 2              | 7       | 0                 | 1           | 0          | 2       | 2                | 14        | 17         | 0                 |
| Plecoptera     | 5           | 0             | 0              | 0         | 1              | 0       | 0                 | 0           | 2          | 0       | 0                | 0         | 2          | 0                 |
| Pseudoscorpion | 9           | 0             | 0              | 4         | 0              | 0       | 0                 | 5           | 0          | 0       | 0                | 0         | 0          | 0                 |
| Psocoptera     | 211         | 51            | 0              | 2         | 53             | 22      | 3                 | 20          | 7          | 18      | 4                | 21        | 9          | 1                 |
| Segmented Worm | 34          | 0             | 0              | 14        | 0              | 0       | 0                 | 12          | 0          | 0       | 8                | 0         | 0          | 0                 |
| Symphyla       | 15          | 0             | 0              | 15        | 0              | 0       | 0                 | 0           | 0          | 0       | 0                | 0         | 0          | 0                 |
| Thysanoptera   | 288         | 1             | 1              | 13        | 91             | 5       | 3                 | 0           | 3          | 0       | 0                | 162       | 5          | 4                 |
| Unknown        | 11          | 0             | 0              | 1         | 0              | 1       | 2                 | 1           | 0          | 0       | 6                | 0         | 0          | 0                 |
| Grand Total    | 16207       | 208           | 36             | 1397      | 8871           | 729     | 61                | 698         | 1692       | 54      | 485              | 1634      | 379        | 52                |

Table 5. Number of invertebrate specimens collected at the Codori-Trostle Thicket site in August 1999 at Gettysburg National Military Park.

| ORDER          | Trap Type   |               |           |                |         |                   |             |            |         |                  |           |            |
|----------------|-------------|---------------|-----------|----------------|---------|-------------------|-------------|------------|---------|------------------|-----------|------------|
|                | Grand Total | Beating Sheet | Soil Core | Ground Malaise | Pitfall | Lower Branch Clip | Leaf Litter | Light Trap | By Hand | Substrate Search | Sweep Net | Trunk Trap |
| Acari          | 600         | 36            | 435       | 58             | 6       | 11                | 4           | 5          | 0       | 23               | 18        | 4          |
| Aranae         | 222         | 21            | 8         | 2              | 28      | 3                 | 7           | 1          | 0       | 28               | 117       | 7          |
| Chilopoda      | 14          | 0             | 1         | 0              | 5       | 0                 | 1           | 0          | 1       | 5                | 0         | 1          |
| Collembola     | 212         | 0             | 132       | 1              | 16      | 0                 | 11          | 0          | 0       | 1                | 47        | 4          |
| Coleoptera     | 311         | 9             | 9         | 53             | 39      | 0                 | 1           | 105        | 2       | 46               | 32        | 15         |
| Diptera        | 2665        | 4             | 1         | 2183           | 1       | 0                 | 0           | 86         | 0       | 0                | 382       | 8          |
| Diplura        | 21          | 0             | 21        | 0              | 0       | 0                 | 0           | 0          | 0       | 0                | 0         | 0          |
| Diplopoda      | 7           | 0             | 1         | 0              | 3       | 0                 | 0           | 0          | 0       | 0                | 3         | 0          |
| Gastropoda     | 10          | 0             | 0         | 0              | 0       | 0                 | 1           | 0          | 0       | 9                | 0         | 0          |
| Hemiptera      | 53          | 4             | 3         | 7              | 0       | 4                 | 3           | 4          | 1       | 3                | 20        | 4          |
| Homoptera      | 1126        | 58            | 37        | 310            | 4       | 3                 | 1           | 102        | 0       | 9                | 593       | 9          |
| Hymenoptera    | 906         | 13            | 7         | 428            | 85      | 1                 | 3           | 25         | 0       | 120              | 178       | 46         |
| Isopoda        | 43          | 0             | 1         | 0              | 21      | 0                 | 0           | 0          | 0       | 21               | 0         | 0          |
| Lepidoptera    | 354         | 0             | 5         | 95             | 3       | 3                 | 0           | 237        | 0       | 0                | 10        | 1          |
| Mantodea       | 2           | 0             | 0         | 0              | 0       | 0                 | 0           | 0          | 0       | 0                | 2         | 0          |
| Microcoryphia  | 2           | 0             | 0         | 0              | 2       | 0                 | 0           | 0          | 0       | 0                | 0         | 0          |
| Neuroptera     | 2           | 0             | 0         | 2              | 0       | 0                 | 0           | 0          | 0       | 0                | 0         | 0          |
| Opiliones      | 19          | 3             | 0         | 4              | 7       | 0                 | 1           | 1          | 0       | 3                | 0         | 0          |
| Orthoptera     | 54          | 5             | 0         | 3              | 13      | 0                 | 0           | 0          | 0       | 2                | 29        | 2          |
| Plecoptera     | 1           | 0             | 0         | 0              | 0       | 0                 | 0           | 1          | 0       | 0                | 0         | 0          |
| Pseudoscorpion | 4           | 0             | 3         | 0              | 0       | 0                 | 1           | 0          | 0       | 0                | 0         | 0          |
| Psocoptera     | 26          | 10            | 1         | 4              | 1       | 0                 | 0           | 0          | 0       | 2                | 1         | 7          |
| Segmented Worm | 2           | 0             | 0         | 0              | 0       | 0                 | 0           | 0          | 0       | 2                | 0         | 0          |
| Symphyla       | 1           | 0             | 0         | 0              | 1       | 0                 | 0           | 0          | 0       | 0                | 0         | 0          |
| Thysanoptera   | 24          | 2             | 12        | 5              | 1       | 0                 | 0           | 0          | 0       | 1                | 3         | 0          |
| Unknown        | 53          | 0             | 1         | 18             | 0       | 2                 | 0           | 0          | 0       | 30               | 2         | 0          |
| Grand Total    | 6734        | 166           | 710       | 3169           | 240     | 28                | 38          | 527        | 5       | 307              | 1433      | 108        |

Table 6. Identification status of invertebrate specimens collected during June and August 1999 in Big Round Top and Codori-Trostle Thicket at Gettysburg National Military Park (Identified to Species includes those indentified to morphospecies).

| Class or Order                                   | # Specimens | # Families | # Identified to Species |
|--------------------------------------------------|-------------|------------|-------------------------|
| Acari (mites):                                   | 1760        | 3          | 1420                    |
| Aranae (spiders):                                | 496         | 21         | 344                     |
| Blattaria (roaches):                             | 8           | 1          | 7                       |
| Coleoptera (beetles):                            | 1213        | 57         | 1130                    |
| Class Chilopoda (centipedes):                    | 34          | 3          | 34                      |
| Collembola (springtails):                        | 1119        | 6          | 929                     |
| Diptera (flies):                                 | 9816        | 47         | 1839                    |
| Diplura (diplurans):                             | 34          | 2          | 34                      |
| Class Diplopoda (millipedes):                    | 120         | 5          | 120                     |
| Ephemeroptera (mayflies):                        | 1           | 1          | 1                       |
| Hemiptera (bugs):                                | 163         | 13         | 99                      |
| Homoptera (cicadas, leafhoppers, scale insects): | 1861        | 12         | 1275                    |
| Hymenoptera (ants, wasps, and bees):             | 3766        | 41         | 3441                    |
| Isoptera (termites):                             | 20          | 1          | 20                      |
| Isopoda (sowbugs):                               | 288         | 1          | 72                      |
| Lepidoptera (moths and butterflies):             | 1202        | 25         | 1185                    |
| Mantodea (mantids):                              | 2           | 1          | 2                       |
| Microcoryphia (jumping bristletails):            | 25          | 2          | 25                      |
| Phylum Nematoda (nematodes):                     | 7           | unknown    | 7                       |
| Neuroptera (lacewings, alderflies):              | 12          | 4          | 12                      |
| Class Oligochaeta (worms):                       | 27          | unknown    | 15                      |
| Opiliones (harvestmen):                          | 69          | 2          | 68                      |
| Orthoptera (grasshoppers, crickets):             | 126         | 5          | 126                     |
| Plecoptera (stoneflies):                         | 14          | 3          | 14                      |
| Protura (proturans):                             | 2           | 1          | 2                       |
| Pseudoscorpiones (pseudoscorpions):              | 13          | 1          | 13                      |
| Psocoptera (psocids):                            | 238         | 11         | 192                     |
| Stylommatophora (snails and slugs)               | 62          | 5          | 62                      |
| Class Symphyla (symphylans)                      | 16          | unknown    | 16                      |
| Thysanoptera (thrips):                           | 237         | 3          | 233                     |
| Trichoptera (caddisflies):                       | 25          | 4          | 25                      |

Araneae (Spiders; Phylum Arthropoda, Class Arachnida): We collected 496 specimens, representing 21 families and 53 genera; the few not identified were immatures too small or young for positive identification (Table H4). The families Amaurobiidae, Hahniidae, and Mimetidae were found only at the Big Round top site, while Tetragnathidae was found only at Codori-Trostle Thicket, and the remaining 17 families were found at both sites. The most abundant families were Anyphaenidae, Araneidae, and Theridiidae. Sweep netting captured the most spiders at both sites.

Opiliones (Harvestmen; Phylum Arthropoda, Class Arachnida): We collected 69 specimens, representing two families and four genera (Table H5). Both families were found at both sites, although most species were found only at one site or the other; Leiobunidae was the most abundant family. Pitfall traps yielded the most harvestmen.

Acari (Mites; Phylum Arthropoda, Class Arachnida): We collected 1760 specimens, representing four suborders and at least three families; due to funding, expertise, and equipment constraints, we could not identify them to lower taxa (Table H6). The family Johnstonianidae was found only at the Big Round Top site, while Erythraeidae was found only at Codori-Trostle Thicket, and Ixodidae was found at both sites. (This may change once the rest of the specimens have been identified to family.) At both sites, the majority of mites were captured from the soil cores.

Pseudoscorpiones (Pseudoscorpions; Phylum Arthropoda, Class Arachnida): We collected 13 specimens, representing the family Neobisiidae, which was found at both sites (Table H7). Further identification was inhibited by funding and expertise constraints. Leaf litter samples yielded the most pseudoscorpions at Big Round Top and soil cores did at Codori-Trostle Thicket.

Isopoda (Sowbugs; Phylum Arthropoda, Class Malacostraca): We collected 288 specimens, representing one family found at both sites; funding and expertise constraints prevented further identification (Table H8). The substrate searches at Big Round Top yielded most of the sowbugs, and the pitfall traps and substrate searches were even at Codori-Trosle Thicket.

Class Diplopoda (Millipedes; Phylum Arthropoda): We collected 120 specimens representing the four orders Polydesmida (13 specimens, three families), Polyxenida (three specimens, one family, one genus), Spirobolida (one specimen, one family), and Spirostreptida (103 specimens, one family); funding and expertise constraints, along with the fact some of these specimens were immatures, prevented further identification (Table H9). Spirostreptida was found at both sites, Polyxenida was found only at Codori-Trostle Thicket, and the other two were found only at Big Round Top. At Big Round Top, most of the millipedes were captured from the leaf litter samples, and at Codori-Trostle Thicket, from the pitfall traps and sweep netting.

Class Chilopoda (Centipedes; Phylum Arthropoda): We collected 34 specimens, representing the three orders Geophilomorpha (10 specimens), Lithobiomorpha (23 specimens, two families), and Scolopendromorpha (one specimen, one family); funding and expertise constraints prevented further identification for all three orders (Table H10). The Scolopendromorpha family, Cryptopidae, was found only at Codori-Trostle Thicket, as was the Lithobiomorpha family,

Henicopidae. Lithobiidae, the other Lithobiomorpha family, was found at both sites. At Big Round Top, we found most of the centipedes in the leaf litter, and from the pitfall traps and substrate searches at Codori-Trostle Thicket.

Class Symphyla (Symphylans; Phylum Arthropoda): We collected 16 specimens from both sites; funding and expertise constraints prevented further identification (Table H11). The Big Round Top symphylans all came from soil cores, the one Codori-Trostle Thicket specimen came from a pitfall trap.

Protura (Proturans): We collected two specimens, representing one family, only at Big Round Top; funding and expertise constraints prevented further identification (Table H12). Soil cores resulted in most of the proturans.

Collembola (Springtails): We collected 1119 specimens, representing six families; funding and expertise constraints, along with the immature state of some specimens, prevented further identification (Table H13). All of the families were found at both sites, except for Neelidae, which was found at Big Round Top only. The most abundant families were Entomobryidae, Hypogastruridae, and Onychiuridae. Most of the springtails were captured in the soil cores.

Diplura (Diplurans): We collected 34 specimens, representing two families; further identification was prevented by funding and expertise constraints (Table H14). The more abundant family, Campodeidae, was found at both sites, while Japygidae was found only at Big Round Top. The soil cores resulted in most of the diplurans captured.

Microcoryphia (Jumping Bristletails): We collected 25 specimens, representing two families; funding and expertise constraints prevented further identification of the specimens (Table H15). Both families were found at both sites and Machilidae was the more abundant family. Pitfall traps accounted for most of the jumping bristletails captured.

Ephemeroptera (Mayflies): We collected one specimen, representing the family Baetidae, at Big Round Top only; funding constraints prevented the identification of this specimen further (Table H16). The specimen was captured at a light trap.

Orthoptera (Grasshoppers, Crickets): We collected 126 specimens, representing 5 families and at least three genera; the presence of immatures, along with funding and expertise constraints, prevented the further identification of specimens (Table H17). Gryllacrididae and Rhaphidophidae were found only at Big Round Top. Acrididae, Gryllidae, and Tettigoniidae were found at both sites. Gryllidae and Tettigoniidae were the most abundant families. Beating sheet samples were best for orthopterans at Big Round Top and sweep netting had the best yield at Codori-Trostle Thicket.

Mantodea (Mantids): We collected two specimens, representing one family (Mantidae), only at Codori-Trostle Thicket (Table H18). Funding and expertise constraints prevented further identification. These specimens were captured using sweep nets.

**Blattaria (Roaches):** We collected eight specimens, representing one family and one genus (Table H19). Funding and expertise constraints prevented identification of all specimens to species. The family Blattellidae was found only at the Big Round Top site. We found most of the roaches during the substrate searches.

**Isoptera (Termites):** We collected 20 specimens, all of the species *Reticulitermes flavipes* (the Eastern subterranean termite) (Table H20). This species, found at both sites, is the only termite occurring in the Northeastern United States. All of the termites came from the substrate searches.

**Plecoptera (Stoneflies):** We collected 14 specimens representing three families; funding and expertise constraints prevented further identification (Table H21). The family Perlidae was found at both sites, but Leuctridae and Nemouridae were found only at Big Round Top. The light traps resulted in most of the stoneflies captured.

**Psocoptera (Psocids):** We collected 238 specimens, representing 11 families; funding and expertise constraints prevented further identification (Table H22). Five families were found at both sites, while Amphipsocidae, Caeciliidae, Liposcelidae, and Mesopsocidae were only found at Big Round Top, and Lepidopsocidae and Philotarsidae were only found at Codori-Trostle Thicket. Caeciliidae, Ectopsocidae, Epipsocidae, and Psocidae were the most abundant families. Most of the psocids were captured using beating sheets.

**Hemiptera (True Bugs):** We collected 163 specimens representing 13 families and at least 2 genera; the presence of immatures, along with funding and expertise constraints, prevented the further identification of the specimens (Table H23). Eight families were found at both sites and five were found only at Big Round Top. The most abundant families were Lygaeidae and Miridae. Sweep netting captured the most hemipterans.

**Homoptera (Cicadas, Leafhoppers, Scale Insects):** We collected 1861 specimens, representing 12 families and 15 genera; the presence of immatures, along with funding and expertise constraints, prevented further identification of the specimens (Table H24). Nine families were found at both sites, while Derbidae was only found at Big Round Top and Cicadidae and Flatidae were only found at Codori-Trostle Thicket. The most abundant families were Cicadellidae, Cercopidae, and Aphididae. Most of the homopterans at Big Round Top were captured in the ground malaise, and at Codori-Trostle in the sweep nets.

**Thysanoptera (Thrips):** We collected 237 specimens, representing three families; funding and expertise constraints prevented further identification (Table H25). The family Aeolothripidae was found only at Big Round Top, while Phlaeothripidae and Thripidae were found at both sites. Thripidae was the most abundant family. Most of the Big Round Top thrips were captured by sweep net and most of the Codori-Trostle Thicket thrips came from soil cores

**Neuroptera (Lacewings, Alderflies):** We collected 12 specimens, representing four families and at least one genus; funding and expertise constraints prevented further identification (Table H26). The family Chrysopidae was found at both sites, Berothidae was found at Codori-Trostle Thicket

only, and Corydalidae and Hemerobiidae were only found at Big Round Top. Chrysopidae and Hemerobiidae were the most abundant families. Sweep netting was most effective for neuroptera at Big Round Top, but the ground malaise traps worked better at Codori-Trostle Thicket.

The beaded lacewings (Berothidae) are represented in North America by only one genus, *Lomamyia*, and its 10 species are all considered rare (Borror et al. 1989).

**Coleoptera (Beetles):** We collected 1213 specimens, representing 57 families and 100 genera; funding and expertise constraints, along with the immature state of some specimens, prevented us from identifying all the beetles to species (Table H27). Twenty-seven of the families were found at both sites, 26 were only at Big Round Top, and four were only at Codori-Trostle Thicket. The most abundant families were Carabidae, Eucnemidae, and Staphylinidae. At Big Round Top, we captured most of the beetles using the ground malaise, and at Codori-Trostle Thicket using the light trap.

**Diptera (Flies):** We collected 9816 specimens, representing 47 families and 164 genera; the presence of immatures, along with funding and expertise constraints, prevented the identification of all the flies to species (Table H28). Thirty-five of the dipteran families were found at both sites, eight were found only at Big Round Top, and four were found only at Codori-Trostle Thicket. By far, the most abundant families were Cecidomyiidae and Phoridae, followed distantly by Ceratopogonidae, Chironomidae, Chloropidae, and Sciaridae. The ground malaise traps caught the most flies.

Within the specimens we sent out to experts for identification, one new genus and seven new species have been discovered. These taxa are unnamed and undescribed in the scientific literature. The specialists who recognized these new taxa have retained the specimens and are working on publishing names and descriptions for the insects.

**Trichoptera (Caddisflies):** We collected 25 specimens, representing four families; funding and expertise constraints prevented further identification (Table H29). The family Hydropsychidae was found at both sites, and Hydroptilidae, Philopotamidae, and Phryganeidae were found only at Big Round Top. Hydropsychidae was the most abundant family. Most of the caddisflies were captured at light traps.

**Lepidoptera (Moths and Butterflies):** We collected 1530 specimens, representing 31 families and 130 genera; funding and expertise constraints prevented further identification of the specimens (Table H30). In addition to collecting at Big Round Top and Codori-Trostle Thicket, sweep netting was conducted at many sites around the park. The sweep netting resulted in the capture of primarily butterflies and skippers, while the light traps at Big Round Top and Codori-Trostle Thicket resulted in the capture of mostly moths. Light traps caught the majority of lepidopterans.

Ten families were found at both Big Round Top and Codori-Trostle Thicket, 10 were found at Big Round Top only, six were captured by only the sweep netting, and two (Psychidae and Yponomeutidae) were found only at Codori-Trostle Thicket. Only three families (Geometridae, Hesperidae, and Noctuidae) were captured at Big Round Top, Codori-Trostle Thicket, and by

the additional sweep netting. Monarch butterflies (*Danaus plexippus*) were found in the park. The most abundant families were Hesperidae, Noctuidae, and Pyralidae.

Hymenoptera (Ants, Wasps, and Bees): We collected 3766 specimens, representing 41 families and at least six genera; funding and expertise constraints prevented the further identification of the specimens (Table H31). Thirty families were found at both sites, while eight were found only at Big Round Top and three were found only at Codori-Trostle Thicket. The most abundant families were Braconidae, Formicidae, and Ichneumonidae. The ground malaise traps captured most of the hymenoptera.

Of the families collected, Trigonalidae and Sierolomorphidae are both rare (Borror et al. 1989). Ormyridae is also rare (Borror and White 1970) and Figitidae is uncommon to rare (Borror and White 1970). As a point of interest, we captured a single specimen of a wingless Ichneumonid.

### Plants and Soil

Not only would the time of year we sampled the two sites be expected to affect the species composition in the samples, but also the habitat characteristics of the sites. We compared vegetation and soil characteristics of the two sites using a two-sample T-test. Mean number, basal area, and species richness of trees; number and species richness of seedlings; species richness of shrubs and saplings; and percentage of canopy cover were all significantly higher at the Big Round Top site than the Codori-Trostle Thicket ( $P < 0.05$ ; Table 7; Appendices A-D). The Codori-Trostle Thicket groundcover had greater levels of herbaceous (primarily grasses) cover than the Big Round Top site ( $P < 0.05$ ). The soil at the Big Round Top site had significantly lower levels of many elements than the Codori-Trostle Thicket, including phosphorous, magnesium, and calcium ( $P < 0.05$ ). The average soil pH at Big Round Top was also significantly lower than at Codori-Trostle Thicket ( $P < 0.05$ ).

The plants and soil of the two sites are under different pressures as Codori-Trostle Thicket is within a farm and the thicket is frequented by a herd of grazing cattle. Big Round Top is away from the farms and, aside from the horses on the horsepath, no large, domesticated animals are found at the site.

Table 7. Means, standard errors, and two-sample t-test results for selected soil and vegetation characteristics measured at two invertebrate sampling sites (n=22) at Gettysburg National Military Park in June and August 1999.

| Variable                                           | Big Round Top Site |       | Codori-Trostle Thicket Site |       | Statistical Comparisons |          |
|----------------------------------------------------|--------------------|-------|-----------------------------|-------|-------------------------|----------|
|                                                    | Mean               | SE    | Mean                        | SE    | <i>t</i>                | <i>P</i> |
| <b>Soil Properties</b>                             |                    |       |                             |       |                         |          |
| pH                                                 | 5.6                | 0.1   | 6.1                         | 0.1   | -3.59                   | 0.002    |
| Phosphorous (ppm)                                  | 2.9                | 0.4   | 13.8                        | 2.1   | -5.23                   | 0.000    |
| Potassium (ppm)                                    | 585.0              | 527.0 | 151.4                       | 29.0  | 0.82                    | 0.430    |
| Potassium % saturation                             | 1.4                | 0.1   | 2.3                         | 0.4   | -1.98                   | 0.073    |
| Magnesium (ppm)                                    | 242.2              | 33.9  | 363.3                       | 32.1  | -2.60                   | 0.018    |
| Magnesium % saturation                             | 18.9               | 2.1   | 18.5                        | 1.5   | 0.15                    | 0.880    |
| Calcium (ppm)                                      | 824.0              | 100.0 | 1915.0                      | 156.0 | -5.88                   | 0.000    |
| Calcium % saturation                               | 39.8               | 4.9   | 56.9                        | 2.0   | -3.24                   | 0.006    |
| Cation Exchange Capacity                           | 10.5               | 0.7   | 16.5                        | 0.7   | -6.17                   | 0.000    |
| Nitrate (ppm)                                      | 8.8                | 2.4   | 9.2                         | 1.7   | -0.14                   | 0.890    |
| Ammonium (ppm)                                     | 16.11              | 2.1   | 7.7                         | 1.0   | 3.56                    | 0.003    |
| % Nitrogen                                         | 0.25               | 0.2   | 0.39                        | 0.06  | -2.24                   | 0.047    |
| <b>Vegetation Characteristics</b>                  |                    |       |                             |       |                         |          |
| # Overstory trees per plot                         | 17.9               | 1.3   | 7.7                         | 1.4   | 5.24                    | 0.000    |
| Basal area overstory trees (m <sup>2</sup> /ha)    | 32.5               | 2.3   | 19.2                        | 3.7   | 3.06                    | 0.008    |
| Species richness overstory trees                   | 8.0                | 0.4   | 3.7                         | 0.6   | 5.98                    | 0.000    |
| Basal area overstory oaks (m <sup>2</sup> /ha)     | 20.7               | 2.8   | 8.1                         | 2.8   | 3.17                    | 0.005    |
| Basal area overstory conifers (m <sup>2</sup> /ha) | 2.5                | 0.6   | 0.2                         | 0.1   | 3.78                    | 0.004    |
| # Shrubs/Saplings per plot                         | 49.9               | 5.6   | 68.7                        | 16.0  | -1.11                   | 0.290    |
| Species richness shrubs/saplings                   | 10.4               | 0.7   | 2.8                         | 0.4   | 9.55                    | 0.000    |
| # Seedlings per plot                               | 42.2               | 4.5   | 10.4                        | 3.8   | 5.36                    | 0.000    |
| Species richness seedlings                         | 10.9               | 0.9   | 2.4                         | 0.7   | 7.61                    | 0.000    |
| % Cover herbaceous plants per plot                 | 11.4               | 2.0   | 22.5                        | 3.6   | -2.71                   | 0.016    |
| Species richness herbaceous plants                 | 5.7                | 0.5   | 4.6                         | 0.6   | 1.40                    | 0.180    |
| % Canopy                                           | 84.1               | 3.1   | 33.2                        | 8.7   | 5.54                    | 0.000    |
| % Rock                                             | 12.1               | 2.8   | 12.5                        | 5.2   | -0.08                   | 0.940    |
| % Woody debris                                     | 6.3                | 0.9   | 2.8                         | 0.9   | 2.81                    | 0.011    |
| % Leaf litter                                      | 38.5               | 4.4   | 4.6                         | 1.4   | 7.48                    | 0.000    |
| % Grass                                            | 2.4                | 1.1   | 45.3                        | 6.2   | -6.84                   | 0.000    |

## Conclusions and Recommendations

### Butterflies

It is certain that there are other butterfly species present in GETT and EISE not collected during this study. The present results demonstrate the parks support a range of families, genera, and species in the adult stage and it is probable that most, if not all, are ecologically associated with the parks in the larval stage through the presence of appropriate host plants. The presence of abundant flowering herbs provides a source of nutrients for the adult nectar feeding species in the parks. The role of the parks in providing habitat for larval development can only be inferred at this time. Many of the host-plants for the collected species are either known to occur in the parks, or are very likely to be present but at this time are undocumented. For host-plants present in the parks, there is little information on their geographic range or abundance within the parks.

The collecting records provide information on when adults of the collected species may be found in the parks, but the dates are not necessarily representative of the actual seasonal periodicity of the species concerned as the sampling program was designed to document species presence within the parks. Documentation of the full seasonal pattern for each species would require a much more intensive sampling regime.

The majority of GETT and EISE butterflies collected represent common and widespread species although they all have specific habitat and host-plant requirements that will affect their conservation status in relation to future patterns of landscape development. GETT and EISE are still surrounded by extensive mixed farmland and forest in which the butterflies collected in the parks may also be present and abundant. Most species collected in GETT and EISE occur well within their geographic distribution range. Distribution patterns for butterflies within Pennsylvania are not precisely documented, so the specific local significance of the GETT and EISE butterflies cannot be compared with state in general. However, most are widespread species and may be expected throughout most of the state wherever suitable habitats and host-plants are found. The occurrence of *Calycopis cecrops* (Red-banded hairstreak) in the parks may represent a northern limit for this species. At least two species in the parks, *Euphys dion* (Dion) and *Euphydryas phaeton* (Baltimore) are associated with wetlands and their persistence within the parks will depend on the maintenance of these habitats.

In the context of changing patterns of landscape development, particularly where intensive farming or urbanization and industrialization expands into rural areas, national parks will increasingly take on a regional significance. The future persistence and abundance of many of species within these parks may become more regionally significant if development of surrounding areas reduces available habitats and the parks become ecological islands representing former habitats. For GETT and EISE, the pattern of mixed forest and farming along with wetlands may be threatened in the surrounding region if the area becomes subject to commercial and residential development.

## Management Recommendations

If butterflies are to be incorporated into the long-term management goals and practices of GETT and EISE, it will be necessary to incorporate additional elements of information:

1. Assess relative population abundance of all or selected species, based on immatures and host plants, as surveys solely based on adults may be problematic from management purposes as species have different levels of visibility affecting sampling.
2. Map the distribution of larval host-plants in the parks and evaluate their health and abundance. If host-plants decline or disappear, the associated butterflies will also follow a similar pattern. At present there is no comprehensive inventory of the composition and distribution of plant species in the parks upon which to assess the habitat requirements of the larval stages.
3. Map the distribution of adult host-plant nectar sources. Nectar sources are as critical to the survival of nectar-feeding butterflies as the larval host-plants. At present there is an abundance of hayfield and undeveloped meadow in the parks, particularly along some of the forest margins. Maintenance of these areas will ensure a continuity of adults and larval host-plants.
4. Butterfly diversity may be enhanced by cropping of hayfields and meadows as late as possible in the season. At present, cropping may take place as early as July. Delay of non-hayfield cropping until September is desirable and should be considered in consultation with butterfly ecologists.

## Terrestrial Arthropods

The completed survey provides a baseline of invertebrate biodiversity information that may be used in future management programs. The results emphasize the presence of a diverse range of invertebrates, particularly insects, within the forested ecosystems of GETT and EISE. However, without further identification of the collected specimens, it is nearly impossible to give an accurate assessment of the status of invertebrates in the parks, or to know the potential effects of tree removal on the invertebrate communities. Future biodiversity and habitat assessment should be an integral component of ecosystem management and implemented before management recommendations and actions are finalized. In order to measure the impact of management it will be necessary to characterize the taxonomic biodiversity as biodiversity measures or indices describing taxonomic heterogeneity and ecological (guild) structure. Completion of taxonomic identification of this material to the species level will provide the necessary resources for developing suitable indices that can be applied to management policy.

Complete taxonomic identification of these specimens would very likely also reveal the presence of unnamed and undiscovered arthropod species within the parks. While most new species seem to be discovered in the tropical regions, there are still many new taxa to be found in the temperate zones, as evidenced by the new genus and seven new species of flies found in the 1999 GETT material. With further identification, we expect more new taxa to be discovered, not only within the flies, but within other orders as well. With an estimated 49.5% of North American arachnid

and insect species undescribed (Koszatarab and Schaefer 1990), the GETT results show us that not only wild areas, but also human-impacted and managed ones, are still sources of undescribed taxa.

### Management Recommendations

1. From a management point of view, it is desirable that future changes in habitat be conducted with a prior consideration of the animal and plant biodiversity. If an inventory has not already been completed for an affected area, a survey should be implemented.
2. The diversity of invertebrates and other organisms in GETT and EISE should be recognized in park management policy.
3. Ecological and taxonomic indices of diversity should be developed for the surveyed area to provide a biodiversity context for evaluating future habitat impacts on biodiversity within GETT and EISE.
4. The discovery of unnamed, undescribed species within GETT suggests the area is regionally significant for supporting unknown or poorly documented species. This role should be recognized in park policy.
5. A natural forest structure, including snags, debris, cavity trees, and hanging and snapped branches, provides more and better habitats for the insects living within the forest than does a forest structure wherein the floor is kept clean. Therefore, the natural forest structure should be maintained where ever possible within the parks.

### Future Research

It is very likely the management for GETT and EISE will want to have additional biodiversity and habitat assessments done in the future, and to that end we make the following recommendations. First, the canopy malaise trap was not productive enough at Big Round Top to warrant its use again at Codori-Trostle, and this would likely hold true for additional studies. Investigators should consider alternate, or additional, means of sampling the invertebrates found in the canopy, for instance, the use of aerial sticky traps.

Second, and perhaps more important, the trapping should be done in such a way as to be temporally and/or spatially relevant. This means either time or space should be constant in the trapping scheme. So, if park management wants to know what invertebrates are found at a given site, traps would be set up at that site over the course of the year, yielding a more complete inventory of the species found in that area. If management wanted to know what invertebrates are found in the parks at a given time of year, traps would be set up throughout the parks at that time; this would show what species are prevalent at GETT and EISE at that time. In both cases, optimal sampling would replicate the trapping in following years to reduce the effect any naturally occurring cycles might have on the results.

As the specimens collected for this study are further identified, the data gathered from them could be used for a variety of purposes and research projects. With genus and species level identification comes the possibility of determining what ecological guilds are present, to what degree each of them is present, and how they may interact with each other; the additional data would also allow us to examine differences within families found at both sites to determine if they can tell us something about one or both of the sites. More complete identification would also allow us to develop a series of biodiversity indices; park management could use these indices to determine the state of park biodiversity and assess whether current management techniques have been successful in maintaining (or improving) the biodiversity of GETT and EISE.

Management could also undertake additional vegetation surveys to locate and identify the host plants used by butterflies, skippers, and other herbaceous arthropods. Knowing what plants are in the parks, and to what extent, would allow management to make better decisions about how to treat and maintain the landscape in such a way as to promote invertebrate and ecosystem health.

The data from the vegetation surveys could eventually be used as the basis for additional research to determine whether or not species historically found in GETT and EISE, but since extirpated, could be reintroduced (e.g. the Regal Fritillary butterfly). This type of effort would have to be a project unto itself as it would require study to determine what the habitat requirements (vegetation, climate, human impact, etc.) for each species is, and then determine if those conditions are still met within GETT and EISE. If they are, then a population would have to be brought into the parks and carefully maintained to make sure it established itself. If the conditions are not met, then the park managers would have to decide 1) if they still want to reintroduce the species and 2) if they can modify, realistically and within the bounds of the park charter, park lands to support the species.

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Appendix A. Overstory tree species identified at Gettysburg National Military Park and Eisenhower National Historic Site in association with an inventory of invertebrates in 1999 and 2000. There were no overstory trees at Valley of Death.

| Common name         | Scientific name                | Big Round Top | Codori-Trostle Thicket | Marsh Creek | PA Monmnt | Will's Farm |
|---------------------|--------------------------------|---------------|------------------------|-------------|-----------|-------------|
| American basswood   | <i>Tilia americana</i>         | x             |                        |             |           |             |
| American elm        | <i>Ulmus americana</i>         | x             | x                      |             |           |             |
| American hornbeam   | <i>Carpinus caroliniana</i>    | x             |                        |             |           |             |
| American sycamore   | <i>Platanus occidentalis</i>   |               |                        | x           |           |             |
| Black cherry        | <i>Prunus serotina</i>         | x             |                        |             | x         |             |
| Black oak           | <i>Quercus velutina</i>        | x             |                        |             |           |             |
| Black tupelo        | <i>Nyssa sylvatica</i>         | x             |                        |             |           |             |
| Black walnut        | <i>Juglans nigra</i>           |               | x                      | x           |           |             |
| Boxelder            | <i>Acer negundo</i>            |               |                        | x           |           |             |
| Chestnut oak        | <i>Quercus prinus</i>          | x             |                        |             |           |             |
| Common persimmon    | <i>Diospyros virginiana</i>    |               | x                      |             |           |             |
| Eastern red cedar   | <i>Juniperus virginiana</i>    | x             | x                      |             |           |             |
| Eastern white pine  | <i>Pinus strobus</i>           | x             |                        |             |           |             |
| Flowering dogwood   | <i>Cornus florida</i>          | x             |                        |             |           |             |
| Mockernut hickory   | <i>Carya tomentosa</i>         | x             |                        |             |           |             |
| Northern catalpa    | <i>Catalpa speciosa</i>        |               | x                      |             |           |             |
| Northern red oak    | <i>Quercus rubra</i>           | x             |                        |             |           |             |
| Northern white oak  | <i>Quercus alba</i>            | x             | x                      |             |           |             |
| Osage-orange        | <i>Maclura pomifera</i>        |               | x                      |             |           |             |
| Pignut hickory      | <i>Carya glabra</i>            | x             |                        |             |           |             |
| Pitch pine          | <i>Pinus rigida</i>            | x             |                        |             |           |             |
| Red maple           | <i>Acer rubrum</i>             | x             | x                      | x           |           |             |
| Redbud / judas-tree | <i>Cercis canadensis</i>       | x             | x                      |             |           |             |
| Sassafras           | <i>Sassafras albidum</i>       | x             |                        |             |           |             |
| Scarlet oak         | <i>Quercus coccinea</i>        |               | x                      |             |           |             |
| Shag-bark hickory   | <i>Carya ovata</i>             | x             | x                      |             |           |             |
| Short-leaf pine     | <i>Pinus echinata</i>          | x             |                        |             |           |             |
| Snag                |                                | x             | x                      |             |           |             |
| Swamp white oak     | <i>Quercus bicolor</i>         |               | x                      |             |           |             |
| Tree-of-heaven      | <i>Ailanthus altissima</i>     |               |                        | x           |           |             |
| Tuliptree           | <i>Liriodendron tulipifera</i> | x             |                        |             |           |             |
| White ash           | <i>Fraxinus americana</i>      | x             | x                      | x           |           | x           |



Appendix B. Sapling and shrub species identified at Gettysburg National Military Park and Eisenhower National Historic Site in association with an inventory of invertebrates in 1999 and 2000. There were no saplings or shrubs at Will's Farm.

| Common name              | Scientific name               | Big Round Top | Codori-Trostle Thicket | Marsh Creek | PA Monmnt | Valley of Death |
|--------------------------|-------------------------------|---------------|------------------------|-------------|-----------|-----------------|
| American basswood        | <i>Tilia americana</i>        | x             |                        |             |           |                 |
| American elm             | <i>Ulmus americana</i>        | x             |                        |             |           |                 |
| American hornbeam        | <i>Carpinus caroliniana</i>   | x             |                        |             |           |                 |
| American witch-hazel     | <i>Hamamelis virginiana</i>   | x             |                        |             |           |                 |
| Autumn-olive             | <i>Elaeagnus umbellata</i>    | x             |                        |             |           |                 |
| Black cherry             | <i>Prunus serotina</i>        | x             |                        |             | x         |                 |
| Black tupelo             | <i>Nyssa sylvatica</i>        | x             |                        |             |           |                 |
| Blackberries/raspberries | <i>Rubus spp.</i>             | x             |                        |             | x         |                 |
| Blueberries              | <i>Vaccinium spp.</i>         | x             |                        |             |           |                 |
| Boxelder                 | <i>Acer negundo</i>           |               |                        | x           |           |                 |
| Catbrier                 | <i>Smilax rotundifolia</i>    |               | x                      |             |           |                 |
| Common hackberry         | <i>Celtis occidentalis</i>    | x             |                        |             |           |                 |
| Eastern hop-hornbeam     | <i>Ostrya virginiana</i>      | x             |                        |             |           |                 |
| Eastern poison-ivy       | <i>Toxicodendron radicans</i> |               | x                      |             |           |                 |
| Eastern red-cedar        | <i>Juniperus virginiana</i>   | x             |                        |             | x         |                 |
| Eastern white pine       | <i>Pinus strobus</i>          | x             |                        |             |           |                 |
| Flowering dogwood        | <i>Cornus florida</i>         | x             |                        |             | x         |                 |
| Gooseberries/currants    | <i>Ribes spp.</i>             | x             |                        |             |           |                 |
| Greenbrier               | <i>Smilax glauca</i>          | x             |                        |             |           |                 |
| Japanese barberry        | <i>Berberis thunbergii</i>    | x             | x                      |             |           |                 |
| Japanese honeysuckle     | <i>Lonicera japonica</i>      | x             | x                      |             |           |                 |
| Mockernut hickory        | <i>Carya tomentosa</i>        | x             |                        |             |           |                 |
| Northern red oak         | <i>Quercus rubra</i>          |               |                        |             | x         |                 |
| Northern spicebush       | <i>Lindera benzoin</i>        | x             |                        |             |           |                 |
| Northern white oak       | <i>Quercus alba</i>           | x             |                        |             |           |                 |
| Osage-orange             | <i>Maclura pomifera</i>       |               | x                      |             |           |                 |
| Pawpaw                   | <i>Asimina triloba</i>        | x             |                        |             |           |                 |
| Rambler rose             | <i>Rosa multiflora</i>        | x             | x                      |             | x         | x               |
| Redbud / judas-tree      | <i>Cercis canadensis</i>      | x             |                        |             |           |                 |
| Sassafras                | <i>Sassafras albidum</i>      | x             |                        |             |           |                 |
| Silky dogwood            | <i>Cornus amomum</i>          |               |                        |             |           | x               |
| Slippery elm             | <i>Ulmus rubra</i>            |               |                        |             | x         |                 |
| Smooth blackhaw          | <i>Viburnum prunifolium</i>   | x             | x                      |             |           |                 |
| Southern arrow-wood      | <i>Viburnum dentatum</i>      | x             |                        |             |           |                 |
| Tree-of-heaven           | <i>Ailanthus altissima</i>    |               | x                      | x           |           |                 |
| White ash                | <i>Fraxinus americana</i>     | x             | x                      |             | x         |                 |
| Willows                  | <i>Salix spp.</i>             |               |                        |             |           | x               |



Appendix C. Herbaceous species identified at Gettysburg National Military Park and Eisenhower National Historic Site in association with an inventory of invertebrates in 1999 and 2000.

| Common name              | Scientific name                 | Big<br>Round<br>Top | Codori-<br>Trostle<br>Thicket | Marsh<br>Creek | PA<br>Monmt | Valley of<br>Death | Will's<br>Farm |
|--------------------------|---------------------------------|---------------------|-------------------------------|----------------|-------------|--------------------|----------------|
| Bedstraws                | <i>Galium spp.</i>              | x                   | x                             |                |             |                    |                |
| Black nightshade         | <i>Solanum nigrum</i>           |                     | x                             |                |             |                    |                |
| Bull thistle             | <i>Cirsium vulgare</i>          |                     | x                             |                |             |                    |                |
| Cattails                 | <i>Typha spp.</i>               |                     |                               |                |             |                    | x              |
| Climbing nightshade      | <i>Solanum dolcamera</i>        |                     | x                             |                |             |                    |                |
| Creeping-jenny           | <i>Lysimachia nummularia</i>    |                     | x                             |                |             |                    |                |
| Cut-leaved teasel        | <i>Dipsacus laciniatus</i>      |                     |                               |                |             |                    | x              |
| Dogbanes                 | <i>Apocynum spp.</i>            |                     |                               |                | x           |                    |                |
| Enchanter's nightshades  | <i>Circaea spp.</i>             | x                   | x                             |                |             |                    |                |
| False solomon's-seal     | <i>Smilacina racemosa</i>       | x                   |                               | x              |             |                    |                |
| Garlic-mustard           | <i>Alliaria officinalis</i>     |                     |                               | x              |             |                    |                |
| Hairy skullcap           | <i>Scutellaria elliptica</i>    | x                   |                               |                |             |                    |                |
| Harvestlice              | <i>Agrimonia parviflora</i>     |                     | x                             |                |             |                    |                |
| Harvestlices             | <i>Agrimonia spp.</i>           |                     |                               |                |             | x                  | x              |
| Horehounds               | <i>Lycopus spp.</i>             |                     | x                             |                |             |                    |                |
| Indian-tobacco           | <i>Lobelia inflata</i>          |                     | x                             |                |             |                    |                |
| Jack-in-the-pulpit       | <i>Arisaema triphyllum</i>      | x                   | x                             |                |             |                    |                |
| Japanese stilt grass     | <i>Microstegium vimineum</i>    |                     |                               | x              |             |                    |                |
| Jewelweed                | <i>Impatiens capensis</i>       |                     |                               |                |             | x                  |                |
| Liverleaf                | <i>Hepatica americana</i>       | x                   |                               |                |             |                    |                |
| Mild water-pepper        | <i>Polygonum hydropiper</i>     |                     | x                             |                |             |                    |                |
| Orange daylily           | <i>Hemerocallis fulva</i>       |                     |                               | x              |             |                    |                |
| Queen anne's-lace        | <i>Daucus carota</i>            |                     | x                             |                |             |                    |                |
| Ragged eupatorium        | <i>Eupatorium pilosum</i>       | x                   |                               |                |             |                    |                |
| Rue anemone              | <i>Anemonella thalictroides</i> | x                   |                               |                |             |                    |                |
| Skullcaps                | <i>Scutellaria spp.</i>         |                     | x                             |                |             |                    |                |
| Small-spike false nettle | <i>Boehmeria cylindrica</i>     |                     | x                             |                |             |                    |                |
| Smartweeds               | <i>Polygonum spp.</i>           |                     | x                             |                |             |                    |                |
| Stinging nettle          | <i>Urtica dioica</i>            |                     |                               | x              |             |                    |                |
| Tick trefoils            | <i>Desmodium spp.</i>           | x                   | x                             |                |             |                    |                |
| Violets                  | <i>Viola spp.</i>               | x                   | x                             |                |             |                    |                |
| Virginia knotweed        | <i>Tovara virginiana</i>        |                     | x                             | x              |             |                    |                |
| Wild comfrey             | <i>Cynoglossum virginianum</i>  | x                   |                               |                |             |                    |                |
| Wood sorrels             | <i>Oxalis spp.</i>              |                     | x                             |                |             |                    |                |



Appendix D. Seedling species identified at Gettysburg National Military Park and Eisenhower National Historic Site in association with an inventory of invertebrates in 1999 and 2000. There were no woody seedlings at Valley of Death, Will's Farm, or Marsh Creek.

| Common name              | Scientific name                    | Big Round Top | Codori-Trostle Thicket | PA Monmnt |
|--------------------------|------------------------------------|---------------|------------------------|-----------|
| American crabapple       | <i>Pyrus coronaria</i>             | x             |                        |           |
| American elm             | <i>Ulmus americana</i>             | x             |                        |           |
| American witch-hazel     | <i>Hamamelis virginiana</i>        | x             |                        |           |
| Black cherry             | <i>Prunus serotina</i>             | x             | x                      | x         |
| Blackberries/raspberries | <i>Rubus spp.</i>                  | x             | x                      | x         |
| Blueberries              | <i>Vaccinium spp.</i>              | x             |                        |           |
| Catbrier                 | <i>Smilax rotundifolia</i>         |               | x                      |           |
| Chestnut oak             | <i>Quercus prinus</i>              | x             |                        |           |
| Common hackberry         | <i>Celtis occidentalis</i>         | x             |                        |           |
| Eastern hop-hornbeam     | <i>Ostrya virginiana</i>           | x             |                        |           |
| Eastern poison-ivy       | <i>Toxicodendron radicans</i>      | x             | x                      |           |
| Eastern red cedar        | <i>Juniperus virginiana</i>        | x             |                        |           |
| Flowering dogwood        | <i>Cornus florida</i>              | x             |                        |           |
| Gooseberries/currants    | <i>Ribes spp.</i>                  | x             |                        |           |
| Grapes                   | <i>Vitis spp.</i>                  | x             |                        |           |
| Japanese barberry        | <i>Berberis thunbergii</i>         | x             | x                      |           |
| Japanese honeysuckle     | <i>Lonicera japonica</i>           | x             | x                      | x         |
| Mockernut hickory        | <i>Carya tomentosa</i>             | x             |                        |           |
| Northern red oak         | <i>Quercus rubra</i>               | x             | x                      |           |
| Northern spicebush       | <i>Lindera benzoin</i>             | x             |                        |           |
| Northern white oak       | <i>Quercus alba</i>                | x             |                        |           |
| Rambler rose             | <i>Rosa multiflora</i>             | x             | x                      |           |
| Red maple                | <i>Acer rubrum</i>                 | x             |                        |           |
| Redbud / judas-tree      | <i>Cercis canadensis</i>           | x             |                        |           |
| Smooth blackhaw          | <i>Viburnum prunifolium</i>        | x             | x                      |           |
| Southern arrow-wood      | <i>Viburnum dentatum</i>           | x             |                        |           |
| Virginia-creeper         | <i>Parthenocissus quinquefolia</i> | x             | x                      | x         |
| White ash                | <i>Fraxinus americana</i>          | x             | x                      |           |



Appendix E. Taxonomists who identified specimens for the inventory of invertebrates at Gettysburg National Military Park and  
Eisenhower National Historic Site.

| Taxa/Name         | Affiliation                        | Department                           | Address                                                                           |
|-------------------|------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------|
| Araneae           |                                    |                                      |                                                                                   |
| Skip Young        | PPL Corp.                          | Environmental<br>Management Division | 2 North Ninth St., Allentown, PA 18101                                            |
| Coleoptera        |                                    |                                      |                                                                                   |
| Bob Davidson      | Carnegie Museum of Natural History | Section of Invertebrate<br>Zoology   | 4400 Forbes Ave., Pittsburgh, PA 15213                                            |
| Diptera           |                                    |                                      |                                                                                   |
| Art Borkent       | Royal British Columbia Museum      | Entomology                           | 1171 Mallory Rd. R1-S20-C, Enderby, BC, V0E 1V0 Canada                            |
| John Burger       | University of New Hampshire        | Zoology                              | Spaulding Hall, Durham, NH 03824                                                  |
| Sidney Camras     | Field Museum of Natural History    | Division of Insects                  | Roosevelt Rd. @ Lake Shore, Chicago, IL 60605                                     |
| Edward Coher      | Long Island University             | Division of Natural<br>Sciences      | 239 Montauk Hgwy., Southampton, NY 11968                                          |
| Robert Cuny       | Lakeland College                   | Environmental Science                | Bag 6600, 2602-59 Av., Lloydminster, Alberta, T9V 1Z3, Canada                     |
| Gregory Dahlem    | Northern Kentucky University       | Biological Sciences                  | Highland Heights, KY 41099                                                        |
| Frank Fee         |                                    |                                      | 910 Cricklewood Dr., State College, PA 16801                                      |
| Benjamin Foote    | Kent State University              | Biological Sciences                  | Kent, OH 44242                                                                    |
| Stephen Gaimari   | National Museum of Natural History | Entomology                           | Smithsonian Institution, Washington, D.C. 20560                                   |
| Graham Griffiths  |                                    |                                      | 117 Collingwood Cove, 51551 Range Rd. 212A, Sherwood Park, AB,<br>T8G 1B2, Canada |
| Richard Hurley    | Montana State University           | Entomology                           | 409 Lewis Hall, Bozeman, MT 49717                                                 |
| Laurance Quate    |                                    |                                      | 16271 Oak Creek Trail, Poway, CA 92064                                            |
| Aubrey Scarbrough | Towson University                  | Biology                              | 259 Smith Hall, Baltimore, MD 21204                                               |
| Sonja Scheffer    | Systematic Entomology Lab          | Entomology                           | Bld 005, Rm 137, BARC-W, Beltsville, MD 20705                                     |
| Gary Steck        | Florida Dept. of Agriculture       | Division of Plant<br>Industry        | PO Box 147100, Gainesville, FL 23614                                              |
| Donald Webb       | Illinois Natural History Survey    | Center for Biodiversity              | 607 E. Peabody Dr., Champaign, IL 61820                                           |
| Norman Woodley    | Systematic Entomology Lab          | Entomology                           | c/o Smithsonian Institution, Washington, D.C. 20560                               |
| Chen Young        | Carnegie Museum of Natural History | Section of Invertebrate<br>Zoology   | 4400 Forbes Ave., Pittsburgh, PA 15213                                            |
| Varuni Kulasekera | American Museum of Natural History | Invertebrate Zoology                 | 79 <sup>th</sup> St. @ CPW, New York, NY 10024                                    |
| Lepidoptera       |                                    |                                      |                                                                                   |
| Cees Gielis       | National History Museum            |                                      | PO Box 9517, 23000 R A Leiden, The Netherlands                                    |



Appendix F. Geographic position of terrestrial invertebrate collection sites and butterfly collection sites used during an inventory of invertebrates at Gettysburg National Military Park and Eisenhower National Historic Site, 1999-2000. Coordinates are in UTM Zone 18N, NAD1983. Big Round Top and Codori-Trostle Thicket points are located in the center of the biodiversity profile plots.

| Site                   | UTM East | UTM North | Habitat                                             |
|------------------------|----------|-----------|-----------------------------------------------------|
| Big Round Top          | 307850   | 4406150   | Deciduous forest near stream border                 |
| Codori-Trostle Thicket | 308297   | 4408439   | Pocket of deciduous forest surrounded by pasture    |
| Marsh Creek            | 305295   | 4407666   | Deciduous forest near stream border                 |
| PA Monument            | 308817   | 4408341   | Hayland                                             |
| Valley of Death        | 308362   | 4407370   | Pasture bordering shrub/brush/range                 |
| Will's Farm            | 307157   | 4412877   | Hayland/wet meadow                                  |
| 1                      | 307200   | 4406250   | Hayland bordering deciduous forest                  |
| 2                      | 308058   | 4406963   | Stream border adjacent to woods                     |
| 3                      | 308250   | 4407650   | Pasture and wet meadow adjacent to deciduous forest |
| 4                      | 308600   | 4407900   | Pasture                                             |
| 5                      | 306961   | 4406307   | Deciduous forest                                    |
| 6                      | 310200   | 4409450   | Hayland surrounded by deciduous forest              |
| 7                      | 307153   | 4411914   | Deciduous forest                                    |
| 8                      | 308726   | 4407383   | Roadside woods                                      |
| 9                      | 308781   | 4406290   | Roadside border adjacent to shrub/brush/range       |
| 10                     | 309100   | 4408800   | Hayland and deciduous forest margin                 |
| 11                     | 309042   | 4409194   | Roadside and shrub/brush/range                      |
| 12                     | 308855   | 4408842   | Hayland adjacent to road                            |
| 13                     | 308453   | 4407397   | Roadside woods and shrubs                           |
| 14                     | 308147   | 4407631   | Cropland bordering road                             |
| 15                     | 307850   | 4407050   | Hayland bordering deciduous forest on hillside      |
| 16                     | 307710   | 4407747   | Hayland adjacent to deciduous forest                |
| 17                     | 309893   | 4410464   | Pocket of hayland bordering deciduous forest        |
| 18                     | 310056   | 4410342   | Pocket of hayland bordering deciduous forest        |
| 19                     | 309702   | 4410142   | Hayland bordering deciduous forest                  |
| 20                     | 307600   | 4410100   | Hayland adjacent to deciduous forest                |
| 21                     | 308815   | 4412636   | Hayland/cropland adjacent to road                   |
| 22                     | 308136   | 4412818   | Cropland bordering road                             |
| 23                     | 308012   | 4407547   | Cropland bordering woods                            |
| 24                     | 307783   | 4407882   | Hayland                                             |
| 25                     | 310272   | 4409226   | Shrub/brush/range bordering road                    |

Appendix F. Geographic position of terrestrial invertebrate collection sites and butterfly collection sites used during an inventory of invertebrates at Gettysburg National Military Park and Eisenhower National Historic Site, 1999-2000. Coordinates are in UTM Zone 18N, NAD1983. Big Round Top and Codori-Trostle Thicket points are located in the center of the biodiversity profile plots (continued).

| <b>Site</b> | <b>UTM East</b> | <b>UTM North</b> | <b>Habitat</b>                                      |
|-------------|-----------------|------------------|-----------------------------------------------------|
| 26          | 308749          | 4408116          | Hayland adjacent to woods and deciduous forest      |
| 27          | 307800          | 4407500          | Hayland bordering woods and deciduous forest        |
| 28          | 307595          | 4406562          | Pasture surrounded by deciduous woods               |
| 29          | 308223          | 4407090          | Pasture and wet meadow adjacent to deciduous forest |
| 30          | 308248          | 4408200          | Pasture adjacent to deciduous forest                |
| 38          | 307781          | 4406248          | Deciduous forest by stream                          |
| 40          | 306700          | 4407000          | Hayland adjacent to deciduous forest                |
| 41          | 314450          | 4411950          | Cropland and grass/shrubland at margin of woods     |
| 42          | 307000          | 4412500          | Hayland bordering deciduous forest                  |
| 43          | 307050          | 4411100          | Hayland/cropland                                    |
| 44          | 307950          | 4413500          | Hayland/cropland bordering deciduous forest         |
| 45          | 305750          | 4407850          | Mixed forest/shrubs along stream border             |
| 46          | 306700          | 4408600          | Hayland bordering deciduous forest                  |
| 47          | 307100          | 4412700          | Hayland/cropland                                    |

Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites.

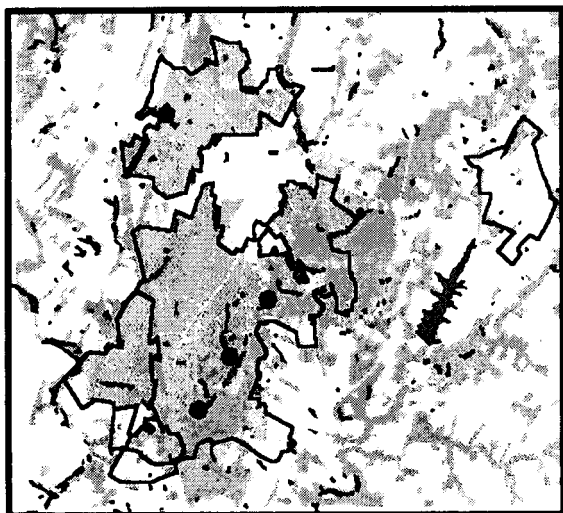
|                                                                   |    |
|-------------------------------------------------------------------|----|
| Map 1. <i>Ancyloxypha numitor</i> (Least skipper) .....           | 59 |
| Map 2. <i>Atalopdes campestris</i> (Sachem) .....                 | 59 |
| Map 3. <i>Epargyreus clarus</i> (Silver-spotted skipper) .....    | 59 |
| Map 4. <i>Erynnis brizo</i> (Sleepy dusky wing) .....             | 59 |
| Map 5. <i>Erynnis juvenalis</i> (Juvenal's dusky wing) .....      | 60 |
| Map 6. <i>Euphyes dion</i> (Dion skipper) .....                   | 60 |
| Map 7. <i>Poanes hobomok</i> (Hobomok skipper) .....              | 60 |
| Map 8. <i>Polites mystic</i> (Long dash) .....                    | 60 |
| Map 9. <i>Polites peckius</i> (Peck's skipper) .....              | 61 |
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| Map 14. <i>Thymelicus lineola</i> (European skipper) .....        | 62 |
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| Map 18. <i>Lycaena philaeas</i> (Little copper) .....             | 63 |
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Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites (continued).

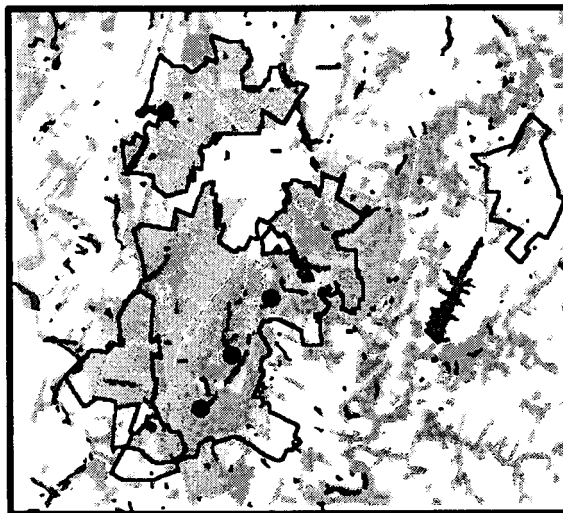
|                                                                   |    |
|-------------------------------------------------------------------|----|
| Map 22. <i>Danaus plexippus</i> (Monarch) .....                   | 64 |
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Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites (continued).

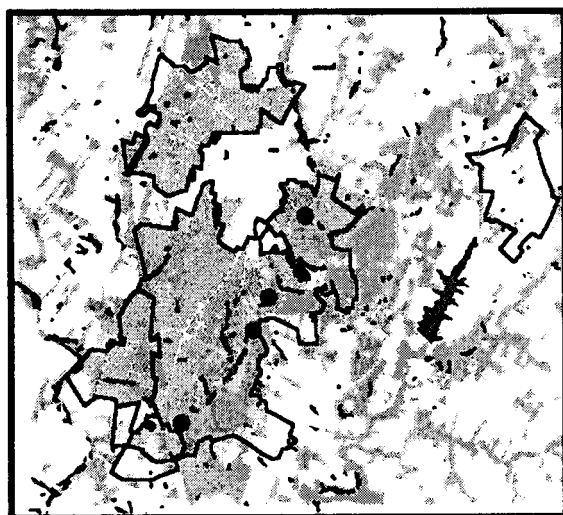
Map 1. *Ancyloxypha numitor* (least skipper)



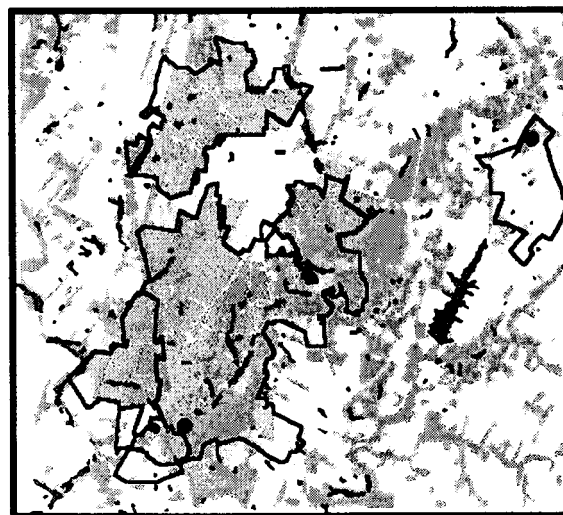
Map 2. *Atalopedes campestris* (sachem)



Map 3. *Epargyreus clarus* (silver-spotted skipper)

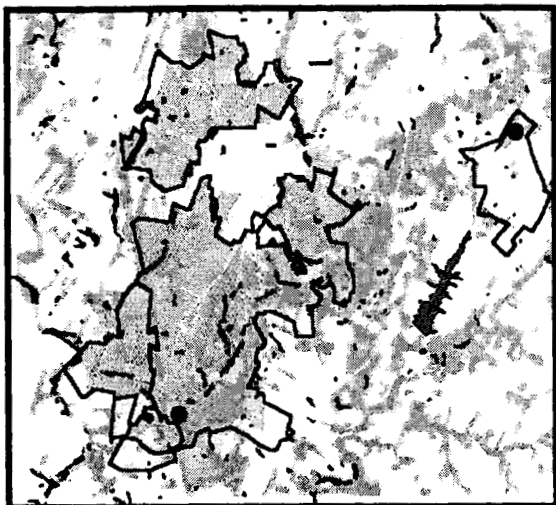


Map 4. *Erynnis brizo* (sleepy dusky wing)

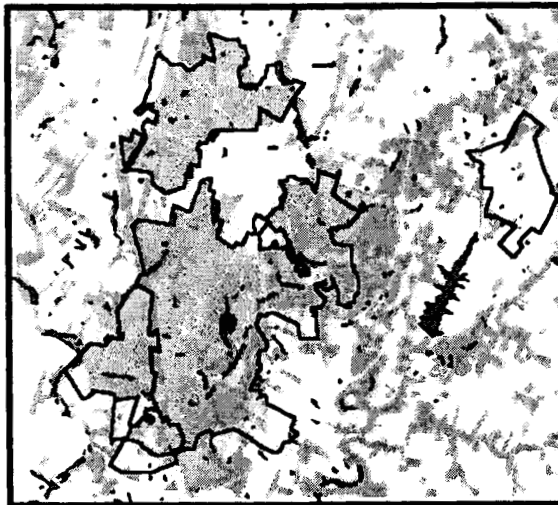


Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites (continued).

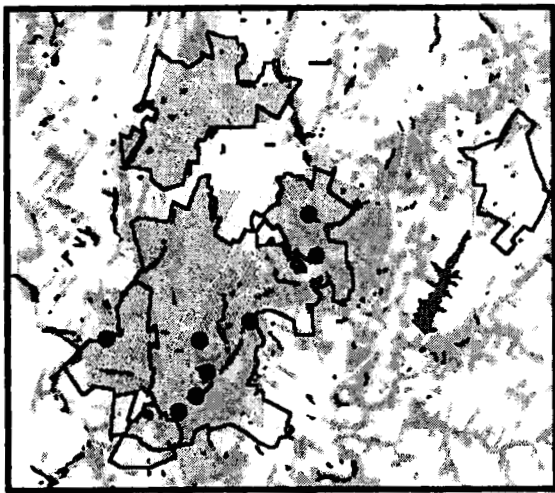
Map 5. *Erynnis juvenalis* (Juvenal's dusky wing)



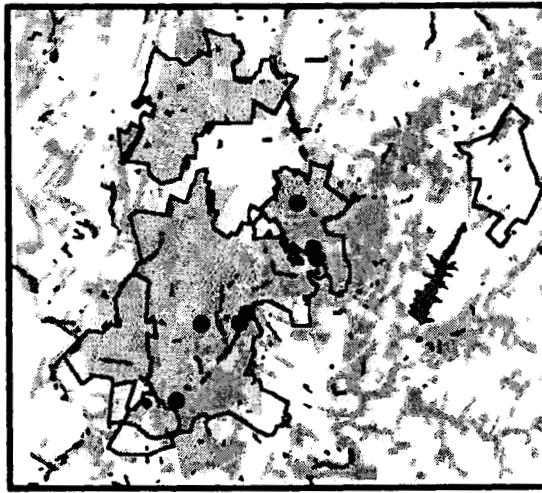
Map 6. *Euphyes dion* (dion skipper)



Map 7. *Poanes hobomok* (hobomok skipper)

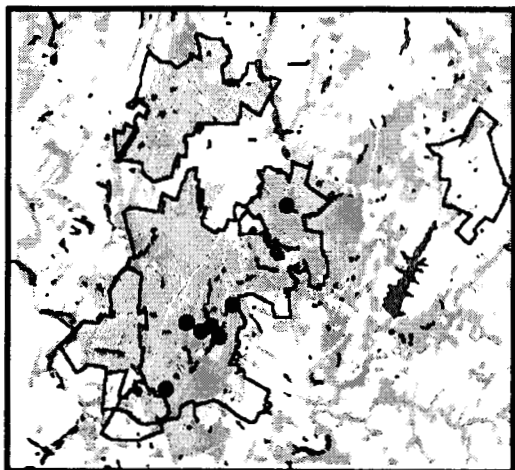


Map 8. *Polites mystic* (long dash)

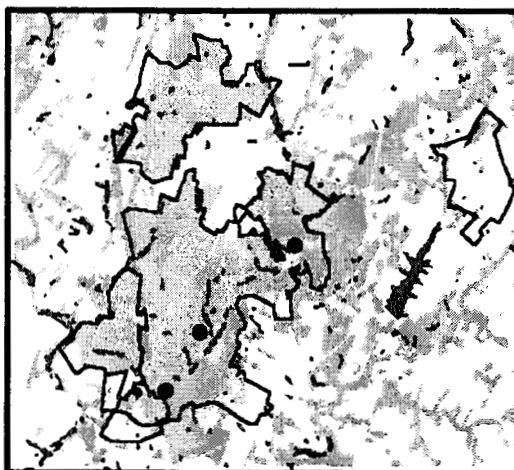


Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites (continued).

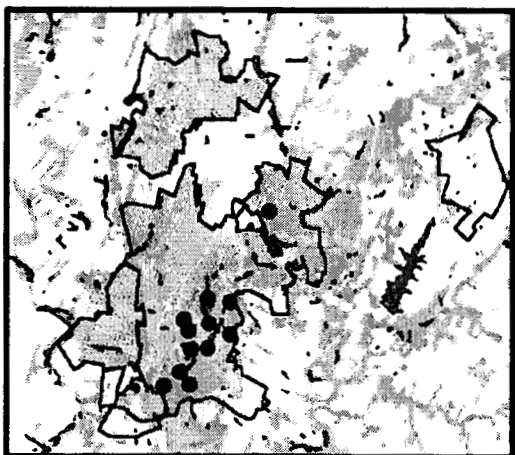
Map 9. *Polites peckius* (Peck's skipper)



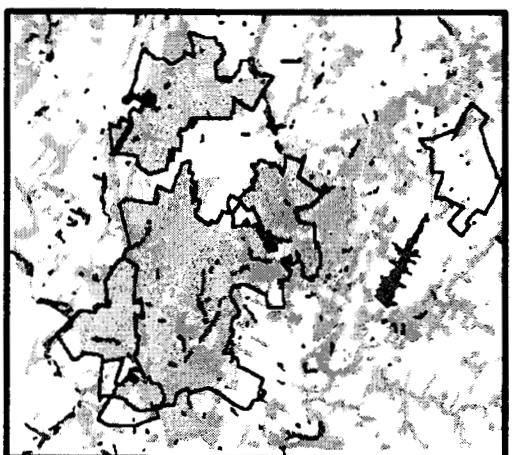
Map 10. *Polites thermistocles* (tawney-edged skipper)



Map 11. *Pompeius verna* (little glassy wing)

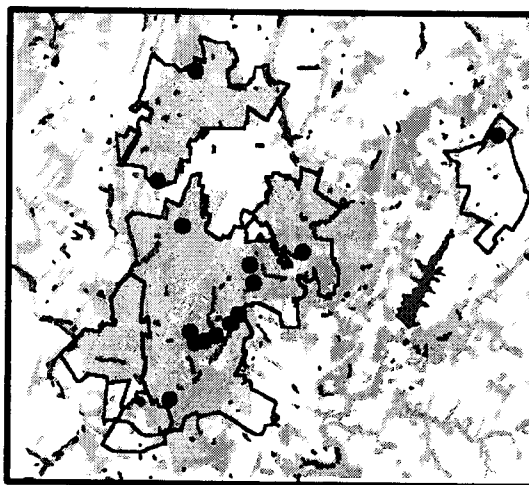
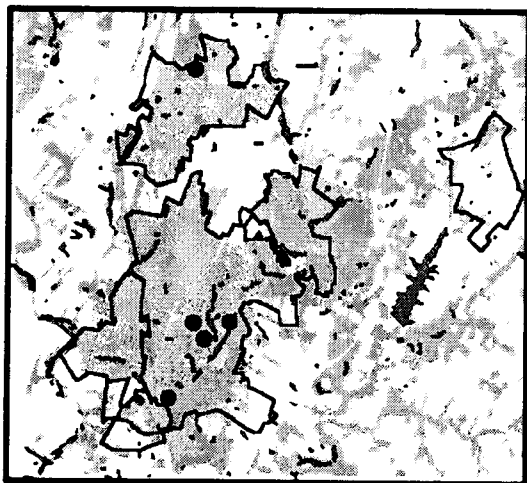


Map 12. *Pyrgus communis* (checkered skipper)

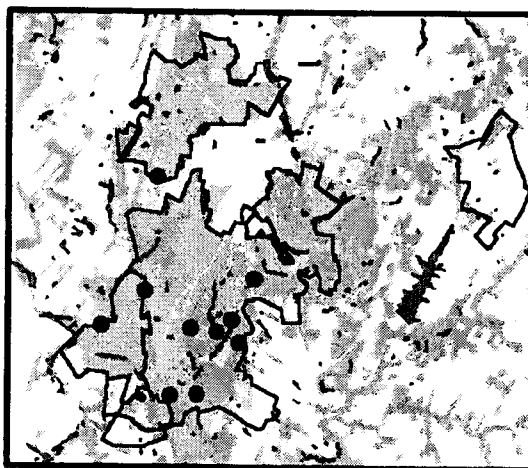
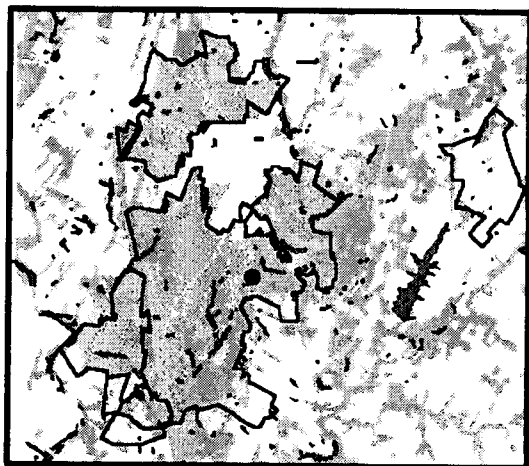


Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites (continued).

Map 13 *Thorbyes pylades* (northern cloudy wing)    Map 14. *Thymelicus lineola* (European skipper)

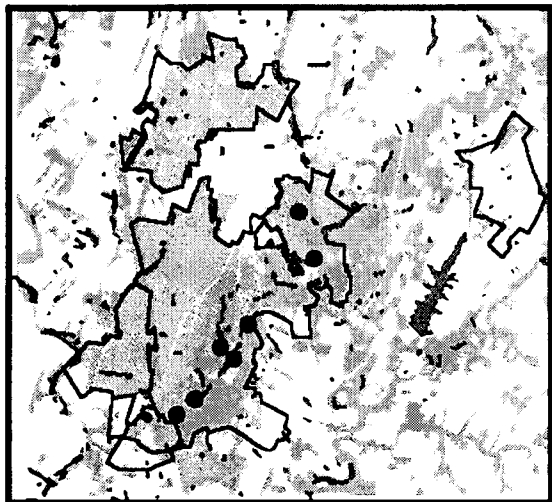


Map 15. *Calycopis cerops* (red-banded hairstreak)    Map 16. *Celastrina agriolus* (spring azure)

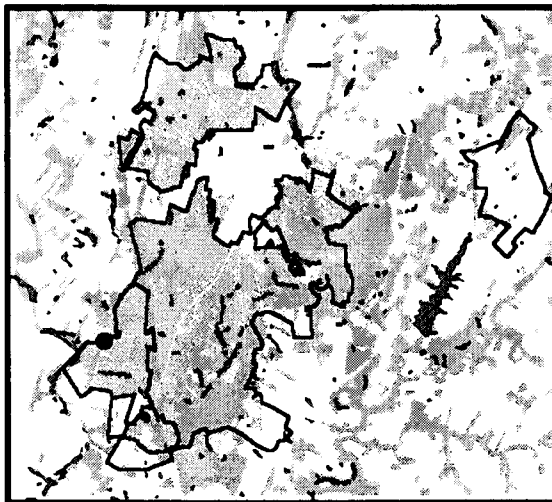


Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites (continued).

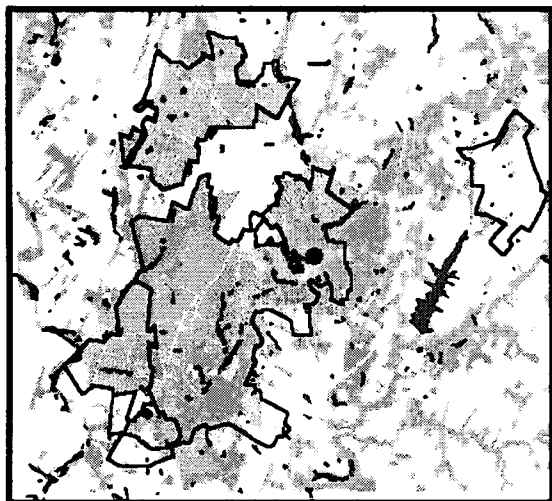
Map 17. *Everes comyntas* (eastern tailed blue)



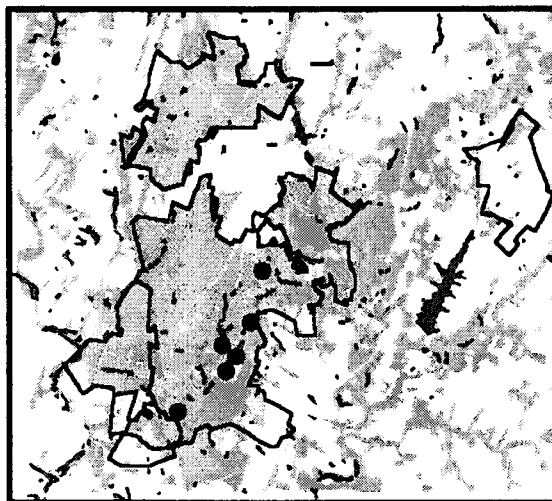
Map 18. *Lycaena philaeas* (little copper)



Map 19. *Satyrrium calanus* (banded hairstreak)

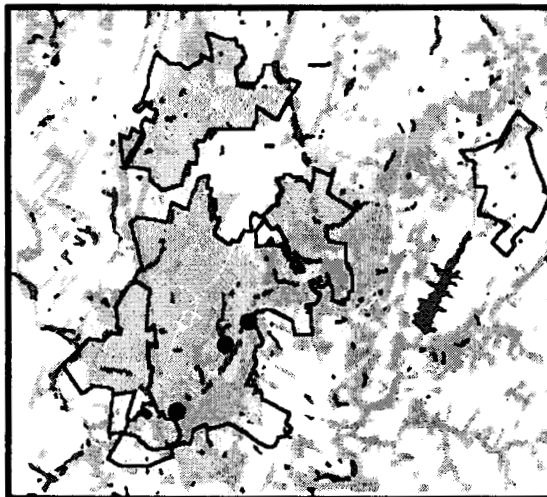
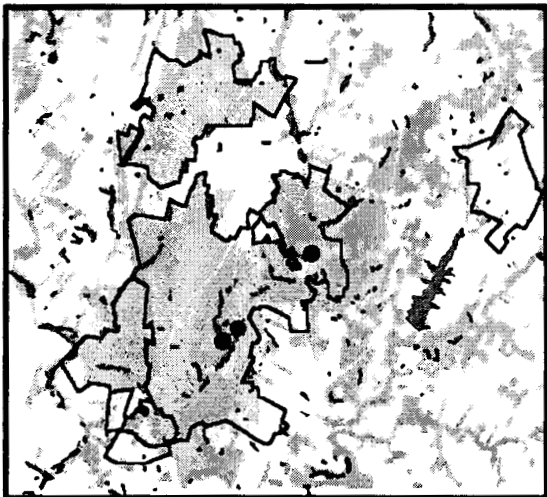


Map 20. *Strymon melinus* (gray hairstreak)

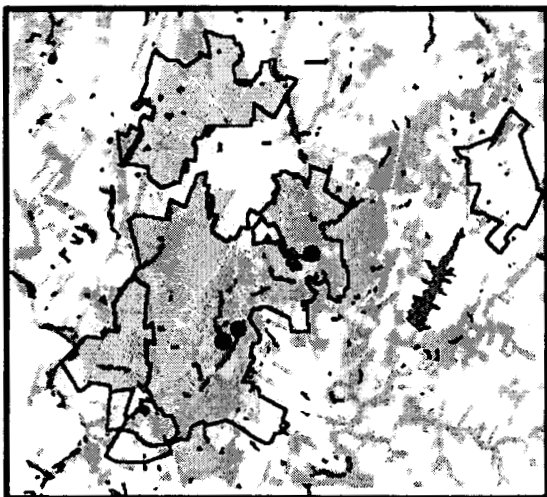


Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites (continued).

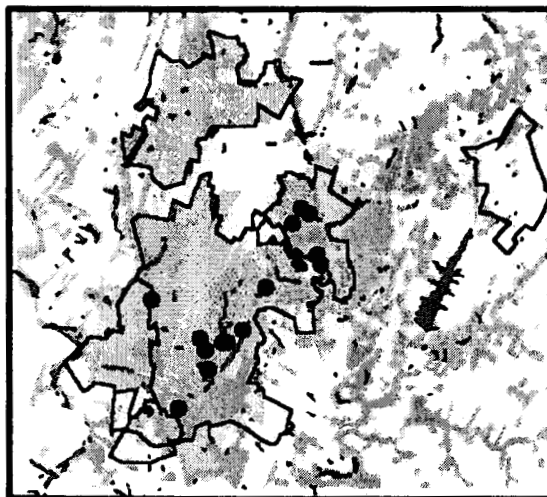
Map 21. *Coenonympha tullia* (common wood nymph)    Map 22. *Danaus plexippus* (monarch)



Map 23. *Euphydryas phaeton* (Baltimore)

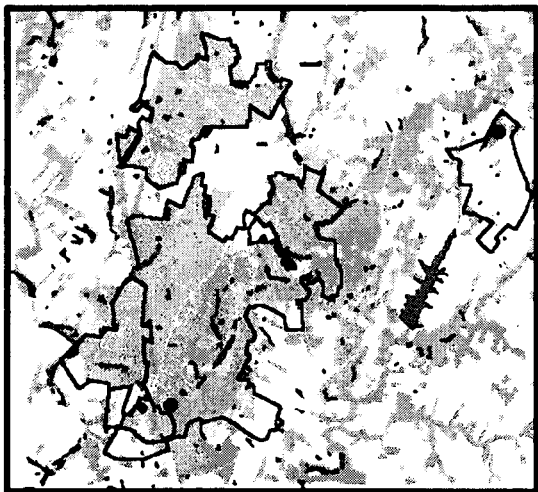


Map 24. *Megisto cymelia* (little wood satyr)

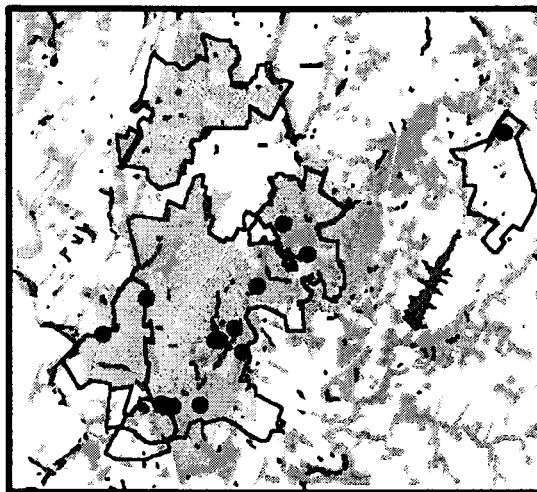


Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites (continued).

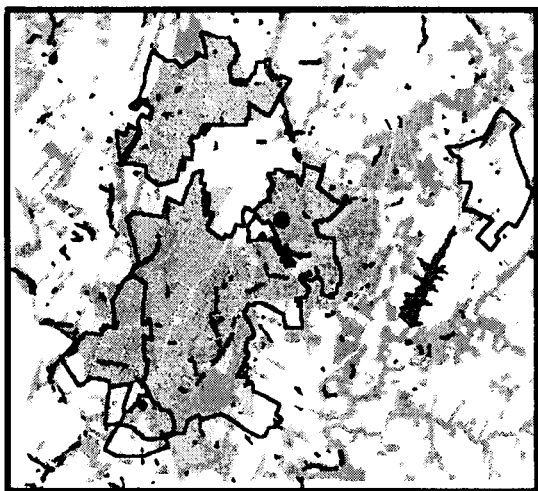
Map 25. *Nymphalis antipoo* (mourning cloak)



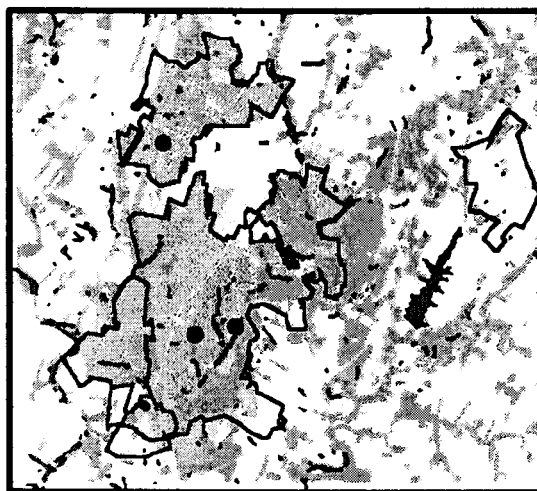
Map 26. *Phyciodes tharos* (pearl crescent)



Map 27. *Polygonia comma* (comma)

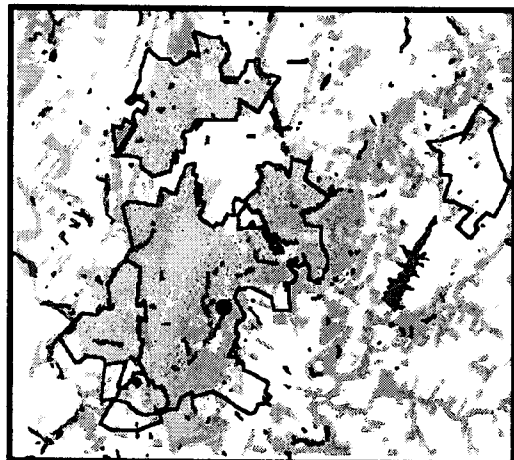
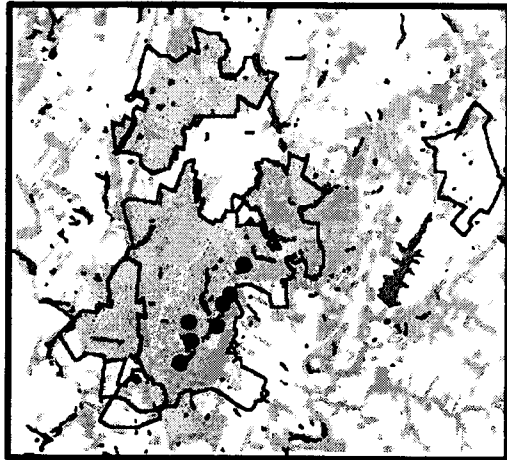


Map 28. *Polygonia interrogationis* (question mark)

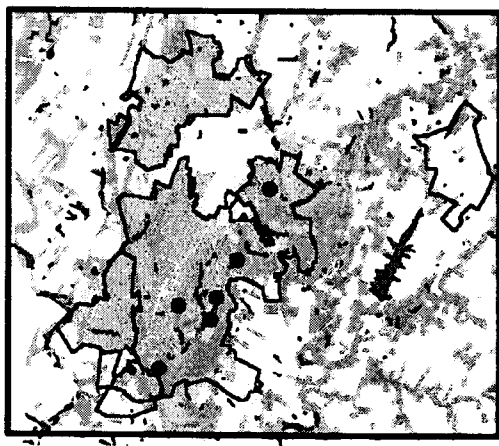
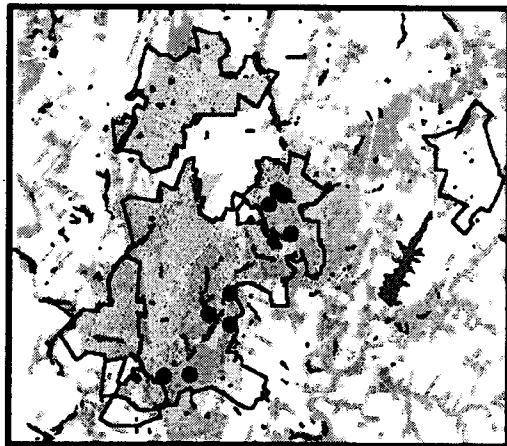


Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites (continued).

Map 29. *Speyeria cybele* (great spangled fritillary) Map 30. *Vanessa atalanta* (red admiral)

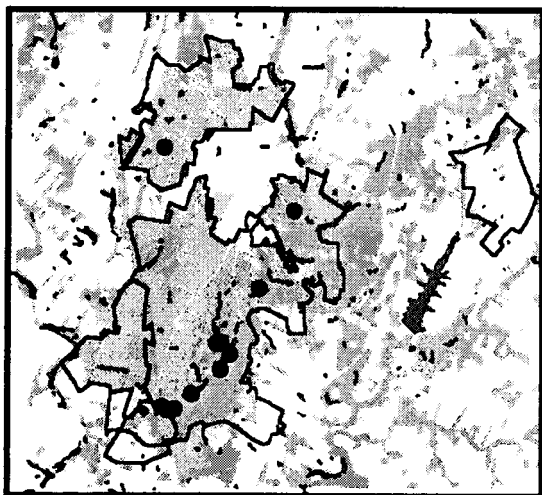


Map 31. *Vanessa virginiensis* (American painted lady) Map 32. *Battus philenor* (pipevine swallowtail)

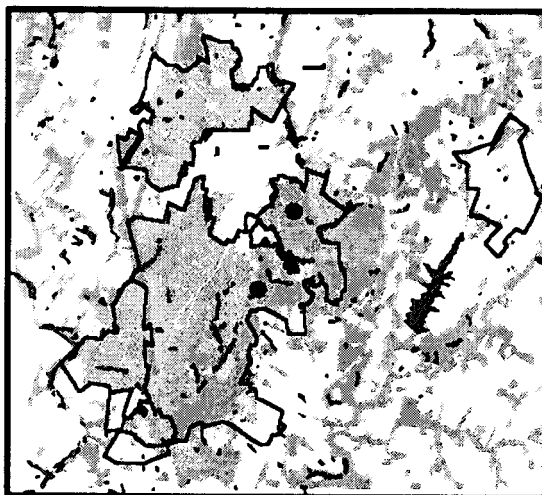


Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites (continued).

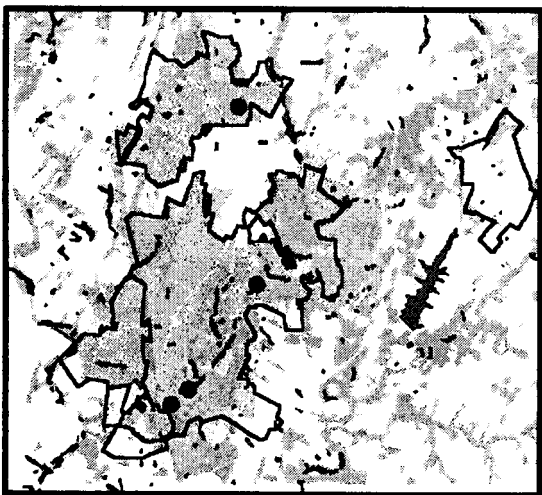
Map 33. *Papilio glaucus*(tiger swallowtail)



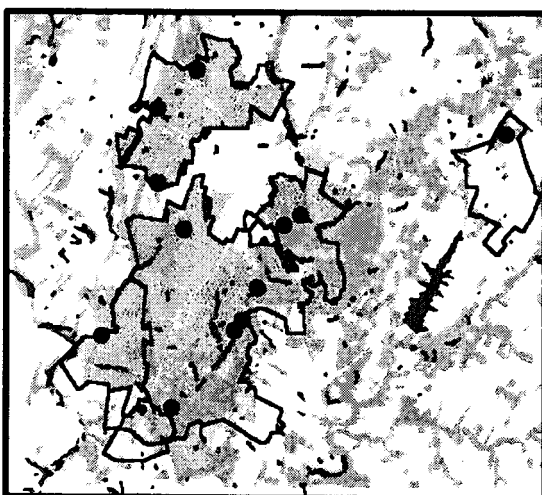
Map 34. *Papilio polyxenes* (black swallowtail)



Map 35. *Papilio troilus* (spicebush swallowtail)

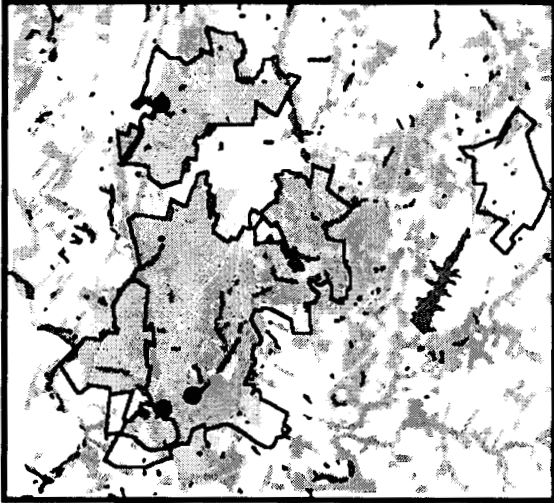


Map 36. *Colius eurytheme* (alfalfa butterfly)

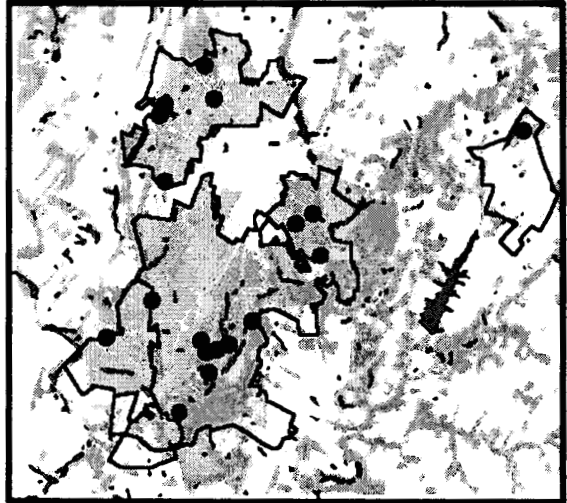


Appendix G. GIS located distribution records for adult butterflies collected at GETT and EISE, 1999-2000, black dots = collection sites (continued).

Map 37. *Colias philodice* (clouded sulphur)



Map 38. *Pieris rapae* (cabbage white)



## Appendix H. Species lists for organisms collected at GETT, 1999.

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Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H1. Nematodes collected at Gettysburg National Military Park (BR = Big Round Top, CT= Codori-Trostle Thicket).

| Family        | Genus species                | BR specimens | CT specimens | Totals   |
|---------------|------------------------------|--------------|--------------|----------|
| Undetermined  | Morpho sp. 1                 | 1            | 0            | 1        |
|               | sp. 2                        | 6            | 0            | 6        |
| <b>Totals</b> |                              | 0            | 0            | 0        |
|               | <b>Families</b>              |              |              |          |
|               | sp.                          | 2            | 0            | 2        |
|               | <b>Potential no. species</b> | 2 so far     | 0            | 2 so far |
|               | <b>Individuals</b>           | 7            | 0            | 7        |

Table H2. Snails and slugs collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species                | BR specimens | CT specimens | Totals    |
|---------------|------------------------------|--------------|--------------|-----------|
| Arionidae     | Morpho sp. 1                 | 13           | 0            | 13        |
| Endodontidae  | Morpho sp. 1                 | 1            | 0            | 1         |
|               | sp. 2                        | 1            | 0            | 1         |
|               | sp. 3                        | 1            | 0            | 1         |
| Polygyridae   | Morpho sp. 1                 | 2            | 0            | 2         |
|               | sp. 2                        | 1            | 0            | 1         |
|               | sp. 3                        | 1            | 0            | 1         |
| Succineidae   | Morpho sp. 1                 | 1            | 0            | 1         |
| Undetermined  | Morpho sp. 1                 | 1            | 0            | 1         |
|               | sp. 2                        | 1            | 0            | 1         |
| Zonitidae     | Morpho sp. 1                 | 23           | 10           | 33        |
|               | sp. 2                        | 6            | 0            | 6         |
| <b>Totals</b> |                              | 5            | 1            | 5         |
|               | <b>Families</b>              |              |              |           |
|               | sp.                          | 12           | 1            | 12        |
|               | <b>Potential no. species</b> | 12 so far    | 1 so far     | 12 so far |
|               | <b>Individuals</b>           | 52           | 10           | 62        |

Table H3. Worms collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species             | BR specimens | CT specimens | Totals   |
|---------------|---------------------------|--------------|--------------|----------|
| Undetermined  | Morpho sp. 1              | 13           | 0            | 13       |
|               | sp. 2                     | 0            | 2            | 2        |
|               | Cannot determine to morph | 12           | 0            | 12       |
| <b>Totals</b> |                           | 0            | 0            | 0        |
|               | <b>Families</b>           |              |              |          |
|               | Potential no. species     | 1 so far     | 1 so far     | 2 so far |
|               | <b>Individuals</b>        | 25           | 2            | 27       |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H4. Spiders collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family       | Genus species                    | BR specimens | CT specimens | Totals |
|--------------|----------------------------------|--------------|--------------|--------|
| Agelenidae   | <i>Agelenopsis pennsylvanica</i> | 0            | 5            | 5      |
|              | <i>Agelenopsis?</i> Sp.          | 2            | 0            | 2      |
|              | <i>Coras juvenilis</i>           | 1            | 0            | 1      |
|              | Cannot be further IDed           | 1            | 0            | 1      |
| Amaurobiidae | <i>Callobius bennetti</i>        | 1            | 0            | 1      |
|              | sp.                              | 1            | 0            | 1      |
| Anyphaenidae | <i>Anyphaena</i> sp.             | 0            | 2            | 2      |
|              | <i>Anyphaena?</i> Sp.            | 3            | 0            | 3      |
|              | <i>Aysa gracilis</i>             | 1            | 0            | 1      |
|              | <i>Wulfila saltibunda?</i>       | 0            | 1            | 1      |
|              | Cannot be further IDed           | 52           | 1            | 53     |
| Araneidae    | <i>Araneus pratensis?</i>        | 0            | 1            | 1      |
|              | <i>Araniella displicata</i>      | 0            | 1            | 1      |
|              | <i>Cyclosa conica?</i>           | 1            | 0            | 1      |
|              | <i>Cyclosa?</i> Sp.              | 1            | 0            | 1      |
|              | <i>Larinioides?</i> Sp.          | 0            | 1            | 1      |
|              | <i>Mangora maculata</i>          | 0            | 1            | 1      |
|              | sp.                              | 22           | 7            | 29     |
|              | <i>Mangora?</i> Sp.              | 3            | 0            | 3      |
|              | <i>Micrathena gracilis?</i>      | 3            | 0            | 3      |
|              | <i>Neoscona?</i> Sp.             | 0            | 1            | 1      |
|              | Cannot be further IDed           | 7            | 3            | 10     |
|              | <i>Agroeca minuta</i>            | 1            | 0            | 1      |
| Clubionidae  | <i>Clubiona abbotii</i>          | 0            | 1            | 1      |
|              | <i>Clubionoides excepta</i>      | 4            | 1            | 5      |
|              | <i>excepta?</i>                  | 1            | 0            | 1      |
|              | <i>Phrurotimpus alarius</i>      | 5            | 0            | 5      |
|              | <i>Phrurotimpus?</i> Sp.         | 1            | 0            | 1      |
|              | Cannot be further IDed           | 10           | 2            | 12     |
|              | <i>Castianeira cingulata</i>     | 2            | 0            | 2      |
| Corinnidae   | <i>longipalpus</i>               | 2            | 0            | 2      |
|              | sp.                              | 2            | 3            | 5      |
|              | <i>Castianeira?</i> Sp.          | 0            | 4            | 4      |
| Dictynidae   | <i>Dictyna</i> sp.               | 2            | 5            | 7      |
|              | <i>sublata</i>                   | 1            | 6            | 7      |
|              | <i>Dictyna?</i> Sp.              | 0            | 1            | 1      |
| Erigonidae   | <i>Ceraticelus fissiceps</i>     | 2            | 1            | 3      |
|              | <i>pygmaeus</i>                  | 1            | 3            | 4      |
|              | sp.                              | 3            | 0            | 3      |
|              | <i>Ceraticelus?</i> Sp.          | 1            | 0            | 1      |
|              | <i>Scylaceus pallidus?</i>       | 1            | 0            | 1      |
|              | Cannot be further IDed           | 2            | 2            | 4      |
| Gnaphosidae  | <i>Drassyllus novus</i>          | 4            | 0            | 4      |
|              | <i>Herpyllus ecclesiasticus</i>  | 2            | 0            | 2      |
|              | <i>Sergiolus capulatus</i>       | 1            | 0            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H4. Spiders collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species                  | BR specimens | CT specimens | Totals |
|---------------|--------------------------------|--------------|--------------|--------|
|               | <b>Cannot be further IDed</b>  | 2            | 1            | 3      |
| Hahniidae     | <i>Neoantistea magna</i>       | 4            | 0            | 4      |
|               | <i>Neoantistea? Sp.</i>        | 2            | 0            | 2      |
| Linyphiidae   | <i>Frontinella pyramitela</i>  | 0            | 1            | 1      |
|               | <i>Lepthyphantes sp.</i>       | 0            | 1            | 1      |
|               | <i>Linyphia pusilla</i>        | 0            | 1            | 1      |
|               | <i>Meioneta simplex</i>        | 2            | 1            | 3      |
|               | <i>Microlinyphia maculata?</i> | 2            | 3            | 5      |
|               | <b>Cannot be further IDed</b>  | 6            | 4            | 10     |
| Lycosidae     | <i>Pardosa milvina</i>         | 0            | 3            | 3      |
|               | <i>saxatilis</i>               | 0            | 1            | 1      |
|               | <i>sp.</i>                     | 0            | 1            | 1      |
|               | <i>Pirata sedentarius</i>      | 15           | 9            | 24     |
|               | <i>sedentarius?</i>            | 1            | 0            | 1      |
|               | <i>sp.</i>                     | 4            | 1            | 5      |
|               | <i>Pirata? Sp.</i>             | 2            | 4            | 6      |
|               | <i>Schizocosa ocreata</i>      | 7            | 0            | 7      |
|               | <i>occreata?</i>               | 2            | 0            | 2      |
|               | <i>Schizocosa? Sp.</i>         | 0            | 1            | 1      |
|               | <b>Cannot be further IDed</b>  | 1            | 16           | 17     |
| Mimetidae     | <i>Mimetus puritanus</i>       | 1            | 0            | 1      |
| Oxyopidae     | <i>Oxyopus scalaris</i>        | 0            | 1            | 1      |
|               | <i>scalaris?</i>               | 0            | 4            | 4      |
|               | <b>Cannot be further IDed</b>  | 1            | 0            | 1      |
| Philodromidae | <i>Philodromus marxi?</i>      | 0            | 4            | 4      |
|               | <i>rufus</i>                   | 1            | 0            | 1      |
|               | <i>rufus?</i>                  | 0            | 2            | 2      |
|               | <i>sp.</i>                     | 1            | 1            | 2      |
|               | <i>Philodromus? Sp.</i>        | 0            | 3            | 3      |
|               | <i>Thanatus? Sp.</i>           | 0            | 1            | 1      |
|               | <b>Cannot be further IDed</b>  | 2            | 5            | 7      |
| Pisauridae    | <i>Dolomedes tenebrosus</i>    | 1            | 0            | 1      |
|               | <i>triton?</i>                 | 1            | 0            | 1      |
|               | <i>Dolomedes? Sp.</i>          | 3            | 3            | 6      |
|               | <i>Pisaurina mira</i>          | 5            | 5            | 10     |
|               | <i>mira?</i>                   | 9            | 4            | 13     |
| Salticidae    | <i>Habrocestum pulex</i>       | 7            | 1            | 8      |
|               | <i>Hentzia mitrata</i>         | 0            | 1            | 1      |
|               | <i>Icius sp.</i>               | 0            | 1            | 1      |
|               | <i>Marpissa lineata</i>        | 1            | 0            | 1      |
|               | <i>Metaphidippus sp.</i>       | 0            | 1            | 1      |
|               | <i>Metaphidippus? Sp.</i>      | 0            | 3            | 3      |
|               | <i>Sitticus sp.</i>            | 1            | 0            | 1      |
|               | <b>Cannot be further IDed</b>  | 2            | 8            | 10     |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H4. Spiders collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family                       | Genus species                 | BR specimens     | CT specimens     | Totals           |
|------------------------------|-------------------------------|------------------|------------------|------------------|
| Tetragnathidae               | <i>Tetragnatha? Sp.</i>       | 0                | 9                | 9                |
| Theridiidae                  | <i>Crustulina altera</i>      | 2                | 0                | 2                |
|                              | <i>Ctenium sp.</i>            | 1                | 0                | 1                |
|                              | <i>Dipoena nigra</i>          | 2                | 0                | 2                |
|                              | <i>nigra?</i>                 | 2                | 0                | 2                |
|                              | <i>Dipoena? Sp.</i>           | 0                | 2                | 2                |
|                              | <i>Euryopis argentea</i>      | 1                | 0                | 1                |
|                              | <i>funebis</i>                | 1                | 5                | 6                |
|                              | <i>Steatoda americana</i>     | 1                | 0                | 1                |
|                              | <i>□mericana?</i>             | 2                | 0                | 2                |
|                              | <i>Theridion differens</i>    | 6                | 0                | 6                |
|                              | <i>frondeum</i>               | 1                | 2                | 3                |
|                              | <i>frondeum?</i>              | 0                | 1                | 1                |
|                              | <i>sp.</i>                    | 1                | 6                | 7                |
|                              | <i>Theridion? Sp.</i>         | 2                | 3                | 5                |
|                              | Cannot be further IDed        | 3                | 10               | 13               |
| Thomisidae                   | <i>Coriarachne versicolor</i> | 1                | 0                | 1                |
|                              | <i>Misumena vatia</i>         | 0                | 1                | 1                |
|                              | <i>Misumenoides? Sp.</i>      | 0                | 5                | 5                |
|                              | <i>Misumenops sp.</i>         | 0                | 2                | 2                |
|                              | <i>Misumenops? Sp.</i>        | 3                | 7                | 10               |
|                              | <i>Xysticus ferox</i>         | 1                | 0                | 1                |
|                              | <i>fraternus</i>              | 4                | 0                | 4                |
|                              | <i>sp.</i>                    | 2                | 1                | 3                |
|                              | <i>Xysticus? sp.</i>          | 3                | 2                | 5                |
|                              | Cannot be further IDed        | 3                | 6                | 9                |
| Uloboridae                   | <i>Hyptiotes cavatus</i>      | 0                | 1                | 1                |
|                              | <i>sp.</i>                    | 1                | 0                | 1                |
|                              | <i>Hyptiotes? sp.</i>         | 6                | 0                | 6                |
| Unknown                      | Cannot be further IDed        | 0                | 2                | 2                |
| <b>Totals</b>                |                               | <b>20</b>        | <b>18</b>        | <b>21</b>        |
| <b>Families</b>              |                               | <b>20</b>        | <b>18</b>        | <b>21</b>        |
| <b>Genera</b>                |                               | <b>36</b>        | <b>31</b>        | <b>53</b>        |
| <b>?Genera</b>               |                               | <b>13</b>        | <b>16</b>        | <b>24</b>        |
| <b>Named species</b>         |                               | <b>33</b>        | <b>22</b>        | <b>46</b>        |
| <b>sp.</b>                   |                               | <b>25</b>        | <b>29</b>        | <b>42</b>        |
| <b>?Species</b>              |                               | <b>11</b>        | <b>8</b>         | <b>17</b>        |
| <b>Potential no. species</b> |                               | <b>57 so far</b> | <b>49 so far</b> | <b>83 so far</b> |
| <b>Individuals</b>           |                               | <b>282</b>       | <b>214</b>       | <b>496</b>       |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H5. Harvestmen collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species             | BR specimens | CT specimens | Totals |
|---------------|---------------------------|--------------|--------------|--------|
| Leiobunidae   | <i>Hadrobunus grandis</i> | 7            | 0            | 7      |
|               | <i>Leiobunum flavum</i> ? | 0            | 1            | 1      |
|               | <i>formosum</i>           | 12           | 0            | 12     |
|               | <i>longipes</i>           | 2            | 0            | 2      |
|               | <i>nigripes</i>           | 6            | 1            | 7      |
|               | <i>nigropalpi</i>         | 7            | 0            | 7      |
|               | <i>politum</i>            | 0            | 3            | 3      |
|               | <i>speciosum</i>          | 0            | 2            | 2      |
|               | <i>vittatum</i>           | 0            | 5            | 5      |
| Phalangidae   | <i>Opilio parietinus</i>  | 16           | 3            | 19     |
|               | <i>Phalangium opilio</i>  | 0            | 3            | 3      |
| Unknown       | Cannot be further IDed    | 1            | 0            | 1      |
| <b>Totals</b> |                           |              |              |        |
|               | <b>Families</b>           | 2            | 2            | 2      |
|               | <b>Genera</b>             | 3            | 3            | 4      |
|               | <b>Named species</b>      | 6            | 7            | 11     |
|               | <b>Individuals</b>        | 51           | 18           | 69     |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H6. Mites collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family               | Genus species                | BR specimens     | CT specimens     | Totals           |
|----------------------|------------------------------|------------------|------------------|------------------|
| Erythraeidae         | Morpho sp. 1                 | 0                | 2                | 2                |
|                      | sp. 2                        | 0                | 1                | 1                |
| Ixodidae             | Morpho sp. 1                 | 2                | 1                | 3                |
| Johnstonianidae      | Morpho sp. 1                 | 2                | 0                | 2                |
|                      | sp. 2                        | 3                | 0                | 3                |
| S.O. Cryptostigmata  | Morpho sp. 1                 | 571              | 253              | 824              |
|                      | sp. 2                        | 1                | 0                | 1                |
|                      | sp. 3                        | 32               | 0                | 32               |
|                      | sp. 4                        | 11               | 0                | 11               |
|                      | sp. 5                        | 0                | 5                | 5                |
|                      | Cannot be further IDed       | 0                | 2                | 2                |
| S.O. Cryptostigmata? | Cannot be further IDed       | 119              | 48               | 167              |
| S.O. Mesostigmata    | Morpho sp. 1                 | 24               | 24               | 48               |
|                      | sp. 2                        | 44               | 27               | 71               |
|                      | sp. 3                        | 1                | 1                | 2                |
|                      | sp. 4                        | 288              | 82               | 370              |
|                      | sp. 5                        | 2                | 1                | 3                |
|                      | sp. 6                        | 0                | 1                | 1                |
|                      | Cannot be further IDed       | 0                | 2                | 2                |
| S.O. Mesostigmata?   | Morpho sp. 4?                | 1                | 0                | 1                |
|                      | Cannot be further IDed       | 0                | 8                | 8                |
| S.O. Metastigmata    | Morpho sp. 1                 | 1                | 1                | 2                |
| S.O. Prostigmata     | Morpho sp. 1                 | 1                | 0                | 1                |
|                      | sp. 2                        | 12               | 9                | 21               |
|                      | sp. 3                        | 1                | 0                | 1                |
|                      | sp. 4                        | 2                | 1                | 3                |
|                      | sp. 5                        | 3                | 0                | 3                |
|                      | sp. 6                        | 0                | 4                | 4                |
|                      | sp. 7                        | 0                | 1                | 1                |
|                      | sp. 8                        | 0                | 4                | 4                |
| S.O. Prostigmata?    | Cannot be further IDed       | 29               | 1                | 30               |
| Unknown              | Cannot be further IDed       | 96               | 35               | 131              |
| <b>Totals</b>        | <b>Families</b>              | <b>2</b>         | <b>2</b>         | <b>3</b>         |
|                      | <b>Potential no. species</b> | <b>18 so far</b> | <b>17 so far</b> | <b>25 so far</b> |
|                      | <b>Individuals</b>           | <b>1246</b>      | <b>514</b>       | <b>1760</b>      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H7. Pseudoscorpions collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species                | BR specimens | CT specimens | Totals   |
|---------------|------------------------------|--------------|--------------|----------|
| Neobisiidae   | <b>Morpho sp. 1</b>          | 4            | 2            | 6        |
|               | <b>sp. 2</b>                 | 5            | 2            | 7        |
| <b>Totals</b> | <b>Families</b>              | 1            | 1            | 1        |
|               | <b>Potential no. species</b> | 2 so far     | 2 so far     | 2 so far |
|               | <b>Individuals</b>           | 9            | 4            | 13       |

Table H8. Sowbugs collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species                    | BR specimens | CT specimens | Totals   |
|---------------|----------------------------------|--------------|--------------|----------|
| Oniscidae     | <b>Morpho sp. 1</b>              | 31           | 41           | 72       |
|               | <b>Cannot determine to morph</b> | 215          | 1            | 216      |
| <b>Totals</b> | <b>Families</b>                  | 1            | 1            | 1        |
|               | <b>sp.</b>                       | 1            | 1            | 1        |
|               | <b>Potential no. species</b>     | 1 so far     | 1 so far     | 1 so far |
|               | <b>Individuals</b>               | 246          | 42           | 288      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H9. Millipedes collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

Order: Polydesmida

| Family            | Genus species                | BR specimens | CT specimens | Totals   |
|-------------------|------------------------------|--------------|--------------|----------|
| Paradoxosomatidae | <i>Morpho sp. 1</i>          | 8            | 0            | 8        |
| Polydesmidae      | <i>Morpho sp. 1</i>          | 4            | 0            | 4        |
| Xystodesmidae     | <i>Morpho sp. 1</i>          | 1            | 0            | 1        |
| <b>Totals</b>     | <b>Families</b>              | 3            | 0            | 3        |
|                   | <b>Potential no. species</b> | 3 so far     | 0            | 3 so far |
|                   | <b>Individuals</b>           | 13           | 0            | 13       |

Order: Polyxenida

| Family        | Genus species                | BR specimens | CT specimens | Totals |
|---------------|------------------------------|--------------|--------------|--------|
| Polyxenidae   | <i>Polyxenus sp. 1</i>       | 0            | 3            | 3      |
| <b>Totals</b> | <b>Families</b>              | 0            | 1            | 1      |
|               | <b>Genera</b>                | 0            | 1            | 1      |
|               | <b>sp.</b>                   | 0            | 1            | 1      |
|               | <b>Potential no. species</b> | 0            | 1            | 1      |
|               | <b>Individuals</b>           | 0            | 3            | 3      |

Order: Spirobolida

| Family        | Genus species                | BR specimens | CT specimens | Totals |
|---------------|------------------------------|--------------|--------------|--------|
| Undetermined  | <i>Morpho sp. 1</i>          | 1            | 0            | 1      |
| <b>Totals</b> | <b>sp.</b>                   | 1            | 0            | 1      |
|               | <b>Potential no. species</b> | 1            | 0            | 1      |
|               | <b>Individuals</b>           | 1            | 0            | 1      |

Order: Spirostreptida

| Family         | Genus species                | BR specimens | CT specimens | Totals   |
|----------------|------------------------------|--------------|--------------|----------|
| Cambalidae     | <i>Morpho sp. 1</i>          | 92           | 6            | 98       |
|                | <i>sp. 2</i>                 | 0            | 1            | 1        |
| Undetermined * | <i>Morpho sp. 1</i>          | 4            | 0            | 4        |
| <b>Totals</b>  | <b>Families</b>              | 1            | 1            | 1        |
|                | <b>Potential no. species</b> | 1 so far     | 2 so far     | 2 so far |
|                | <b>Individuals</b>           | 96           | 7            | 103      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H10. Centipedes collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

Order: Geophilomorpha

| Family        | Genus species                | BR specimens | CT specimens | Totals   |
|---------------|------------------------------|--------------|--------------|----------|
| Undetermined  | <i>Morpho sp. 1</i>          | 3            | 2            | 5        |
|               | <i>sp. 2</i>                 | 1            | 0            | 1        |
|               | <i>sp. 3</i>                 | 3            | 0            | 3        |
|               | <i>sp. 4</i>                 | 1            | 0            | 1        |
| <b>Totals</b> | <b>Families</b>              | 0            | 0            | 0        |
|               | <b>Potential no. species</b> | 4 so far     | 1 so far     | 4 so far |
|               | <b>Individuals</b>           | 8            | 2            | 10       |

Order: Lithobiomorpha

| Family        | Genus species                | BR specimens | CT specimens | Totals   |
|---------------|------------------------------|--------------|--------------|----------|
| Henicopidae   | <i>Morpho sp. 1</i>          | 0            | 1            | 1        |
| Lithobiidae   | <i>Morpho sp. 1</i>          | 15           | 5            | 20       |
|               | <i>sp. 2</i>                 | 0            | 2            | 2        |
| <b>Totals</b> | <b>Families</b>              | 1            | 2            | 2        |
|               | <b>Potential no. species</b> | 1 so far     | 3 so far     | 3 so far |
|               | <b>Individuals</b>           | 15           | 8            | 23       |

Order: Scolopendromorpha

| Family        | Genus species                | BR specimens | CT specimens | Totals |
|---------------|------------------------------|--------------|--------------|--------|
| Cryptopidae   | <i>Morpho sp. 1</i>          | 0            | 1            | 1      |
| <b>Totals</b> | <b>Families</b>              | 0            | 1            | 1      |
|               | <b>Potential no. species</b> | 0            | 1            | 1      |
|               | <b>Individuals</b>           | 0            | 1            | 1      |

Table H11. Symphylans collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species                | BR specimens | CT specimens | Totals   |
|---------------|------------------------------|--------------|--------------|----------|
| Undetermined  | <i>Morpho sp. 1</i>          | 11           | 1            | 12       |
|               | <i>sp. 2</i>                 | 4            | 0            | 4        |
| <b>Totals</b> | <b>Families</b>              | 0            | 0            | 0        |
|               | <b>sp.</b>                   | 2            | 1            | 2        |
|               | <b>Potential no. species</b> | 2 so far     | 1 so far     | 2 so far |
|               | <b>Individuals</b>           | 15           | 1            | 16       |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H12. Proturans collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species                | BR specimens | CT specimens | Totals   |
|---------------|------------------------------|--------------|--------------|----------|
| Acerentomidae | Morpho sp. 1                 | 2            | 0            | 2        |
| <b>Totals</b> | <b>Families</b>              | 1            | 0            | 1        |
|               | <b>Potential no. species</b> | 1 so far     | 0            | 1 so far |
|               | <b>Individuals</b>           | 2            | 0            | 2        |

Table H13. Springtails collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family          | Genus species                | BR specimens | CT specimens | Totals    |
|-----------------|------------------------------|--------------|--------------|-----------|
| Entomobryidae   | Morpho sp. 1                 | 265          | 32           | 297       |
|                 | sp. 2                        | 4            | 2            | 6         |
|                 | sp. 3                        | 21           | 6            | 27        |
|                 | sp. 4                        | 21           | 1            | 22        |
|                 | sp. 5                        | 11           | 1            | 12        |
|                 | sp. 6                        | 40           | 3            | 43        |
|                 | sp. 7                        | 3            | 0            | 3         |
|                 | sp. 8                        | 4            | 0            | 4         |
|                 | sp. 9                        | 5            | 0            | 5         |
|                 | sp. 10                       | 0            | 62           | 62        |
|                 | Cannot be further IDed       | 26           | 47           | 73        |
| Hypogastruridae | Morpho sp. 1                 | 4            | 0            | 4         |
|                 | sp. 2                        | 146          | 3            | 149       |
|                 | sp. 3                        | 50           | 0            | 50        |
|                 | Cannot be further IDed       | 0            | 1            | 1         |
| Isotomidae      | Morpho sp. 1                 | 33           | 0            | 33        |
|                 | sp. 2                        | 1            | 0            | 1         |
|                 | sp. 3                        | 1            | 0            | 1         |
|                 | Cannot be further IDed       | 85           | 21           | 106       |
| Neelidae        | Morpho sp. 1                 | 1            | 0            | 1         |
|                 | Cannot be further IDed       | 1            | 0            | 1         |
| Onychiuridae    | Morpho sp. 1                 | 186          | 2            | 188       |
|                 | sp. 2                        | 0            | 1            | 1         |
| Sminthuridae    | Morpho sp. 1                 | 1            | 9            | 10        |
|                 | sp. 2                        | 7            | 0            | 7         |
|                 | sp. 3                        | 1            | 1            | 2         |
|                 | sp. 4                        | 1            | 0            | 1         |
|                 | Cannot be further IDed       | 7            | 0            | 7         |
| Unknown         | Cannot be further IDed       | 1            | 1            | 2         |
| <b>Totals</b>   | <b>Families</b>              | 6            | 5            | 6         |
|                 | <b>sp.</b>                   | 21           | 12           | 23        |
|                 | <b>Potential no. species</b> | 21 so far    | 13 so far    | 23 so far |
|                 | <b>Individuals</b>           | 926          | 193          | 1119      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H14. Diplurans collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species                | BR specimens | CT specimens | Totals   |
|---------------|------------------------------|--------------|--------------|----------|
| Campodeidae   | <b>Morpho sp. 1</b>          | 7            | 23           | 30       |
| Japygidae     | <b>Morpho sp. 1</b>          | 4            | 0            | 4        |
| <b>Totals</b> | <b>Families</b>              | 2            | 1            | 2        |
|               | <b>Potential no. species</b> | 2 so far     | 1 so far     | 2 so far |
|               | <b>Individuals</b>           | 11           | 23           | 34       |

Table H15. Jumping bristletails collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family         | Genus species                | BR specimens | CT specimens | Totals   |
|----------------|------------------------------|--------------|--------------|----------|
| Machilidae     | <b>Morpho sp. 1</b>          | 12           | 0            | 12       |
|                | sp. 2                        | 6            | 0            | 6        |
|                | sp. 3                        | 0            | 1            | 1        |
| Meinertellidae | <b>Morpho sp. 1</b>          | 5            | 0            | 5        |
|                | sp. 2                        | 0            | 1            | 1        |
| <b>Totals</b>  | <b>Families</b>              | 2            | 2            | 2        |
|                | <b>Potential no. species</b> | 3 so far     | 2 so far     | 5 so far |
|                | <b>Individuals</b>           | 23           | 2            | 25       |

Table H16. Mayflies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species                | BR specimens | CT specimens | Totals |
|---------------|------------------------------|--------------|--------------|--------|
| Baetidae      | <b>Morpho sp. 1</b>          | 1            | 0            | 1      |
| <b>Totals</b> | <b>Families</b>              | 1            | 0            | 1      |
|               | <b>sp.</b>                   | 1            | 0            | 1      |
|               | <b>Potential no. species</b> | 1            | 0            | 1      |
|               | <b>Individuals</b>           | 1            | 0            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H17. Grasshoppers and crickets collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family                       | Genus species                   | BR specimens | CT specimens | Totals    |
|------------------------------|---------------------------------|--------------|--------------|-----------|
| Acrididae                    | <b>Morpho sp. 1</b>             | 2            | 0            | 2         |
|                              | sp. 2                           | 1            | 0            | 1         |
|                              | sp. 3                           | 0            | 1            | 1         |
|                              | sp. 4                           | 0            | 2            | 2         |
| Gryllacrididae               | <i>Camptonotus carolinensis</i> | 4            | 0            | 4         |
| Gryllidae                    | <i>Oecanthus fultoni</i>        | 2            | 0            | 2         |
|                              | sp. 1                           | 33           | 0            | 33        |
|                              | <b>Morpho sp. 1</b>             | 10           | 0            | 10        |
|                              | sp. 2                           | 1            | 1            | 2         |
|                              | sp. 3                           | 7            | 2            | 9         |
|                              | sp. 4                           | 2            | 1            | 3         |
|                              | sp. 5                           | 0            | 3            | 3         |
|                              | sp. 6                           | 0            | 1            | 1         |
|                              | sp. 7                           | 0            | 1            | 1         |
|                              | sp. 8                           | 0            | 2            | 2         |
|                              | sp. 9                           | 0            | 3            | 3         |
|                              | sp. 10                          | 0            | 6            | 6         |
|                              | sp. 11                          | 0            | 3            | 3         |
| Rhaphidophidae               | <i>Ceuthophilus sp. 1</i>       | 4            | 0            | 4         |
| Tettigoniidae                | <b>Morpho sp. 1</b>             | 2            | 0            | 2         |
|                              | sp. 2                           | 5            | 26           | 31        |
|                              | sp. 3                           | 0            | 1            | 1         |
| <b>Totals</b>                |                                 | 5            | 3            | 5         |
| <b>Families</b>              |                                 | 3            | 0            | 3         |
| <b>Genera</b>                |                                 | 2            | 0            | 2         |
| <b>Named species</b>         |                                 | 10           | 14           | 20        |
| <b>sp.</b>                   |                                 | 12 so far    | 14 so far    | 22 so far |
| <b>Potential no. species</b> |                                 | 73           | 53           | 126       |
| <b>Individuals</b>           |                                 |              |              |           |

Table H18. Mantids collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family                       | Genus species       | BR specimens | CT specimens | Totals   |
|------------------------------|---------------------|--------------|--------------|----------|
| Mantidae                     | <b>Morpho sp. 1</b> | 0            | 2            | 2        |
| <b>Totals</b>                |                     | 0            | 1            | 1        |
| <b>Families</b>              |                     | 0            | 1            | 1        |
| <b>sp.</b>                   |                     | 0            | 1 so far     | 1 so far |
| <b>Potential no. species</b> |                     | 0            | 2            | 2        |
| <b>Individuals</b>           |                     |              |              |          |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H19. Roaches collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species                | BR specimens | CT specimens | Totals   |
|---------------|------------------------------|--------------|--------------|----------|
| Blattellidae  | <b>Morpho sp. 1</b>          | 4            | 0            | 4        |
|               | <i>Parcoblatta sp. 1</i>     | 1            | 0            | 1        |
|               | <i>virginica</i>             | 2            | 0            | 2        |
|               | <b>Not identified *</b>      | 1            | 0            | 1        |
| <b>Totals</b> | <b>Families</b>              | 1            | 0            | 1        |
|               | <b>Genera</b>                | 1            | 0            | 1        |
|               | <b>Named species</b>         | 1            | 0            | 1        |
|               | <b>sp.</b>                   | 2            | 0            | 2        |
|               | <b>Potential no. species</b> | 3 so far     | 0            | 3 so far |
|               | <b>Individuals</b>           | 8            | 0            | 8        |

\* This specimen is actually an egg case.

Table H20. Termites collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family          | Genus species                  | BR specimens | CT specimens | Totals |
|-----------------|--------------------------------|--------------|--------------|--------|
| Rhinotermitidae | <i>Reticulitermes flavipes</i> | 14           | 6            | 20     |
| <b>Totals</b>   | <b>Families</b>                | 1            | 1            | 1      |
|                 | <b>Genera</b>                  | 1            | 1            | 1      |
|                 | <b>Named species</b>           | 1            | 1            | 1      |
|                 | <b>Individuals</b>             | 14           | 6            | 20     |

Table H21. Stoneflies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species                | BR specimens | CT specimens | Totals   |
|---------------|------------------------------|--------------|--------------|----------|
| Leuctridae    | <b>Morpho sp. 1</b>          | 5            | 0            | 5        |
|               | <i>sp. 2</i>                 | 1            | 0            | 1        |
| Nemouridae    | <b>Morpho sp. 1</b>          | 4            | 0            | 4        |
| Perlidae      | <b>Morpho sp. 1</b>          | 3            | 0            | 3        |
|               | <i>sp. 2</i>                 | 0            | 1            | 1        |
| <b>Totals</b> | <b>Families</b>              | 3            | 1            | 3        |
|               | <b>sp.</b>                   | 4            | 1            | 5        |
|               | <b>Potential no. species</b> | 4 so far     | 1            | 5 so far |
|               | <b>Individuals</b>           | 13           | 1            | 14       |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H22. Psocids collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family         | Genus species                 | BR specimens | CT specimens | Totals    |
|----------------|-------------------------------|--------------|--------------|-----------|
| Amphipsocidae  | <b>Morpho sp. 1</b>           | 12           | 0            | 12        |
|                | sp. 2                         | 1            | 0            | 1         |
| Caeciliidae    | <b>Morpho sp. 1</b>           | 48           | 0            | 48        |
| Ectopsocidae   | <b>Morpho sp. 1</b>           | 1            | 7            | 8         |
|                | sp. 2                         | 41           | 2            | 43        |
|                | sp. 3                         | 21           | 0            | 21        |
|                | <b>Cannot be further IDed</b> | 1            | 0            | 1         |
| Epipsocidae    | <b>Morpho sp. 1</b>           | 21           | 1            | 22        |
| Lachesillidae  | <b>Morpho sp. 1</b>           | 5            | 1            | 6         |
|                | sp. 2                         | 1            | 0            | 1         |
|                | sp. 3                         | 1            | 0            | 1         |
|                | <b>Cannot be further IDed</b> | 1            | 0            | 1         |
| Lepidopsocidae | <b>Morpho sp. 1</b>           | 0            | 5            | 5         |
|                | <b>Cannot be further IDed</b> | 0            | 1            | 1         |
| Liposcelidae   | <b>Morpho sp. 1</b>           | 1            | 0            | 1         |
| Mesopsocidae   | <b>Morpho sp. 1</b>           | 1            | 0            | 1         |
| Philotarsidae  | <b>Morpho sp. 1</b>           | 0            | 1            | 1         |
| Psocidae       | <b>Morpho sp. 1</b>           | 7            | 1            | 8         |
|                | sp. 2                         | 10           | 0            | 10        |
| Trogiidae      | <b>Morpho sp. 1</b>           | 2            | 1            | 3         |
| Undetermined   | <b>Cannot be further IDed</b> | 32           | 6            | 38        |
| Unknown        | <b>Cannot be further IDed</b> | 5            | 0            | 5         |
| <b>Totals</b>  | <b>Families</b>               | 9            | 7            | 11        |
|                | <b>Potential no. species</b>  | 15 so far    | 8 so far     | 17 so far |
|                | <b>Individuals</b>            | 212          | 26           | 238       |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H23. True bugs collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family                       | Genus species                 | BR specimens | CT specimens | Totals    |
|------------------------------|-------------------------------|--------------|--------------|-----------|
| Alydidae                     | <b>Morpho sp. 1</b>           | 1            | 0            | 1         |
| Anthocoridae                 | <b>Morpho sp. 1</b>           | 0            | 2            | 2         |
|                              | <i>sp. 2</i>                  | 1            | 0            | 1         |
| Aradidae                     | <b>Morpho sp. 1</b>           | 1            | 0            | 1         |
|                              | <b>Cannot be further IDed</b> | 1            | 0            | 1         |
| Berytidae                    | <b>Morpho sp. 1</b>           | 7            | 0            | 7         |
| Cydnidae                     | <b>Morpho sp. 1</b>           | 2            | 1            | 3         |
|                              | <i>sp. 2</i>                  | 1            | 0            | 1         |
|                              | <b>Cannot be further IDed</b> | 0            | 1            | 1         |
|                              | <b>Morpho sp. 1</b>           | 7            | 0            | 7         |
| Gerridae                     | <b>Morpho sp. 1</b>           | 7            | 0            | 7         |
| Hebridae                     | <i>Merragata sp. 1</i>        | 1            | 0            | 1         |
| Lygaeidae                    | <i>Geocoris sp. 1</i>         | 0            | 2            | 2         |
|                              | <b>Morpho sp. 1</b>           | 0            | 1            | 1         |
|                              | <i>sp. 2</i>                  | 0            | 1            | 1         |
|                              | <i>sp. 3</i>                  | 6            | 0            | 6         |
|                              | <i>sp. 4</i>                  | 2            | 0            | 2         |
|                              | <i>sp. 5</i>                  | 1            | 0            | 1         |
|                              | <b>Cannot be further IDed</b> | 11           | 7            | 18        |
|                              | <b>Morpho sp. 1</b>           | 2            | 1            | 3         |
|                              | <i>sp. 2</i>                  | 1            | 0            | 1         |
| Miridae                      | <i>sp. 3</i>                  | 7            | 0            | 7         |
|                              | <i>sp. 4</i>                  | 2            | 0            | 2         |
|                              | <i>sp. 5</i>                  | 1            | 0            | 1         |
|                              | <i>sp. 6</i>                  | 1            | 0            | 1         |
|                              | <i>sp. 7</i>                  | 1            | 0            | 1         |
|                              | <i>sp. 8</i>                  | 1            | 0            | 1         |
|                              | <i>sp. 9</i>                  | 1            | 0            | 1         |
|                              | <b>Cannot be further IDed</b> | 17           | 5            | 22        |
|                              | <b>Morpho sp. 1</b>           | 13           | 4            | 17        |
|                              | <i>sp. 2</i>                  | 3            | 0            | 3         |
| Pentatomidae                 | <b>Morpho sp. 1</b>           | 3            | 2            | 5         |
|                              | <i>sp. 2</i>                  | 2            | 2            | 4         |
|                              | <b>Cannot be further IDed</b> | 8            | 1            | 9         |
| Reduviidae                   | <b>Morpho sp. 1</b>           | 1            | 0            | 1         |
|                              | <i>sp. 2</i>                  | 0            | 1            | 1         |
|                              | <b>Cannot be further IDed</b> | 2            | 11           | 13        |
| Tingidae                     | <b>Morpho sp. 1</b>           | 0            | 2            | 2         |
|                              | <i>sp. 2</i>                  | 11           | 0            | 11        |
| <b>Totals</b>                |                               | 13           | 8            | 13        |
| <b>Families</b>              |                               |              |              |           |
| <b>Genera</b>                |                               | 1            | 1            | 2         |
| <b>sp.</b>                   |                               | 26           | 11           | 32        |
| <b>Potential no. species</b> |                               | 26 so far    | 11 so far    | 32 so far |
| <b>Individuals</b>           |                               | 119          | 44           | 163       |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H24. Homopterans collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species                 | BR specimens | CT specimens | Totals |
|---------------|-------------------------------|--------------|--------------|--------|
| Acanaloniidae | <b>Morpho sp. 1</b>           | 2            | 1            | 3      |
| Aleyrodidae   | <b>Morpho sp. 1</b>           | 8            | 8            | 16     |
|               | sp. 2                         | 0            | 1            | 1      |
|               | sp. 3                         | 0            | 70           | 70     |
| Aphididae     | <b>Morpho sp. 1</b>           | 17           | 8            | 25     |
|               | sp. 2                         | 0            | 1            | 1      |
|               | sp. 3                         | 7            | 2            | 9      |
|               | sp. 4                         | 0            | 1            | 1      |
|               | sp. 5                         | 6            | 1            | 7      |
|               | sp. 6                         | 1            | 1            | 2      |
|               | sp. 7                         | 3            | 7            | 10     |
|               | sp. 8                         | 0            | 1            | 1      |
|               | sp. 9                         | 5            | 0            | 5      |
|               | sp. 10                        | 1            | 0            | 1      |
|               | sp. 11                        | 1            | 0            | 1      |
|               | sp. 12                        | 1            | 0            | 1      |
|               | sp. 13                        | 3            | 0            | 3      |
|               | <b>Cannot be further IDed</b> | 75           | 4            | 79     |
| Cercopidae    | <i>Clastoptera sp. 1</i>      | 6            | 3            | 9      |
|               | <i>Lepyronia sp. 1</i>        | 4            | 0            | 4      |
|               | <i>Philaenus spumarius</i>    | 15           | 198          | 213    |
|               | <b>Not identified</b>         | 11           | 3            | 14     |
| Cicadellidae  | <i>Agallia constricta</i>     | 4            | 16           | 20     |
|               | <i>Amblysellus curtisii</i>   | 1            | 11           | 12     |
|               | <i>Arthaldeus pascuellus</i>  | 19           | 0            | 19     |
|               | <i>Draeculacephala sp. 1</i>  | 10           | 68           | 78     |
|               | <i>Endria inimica</i>         | 0            | 4            | 4      |
|               | <i>Graminella nigrafrons</i>  | 0            | 10           | 10     |
|               | <i>Graphocephala coccinea</i> | 8            | 0            | 8      |
|               | ? <i>Jassus sp. 1</i>         | 0            | 1            | 1      |
|               | <i>Jassus sp. 1</i>           | 0            | 2            | 2      |
|               | <i>Latalus sayii</i>          | 7            | 10           | 17     |
|               | <b>Morpho sp. 1</b>           | 0            | 2            | 2      |
|               | sp. 2                         | 0            | 1            | 1      |
|               | sp. 3                         | 2            | 31           | 33     |
|               | sp. 4                         | 0            | 23           | 23     |
|               | sp. 5                         | 6            | 22           | 28     |
|               | sp. 6                         | 161          | 60           | 221    |
|               | sp. 7                         | 2            | 67           | 69     |
|               | sp. 8                         | 19           | 30           | 49     |
|               | sp. 9                         | 1            | 43           | 44     |
|               | sp. 10                        | 0            | 10           | 10     |
|               | sp. 11                        | 0            | 3            | 3      |
|               | sp. 12                        | 0            | 1            | 1      |
|               | sp. 13                        | 0            | 1            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H24. Homopterans collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species             | BR specimens | CT specimens | Totals |
|---------------|---------------------------|--------------|--------------|--------|
|               | <i>sp. 14</i>             | 0            | 1            | 1      |
|               | <i>sp. 15</i>             | 51           | 3            | 54     |
|               | <i>sp. 16</i>             | 0            | 1            | 1      |
|               | <i>sp. 17</i>             | 2            | 1            | 3      |
|               | <i>sp. 18</i>             | 0            | 1            | 1      |
|               | <i>sp. 19</i>             | 0            | 1            | 1      |
|               | <i>sp. 20</i>             | 26           | 1            | 27     |
|               | <i>sp. 21</i>             | 0            | 1            | 1      |
|               | <i>sp. 22</i>             | 6            | 1            | 7      |
|               | <i>sp. 23</i>             | 1            | 0            | 1      |
|               | <i>sp. 24</i>             | 1            | 0            | 1      |
|               | <i>sp. 25</i>             | 6            | 0            | 6      |
|               | <i>sp. 26</i>             | 1            | 0            | 1      |
|               | <i>sp. 27</i>             | 1            | 0            | 1      |
|               | <i>sp. 28</i>             | 1            | 0            | 1      |
|               | <i>sp. 29</i>             | 1            | 0            | 1      |
|               | <i>sp. 30</i>             | 2            | 0            | 2      |
|               | <i>sp. 31</i>             | 1            | 0            | 1      |
|               | <i>sp. 32</i>             | 2            | 0            | 2      |
|               | Cannot be further IDed    | 93           | 193          | 286    |
| Cicadidae     | <i>Morpho sp. 1</i>       | 0            | 1            | 1      |
| Delphacidae   | <i>Liberniella ornata</i> | 1            | 3            | 4      |
|               | <i>Morpho sp. 1</i>       | 1            | 0            | 1      |
|               | <i>sp. 2</i>              | 0            | 2            | 2      |
|               | <i>sp. 3</i>              | 0            | 10           | 10     |
|               | <i>sp. 4</i>              | 0            | 5            | 5      |
|               | Cannot be further IDed    | 16           | 46           | 62     |
| Derbidae      | <i>Morpho sp. 1</i>       | 1            | 0            | 1      |
| Eriosomatidae | <i>Morpho sp. 1</i>       | 1            | 0            | 1      |
|               | <i>sp. 2</i>              | 0            | 1            | 1      |
| Flatidae      | <i>Morpho sp. 1</i>       | 0            | 1            | 1      |
|               | <i>sp. 2</i>              | 0            | 3            | 3      |
| Membracidae   | <i>Atymna sp. 1</i>       | 1            | 0            | 1      |
|               | <i>Cyrtolobus sp. 1</i>   | 2            | 0            | 2      |
|               | <i>sp. 2</i>              | 1            | 0            | 1      |
|               | <i>Morpho sp. 1</i>       | 0            | 20           | 20     |
|               | <i>sp. 2</i>              | 0            | 1            | 1      |
|               | Cannot be further IDed    | 3            | 3            | 6      |
| Psyllidae     | <i>Morpho sp. 1</i>       | 3            | 0            | 3      |
|               | <i>sp. 2</i>              | 22           | 0            | 22     |
|               | <i>sp. 3</i>              | 0            | 9            | 9      |
|               | <i>sp. 4</i>              | 0            | 1            | 1      |
| Undetermined  | <i>Morpho sp. 1</i>       | 2            | 0            | 2      |
|               | <i>sp. 2</i>              | 13           | 15           | 28     |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H24. Homopterans collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species                | BR specimens | CT specimens | Totals    |
|---------------|------------------------------|--------------|--------------|-----------|
|               | <i>sp. 3</i>                 | 3            | 0            | 3         |
|               | Cannot be further IDed       | 97           | 41           | 138       |
| Unknown       | Cannot be further IDed       | 1            | 0            | 1         |
| <b>Totals</b> | <b>Families</b>              | 10           | 11           | 12        |
|               | <b>Genera</b>                | 12           | 10           | 15        |
|               | <b>? Genera</b>              | 0            | 1            | 1         |
|               | <b>Named species</b>         | 7            | 7            | 9         |
|               | <b>sp.</b>                   | 46           | 49           | 76        |
|               | <b>Potential no. species</b> | 53 so far    | 56 so far    | 85 so far |
|               | <b>Individuals</b>           | 769          | 1092         | 1861      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H25. Thrips collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family          | Genus species                | BR specimens | CT specimens | Totals    |
|-----------------|------------------------------|--------------|--------------|-----------|
| Aeolothripidae  | <b>Morpho</b> sp. 1          | 2            | 0            | 2         |
|                 | sp. 2                        | 4            | 0            | 4         |
|                 | sp. 3                        | 2            | 0            | 2         |
|                 | sp. 4                        | 1            | 0            | 1         |
| Phlaeothripidae | <b>Morpho</b> sp. 1          | 1            | 3            | 4         |
|                 | sp. 2                        | 3            | 3            | 6         |
|                 | sp. 3                        | 9            | 0            | 9         |
|                 | sp. 4                        | 1            | 1            | 2         |
|                 | sp. 5                        | 0            | 2            | 2         |
|                 | Cannot be further IDed       | 3            | 0            | 3         |
| Thripidae       | <b>Morpho</b> sp.1           | 133          | 2            | 135       |
|                 | sp.2                         | 21           | 2            | 23        |
|                 | sp.3                         | 10           | 6            | 16        |
|                 | sp.4                         | 20           | 0            | 20        |
|                 | sp.5                         | 3            | 0            | 3         |
|                 | sp.6                         | 2            | 2            | 4         |
|                 | Cannot be further IDed       | 0            | 1            | 1         |
| <b>Totals</b>   | <b>Families</b>              | 3            | 2            | 3         |
|                 | <b>sp.</b>                   | 14           | 8            | 15        |
|                 | <b>Potential no. species</b> | 14 so far    | 8 so far     | 15 so far |
|                 | <b>Individuals</b>           | 215          | 22           | 237       |

Table H26. Lacewings and alderflies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species                | BR specimens | CT specimens | Totals   |
|---------------|------------------------------|--------------|--------------|----------|
| Berothidae    | <i>Lomamyia</i> sp. 1        | 0            | 1            | 1        |
| Chrysopidae   | <b>Morpho</b> sp. 1          | 3            | 1            | 4        |
|               | sp. 2                        | 1            | 0            | 1        |
| Corydalidae   | <b>Morpho</b> sp. 1          | 1            | 0            | 1        |
| Hemerobiidae  | <b>Morpho</b> sp. 1          | 3            | 0            | 3        |
|               | sp. 2                        | 2            | 0            | 2        |
| <b>Totals</b> | <b>Families</b>              | 3            | 2            | 4        |
|               | <b>Genera</b>                | 0            | 1            | 1        |
|               | <b>sp.</b>                   | 5            | 2            | 6        |
|               | <b>Potential no. species</b> | 5 so far     | 2            | 6 so far |
|               | <b>Individuals</b>           | 10           | 2            | 12       |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H27. Beetles collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family      | Genus species                            | BR specimens | CT specimens | Totals |
|-------------|------------------------------------------|--------------|--------------|--------|
| Aderidae    | <b>Morpho</b> sp. 1                      | 1            | 0            | 1      |
| Alleculidae | <i>Hymenorus</i> sp. 1                   | 3            | 0            | 3      |
|             | sp. 2                                    | 0            | 1            | 1      |
|             | <i>Mycetochara</i> sp. 1                 | 11           | 0            | 11     |
|             | sp. 2                                    | 0            | 1            | 1      |
|             | <i>Caenocara</i> sp. 1                   | 7            | 3            | 10     |
| Anobiidae   | <i>Hadrobregmus notatus</i>              | 1            | 0            | 1      |
|             | <b>Morpho</b> sp. 2                      | 2            | 0            | 2      |
|             | sp. 3                                    | 1            | 0            | 1      |
|             | sp. 4                                    | 1            | 0            | 1      |
|             | sp. 5                                    | 2            | 0            | 2      |
|             | sp. 6                                    | 2            | 0            | 2      |
|             | <i>Anthicus</i> sp. 1                    | 2            | 1            | 3      |
| Anthicidae  | <i>Vanonus vigilans</i>                  | 0            | 1            | 1      |
| Anthribidae | <b>Morpho</b> sp. 1                      | 4            | 0            | 4      |
|             | sp. 2                                    | 1            | 0            | 1      |
| Buprestidae | <i>Agrilus</i> sp. 1                     | 22           | 0            | 22     |
|             | sp. 2                                    | 1            | 0            | 1      |
|             | sp. 3                                    | 4            | 0            | 4      |
|             | <i>Haplostethus subcyaneus</i>           | 1            | 0            | 1      |
|             | <i>Pachyschelus purpureus</i>            | 1            | 0            | 1      |
| Byrrhidae   | <i>Syncalypta spinosa</i>                | 0            | 1            | 1      |
| Cantharidae | <i>Cantharis</i> sp. 1                   | 7            | 0            | 7      |
|             | sp. 2                                    | 1            | 0            | 1      |
|             | sp. 3                                    | 5            | 0            | 5      |
|             | <b>Morpho</b> sp. 1                      | 1            | 0            | 1      |
|             | <i>Podabrus</i> sp. 1                    | 11           | 0            | 11     |
|             | <i>Trypherus latipennis</i>              | 1            | 0            | 1      |
|             | <i>Acupalpus pumilus</i>                 | 1            | 1            | 2      |
|             | rectangulus                              | 0            | 2            | 2      |
|             | <i>Agonum aeruginosum</i>                | 1            | 0            | 1      |
|             | melanarium                               | 0            | 5            | 5      |
| Carabidae   | punctiforme                              | 0            | 1            | 1      |
|             | <i>Amara pallipes</i>                    | 0            | 1            | 1      |
|             | <i>Anisodaetylus nigellimus</i>          | 1            | 0            | 1      |
|             | <i>Badister reflexus</i>                 | 1            | 0            | 1      |
|             | <i>Bembidion (Furcacampa) affine</i>     | 41           | 23           | 64     |
|             | impotens                                 | 0            | 1            | 1      |
|             | mimus                                    | 0            | 1            | 1      |
|             | <i>Calathus gregarius</i>                | 0            | 1            | 1      |
|             | <i>Chlaenius (Chlaenius) aestivus</i>    | 2            | 6            | 8      |
|             | laticollis                               | 0            | 1            | 1      |
|             | <i>Clivina (Paraclivina) bipustulata</i> | 1            | 0            | 1      |
|             | <i>Coptodera aerata</i>                  | 1            | 0            | 1      |
|             | <i>Cymindis (Pinacodera) limbatus</i>    | 2            | 0            | 2      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H27. Beetles collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species                            | BR specimens | CT specimens | Totals |
|---------------|------------------------------------------|--------------|--------------|--------|
|               | <i>Dicaelus dilatatus</i>                | 1            | 0            | 1      |
|               | <i>Elaphropus xanthopus</i>              | 1            | 3            | 4      |
|               | <i>Galerita bicolor</i>                  | 0            | 1            | 1      |
|               | <i>Harpalus pensylvanicus</i>            | 0            | 2            | 2      |
|               | <i>Lebia solea</i>                       | 1            | 3            | 4      |
|               | <i>tricolor</i>                          | 0            | 1            | 1      |
|               | <i>Myas caracinus</i>                    | 1            | 0            | 1      |
|               | <i>Notiophilus aeneus</i>                | 2            | 0            | 2      |
|               | <i>Paratachys oblitus</i>                | 1            | 0            | 1      |
|               | <i>potomaca</i>                          | 1            | 3            | 4      |
|               | <i>proximus</i>                          | 7            | 1            | 8      |
|               | <i>pumilus</i>                           | 0            | 1            | 1      |
|               | <i>sp. 1</i>                             | 0            | 2            | 2      |
|               | <i>Perigona nigriceps</i>                | 0            | 1            | 1      |
|               | <i>Platynus decentis</i>                 | 2            | 0            | 2      |
|               | <i>Poecilus lucublandus</i>              | 4            | 6            | 10     |
|               | <i>Pterostichus (Abacidus) permundus</i> | 1            | 0            | 1      |
|               | <i>(Morphnosoma) stygicus</i>            | 1            | 0            | 1      |
|               | <i>Scaphinotus (Irichroa) viduus</i>     | 2            | 0            | 2      |
|               | <i>stenostomus</i>                       |              |              |        |
|               | <i>Sphaeroderus stenostomus</i>          | 1            | 0            | 1      |
|               | <i>Stenolophus</i>                       |              |              |        |
|               | <i>(Agonoderus) lecontei</i>             | 0            | 2            | 2      |
|               | <i>(Stenolophus) ochropezus</i>          | 14           | 22           | 36     |
|               | <i>Trichotichnus autumnalis</i>          | 1            | 0            | 1      |
|               | <b>Cannot be further IDed</b>            | 1            | 1            | 2      |
| Cerambycidae  | <i>Analeptura lineola</i>                | 1            | 0            | 1      |
|               | <i>Aneflomorpha subpubescens</i>         | 3            | 0            | 3      |
|               | <i>Anelaphus villosus</i>                | 2            | 0            | 2      |
|               | <i>Distenia undata</i>                   | 0            | 1            | 1      |
|               | <i>Lepturges confluens</i>               | 1            | 0            | 1      |
|               | <i>Necydalis mellita</i>                 | 4            | 0            | 4      |
|               | <i>Obrium maculatum</i>                  | 2            | 0            | 2      |
|               | <i>Sarosesthes fulminans</i>             | 3            | 0            | 3      |
|               | <i>Typocerus lugubris</i>                | 1            | 0            | 1      |
|               | <i>Urographis fasciatus</i>              | 3            | 0            | 3      |
|               | <i>Xylotrechus colonus</i>               | 1            | 0            | 1      |
| Chrysomelidae | <b>Morpho sp. 1</b>                      | 7            | 3            | 10     |
|               | <i>sp. 2</i>                             | 2            | 1            | 3      |
|               | <i>sp. 3</i>                             | 4            | 0            | 4      |
|               | <i>sp. 4</i>                             | 1            | 0            | 1      |
|               | <i>sp. 5</i>                             | 1            | 0            | 1      |
|               | <i>sp. 6</i>                             | 1            | 0            | 1      |
|               | <i>sp. 7</i>                             | 0            | 1            | 1      |
|               | <i>sp. 8</i>                             | 0            | 1            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H27. Beetles collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family         | Genus species                     | BR specimens | CT specimens | Totals |
|----------------|-----------------------------------|--------------|--------------|--------|
|                | <i>sp. 9</i>                      | 0            | 1            | 1      |
|                | <i>sp. 10</i>                     | 0            | 2            | 2      |
|                | <i>sp. 11</i>                     | 0            | 2            | 2      |
|                | <i>sp. 12</i>                     | 0            | 1            | 1      |
|                | <i>sp. 13</i>                     | 0            | 2            | 2      |
|                | <i>sp. 14</i>                     | 0            | 2            | 2      |
|                | <i>sp. 15</i>                     | 0            | 1            | 1      |
|                | <i>sp. 16</i>                     | 0            | 4            | 4      |
|                | <i>sp. 17</i>                     | 0            | 3            | 3      |
|                | <i>sp. 18</i>                     | 0            | 1            | 1      |
|                | <i>Stenispa metallica</i>         | 0            | 1            | 1      |
|                | <i>Systema hudsonias</i>          | 4            | 0            | 4      |
| Cicindelidae   | <i>Cicindela sexguttata</i>       | 2            | 0            | 2      |
| Cleridae       | <i>Cregya oculata</i>             | 1            | 0            | 1      |
|                | <i>Cymatodera sp. 1</i>           | 1            | 0            | 1      |
|                | <i>sp. 2</i>                      | 0            | 1            | 1      |
|                | <b>Morpho sp. 1</b>               | 1            | 0            | 1      |
| Coccinellidae  | <i>Brachiacantha sp. 1</i>        | 2            | 1            | 3      |
|                | <i>Coleomegilla fuscilabris</i>   | 0            | 2            | 2      |
|                | <i>Cycloneda munda</i>            | 0            | 1            | 1      |
|                | <i>Harmonia axyridis</i>          | 5            | 0            | 5      |
|                | <b>Morpho sp. 1</b>               | 1            | 0            | 1      |
|                | <i>sp. 2</i>                      | 1            | 0            | 1      |
|                | <i>sp. 3</i>                      | 2            | 1            | 3      |
|                | <i>sp. 4</i>                      | 0            | 1            | 1      |
|                | <i>Psyllobora vigintimaculata</i> | 1            | 1            | 2      |
|                | <i>Scymnus sp. 1</i>              | 5            | 10           | 15     |
|                | <b>Cannot be further IDed</b>     | 1            | 0            | 1      |
| Colydiidae     | <i>Microsicus parvulus</i>        | 1            | 0            | 1      |
|                | <b>Morpho sp. 1</b>               | 1            | 0            | 1      |
|                | <i>sp. 2</i>                      | 1            | 0            | 1      |
|                | <i>sp. 3</i>                      | 1            | 0            | 1      |
| Corylophidae   | <b>Morpho sp. 1</b>               | 3            | 4            | 7      |
|                | <i>sp. 2</i>                      | 1            | 0            | 1      |
| Cryptophagidae | <b>Morpho sp. 1</b>               | 0            | 2            | 2      |
|                | <i>sp. 2</i>                      | 0            | 3            | 3      |
| Cucujidae      | <i>Catogenus rufus</i>            | 1            | 0            | 1      |
|                | <i>Lamophloeus biguttatus</i>     | 1            | 0            | 1      |
|                | <b>Morpho sp. 1</b>               | 3            | 0            | 3      |
|                | <i>Telephanus sp. 1</i>           | 0            | 3            | 3      |
| Curculionidae  | <b>Morpho sp. 1</b>               | 8            | 1            | 9      |
|                | <i>sp. 2</i>                      | 5            | 0            | 5      |
|                | <i>sp. 3</i>                      | 2            | 0            | 2      |
|                | <i>sp. 4</i>                      | 2            | 0            | 2      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H27. Beetles collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family       | Genus species                | BR specimens | CT specimens | Totals |
|--------------|------------------------------|--------------|--------------|--------|
|              | <i>sp. 5</i>                 | 2            | 0            | 2      |
|              | <i>sp. 6</i>                 | 1            | 0            | 1      |
|              | <i>sp. 7</i>                 | 1            | 0            | 1      |
|              | <i>sp. 8</i>                 | 1            | 0            | 1      |
|              | <i>sp. 9</i>                 | 1            | 0            | 1      |
|              | <i>sp. 10</i>                | 1            | 0            | 1      |
|              | <i>sp. 11</i>                | 0            | 11           | 11     |
|              | <i>sp. 12</i>                | 1            | 0            | 1      |
|              | <i>sp. 13</i>                | 0            | 3            | 3      |
|              | <i>sp. 14</i>                | 0            | 1            | 1      |
|              | <i>sp. 15</i>                | 0            | 1            | 1      |
|              | <i>Sphenophorus sp. 1</i>    | 0            | 1            | 1      |
| Dascillidae  | <b>Morpho sp. 1</b>          | 9            | 0            | 9      |
| Dermestidae  | <b>Morpho sp. 1</b>          | 3            | 0            | 3      |
|              | <i>sp. 2</i>                 | 1            | 0            | 1      |
| Dytiscidae   | <b>Morpho sp. 1</b>          | 1            | 0            | 1      |
| Elateridae   | <i>Aeolus sp. 1</i>          | 1            | 0            | 1      |
|              | <i>Glyphonyx sp. 2</i>       | 2            | 0            | 2      |
|              | <i>Lacon discoidea</i>       | 1            | 0            | 1      |
|              | <i>Limonius sp. 1</i>        | 5            | 0            | 5      |
|              | <i>Melanotus sp. 1</i>       | 5            | 3            | 8      |
|              | <i>sp. 2</i>                 | 2            | 0            | 2      |
|              | <i>sp. 3</i>                 | 1            | 0            | 1      |
|              | <b>Morpho sp. 1</b>          | 5            | 0            | 5      |
|              | <i>sp. 2</i>                 | 3            | 0            | 3      |
|              | <i>sp. 3</i>                 | 1            | 0            | 1      |
|              | <i>sp. 4</i>                 | 1            | 0            | 1      |
|              | <i>sp. 5</i>                 | 1            | 0            | 1      |
|              | <i>sp. 6</i>                 | 1            | 0            | 1      |
|              | <i>sp. 7</i>                 | 0            | 1            | 1      |
|              | <i>sp. 8</i>                 | 0            | 1            | 1      |
| Endomychidae | <i>Aphorista vittata</i>     | 0            | 1            | 1      |
|              | <i>Endomychus biguttatus</i> | 1            | 0            | 1      |
| Erotylidae   | <b>Morpho sp. 1</b>          | 2            | 0            | 2      |
|              | <i>sp. 2</i>                 | 0            | 1            | 1      |
|              | <i>Triplax festiva</i>       | 1            | 0            | 1      |
|              | <i>sp. 1</i>                 | 1            | 0            | 1      |
|              | <i>Tritoma biguttata</i>     | 1            | 0            | 1      |
|              | <i>humeralis</i>             | 1            | 1            | 2      |
| Eucnemidae   | <b>Morpho sp. 1</b>          | 86           | 0            | 86     |
|              | <i>sp. 2</i>                 | 2            | 0            | 2      |
|              | <i>sp. 3</i>                 | 2            | 0            | 2      |
|              | <i>sp. 4</i>                 | 3            | 0            | 3      |
| Helodidae    | <i>Cyphon sp. 1</i>          | 14           | 1            | 15     |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H27. Beetles collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species              | BR specimens | CT specimens | Totals |
|---------------|----------------------------|--------------|--------------|--------|
| Heteroceridae | <b>Morpho</b> sp. 1        | 1            | 2            | 3      |
| Histeridae    | <i>Cylistix</i> sp. 1      | 1            | 0            | 1      |
|               | <i>Hololepta</i> sp. 1     | 1            | 0            | 1      |
|               | <b>Morpho</b> sp. 1        | 1            | 0            | 1      |
|               | sp. 2                      | 0            | 8            | 8      |
| Hydraenidae   | <b>Morpho</b> sp. 1        | 1            | 0            | 1      |
| Hydrophilidae | <b>Morpho</b> sp. 1        | 1            | 1            | 2      |
|               | sp. 2                      | 0            | 1            | 1      |
|               | sp. 3                      | 0            | 2            | 2      |
| Lagriidae     | <i>Arthromacra aenea</i>   | 2            | 0            | 2      |
| Lampyridae    | <i>Lucidota atra</i>       | 8            | 0            | 8      |
|               | <i>punctata</i>            | 5            | 0            | 5      |
|               | <i>Photinus</i> sp. 1      | 3            | 0            | 3      |
| Lathridiidae  | <b>Morpho</b> sp. 1        | 4            | 8            | 12     |
|               | sp. 2                      | 0            | 3            | 3      |
|               | sp. 3                      | 0            | 1            | 1      |
| Leiodidae     | <b>Morpho</b> sp. 1        | 2            | 0            | 2      |
|               | sp. 2                      | 1            | 0            | 1      |
|               | sp. 3                      | 1            | 0            | 1      |
|               | sp. 4                      | 0            | 1            | 1      |
| Leptodiridae  | <b>Morpho</b> sp. 1        | 1            | 0            | 1      |
| Lycidae       | <i>Calopteron</i> sp. 1    | 0            | 1            | 1      |
|               | <i>Lycus</i> sp. 1         | 0            | 3            | 3      |
|               | <i>Plateros</i> sp. 1      | 2            | 0            | 2      |
|               | sp. 2                      | 1            | 0            | 1      |
|               | sp. 3                      | 1            | 0            | 1      |
|               | sp. 4                      | 1            | 0            | 1      |
| Melandryidae  | <i>Anaspis</i> sp. 1       | 1            | 0            | 1      |
|               | <i>Dircaea liturata</i>    | 8            | 2            | 10     |
|               | <b>Morpho</b> sp. 1        | 5            | 0            | 5      |
|               | sp. 2                      | 5            | 0            | 5      |
|               | sp. 3                      | 2            | 0            | 2      |
|               | sp. 4                      | 1            | 1            | 2      |
|               | sp. 5                      | 1            | 0            | 1      |
|               | <i>Synstrophus reponus</i> | 1            | 0            | 1      |
| Melyridae     | <i>Hypebaeus</i> sp. 1     | 2            | 0            | 2      |
|               | <b>Morpho</b> sp. 1        | 2            | 0            | 2      |
| Mordellidae   | <b>Morpho</b> sp. 1        | 2            | 3            | 5      |
|               | sp. 2                      | 1            | 1            | 2      |
|               | sp. 3                      | 4            | 0            | 4      |
|               | sp. 4                      | 5            | 0            | 5      |
|               | sp. 5                      | 5            | 0            | 5      |
|               | sp. 6                      | 4            | 0            | 4      |
|               | sp. 7                      | 4            | 0            | 4      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H27. Beetles collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family          | Genus species                   | BR specimens | CT specimens | Totals |
|-----------------|---------------------------------|--------------|--------------|--------|
|                 | <i>sp. 8</i>                    | 1            | 0            | 1      |
|                 | <i>sp. 9</i>                    | 1            | 0            | 1      |
|                 | <i>sp. 10</i>                   | 0            | 2            | 2      |
|                 | <i>sp. 11</i>                   | 0            | 1            | 1      |
|                 | <i>sp. 12</i>                   | 0            | 1            | 1      |
|                 | <i>sp. 13</i>                   | 8            | 0            | 8      |
| Mycetophagidae  | <i>Mycetophagus sp. 1</i>       | 4            | 0            | 4      |
|                 | <i>sp. 2</i>                    | 2            | 0            | 2      |
|                 | <i>sp. 3</i>                    | 1            | 0            | 1      |
| Nitidulidae     | <b>Morpho</b> <i>sp. 1</i>      | 6            | 0            | 6      |
|                 | <i>sp. 2</i>                    | 2            | 0            | 2      |
|                 | <i>sp. 3</i>                    | 1            | 0            | 1      |
|                 | <i>sp. 4</i>                    | 1            | 0            | 1      |
|                 | <i>sp. 5</i>                    | 2            | 0            | 2      |
|                 | <i>sp. 6</i>                    | 1            | 0            | 1      |
|                 | <i>sp. 7</i>                    | 1            | 0            | 1      |
|                 | <i>sp. 8</i>                    | 1            | 0            | 1      |
| Passalidae      | <i>Odontotaenius disjunctus</i> | 0            | 13           | 13     |
|                 | <b>Cannot be further IDed</b>   | 0            | 2            | 2      |
| Phalacridae     | <b>Morpho</b> <i>sp. 1</i>      | 3            | 0            | 3      |
|                 | <i>sp. 2</i>                    | 0            | 2            | 2      |
|                 | <i>sp. 3</i>                    | 0            | 1            | 1      |
| Phengodidae     | <i>Phengodes sp. 1</i>          | 1            | 0            | 1      |
| Pselaphidae     | <b>Morpho</b> <i>sp. 1</i>      | 2            | 0            | 2      |
|                 | <i>sp. 2</i>                    | 1            | 0            | 1      |
|                 | <i>sp. 3</i>                    | 1            | 0            | 1      |
| Ptiliidae       | <b>Morpho</b> <i>sp. 1</i>      | 1            | 0            | 1      |
| Ptilodactylidae | <i>Ptilodactyla sp. 1</i>       | 5            | 0            | 5      |
| Pyrochroidae    | <i>Dendroides canadensis</i>    | 1            | 0            | 1      |
| Rhizophagidae   | <b>Morpho</b> <i>sp. 1</i>      | 2            | 0            | 2      |
| Scaphidiidae    | <b>Morpho</b> <i>sp. 1</i>      | 1            | 0            | 1      |
| Scarabaeidae    | <b>Morpho</b> <i>sp. 1</i>      | 1            | 0            | 1      |
|                 | <i>sp. 2</i>                    | 20           | 1            | 21     |
|                 | <i>sp. 3</i>                    | 0            | 1            | 1      |
|                 | <i>sp. 4</i>                    | 7            | 0            | 7      |
|                 | <i>sp. 5</i>                    | 1            | 0            | 1      |
|                 | <i>sp. 6</i>                    | 1            | 0            | 1      |
|                 | <i>Phyllophaga sp. 1</i>        | 1            | 0            | 1      |
|                 | <i>sp. 2</i>                    | 1            | 0            | 1      |
|                 | <i>Popillia japonica</i>        | 1            | 1            | 2      |
|                 | <i>Serica sp. 1</i>             | 22           | 0            | 22     |
|                 | <i>Trox sp. 1</i>               | 2            | 0            | 2      |
|                 | <i>sp. 2</i>                    | 0            | 1            | 1      |
| Scolytidae      | <b>Morpho</b> <i>sp. 1</i>      | 37           | 2            | 39     |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H27. Beetles collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species              | BR specimens | CT specimens | Totals |
|---------------|----------------------------|--------------|--------------|--------|
|               | <i>sp. 2</i>               | 5            | 1            | 6      |
|               | <i>sp. 3</i>               | 1            | 0            | 1      |
|               | <i>sp. 4</i>               | 6            | 0            | 6      |
|               | <i>sp. 5</i>               | 5            | 0            | 5      |
|               | <i>sp. 6</i>               | 8            | 0            | 8      |
|               | <i>sp. 7</i>               | 1            | 0            | 1      |
|               | <i>sp. 8</i>               | 2            | 0            | 2      |
| Scydmaenidae  | <b>Morpho</b> <i>sp. 1</i> | 4            | 0            | 4      |
|               | <i>sp. 2</i>               | 2            | 0            | 2      |
| Staphylinidae | <b>Stenus</b> <i>sp. 1</i> | 0            | 3            | 3      |
|               | <b>Morpho</b> <i>sp. 1</i> | 15           | 0            | 15     |
|               | <i>sp. 2</i>               | 12           | 0            | 12     |
|               | <i>sp. 3</i>               | 3            | 0            | 3      |
|               | <i>sp. 4</i>               | 1            | 2            | 3      |
|               | <i>sp. 5</i>               | 1            | 2            | 3      |
|               | <i>sp. 6</i>               | 4            | 6            | 10     |
|               | <i>sp. 7</i>               | 8            | 0            | 8      |
|               | <i>sp. 8</i>               | 12           | 0            | 12     |
|               | <i>sp. 9</i>               | 10           | 0            | 10     |
|               | <i>sp. 10</i>              | 0            | 24           | 24     |
|               | <i>sp. 11</i>              | 6            | 0            | 6      |
|               | <i>sp. 12</i>              | 1            | 0            | 1      |
|               | <i>sp. 13</i>              | 1            | 0            | 1      |
|               | <i>sp. 14</i>              | 3            | 0            | 3      |
|               | <i>sp. 15</i>              | 3            | 0            | 3      |
|               | <i>sp. 16</i>              | 1            | 0            | 1      |
|               | <i>sp. 17</i>              | 1            | 0            | 1      |
|               | <i>sp. 18</i>              | 2            | 0            | 2      |
|               | <i>sp. 19</i>              | 1            | 0            | 1      |
|               | <i>sp. 20</i>              | 1            | 0            | 1      |
|               | <i>sp. 21</i>              | 1            | 0            | 1      |
|               | <i>sp. 22</i>              | 1            | 0            | 1      |
|               | <i>sp. 23</i>              | 2            | 0            | 2      |
|               | <i>sp. 24</i>              | 1            | 0            | 1      |
|               | <i>sp. 25</i>              | 2            | 0            | 2      |
|               | <i>sp. 26</i>              | 1            | 0            | 1      |
|               | <i>sp. 27</i>              | 1            | 0            | 1      |
|               | <i>sp. 28</i>              | 2            | 0            | 2      |
|               | <i>sp. 29</i>              | 1            | 0            | 1      |
|               | <i>sp. 30</i>              | 0            | 1            | 1      |
|               | <i>sp. 31</i>              | 0            | 1            | 1      |
|               | <i>sp. 32</i>              | 0            | 1            | 1      |
|               | <i>sp. 33</i>              | 0            | 1            | 1      |
|               | <i>sp. 34</i>              | 0            | 1            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H27. Beetles collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species                | BR specimens | CT specimens | Totals     |
|---------------|------------------------------|--------------|--------------|------------|
|               | <i>sp. 35</i>                | 0            | 1            | 1          |
|               | <i>sp. 36</i>                | 0            | 1            | 1          |
|               | <i>sp. 37</i>                | 0            | 1            | 1          |
|               | <i>sp. 38</i>                | 0            | 1            | 1          |
|               | Cannot be further IDed       | 2            | 1            | 3          |
| Tenebrionidae | Morpho <i>sp. 1</i>          | 0            | 2            | 2          |
|               | <i>sp. 2</i>                 | 0            | 1            | 1          |
|               | <i>sp. 3</i>                 | 0            | 1            | 1          |
| Throscidae    | Morpho <i>sp. 1</i>          | 15           | 4            | 19         |
| Trogositidae  | Morpho <i>sp. 1</i>          | 3            | 0            | 3          |
| Undetermined  | Cannot be further IDed       | 42           | 32           | 74         |
| Unknown       | Cannot be further IDed       | 1            | 0            | 1          |
| <b>Totals</b> |                              |              |              |            |
|               | <b>Families</b>              | 53           | 31           | 57         |
|               | <b>Genera</b>                | 81           | 42           | 100        |
|               | <b>Named species</b>         | 59           | 35           | 81         |
|               | <b>sp.</b>                   | 177          | 81           | 234        |
|               | <b>Potential no. species</b> | 236 so far   | 116 so far   | 315 so far |
|               | <b>Individuals</b>           | 875          | 338          | 1213       |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H28. Flies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family          | Genus species                        | BR specimens | CT specimens | Totals |
|-----------------|--------------------------------------|--------------|--------------|--------|
| Agromyzidae     | <i>Agromyza</i> sp.                  | 1            | 1            | 2      |
|                 | <i>Calycomyza</i> sp. 1              | 0            | 2            | 2      |
|                 | sp. 2                                | 0            | 2            | 2      |
|                 | <i>Cerodontha dorsalis</i>           | 1            | 2            | 3      |
|                 | sp.                                  | 1            | 0            | 1      |
|                 | sp. 1                                | 0            | 1            | 1      |
|                 | sp. 2                                | 0            | 1            | 1      |
|                 | sp. 3                                | 0            | 1            | 1      |
|                 | <i>Liriomyza</i> sp.                 | 1            | 2            | 3      |
|                 | <i>Melanagromyza</i> sp.             | 1            | 0            | 1      |
|                 | sp. 1                                | 0            | 1            | 1      |
|                 | sp. 2                                | 0            | 1            | 1      |
|                 | <i>Metopomyza</i> sp.                | 0            | 1            | 1      |
|                 | <i>Ophiomyia</i> sp.                 | 1            | 2            | 3      |
|                 | <i>Phytoliriomyza</i> sp.            | 0            | 1            | 1      |
|                 | <i>Phytomyza crassiseta</i>          | 86           | 0            | 86     |
|                 | sp.                                  | 1            | 0            | 1      |
|                 | <b>Cannot be further IDed</b>        | 1            | 1            | 2      |
| Anthomyiidae    | <i>Adia cinerella</i>                | 0            | 1            | 1      |
|                 | <i>Anthomyia liturata</i> subsection | 1            | 0            | 1      |
|                 | <i>oculifera</i>                     | 6            | 1            | 7      |
|                 | <i>Eustalomyia vittipes</i>          | 4            | 6            | 10     |
|                 | <i>Eutrichota affinis</i>            | 0            | 1            | 1      |
|                 | <i>lipsia</i>                        | 1            | 0            | 1      |
|                 | <i>Hylemya alcatheae</i>             | 2            | 0            | 2      |
|                 | <i>partita</i>                       | 0            | 1            | 1      |
|                 | <i>Pegomya rufescens</i>             | 1            | 0            | 1      |
|                 | <i>wintheri</i>                      | 1            | 0            | 1      |
|                 | <i>Pegoplata palposa</i>             | 2            | 0            | 2      |
|                 | <i>Zaphne uniformis</i>              | 2            | 0            | 2      |
| Anthomyzidae    | <i>Anthomyza</i> sp.                 | 0            | 1            | 1      |
| Asilidae        | <i>Laphria canis</i>                 | 3            | 0            | 3      |
|                 | <i>Leptogaster flavipes</i>          | 36           | 0            | 36     |
|                 | <b>Determinations in progress</b>    | 0            | 4            | 4      |
| Aulacigastridae | <i>Stenomicroa angustata</i>         | 1            | 1            | 2      |
| Calliphoridae   | <i>Phaenicia coeruleiviridis</i>     | 2            | 1            | 3      |
|                 | <i>Pollenia pseudorudis</i>          | 16           | 0            | 16     |
|                 | <i>rudis</i>                         | 8            | 2            | 10     |
| Cecidomyiidae   | <b>Not identified</b>                | 3845         | 1503         | 5348   |
| Ceratopogonidae | <i>Atrichopogon fuscus</i>           | 2            | 0            | 2      |
|                 | sp.                                  | 5            | 36           | 41     |
|                 | <i>Bezzia nobilis</i>                | 1            | 2            | 3      |
|                 | sp.                                  | 2            | 0            | 2      |
|                 | <i>Brachypogon</i> sp.               | 8            | 0            | 8      |
|                 | <i>Ceratoculicoides</i> sp.          | 5            | 0            | 5      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H28. Flies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species                                    | BR specimens | CT specimens | Totals |
|---------------|--------------------------------------------------|--------------|--------------|--------|
|               | <i>Clinohoelea bimaculata</i>                    | 6            | 0            | 6      |
|               | <i>Culicoides biguttatus</i>                     | 198          | 0            | 198    |
|               | <i>footei</i>                                    | 1            | 0            | 1      |
|               | <i>haematopotus</i>                              | 2            | 1            | 3      |
|               | <i>stellifer</i>                                 | 2            | 0            | 2      |
|               | <i>testudinalis</i>                              | 2            | 0            | 2      |
|               | <i>variipennis</i>                               | 0            | 1            | 1      |
|               | <i>villosipennis</i>                             | 1            | 0            | 1      |
|               | <i>Dasyhelea grisea</i>                          | 34           | 0            | 34     |
|               | <i>mutabilis</i>                                 | 4            | 17           | 21     |
|               | <i>n.sp.</i>                                     | 4            | 2            | 6      |
|               | <i>n.sp.?</i>                                    | 0            | 2            | 2      |
|               | <i>pseudoincisurata</i>                          | 14           | 0            | 14     |
|               | <i>sp.</i>                                       | 0            | 2            | 2      |
|               | <i>stemlerae</i>                                 | 5            | 0            | 5      |
|               | <i>Forcipomyia glauca</i>                        | 25           | 0            | 25     |
|               | <i>miscellaneous</i>                             | 3            | 0            | 3      |
|               | <i>n.sp.</i>                                     | 43           | 0            | 43     |
|               | <i>pinicola</i>                                  | 1            | 0            | 1      |
|               | <i>pluvialis</i>                                 | 4            | 0            | 4      |
|               | <i>sp.</i>                                       | 9            | 1            | 10     |
|               | <i>Monohelea grogani</i>                         | 1            | 0            | 1      |
|               | <i>jamnbacki</i>                                 | 4            | 0            | 4      |
|               | <i>sp.</i>                                       | 3            | 0            | 3      |
|               | <i>Parabezzia huberti</i>                        | 2            | 0            | 2      |
|               | <i>Stilobezzia antennalis</i>                    | 3            | 0            | 3      |
|               | <i>bullae</i>                                    | 3            | 1            | 4      |
|               | <i>glauca</i>                                    | 1            | 0            | 1      |
|               | <i>lutea</i>                                     | 7            | 0            | 7      |
|               | <b>Cannot be further IDed</b>                    | 0            | 10           | 10     |
| Chamaemyiidae | <i>Chamaemyia polystigma</i>                     | 0            | 1            | 1      |
|               | <i>Pseudodinia polita</i>                        | 1            | 0            | 1      |
| Chaoboridae   | <i>Chaoborus</i> ( <i>Chaoborus</i> ) <i>sp.</i> | 3            | 0            | 3      |
|               | ( <i>Sayomyia</i> ) <i>sp.</i>                   | 2            | 1            | 3      |
| Chironomidae  | <b>Not identified</b>                            | 475          | 31           | 506    |
| Chloropidae   | <i>Chlorops obscuricornis?</i>                   | 1            | 1            | 2      |
|               | <i>sp.</i>                                       | 0            | 8            | 8      |
|               | <i>Elachiptera costata</i>                       | 0            | 1            | 1      |
|               | <i>sp.</i>                                       | 0            | 1            | 1      |
|               | <i>Incertella sp.</i>                            | 1            | 0            | 1      |
|               | <i>Oscinella frit</i>                            | 260          | 3            | 263    |
|               | <i>Rhopalopteron carbonarium</i>                 | 12           | 69           | 81     |
|               | <i>Thaumatomyia glabra</i>                       | 0            | 1            | 1      |
|               | <i>pulla</i>                                     | 0            | 1            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H28. Flies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family         | Genus species                     | BR specimens | CT specimens | Totals |
|----------------|-----------------------------------|--------------|--------------|--------|
|                | <b>Cannot be further IDed</b>     | 1            | 7            | 8      |
|                | <b>Not identified</b>             | 2            | 0            | 2      |
| Clusiidae      | <i>Clusia</i> sp.                 | 1            | 0            | 1      |
| Conopidae      | <i>Thecophora nigripes</i>        | 0            | 1            | 1      |
|                | <i>propinqua</i>                  | 0            | 3            | 3      |
| Culicidae      | <b>Determinations in progress</b> | 6            | 11           | 17     |
| Dixidae        | <b>Not identified</b>             | 0            | 1            | 1      |
| Dolichopodidae | <i>Amblypsilopus scintillans?</i> | 0            | 1            | 1      |
|                | <i>unicoensis</i>                 | 1            | 1            | 2      |
|                | <i>Argyra flavipes</i>            | 1            | 0            | 1      |
|                | <i>Chrysotimus flavicomis</i>     | 5            | 0            | 5      |
|                | <i>lutea</i>                      | 4            | 0            | 4      |
|                | sp.                               | 3            | 0            | 3      |
|                | <i>Chrysotus obliquus</i> complex | 1            | 38           | 39     |
|                | <i>pallipes</i>                   | 0            | 2            | 2      |
|                | <i>pallipes?</i>                  | 1            | 0            | 1      |
|                | sp.                               | 5            | 0            | 5      |
|                | <i>Condyllostylus calcaratus</i>  | 1            | 2            | 3      |
|                | sp.                               | 0            | 1            | 1      |
|                | <i>Diaphorus mundus</i>           | 4            | 4            | 8      |
|                | sp.                               | 1            | 0            | 1      |
|                | <i>Dolichopus comatus</i>         | 0            | 2            | 2      |
|                | <i>correus</i>                    | 1            | 0            | 1      |
|                | <i>cuprinus</i>                   | 0            | 15           | 15     |
|                | <i>funditor</i>                   | 0            | 1            | 1      |
|                | <i>pantomima</i>                  | 1            | 0            | 1      |
|                | <i>reflectus</i>                  | 0            | 1            | 1      |
|                | <i>scapularis</i>                 | 0            | 5            | 5      |
|                | sp.                               | 1            | 26           | 27     |
|                | <i>vigilans?</i>                  | 0            | 1            | 1      |
|                | <i>vittatus</i>                   | 0            | 20           | 20     |
|                | <i>Gymnopternus crassicauda</i>   | 1            | 0            | 1      |
|                | <i>difficilis</i>                 | 2            | 0            | 2      |
|                | <i>exilis</i>                     | 0            | 1            | 1      |
|                | <i>opacus</i>                     | 4            | 0            | 4      |
|                | <i>politus</i>                    | 10           | 0            | 10     |
|                | sp.                               | 2            | 0            | 2      |
|                | <i>Medetera aberrans</i>          | 0            | 3            | 3      |
|                | <i>isobellae</i>                  | 0            | 1            | 1      |
|                | <i>nova</i>                       | 1            | 0            | 1      |
|                | sp.                               | 2            | 1            | 3      |
|                | <i>vittata</i>                    | 4            | 3            | 7      |
|                | <i>Neurigona carbonifer</i>       | 1            | 0            | 1      |
|                | <i>rubella?</i>                   | 1            | 0            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H28. Flies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family         | Genus species                                   | BR specimens | CT specimens | Totals |
|----------------|-------------------------------------------------|--------------|--------------|--------|
|                | sp.                                             | 2            | 1            | 3      |
|                | <i>Pelastoneurus neglectus</i>                  | 0            | 1            | 1      |
|                | <i>vagans</i>                                   | 1            | 0            | 1      |
|                | <i>Peloropectes bicolor</i>                     | 1            | 0            | 1      |
|                | sp.                                             | 6            | 0            | 6      |
|                | <i>Sympycnus lineatus</i>                       | 4            | 0            | 4      |
|                | <i>Thrypticus muhlenbergiae</i>                 | 18           | 0            | 18     |
| Drosophilidae  | <i>Chymomyza amoena</i>                         | 1            | 0            | 1      |
|                | sp.                                             | 15           | 2            | 17     |
|                | <i>Drosophila</i> sp.                           | 1            | 20           | 21     |
|                | <i>Scaptomyza</i> sp.                           | 3            | 0            | 3      |
| Empididae      | <b>Not identified</b>                           | 39           | 6            | 45     |
| Ephydriidae    | <i>Athyroglossa granulosa</i>                   | 2            | 0            | 2      |
|                | <i>Brachydeutera argentata</i>                  | 0            | 4            | 4      |
|                | <i>Leptopsilopa atrimana</i>                    | 0            | 2            | 2      |
| Heleomyzidae   | <i>Acantholeria</i> sp.                         | 1            | 0            | 1      |
|                | <i>Amoebaleria helvola</i>                      | 1            | 0            | 1      |
|                | <i>Eccopectera</i> sp.                          | 1            | 0            | 1      |
|                | <i>Suillia</i> sp.                              | 2            | 0            | 2      |
| Lauxaniidae    | <i>Homoneura fraterna</i>                       | 3            | 0            | 3      |
|                | <i>Minettia magna</i>                           | 1            | 0            | 1      |
|                | <i>Poecilominettia</i> sp. nr. <i>ordinaria</i> | 1            | 0            | 1      |
|                | <i>Poeciloycia obtusilamellata</i>              | 2            | 0            | 2      |
| Lonchaeidae    | <i>Earomyia</i> sp.                             | 1            | 0            | 1      |
|                | <b>Not identified</b>                           | 0            | 1            | 1      |
| Lonchopteridae | <i>Lonchoptera</i> sp.                          | 0            | 1            | 1      |
|                | <b>Cannot be further IDed</b>                   | 1            | 0            | 1      |
| Milichiidae    | <i>Paramyia nitens</i>                          | 1            | 0            | 1      |
|                | <i>Phyllomyza</i> sp.                           | 1            | 1            | 2      |
| Muscidae       | <i>Fannia</i> sp.                               | 1            | 0            | 1      |
|                | <i>Neomyia comicina</i>                         | 0            | 1            | 1      |
|                | <b>Determinations in progress</b>               | 65           | 32           | 97     |
|                | <b>Not identified</b>                           | 13           | 0            | 13     |
| Mycetophilidae | <i>Cluzobra</i> n. sp.                          | 1            | 0            | 1      |
|                | <i>Cordyla recens</i>                           | 35           | 2            | 37     |
|                | <i>Diadocidia valida</i>                        | 0            | 1            | 1      |
|                | <i>Exechia cincinnata</i>                       | 1            | 0            | 1      |
|                | <i>Hadroneura</i> n. sp.                        | 0            | 1            | 1      |
|                | <i>Macrocera</i> sp. A                          | 1            | 1            | 2      |
|                | ? <i>Megophthalmidia</i> sp.                    | 1            | 0            | 1      |
|                | <i>Mycetophila fisherae</i>                     | 0            | 5            | 5      |
|                | sp.                                             | 1            | 1            | 2      |
|                | sp. A                                           | 2            | 0            | 2      |
|                | sp. B                                           | 0            | 1            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H28. Flies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family          | Genus species                             | BR specimens | CT specimens | Totals |
|-----------------|-------------------------------------------|--------------|--------------|--------|
|                 | <i>sp. C</i>                              | 2            | 0            | 2      |
|                 | <i>sp. D</i>                              | 0            | 1            | 1      |
|                 | <i>Mycomya byersi</i>                     | 1            | 0            | 1      |
|                 | <i>obliqua</i>                            | 2            | 0            | 2      |
|                 | <i>sp.</i>                                | 1            | 0            | 1      |
|                 | <i>N. Genus n. sp.</i>                    | 6            | 0            | 6      |
|                 | <i>Neoempheria indulgens</i>              | 5            | 0            | 5      |
|                 | <i>Neoplatyura bella m.s.</i>             | 4            | 7            | 11     |
|                 | <i>mendosa</i>                            | 1            | 0            | 1      |
|                 | <i>n. sp.</i>                             | 36           | 0            | 36     |
|                 | <i>nr. Palaeodocosia sp.</i>              | 1            | 0            | 1      |
|                 | <i>Proceroplatus elegans</i>              | 1            | 1            | 2      |
|                 | <i>Sceptonia sp. A</i>                    | 6            | 0            | 6      |
|                 | <i>sp. B</i>                              | 2            | 0            | 2      |
|                 | <i>Sciophila sp. #1</i>                   | 0            | 1            | 1      |
|                 | <i>sp. #2</i>                             | 0            | 1            | 1      |
| Phoridae        | <b>Not identified</b>                     | 853          | 393          | 1246   |
| Pipunculidae    | <i>Cephalosphaera sp.</i>                 | 0            | 1            | 1      |
|                 | <i>Chalarus sp.</i>                       | 1            | 9            | 10     |
|                 | <i>Pipunculus (Eudorylas) sp.</i>         | 7            | 1            | 8      |
|                 | <i>(Pipunculus) sp.</i>                   | 4            | 0            | 4      |
|                 | <i>Tomosvaryella sp.</i>                  | 3            | 10           | 13     |
| Platystomatidae | <i>Rivellia metalica</i>                  | 1            | 0            | 1      |
|                 | <b>Determinations in progress</b>         | 2            | 1            | 3      |
| Psilidae        | <i>Chyliza (Chyliza) sp.</i>              | 1            | 0            | 1      |
| Psychodidae     | <i>Psychoda alternata</i>                 | 1            | 0            | 1      |
|                 | <i>bishoppi</i>                           | 1            | 0            | 1      |
|                 | <i>lativentris</i>                        | 34           | 0            | 34     |
|                 | <i>phalaenoides</i>                       | 4            | 0            | 4      |
|                 | <i>pusilla</i>                            | 2            | 0            | 2      |
|                 | <i>Trichomyia nuda</i>                    | 2            | 0            | 2      |
|                 | <b>Determinations in progress</b>         | 29           | 15           | 44     |
| Rhagionidae     | <i>Chrysopilus fasciatus</i>              | 3            | 0            | 3      |
|                 | <i>ornatus</i>                            | 1            | 0            | 1      |
|                 | <i>Symphoromyia sp.</i>                   | 5            | 0            | 5      |
| Sarcophagidae   | <i>Blaesoxipha (Tephromyia) spatulata</i> | 0            | 6            | 6      |
|                 | <i>Boettcheria bisetosa</i>               | 1            | 0            | 1      |
|                 | <i>cimbicis</i>                           | 0            | 7            | 7      |
|                 | <i>latisterna</i>                         | 2            | 0            | 2      |
|                 | <i>Brachicoma sarcophagina</i>            | 7            | 0            | 7      |
|                 | <i>sp.</i>                                | 2            | 0            | 2      |
|                 | <i>Erythrandra picipes</i>                | 0            | 2            | 2      |
|                 | <i>Helicobia rapax</i>                    | 0            | 11           | 11     |
|                 | <i>sp.</i>                                | 0            | 1            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H28. Flies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family         | Genus species                          | BR specimens | CT specimens | Totals |
|----------------|----------------------------------------|--------------|--------------|--------|
|                | <i>Mecynocorpus saluum</i>             | 0            | 2            | 2      |
|                | <i>Oxysarcodexia</i> sp.               | 1            | 2            | 3      |
|                | <i>ventricosa</i>                      | 0            | 18           | 18     |
|                | <i>Ravinia derelicta</i>               | 0            | 1            | 1      |
|                | <i>querula</i>                         | 0            | 4            | 4      |
|                | <i>stimulans</i>                       | 1            | 4            | 5      |
|                | <i>Sarcophaga (Bercaepsis) mimoris</i> | 1            | 0            | 1      |
|                | <b>Cannot be further IDed</b>          | 0            | 4            | 4      |
| Scathophagidae | <i>Scathophaga</i> sp.                 | 3            | 0            | 3      |
|                | <b>Not identified</b>                  | 3            | 0            | 3      |
| Scatopsidae    | <i>Apiloscatopse</i> sp.               | 5            | 0            | 5      |
| Sciaridae      | <i>Pnyxia</i> sp.                      | 2            | 0            | 2      |
|                | <b>Not identified</b>                  | 358          | 76           | 434    |
| Sciomyzidae    | <i>Euthycera arcuata</i>               | 6            | 0            | 6      |
|                | <i>Limnia boscii</i>                   | 0            | 1            | 1      |
|                | sp.                                    | 0            | 2            | 2      |
|                | <i>Trypetoptera canadensis</i>         | 0            | 2            | 2      |
| Sepsidae       | <i>Enicomira minor</i>                 | 1            | 0            | 1      |
|                | <i>Sepsis</i> sp.                      | 5            | 10           | 15     |
| Sphaeroceridae | <b>Not identified</b>                  | 73           | 65           | 138    |
| Stratiomyiidae | <i>Allognosta fuscitarsis</i>          | 0            | 1            | 1      |
|                | <i>Caloparyphus tetraspilus</i>        | 1            | 0            | 1      |
|                | <i>Ptecticus trivittatus</i>           | 5            | 0            | 5      |
|                | <i>Sargus decorus</i>                  | 7            | 0            | 7      |
| Syrphidae      | <i>Chrysogaster</i> sp. 1              | 1            | 0            | 1      |
|                | <i>Epistrophe emarginata</i>           | 1            | 0            | 1      |
|                | <i>Orthonevra nitida</i>               | 1            | 0            | 1      |
|                | <i>Paragus haemorrhous</i>             | 1            | 1            | 2      |
|                | <i>Platycheirus obscurus</i>           | 2            | 0            | 2      |
|                | <i>Somula decora</i>                   | 1            | 0            | 1      |
|                | <i>Sphaerophoria contigua</i>          | 1            | 0            | 1      |
|                | <i>Toxomerus germinatus</i>            | 8            | 3            | 11     |
|                | <i>marginatus</i>                      | 0            | 2            | 2      |
|                | <i>Xanthogramma flavipes</i>           | 3            | 2            | 5      |
|                | <b>Cannot be further IDed</b>          | 1            | 0            | 1      |
| Tabanidae      | <i>Chrysops (Chrysops) callidus</i>    | 1            | 0            | 1      |
|                | sp.                                    | 1            | 0            | 1      |
|                | <i>univittatus</i>                     | 3            | 0            | 3      |
|                | <i>Hybomitra lasiophthalma</i>         | 3            | 0            | 3      |
|                | sp.                                    | 2            | 0            | 2      |
|                | <i>Tabanus lineola</i>                 | 1            | 0            | 1      |
|                | <i>pumilus</i>                         | 9            | 0            | 9      |
|                | <i>quinquevittatus</i>                 | 3            | 5            | 8      |
|                | sp.                                    | 1            | 0            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H28. Flies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family      | Genus species                               | BR specimens | CT specimens | Totals |
|-------------|---------------------------------------------|--------------|--------------|--------|
| Tachinidae  | <i>sparus</i>                               | 10           | 0            | 10     |
|             | <i>subsimilis</i>                           | 1            | 0            | 1      |
|             | <i>trimaculatus</i>                         | 1            | 0            | 1      |
|             | <i>Campylochaeta plathypenae</i>            | 0            | 2            | 2      |
|             | <i>Catharosia n. sp.</i>                    | 0            | 1            | 1      |
|             | <i>sp. nr. nebulosa</i>                     | 0            | 2            | 2      |
|             | <i>Ceracia dentata</i>                      | 0            | 1            | 1      |
|             | <i>Chrysotachina alcedo</i>                 | 1            | 0            | 1      |
|             | <i>Copecrypta ruficauda</i>                 | 0            | 1            | 1      |
|             | <i>Euthera sp.</i>                          | 1            | 0            | 1      |
|             | <i>Genea pavonacea</i>                      | 8            | 0            | 8      |
|             | <i>Lypha sp.</i>                            | 3            | 0            | 3      |
|             | <i>Neomintho celeris</i>                    | 2            | 0            | 2      |
|             | <i>Paradidyma singularis</i>                | 0            | 1            | 1      |
|             | <i>sp.</i>                                  | 1            | 0            | 1      |
|             | <i>Periscepsia laevigata</i>                | 0            | 1            | 1      |
|             | <i>Phytomyptera johnsoni</i>                | 0            | 1            | 1      |
|             | <i>sp.</i>                                  | 1            | 0            | 1      |
|             | <i>Pseudapinops niger</i>                   | 2            | 0            | 2      |
|             | <i>Spathidexia clemonsi</i>                 | 0            | 5            | 5      |
|             | <i>Strongygaster triangulifer</i>           | 0            | 1            | 1      |
|             | <i>Xanthomelanodes arcuatus</i>             | 2            | 0            | 2      |
|             | <i>Xanthophyto sp.</i>                      | 1            | 0            | 1      |
|             | <i>Zelia zonata</i>                         | 1            | 1            | 2      |
|             | <b>Cannot be further IDed</b>               | 1            | 0            | 1      |
| Tephritidae | <i>Euaresta aequalis</i>                    | 0            | 1            | 1      |
| Tipulidae   | <i>Atarba (Atarba) picticornis</i>          | 4            | 7            | 11     |
|             | <i>Austrolimnophila</i>                     |              |              |        |
|             | <i>(Austrolimnophila) toxoneura</i>         | 1            | 0            | 1      |
|             | <i>Dolixhopeza (Oropeza) tridenticulata</i> | 1            | 0            | 1      |
|             | <i>walleyi</i>                              | 0            | 1            | 1      |
|             | <i>Epiphragma (Epiphragma) solatrix</i>     | 5            | 3            | 8      |
|             | <i>Erioptera (Erioptera) septemtrionis</i>  | 2            | 0            | 2      |
|             | <i>vespertina</i>                           | 0            | 1            | 1      |
|             | <i>(Mysocyphora) needhami</i>               | 1            | 0            | 1      |
|             | <i>(Psiloconopa) venusta</i>                | 1            | 0            | 1      |
|             | <i>Limonia (Metalimnobia) novaeangliae</i>  | 0            | 1            | 1      |
|             | <i>(Rhipidia) bryanti</i>                   | 1            | 0            | 1      |
|             | <i>lecontei</i>                             | 1            | 0            | 1      |
|             | <i>Nephrotoma alterna</i>                   | 1            | 0            | 1      |
|             | <i>euceroidea</i>                           | 3            | 0            | 3      |
|             | <i>Pilaria imbecilla</i>                    | 1            | 0            | 1      |
|             | <i>Teucholabis (Teucholabis) complexa</i>   | 1            | 0            | 1      |
|             | <i>Tipula (Pterelachisus) trivittata</i>    | 2            | 0            | 2      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H28. Flies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species                | BR specimens | CT specimens | Totals     |
|---------------|------------------------------|--------------|--------------|------------|
| Unknown       | Cannot be further IDed       | 2            | 0            | 2          |
|               | Cannot be further IDed       | 40           | 5            | 45         |
|               | Not identified               | 1            | 0            | 1          |
| Xylomyidae    |                              |              |              |            |
| <b>Totals</b> | <b>Families</b>              | 43           | 39           | 47         |
|               | <b>Genera</b>                | 132          | 90           | 164        |
|               | <b>New genera</b>            | 1            | 0            | 1          |
|               | <b>nr. genera</b>            | 1            | 0            | 1          |
|               | <b>? Genera</b>              | 1            | 0            | 1          |
|               | <b>Named species</b>         | 135          | 78           | 185        |
|               | <b>? Species</b>             | 3            | 3            | 5          |
|               | <b>sp. nr.</b>               | 1            | 1            | 2          |
|               | <b>sp.</b>                   | 63           | 41           | 85         |
|               | <b>n. sp.</b>                | 5            | 3            | 7          |
|               | <b>? n. sp.</b>              | 0            | 1            | 1          |
|               | <b>Potential no. species</b> | 211 so far   | 133 so far   | 279 so far |
|               | <b>Individuals</b>           | 7137         | 2679         | 9816       |

Table H29. Caddisflies collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family         | Genus species                | BR specimens | CT specimens | Totals   |
|----------------|------------------------------|--------------|--------------|----------|
| Hydropsychidae | <b>Morpho sp. 1</b>          | 13           | 8            | 21       |
| Hydroptilidae  | <b>Morpho sp. 1</b>          | 1            | 0            | 1        |
| Philopotamidae | <b>Morpho sp. 1</b>          | 1            | 0            | 1        |
| Phryganeidae   | <b>Morpho sp. 1</b>          | 1            | 0            | 1        |
|                | <b>sp. 2</b>                 | 1            | 0            | 1        |
| <b>Totals</b>  | <b>Families</b>              | 4            | 1            | 4        |
|                | <b>sp.</b>                   | 5            | 1            | 6        |
|                | <b>Potential no. species</b> | 5 so far     | 1 so far     | 5 so far |
|                | <b>Individuals</b>           | 17           | 8            | 25       |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H30. Moths and butterflies collected at Gettysburg National Military Park and Eisenhower National Historic Site (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family          | Genus species                       | BR spec. | CT spec. | Other spec. | Totals |
|-----------------|-------------------------------------|----------|----------|-------------|--------|
| Acrolophidae    | <i>Acrolophus arcanella</i>         | 5        | 1        | 0           | 6      |
| Arctiidae       | <i>Cisthene plumbea</i>             | 3        | 0        | 0           | 3      |
|                 | <i>Clemensia albata</i>             | 4        | 0        | 0           | 4      |
|                 | <i>Cycnia tenera</i>                | 0        | 12       | 0           | 12     |
|                 | <i>Grammia anna</i>                 | 10       | 0        | 0           | 10     |
|                 | <i>Halysidota tessellarius</i>      | 11       | 0        | 0           | 11     |
|                 | <i>Haploa lecontei</i>              | 11       | 0        | 0           | 11     |
|                 | <i>Holomelina immaculata</i>        | 1        | 0        | 0           | 1      |
|                 | <i>Hyphantria cunea</i>             | 18       | 0        | 0           | 18     |
|                 | <i>Hypoprepia fucosa</i>            | 0        | 3        | 0           | 3      |
|                 | <i>Isia isabella</i>                | 2        | 0        | 0           | 2      |
|                 | <i>Laphocampa caryae</i>            | 3        | 0        | 0           | 3      |
|                 | <i>Spilosoma congrua</i>            | 9        | 0        | 0           | 9      |
|                 | sp. 1                               | 3        | 0        | 0           | 3      |
|                 | virginica                           | 0        | 2        | 0           | 2      |
| Blastobasidae   | <b>Morpho</b> sp. 1                 | 3        | 0        | 0           | 3      |
|                 | sp. 2                               | 1        | 0        | 0           | 1      |
| Cosmopterigidae | <i>Cosmopterix gemmiferella</i>     | 3        | 0        | 0           | 3      |
|                 | nr. <i>gemmiferella</i>             | 1        | 0        | 0           | 1      |
| Danaidae        | <i>Danaus plexippus</i>             | 0        | 0        | 6           | 6      |
| Epiplemidae     | <i>Calledapteryx dryopterata</i>    | 1        | 2        | 0           | 3      |
|                 | <b>Morpho</b> sp. 1                 | 1        | 0        | 0           | 1      |
| Gelechiidae     | <b>Morpho</b> sp. 1                 | 0        | 1        | 0           | 1      |
|                 | sp. 2                               | 0        | 2        | 0           | 2      |
|                 | sp. 3                               | 0        | 3        | 0           | 3      |
|                 | sp. 4                               | 0        | 1        | 0           | 1      |
|                 | sp. 5                               | 0        | 1        | 0           | 1      |
|                 | sp. 6                               | 0        | 1        | 0           | 1      |
|                 | sp. 7                               | 0        | 1        | 0           | 1      |
|                 | sp. 8                               | 0        | 1        | 0           | 1      |
|                 | sp. 9                               | 0        | 1        | 0           | 1      |
|                 | sp. 10                              | 0        | 1        | 0           | 1      |
|                 | sp. 11                              | 0        | 1        | 0           | 1      |
|                 | sp. 12                              | 1        | 0        | 0           | 1      |
|                 | sp. 13                              | 1        | 0        | 0           | 1      |
|                 | sp. 14                              | 1        | 0        | 0           | 1      |
|                 | sp. 15                              | 1        | 0        | 0           | 1      |
|                 | sp. 16                              | 1        | 0        | 0           | 1      |
|                 | sp. 17                              | 2        | 0        | 0           | 2      |
|                 | sp. 18                              | 1        | 0        | 0           | 1      |
| Geometridae     | <i>Anacamptodes humaria</i>         | 0        | 2        | 0           | 2      |
|                 | <i>Biston betularia</i>             | 1        | 0        | 0           | 1      |
|                 | <i>Chlorochlamys chloroleucaria</i> | 0        | 2        | 0           | 2      |
|                 | <i>Epimecis hortaria</i>            | 1        | 0        | 0           | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H30. Moths and butterflies collected at Gettysburg National Military Park and Eisenhower National Historic Site (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family | Genus species                   | BR spec. | CT spec. | Other spec. | Totals |
|--------|---------------------------------|----------|----------|-------------|--------|
|        | <i>Eubaphe mendica</i>          | 4        | 1        | 0           | 5      |
|        | <i>Euchlaena serrata</i>        | 1        | 0        | 0           | 1      |
|        | <i>Eusarca confusaria?</i>      | 0        | 0        | 1           | 1      |
|        | <i>Haematopis grataria</i>      | 0        | 1        | 0           | 1      |
|        | <i>Heterophleps triguttaria</i> | 0        | 2        | 0           | 2      |
|        | <i>Hydria undulata</i>          | 1        | 0        | 0           | 1      |
|        | <i>Hypagyrtis piniata</i>       | 0        | 3        | 0           | 3      |
|        | sp. 1                           | 0        | 1        | 0           | 1      |
|        | <i>unipunctata</i>              | 1        | 0        | 0           | 1      |
|        | <i>Itame pustularia</i>         | 1        | 0        | 0           | 1      |
|        | <i>Metarranthis</i> sp. 1       | 6        | 0        | 0           | 6      |
|        | <i>Orthonama obstipata</i>      | 0        | 2        | 0           | 2      |
|        | <i>Protoboarmia porcelaria</i>  | 2        | 0        | 0           | 2      |
|        | <i>Scopula limboundata</i>      | 0        | 1        | 0           | 1      |
|        | <i>Semiothisa aemulataria</i>   | 2        | 0        | 0           | 2      |
|        | <i>eremiata</i>                 | 1        | 0        | 0           | 1      |
|        | sp. 1                           | 1        | 0        | 0           | 1      |
|        | <b>Morpho</b> sp. 1             | 1        | 0        | 0           | 1      |
|        | sp. 2                           | 0        | 2        | 0           | 2      |
|        | sp. 3                           | 1        | 0        | 0           | 1      |
|        | sp. 4                           | 1        | 0        | 0           | 1      |
|        | sp. 5                           | 1        | 0        | 0           | 1      |
|        | sp. 6                           | 1        | 0        | 0           | 1      |
|        | sp. 7                           | 3        | 0        | 0           | 3      |
|        | sp. 8                           | 1        | 1        | 0           | 2      |
|        | sp. 9                           | 0        | 2        | 0           | 2      |
|        | sp. 10                          | 0        | 1        | 0           | 1      |
|        | sp. 11                          | 3        | 0        | 0           | 3      |
|        | sp. 12                          | 1        | 2        | 0           | 3      |
|        | sp. 13                          | 0        | 1        | 0           | 1      |
|        | sp. 14                          | 0        | 1        | 0           | 1      |
|        | sp. 15                          | 0        | 1        | 0           | 1      |
|        | sp. 16                          | 1        | 0        | 0           | 1      |
|        | sp. 17                          | 1        | 0        | 0           | 1      |
|        | sp. 18                          | 1        | 0        | 0           | 1      |
|        | sp. 19                          | 1        | 0        | 0           | 1      |
|        | sp. 20                          | 1        | 0        | 0           | 1      |
|        | sp. 21                          | 1        | 0        | 0           | 1      |
|        | sp. 22                          | 1        | 0        | 0           | 1      |
|        | sp. 23                          | 2        | 0        | 0           | 2      |
|        | sp. 24                          | 2        | 0        | 0           | 2      |
|        | sp. 25                          | 1        | 0        | 0           | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H30. Moths and butterflies collected at Gettysburg National Military Park and Eisenhower National Historic Site (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family         | Genus species                 | BR spec. | CT spec. | Other spec. | Totals |
|----------------|-------------------------------|----------|----------|-------------|--------|
|                | sp. 26                        | 1        | 0        | 0           | 1      |
|                | <i>Synchlora aerata</i>       | 1        | 0        | 0           | 1      |
|                | <i>Xanthorhoe lacustrata</i>  | 6        | 0        | 0           | 6      |
|                | <i>Xanthotype sospeta</i>     | 1        | 0        | 0           | 1      |
|                | <b>Cannot be further IDed</b> | 2        | 0        | 0           | 2      |
| Gracillariidae | <b>Morpho sp. 1</b>           | 1        | 0        | 0           | 1      |
| Hesperiidae    | <i>Ancyloxypha numitor</i>    | 0        | 3        | 6           | 9      |
|                | <i>Atalopedes campestris</i>  | 0        | 0        | 1           | 1      |
|                | <i>Epargyreus clarus</i>      | 0        | 0        | 6           | 6      |
|                | <i>Erynnis brizo</i>          | 0        | 0        | 2           | 2      |
|                | <i>juvenalis</i>              | 0        | 0        | 6           | 6      |
|                | <i>Euphys dion</i>            | 0        | 0        | 1           | 1      |
|                | <b>Morpho sp. 1</b>           | 0        | 0        | 1           | 1      |
|                | sp. 2                         | 0        | 0        | 1           | 1      |
|                | sp. 3                         | 0        | 0        | 1           | 1      |
|                | <i>Poanes hobomok</i>         | 1        | 0        | 11          | 12     |
|                | <i>Polites mystic</i>         | 0        | 0        | 14          | 14     |
|                | <i>peckius</i>                | 0        | 0        | 12          | 12     |
|                | <i>thermistocles</i>          | 0        | 0        | 3           | 3      |
|                | <i>Pompeius verna</i>         | 0        | 0        | 26          | 26     |
|                | <i>Pyrgus communis</i>        | 0        | 0        | 1           | 1      |
|                | <i>Thorybes pylades</i>       | 0        | 0        | 6           | 6      |
|                | <i>Thymelicus lineola</i>     | 0        | 0        | 30          | 30     |
| Lasiocampidae  | <i>Malacosoma americana</i>   | 73       | 0        | 0           | 73     |
|                | <i>disstria</i>               | 1        | 0        | 0           | 1      |
| Limacodidae    | <i>Euclea delphinii</i>       | 2        | 0        | 0           | 2      |
| Lycaenidae     | <i>Calycopis cecrops</i>      | 0        | 0        | 1           | 1      |
|                | <i>Celastrina agriolus</i>    | 0        | 0        | 14          | 14     |
|                | <i>Everes comyntas</i>        | 0        | 0        | 11          | 11     |
|                | <i>Lycaena phlaeas</i>        | 0        | 0        | 1           | 1      |
|                | <i>Satyrrium calanus</i>      | 0        | 0        | 1           | 1      |
|                | <i>Strymon melinus</i>        | 0        | 0        | 6           | 6      |
| Lymantriidae   | <i>Dasychira obliquata</i>    | 2        | 0        | 0           | 2      |
|                | <i>plagiata</i>               | 1        | 0        | 0           | 1      |
|                | <b>Morpho sp. 1</b>           | 2        | 0        | 0           | 2      |
| Neptoculidae   | <b>Cannot be further IDed</b> | 1        | 2        | 0           | 3      |
| Noctuidae      | <i>Abigrotis sp. 1</i>        | 1        | 0        | 0           | 1      |
|                | <i>Acronicta americana</i>    | 1        | 0        | 0           | 1      |
|                | sp. 1                         | 1        | 0        | 0           | 1      |
|                | <i>Agrotis ipsilon</i>        | 1        | 4        | 0           | 5      |
|                | <i>Allotria elonympha</i>     | 1        | 0        | 0           | 1      |
|                | <i>Amphipoea velata</i>       | 1        | 0        | 0           | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H30. Moths and butterflies collected at Gettysburg National Military Park and Eisenhower National Historic Site (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family | Genus species                     | BR spec. | CT spec. | Other spec. | Totals |
|--------|-----------------------------------|----------|----------|-------------|--------|
|        | <i>Baileya levitans</i>           | 3        | 0        | 0           | 3      |
|        | <i>Bleptina caradrinalis</i>      | 8        | 6        | 0           | 14     |
|        | <i>Bomolocha abalienalis</i>      | 1        | 0        | 0           | 1      |
|        | <i>bijugalis</i>                  | 1        | 0        | 0           | 1      |
|        | <i>edictalis</i>                  | 2        | 7        | 0           | 9      |
|        | <i>madefactalis</i>               | 0        | 3        | 0           | 3      |
|        | <i>Caenurgina erechtea</i>        | 0        | 2        | 0           | 2      |
|        | <i>Catocala ilia</i>              | 1        | 0        | 0           | 1      |
|        | <i>Celiptera frustulum</i>        | 2        | 0        | 0           | 2      |
|        | <i>Chytolita morbidalis</i>       | 2        | 0        | 0           | 2      |
|        | <i>Chytonix palliatricula</i>     | 10       | 0        | 0           | 10     |
|        | <i>Crambodes talidiformes</i>     | 0        | 1        | 0           | 1      |
|        | <i>Elaphra festivoidea</i>        | 2        | 0        | 0           | 2      |
|        | <i>vessicolor</i>                 | 0        | 0        | 0           | 0      |
|        | <i>Eudryas grata</i>              | 1        | 0        | 0           | 1      |
|        | <i>Euplexia benesimilis</i>       | 1        | 0        | 0           | 1      |
|        | <i>Feltia tricola</i>             | 0        | 1        | 0           | 1      |
|        | <i>Galgula partita</i>            | 0        | 4        | 0           | 4      |
|        | <i>Hyperstrotia pervertens</i>    | 0        | 1        | 0           | 1      |
|        | <i>Idia aemula</i>                | 3        | 0        | 0           | 3      |
|        | <i>americana</i>                  | 2        | 0        | 0           | 2      |
|        | <i>diminuedis</i>                 | 9        | 0        | 0           | 9      |
|        | <i>scobialis</i>                  | 2        | 0        | 0           | 2      |
|        | <i>Lasconia ambigua</i>           | 0        | 1        | 0           | 1      |
|        | <i>Leucania phragmitidicola</i>   | 2        | 0        | 0           | 2      |
|        | <i>pseudargyria</i>               | 1        | 0        | 0           | 1      |
|        | <i>sp. 1</i>                      | 0        | 4        | 0           | 4      |
|        | <i>Leuconycta diptheroides</i>    | 1        | 0        | 0           | 1      |
|        | <i>Lithocodia muscosa</i>         | 1        | 52       | 0           | 53     |
|        | <i>Nola sp. 1</i>                 | 0        | 1        | 0           | 1      |
|        | <i>Orthodes cynica</i>            | 1        | 0        | 0           | 1      |
|        | <i>cynica?</i>                    | 3        | 0        | 0           | 3      |
|        | <i>detracta</i>                   | 6        | 0        | 0           | 6      |
|        | <i>Palthis asopialis</i>          | 0        | 1        | 0           | 1      |
|        | <i>Pamopoda rufimargo</i>         | 1        | 0        | 0           | 1      |
|        | <i>Perigea xanthiodes</i>         | 0        | 2        | 0           | 2      |
|        | <i>Phalaenostola larentioides</i> | 0        | 6        | 0           | 6      |
|        | <i>sp. 1</i>                      | 0        | 1        | 0           | 1      |
|        | <i>Plathypena scabra</i>          | 1        | 1        | 1           | 3      |
|        | <i>Polygrammate hebraeicum</i>    | 0        | 1        | 0           | 1      |
|        | <i>Protolampra brunneicollis</i>  | 3        | 0        | 0           | 3      |
|        | <i>Proxenus miranda</i>           | 0        | 2        | 0           | 2      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H30. Moths and butterflies collected at Gettysburg National Military Park and Eisenhower National Historic Site (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family | Genus species                | BR spec. | CT spec. | Other spec. | Totals |
|--------|------------------------------|----------|----------|-------------|--------|
|        | <i>Scolecocampa libuma</i>   | 1        | 0        | 0           | 1      |
|        | <i>Scoliopteryx libatrix</i> | 1        | 0        | 0           | 1      |
|        | <b>Morpho</b> sp. 1          | 1        | 2        | 0           | 3      |
|        | sp. 2                        | 0        | 1        | 0           | 1      |
|        | sp. 3                        | 0        | 1        | 0           | 1      |
|        | sp. 4                        | 0        | 1        | 0           | 1      |
|        | sp. 5                        | 0        | 1        | 0           | 1      |
|        | sp. 6                        | 0        | 1        | 0           | 1      |
|        | sp. 7                        | 0        | 1        | 0           | 1      |
|        | sp. 8                        | 0        | 1        | 0           | 1      |
|        | sp. 9                        | 0        | 1        | 0           | 1      |
|        | sp. 10                       | 0        | 1        | 0           | 1      |
|        | sp. 11                       | 0        | 1        | 0           | 1      |
|        | sp. 12                       | 0        | 1        | 0           | 1      |
|        | sp. 13                       | 0        | 1        | 0           | 1      |
|        | sp. 14                       | 1        | 0        | 0           | 1      |
|        | sp. 15                       | 1        | 0        | 0           | 1      |
|        | sp. 16                       | 0        | 1        | 0           | 1      |
|        | sp. 17                       | 0        | 2        | 0           | 2      |
|        | sp. 18                       | 0        | 1        | 0           | 1      |
|        | sp. 19                       | 0        | 2        | 0           | 2      |
|        | sp. 20                       | 1        | 0        | 0           | 1      |
|        | sp. 21                       | 1        | 0        | 0           | 1      |
|        | sp. 22                       | 2        | 0        | 0           | 2      |
|        | sp. 23                       | 1        | 0        | 0           | 1      |
|        | sp. 24                       | 1        | 0        | 0           | 1      |
|        | sp. 25                       | 0        | 1        | 0           | 1      |
|        | sp. 26                       | 1        | 3        | 0           | 4      |
|        | sp. 27                       | 1        | 0        | 0           | 1      |
|        | sp. 28                       | 1        | 0        | 0           | 1      |
|        | sp. 29                       | 1        | 0        | 0           | 1      |
|        | sp. 30                       | 1        | 0        | 0           | 1      |
|        | sp. 31                       | 1        | 0        | 0           | 1      |
|        | sp. 32                       | 1        | 0        | 0           | 1      |
|        | sp. 33                       | 0        | 1        | 0           | 1      |
|        | sp. 34                       | 0        | 1        | 0           | 1      |
|        | sp. 35                       | 0        | 1        | 0           | 1      |
|        | <i>Spodoptera dolichos</i>   | 0        | 1        | 0           | 1      |
|        | <i>Tarachidia candefacta</i> | 0        | 1        | 0           | 1      |
|        | erastroides                  | 1        | 0        | 0           | 1      |
|        | <i>Xestia bicamea</i>        | 0        | 1        | 0           | 1      |
|        | collaris                     | 1        | 0        | 0           | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H30. Moths and butterflies collected at Gettysburg National Military Park and Eisenhower National Historic Site (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species                  | BR spec. | CT spec. | Other spec. | Totals |
|---------------|--------------------------------|----------|----------|-------------|--------|
| Notodontidae  | <i>Zanclognatha cruralis</i>   | 1        | 0        | 0           | 1      |
|               | <i>ochreipennis</i>            | 4        | 0        | 0           | 4      |
|               | <i>sp. 1</i>                   | 0        | 1        | 0           | 1      |
|               | <i>sp. 2</i>                   | 1        | 0        | 0           | 1      |
|               | <i>sp. 3</i>                   | 1        | 0        | 0           | 1      |
|               | <b>Cannot be further IDed</b>  | 1        | 0        | 0           | 1      |
|               | <i>Dasylophia anguina</i>      | 1        | 2        | 0           | 3      |
|               | <i>Heterocampa obliqua</i>     | 2        | 0        | 0           | 2      |
|               | <i>Hyperaeshra georgica</i>    | 2        | 0        | 0           | 2      |
|               | <i>Lochmaeus bilineata</i>     | 2        | 1        | 0           | 3      |
|               | <i>Macrurocampa marthesia</i>  | 8        | 0        | 0           | 8      |
|               | <i>Nadata gibbosa</i>          | 5        | 2        | 0           | 7      |
|               | <i>Oligocentria lignicolor</i> | 0        | 2        | 0           | 2      |
|               | <i>Peridea angulosa</i>        | 7        | 2        | 0           | 9      |
| Nymphalidae   | <i>Schizura leptinoides</i>    | 0        | 1        | 0           | 1      |
|               | <i>Symmeristra albifrons</i>   | 16       | 0        | 0           | 16     |
|               | <i>Euphydryas phaeton</i>      | 0        | 0        | 9           | 9      |
|               | <i>Megisto cymela</i>          | 0        | 0        | 31          | 31     |
|               | <i>Phyciodes tharos</i>        | 0        | 0        | 19          | 19     |
|               | <i>Polygonia comma</i>         | 0        | 0        | 1           | 1      |
|               | <i>interrogationis</i>         | 0        | 0        | 3           | 3      |
|               | <i>Speyeria cybele</i>         | 0        | 0        | 11          | 11     |
|               | <i>Vanessa atalanta</i>        | 0        | 0        | 1           | 1      |
|               | <i>virginiensis</i>            | 0        | 0        | 10          | 10     |
| Oecophoridae  | <i>Antaeorhiza leucillana</i>  | 0        | 1        | 0           | 1      |
|               | <b>Morpho sp. 1</b>            | 1        | 1        | 0           | 2      |
|               | <i>sp. 2</i>                   | 1        | 0        | 0           | 1      |
|               | <i>sp. 3</i>                   | 0        | 1        | 0           | 1      |
| Papilionidae  | <i>Battus philenor</i>         | 0        | 0        | 9           | 9      |
|               | <i>Papilio glaucus</i>         | 0        | 0        | 12          | 12     |
|               | <i>polyxenes</i>               | 0        | 0        | 2           | 2      |
|               | <i>troilus</i>                 | 0        | 0        | 5           | 5      |
| Pieridae      | <i>Colias eurytheme</i>        | 0        | 0        | 13          | 13     |
|               | <i>philodice</i>               | 0        | 0        | 3           | 3      |
|               | <i>Pieris rapae</i>            | 0        | 0        | 24          | 24     |
| Psychidae     | <b>Morpho sp. 1</b>            | 0        | 1        | 0           | 1      |
| Pterophoridae | <i>Geina tenuidactyla</i>      | 2        | 0        | 0           | 2      |
|               | <b>Cannot be further IDed</b>  | 1        | 0        | 0           | 1      |
| Pyralidae     | <i>Crambus agitatellus</i>     | 8        | 21       | 0           | 29     |
|               | <i>girardellus</i>             | 2        | 0        | 0           | 2      |
|               | <i>sp. 1</i>                   | 31       | 0        | 0           | 31     |
|               | <i>Desmia funeralis</i>        | 5        | 0        | 0           | 5      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H30. Moths and butterflies collected at Gettysburg National Military Park and Eisenhower National Historic Site (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family      | Genus species                      | BR spec. | CT spec. | Other spec. | Totals |
|-------------|------------------------------------|----------|----------|-------------|--------|
|             | <i>Fumibotys famalis</i>           | 0        | 10       | 0           | 10     |
|             | <i>Herculia olinalis</i>           | 6        | 0        | 0           | 6      |
|             | <b>Morpho sp. 2</b>                | 0        | 2        | 0           | 2      |
|             | sp. 3                              | 0        | 5        | 0           | 5      |
|             | sp. 4                              | 0        | 2        | 0           | 2      |
|             | sp. 5                              | 3        | 2        | 0           | 5      |
|             | sp. 6                              | 2        | 0        | 0           | 2      |
|             | sp. 7                              | 5        | 0        | 0           | 5      |
|             | sp. 8                              | 1        | 0        | 0           | 1      |
|             | sp. 9                              | 7        | 0        | 0           | 7      |
|             | sp. 10                             | 1        | 0        | 0           | 1      |
|             | sp. 11                             | 1        | 0        | 0           | 1      |
|             | sp. 12                             | 0        | 3        | 0           | 3      |
|             | sp. 13                             | 0        | 1        | 0           | 1      |
|             | sp. 14                             | 1        | 4        | 0           | 5      |
|             | sp. 15                             | 0        | 1        | 0           | 1      |
|             | sp. 16                             | 0        | 2        | 0           | 2      |
|             | sp. 17                             | 1        | 0        | 0           | 1      |
|             | sp. 18                             | 4        | 5        | 0           | 9      |
|             | sp. 19                             | 1        | 2        | 0           | 3      |
|             | sp. 20                             | 0        | 1        | 0           | 1      |
|             | sp. 21                             | 0        | 1        | 0           | 1      |
|             | sp. 22                             | 0        | 1        | 0           | 1      |
|             | sp. 23                             | 0        | 2        | 0           | 2      |
|             | sp. 24                             | 1        | 0        | 0           | 1      |
|             | sp. 25                             | 1        | 0        | 0           | 1      |
|             | sp. 26                             | 1        | 0        | 0           | 1      |
|             | sp. 27                             | 1        | 0        | 0           | 1      |
|             | sp. 28                             | 2        | 0        | 0           | 2      |
|             | sp. 29                             | 1        | 0        | 0           | 1      |
|             | sp. 30                             | 0        | 1        | 0           | 1      |
|             | sp. 31                             | 0        | 1        | 0           | 1      |
|             | sp. 32                             | 0        | 1        | 0           | 1      |
|             | sp. 33                             | 0        | 1        | 0           | 1      |
|             | sp. 34                             | 0        | 1        | 0           | 1      |
|             | sp. 35                             | 0        | 1        | 0           | 1      |
|             | sp. 36                             | 0        | 1        | 0           | 1      |
|             | <i>Pediasia sp. 1</i>              | 0        | 25       | 0           | 25     |
| Saturniidae | <i>Dryocampa rubicunda</i>         | 2        | 0        | 0           | 2      |
| Satyridae   | <i>Coenonympha tullia inornata</i> | 0        | 0        | 8           | 8      |
| Sphingidae  | <i>Laothoe juglandis</i>           | 1        | 0        | 0           | 1      |
|             | <i>Darapsa pholus</i>              | 1        | 0        | 0           | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H30. Moths and butterflies collected at Gettysburg National Military Park and Eisenhower National Historic Site (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family      | Genus species                 | BR spec. | CT spec. | Other spec. | Totals |
|-------------|-------------------------------|----------|----------|-------------|--------|
| Tineidae    | <b>Morpho sp. 1</b>           | 0        | 1        | 0           | 1      |
|             | sp. 2                         | 1        | 0        | 0           | 1      |
|             | sp. 3                         | 1        | 0        | 0           | 1      |
|             | sp. 4                         | 1        | 0        | 0           | 1      |
|             | sp. 5                         | 1        | 0        | 0           | 1      |
|             | <b>Cannot be further IDed</b> | 0        | 4        | 0           | 4      |
| Tortricidae | <b>Morpho sp. 1</b>           | 5        | 0        | 0           | 5      |
|             | sp. 2                         | 6        | 0        | 0           | 6      |
|             | sp. 3                         | 1        | 0        | 0           | 1      |
|             | sp. 4                         | 1        | 0        | 0           | 1      |
|             | sp. 5                         | 1        | 0        | 0           | 1      |
|             | sp. 6                         | 1        | 0        | 0           | 1      |
|             | sp. 7                         | 1        | 0        | 0           | 1      |
|             | sp. 8                         | 1        | 0        | 0           | 1      |
|             | sp. 9                         | 2        | 0        | 0           | 2      |
|             | sp. 10                        | 1        | 0        | 0           | 1      |
|             | sp. 11                        | 0        | 2        | 0           | 2      |
|             | sp. 12                        | 0        | 1        | 0           | 1      |
|             | sp. 13                        | 0        | 1        | 0           | 1      |
|             | sp. 14                        | 0        | 2        | 0           | 2      |
|             | sp. 15                        | 0        | 5        | 0           | 5      |
|             | sp. 16                        | 0        | 1        | 0           | 1      |
|             | sp. 17                        | 0        | 1        | 0           | 1      |
|             | sp. 18                        | 0        | 1        | 0           | 1      |
|             | sp. 19                        | 3        | 0        | 0           | 3      |
|             | sp. 20                        | 2        | 0        | 0           | 2      |
|             | sp. 21                        | 1        | 0        | 0           | 1      |
|             | sp. 22                        | 2        | 0        | 0           | 2      |
|             | sp. 23                        | 0        | 2        | 0           | 2      |
|             | sp. 24                        | 0        | 1        | 0           | 1      |
|             | sp. 25                        | 2        | 0        | 0           | 2      |
|             | sp. 26                        | 1        | 0        | 0           | 1      |
|             | sp. 27                        | 1        | 0        | 0           | 1      |
|             | sp. 28                        | 0        | 1        | 0           | 1      |
|             | sp. 29                        | 0        | 1        | 0           | 1      |
|             | sp. 30                        | 0        | 1        | 0           | 1      |
|             | sp. 31                        | 0        | 1        | 0           | 1      |
|             | sp. 32                        | 0        | 1        | 0           | 1      |
|             | sp. 33                        | 0        | 1        | 0           | 1      |
|             | sp. 34                        | 1        | 1        | 0           | 2      |
|             | sp. 35                        | 0        | 1        | 0           | 1      |
|             | sp. 36                        | 0        | 5        | 0           | 5      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H30. Moths and butterflies collected at Gettysburg National Military Park and Eisenhower National Historic Site (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species                | BR spec.   | CT spec.   | Other spec. | Totals     |
|---------------|------------------------------|------------|------------|-------------|------------|
|               | <i>sp. 37</i>                | 0          | 1          | 0           | 1          |
|               | Cannot be further IDed       | 0          | 5          | 0           | 5          |
| Unknown       | Cannot be further IDed       | 226        | 103        | 0           | 329        |
| Yponomeutidae | <i>Atteva punctella</i>      | 0          | 1          | 0           | 1          |
| Zygaenidae    | <i>Pyromorpha dimidiata</i>  | 1          | 0          | 0           | 1          |
| <b>Totals</b> | <b>Families</b>              | 23         | 15         | 9           | 31         |
|               | <b>Genera</b>                | 74         | 47         | 31          | 130        |
|               | <b>Named species</b>         | 84         | 44         | 38          | 151        |
|               | <b>? Species</b>             | 1          | 0          | 1           | 2          |
|               | <b>sp. nr.</b>               | 1          | 0          | 0           | 1          |
|               | <b>sp.</b>                   | 96         | 93         | 3           | 182        |
|               | <b>Potential no. species</b> | 180 so far | 137 so far | 42 so far   | 334 so far |
|               | <b>Individuals</b>           | 746        | 453        | 331         | 1530       |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H31. Hymenoptera collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket).

| Family        | Genus species       | BR specimens | CT specimens | Totals |
|---------------|---------------------|--------------|--------------|--------|
| Aphelinidae   | <b>Morpho</b> sp. 1 | 10           | 2            | 12     |
|               | sp. 2               | 1            | 2            | 3      |
|               | sp. 3               | 2            | 1            | 3      |
|               | sp. 4               | 2            | 1            | 3      |
|               | sp. 5               | 2            | 0            | 2      |
| Apidae        | <b>Morpho</b> sp. 1 | 1            | 0            | 1      |
|               | sp. 2               | 2            | 2            | 4      |
|               | sp. 3               | 1            | 0            | 1      |
| Bethyidae     | <b>Morpho</b> sp. 1 | 6            | 12           | 18     |
|               | sp. 2               | 2            | 0            | 2      |
|               | sp. 3               | 0            | 1            | 1      |
|               | sp. 4               | 0            | 3            | 3      |
| Braconidae    | <b>Morpho</b> sp. 1 | 117          | 35           | 152    |
|               | sp. 2               | 2            | 1            | 3      |
|               | sp. 3               | 1            | 4            | 5      |
|               | sp. 4               | 0            | 8            | 8      |
|               | sp. 6               | 0            | 4            | 4      |
|               | sp. 7               | 0            | 1            | 1      |
|               | sp. 8               | 5            | 4            | 9      |
|               | sp. 9               | 1            | 1            | 2      |
|               | sp. 10              | 55           | 11           | 66     |
|               | sp. 11              | 0            | 2            | 2      |
|               | sp. 12              | 13           | 3            | 16     |
|               | sp. 13              | 12           | 3            | 15     |
|               | sp. 14              | 5            | 1            | 6      |
|               | sp. 15              | 0            | 1            | 1      |
|               | sp. 16              | 2            | 2            | 4      |
|               | sp. 17              | 0            | 1            | 1      |
|               | sp. 18              | 0            | 1            | 1      |
|               | sp. 19              | 7            | 0            | 7      |
|               | sp. 20              | 13           | 0            | 13     |
|               | sp. 21              | 4            | 0            | 4      |
|               | sp. 22              | 3            | 0            | 3      |
|               | sp. 23              | 1            | 0            | 1      |
|               | sp. 24              | 1            | 0            | 1      |
|               | sp. 25              | 1            | 0            | 1      |
|               | sp. 26              | 8            | 0            | 8      |
|               | sp. 27              | 1            | 0            | 1      |
|               | sp. 28              | 1            | 0            | 1      |
|               | sp. 29              | 1            | 0            | 1      |
|               | sp. 30              | 1            | 0            | 1      |
| Ceraphronidae | <b>Morpho</b> sp. 1 | 100          | 15           | 115    |
|               | sp. 2               | 16           | 2            | 18     |
|               | sp. 3               | 1            | 1            | 2      |
| Chalcidae     | <b>Morpho</b> sp. 1 | 0            | 2            | 2      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H31. Hymenoptera collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family      | Genus species        | BR specimens | CT specimens | Totals |
|-------------|----------------------|--------------|--------------|--------|
| Chrysididae | <b>Morpho</b> sp. 1  | 5            | 2            | 7      |
|             | sp. 2                | 0            | 4            | 4      |
|             | sp. 3                | 4            | 2            | 6      |
| Cynipidae   | <b>Morpho</b> sp. 1  | 1            | 2            | 3      |
|             | sp. 2                | 4            | 1            | 5      |
|             | sp. 3                | 19           | 0            | 19     |
|             | sp. 4                | 7            | 0            | 7      |
|             | sp. 5                | 2            | 0            | 2      |
|             | sp. 6                | 1            | 0            | 1      |
|             | sp. 7                | 1            | 0            | 1      |
|             | sp. 8                | 1            | 0            | 1      |
| Diapriidae  | <b>Morpho</b> sp. 1  | 19           | 5            | 24     |
|             | sp. 2                | 95           | 19           | 114    |
|             | sp. 3                | 53           | 3            | 56     |
|             | sp. 4                | 0            | 1            | 1      |
|             | sp. 5                | 15           | 7            | 22     |
|             | sp. 6                | 1            | 0            | 1      |
|             | sp. 7                | 2            | 0            | 2      |
|             | sp. 8                | 1            | 0            | 1      |
| Dryinidae   | <b>Morpho</b> sp. 1  | 1            | 0            | 1      |
|             | sp. 2                | 1            | 8            | 9      |
|             | sp. 3                | 1            | 0            | 1      |
|             | sp. 4                | 0            | 3            | 3      |
| Elasmidae   | <i>Elasmus</i> sp. 1 | 0            | 1            | 1      |
| Encyrtidae  | <b>Morpho</b> sp. 1  | 2            | 0            | 2      |
|             | sp. 2                | 4            | 4            | 8      |
|             | sp. 3                | 3            | 19           | 22     |
|             | sp. 4                | 1            | 0            | 1      |
|             | sp. 5                | 0            | 1            | 1      |
| Eucoilidae  | <b>Morpho</b> sp. 1  | 3            | 1            | 4      |
|             | sp. 2                | 7            | 2            | 9      |
|             | sp. 3                | 2            | 5            | 7      |
| Eulophidae  | <b>Morpho</b> sp. 1  | 3            | 3            | 6      |
|             | sp. 2                | 58           | 44           | 102    |
|             | sp. 3                | 0            | 6            | 6      |
|             | sp. 4                | 0            | 10           | 10     |
|             | sp. 5                | 0            | 2            | 2      |
|             | sp. 6                | 4            | 1            | 5      |
|             | sp. 7                | 0            | 1            | 1      |
| Eupelmidae  | <b>Morpho</b> sp. 1  | 1            | 0            | 1      |
|             | sp. 2                | 1            | 0            | 1      |
|             | sp. 3                | 1            | 1            | 2      |
|             | sp. 4                | 0            | 5            | 5      |
|             | sp. 5                | 0            | 1            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H31. Hymenoptera collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family        | Genus species                 | BR specimens | CT specimens | Totals |
|---------------|-------------------------------|--------------|--------------|--------|
|               | <i>sp. 6</i>                  | 0            | 2            | 2      |
| Eurytomidae   | <b>Morpho</b> <i>sp. 1</i>    | 1            | 0            | 1      |
|               | <i>sp. 2</i>                  | 0            | 1            | 1      |
|               | <i>sp. 3</i>                  | 0            | 1            | 1      |
| Evaniidae     | <b>Morpho</b> <i>sp. 1</i>    | 1            | 0            | 1      |
| Figitidae     | <b>Morpho</b> <i>sp. 1</i>    | 3            | 0            | 3      |
|               | <i>sp. 2</i>                  | 1            | 0            | 1      |
|               | <i>sp. 3</i>                  | 1            | 0            | 1      |
| Formicidae    | <i>Camponotus sp. 1</i>       | 28           | 44           | 72     |
|               | <i>sp. 2</i>                  | 89           | 20           | 109    |
|               | <i>sp. 3</i>                  | 0            | 1            | 1      |
|               | <i>Formica sp. 1</i>          | 3            | 5            | 8      |
|               | <b>Morpho</b> <i>sp. 1</i>    | 26           | 4            | 30     |
|               | <i>sp. 2</i>                  | 377          | 80           | 457    |
|               | <i>sp. 3</i>                  | 0            | 2            | 2      |
|               | <i>sp. 4</i>                  | 168          | 63           | 231    |
|               | <i>sp. 5</i>                  | 15           | 1            | 16     |
|               | <i>sp. 6</i>                  | 0            | 5            | 5      |
|               | <i>sp. 7</i>                  | 3            | 3            | 6      |
|               | <i>sp. 8</i>                  | 133          | 20           | 153    |
|               | <i>sp. 9</i>                  | 1            | 0            | 1      |
|               | <b>Cannot be further IDed</b> | 47           | 2            | 49     |
| Halictidae    | <b>Morpho</b> <i>sp. 1</i>    | 9            | 46           | 55     |
|               | <i>sp. 2</i>                  | 1            | 0            | 1      |
|               | <i>sp. 3</i>                  | 0            | 2            | 2      |
|               | <i>sp. 4</i>                  | 0            | 5            | 5      |
|               | <i>sp. 5</i>                  | 0            | 7            | 7      |
|               | <i>sp. 6</i>                  | 0            | 1            | 1      |
| Heloridae     | <b>Morpho</b> <i>sp. 1</i>    | 1            | 0            | 1      |
| Ichneumonidae | <b>Morpho</b> <i>sp. 1</i>    | 5            | 0            | 5      |
|               | <i>sp. 2</i>                  | 1            | 0            | 1      |
|               | <i>sp. 3</i>                  | 1            | 0            | 1      |
|               | <i>sp. 4</i>                  | 7            | 0            | 7      |
|               | <i>sp. 5</i>                  | 1            | 0            | 1      |
|               | <i>sp. 6</i>                  | 14           | 0            | 14     |
|               | <i>sp. 7</i>                  | 3            | 0            | 3      |
|               | <i>sp. 8</i>                  | 8            | 0            | 8      |
|               | <i>sp. 9</i>                  | 4            | 0            | 4      |
|               | <i>sp. 10</i>                 | 37           | 0            | 37     |
|               | <i>sp. 11</i>                 | 10           | 0            | 10     |
|               | <i>sp. 12</i>                 | 2            | 0            | 2      |
|               | <i>sp. 13</i>                 | 1            | 0            | 1      |
|               | <i>sp. 14</i>                 | 3            | 0            | 3      |
|               | <i>sp. 15</i>                 | 6            | 0            | 6      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H31. Hymenoptera collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family | Genus species | BR specimens | CT specimens | Totals |
|--------|---------------|--------------|--------------|--------|
|        | <i>sp. 16</i> | 4            | 0            | 4      |
|        | <i>sp. 17</i> | 5            | 0            | 5      |
|        | <i>sp. 18</i> | 3            | 0            | 3      |
|        | <i>sp. 19</i> | 2            | 0            | 2      |
|        | <i>sp. 20</i> | 6            | 0            | 6      |
|        | <i>sp. 21</i> | 1            | 0            | 1      |
|        | <i>sp. 22</i> | 4            | 0            | 4      |
|        | <i>sp. 23</i> | 12           | 0            | 12     |
|        | <i>sp. 24</i> | 2            | 0            | 2      |
|        | <i>sp. 25</i> | 1            | 0            | 1      |
|        | <i>sp. 26</i> | 1            | 0            | 1      |
|        | <i>sp. 27</i> | 2            | 0            | 2      |
|        | <i>sp. 28</i> | 10           | 0            | 10     |
|        | <i>sp. 29</i> | 13           | 0            | 13     |
|        | <i>sp. 30</i> | 2            | 0            | 2      |
|        | <i>sp. 31</i> | 1            | 0            | 1      |
|        | <i>sp. 32</i> | 1            | 0            | 1      |
|        | <i>sp. 33</i> | 6            | 0            | 6      |
|        | <i>sp. 34</i> | 6            | 0            | 6      |
|        | <i>sp. 35</i> | 4            | 0            | 4      |
|        | <i>sp. 36</i> | 1            | 0            | 1      |
|        | <i>sp. 37</i> | 4            | 0            | 4      |
|        | <i>sp. 38</i> | 3            | 0            | 3      |
|        | <i>sp. 39</i> | 1            | 0            | 1      |
|        | <i>sp. 40</i> | 5            | 0            | 5      |
|        | <i>sp. 41</i> | 3            | 0            | 3      |
|        | <i>sp. 42</i> | 3            | 0            | 3      |
|        | <i>sp. 43</i> | 3            | 0            | 3      |
|        | <i>sp. 44</i> | 3            | 0            | 3      |
|        | <i>sp. 45</i> | 1            | 0            | 1      |
|        | <i>sp. 46</i> | 2            | 0            | 2      |
|        | <i>sp. 47</i> | 2            | 0            | 2      |
|        | <i>sp. 48</i> | 1            | 0            | 1      |
|        | <i>sp. 49</i> | 1            | 0            | 1      |
|        | <i>sp. 50</i> | 2            | 0            | 2      |
|        | <i>sp. 51</i> | 4            | 0            | 4      |
|        | <i>sp. 52</i> | 1            | 0            | 1      |
|        | <i>sp. 53</i> | 23           | 0            | 23     |
|        | <i>sp. 54</i> | 1            | 0            | 1      |
|        | <i>sp. 55</i> | 2            | 0            | 2      |
|        | <i>sp. 56</i> | 5            | 0            | 5      |
|        | <i>sp. 57</i> | 1            | 0            | 1      |
|        | <i>sp. 58</i> | 1            | 0            | 1      |
|        | <i>sp. 59</i> | 2            | 0            | 2      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H31. Hymenoptera collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family       | Genus species         | BR specimens | CT specimens | Totals     |
|--------------|-----------------------|--------------|--------------|------------|
|              | <i>sp. 60</i>         | 1            | 0            | 1          |
|              | <i>sp. 61</i>         | 12           | 0            | 12         |
|              | <i>sp. 62</i>         | 2            | 0            | 2          |
|              | <i>sp. 63</i>         | 1            | 0            | 1          |
|              | <i>sp. 64</i>         | 2            | 0            | 2          |
|              | <i>sp. 65</i>         | 3            | 0            | 3          |
|              | <i>sp. 66</i>         | 2            | 0            | 2          |
|              | <i>sp. 67</i>         | 5            | 0            | 5          |
|              | <i>sp. 68</i>         | 1            | 0            | 1          |
|              | <i>sp. 69</i>         | 2            | 0            | 2          |
|              | <i>sp. 70</i>         | 1            | 0            | 1          |
|              | <i>sp. 71</i>         | 7            | 0            | 7          |
|              | <i>sp. 72</i>         | 4            | 0            | 4          |
|              | <i>sp. 73</i>         | 1            | 0            | 1          |
|              | <i>sp. 74</i>         | 2            | 0            | 2          |
|              | <i>sp. 75</i>         | 3            | 0            | 3          |
|              | <i>sp. 76</i>         | 1            | 0            | 1          |
|              | <i>sp. 77</i>         | 1            | 0            | 1          |
|              | <i>sp. 78</i>         | 3            | 0            | 3          |
|              | <i>sp. 79</i>         | 1            | 0            | 1          |
|              | <i>sp. 80</i>         | 1            | 0            | 1          |
|              | <i>sp. 81</i>         | 1            | 0            | 1          |
|              | <i>sp. 82</i>         | 1            | 0            | 1          |
|              | <i>sp. 83</i>         | 1            | 0            | 1          |
|              | <i>sp. 84</i>         | 1            | 0            | 1          |
|              | <i>sp. 85</i>         | 1            | 0            | 1          |
|              | <i>sp. 86</i>         | 1            | 0            | 1          |
|              | <i>sp. 87</i>         | 3            | 0            | 3          |
|              | <i>sp. 88</i>         | 2            | 0            | 2          |
|              | <i>sp. 89</i>         | 2            | 0            | 2          |
|              | <i>sp. 90</i>         | 1            | 0            | 1          |
|              | <i>sp. 91</i>         | 2            | 0            | 2          |
|              | <i>sp. 92</i>         | 1            | 0            | 1          |
|              | <b>Not identified</b> | <b>214</b>   | <b>37</b>    | <b>251</b> |
| Megaspilidae | <b>Morpho sp. 1</b>   | <b>54</b>    | <b>1</b>     | <b>55</b>  |
|              | <i>sp. 2</i>          | 8            | 0            | 8          |
|              | <i>sp. 3</i>          | 1            | 0            | 1          |
|              | <i>sp. 4</i>          | 1            | 0            | 1          |
| Mutillidae   | <b>Morpho sp. 1</b>   | <b>0</b>     | <b>3</b>     | <b>3</b>   |
|              | <i>sp. 2</i>          | 0            | 1            | 1          |
|              | <i>sp. 3</i>          | 1            | 0            | 1          |
|              | <i>sp. 4</i>          | 1            | 0            | 1          |
| Mymaridae    | <b>Morpho sp. 1</b>   | <b>52</b>    | <b>0</b>     | <b>52</b>  |
|              | <i>sp. 2</i>          | 34           | 3            | 37         |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H31. Hymenoptera collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family         | Genus species          | BR specimens | CT specimens | Totals |
|----------------|------------------------|--------------|--------------|--------|
|                | <i>sp. 3</i>           | 71           | 8            | 79     |
|                | <i>sp. 4</i>           | 15           | 4            | 19     |
|                | <i>sp. 5</i>           | 3            | 0            | 3      |
|                | <i>sp. 6</i>           | 8            | 3            | 11     |
|                | <i>sp. 7</i>           | 4            | 3            | 7      |
|                | <i>sp. 8</i>           | 6            | 1            | 7      |
|                | <i>sp. 9</i>           | 3            | 6            | 9      |
|                | <i>sp. 10</i>          | 1            | 1            | 2      |
|                | <i>sp. 11</i>          | 4            | 4            | 8      |
|                | <i>sp. 12</i>          | 1            | 2            | 3      |
|                | <i>sp. 13</i>          | 9            | 9            | 18     |
|                | <i>sp. 14</i>          | 5            | 0            | 5      |
|                | <i>sp. 15</i>          | 1            | 0            | 1      |
|                | <i>sp. 16</i>          | 0            | 7            | 7      |
|                | <i>sp. 17</i>          | 0            | 1            | 1      |
|                | Cannot be further IDed | 2            | 0            | 2      |
| Ormyridae      | Morpho <i>sp. 1</i>    | 1            | 0            | 1      |
| Pergidae       | Morpho <i>sp. 1</i>    | 1            | 0            | 1      |
| Perilampidae   | Morpho <i>sp. 1</i>    | 1            | 2            | 3      |
|                | <i>sp. 2</i>           | 0            | 1            | 1      |
|                | <i>sp. 3</i>           | 0            | 1            | 1      |
| Platygastridae | Morpho <i>sp. 1</i>    | 8            | 2            | 10     |
|                | <i>sp. 2</i>           | 4            | 1            | 5      |
|                | <i>sp. 3</i>           | 2            | 1            | 3      |
|                | <i>sp. 4</i>           | 18           | 2            | 20     |
|                | <i>sp. 5</i>           | 6            | 0            | 6      |
|                | <i>sp. 6</i>           | 3            | 1            | 4      |
|                | <i>sp. 7</i>           | 7            | 0            | 7      |
|                | <i>sp. 8</i>           | 6            | 1            | 7      |
|                | <i>sp. 9</i>           | 3            | 5            | 8      |
|                | <i>sp. 10</i>          | 4            | 2            | 6      |
|                | <i>sp. 11</i>          | 1            | 0            | 1      |
|                | <i>sp. 12</i>          | 1            | 0            | 1      |
|                | <i>sp. 13</i>          | 4            | 0            | 4      |
|                | <i>sp. 14</i>          | 0            | 2            | 2      |
|                | <i>sp. 15</i>          | 0            | 1            | 1      |
|                | <i>sp. 16</i>          | 0            | 3            | 3      |
|                | <i>sp. 17</i>          | 0            | 1            | 1      |
|                | <i>sp. 18</i>          | 0            | 1            | 1      |
| Pompilidae     | Morpho <i>sp. 1</i>    | 21           | 3            | 24     |
|                | <i>sp. 2</i>           | 12           | 2            | 14     |
|                | <i>sp. 3</i>           | 18           | 2            | 20     |
|                | <i>sp. 4</i>           | 0            | 1            | 1      |
|                | <i>sp. 5</i>           | 0            | 1            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H31. Hymenoptera collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family           | Genus species              | BR specimens | CT specimens | Totals |
|------------------|----------------------------|--------------|--------------|--------|
|                  | <i>sp. 6</i>               | 2            | 0            | 2      |
|                  | <i>sp. 7</i>               | 1            | 0            | 1      |
|                  | <i>sp. 8</i>               | 18           | 0            | 18     |
| Proctotrupidae   | <b>Morpho</b> <i>sp. 1</i> | 2            | 0            | 2      |
| Pteromalidae     | <b>Morpho</b> <i>sp. 1</i> | 0            | 1            | 1      |
|                  | <i>sp. 2</i>               | 0            | 1            | 1      |
|                  | <i>sp. 3</i>               | 0            | 1            | 1      |
|                  | <i>sp. 4</i>               | 0            | 4            | 4      |
|                  | <i>sp. 5</i>               | 0            | 2            | 2      |
|                  | <i>sp. 6</i>               | 1            | 0            | 1      |
|                  | <i>sp. 7</i>               | 1            | 0            | 1      |
|                  | <i>sp. 8</i>               | 1            | 1            | 2      |
|                  | <i>sp. 9</i>               | 3            | 0            | 3      |
|                  | <i>sp. 10</i>              | 1            | 0            | 1      |
|                  | <i>sp. 11</i>              | 1            | 3            | 4      |
|                  | <i>sp. 12</i>              | 1            | 0            | 1      |
|                  | <i>sp. 13</i>              | 1            | 0            | 1      |
|                  | <i>sp. 14</i>              | 1            | 1            | 2      |
| Scelionidae      | <b>Morpho</b> <i>sp. 1</i> | 29           | 5            | 34     |
|                  | <i>sp. 2</i>               | 22           | 74           | 96     |
|                  | <i>sp. 3</i>               | 11           | 5            | 16     |
|                  | <i>sp. 4</i>               | 7            | 13           | 20     |
|                  | <i>sp. 5</i>               | 2            | 0            | 2      |
|                  | <i>sp. 6</i>               | 7            | 1            | 8      |
|                  | <i>sp. 7</i>               | 5            | 3            | 8      |
|                  | <i>sp. 8</i>               | 0            | 3            | 3      |
|                  | <i>sp. 9</i>               | 0            | 1            | 1      |
|                  | <i>sp. 10</i>              | 0            | 1            | 1      |
| Sierolomorphidae | <i>Sierolomorpha sp. 1</i> | 4            | 0            | 4      |
| Signiphoridae    | <b>Morpho</b> <i>sp. 1</i> | 0            | 1            | 1      |
| Sphecidae        | <b>Morpho</b> <i>sp. 1</i> | 14           | 7            | 21     |
|                  | <i>sp. 2</i>               | 2            | 2            | 4      |
|                  | <i>sp. 3</i>               | 0            | 5            | 5      |
|                  | <i>sp. 4</i>               | 0            | 2            | 2      |
|                  | <i>sp. 5</i>               | 0            | 1            | 1      |
| Tenthredinidae   | <b>Morpho</b> <i>sp. 1</i> | 4            | 3            | 7      |
|                  | <i>sp. 2</i>               | 11           | 0            | 11     |
|                  | <i>sp. 3</i>               | 1            | 0            | 1      |
|                  | <i>sp. 4</i>               | 2            | 0            | 2      |
|                  | <i>sp. 5</i>               | 1            | 0            | 1      |
| Tiphiidae        | <b>Morpho</b> <i>sp. 1</i> | 0            | 1            | 1      |
|                  | <i>sp. 2</i>               | 2            | 3            | 5      |
|                  | <i>sp. 3</i>               | 0            | 1            | 1      |
|                  | <i>sp. 4</i>               | 1            | 0            | 1      |

Appendix H. Species lists for organisms collected at GETT, 1999 (continued).

Table H31. Hymenoptera collected at Gettysburg National Military Park (BR = Big Round Top, CT = Codori-Trostle Thicket) (continued).

| Family              | Genus species                  | BR specimens | CT specimens | Totals     |
|---------------------|--------------------------------|--------------|--------------|------------|
|                     | <i>sp. 5</i>                   | 1            | 0            | 1          |
| Trichogrammatidae   | <b>Morpho</b> <i>sp. 1</i>     | 81           | 3            | 84         |
|                     | <i>sp. 2</i>                   | 0            | 1            | 1          |
| Trigonalidae        | <b>Morpho</b> <i>sp. 1</i>     | 6            | 0            | 6          |
| <b>Undetermined</b> | <b>Not identified</b>          | 17           | 4            | 21         |
| Unknown             | <b>Cannot be further IDed</b>  | 1            | 1            | 2          |
| Vespidae            | <i>Dolichovespula maculata</i> | 0            | 2            | 2          |
|                     | <b>Morpho</b> <i>sp. 1</i>     | 2            | 0            | 2          |
|                     | <i>sp. 2</i>                   | 1            | 0            | 1          |
|                     | <i>sp. 4</i>                   | 0            | 3            | 3          |
|                     | <i>sp. 5</i>                   | 0            | 3            | 3          |
|                     | <i>Vespula sp. 1</i>           | 5            | 4            | 9          |
| <hr/>               |                                |              |              |            |
| <b>Totals</b>       | <b>Families</b>                | 38           | 33           | 41         |
|                     | <b>Genera</b>                  | 4            | 5            | 6          |
|                     | <b>Named species</b>           | 0            | 1            | 1          |
|                     | <b>sp.</b>                     | 254          | 147          | 317        |
|                     | <b>Potential no. species</b>   | 254 so far   | 149 so far   | 318 so far |
|                     | <b>Individuals</b>             | 2863         | 903          | 3766       |