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MOTH SPECIES DIVERSITY IN FUNDY NATIONAL PARK 1994-1996 BLACK-LIGHT TRAP CATCHES AT WOLFE LAKE

ORIGINAL

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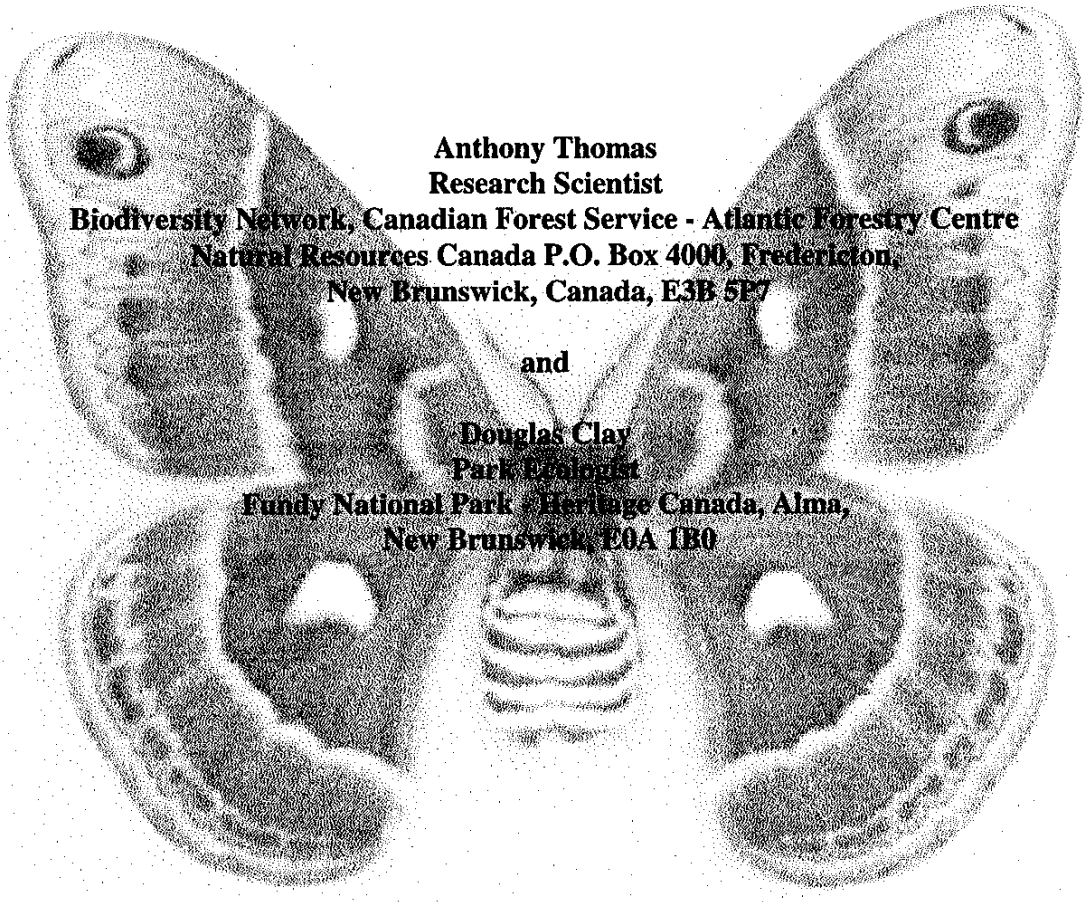
Moth Species Diversity in Fundy National Park. II. 1994-1996 Black-Light Trap Catches at Wolfe Lake

by



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Abstract

This report gives an account of the seasonal distribution of 515 species of moths, mostly macromoths, captured in two 22-watt black-light traps over a 3-year period (1994-1996) in an old-growth mixedwood forest. This report is meant to serve as a database to support manuscripts in preparation that deal, in an analytical nature, with species diversity in this old-growth forest.

Introduction

Beginning in 1994, two 22-watt black-light traps were operated for three seasons in the old-growth forest at Wolfe Lake, Fundy National Park, with the immediate objective of measuring species diversity in 15 families of, mostly, the larger moths (Lepidoptera). Moths were chosen as exemplars to study faunal diversity, at the species level, in forested ecosystems. As the major converters of plant biomass to animal fats and proteins, lepidoptera drive the flow of energy that allows for the high biodiversity seen in forest ecosystems. Lepidoptera are a high quality food item for predators such as birds, small mammals (terrestrial, arboreal, and aerial), amphibians and reptiles. The variation in size of lepidoptera and their exploitation of every plant-orientated feeding niche allows for the high diversity of the forest fauna. This study has concentrated on the generally larger species of moths of which there are about 600 species in Fundy National Park. The diversity within these larger moths is likely to be mirrored in the other moth families, the so-called microlepidoptera, of which there are probably the same number of species. (Hodges (1983) lists 10,0036 moth species in North America of which 5,259 are in the 15 families monitored in this study. The other moth families contain 4,777 species).

Moths were selected as the representative group not only because of their biological importance but also because they can be sampled relatively simply with a standardized procedure. There is also a wealth of information on their identification and biology. Our belief is that any comparison of diversity between forested sites, or any assessment of impacts on a forested ecosystem, or any validation of a conservation strategy, can be measured using moths as the monitoring tool of choice. The changes in moth diversity over time have been shown to be useful indicators of environmental disturbances (Kempton & Taylor 1974, Taylor et al. 1978, Kempton 1979. Yapp (1979) argued that using an index of diversity to measure the diversity of a group of organisms in conifer plantations is the most satisfactory method for assessing the effect of forestry on wildlife. Magurran (1985) took up the challenge and used moths to compare the biodiversity of two forests. She showed that a conifer plantation adjacent to a native forest was faunistically impoverished, thus confirming Peterken's (1981) assertion that conifer plantations are the least attractive form of woodland for conservation (Magurran 1988).

Methodology and objective

In 1994, the two traps were operated from 11 May-29 September: in 1995 from 4 May-5 September: and in 1966 from 12 April-17 October: in the old-growth mixedwood forest at the western edge of Wolfe Lake. The traps were not run continuously, most often they operated five nights/week (Sunday night through Thursday night). In 1994, the traps were not operated from 4-24 September, weeks 36-38; in 1995, the traps were not operated from 2-8 July, week 27, and from 6-12 August, week 32. In 1996 the longest non-operating periods were for three nights. Appendix I gives the calendar dates for the weeks of each year and shows the weeks when the traps were operating.

In 1994 the traps were designated traps #1 and #2. They were sited 850m south of Hwy. 114 and about 50m from the lake. Trap #1 was at ground level, lamp at 46cm, whereas trap #2 was suspended in the upper canopy of red spruce trees, lamp at 12.5m. The horizontal distance between the traps was 80m.

In 1995 the traps were designated trap #3 and trap #4. They were sited 700m closer to Hwy. 114 than the 1994 traps, were 150m from the lake and were 80m apart. In 1996, the same two traps, trap #3 and trap # 4 were located in the same sites.

Vegetation analysis

At 305m above sea level and 15 Km from the coast, Wolfe Lake is part of the maritime uplands ecoregion of the suger maple-yellow birch-fir zone of Loucks (1962). Rowe (1972) places Wolfe Lake in the Fundy Coast Section of the Acadian Forest Region, a forest characterized by red spruce, balsam fir, yellow birch and sugar maple. The dominant tree is red spruce. Hirvonen and Madill (1978) and Burzynski et al (1986) give descriptions of the forest types in Fundy National Park. Hirvonen and Madill (1978) described nine distinct forest groups in Fundy National Park. Based on their forest cover map (map 3) the 1995/1996 light-trap sites at Wolfe Lake were situated in an area where three forest cover groups meet, i.e., softwood, mixedwood, and hardwood, in addition the sites are close to field and meadow. The 1994 sites were in a zone classified as softwood. Hirvonen and Madill's (1978) cover type group of spruce-fir-birch, seems to be the best description of the forest on the western edge of Wolfe Lake. They describe this cover type as having red spruce as the single most numerous species, followed by balsam fir with white and yellow birch equally divided. Regeneration is abundant, balsam fir being most common, followed by red spruce and the two birches.

An increase in spruce budworm population resulted in severe defoliation of balsam fir beginning in 1967. Aerial application of organophosphate insecticides was carried out in the park from 1967 to 1975. Since 1975 there has been widespread mortality of balsam fir within the park (Burzynski et al 1986). The effect of this mortality was obvious at the Wolfe Lake trap sites. The forest was open with many fallen trees and dense patches of regeneration. Some mature baslam fir trees survived the budworm outbreak and were still present in the stand in 1996. Bursynski et al (1986) reported that 37.4% of the park's

forest can be classified as disturbed forest. Such a forest was mainly softwood but is now regenerating in a mix of white birch, balsam fir, red spruce and yellow birch. A dense understory of small trees reflects rapid regeneration following heavy tree mortality due to spruce budworm. Many stands are uneven-aged and multi-storied containing two or more height classes. The Wolfe Lake sites fit this description.

In July 1995, a vegetation survey was conducted by botanists on the 1995/96 trap sites under contract to Parks Canada. This survey consisted of sampling a plot beginning at each trap and extending 25m in opposite directions. All vascular plants within 2m either side of a transect line were identified and counted. Both sites were recorded as having 60% crown density. In the $200m^2$ plot centered on trap #3, there were 106 trees in 5 species of which 99 were living and 7 dead. There were 17 species of vascular plants in the understory (Appendix II). In the plot centered on trap #4, there were 80 trees in 7 species of which all were living. There were 24 species of vascular plants in the understory (Appendix III).

Two other tree species that were visible from the position of the light-traps but were not encountered in the survey plot were *Larix laricina* (DuRoi) K. Koch and *Pinus strobus* L.

Objective

The objective of this report is to present the catch data from the two 22-watt black-light traps for the years 1994-1996. Such documentation is necessary for the understanding and interpretation of the more detailed analysis of moth diversity in Fundy NP and its greater ecosystem that is currently underway. These catch data furnish the two basic components of species diversity, i.e., a listing of the actual species present (species richness) and a measure of their relative abundance. As such, these data are valuable in their own right.

Nomenclature and species monitoring

The species identification numbers (ID#) in the tables refer to the check list numbers in Hodges (1983). Since 1983, there have been some changes in nomenclature. These changes are scattered throughout the literature but many are in Poole (1996). We have incorporated the changes that we are aware of.

All individuals in species of only the following 15 families were identified and counted:

Family	ID numbers
Hepialidae	18-31
Sessiidae	2554
Cossidae	no specimens collected
Limacodidae	4652-4661
Thyatiridae	6235-6240
Drepanidae	6251-6253
Geometridae	6270-7640
Epiplemidae	7650
Lasiocampidae	7673-7701
Saturniidae	7715-7768
Sphingidae	7787-7886
Notodontidae	7895-8017
Arctiidae	8043-8267
Lymantriidae	8304-8319
Noctuidae	8322-11164.

In this study, identification to species relied heavily upon genitalic characters. Voucher specimens of pinned, spread, adults and genitalia dissections are housed in the Canadian Forest Service-Atlantic Forestry Centre in Fredericton.

Results

A total of 45,318 individuals were identified and placed in 514 species. Only 14 of the 15 targeted families were represented. No members of the Cossidae were collected during the study period at Wolfe Lake. Six individuals in the genus *Cucullia* , members of the *florea/postera* species complex (ID# 10197, 10198), could not be identified to species. Thus the total number of individuals captured was 45,324 in a, conservative, 515 species. The data are summarized (Table 1) as the extreme dates of capture and the total number of individuals trapped for each species over the three-year sampling period. Appendix I gives the calendar dates for the weeks of the year, and Appendices II and III give the results of the vegetation surveys.

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Literature Cited

Burzynski, M. P., S. J. Woodley and A. Marceau. 1986. The vascular flora of Fundy National Park, New Brunswick. New Brunswick Museum Publications in Natural Science. Number 4. Saint John, New Brunswick. 77 pp.

Hirvonen, R. and R. J. Madill. 1978. Fundy National Park, N. B. and the proposed western extension. Can. For. Serv. Info. Rep., FMR-X-105. 225 pp.

Hodges, R. W., et al. 1983. Check list of the Lepidoptera of America north of Mexico. E. W. Classey Ltd. and the Wedge Entomological Research Foundation. 284 pp.

Kempton, R. A. 1979. The structure of species abundance and measurement of diversity. Biometrics 35: 307-321.

Kempton, R. A. and L. R. Taylor. 1974. Log-series and log-normal parameters as diversity discriminants for the Lepidoptera. J. Anim. Ecol. 43: 381-399.

Loucks, O. L. 1962. A forest classification for the Maritime provinces. Proc. Nova Scotia Institute of Science. 25: 85-167.

Magurran, A. E. 1985. The diversity of macrolepidoptera in two contrasting woodland habitats at Banagher, Northern Ireland. Proc. Roy. Ir. Acad. 85 B: 121-132.

Magurran, A. E. 1988. Ecological diversity and it measurement. Princeton University Press, Princeton, New Jersey. 179 pp.

Peterken, G. F. 1981. Woodland conservation and management. Chapman and Hall, London.

Poole, R. W. 1996. Nomina Insecta Nearctica, A checklist of the insects of North America. Volume 3: Diptera, Lepidoptera, Siphonaptera. Entomological Information Services, Rockville, Maryland. 1143 pp.

Rowe, J. S. 1972. Forest regions of Canada. Dept. Environ., Can. For. Serv. #FO-47-1300. 172 pp.

Taylor, L. R., R. A. French and I. P. Woiwod. 1978. The Rothamsted insect survey and the urbanization of land in Great Britain, pp. 31-65. *In* Frankie, G. W. and C. S. Koehler (eds.) Perspectives in urban entomology. Academic Press, New York.

Yapp, W. B. 1979. Specific diversity in woodland birds. Field Studies 5: 45-58.

Table 1. Moth species diversity at the Wolfe Lake site in Fundy National Park, 1994-1996

Family, ID # and Species		Date range	Total numbers
Hepialidae			
18	*Sthenopis argenteomaculatus* (Harr.)	01-25/07	4
22	*Sthenopis auratus* Grt.	12-26/07	5
31	*Korscheltellus gracilis* (Grt.)	02/07-9/08	247
Sesiidae			
2554	*Synanthedon acerni* (Clem.)	27/06	1
Limacodidae			
4652	*Tortricidia testacea* Pack.	18/06-01/08	82
4654	*Tortricidia flexuosa* (Grt.)	06-23/07	6
4659	*Packardia geminata* (Pack.)	19/06-06/07	3
4661	*Packardia elegans* (Pack.)	26/06-07/07	2
Thyatiridae			
6235	*Habrosyne scripta* (Gosse)	12/06-06/09	427
6237	*Pseudothyatira cymatophoroides* (Gn.)	18/06-14/08	105
6240	*Euthyatira pudens* (Gn.)	22/05	1
Drepanidae			
6251	*Drepana arcuata* Wlk.	1/06-29/09	219
6252	*Drepana bilineata* (Pack.)	21/05-31/08	496
6253	*Eudeilinia herminiata* (Gn.)	03/06-26/07	11
Geometridae			
6270	*Protitame virginalis* (Hulst)	12/07	1
6273	*Itame pustularia* (Gn.)	18/07-28/09	386
6286	*Itame brunneata* (Thunb.)	20/07	1
6287	*Itame anataria* (Swett)	18/07-17/08	65
6303	*Itame subcessaria* (Wlk.)	28/07-09/08	7
6304	*Itame bitactata* (Wlk.)	17/07-25/08	43
6326	*Semiothisa aemulataria* (Wlk.)	13/06-26/07	37
6330	*Semiothisa ulsterata* (Pears.)	11/06-14/08	429
6342	*Semiothisa bisignata* (Wlk.)	26/07-01/08	8
6342.1	*Semiothisa* n.sp. nr *bisignata*	05/07-06/08	7
6343	*Semiothisa sexmaculata* (Pack.)	13/06-22/08	93
6344	*Semiothisa signaria dispuncta* (Wlk.)	01/06-02/10	1703
6347	*Semiothisa pinistrobata* Fgn.	05/07	1
6349	*Semiothisa banksianae* Fgn.	15/06-07/08	34
6350	*Semiothisa submarmorata* (Wlk.)	17/06-16/08	48
6396	*Semiothisa neptaria* (Gn.)	01/08	1
6428	*Orthofidonia tinctaria* (Wlk.)	06/06-10/07	26
6429	*Orthofidonia exornata* (Wlk.)	04-29/06	14
6430	*Orthofidonia flavivenata* (Hulst)	20/05	1
6570	*Aethalura intetexta* (Wlk.)	11/05-27/07	381
6583	*Anacamptodes ephyraria* (Wlk.)	14/08-09/09	6
6588	*Iridopsis larvaria* (Gn.)	13/06-10/08	136
6590	*Anavitrinella pampinaria* (Gn.)	17/06-19/07	16
6597	*Ectropis crepuscularia* (D. & S.)	15/05-04/07	298
6598	*Protoboarmia porcelaria* (Gn.)	29/06-13/08	40
6620	*Melanolophia canadaria* (Gn.)	04/06-07/07	277
6621	*Melanolophia signataria* (Wlk.)	20/05-29/06	619
6637	*Eufidonia convergaria* (Wlk.)	18-27/06	2
6639	*Eufidonia discopilata* (Wlk.)	19/06	1
6640	*Biston betularia cognataria* (Gn.)	13/06-26/08	154

6654	*Hypagyrtis unipunctata* (Haw.)	06/07-15/08	121
6656	*Hypagyrtis piniata* (Pack.)	04/07-15/08	259
6658	*Phigalia titea* (Cram.)	08-22/05	4
6666	*Lomographa semiclarata* (Wlk.)	04-22/06	41
6667	*Lomographa vestaliata* (Gn.)	04/06-25/07	382
6668	*Lomographa glomeraria* (Grt.)	11/05-22/06	296
6677	*Cabera erythemaria* Gn.	13/06-10/08	77
6678	*Cabera variolaria* Gn.	26/06-22/07	17
6725	*Euchlaena muzaria* (Wlk.)	28/06-07/08	69
6731	*Euchlaena madusaria* (Wlk.)	17/07	1
6734	*Euchlaena marginaria* (Minot)	13-19/06	6
6740	*Xanthotype urticaria* Swett	27/06-26/07	21
6743	*Xanthotype sospeta* (Drury)	05-20/07	15
6755	*Pero morrisonaria* (Hy. Edw.)	10/06-23/07	473
6763	*Nacophora quernaria* (J. E. Smith)	07/06-17/07	23
6796	*Campaea perlata* (Gn.)	29/06-14/08	71
6797	*Ennomos magnaria* Gn.	15/08-29/09	78
6798	*Ennomos subsignaria* (Hbn.)	08/08-05/09	8
6799	*Epirranthis substriataria* (Hulst)	15-29/05	4
6804	*Petrophora subaequaria* (Wlk.)	15/05-21/06	45
6806	*Tacparia atropunctata* (Pack.)	09/06	1
6807	*Tacparia detersata* (Gn.)	01/06-03/07	156
6811	*Homochlodes lactispargaria* (Wlk.)	31/05-17/06	2
6812	*Homochlodes fritillaria* (Gn.)	01/06-15/07	103
6815	*Guenaria similaria* (Wlk.)	13/06-06/07	18
6817	*Selenia alciphearia* Wlk.	22/05-27/06	57
6818	*Selenia kentaria* (G. & R.)	31/05-05/07	10
6819	*Metanema inatomaria* Gn.	19/06-23/08	21
6820	*Metanema determinata* Wlk.	17/06-25/07	41
6822	*Metanema duaria* (Gn.)	02-28/06	148
6826	*Metanema hypocharia* (H.-S.)	09-27/06	16
6836	*Anagoga occiduaria* (Wlk.)	09/06-19/07	68
6838	*Probole amicaria* (H.-S.)	02/06-03/08	280
6840	*Plagodis serinaria* H.-S.	06/06-09/07	372
6842	*Plagodis phlogosaria* (Gn.)	21/05-07/07	510
6844	*Plagodis alcoolaria* (Gn.)	12/06-12/07	117
6863	*Caripeta divisata* Wlk.	14/06-14/08	417
6864	*Caripeta piniata* (Pack.)	29/06	1
6867	*Caripeta angustiorata* Wlk.	14-24/07	4
6885	*Besma quercivoraria* (Gn.)	07/06-23/07	264
6888	*Lambdina fiscellaria* (Gn.)	15/08-13/10	1405
6898	*Cingilia catenaria* (Drury)	27/09	1
6912	*Sicya macularia* (Harr.)	20/06-29/08	82
6963	*Tetracis crocallata* Gn.	07/06-17/07	66
6964	*Tetracis cachexiata* Gn.	07/06-10/07	238
6965	*Eugonobapta nivosaria* (Gn.)	20/07-03/08	16
6966	*Eutrapela clemataria* (J. E. Smith)	23/05-24/06	74
6982	*Prochoerodes transversata* (Drury)	31/07-28/09	84
7009	*Nematocampa resistaria* (H.-S.)	20/07-29/08	307
7048	*Nemoria mimosaria* (Gn.)	09/06-11/07	76
7058	*Synchlora aerata* (F.)	26/07	2
7132	*Pleuroprucha insulsaria* (Gn.)	12/07	1
7139	*Cyclophora pendulinaria* (Gn.)	06/06-05/09	785
7159	*Scopula limboundata* (Haw.)	06/07-09/08	99

7164	*Scopula junctaria* (Wlk.)	03/07-01/08	8
7169	*Scopula inductata* (Gn.)	17-26/07	3
7182	*Dysstroma citrata* (L.)	20/07-09/10	182
7187	*Dysstroma truncata traversata* (Kellicott)	07-27/07	104
7188	*Dysstroma walkerata* (Pears.)	27/06-20/07	13
7189	*Dysstroma hersiliata* (Gn.)	06-24/07	9
7191	*Dysstroma formosa* (Hulst)	24/07	1
7194	*Dysstroma brunneata* (Pack.)	06-13/07	7
7199	*Eulithis propulsata* (Wlk.)	06-17/08	5
7201	*Eulithis testata* (L.)	23/08-11/09	6
7206	*Eulithis explanata* (Wlk.)	18/07-12/09	149
7208	*Eulithis serrataria* (B. & McD.)	02-19/08	5
7213	*Ecliptopera silaceata albolineata* (Pack.)	02/06-25/08	29
7216	*Plemyria georgii* Hulst	24/08-05/09	5
7229	*Hydriomena perfracta* Swett	31/05-28/06	11
7235	*Hydriomena divisaria* (Wlk.)	11/06-19/07	214
7236	*Hydriomena renunciata* (Wlk.)	10/06-31/07	274
7254	*Hydriomena ruberata* (Freyer)	09/06-27/07	16
7285	*Triphosa haesitata affirmaria* (Wlk.)	13/10	1
7291	*Hydria undulata* (L.)	29/06-07/08	4
7293	*Rheumaptera hastata* (L.)	14/06-10/07	12
7294	*Rheumaptera subhastata* (Nolcken)	18-28/06	8
7307	*Mesoleuca ruficillata* (Gn.)	15/06-02/08	13
7312	*Spargania magnoliata* Gn.	14/06-25/08	16
7316	*Perizoma basaliata* (Wlk.)	21/07-26/08	128
7320	*Perizoma alchemillata* (L.)	24/06-08/08	72
7329	*Anticlea vasiliata* Gn.	08/05-16/06	23
7330	*Anticlea multiferata* Gn.	11-27/06	5
7368	*Xanthorhoe labradorensis* (Pack.)	23/06-22/07	4
7370	*Xanthorhoe abrasaria congegata* (Wlk.)	18/06-22/07	26
7371	*Xanthorhoe iduata* (Gn.)	06-19/07	9
7384	*Xanthorhoe munitata* (Hbn.)	17-24/07	9
7388	*Xanthorhoe ferrugata* (Cl.)	26-29/06	5
7390	*Xanthorhoe lacustrata* (Gn.)	31/05-26/06	6
7394	*Epirrhoe alternata* (Muller)	12/07-21/08	4
7399	*Euphyia unangulata intermediata* (Gn.)	29/06-14/08	8
7414	*Orthonama obstipata* (F.)	19/07-17/08	2
7416	*Orthonama centrostrigaria* (Woll.)	06/07	1
7419	*Hydrelia lucata* (Gn.)	17/06-06/08	269
7420	*Hydrelia condensata* (Wlk.)	13/06-31/07	157
7423	*Hydrelia albifera* (Wlk.)	05-22/07	2
7425	*Venusia cambrica* Curt.	19/06-02/08	36
7428	*Venusia comptaria* (Wlk.)	11/05-14/06	27
7430	*Trichodezia albovittata* (Gn.)	07/06-19/07	28
7433	*Epirrita autumnata* henshawi (Swett)	25/09-14/10	47
7449	*Eupithecia palpata* Pack.	02/06-18/07	455
7459	*Eupithecia columbiata* (Dyar)	16/05-26/06	57
7474	*Eupithecia miserulata* Grt.	16/06-27/09	14
7476	*Eupithecia misturata* (Hulst)	07/06	1
7487	*Eupithecia subfuscata* (Haw.)	14/06-25/07	652
7489	*Eupithecia lariciata* (Freyer)	06/06-05/07	77
7491	*Eupithecia fletcherata* Tayl.	14-24/08	6
7492	*Eupithecia casloata* (Dyar)	11-29/06	47
7494	*Eupithecia sheppardata* McD.	09-11/07	12

7518	*Eupithecia intricata taylorata* Swett	18/06	1
7520	*Eupithecia satyrata dodata* Tayl.	12/06-23/07	93
7523	*Eupithecia strattonata* Pack.	12-22/06	9
7526	*Eupithecia russeliata* Swett	11/06-07/08	98
7528	*Eupithecia assimilata* Doubleday	16/06-22/08	46
7529	*Eupithecia absinthiata* (Clerck)	15/06-17/08	13
7540	*Eupithecia perfusca* (Hulst)	19/06-18/08	158
7543	*Eupithecia annulata* (Hulst)	12/05-09/06	8
7551	*Eupithecia interruptofasciata* Pack.	02/10	1
7574	*Eupithecia albicapitata* Pack.	17/06-05/07	7
7575	*Eupithecia mutata* Pears.	28/06-20/07	16
7594	*Eupithecia anticaria* Wlk.	14/06-20/07	31
7605	*Eupithecia ravocostaliata* Pack.	15/05-15/06	10
7625	*Chloroclystis rectangulata* (L.)	05-07/07	3
7635	*Acasis viridata* (Pack.)	02-26/06	7
7637	*Cladara limitaria* (Wlk.)	08/05-20/06	379
7639	*Cladara atroliturata* (Wlk.)	05/05-18/06	196
7640	*Lobophora nivigerata* Wlk.	04/06-01/09	52
Epiplemidae			
7650	*Callizia amorata* Pack.	22/06-07/08	160
Lasiocampidae			
7673	*Tolype laricis* (Fitch)	21/08-27/09	43
7687	*Phyllodesma americana* (Harr.)	22/05-10/07	241
7698	*Malacosoma disstria* Hbn.	05/07-05/09	464
7701	*Malacosoma americanum* (F.)	13/07-04/08	12
Saturniidae			
7715	*Dryocampa rubicunda* (F.)	02/06-21/08	47
7757	*Antheraea polyphemus* (Cram.)	13/06-27/07	44
7758	*Actias luna* (L.)	07/06-19/07	14
7767	*Hyalophora cecropia* (L.)	21/06	1
7768	*Hyalophora columbiata* (S.I. Smith)	17/06	1
Sphingidae			
7787	*Ceratomia undulosa* (Wlk.)	12-14/07	2
7810	*Sphinx gordius* Cram.	04/06-09/08	167
7812	*Sphinx drupiferarum* J.E. Smith	17/06	1
7817	*Lapara bombycoides* Wlk.	09/07	1
7821	*Smerinthus jamaicensis* (Drury)	01/06-06/08	220
7822	*Smerinthus cerisyi* Kby.	02/06-04/07	47
7824	*Paonias excaecutus* (J. E. Smith)	12/06-22/08	1689
7825	*Paonias myops* (J.E. Smith)	09/06-10/09	68
7827	*Laothoe juglandis* (J.E. Smith)	15/06	1
7828	*Pachysphinx modesta* (Harr.)	04/06-24/07	7
7886	*Darapsa pholus* (Cram.)	19/06-13/07	4
Notodontidae			
7895	*Clostera albosigma* Fitch	13/06-14/08	5
7898	*Clostera strigosa* (Grt.)	19-22/06	3
7901	*Clostera apicalis* (Wlk.)	09/06-12/07	37
7915	*Nadata gibbosa* (J. E. Smith)	07/06-11/09	674
7917	*Hyperaeschra georgica* (H.-S.)	24/07	1
7919	*Peridea basitriens* (Wlk.)	17/06-14/08	279
7921	*Peridea ferruginea* (Pack.)	15/06-22/08	574
7922	*Pheosia rimosa* Pack.	07/06-23/08	40
7926	*Notodonta scitipennis* Wlk.	12/06-26/07	8
7928	*Notodonta simplaria* Graef	02/06-13/08	15

7931	*Gluphisia septentrionis* Wlk.	14/06-09/08	38
7933	*Gluphisia avimacula* Hudson	22/05-22/06	19
7939	*Furcula occidentalis* (Lint.)	11-24/07	4
7941	*Furcula modesta* (Hudson)	01/06-06/08	5
7951	*Symmerista albifrons* (J.E. Smith)	02-24/07	3
7952	*Symmerista canicosta* Franc.	14/06-18/07	5
7953	*Symmerista leucitys* Franc.	29/06-24/07	10
7958	*Dasylophia thyatiroides* (Wlk.)	20/06-12/07	8
7975	*Macrurocampa marthesia* (Cram.)	23-31/07	7
7990	*Heterocampa umbrata* Wlk.	19/06-26/07	124
7994	*Heterocampa guttivitta* (Wlk.)	01/06-20/07	222
7995	*Heterocampa biundata* Wlk.	14/06-21/08	190
7998	*Lochmaeus manteo* Doubleday	28/06-15/08	21
8005	*Schizura ipomoeae* Doubleday	19/06-12/09	236
8006	*Schizura badia* (Pack.)	29/06	1
8007	*Schizura unicornis* (J. E. Smith)	14/06-25/08	203
8011	*Schizura leptinoides* (Grt.)	27/06-09/08	47
8012	*Schizura semirufescens* (Wlk.)	29/06-17/08	42
8017	*Oligocentria lignicolor* Wlk.	05/07-19/08	75
Arctiidae			
8043	*Eilema bicolor* (Grt.)	25/07	1
8090	*Hypoprepia fucosa tricolor* (Fitch)	24/07	1
8098	*Clemensia albata* Pack.	07/07-08/08	12
8111	*Haploa lecontei* (Guer.-Meneville)	10/07-06/08	39
8114	*Holomelina laeta treatii* (Grt.)	10/07-07/08	20
8123	*Holomelina ferruginosa* (Wlk.)	11/07-09/08	30
8129	*Pyrrharctia isabella* (J. E. Smith)	29/06-24/07	5
8134	*Spilosoma congrua* Wlk.	06/06-19/07	119
8136	*Spilosoma dubia* (Wlk.)	05/06-24/07	3
8137	*Spilosoma virginica* (F.)	07/06-06/09	276
8140	*Hyphantria cunea* (Drury)	07/06-18/08	165
8156	*Phragmatobia fuliginosa rubricosa* (Harr.)	17-29/06	6
8158	*Phragmatobia assimilans* Wlk.	01-21/06	170
8162	*Platarctia parthenos* (Harr.)	24/06-08/08	432
8186	*Grammia williamsii* (Dodge)	28/06-28/07	10
8197	*Grammia virgo* (L.)	14-26/07	4
8203	*Halysidota tessellaris* (J. E. Smith)	19/07-14/08	12
8214	*Lophocampa maculata* Harr.	07/06-02/08	959
8262	*Ctenucha virginica* (Esp.)	09-26/07	32
8267	*Cisseps fulvicollis* (Hbn.)	27/06	1
Lymantriidae			
8304	*Dasychira plagiata* (Wlk.)	04/07-08/08	34
8316	*Orgyia leucostigma* plagiata (Wlk.)	15/08-30/09	120
8318	*Lymantria dispar* (L.)	05/09	1
8319	*Leucoma salicis* (L.)	11-24/07	12
Noctuidae			
8322	*Idia americalis* (Gn.)	28/06-12/09	457
8323.1	*Idia* n.sp. nr *aemula*	04/07-18/08	167
8326	*Idia rotundalis* (Wlk.)	11/07-06/08	3
8338	*Phalaenophana pyramusalis* (Wlk.)	09/06-02/08	77
8340	*Zanclognatha lituralis* (Hbn.)	04-13/07	3
8341	*Zanclognatha theralis* (Wlk.)	13/07-06/08	68
8344	*Zanclognatha inconspicualis* (Grt.)	16/07-07/08	39
8349	*Zanclognatha protumnusalis* (Wlk.)	11/07-10/09	280

8351	*Zanclognatha cruralis* (Gn.)	20/06-28/07	29
8352	*Zanclognatha jacchusalis* (Wlk.)	02/08	1
8356	*Chytolita petrealis* Grt.	18/06-20/07	111
8362	*Phalaenostola metonalis* (Wlk.)	29/06-09/08	64
8370	*Bleptina caradrinalis* Gn.	28/06-26/07	84
8387	*Renia sobrialis* (Wlk.)	13/07-07/08	5
8397	*Palthis angulalis* (Hbn.)	16/06-18/07	28
8404	*Rivula propinqualis* Gn.	10/07-14/08	25
8442	*Bomolocha baltimoralis* (Gn.)	16/06-28/09	43
8443	*Bomolocha bijugalis* (Wlk.)	04-12/07	3
8444	*Bomolocha palparia* (Wlk.)	19/06-26/07	10
8455	*Lomanaltes eductalis* (Wlk.)	07/06-31/08	34
8465	*Plathypena scabra* (F.)	24/07	1
8479	*Spargaloma sexpunctata* Grt.	03/07	1
8490	*Pangrapta decoralis* Hbn.	02-26/07	10
8536	*Calyptra canadensis* (Bethune)	24-26/07	2
8689	*Zale lunata* (Drury)	14/10	1
8694	*Zale aeruginosa* (Gn.)	01-27/06	17
8697	*Zale minerea* (Gn.)	22/05-06/07	363
8703	*Zale duplicata* (Bethune)	19/06	1
8713	*Zale lunifera* (Hbn.)	06-19/06	3
8716	*Zale unilineata* (Grt.)	26/05-09/06	2
8717	*Zale horrida* Hbn.	07-28/06	21
8727	*Parallelia bistriaris* Hbn.	29/06-02/08	13
8738	*Caenurgina crassiuscula* (Haw.)	03/08	1
8776	*Catocala coelebs* Grt.	03/08-13/09	4
8803	*Catocala relicta* Wlk.	06/09	1
8817	*Catocala briseis* Edw.	23/08	1
8833	*Catocala concumbens* Wlk.	22/08-29/09	7
8846	*Catocala sordida* Grt.	08-31/08	5
8857	*Catocala ultronia* (Hbn.)	22/08-30/09	12
8867	*Catocala blandula* Hulst	18/08	1
8896	*Diachrysia aereoides* (Grt.)	18/07-17/08	12
8897	*Diachrysia balluca* Gey.	18-24/07	2
8904	*Chrysanympha formosa* (Grt.)	25/07-07/08	2
8909	*Autographa rubida* Ottol.	20-21/06	2
8911	*Autographa bimaculata* (Steph.)	05/09	1
8912	*Autographa mappa* (G. & R.)	29/06-13/07	3
8923	*Autographa ampla* (Wlk.)	27/06-22/07	3
8925	*Syngrapha altera* (Ottol.)	11/08	1
8926	*Syngrapha octoscripta* (Grt.)	08-22/08	4
8929	*Syngrapha viridisigma* (Grt.)	26/07-09/09	21
8939	*Syngrapha alias* (Ottol.)	07/07-21/08	19
8940	*Syngrapha abstrusa* Eichlin & Cunningham	27/06-21/07	24
8941	*Syngrapha cryptica* Eichlin & Cunningham	18/08	1
8942	*Syngrapha rectangula* (W. Kby.)	12/07-14/08	14
8950	*Plusia putnami* Grt.	12-25/07	4
8953	*Plusia venusta* Wlk.	25/07	1
8969	*Baileya doubledayi* (Gn.)	11/06-18/07	57
8970	*Baileya ophthalmica* (Gn.)	02/06-06/07	63
9046	*Lithacodia bellicula* Hbn.	13/06-18/07	8
9047	*Lithacodia muscosula* (Gn.)	02/07-14/08	33
9048	*Lithacodia albidula* (Gn.)	15/06-29/08	542
9053	*Pseudeustrotia carneola* (Gn.)	29/06-01/08	8

9055.1	*Maliattha synochitis* (G. & R.)	16/07	1
9055.2	*Maliattha concinnimacula* (Gn.)	12/06-20/07	39
9059	*Capis curvata* Grt.	26/06-10/07	4
9061	*Cerma cora* Hbn.	04/07	1
9065	*Leuconycta diphteroides* (Gn.)	14/06-15/08	45
9066	*Leuconycta lepidula* (Grt.)	1/06-24/07	12
9177	*Panthea acronyctoides* (Wlk.)	06/06-18/08	142
9183	*Panthea pallescens* McD.	18-26/07	4
9184	*Colocasia flavicornis* (Sm.)	22/05-24/06	55
9189	*Charadra deridens* (Gn.)	17/06-16/07	10
9193	*Raphia frater* Grt.	18/06-09/08	18
9200	*Acronicta americana* (Harr.)	14/06-09/08	154
9203	*Acronicta dactylina* Grt.	07/06-11/09	409
9205	*Acronicta lepusculina* Gn.	07/06	1
9206	*Acronicta leporina vulpina* (Grt.)	07/06-08/08	56
9207	*Acronicta innotata* Gn.	12/06-03/09	589
9211	*Acronicta tritona* (Hbn.)	12/06-24/07	7
9212	*Acronicta grisea* Wlk.	11/06-27/07	1325
9221	*Acronicta funeralis* G. & R.	27/06-17/07	8
9226	*Acronicta superans* Gn.	07/06-25/08	118
9229	*Acronicta hasta* Gn.	07/06-27/07	89
9237	*Acronicta interrupta* Gn.	15-29/06	4
9238	*Acronicta lobeliae* Gn.	19/06-14/08	5
9241	*Acronicta fragilis* (Gn.)	02/06-01/09	1030
9249	*Acronicta increta* Morr.	27/06-19/08	346
9251	*Acronicta retardata* (Wlk.)	19/06-06/08	54
9257	*Acronicta impleta* Wlk.	04/06-24/07	53
9259	*Acronicta noctivaga* Grt.	04/06-18/07	44
9261	*Acronicta impressa* Wlk.	01/06-22/08	46
9272	*Acronicta oblinita* (J. E. Smith)	14/06-24/07	34
9274	*Acronicta lanceolaria* (Grt.)	07/06	1
9281	*Agriopodes fallax* (H.-S.)	28/06-07/08	46
9286	*Harrisimemna trisignata* (Wlk.)	18/06-07/08	18
9326	*Apamea verbascoides* (Gn.)	06-25/07	6
9333	*Apamea lignicolora* (Gn.)	05/07-14/08	16
9341	*Apamea vultuosa* (Grt.)	06/07	2
9348	*Apamea amputatrix* (Fitch)	12/07-18/08	8
9359	*Apamea commoda* (Wlk.)	12/07	1
9362	*Apamea remissa indocilis* (Wlk.)	24/07	1
9364	*Apamea sordens* (Hufnagel)	17/06-06/07	2
9367	*Apamea dubitans* (Wlk.)	04-22/08	3
9367.1	*Apamea cogitata* (Sm.)	11-25/07	6
9369	*Apamea inficita* (Wlk.)	25/08	1
9382	*Apamea devastator* (Brace)	24/07-19/08	5
9396	*Eremobina claudens* (Wlk.)	02/08-11/09	10
9398	*Eremobina jocasta* (Sm.)	30/09	1
9415	*Oligia bridghami* (G. & R.)	22/08-05/09	2
9419	*Oligia mactata* (Gn.)	01-19/09	10
9420	*Oligia illocata* (Wlk.)	28/08-10/10	60
9427	*Meropleon diversicolor* (Morr.)	26-27/09	4
9437	*Chortodes inquinita* (Gn.)	19/07-07/08	14
9454	*Amphipoea velata* (Wlk.)	02-17/08	2
9457	*Amphipoea americana* Speyer)	24/08-05/09	3
9480	*Papaipema pterisii* Bird	26/09-10/10	4

9490	*Papaipema nepheleptena* (Dyar)	26/09	1
9509	*Papaipema unimoda* (Sm.)	10/09-09/10	7
9514	*Hydraecia micacea* (Esp.)	09-11/09	2
9525	*Bellura obliqua* (Wlk.)	18/06-17/07	2
9545	*Euplexia benesimilis* McD.	07/06-25/07	49
9546	*Phlogophora iris* Gn.	13/06-19/07	344
9547	*Phlogophora periculosa* Gn.	26/07-28/09	75
9549	*Enargia decolor* (Wlk.)	22-24/08	5
9550	*Enargia infumata* (Grt.)	25/07-29/08	3
9556	*Chytonix palliatricula* (Gn.)	14/06-24/07	29
9564	*Andropolia contacta* (Wlk.)	04-09/08	2
9578.1	*Hyppa 'xylinoides'* (Gn.)	20/06	1
9578.2	*Hyppa 'ancocisconensis'* (Morr.)	19/06-25/08	68
9582	*Nedra ramosula* (Gn.)	01/06-23/08	10
9631	*Callopistria mollissima* (Gn.)	05-17/07	2
9633	*Callopistria cordata* (Ljungh)	19/06-07/08	43
9638	*Amphipyra pyramidoides* (Gn.)	05/07-29/09	11
9639	*Amphipyra tragopoginis* (Cl.)	09/08-12/09	3
9647	*Athetis miranda* (Grt.)	26/06-04/08	11
9653	*Caradrina morpheus* (Hufn.)	12-22/07	3
9657	*Caradrina multifera* (Wlk.)	14-31/08	4
9664	*Balsa labecula* (Grt.)	11/07-01/08	2
9666	*Spodoptera frugiperda* (J. E. Smith)	14/08	1
9678	*Elaphria versicolor* (Grt.)	02/06-26/07	605
9681	*Elaphria festivoides* (Gn.)	11/06-06/08	736
9696	*Condica vecors* (Gn.)	09-20/06	4
9873	*Xylena nupera* (Lint.)	02/05	1
9874	*Xylena curvimacula* (Morr.)	19/04-27/09	78
9875	*Xylena thoracica* (Putnam-Cramer)	11-21/05	3
9876	*Xylena cineritia* (Grt.)	11-29/05	3
9878	*Lithomoia germana* (Morr.)	18/08-29/09	23
9881	*Homoglaea hircina* Morr.	01-26/05	2
9884	*Litholomia napaea* (Morr.)	13/05-12/09	6
9888	*Lithophane innominata* (Sm.)	12/05-28/09	13
9889	*Lithophane petulca* Grt.	24/04-02/06	8
9893	*Lithophane hemina* Grt.	08-20/05	5
9902	*Lithophane baileya* Grt.	24/04-26/09	12
9909	*Lithophane tepida* Grt.	16/05-01/06	5
9913	*Lithpophane georgii* Grt.	21/05-27/09	2
9915	*Lithophane grotei* Riley	17/10	1
9916	*Lithophane unimoda* (Lint.)	20/05	1
9917	*Lithophane fagina* Morr.	19/04-28/09	21
9922	*Lithophane pexata* Grt.	24/04-27/09	38
9928	*Lithophane thaxteri* Grt.	01/06	1
9933	*Eupsilia vinulenta* (Grt.)	23/05	1
9935	*Eupsilia tristigmata* (Grt.)	26-28/09	4
9936	*Eupsilia morrisoni* (Grt.)	26/05	1
9939	*Eupsilia devia* (Grt.)	18/05	1
9947	*Epiglaea apiata* (Grt.)	11/09	1
9952	*Eucirroedia pampina* (Gn.)	29/08-28/09	10
9957	*Sunira bicolorago* (Gn.)	23/09-09/10	21
9961	*Anathix ralla* (G. & R.)	31/08	1
9965	*Xanthia* n.sp. nr *togata*	19/09-09/10	4
9967	*Hillia iris* (Zett.)	26/09	1

9976	*Platypolia anceps* (Steph.)	17-28/09	9
9980	*Xylotype acadia* B. & Benj.	04/09	1
9985	*Mniotype miniota* (Grt.)	15-18/06	2
9989	*Sutyna privata* (Wlk.)	25/08-27/09	5
9998	*Brachylomia algens* (Grt.)	09/09	1
10005	*Feralia jocosa* (Gn.)	15/05-09/06	7
10008	*Feralia comstocki* (Grt.)	12/05-23/06	359
10011	*Brachionycha borealis* (Sm.)	12-17/05	4
10055	*Apharetra dentata* (Grt.)	19/07-05/09	25
10065	*Homohadena infixa* (Wlk.)	26-28/07	3
10123	*Oncocnemis piffardi* (Wlk.)	23-31/08	2
10194	*Cucullia intermedia* Speyer	09/06	1
10197/8	*Cucullia florea* Gn./*postera* Gn. complex	23/06-23/08	6
10199	*Cucullia omissa* Dod	21/06	1
10202	*Cucullia convexipennis* G. & R.	19/07-18/08	3
10266	*Sideridis congermana* (Morr.)	18-19/07	2
10272	*Mamestra curialis* (Sm.)	20-24/06	2
10275	*Polia nimbosa* (Gn.)	10/07-07/08	89
10276	*Polia imbrifera* (Gn.)	10/07-07/08	172
10280	*Polia purpurissata* (Grt.)	17/06-21/08	17
10288	*Polia detracta* (Wlk.)	29/06-08/08	331
10292	*Melanchra adjuncta* (Harr.)	06/06-26/06	119
10293	*Melanchra picta* (Harr.)	29/06-18/07	3
10294	*Melanchra pulverulenta* (Sm.)	12/06-15/07	37
10295	*Melanchra assimilis* (Morr.)	18/06-10/07	15
10298	*Lacanobia radix* (Wlk.)	05/06-20/07	22
10299	*Lacanobia subjuncta* (G. & R.)	21/06	1
10300	*Spiramater grandis* (Gn.)	10/06-20/07	188
10301	*Spiramater lutra* (Gn.)	13/06-25/07	337
10302	*Trichordestra rugosa* (Morr.)	09/06	1
10303	*Trichordestra tacoma* (Stkr.)	07/06-09/07	10
10304	*Trichordestra legitima* (Grt.)	19/06-28/07	3
10311	*Papestra biren* (Goeze)	21/06	1
10370	*Lacinipolia lustralis* (Grt.)	05-24/07	9
10372	*Lacinipolia anguina* (Grt.)	12-29/06	26
10397	*Lacinipolia renigera* (Steph.)	29/07-21/08	5
10405	*Lacinipolia lorea* (Gn.)	29/06-19/07	34
10406	*Lacinipolia olivacea* (Morr.)	24/07-09/09	74
10431	*Faronta diffusa* (Wlk.)	13/06-27/07	2
10436	*Aletia oxygala luteopallens* (Sm.)	24/07-15/08	3
10438	*Pseudaletia unipuncta* (Haw.)	05/06-29/08	37
10446	*Leucania multilinea* (Wlk.)	11/07-19/08	54
10449	*Leucania insueta* Gn.	29/06-26/07	16
10459	*Leucania inermis* (Fbs.)	29/06-12/07	2
10487	*Orthosia rubescens* (Wlk.)	08/05-13/06	86
10490	*Orthosia revicta* (Morr.)	08/05-21/06	436
10495	*Orthosia hibisci* (Gn.)	01-21/05	6
10501	*Crocigrapha normani* (Grt.)	12/05-27/06	573
10513	*Egira dolosa* (Grt.)	20-23/05	5
10520	*Morrisonia evicta* (Grt.)	12/05-09/06	88
10521.1	*Morrisonia latex* (Gn.)	04/06-10/07	260
10524	*Nephelodes minians* Gn.	21/08-03/09	9
10563	*Protorthodes oviduca* (Gn.)	06/06-10/07	65
10578	*Pseudorthodes vecors* (Gn.)	20/06-09/07	2

10587	*Orthodes cynica* Gn.	12/06-25/07	1456
10589.1	*Orthodes goodelli* (Grt.)	05-18/07	5
10627	*Tricholita signata* (Wlk.)	02-17/08	5
10644	*Agrotis molllis* Wlk.	11-27/07	15
10651	*Agrotis venerabilis* Wlk.	05-19/09	5
10663	*Agrotis ipsilon* (Hufn.)	01/06-31/08	12
10705	*Euxoa messoria* (Harr.)	21-23/08	2
10714	*Euxoa quebecensis* (Sm.)	29/06	1
10738	*Euxoa mimallonis* (Grt.)	23-26/08	2
10756	*Euxoa campestris* (Grt.)	31/08	1
10780	*Euxoa comosa ontario* (Sm.)	03-12/09	5
10865	*Euxoa perpolita* (Morr.)	23/08-02/09	2
10891	*Ochropleura plecta* (L.)	14/06-19/08	110
10915	*Peridroma saucia* (Hbn.)	10/08	1
10917	*Diarsia rubifera* (Grt.)	26/07-26/08	70
10919	*Diarsia jucunda* (Wlk.)	04/07-22/08	118
10922	*Diarsia freemani* Hdwk.	27/06-27/07	13
10926	*Spaelotis clandestina* (Harrr.)	05-20/07	6
10928	*Graphiphora augur haruspica* (Grt.)	21/07-15/08	9
10929	*Eurois occulta* (L.)	29/06-13/09	106
10930	*Eurois astricta* Morr.	18/07-05/09	263
10942a	*Xestia c-nigrum adela* Franc.	14/07-18/08	24
10942.1	*Xestia dolosa* Franc.	27/09	1
10943	*Xestia normaniana* (Grt.)	24/07-25/08	118
10944	*Xestia smithii* (Snell.)	26/07-12/09	125
10947	*Xestia oblata* (Morr.)	28/06-17/07	11
10950	*Xestia bicarnea* (Gn.)	09-22/08	6
10951	*Xestia tenuicula* (Morr.)	26/07-23/08	6
10962	*Xestia perquiritata* (Morr.)	24/07-23/08	96
10968	*Xestia badicollis* (Grt.)	03/08-12/09	98
10970	*Xestia youngii* (Sm.)	23-25/08	2
10993a	*Hemipachnobia subporphyrea monochromatea* (Morr.)	27-29/06	2
10994	*Cerastis tenebrifera* (Wlk.)	15/05-06/06	2
10996	*Metalepsis salicarum* (Wlk.)	03/05-06/06	174
10999	*Aplectoides condita* (Gn.)	10/06-20/07	628
11000	*Anaplectoides prasina* (D. & S.)	05/07-21/08	107
11001	*Anaplectoides pressus* (Grt.)	27/06-15/08	132
11004	*Protolampra rufipectus* (Morr.)	25/07-06/09	27
11008	*Eueratagrotis perattenta* (Grt.)	29/06-19/08	120
11009	*Eueretagrotis attenta* (Grt.)	05/07-22/08	174
11010	*Heptagrotis phyllophora* (Grt.)	28/06-02/08	113
11012	*Cryptocala acadiensis* (Bethune)	22/07-19/08	62
11029	*Abagrotis alternata* (Grt.)	25/07-16/08	5
11050.1	*Noctua pronuba* (L.)	24/07-21/08	4
11051	*Ufeus satyricus* Grt.	06-13/10	5
11064	*Pyrrhia exprimens* (Wlk.)	28/06	1
11164	*Schinia florida* (Gn.)	20/07	3

Appendix I. Calendar dates for weeks of years, 1994-1996; and weeks traps operating.

Week	Calendar dates for year		
	1994	1995	1996
16	X	X	14-20/04
17	X	X	21-27/04
18	X	30/04-06/05	28/04-04/05
19	08-14/05	07-13/05	05-11/05
20	15-21/5	14-20/05	12-18/05
21	22-28/5	21-27/05	19-25/05
22	29/5-4/6	28/05-03/06	26/5-1/06
23	05-11/06	04-10/06	02-08/06
24	12-18/06	11-17/06	09-15/06
25	19-25/06	18-24/06	16-22/06
26	26/6-02/07	25/06-01/07	23/06-29/07
27	03-09/07	X	30/06-06/07
28	10-16/07	09-15/07	07-13/07
29	17-23/07	16-22/07	14-20/07
30	24-30/07	23-29/07	21-27/07
31	31/07-06/08	30/07-05/08	28/07-03/08
32	07-13/08	X	04-10/08
33	14-20/08	13-19/08	11-17/08
34	21-27/08	20-26/08	18-24/08
35	28/08-03/09	27/08-02/09	25-31/08
36	X	03-09/09	01-07/09
37	X	X	08-14/09
38	X	X	15-21/09
39	25/09-01/10	X	22-28/09
40	X	X	29/09-5/10
41	X	X	06-12/10
42	X	X	13-19/10

X, traps not operating

Appendix II. Vegetation analysis at the Wolfe Lake site, trap #3. Vascular plants in a 200m^2 plot.

Tree species:	Abundance <2m	>2m alive	>2m dead
Abies balsamea (L.) Mill.	>50<250	54	7
Picea mariana (Mill.) BSP	1	10	
Betula papyrifera Marsh.	14	32	
Acer rubrum L.	4		
Prunus pensylvanica L.	1	2	
Prunus virginiana L.	2	1	

other vascular plant species:

Cornus canadensis L.	>50<250
Maianthemum canadense Desf.	>50<250
Ribes glandulosum Grauer.	32
Trientalis borealis Raf.	12
Rubus strigosus Michx.	11
Osmunda cinnamomea L.	6
Osmunda claytoniana L.	6
Dryopteris spinulosa (O. F. Muell.) Watt	5
Aralia nudicaulis L.	4
Nemopanthus mucronatus (L.) Trel.	3
Coptis trifolia groenlandica (Oeder) Hulte	3

Appendix III. Vegetation analysis at the Wolfe Lake site, trap #4. Vascular plants in a 200m^2 plot.

Tree species:

	Abundance <2m	>2m alive
Abies balsamea (L.) Mill.	35	24
Picea mariana (Mill.) BSP		7
Picea rubens Sarg.		1
Betula papyrifera Marsh.	8	1
Sorbus americana Marsh.	1	2
Nemopanthus mucronatus (L.) Trel.	23	1
Alnus rugosa (DuRoi) Spreng.	22	44

other vascular plant species:

Glyceria melicaria (Michx.) Hubbard	>250
Oxalis acetosela L.	>50<250
Cornus canadensis L.	>50<250
Ribes glandulosum Grauer.	>50<250
Carex trisperma Dew.	>50<250
Calmagrostis canadensis (Mixhx.) Nutt.	>50<250
Rubes pubescens Raf.	>50<250
Veronica americana (Raf.) Schwein.	>50<250
Onoclea sensibilis L.	40
Rubus strigosus Michx.	10
Dryopteris spinulosa (O. F. Muell.) Watt	8
Osmunda cinnamomea L.	8
Poa palustris L.	5
Trientalis borealis Raf.	5
Osmunda claytoniana L.	3
Epilobium leptophyllum Raf.	3
Galium palustre L.	2
Carex intumescens Michx	3
Viola sp.	1