The Moth Fauna at Pierce Cedar Creek Institute with Special Emphasis on the Noctuidae (*s.l.*) (Lepidoptera)

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Abstract

Biological inventories of plants and animals are important data for long range habitat management and ecological monitoring in research natural areas. There are a number of ways in which the biodiversity of an area might be examined, but for the purpose of this study we attempted to only sample, and then determine as many species as we could that occur at PCCI from mid-May through mid-August. Previous work, conducted from 2006-2009, found 308 species of Lepidoptera occurring at the Institute. The current study brings the total number of identified moths from all families Lepidoptera to 433 species. Of that number, more than 242 species are presently known to occur from the largest moth superfamily of Lepidoptera, the Noctuioidea. Two species on the State of Michigan's list of special concern insects, *Papaipema speciosissima* and *Meropleon ambifuscum* have been discovered as a result of this survey. In addition to providing the species identities of the 433 species of moths found during this study, host associations and habitat affiliations are presented in the discussion.

Introduction and Background

Biological inventories are an important component in the management at research natural areas and can be useful in guiding research projects that may occur within their boundaries. They can serve as the foundation for research by providing biologists with information on the composition of biotic communities and occurrence of plant and animal species that occur there. Additionally, increasing habitat change and fragmentation and the threat of global environmental and climate change increases the importance of sound biological inventories for the continued monitoring of environmental health in these natural areas **(**Cutko, 2009**).** Biotic inventories that attempt to determine the identity of species present can help alert biologists of declining populations of moths that may be in danger of extinction. One unforeseen consequence of completing more comprehensive biological inventories is that species considered rare and potentially endangered, may be found to be much more common than previously thought when long-term, and rigorous inventories are carried out (Cutko, 2009).

Botanical inventories are probably the most important type of biotic inventory since ecosystem productivity and characteristics are tied to the plants that occur in that community **(**Cutko, 2009**).** Fortunately, several studies have been published for PCCI providing data on the botanical composition at PCCI (Slaughter and Skein, 2003a and 2003b). In one study Slaughter and Skein (2003a) completed an initial inventory of the flora of PCCI, concentrating on the wetland and woodland complexes. This study provided the basis for outlining the plant community types found at PCCI and accounted for the flora found there. In a second companion study (Slaughter and Skein, 2003b), a comparative analysis of the floral communities in tamarack and the white cedar wetlands at PCCI was conducted and measures of floristic quality were assessed. As pointed out by the authors, the cedar swamplands, to which PCCI owes its name, are unusual at such a southerly location in Michigan (Slaughter and Skein 2003b). Biodiversity indexes were not established for the moth fauna during the course of this study, chiefly because the time necessary to achieve adequate skills in sorting moth species to 'morphospecies' would not be possible in such a short time frame.

Species inventories of Lepidoptera from specific habitats (Powell 2004) and larger regional inventories (Ferge and Balogh 2000; Rings et al. 1992; Sharkey 2001) which concentrate on taxonomic groups and divisions of Lepidoptera (i.e. moths and butterflies), can be important chiefly because as a whole, most Lepidoptera are phytophagous and their diversity can be seen to act as a mirror of botanical diversity and health of a specific habitat or region**.** It is hoped that a detailed picture of the species found at PCCI will be useful to the research community in the future, and allow for generation of explicit hypotheses that can be tested.

Large scale inventories of Lepidoptera at PCCI have been conducted by Wilterding since 2004 (Dr. Joe Jacquot at GVSU also provided moth data) on a volunteer basis, and formally for a 2006 URGE project that concentrated on wetland moths of PCCI (Gleave and Wilterding, 2006). This initial study, uncovered 308 species of moths from the Institute from all taxonomic levels in the Lepidoptera, but concentrated on the higher, so-called "macromoths." While these species were from a number of moth families, the majority of these species were confined to the most diverse superfamily in the Lepidoptera, the Noctuioidea (the chief area of interest of the faculty mentor). From these studies, a number of interesting and poorly known species of moths have been found at PCCI. It was the objective of this study to do the following:

1) Continue sampling moths at PCCI, with an emphasis on macromoths, especially the higher moths of the Noctuioidea (Notodontidae, Lymantriidae, Arctiidae, Nolidae, Erebidae, Noctuidae), but also smaller, so-called micro-Lepidoptera as well.

2) Continue sampling the wetland complexes, woodland and prairie habitats.

3) Develop a small collection of representative species of moths from PCCI that may be useful for educational purposes and future work on the moth fauna of PCCI in the future.

It is hoped that a comprehensive knowledge of the moth flora at PCCI will, over time, become increasingly important for understanding specifically how the moth biodiversity at the Institute has changed. This inventory should be of use to both land managers at PCCI and researchers who seek to understand how biodiversity has changed over longer periods of time.

Materials and Methods

Areas sampled and sampling technique Sampling took place on the dates of: May 19, 23-25, 26-27, 31; June 1-3, 6, 7, 9, 13, 16, 20, 24, 27-29; July 5-7, 12-13, 26-28; August 1-4, 9-10, and 12. There was a total of 36 sampling days, with a total of 130 trap samples examined over the course of the summer. Moths were sampled using a night insect trap (BioQuip Products) powered by a 12V lead acid battery, and a 15W black light with non-toxic, ethyl acetate as the 'knockdown' compound. Traps were placed in a variety of locations when conditions were favorable. Four traps were run on each sampling night.

Specimen sorting and preparation: Each cycle of moth sampling involved the following stages: 1) setting trap to run all night until the early morning hours, 2) retrieval and specimen sorting, 3) estimate of the number of moth species (excluding very small moths), 4) selection of material for preparation, 5) pinning and mounting (technically, called 'spreading' in which the forewings are lifted to expose the hind wings which make identification possible, 6) labeling each specimen with locality and date information following an extended drying period, 7)species identification and confirmation was carried out by R. Redemsky who initially identified most of the specimens and each was confirmed by the project mentor, J. Wilterding. A wide variety of technical resources were used to achieve species identification (only partially given here in the bibliography) was consulted during the course of this work.

RESULTS AND DISCUSSION

The present work extends the number of *identified* Lepidoptera from 308 species (Gleave and Wilterding 2006) to at least 433 species of moths known from PCCI. The vast majority of these species can be considered to be residents of PCCI and surrounding environment. An undetermined number of species (perhaps more than 100) from more difficult taxonomic levels remain to be identified and studied. It is hypothesized that the total species diversity of moths at PCCI should be well over 600 species as more work is completed. To put this in context, slightly over 2,500 species of moth known to occur in MI while around roughly 150 species of butterfly are known from the State (Nielson personal comm., 2010).

Six hundred species compares favorably with other inventories and extensive sampling completed by the author in the Door (WI) and Garden (MI) peninsula's and extensive sampling work completed in Eaton and Calhoun Counties (MI) (Wilterding personal observation, 2010). The present composition of the moth flora indicates a wide diversity of moth species from those more commonly, and generally distributed in MI, to more unusual species which should be of interest to habitat managers at PCCI. A complete, annotated list of species and hosts (if known) from the higher moths (Noctuidae in the broad sense) is shown in Appendix A, and a checklist of all species presently identified from the Institute is found in Appendix B).

Sampling during this project added a number of interesting taxa not previously known from PCCI, and extended our understanding of species found at the Institute. Many of the species found during the course of both studies are widely distributed in MI and comprised the bulk of the species diversity at PCCI. Of these, several are newly introduced, invasive or weedy species that often now comprise the majority of the specimens found on some nights throughout the sampling period. *Noctua pronuba*, introduced in the East from Europe in the 90's (Lafontaine, 1998) has come to (at times) dominate the moth fauna at PCCI. A dietary generalist, it is not known if the continued presence of this insect represents a threat to the diversity of the herbaceous layer and the moths that feed on this layer. *Apamea unanimis* and *A. ophiogramma* were also recorded from PCCI this year, but not in high numbers seen in *N. pronuba*. The later species is known to feed on *Phragmites* in the Palearctic region, and it may be that its presence may have a positive impact on controlling the invasive wetland forms of *Phragmites* (Mikkola et al, 2009), now present at PCCI.

No moths currently on the Endangered and Threatened species inventory for the state of MI were found during the present study however, two moth species found at PCCI are listed in MI as special concern. One species not found in the present study, but seen previously by the faculty mentor, *Papaipema speciosissima* (regal fern borer moth)(MNFI, 2009; Cuthrell 2007) and *Meropleon ambifuscum* (recorded this year) are on the MNFI (Michigan Natural Features Inventory) as special concern (MNFI, 2009). *Papaipema speciosissima* has been seen along the blue trail following the

forested swampland rich in the host plant of this species. Given the size of the fern population at PCCI, and the mentor's experience with this species at sites in Eaton and County, the population of this moth appears to be very healthy at the present time. *M. ambifuscum* was also detected this year, and in previous years, in very high numbers at PCCI and surrounding habitats in Eaton and Calhoun County (Wilterding personal observation, 2010).

A number of species that occur at the Institute may be interesting to land managers due to1) being generally uncommon throughout their range, 2) being on the edge of their distribution in Michigan, or 3) being sampled infrequently at PCCI. Determining the relative abundance of infrequently sampled species at PCCI represents a challenge for our research, but some species found at the Institute are very unusual, and do indicate that, at least in terms of moth species, there is considerable species richness found at PCCI.

Generally speaking, in order for a moth to be state or federally listed for protection, a good deal needs to be known about the habitat and host requirements of the species before protection can be adequately enforced. In some cases, a species is so poorly known to biologists (few specimens, few localities or little interest) that little can be said of it other than it is infrequently found and uncommon throughout its range. Pierce Cedar Creek Institute's most unusual moth species is likely *Chortodes enervata* (Noctuidae) (Metzler et al., 2005), a moth which has been sampled previously at PCCI, but not during sampling period in 2010. Indeed, the application of the name *enervata* to the taxon found at PCCI is uncertain, but what is certain is that this moth is infrequently found throughout its range, and likely is associated with chord grass, found in the fen complex on the south end of Brewster Lake (Matt Dykstra and Jen Howell personal comm., 2010). Managers at PCCI are aware of this unusual species, and management of the burning at the fen on Brewster Lake was incomplete in an effort to preserve a portion of its habitat as a refugia. Two other species of snout moth (Pyralidae) have both been found in the fen complex and are of particular interest to habitat managers. One example is a moth only recently described, *Ortholepis baloghi*, and is host associated with *Potentilla* populations around the fen and Brewster Lake. In addition,

another fen species (*Pediasia abnaki*), found once more this year, seems to have healthy populations at PCCI.

Another moth, *Macrochilo bivittata,* detected previously, is still found in strong numbers at PCCI, but appears to be localized on the wetland complex to the south of the "wet lab" and found in no other wetland habitat at PCCI. We have not detected this species in other wetland areas of the Institute. Caution is advised because the center of the population appears very closely associated with a growing patch of *Phragmites* in the vicinity. This invasive plant is almost certainly not the host of this species, and its continued expansion in the area possibly represents a future threat to this species. If attempts are made to control the invasive *Phragmites,* care should be taken not to disturb the area surrounding the infestation.

The wetlands at PCCI are arguably its most distinctive biological asset, and represent the most pristine, undisturbed component of the biota (Matt Dykstra personal comm., 2010 and Slaughter and Skein, 2003a). The moth fauna reflects this diversity nicely, and a number of species at PCCI appear to be associated with these wetlands. Common (many individuals seen over the season and previous years) moth species (Noctuidae, *s.l.*) associated with wetlands are (these designations are chiefly based on the observations of the J. Wilterding): *Macrochilo orciferalis, M. bivitatta, Phalaenostola hanhami, Zanclognatha literalis, Plusia contexta (species complex), Diachrysia balluca, Homophoberia cristata, H. apicosa, Meropleon diversicolor, Xylomoia chagnoni, Capsula oblonga, C. laeta, Bellura densa, B. gortynoides, B. obliqua, Fagitana littera, Hypocoena inquinata, Photedes panatela, Meropleon ambifuscum, M. diversicolor, Capis curvata, Leucania lapidaria, L. commoides, L. multilinea, and L. linita.*

Other moths (higher Noctuioidea) of interest found during the course of our study include species whose presence at PCCI is uncertain due to very few specimens found include *Mocis latipes*, *Celiptera frustulum, Phosphila miselioides*, *Ulolonche culea*, *Dichagyris acclivus*, *Choephora fungorum.* In addition, a number of species are infrequently seen in the lower half of MI, and may be near the edge of their distribution include *Ipimorpha pleonectusa* and *Cryptocala acadiensis*. *Anicla forbesi* probably is

found at PCCI, but the habitat requirements or hosts are not known but appear to be associated with drier, sandy habitats (J. Bess, personal comm., 2010). *A. forbesi* was found near Batt's cottage and may be associated with the generally overgrown sandy ridge to the north of the cottage on the red trail. Land managers might consider 'opening' up this ridge in the future. Lastly, there appear to be strong populations of *Papaipema* species (12 species at PCCI), larval borer moths associated with a wide range of plants (see discussion above for *P. speciosissima*).

One group of noctuid moths associated with deciduous woodland habitats is the genus *Apamea* which was a target species for this year's study, having previously only accounted for two species from the genus at the Institute (Gleave and Wilterding 2006). This genus of chiefly grass feeding herbivores might be of interest to land managers due to specialization of feeding on the forest understory (Mikkola et al, 2009). Recent advances of garlic mustard populations at the Institute pose a considerable threat to *Apamea* moths, which were already considered to be widespread, local and generally uncommon for many years. We were able to increase the number of *Apamea* known from the Institute from two to 13 species (Appendix A). Of these, *A. nigrior*, *A. vultuosa*, *A. vulgaris* and *A. plutonia* likely have the most interest to land managers at PCCI, the remaining species being more generalist herbivores or more commonly encountered in a variety of habitats in MI (Mikkola et al., 2009).

Lastly, during the course of this study, traps were also placed in the restored prairie near the entrance of PCCI in hopes of finding unusual moth species associated with tall grass prairie. Our hypothesis was that, given the relative young age of the restored prairie, and the absence native prairie remnants nearby, that it was not likely that this habitat would contain anything but weedy, or widespread species of moths. We trapped there over the period of several weeks, and actually did recover a rare, probably non-resident species of moth that is considered to be largely tall grass prairie dependent (Metzler et al., 2005). In the northern tier of states, the moth is not considered to be common, and is not likely a resident, but likely, under appropriate population pressures, will fly north and colonize suitable habitat (Metzler et al., 2005). We think, however, it is noteworthy that the restored prairie was 'found' by a female moth flying from the

deep south, and suggests that PCCI may want to complete a more intensive sampling of the prairies in the years to come to see if interesting species are colonizing the restored prairie.

Generally speaking, the moth fauna at PCCI is very rich and has many notable species in its biota (second author's opinion). We believe we are close to a better understanding of the moth species found at PCCI. Still, there is work to be done before our understanding can be claimed to be reasonably complete. The largest gap in our understanding of the moth fauna are the species comprising the early spring (chiefly Mar. – Apr.) and fall (chiefly Sept.-Nov.). Further work during these times should begin to bring us to a better understanding of entire moth fauna at PCCI.

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APPENDIX A: Annotated Checklist of Noctuidae (*s. l*)* Moths at PCCI

NOCTUIDAE (s.l)

Idia americalis-8322#
Host: Probably scavenger, ant and bird nests; lichens (Rings et al., 1992)

Idia aemula-8323
Host: Probably scavenger, spruce, firs, cedars; leaf litter (Rings et al., 1992)

New sp. 8323.1
Host: Unknown. Probably the same as *Idia aemula* (Rings et al., 1992)

Idia majoralis-8324
Host: Probably wood rat nests (Rings et al., 1992)

Phalaenophana pyramusalis-8338
Host: Decaying leaf litter (Rings et al., 1992)

Zanclognatha lituralis-8340
Host: Decaying leaf litter (Rings et al., 1992)

Zanclognatha laevigata- 8340
Host: Unknown (Rings et al., 1992)

Zanclognatha pedipilalis-8348
Host: Decaying leaf litter (Rings et al., 1992)

Zanclognatha cruralis-8351
Host: Balsam fir as adult, larvae eat decaying leaf litter (Rings et al., 1992)

Zanclognatha ochreipennis-8353
Host: Unknown (Rings et al., 1992)

Chytolita morbidalis-8355
Host: Decaying leaf litter (Rings et al., 1992)

Chytolita petrealis-8356
Host: One larval collection reported feeding on tamarack (Rings et al., 1992)

Macrochilo absorptalis-8357
Host: Sedges (Rings et al., 1992)

Macrochilo hypocritalis-8357.1
Host: Unknown (Rings et al., 1992)

Macrochilo bivittata-8359
Host: Unknown (Rings et al., 1992)

Macrochilo litophora-8358
Host: Kentucky bluegrass and clover (Rings et al., 1992)

Macrochilo orciferalis-8360
Host: Unknown (Rings et al., 1992)

Macrochilo louisiana-8361
Host: Unknown (Rings et al., 1992)

Phalaenostola eumelusalis-8363
Host: Unknown (Rings et al., 1992)

Phalaenostola larentioides-8364
Host: Leaf litter and Kentucky bluegrass (Rings et al., 1992)

Phalaenostola hanhami-8365
Host: Unknown (Rings et al., 1992)

Bleptina caradrinalis-8370
Host: Decaying leaf litter (Rings et al., 1992)

Renia nemoralis-8380
Host: Unknown (Rings et al., 1992)

Renia sobrialis-8387
Host: Decaying leaf litter (Rings et al., 1992)

Lascoria ambigualis-8393
Host: Larvae have been found on chrysanthemum (Rings et al., 1992)

Palthis angulalis-8397, fen
Host: Varieties of deciduous trees and shrubs (Rings et al., 1992)

Palthis asopialis-8398, fen
Host: Larvae found on coralberry (Rings et al., 1992)

Rivula propinqualis-8404
Host: Unknown (Rings et al., 1992)

Colobochyla interpuncta-8411
Host: Willow trees (Rings et al., 1992)

Melanomma auricinctaria-8412
Host: Huckleberry (Rings et al., 1992)

Hypenodes caducus-8420
Host: Unknown (Rings et al., 1992)

Dispyralis nigellus-8428
Host: Unknown (Rings et al., 1992)

Negetia formosalis-8440
Host: Unknown (Rings et al., 1992)

Hypena manalis-8441
Host: Unknown (Rings et al., 1992)

Hypena bijugalis-8443
Host: Dogwood trees (Rings et al., 1992)

Hypena deceptalis-8446
Host: Basswood (Rings et al., 1992)

Hypena madefactalis-8447
Host: Walnut (Rings et al., 1992)

Hypena sordidula-8448
Host: Alder and butternut (Rings et al., 1992)

Hypena edictalis-8452
Host: Unknown (Rings et al., 1992)

Hypena humuli-8461
Host: Hops and stinging nettle (Rings et al., 1992)

Hypena scabra -8465
Host: Feeds on a wide variety of herbs, legumes and trees (Rings et al., 1992)

Spargaloma sexpunctata-8479
Host: Dogbane (Rings et al., 1992)

Ledaea perditalis-8491
Host: Buttonbush and wool-grass (Rings et al., 1992)

Plusiodonta compressipalpis-8534
Host: Dry moonseed vine leaves (Rings et al., 1992)

Calyptra canadensis-8536
Host: Meadow-rue (Rings et al., 1992)

Scoliopteryx libatrix-8555
Host: Willow, birch, alder, trembling aspen, balsam poplar (Rings et al., 1992)

Panopoda rufimargo- 8587
Host: Oak and beech (Rings et al., 1992)

Panopoda carniecosta-8588
Host: Oaks, hickories, and willows (Rings et al., 1992)

Zale lunata-8689
Host: Deciduous trees (Rings et al., 1992)

Zale galbanata-8692
Host: Maples and box-elder (Rings et al., 1992)

Zale undularis -8695
Host: Black locust and honey-locust (Rings et al., 1992)

Euclidia cuspidea- 8731
Host: Clovers (Rings et al., 1992)

Caenurgina crassiuscula-8738
Host: Lupine, clover and grasses (Rings et al., 1992)

Caenurgina erechtea-8739
Host: Clovers (Rings et al., 1992)

Mocis latipes-8743
Host: Unknown (Rings et al., 1992)

Celiptera frustulum-8747
Host: Black locust (Rings et al., 1992)

Catocala vidua-8792
Host: Walnut and hickories (Rings et al., 1992)

Catocala nebulosa-8796
Host: Bitternut hickory (Rings et al., 1992)

Catocala cerogama-8802
Host: Basswood (Rings et al., 1992)

Catocala relicta-8803
Host: Cottonwood, aspens, willows and poplar (Rings et al., 1992)

Catocala cara-8832
Host: Black willow (Rings et al., 1992)

Catocala ultronia-8857
Host: Various species of Rosaceae; apples, cherries and plums (Rings et al., 1992)

Catocala praeclara-8865
Host: Chokeberry and service berry (Rings et al., 1992)

Catocala blandula-8867
Host: Hawthorn (Rings et al., 1992)

Catocala amica-8878
Host: Various oaks (Rings et al., 1992)

Abrostola urentis-8881
Host: Stinging nettle (Rings et al., 1992)

Diachrysia balluca-8897
Host: Aspen, wood nettle, wild raspberry (Rings et al., 1992)

Allagrapha aerea-8898
Host: Stinging nettle, aster and soybean (Rings et al., 1992) (Lafontaine; Poole 1991)

Megalographa biloba-8907
Host: Wide variety of herb plants (Lafontaine; Poole 1991)

Autographa precationis- 8908
Host: Various herbs (Rings et al., 1992)

Anagrapha falcifera-8924
Host: Various herbs, viburnum, cranberry (Rings et al., 1992); lettuce, corn (Lafontaine; Poole 1991)

Plusia contexta-8952 (species complex)
Host: Grasses (Rings et al., 1992)

Marathyssa inficita-8955
Host: Sumac and poison ivy (Rings et al., 1992)

Peactes oculatrix-8957
Host: Poison ivy (Rings et al., 1992)

Baileya ophthalmica-8970
Host: Ironwood, butternut, and blue beech (Rings et al., 1992)

Baileya dormitans-8971
Host: Ironwood, butternut, ash and walnut (Rings et al., 1992)

Baileya australis-8973, fen
Host: Unknown (Rings et al., 1992)

Meganola minuscula-8983
Host: Unknown (Rings et al., 1992)

Nola triquetrana-8992
Host: Witch-hazel (Rings et al., 1992)

Nola ovilla-8995
Host: N/A

Deltote bellicula-9046
Host: Unknown (Rings et al., 1992)

Protodeltote albidula-9048
Host: Grasses (Rings et al., 1992)

Lithacodia synochitis-9049
Host: Smartweeds (Rings et al., 1992)

Lithacodia musta-9051
Host: Unknown (Rings et al., 1992)

Pseudeustrotia carneola-9053
Host: Docks and smartweed (Rings et al., 1992)

Homophoberia cristata-9056
Host: Yellow pond lily, fruit and foliage (Rings et al., 1992)

Homophoberia apicosa-9057
Host: Smartweeds (Rings et al., 1992)

Capis curvata-9059
Host: Unknown (Rings et al., 1992)

Cerma cerintha-9062
Host: Fruit trees such as cherry, apple and plum (Rings et al., 1992)

Leuconycta diphteroides-9065
Host: Goldenrods (Rings et al., 1992)

Leuconycta lepidula-9066
Host: Dandelion (Rings et al., 1992)

Ponometia candefacta-9090
Host: Ragweed (Rings et al., 1992)

Ponometia erastrioides-9095
Host: Ragweed (Rings et al., 1992)

Spragueia leo-9127
Host: Bindweed (Rings et al., 1992)

Panthea acronyctoides-9177
Host: Various pines and tamarack (Rings et al., 1992)

Colocasia propinquilinea-9185
Host: Various deciduous trees (Rings et al., 1992)

Raphia frater-9193
Host: Aspens, poplar, willow, birch, cottonwood (Rings et al., 1992)

Acronicta americana-9200
Host: Various deciduous trees such as elm, oak, maple (Rings et al., 1992)

Acronicta dactylina-9203
Host: Alder, willow, birch (Rings et al., 1992)

Acronicta vulpine-9206
Host: Unknown

Acronicta grisea-9212
Host: Unknown

Acronicta superans-9226
Host: Ash, birch, sugarplum, apple (Rings et al., 1992)

Acronicta hasta-9229
Host: Choke-cherry, pin cherry, red oak (Rings et al., 1992)

Acronicta spinigera-9235
Host: Unknown (Rings et al., 1992)

Acronicta morula-9236
Host: Elm, apple, basswood, hawthorn (Rings et al., 1992)

Acronicta fragilis-9241
Host: Birch, ash, apple, willow, spruce (Rings et al., 1992)

Acronicta haesitata-9245
Host: Red oak and white oak (Rings et al., 1992)

Acronicta increta-9249
Host: Unknown (Rings et al., 1992)

Acronicta noctivaga-9259
Host: Poplar and low plants (Rings et al., 1992)

Acronicta oblinita-9272
Host: Buttonbush, willow, alder, strawberry, raspberry (Rings et al., 1992)

Simyra insularis-9280
Host: Saltmarsh grasses, willow, smartweed (Rings et al., 1992)

Agriopodes fallax-9281
Host: Arrowwood (Rings et al., 1992)

Agriopodes teratophora-9284
Host: Mint and Oswego tea (Rings et al., 1992)

Eudryas unio-9299
Host: Grape, evening primrose, loosestrife (Rings et al., 1992)

Eudryas grata-9301
Host: Grape, Virginia creepers, hops, buttonbush (Rings et al., 1992)

Apamea nigrior-9328
Host: Unknown, likely monocots (Mikkola et al., 2009)

Apamea cariosa-9329
Host: Grasses (Rings et al., 1992) and perhaps litter (Mikkola et al., 2009)

Apamea vulgaris-9332
Host: Probably monocots (Mikkola et al., 2009)

Apamea lignicolora-9333
Host: Probably grasses (Mikkola et al., 2009)

Apamea vultuosa-9341
Host: Grasses (Rings et al., 1992)

Apamea plutonia-9344
Host: Grasses (Rings et al., 1992)

Apamea amputatrix-9348
Host: A wide range of host plants including vegetables (Rings et al., 1992)

Apamea unanimis-9362.2
Host: Grasses and sedges (Rings et al., 1992)

Apamea sordens-9364
Host: Wheat, corn, rice and timothy (Rings et al., 1992)

Apamea dubitans-9367
Host: Grasses (Rings et al., 1992)

Apamea helva-9373
Host: Sod (Rings et al., 1992)

Apamea devastator-9382
Host: Wide range of herbaceous plants (Mikkola et al., 2009)

Apamea ophiogramma-9385.1
Host: Phalanis; phragmites (Mikkola et al., 2009)

Resapamea passer-9391
Host: Roots of dock (Rings et al., 1992)

Oligia modica-9404
Host: Unknown (Rings et al., 1992)

Mesapamea fractilinea-9406
Host: Grasses, lined stalk, corn (Rings et al., 1992)

Meropleon diversicolor-9427
Host: Stems of sedges (Rings et al., 1992)

Meropleon ambifusca-9428
Host: Unknown (Rings et al., 1992)

Xylomoia chagnoni-9433
Host: Reed canary grass (Rings et al., 1992)

Photedes panatela-9436
Host: Unknown (Rings et al., 1992)

Hypocoena inquinata-9437
Host: Sedges (Rings et al., 1992)
)
Chortodes enervata-9441
Host: Salt and fresh water cord grass (Rings et al., 1992)

Capsula oblonga-9449
Host: Cat-tail stalks (Rings et al., 1992)

Capsula laeta-9451
Host: Bur-reed (Rings et al., 1992)

Helotropha reniformis-9453
Host: Sedges (Rings et al., 1992)

Amphipoea americana-9457
Host: Minor pest of corn in larval stage, otherwise unknown (Rings et al., 1992)

Papaipema cataphracta-9466
Host: Stems and roots of burdocks, thistles, lilies (Rings et al., 1992)

Papaipema arctivorens-9471
Host: Feeds on stems of great burdock and thistles (Rings et al., 1992)

Papaipema harrisii-9472
Host: Stems of cow parsnip and angelica (Rings et al., 1992)

Papaipema speciosissima-9482
Host: Various fern species, mostly regal and cinnamon (Rings et al., 1992)

Papaipema inquaesita-9483
Host: Roots of sensitive fern (Rings et al., 1992)

Papaipema birdi-9486
Host: Various roots of umbellates (Rings et al., 1992)

Papaipema eupatorii-9497
Host: Stems and roots of sunflower and Indian-plantain (Rings et al., 1992)

Papaipema rigida-9503
Host: Sunflower, golden alexander, ox-eye (Rings et al., 1992)

Papaipema cerussata-9505
Host: Stems and roots of ironweed (Rings et al., 1992)

Papaipema unimoda-9509
Host: Stems and roots of Jacob's ladder, carrion-flower and meadow-rue (Rings et al., 1992)

Hydraecia micacea-9514
Host: Corn and potatoes (Rings et al., 1992)

Achatodes zeae-9520
Host: Bores into stem of elderberry. Also feeds on corn, dahlias, and grasses (Rings et al., 1992)

Bellura gortynoides-9523
Host: Yellow water lily (Rings et al., 1992)

Bellura obliqua-9525
Host: Cat-tail, American lotus, bur-reed, skunk cabbage (Rings et al., 1992)

Bellura densa-9526
Host: Wetland plants such as hyacinth and pickerelweed (Rings et al., 1992)

Euplexia benesimilis-9545
Host: Hemlock, willow, red alder (Rings et al., 1992)

Ipimorpha pleonectusa-9555
Host: Poplars, aspens, willow (Rings et al., 1992)

Hyppa xylinoides-9578
Host: Alders, roses, cranberries, St. Johns wort (Rings et al., 1992)

Nedra ramosula-9582
Host: St. John's wort (Rings et al., 1992)

Phosphila miselioides-9619
Host: Greenbrier (Rings et al., 1992)

Fagitana littera-9629
Host: Marsh fern (Rings et al., 1992)

Callopistria mollissima—9631
Host: New York fern (Rings et al., 1992)

Callopistria cordata-9633
Host: Ferns (Rings et al., 1992)

Amphipyra pryamidoides-9638
Host: Various trees, shrubs, herbs (Rings et al.,1992)

Amphipyra tragopoginis-9639
Host: Hawthorn, geraniums, columbines, and plantains. (Rings et al., 1992)

Proxenus miranda-9647
Host: Dandelion, various fruits, sweet potato (Rings et al., 1992)

Crambodes talidiformis-9661

Host: Vervains (Rings et al., 1992)

Balsa malana-9662
Host: Apple and crab apple (Rings et al., 1992)

Balsa tristrigella-9663
Host: White spruce and hawthorns (Rings et al., 1992)

Elaphria versicolor-9678
Host: Various conifers and birch trees (Rings et al., 1992)

Galgula partita-9688
Host: Wood sorrel (Rings et al. 1992)

Condica sutor-9699
Host: Unknown

Ogdoconta cinereola-9720
Host: Ragweed (Rings et al., 1992)

Cirrophanus triangulifer-9766
Host: Spanish needles (Rings et al. 1992)

Cosmia calami-9815
Host: Various oak tree species (Rings et al., 1992)

Amolita fessa-9818
Host: Grasses (Rings et al., 1992)

Lithophane bethunei-9887
Host: Many species of deciduous trees, cranberry (Rings et al, 1992)

Sunira bicolorago-9957
Host: Elm, willow, maple, peach blossoms (Rings et al., 1992)

Brachylomia algens-9998
Host: Willow and trembling aspen (Rings et al., 1992)

Anarta trifolii-10223
Host: Crops such as lettuce, spinach, alfalfa (Rings et al., 1992)

Orthodes detracta-10288
Host: Buds of oaks, blueberries, serviceberries, hickory (Rings et al., 1992)

Melanchra adjuncta-10292
Host: Red alder, willow, American elm, dandelion (Rings et al., 1992)

Trichordestra legitima-10304
Host: A general feeder, trees and grasses (Rings et al., 1992)

Lacinipolia renigera-10397
Host: Apple, cottonwood, grape and many herbaceous plants (Rings et al., 1992)

Lacinipolia lorea-10405
Host: Blueberry, gray birch, sweet fern (Rings et al., 1992)

Lacinipolia olivacea-10406
Host: Dandelion and rabbit bush flowers (Rings et al., 1992)

Dargida diffusa-10431
Host: Various grasses and cereal crops (Rings et al., 1992)

Dargida rubripennis-10434
Host: Prairie grasses such as crab grass (Rings et al., 1992)

Mythimna oxygala-10436
Host: Grasses (Rings et al., 1992)

Pseudaletia unipuncta-10438
Host: Grasses (Rings et al., 1992)

Leucania linita-10440
Host: Orchard grass (Rings et al., 1992)

Leucania phragmitidicola-10444
Host: Grasses (Rings et al., 1992)

Leucania multilinea-10446
Host: Grasses (Rings et al., 1992)

Leucania lapidaria-10446.1
Host: Unknown (Rings et al., 1992)

Leucania commoides-10447
Host: Grasses (Rings et al., 1992)

Leucania inermis-10459
Host: Grasses (Rings et al., 1992)

Leucania ursula-10461
Host: Grasses and honeysuckle (Rings et al., 1992)

Leucania pseudargyria-10462
Host: Grasses (Rings et al., 1992)

Orthosia hibisci-10495
Host: Many types of trees from deciduous to fruit (Rings et al., 1992)

Crocigrapha normani-10501
Host: Various types of deciduous trees (Rings et al., 1992)

Morrisonia confusa-10521
Host: Various types of deciduous trees (Rings et al., 1992)

Nephalodes minians-10524
Host: Grasses and corn (Rings et al., 1992)

Homorthodes furfurata-10532
Host: Maples (Rings et al., 1992)

Ulolonche culea-10567
Host: Water and red oak (Rings et al., 1992)

Orthodes majuscula-10585
Host: Grasses, dandelion, plantain (Rings et al., 1992)

Orthodes cynica-10587
Host: Dandelion and goldenrod (Rings et al., 1992)

Tricholita signata-10627
Host: Dandelion and goldenrod (Rings et al., 1992)

Agrotis venerabilis-10651
Host: White clover (Rings et al., 1992)

Agrotis stigmosa-10658
Host: Unknown (Rings et al., 1992)

Agrotis ipsilon-10663
Host: Crops and vegetables (Rings et al., 1992)

Feltia herilis-10676 (species complex, likely three species here)
Host: Probably a general feeder (Rings et al., 1992)

Euxoa divergens-10702
Host: N/A

Euxoa velleripennis-10803
Host: Unknown (Rings et al., 1992)

Euxoa tessellata-10805
Host: Various crop plants (Rings et al., 1992)

Dichagryis acclivis-10870
Host: Unknown (Rings et al., 1992)

Ochropleura implecta-10891
Host: Clovers (Rings et al., 1992); Willow (Crumb 1965); Endive (Lafontaine 1998)

Anicla forbesi-10902
Host: Unknown (Rings et al., 1992)

Anicla illapsa-10903
Host: Unknown (Rings et al. 1992)

Peridroma saucia-10915
Host: Alder, cabbage, carrot, corn, fruit trees, maples, tobacco (Rings et al., 1992)

Spaelotis clandestina-10926
Host: General feeder of trees, shrubs and herbaceous plants (Rings et al., 1992)

Xestia c-nigrum-10942
Host: Apple, barley, corn, clover, maple, tobacco

Xestia dolosa-10942.1
Host: Apple, barley, corn, clover, maple, tobacco

Xestia normanianus-10943
Host: Blueberry, black cherry (Rings et al., 1992); shrubs including raspberry (Lafontaine 1998)

Xestia smithii-10944
Host: Strawberry, raspberry, alder, elder, violet (Lafontaine 1998)

Pseudohermonassa bicarnia-10950
Host: Blueberries, gray birch, dandelion, maples, meadow-sweet (Rings et al., 1992)

Xestia badinodis-10955
Host: Chickweeds and docks (Rings et al., 1992); aster, mustard, tobacco (Lafontaine 1998)

Xestia elimata-10967
Host: Various species of conifers (Rings et al., 1992)

Cerastas salicarum-10996
Host: Unknown (Rings et al., 1992) (Lafontaine 1998)

Choephora fungorum-10998
Host: Dandelion (Rings et al., 1992); clover, various weeds (Lafontaine 1998)

Anaplectoides prasina-11000
Host: Wide variety of trees, shrubs, herbs (Lafontaine 1998)

Protolampra brunneicollis-11006
Host: Blueberry, tobacco, clover (Rings et al., 1992); dandelion (Lafontaine 1998)

Eueretagrotis sigmoides-11007
Host: Unknown (Rings et al., 1992)

Eueretagrotis perattentus-11008
Host: Blueberry; pin cherry (Lafontaine 1998)

Lycophotia phyllophora-11010
Host: Various trees, blueberries, arrowwoods (Rings et al., 1992); variety of woody shrubs (Lafontaine 1998)

Cryptocala acadiensis-11012
Host: Probably St. John's wort (Rings et al., 1992); arrowhead, elder, yarrow (Lafontaine 1998)

Abagrotis alternata-11029
Host: Various trees, shrubs, herbs (Lafontaine 1998)

Noctua pronuba-11003.1
Host: Grasses, strawberry, tomato, carrot, beet caggage (Lafontaine 1998)

Pyrrhia cilisca-11063

Helicoverpa zeae-11068
Host: Corn, tomato, other plants (Rings et al., 1992)

Heliothis phloxiphagus-11072
Host: Aster, gumweed, gladiolus, strawberry, tarweed (Rings et al., 1992)

Schinia arcigera-11128
Host: Several species of aster (Rings et al., 1992)

Schinia rivulosa-11135
Host: Ragweed (Rings et al., 1992)
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**sensu lato*: Sytematics language for something like 'in the wider sense,' meaning that if a large family is split into several, sometimes smaller families, the former, more inclusive classification is being referenced here.
#Hodges Number. This is an index number given to all species of Lepidoptera in North America. If the name changes, the number, like a UPC code, stays the same.

APPENDIX B: Checklist of Lepidoptera at PCCI*

OECOPHORIDAE
Agonopteryx argillicae-889
YPONOMEUTIDAE
Atteva punctella-2401

SESIIDAE
Synanthedon acerni-2554

TORTRICIDAE
Phaneta awemeana-2911
Phaneta formosana-2916
Suleima cinerodorsana-3217
Argyrotaenia juglandana-3622
Archips purpurana-3658
Clepsis clemensiana-3684
Phaneta amodaidaleia-3007.95
Sparganothis unifasciana
Hysterosia birdana-3801

LIMACODIDAE
Tortricidia flexuosa-4654
Tortricidia testacea-4652
Packardia geminate-4659
Lithacodes fasciola-4665
Apoda y-inversum-4667
Prolimacodes trigona-4670
Prolimacodes badia-4671
Adoneta spinuloides-4685
Euclea delphinii-4697

PYRALIDAE
Munroessa icciusalis-4748
Munroessa gyralis-4751
Parapoynx obscuralis-4760
Parapoynx badiusalis-4761
Stegea eripalis-4864
Dicymolomia julianalis-4889
Evergestis pallidata-4897
Nascia acutella-4937
Crocidophora serratissimalis-4944
Crocidophora tuberculalis-4945
Ostrinia nubilalis-4949
Fumibotys fumalis-4950
Phlyctaenia coronata-4953
Pyrausta bicoloralis-5040
Nomophila nearctica-5156
Desmia funeralis-5159
Desmia maculalis-5160
Herpetogramma pertextalis-5275
Crambus alballus-5361
Pediasia abnaki-5416

Urola nivalis-5464
Vaxi auratella-5465
Vaxi critica-5466
Aglossa cuprina-5518
Aphomia sociella-5629
Aphomia terrenella-5630
Ancylis albocostana-5750
Ortholepsis baloghi-5781.1

DREPANIDAE
Drepana arcuata-6251

GEOMETRIDAE
Alsophila pometaria-6258
Protitame virginalis-6270
Eumacaria latiferrugata-6272
Macaria (Itame) pustularia-6273
Macaria (Itame) subcessaria-6303
Semiothisa promiscuata-6331
Semiothisa oweni-6351
Aethalura intertexta?-6570
Iridopsis humaria-6584
Iridopsis larvaria-6588
Ectropis crepuscularia-6597
Protoboarmia procelaria-6598
Epimecis hortaria-6599
Melanolophia canadaria?-6620
Melanolophia signataria-6621
Eufidonia notataria-6638
Biston betularia-6640
Hypagyrtis piniata-6656
Phigalia titea-6658
Phigalia strigataria-6660
Cabera erythemaria-6677
Cabera variolaria-6678
Xanthotype urticaria-6740
Xanthotype sospeta-6743
Xanthotype attenuaria-6744
Pero honestaria-6753
Pero morrisonaria-6755
Phaeoura quernaria-6673
Campaea perlata-6796
Ennomos magnaria-6797
Metanema determinate-6820
Metarranthis homuraria-6828
Cepphis armatiaria-6835
Probole amicaria-6838
Probole nepiasaria-6839
Plagodis serinaria-6840
Plagodis kuetzingi-6841
Sicya macularia-6912

Eusarca confusaria-6941
Tetracis crocallata-6963
Tetracis cachexiata-6964
Eutrapela clemataria-6966
Prochoerodes transversata-6982
Nematocampa limbata-7009
Nemoria bifilata?-7045
Dichorda iridaria-7053
Chlorochlamys chloroleucaria-7071
Chlorochlamys triangularis (?)-7072
Lobocleta ossularia(?)-7094
Scopula lumboundata-7159
Scopula inductata-7169
Eulithis diversilineata-7196
Hydriomena divisaria-7235
Anticlea multiferata-7330
Xanthorhoe ferrugata-7388
Xanthorhoe lacustrata-7390
Epirrhoe alterata-7394
Euphyia unangulata-7399
Orthonama obstipata-7414
Orthonama centrostrigaria-7416
Horisma intestinata-7445
Eupithecia herefordaria?-7509
Eupethecia segregate-7557
Lobophora nivigerata-7640
Heteropheleps triguttaria-7647
Apatelodes torrefacta-7663
Olceclostera angelica-7665
Malacosoma disstria-7698
Malacosoma americanum-7701

APATELODIDAE
Apatelodes torrefacta-7663
Olceclostera angelica-7665

SATURNIIDAE

Dryocampa rubicund-7715
Automeris io-7746
Antherea polyphemus-7757
Callosamia cecropia-7767

SPHINGIDAE
Ceratomia amyntor-7786
Ceratomia undulosa-7787
Sphinx canadensis-7807
Sphinx gordius-7810
Smerinthus jamaicensis-7821
Paonias excaecatus-7824

Paonias myops-7825
Laothoe juglandis-7827
Deidamia inscripta-7871
Darapsa myron-7885
Darapsa pholus-7886

NOTODONTIDAE
Clostera albosigma-7895
Clostera inclusa-7896
Clostera apicalis-7901
Datana ministra-7902
Datana integerrima-7907
Nadata gibbosa-7915
Peridea angulosa-7920
Peridea ferruginea-7921
Nerice bidentata-7929
Ellida canipelaga-7930
Gluphisa septentrionis-7931
Gluphisia severa-7935
Furcula cinerea-7937
Furcula scolopendrina-7940
Cerura scitiscripta-7942
Symmerista leucitys-7953
Macrurocampa marthesia-7975
Heterocampa oblique-7983
Heterocampa guttivitta-7994
Heterocampa biundata-7995
Schizura ipomoeae-8005
Schizura badia-8006
Schizura unicornis-8007
Schizura leptinoides-8011

ARCTIIDAE
Crambidia pallida-8045.1
Hypoprepia mineata-8089
Hypoprepia fucosa-8090
Clemensia albata-8098
Haploa clymene-8107
Haploa reversa-8109
Haploa lacontei-8111
Virbia lamae-8120
Pyrrharctia isabella-8129
Estigmene acrea-8131
Spilosoma congrua-8134
Spilosoma virginica-8137
Hypercompe scribonia-8146
Phragmatobia fuliginosa-8156
Phragmatobia lineate-8157
Apantesis phalerata- 8169
Apantesis vittata-8170

Apantesis nais-8171
Grammia speciosa-8175.1
Grammia ornata-8177
Grammia virgo-8197
Grammia arge-8199
Halysidota tesselaris-8203
Lophocampa caryae-8211
Cycnia tenera-8230
Cycnia oregonensis-8231
Ctenucha virginica-8262
Cisseps fulvicollis- 8267

LYMANTRIIDAE
Dasychira dorsipennata- 8293
Orgyia leucostigma-8316
Lymantria dispar-8318

NOCTUIDAE (s.l.)
Idia americalis-8322
Idia aemula-8323
New sp. 8323.1
Idia majoralis-8324
Phalaenophana pyramusalis-8338
Zanclognatha lituralis-8340
New sp. 8345 laevigata
Zanclognatha pedipilalis-8348
Zanclognatha cruralis-8351
Zanclognatha ochreipennis-8353
Chytolita morbidalis-8355
Chytolita petrealis-8356
Macrochilo absorptalis-8357
Macrochilo hypocritalis-8357.1
Macrochilo bivittata-8359
Macrochilo litophora-8358
Macrochilo orciferalis-8360
Macrochilo louisiana-8361
Phalaenostola eumelusalis-8363
Phalaenostola larentioides-8364
Phalaenostola hanhami-8365
Bleptina caradrinalis-8370
Renia nemoralis-8380
Renia sobrialis-8387
Lascoria ambigualis-8393
Palthis angulalis-8397, fen
Palthis asopialis-8398, fen
Rivula propinqualis-8404
Colobochyla interpuncta-8411
Melanomma auricinctaria-8412
Hypenodes caducus-8420
Dispyralis nigellus-8428
Negetia formosalis-8440

Hypena manalis-8441
Hypena bijugalis-8443
Hypena deceptalis-8446
Hypena madefactalis-8447
Hypena sordidula-8448
Hypena edictalis-8452
Hypena humuli-8461
Hypena scabra -8465
Spargaloma sexpunctata-8479
Ledaea perditalis-8491
Plusiodonta compressipalpis-8534
Calyptra canadensis-8536
Scoliopteryx libatrix-8555
Panopoda rufimargo- 8587
Panopoda carniecosta-8588
Zale lunata-8689

Zale galbanata-8692
Zale undularis -8695
Euclidia cuspidea- 8731
Caenurgina crassiuscula-8738
Caenurgina erechtea-8739
Mocis latipes-8743
Celiptera frustulum-8747
Catocala vidua-8792
Catocala nebulosa-8796
Catocala cerogama-8802
Catocala relicta-8803
Catocala cara-8832
Catocala ultronia-8857
Catocala praeclara-8865
Catocala blandula-8867
Catocala amica-8878
Abrostola urentis-8881
Diachrysia balluca-8897
Allagrapha aerea-8898
Megalographa biloba-8907
Autographa precationis- 8908
Anagrapha falcifera-8924
Plusia context-8952
Marathyssa inficita-8955
Peactes oculatrix-8957
Baileya ophthalmica-8970
Baileya dormitans-8971
Baileya australis-8973, fen
Meganola minuscula-8983
Nola triquetrana-8992
Nola ovilla-8995
Deltote bellicula-9046
Protodeltote albidula-9048
Lithacodia synochitis-9049

Lithacodia musta-9051
Pseudeustrotia carneola-9053
Homophoberia cristata-9056
Homophoberia apicosa-9057
Capis curvata-9059
Cerma cerintha-9062
Leuconycta diphteroides-9065
Leuconycta lepidula-906
Ponometia candefacta-9090
Ponometia erastrioides-9095
Spragueia leo-9127
Panthea acronyctoides-9177
Colocasia propinquilinea-9185
Raphia frater-9193
Acronicta americana-9200
Acronicta dactylina-9203
Acronicta vulpina-9206
Acronicta grisea-9212
Acronicta superans-9226
Acronicta hasta-9229
Acronicta spinigera-9235
Acronicta morula-9236
Acronicta fragilis-9241
Acronicta haesitata-9245
Acronicta increta-9249
Acronicta noctivaga-9259
Acronicta oblinita-9272
Simyra insularis-9280
Agriopodes fallax-9281
Agriopodes teratophora-9284
Eudryas unio-9299
Eudryas grata-9301
Apamea nigrior-9328
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Apamea lignicolora-9333
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Apamea plutonia-9344
Apamea amputatrix-9348
Apamea unanimis-9362.2
Apamea sordens-9364
Apamea dubitans-9367
Apamea helva-9373
Apamea devastator-9382
Apamea ophiogramma-9385.1
Resapamea passer-9391
Oligia modica-9404
Mesapamea fractilinea-9406
Meropleon diversicolor-9427
Meropleon ambifusca-9428
Xylomoia chagnoni-9433

Photedes panatela-9436
Hypocoena inquinata-9437
Chortodes enervata-9441
Capsula oblonga-9449
Capsula laeta-9451
Helotropha reniformis-9453
Amphipoea americana-9457
Papaipema cataphracta-9466
Papaipema arctivorens-9471
Papaipema harrisii-9472
Papaipema speciosissima-9482
Papaipema inquaesita-9483
Papaipema birdi-9486
Papaipema eupatorii-9497
Papaipema rigida-9503
Papaipema ceurssata-9505
Papaipema unimoda-9509
Hydraecia micacea-9514
Achatodes zeae-9520
Bellura gortynoides-9523
Bellura obliqua-9525
Bellura densa-9526
Euplexia benesimilis-9545
Ipimorpha pleonectusa-9555
Hyppa xylinoides-9578
Nedra ramosula-9582
Phosphila miselioides-9619
Fagitana littera-9629
Callopistria mollissima—9631
Callopistria cordata-9633
Amphipyra pryamidoides-9638
Amphipyra tragopoginis-9639
Proxenus miranda-9647
Crambodes talidiformis-9661
Balsa malana-9662
Balsa tristrigella-9663
Elaphria versicolor-9678
Galgula partita-9688
Condica sutor-9699
Ogdoconta cinereola-9720
Cirrophanus triangulifer-9766
Cosmia calami-9815
Amolita fessa-9818
Lithophane bethunei-9887
Sunira bicolorago-9957
Brachylomia algens-9998
Anarta trifolii-10223
Orthodes detracta-10288
Melanchra adjuncta-10292
Trichordestra legitima-10304
Lacinipolia renigera-10397

Lacinipolia lorea-10405
Lacinipolia olivacea-10406
Dargida diffusa-10431
Dargida rubripennis-10434
Mythimna oxygala-10436
Pseudaletia unipuncta-10438
Leucania linita-10440
Leucania phragmitidicola-10444
Leucania multilinea-10446
Leucania lapidaria-10446.1
Leucania commoides-10447
Leucania inermis-10459
Leucania ursula-10461
Leucania pseudargyria-10462
Orthosia hibisci-10495
Crocigrapha normani-10501
Morrisonia confusa-10521
Nephalodes minians-10524
Homorthodes furfurata-10532
Ulolonche culea-10567
Orthodes majuscule-10585
Orthodes cynica-10587
Tricholita signata-10627
Agrotis venerabilis-1065
Agrotis stigmosa-10658
Agrotis ipsilon-10663
Feltia herilis-10676
Euxoa divergens-10702
Euxoa velleripennis-10803
Euxoa tessellata-10805
Dichagryis acclivis-10870
Ochropleura implecta-10891
Anicla forbesi-10902
Anicla illapsa-10903
Peridroma saucia-10915
Spaelotis clandestine-10926
Xestia c-nigrum-10942
Xestia dolosa-10942.1
Xestia normanianus-10943
Xestia smithii-10944
Pseudohermonassa bicarnia-10950
Xestia badinodis-10955
Xestia elimata-10967
Cerastas salicarum-10996
Choephora fungorum-10998
Anaplectoides prasina-11000
Protolampra brunneicollis-11006
Eueretagrotis sigmoides-11007
Eueretagrotis perattentus-11008
Lycophotia phyllophora-11010
Cryptocala acadiensis-11012

Abagrotis alternata-11029
Noctua pronuba-11003.1
Pyrrhia cilisca-11063
Helicoverpa zea-11068
Heliothis phloxiphagus-11072
Schinia arcigera-11128
Schinia rivulosa-11135

*Names other than noctuids may not be current in Appendix B.