

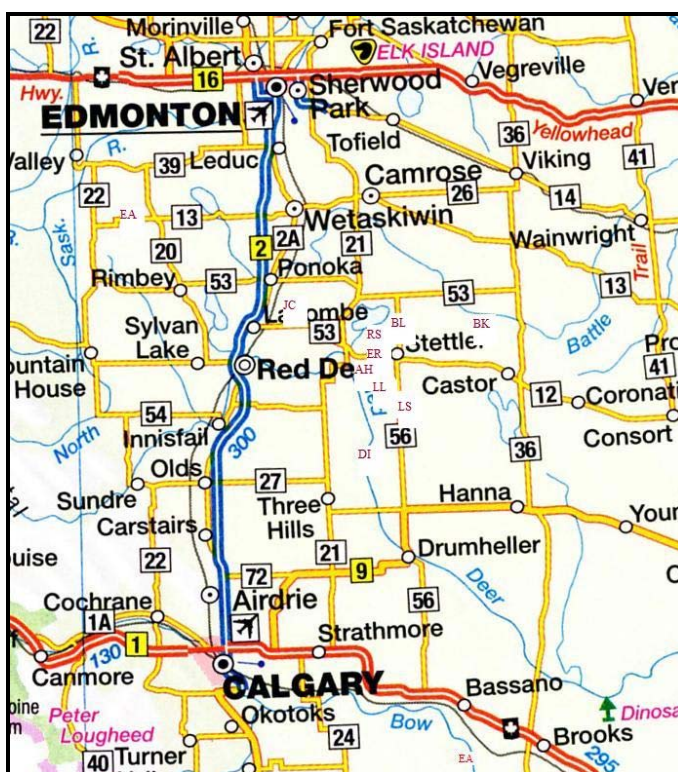
MOTH INVENTORIES OF ELEVEN MAJOR STUDY AREAS IN SOUTH-CENTRAL ALBERTA: ANALYSIS

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Inventory research, starting in 1999 and continuing through 2007, has been carried out on the moths of eleven major study areas in south-central Alberta. With the exception of a semi-urban site in Erskine, all sites were in areas where the vegetation had been relatively undisturbed. Realizing that about 95% of the Aspen Parkland has been disturbed by agriculture or other activities, and some of the remainder will soon be disturbed, the purpose of the research was to document the native moth biodiversity while there was still time to do so. It is strongly recommended that government and other agencies like the Alberta Conservation Association, Ducks Unlimited and Nature Conservancy Canada continue to protect the undisturbed areas (Parks, Conservation Areas, Natural Areas, etc.) under their care and also that more areas be selected for preservation.



The eleven study areas are marked in red on the above map. The areas are: AH – the former Allan Hall Acreage, 3 km S of Nevis; BK – Big Knife Provincial Park, N of Halkirk; BL – Buffalo Lake Conservation Area, N of Stettler; DI – Dry Island Buffalo Jump Provincial Park, E of Huxley; EA – East Arrowwood Coulee, NE of Arrowwood; EP the Bird quarter on East Poplar Creek, NW of Winfield; ER – Bird residence, 5 Maple Close, Erskine; LL – the former Lloyd Lohr farm, SE of Erskine; LS – Lowden Springs Conservation Area, S of Stettler; and RS – Rochon Sands Provincial Park, N of Erskine. One area (ER) is in a semi-urban setting in Erskine, one (EP) is in mixed woods NW of Rimbey, and one (EA) is in the Prairies south of Bassano; all of the remainder are in Aspen Parkland. It wasn't until now that enough sampling had been done to warrant the present analysis. It is hoped that more research will be carried out in 2008.

HABITATS

In simple terms, the Aspen Parkland is a mosaic of aspen groves surrounded by areas of grassland. However, there is much diversity when one looks in detail at the habitats found in each area and each habitat has its own characteristic plant species. Due to topography, soil type, soil moisture and exposure few sites have exactly similar habitats. The following table illustrates the various habitats present in the study areas.

HABITATS IN STUDY AREAS

1999-2007, South-central
Alberta

Habitats	AH	BK	BL	DI	JC	EA	EP	ER	LL	LS	RS
Acer negundo								x			
Artemisia spp.		x	x	x		x				x	
Badlands				x							
Chokecherry/saskatoon	x	x	x	x	x	x	x	x			x
Creek/river		x		x		x	x				
Elaeagnus commutata	x	x	x	x						x	
Garden/lawn								x			
Marsh	x		x								
Mesic prairie/grassland	x	x	x	x	x	x				x	
Mixed woods		x		x	x		x				
Old fields			x				x			x	
Picea glauca				x	x		x	x			
Pinus contorta					x		x				
Populus balsamifera woods						x	x				
Populus tremuloides woods	x	x	x	x	x		x	x	x		x
Riverine forest				x		x	x				
Salix spp.		x	x		x		x		x		x
Short grass prairie				x		x					
Steep N-facing slope				x							
Steep S-facing slope				x							
Steep W-facing slope						x					
Symphoricarpos occidentalis	x	x	x	x	x	x	x			x	
Totals (22)	6	9	9	14	8	9	11	5	2	5	3

Moths with one or a small number of food plants (oligophagy) tend to be found in fewer areas than those that have a wider range of foodplants (polyphagy). Areas with many habitats tend to have many species/greater biodiversity, similarly areas with few habitats tend to have few species/lesser biodiversity.

SIMILARITY OF THE STUDY AREAS

The study areas have been compared on the basis of simple Percentage Similarity as seen in the following table.

PERCENTAGE SIMILARITY* OF MAJOR STUDY AREAS

	<i>AH</i>	<i>BK</i>	<i>BL</i>	<i>DI</i>	<i>EA</i>	<i>EP</i>	<i>ER</i>	<i>JC</i>	<i>LL</i>	<i>LS</i>	<i>RS</i>
<i>AH</i>		54.39%	62.26%	49.62%	40.15%	40.30%	56.17%	34.62%	38.35%	41.94%	53.23%
<i>BK</i>	54.39%		55.61%	47.74%	36.47%	44.97%	53.19%	38.21%	35.05%	36.74%	53.45%
<i>BL</i>	62.26%	55.61%		49.17%	38.33%	46.11%	59.29%	35.51%	37.32%	39.18%	55.25%
<i>DI</i>	49.62%	47.74%	49.17%		38.70%	37.41%	48.69%	31.56%	28.43%	33.33%	43.15%
<i>EA</i>	40.15%	36.47%	38.33%	38.70%		27.37%	36.80%	27.33%	27.87%	36.56%	40.46%
<i>EP</i>	40.30%	44.97%	46.11%	37.41%	27.37%		50.40%	36.46%	31.07%	23.31%	44.88%
<i>ER</i>	56.17%	53.19%	59.29%	48.69%	36.80%	50.40%		36.55%	36.08%	33.73%	58.52%
<i>JC</i>	34.62%	38.21%	35.51%	31.56%	27.33%	36.46%	36.55%		36.93%	24.71%	39.29%
<i>LL</i>	38.35%	35.05%	37.32%	28.43%	27.87%	31.07%	36.08%	36.93%		28.425	39.66%
<i>LS</i>	41.94%	36.74%	39.18%	33.33%	36.56%	23.31%	33.73%	24.71%	28.42%		32.62%
<i>RS</i>	53.23%	53.45%	55.25%	43.15%	40.46%	44.88%	58.52%	39.29%	39.66%	32.62%	

* number of species common to both sites/total species in site 1 + total species in site 2

The study areas have also been compared on the basis of the Simpson Coefficient. This coefficient reduces the differences in size between the two samples and is widely used in biotic comparisons.

SIMPSON COEFFICIENT* OF MAJOR STUDY AREAS

	<i>AH</i>	<i>BK</i>	<i>BL</i>	<i>DI</i>	<i>EA</i>	<i>EP</i>	<i>ER</i>	<i>JC</i>	<i>LL</i>	<i>LS</i>	<i>RS</i>
<i>AH</i>		75.94	84.43	76.65	64.81	70.05	79.48	59.87	72.98	74.91	70.05
<i>BK</i>	75.94		70.02	67.31	66.98	66.54	67.70	71.57	77.02	75.64	75.06
<i>BL</i>	84.43	70.02		67.62	70.99	67.81	73.52	69.23	81.85	81.55	77.83
<i>DI</i>	76.65	67.31	67.62		75.62	53.27	67.24	65.55	70.16	76.01	69.05
<i>EA</i>	64.81	66.98	70.99	75.62		61.42	68.83	42.14	47.98	57.20	71.30
<i>EP</i>	70.05	66.54	67.81	53.27	61.42		72.00	79.26	81.05	60.89	74.83
<i>ER</i>	79.48	67.70	73.52	67.24	68.83	72.00		70.90	79.44	72.69	80.12
<i>JC</i>	59.87	71.57	69.23	65.55	42.14	79.26	70.90		52.24	39.48	66.89
<i>LL</i>	72.98	77.02	81.85	70.16	47.98	81.05	79.44	52.24		44.35	75.00
<i>LS</i>	74.91	75.65	81.55	76.01	57.20	60.89	72.69	39.48	44.35		67.34
<i>RS</i>	70.05	75.06	77.83	69.05	71.30	74.83	80.12	66.89	75.00	67.34	

*C/N1 x 100, where C = number of taxa common to both and N1 = total number of taxa in the smaller sample.

SPECIES ENCOUNTERED

The following table shows the species encountered in each area.

SPECIES ENCOUNTERED IN THE AREAS

MONA

#	Name	AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
5	Eriocrania semipurpurella						x	x				
6	Acanthopteroctetes bimaculata			x								
19	Sthenopis purpurascens	x	x	x	x		x	x				
23	Gazoryctra hyperboreus						x					
29	Gazoryctra novigannus	x	x	x	x		x	x	x	x	x	x
184	Lampronia aenescens	x					x					
185	Lampronia sublustris		x				x					
186	Lampronia humilis						x?					
334	Amydria effrentella	x	x	x	x						x	
399	Tinea irrepta	x	x	x	x	x	x	x	x		x	x
412	Niditinea orleansella						x					x
420	Monopis rusticella					x	x					
421	Monopis spilotella	x	x	x	x	x	x	x		x	x	x
471	Lyonetia saliciella						x					
587	Caloptilia alnivorella			x	x		x	x	x			
589	Caloptilia anthobaphes				x		x	x				x
594.1	Caloptilia betulivora		x		x		x	x				
595	sp. nr. Caloptilia bimaculatella		x		x							
639	Caloptilia stigmatella			x	x		x	x	x			
640	Caloptilia strictella						x					
645	sp. nr. Caloptilia syringella									x		
645	Caloptilia syringella						x					
647	Micrurapteryx salicifoliella						x					
669	Parornix conspicuella		x	x	x		x	x	x			x
692	Acrocercops astericola		x	x	x		x					
798	Phyllonorycter apparella?		x	x			x					
855	Agonopterix gelidella						x					
876	Agonopterix rosaciliella		x				x	x	x			
878	Agonopterix canadensis			x		x	x	x			x	
889	Agonopterix argillacea		x	x	x		x	x	x			x
908	Depressariodes ciniflonella	x	x	x	x		x	x	x	x		x
910	Martyrhilda fulva	x		x	x	x			x		x	
911	Bibarrambra allenella						x					
912	Semioscopis packardella	x	x	x	x		x	x	x			x
913	Semioscopis merricella		x						x			
914	Semioscopis inornata	x	x	x			x	x	x	x		x
915	Semioscopis megamicrella		x	x	x		x	x	x	x		x
916	Semioscopis aurerella	x	x	x	x		x	x	x	x		x

MONA

#

Name

918	Depressaria atrostrigella
922	Depressaria pastinacella
926	Depressaria alienella
944	Nites betulella
987	Ethmia monticola
1055	Brymbia quadrimaculella
1056	Denisia haydenella
1058	Polix coloradella
1077	Perittia cygnodiella
1088.01	Elachista virgatula
1113	Elachista maritimella
1138.1	Glyphidocera hurlberti
1156	Hypatopa titanella
1271	Coleophora pruniella
1283	Coleophora cretaticostella
1313	Coleophora rosaevorella
1316	Coleophora rosacella
1321	Coleophora mcdunnoughiella
1352	Coleophora sparsipulvella
1367	Coleophora brunneipennis
1385	Coleophora maritella
1387	Coleophora mayrella
1388	Coleophora trifolii
1399	Batrachedra praeangustata
1423	Mompha albapalpella
n.n.	Mompha raschkiella
1457	Mompha tricristatella
1458	Mompha unifasciella
1461	Blastodacna curvilineella
1515	Limnaecia phragmitella
1615	Walshia miscecolorella
1655	Scythris eboracensis
1662	Asymmetrura impositella
1665	Scythris mixaula
1734	Aristotelia devexella
1738	Aristotelia fungivorella
1761	Aristotelia roseosuffusella
1762	Aristotelia rubidella
1771	Evippe prunifoliella
1792	Coleotechnites atrupictella

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
		x	x	x					x	
	x			x			x			x
x		x	x		x	x				x
					x					
				x						
					x					
		x	x			x				
										x
			x							
					x					
x	x	x	x	x	x	x		x	x	x
	x		x		x					x
x					x	x	x			x
x	x	x								
			x							
x	x	x		x		x				
				x						
			x			x				
		x				x				x
										x
					x					
x	x	x	x	x	x	x	x		x	x
		x	x		x	x				
		x			x					
					x					
			x							
x		x	x	x						
x			x	x		x				
			x							
					x					
		x								
x		x	x	x						
					x	x		x	x	
			x		x					
			x							
				x?						
			x		x	x	x			

MONA

#

Name

1796	Coleotechnites blastovora
1826	Coleotechnites picaella
1865	Neotelphusa praefixa
1875	Xanolechia aethiops
1880	Xenolechia velatella
1898	Lita sexpunctella
1902	Lita variabilis
1946	Gelechia lynceola
1985	Gnorimoschema gallaeasterella
1986	Gnorimoschema gallaesolidaginis
	Gnorimoschema septentrionella
2008	Gnorimoschema vastificum
2040	Caryocolum cassella
2069.11	Chionodes sattleri
2071.1	Chionodes landryi
2090	Chionodes lugubrella
2093	Chionodes mediofussella
2099	Chionodes obscurusella
2111	Chionodes psilopterus
2117	Chionodes terminimaculella
2123	Chionodes viduella
2127	Filatima abactella
nr 2193	Aroga near paraplutella
2235	Anacampsis fragariella
2243	Anacampsis niveopulvella
2267	Helcystogramma fernaldella
2291	Dichomeris bilobella
2300	Dichomeris levisella
2302	Dichomeris setosella
2303	Dichomeris simplicella
2308	Dichomeris purpureofusca
2313	Alucita montana
2313	Alucita adriendenisi
2318	Bondia comonana
2319	Bondia crescentella
n.n.	Wockia asperipunctella
2334	Ochromolopis ramapoella
2360	Rhizognothis interrupta
2363	Plutella porectella
2365	Plutella (Greya) vanella

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
	x	x	x	x	x	x	x	x		x
			x		x	x				
					x					
					x					
	x	x	x	x	x	x	x		x	x
							x			
	x	x	x			x			x	
x	x	x	x	x	x	x	x	x		x
x	x	x			x			x		
	x	x								x
x	x	x	x		x	x		x	x	
x	x								x	
	x	x	x				x			
			x		x	x				
	x		x							
x	x	x	x	x	x	x	x		x	x
x	x	x	x		x	x	x			x
		x	x							
x	x	x	x	x	x	x	x	x	x	x
			x							
			x				x			
				x	x			x		
	x		x		x		x	x		x
	x		x	x		x				
x	x	x	x						x	
x	x	x	x	x		x		x	x	x
	x						x			
				x						
			x	x	x	x				
					x					
x	x	x	x	x	x					x
					x					
x	x					x				
					x					

MONA

#	Name	AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
2366	Plutella xylostella	x	x	x	x	x	x	x	x		x	x
2371	Ypsolopha canariella	x	x	x	x	x	x	x	x	x	x	x
2376	Ypsolopha dentiferella	x	x	x	x	x	x	x	x	x	x	x
2380	Ypsolopha falciferella		x	x	x		x	x	x			x
2392	Ypsolopha senex							x				
2413	Swammerdamia caesiella	x					x					
2426	Euhyponomeutoides gracilariella						x		x			
2449	Argyresthia conjugella	x			x	x	x	x				x
2467	Argyresthia oreasella			x	x		x	x		x		
2474	Argyresthia pygmaeella		x				x					
2509	Schreckensteinia festaliella						x					
2513	Pennisetia marginata							x				
2555	Synanthedon fatifera						x					
2581	Synanthedon polygoni				x							
nr 2629	Prochoreutis sp. nr myllerana						x					
2635	Caloreas occidentella						x					
2651	Choreutis diana						x		x			
2675	Acosus centerensis						x				x	
2676	Acosus populi		x			x	x					x
2693	Prionoxystus robiniae						x					
2706	Bactra furfurana			x							x	
2707	Bactra verutana	x		x				x			x	x
2743a	Endothenia nubilana		x	x	x	x	x	x	x	x	x	x
2745	Endothenia albolineana				x		x	x				x
2753	Apotomis capreana	x	x	x	x		x					
2755	Apotomis funerea						x	x	x			
2765	Apotomis deceptana		x	x		x	x	x	x	x	x	
2766	Apotomis dextrana	x	x	x	x	x	x	x	x	x	x	x
2769	Pseudosciaphila duplex	x	x	x	x			x	x			x
2770	Orthotaenia undulana	x	x	x	x	x	x	x	x	x	x	x
2788	Olethreutes inornatana				x							
2794	Olethreutes quadrifidus				x				x		x	x
2821	Olethreutes appendicea	x	x		x		x	x				
2835	Olethreutes galaxana	x		x	x			x				
2839	Olethreutes puncticostana		x				x		x			
2848	Olethreutes bipartitana	x		x			x	x				
2860	Hedya separatana		x			x	x	x				
2861	Hedya ochroleucana	x	x	x	x		x	x	x	x	x	x
2900	Petrova burkeana		x		x		x	x				
2905	Barbara mappana						x					

MONA

#

Name

2911	Phaneta awemeana
2913	Phaneta umbrastriana
2916	Phaneta formosana
2926	Phaneta verna
2929	Phaneta ochroterminana
2933	Phaneta marmontana
2937	Phaneta parmatana
2940	Phaneta convergana
2947	Phaneta influana
2949	Phaneta lapidana
2952	Phaneta elongana
2956	Phaneta tarandana
2965	Phaneta fertoriana
2969	Phaneta indagatricana
2972	Phaneta dorsiatomana
2973	Phaneta striatana
2977	Phaneta modicellana
2980	Phaneta pallidicostana
2983	Phaneta salmicolorana
2984	Phaneta artemisiana
2985	Phaneta infimbriana
2986	Phaneta octopunctana
3005	Phaneta offectalis
	Eucosma n. sp. 1 Wright
3014	Eucosma ridingsana
3031	Eucosma serpentana
3032	Eucosma ophonana
3035	Eucosma morrisoni
3037	Eucosma agricolana
nr 3039	Eucosma nr barbara
3042	Eucosma vagana
3049	Eucosma serapicana
3104	Eucosma mediotriata
3116	Eucosma dorsisignatana
3116a	Eucosma similiana
3119	Eucosma juncticiliana
3133	Eucosma consobrinana
3142	Eucosma cataclystana
3149	Pelochrista argenteana
3151a	Pelochrista scintillana

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
x	x				x					
x		x								
					x	x				x
	x	x			x					
	x									x
x	x	x			x				x	x
x		x	x		x				x	
	x	x								
			x			x				
x					x					x
				x	x					
	x	x	x	x					x	x
x	x	x	x	x	x	x	x		x	
x	x		x				x		x	
x		x	x						x	
			x			x				
x	x	x	x	x		x			x	x
x									x	
x										
x		x	x	x		x	x	x		
		x	x							
	x	x								x
	x		x							
x	x	x	x	x					x	x
									x	
			x							
			x							
x	x	x	x		x					
		x								
x	x	x	x						x	x
			x	x						
x		x	x	x		x			x	
	x		x	x						
			x						x	

MONA

#	Name	AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
3156	Pelochrista occipitana				x							
3161	Pelochrista fuscosparsa				x?	x?						
3185	Epiblema benignatum				x						x	
3205	Epiblema resumptana										x	
3209	Notocelia purpurissitana			x	x			x				
3211	Notocelia culminana	x	x	x	x	x	x	x	x	x	x	
nr 3218	Sonia n. sp.					x						
3223	Gypsonoma fasciolana	x	x	x	x		x	x	x	x		x
3227	Gypsonoma substitutionis	x	x	x	x		x	x	x	x		
3228	Gypsonoma salicolana						x		x			
3229	Gypsonoma adjuncta				x		x	x				x
3230	Proteoteras aesculana				x			x				
3232	Proteoteras willingana							x				
3240	Zeiraphera canadensis						x	x				
3242	Zeiraphera fortunana						x	x				
3248	Pseudexentera oregonana	x	x	x	x	x	x	x	x	x		x
3269	Griselda radicana				x		x	x				
3276	Rhopobota naevana			x	x		x					
3283	Epinotia solandriana		x				x					
3288	Epinotia castaneana	x	x	x	x		x	x		x	x	x
3296	Epinotia albicapitana				x							x
3302	Epinotia rectiplicana						x	x				
3306	Epinotia nisella	x	x	x	x	x	x	x	x	x		x
3307	Epinotia criddleana	x	x	x	x		x	x	x	x		x
3310	Epinotia transmissana	x	x			x	x					
3324	Epinotia columbia sensu R.L. Brown				x							
3342	Epinotia lomonana	x	x	x	x	x		x				x
3344	Epinotia medioplagata						x					
3345	Epinotia cruciana						x					
3351	Epinotia lindana	x	x	x	x		x	x		x		x
3354	Ancylis nubeculana				x							
3355	Ancylis subaequana		x		x		x	x				x
3358	Ancylis discigerana		x				x					
3366	Ancylis laciniana						x	x				x
3374	Ancylis comptana	x		x	x		x	x				
3379	Ancylis diminutana						x				x	
3382	Ancylis unguicella		x		x				x			
3384	Ancylis mediofasciana	x	x	x	x		x		x			x
3386	Ancylis tineana				x		x					
3391	Hystriophora stygiana	x	x	x	x	x						

MONA

#

Name

3396 Hystrichophora ochreicostana

3399 Hystrichophora vestaliana

3404 Dichrorampha simulana

3406 Dichrorampha bittana

3412 Dichrorampha sedatana

3428 Grapholita packardi

3437 Grapholita lunatana

3455 Cydia strobilella

3460 Cydia ingrata

3463 Cydia populana

3465 Cydia flexiloqua

3466 Cydia youngana

3467 Cydia nigricana

3476 Cydia prosperana

3480 Cydia lautiuscula

3502 Croesia albicomana

3504 Croesia curvalana

3506 Acleris macdunnoughi

3508 Acleris caliginosana

3514 Acleris cervinana

3518 Acleris braunana

3520 Acleris obligatoria

3521 Acleris semiannula

3522 Acleris implexana

3525 Acleris forbesana

3529 Acleris oxycoccana

3531 Acleris hastiana

3533 Acleris celiana

3534 Acleris walkerana

3536 Acleris robinsoniana

3537 Acleris maximana

3540 Acleris logiana

3548 Acleris variana

3549 Acleris maccana

3552 Acleris scabrana

3553 Acleris bowmanana

3556 Acleris nigrolinea

3557 Acleris maximana

3559 Acleris emargana

3561 Acleris hudsoniana complex

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
			x							
			x							
			x							
			x							
			x							
					x	x				
					x	x	x			
			x		x					
			x		x		x			x
x			x			x				x
x		x	x	x	x	x		x		x
	x					x		x		
			x		x			x		
					x					
						x				x
x	x	x	x	x	x	x		x	x	x
	x									
		x			x			x		x
					x	x				
	x			x	x	x	x			x
						x				
						x?				
x	x	x	x		x	x	x			
		x	x		x	x				
	x				x		x			
					x					
x	x	x	x		x	x				x
x	x	x	x		x	x				x
										x?
					x					x
	x		x		x	x	x		x	
	x	x			x	x	x			
	x?				x?					
		x			x	x				x
x	x	x			x	x	x			x
					x	x	x			
		x	x		x	x				x
	x	x			x	x	x	x		

MONA

#	Name
3760	Platphalonidia felix
<i>n.n.</i>	Platphalonidia poss. albertae
3764	Cochylis nana
3769	Thyralia bunteana
<i>n.n.</i>	Phtheochroa near vulneratana
3787	Phtheochroa vitellinana
3792	Phtheochroa fulviplicana
3794	Phtheochroa aureoalbida
3796	Phtheochroa waracana
3834	Platphalonidia prob lavana
3844	Aethes promptana
3858	Cochylis nr voxcana
3910	Thorybes pylades
3945	Erynnis icelus
3961	Erynnis persius
3966	Pyrgus communis
3982	Carterocephalus palaemon
4007	Oarisma garita
4012	Thymelicus lineola
4018	Hesperia uncas
4041	Polites themistocles
4043	Polites mystic
4059	Poanes hobomok
4078	Euphyes vestris
4165a	Papilio machaon dodi
4176a	Papilio glaucus canadensis
4194	Pontia occidentalis
4195d	Pieris oleracea
4197	Pieris rapae
4200	Euchloe ausonides
4209	Colias philodice
4211e	Colias christina
4275	Harkenclenus titus
4324	Incisalia polia
4362b	Everes amyntula
4363	Celastrina ladon
4372a	Glaucopsyche lygdamus couperi
4375	Lycaeides melissa
4376	Plebejus saepiolus
4379	Icaricia shasta

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
		x		x		x				x
						x?				
	x									
					x?					
			x?							
x	x	x			x	x?				
x	x	x	x	x	x	x?				
	x?		x?							
x	x	x		x	x	x	x			x
	x								x	x
	x?									
						x?				x?
			x		x			x		
	x	x			x		x			
					x		x			
			x	x						
					x					
			x							
				x						
			x		x			x		
			x		x			x		
								x		
								x		
			x							
		x	x			x				
			x							
	x		x	x	x		x	x	x	
		x	x			x				
	x		x		x		x	x		
	x				x	x	x			
	x		x		x		x			
		x	x	x						
		x	x	x						
			x							

MONA

#

Name

5365	Crambus girardellus
5379	Neodactria luteolella
5391	Chrysoteuchia topiaria
5394	Platytes vobisne
5395	Agriphila biarmica
5399	Agriphila ruricolella
5403	Agriphila vulgivagella
5404	Agriphila attenuata
5408	Catoptria latiradiella
5413	Pediasia trisecta
5415	Pediasia ericella
5416	Pediasia abnaki
5417	Pediasia dorsipunctella
5439b	Thaumtopsia pexella coloradella
5441a	Thaumtopsia fernaldella nortella
5453	Tehama bonifatella
5455	Euchromius californialis
5474	Acigona comptulatilil
5510	Pyrallis farinalis
5518	Aglossa cuprina
n.n.	Aglossa n. sp.
5529	Herculia thymetusalis
5585	Toripalpus trabalis
5606	Tetralopha asperatella
5655	Acrobasis tricolorella
5718	Myelopsis subtetricella
5719	Myelopsis minutularia
5721	Apomyeloidis bistriatella
5751	Pima prob. fulvirugella
5759	Ambesa laetella
5764	Catastia actualis
5783	Ortholepis pasadamia
5787	Meroptera pravella
5792	Nephopterix fernaldella
5799	Nephopterix basilaris
5812	Telethusia ovalis
5824	Pyla aequivoca
5827	Pyla aenigmatica
5829	Pyla fusca (Haw.)
5831	Pyla hanhamella

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
x		x			x					
x	x	x	x			x	x		x	x
x	x	x	x	x	x	x	x	x	x	x
			x							
					x					
x	x	x	x	x	x	x	x	x	x	x
	x	x	x	x	x				x	x
	x			x	x				x	
			x		x					
x	x	x	x	x	x	x			x	x
x	x	x			x				x	
					x		x			
x	x	x	x	x	x	x	x	x	x	x
		x				x				x
	x		x						x	
					x					
			x	x						
x	x	x				x				x
				x		x				
			x							
	x		x							
			x							
					x			x		
x	x	x	x	x	x	x	x			x
x	x	x	x			x	x			x
x			x	x		x				
	x		x							
			x							
					x			x		
x	x	x	x	x	x	x	x			x
			x	x					x	
x	x	x	x			x	x			x
x		x	x		x	x				
		x								
x	x	x	x			x	x			
	x		x	x	x	x	x			x
			x							

MONA

#

Name

5841	Dioryctria abietivorella
5843	Dioryctria reniculelloides
5844	Dioryctria pseudotsugella
5870	Sarata caudelella
5886	Lipographis fenestrella
5918	Hulstia undulatella
5936	Homoeosoma stipiticellum
5946	Phycitoides mucidellum
5968	Zophodia grossulariella
5971	Melitara dentata
5999	Eulogia ochrifrontella
6007c	Vitula seratilineella
6014	Caudellia nigrella
6038	Anerastia lotella
6053	Peoria approximella
6092	Geina tenuidactyla
6094	Capperia ningoris
6102	Dejongia lobidactyla
6107	Gillmeria pallidactyla
6109	Platyptilia carduidactyla
6118	Platyptilia pica
6130	Paraplatyptilia albiciliata
6149	Stenoptilia coloradensis
6166	Oidaematophorus mathewianus
6170	Oidaematophorus phaceliae
6171	Oidaematophorus grisescens
6185	Hellinsia brucei
6203	Hellinsia homodactylus
6205	Hellinsia pectodactylus
6213	Hellinsia lactodactylus
6232	Hellinsia arion
6234	Emmelina monodactyla
6235	Habrosyne scripta
6237	Pseudothyatira cymatophoroides
6240	Euthyatira pudens
6248	Ceranemota albertae
6251	Drepana arcuata
6252	Drepana bilineata
6253	Eudeilinea herminiata
6255	Oreta rosea

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
					x	x				
	x		x	x	x	x				
	x									
		x	x							
	x		x						x	
x		x	x	x		x			x	x
			x							
x	x		x	x	x	x			x	x
x	x	x	x	x	x	x	x	x	x	x
x			x							
x			x		x	x		x		x
x	x		x	x	x	x				
					x					
	x	x	x			x	x	x		x
	x		x	x						
			x	x						
					x					
	x				x					
					x					
x	x	x	x		x	x			x	
					x					
			x							
		x		x	x					
		x	x		x					
x	x	x	x		x	x		x		x
										x
x	x	x						x		
	x									
	x		x	x	x		x			
x	x	x	x	x		x	x		x	x
	x				x		x			
	x		x	x	x		x			
					x	x				x
x	x		x		x					x

MONA

#

Name

6740 Xanthotype urticaria
 6743 Xanthotype sospeta
 6753 Pero honestaria
 6755 Pero morrisonaria
 6796 Campaea perlata
 6797 Ennomos magnaria
 6798 Ennomos subsignaria
 6799 Spodolepis substriaria
 6817 Selenia alciphearia
 6818 Selenia kentaria
 6819 Metanema inatormaria
 6820 Metanema determinata
 6822 Metarranthis duaria
 6836 Anagoga occiduaria
 6837 Probole alienaria
 6838 Probole amicara
 6842 Plagodis phlogosaria
 6844 Plagodis alchoolaria
 6860 Neoterpes trianguliferata
 6863 Caripeta divisata
 6885 Besma quercivoraria
 6888 Lambdina fiscellaria
 6906 Nepytia canosaria
 6912 Sicya macularia
 6926 Plataea trilinearia
 6954 Synaxis jubararia
 6963 Tetracis crocallata
 6964 Tetracis cachexiata
 6982 Prochoerodes transversata
 7009 Nematocampa resistaria
 7018 Nemoria unitaria
 7048 Nemoria mimosaria
 7058 Synchlora aerata
 7065 Chaetoscelis bistriaria
 7085 Mesotheta incertata
 7125 Idaea rotundopennata
 7139 Cyclophora pendulinaria
 7159 Scopula limboundata
 7162 Scopula ancellata
 7164 Scopula junctaria

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
x		x	x		x	x				
	x	x	x	x	x	x	x	x	x	x
				x						
x	x	x	x	x	x	x	x		x	x
x	x	x	x		x	x	x	x		
x	x	x	x	x	x	x		x		x
				x						
							x			
x	x	x			x	x	x	x		x
	x	x			x	x	x	x		x
x	x	x	x		x	x	x			x
x	x	x	x	x	x	x	x	x		x
x	x	x	x	x	x	x	x	x		x
x	x	x	x	x	x	x		x		x
x	x	x	x	x	x	x				x
x	x	x	x	x	x	x	x			
x	x	x	x		x	x	x	x		x
					x		x			
				x						
	x		x		x		x			
					x					
						x				
x	x	x	x	x	x	x	x	x		x
			x							
x	x	x			x	x		x	x	x
	x	x			x	x			x	x
				x						
x	x	x	x	x	x	x	x	x	x	x
	x	x			x	x	x	x		
x	x	x	x			x		x		x
										x
x	x	x	x			x			x	x
		x			x					
	x		x		x		x	x		x
			x		x					
x	x		x			x	x	x		x
	x									
x		x	x	x	x	x		x		x

MONA

#

Name

7395	Epirrhoe plebeculata
7396	Epirrhoe sperryi
7399a	Euphyia intermediata
7408	Zenophleps alpinata
7414	Orthonama obstipata
7415	Orthonama evansi
7423	Hydrelia albifera
7425	Venusia cambrica
7429	Venusia pearsalli
7430	Trichodezia albovittata
7433	Epirrita autumnata
7437	Operophtera bruceata
7440	Eubaphe mendica
7445	Horisme intestinata
7446	Horisme incana
7449	Eupithecia palpata
7459	Eupithecia columbiata
7476	Eupithecia misturata
7483	Eupithecia regina
7487	Eupithecia subfuscata
7488	Eupithecia tripunctaria
7489	Eupithecia lariciata
7494	Eupithecia sheppardata
7520c	Eupithecia satyrata dodata
7522	Eupithecia nimbicolor
7524	Eupithecia cemicifugata
7527	Eupithecia ammonata
7528	Eupithecia assimilata
7539	Eupithecia multistrigata
7543	Eupithecia annulata
7548	Eupithecia lachrymosa
7551a	Eupithecia interruptofasciata
7564	Eupithecia stellata
7574	Eupithecia albicapitata
7575	Eupithecia mutata
7594	Eupithecia anticaria
7605	Eupithecia ravocostaliata
7637	Cladara limitaria
7639	Cladara atroliturlata
7640	Lobophora nivigerata

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
					x	x		x		
					x		x		x	
x	x	x	x		x	x	x			x
x	x	x	x	x	x	x	x	x		x
	x	x				x				
					x					
		x				x				
					x					
	x				x		x			
					x					
		x			x					
					x	x		x		x
x			x		x	x		x		x
x	x	x	x	x	x	x	x			x
		x	x	x						
					x					
	x				x	x	x			x
				x	x					
x			x					x	x	
x	x	x	x	x	x	x				x
					x		x			
					x		x			
						x				
		x			x	x	x			
					x	x				
							x			x
x										
	x				x	x		x		
			x							
					x					
			x			x				
			x							
x		x				x		x	x	
x	x	x	x		x	x	x	x		x
					x		x			
	x				x		x			
x	x	x	x		x	x	x			x

MONA

#

Name

7643 Lobophora magnoliotidata

7650 Callizia amorata

7687 Phyllodesma americana

7698 Malacosoma disstria

7702 Malacosoma californicum

7757 Antheraea polyphemus

7769 Hyalophora gloveri

7787 Ceratomia undulosa

7803 Sphinx vashti

7810 Sphinx poecila

7811 Sphinx luscitiosa

7812 Sphinx drupiferarum

7821 Smerinthus jamaicensis

7822 Smerinthus cerisyi

7824 Paonias excaecatus

7825 Paonias myops

7828 Pachysphinx modesta

7855 Hemaris diffinis

7893 Hyles gallii

7894 Hyles lineata

7895 Clostera albosigma

7898 Clostera strigosa

7900 Clostera brucei

7901 Clostera apicalis

7915 Nadata gibbosa

7922 Pheosia rimosa

7924 Odontosia elegans

7926 Notodonta scitipennis

7928 Notodonta simplaria

7931 Gluphisia septentrionis

7934 Gluphisia lintneri

7939 Furcula occidentalis

7940 Furcula scolopendrina

7941 Furcula modesta

8005 Schizura ipomeae

8007 Schizura unicornis

8011 Schizura leptinoides

8012 Oligocentria semirufescens

8037 Gnophaela vermiculata

8043 Eilema bicolor

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
		X				X				
	X				X	X		X		X
X	X	X	X	X	X	X	X	X		X
X	X	X	X		X	X		X	X	X
X	X	X	X	X		X			X	X
X	X	X		X	X	X	X	X	X	X
X	X	X				X			X	
						X				
X	X	X	X	X		X			X	X
					X					
	X					X				
	X		X							
X	X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X	X
X	X	X	X			X	X			X
X	X	X	X	X		X				X
X	X	X				X		X	X	X
							X			
X	X	X	X	X	X	X			X	
		X								
X	X	X	X		X	X	X	X	X	X
X	X	X	X		X	X	X	X		X
X	X	X	X		X	X	X			X
X	X	X	X	X	X	X	X	X		X
X	X	X	X		X	X	X			X
X	X		X		X	X			X	X
X	X	X	X	X	X	X		X	X	X
X	X	X	X	X	X	X	X	X	X	X
X		X	X			X		X		X
X	X		X			X			X	X
X		X	X		X	X				X
	X				X	X				X
					X		X			
X	X	X	X		X			X		

MONA

#

Name

8051	Crambidia casta
8089	Hypoprepia miniata
8098	Clemensia albata
8111	Haploa lecontei
8123	Holomelina ferruginosa
8127	Parasemia plantaginis
8129	Pyrrharctia isabella
8131	Estigmene acraea
8134	Hyphantria congrua
8136	Spilosoma dubia
8137	Spilosoma virginica
8144	Hypercompe permaculata
8158	Phragmatobia assimilians
8162	Platartia parthenos
8166	Arctia caja
8175	Grammia virguncula
8186	Grammia williamsii
8196	Grammia parthenice
8197	Grammia virgo
8214	Lophocampa maculata
8262	Ctenucha virginica
8267	Cisseps fulvicollis
8294	Dasychira vagans
8304	Dasychira plagiata
8308	Orgyia antiqua
8322	Idia americalis
8323	Idia aemula
8323.1	Idia sp. nr. aemula
8334	Idia lubricalis
8338	Phalaenophana pyramusalis
8354	Zanclognatha litalba
8356	Chytolita petrealis
8359	Macrochilo bivittata
8362	Phalaenostola metonalis
8365	Phalaenostola hanhami
8370	Bleptina caradrinalis
8397	Palthis angulalis
8404	Rivula propinquialis
8413	Mycterophora inexplicata
8421	Hypenodes fractilinea

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
x	x	x	x	x					x	x
x	x	x	x				x		x	
x	x	x	x		x		x	x		x
		x			x					x
x	x	x	x		x	x	x	x	x	x
					x			x		
x	x	x	x			x			x	
x	x	x	x	x				x	x	
x	x	x	x				x	x		x
					x		x			
	x		x	x	x		x		x	x
			x	x						
x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	x
x		x			x	x				
x	x	x			x				x	x
x	x	x	x	x					x	
x	x	x	x		x	x	x	x	x	x
x	x	x	x	x	x	x	x	x		x
x	x	x	x		x	x				
	x					x			x	x
x	x	x	x	x	x	x		x	x	x
			x							
					x					
x		x	x		x	x		x		x
	x	x	x		x	x	x	x		x
x		x				x				x
x	x	x	x		x		x	x	x	
			x			x				
	x	x	x	x						
x	x	x	x		x	x	x			x
x	x	x			x	x		x		x
x		x						x		
	x		x		x					x

MONA

#

Name

8446 Hypena deceptalis
 8450 Bomolocha atomaria
 8452 Bomolocha edictalis
 8455 Lomanaltes eductalis
 8461 Hypena humuli
 8462 Hypena californica
 8555 Scoliopteryx libatrix
 8632 Drasteria hudsonica
 8635 Drasteria perplexa
 8636 Drasteria adumbrata
 8697 Zale minerea
 8731 Euclidea cuspidea
 8738 Caenurgina crassiuscula
 8739 Caenurgina erechthea
 8803 Catocala relictia
 8805 Catocala unijuga
 8812 Catocala hermia
 8817 Catocala briseis
 8821 Catocala semirelictia
 8822 Catocala meskei
 8867 Catocala blandula
 8881 Abrostola urentis
 8887 Trichoplusia ni
 8896 Diachrysis aeroides
 8899 Pseudeva purpurigera
 8901 Polychrisia esmeralda
 8905 Eosphoropteryx thyatyroides
 8909 Autographa rubida
 8910 Autographa sansoni
 8911 Autographa bimaculata
 8912 Autographa mappa
 8913 Autographa pseudogamma
 8914 Autographa californica
 8916 Autographa flagellum
 8923 Autographa ampla
 8924 Anagrapha falcifera
 8926 Syngrapha octoscripta
 8939 Syngrapha alias
 8950 Plusia putnami
 8953 Plusia venusta

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
					x					
						x				
	x	x			x	x				x
					x					
	x		x	x	x	x				x
						x				
	x		x		x	x			x	
		x	x	x						
			x							
			x							
x	x	x	x	x	x	x				x
x	x		x		x		x			
x	x	x	x	x	x	x	x	x	x	
x		x	x	x					x	
x	x	x	x	x	x	x	x			x
x		x	x	x	x	x	x	x		x
			x	x						
x	x	x	x	x	x	x	x			
		x	x	x	x	x		x		x
				x						
	x	x	x		x	x				x
		x			x	x		x		x
		x								
x	x	x			x				x	x
x		x			x	x		x		
					x					
					x					
					x					
		x			x	x				
					x					
x					x					
x	x	x	x	x	x	x			x	x
		x								
x	x	x		x	x				x	x
x	x	x	x	x	x	x			x	x
	x		x			x				
					x					
x	x	x		x	x	x			x	x
x	x	x			x	x			x	

MONA

#

Name

9374	Apamea niveivenosa
9382	Apamea devastator
9383	Apamea longula
9391	Luperina passer
9396	Eremobina claudens
9412.1	Oligia subjuncta
9417	Oligia egens
9419	Oligia mactata
9420	Oligia illocata
9431	Parastichtis suspecta
9434	Spartiniphaga includens
9437	Chortodes inquinata
9439	Chortodes basistriga
9440	Chortodes rufostrigata
9443	Chortodes defecta
9450	Archanara subflava
9453	Celaena reniformis
9456	Amphipoea interoceanica
9457	Amphipoea americana
9472	Papaipema harrisii
9515	Hydraecia perobliqua
9525	Bellura obliqua
9543	Aseptis characta
9545	Euplexia benesimilis
9547	Phlogophora periculosa
9549	Enargia decolor
9550	Enargia infumata
9555	Ipimorpha pleonectusa
9556	Chytonix palliatricula
9564	Andropolia contacta
9579	Hyppa contrasta
9626	Trachea delicata
9647	Proxenus miranda
9649	Proxenus mendosa
9654	Platyperigea meralis
9656	Platyperigea montana
9681.1	Elaphria alapallida
9832	Escarica homogena
9873	Xylena nupera
9874	Xylena curvimacula

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
x	x	x	x			x			x	x
x	x	x	x	x	x	x		x	x	x
			x							
x	x			x	x	x			x	x
x		x	x		x	x				x
x		x			x	x	x		x	x
x		x	x	x		x			x	x
x	x	x	x		x	x	x	x		x
x	x	x	x		x	x	x	x		x
x	x	x			x	x			x	x
x	x	x	x		x	x			x	x
x		x			x	x				x
x					x	x				
x	x	x	x	x		x			x	x
	x	x		x	x	x		x	x	x
		x								
x	x	x	x	x	x	x	x	x		x
	x	x		x	x	x		x	x	x
		x			x	x				
					x	x				
x	x	x	x	x	x	x	x			x
x	x	x	x		x	x	x	x	x	x
x	x	x	x		x	x	x	x		x
			x							x
	x	x	x							
		x			x		x	x		x
						x				
x	x	x	x	x	x	x	x	x	x	x
x	x		x	x			x			x
			x	x						
x	x	x	x	x	x	x	x	x	x	x
			x							x
									x	
			x	x	x	x				x
x	x	x	x		x	x	x	x		x

MONA

#

Name

9875 Xylena thoracica
 9876 Xylena cineritia
 9878 Lithomoia germana
 9881 Homoglaea hircina
 9884 Litholomia napaea
 9888 Lithophane innominata
 9889 Lithophane petulca
 9891 Lithophane amanda
 9909 Lithophane tepida
 9913 Lithophane georgii
 9915 Lithophane grotei
 9917 Lithophane fagina
 9922 Lithophane pexata
 9933 Eupsilia vinulenta
 9935 Eupsilia tristigmata
 9939 Eupsilia devia
 9952 Eucirroedia pampina
 9957 Sunira bicolorago
 9960 Sunira verberata
 9962 Anathix puta
 9963 Anathix aggressa
 9965 Xanthia tatago
 9967 Hillia iris
 9970 Fishia discors
 9976 Platypolia anceps
 9980 Xylotype acadia
 9987 Mniotype ducta
 9988 Mniotype tenera
 9990 Sutyna profunda
 9993 Brachylomia populi
 9998 Brachylomia algens
 9999 Brachylomia discinigra
 10008 Feralia comstocki
 10011 Brachylomia borealis
 10028 Pleromelloida conserta
 10035 Noctua pronuba
 10055 Apharetra dentata
 10059 Homohadena badistriga
 10062 Homohadena stabilis
 10065 Homohadena infixa

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
x	x	x			x	x				x
x	x	x		x	x	x	x	x		x
	x	x	x		x	x				x
x	x	x			x	x	x		x	x
x	x	x	x		x	x	x	x	x	x
	x	x			x	x				x
					x					
					x	x				x
			x		x		x			
			x						x	
	x									
				x	x		x			
					x					
	x					x				
	x	x		x	x	x			x	x
					x					
x	x	x	x	x	x	x	x			x
	x	x			x	x				
	x	x			x	x				x
x	x	x	x		x	x	x	x		x
		x								
x	x				x					
		x	x		x					
					x		x			
	x									x
x	x	x	x	x	x	x	x	x		x
	x		x		x	x		x	x	x
		x	x							
					x		x			
	x									
x	x		x				x	x	x	x
			x	x						
	x		x		x					
x	x	x	x			x			x	
x	x	x	x		x	x		x		x

MONA

#	Name
10067	Adita chionanthi
10099	Oncocnemis saundersiana
10108	Oncocnemis viriditincta
10124	Oncocnemis cibalis
10130.1	Oncocnemis pallidior
10135	Oncocnemis riparia
10140	Oncocnemis poliochroa
10143	Oncocnemis mackiei
10190	Cucullia speyeri
10194	Cucullia intermedia
10198	Cucullia postera
10223	Discestra trifolii
10224	Discestra mutata
10228c	Discestra oregonica montanica
10232	Discestra farnhami
10233	Discestra crotchii
10238	Scotogramma submarina
10265	Sideridis rosea
10271	Mamestra configurata
10272	Mamestra curialis
10273	Polia discalis
10275	Polia nimbosa
10276	Polia imbrifera
10280	Polia purpurissata
10281	Polia nugatis
10288	Polia detracta
10289	Polia goodelli
10290	Orthodes obscura
10292	Melanchra adjuncta
10293	Melanchra picta
10295	Melanchra assimilis
10296	Lacanobia nevadae
10297	Lacanobia atlantica
10298	Lacanobia radix
10299	Lacanobia subjuncta
10300	Spirameter grandis
10301	Spiramater lutra
10303	Trichordestra tacoma
10305	Trichordestra dodii
10307	Trichordestra lilacina

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
x		x		x		x	x			x
		x								
		x								
x		x	x							x
			x							
			x							
	x	x								x
x	x	x	x	x		x				
				x						
x		x	x	x	x	x			x	x
	x									
x	x	x				x			x	x
	x	x		x		x				x
			x	x						
x	x	x	x	x		x			x	x
x		x	x	x	x	x			x	
x										
			x	x		x			x	
x	x	x	x	x		x		x	x	x
x	x	x	x		x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	
			x							
x	x	x	x	x	x		x	x	x	x
	x	x	x	x		x				
x	x	x	x	x						
		x			x			x		x
				x						
x	x	x				x		x		
					x					
x	x	x		x	x	x	x	x	x	x
	x	x	x	x	x	x	x		x	x
x			x	x		x				
			x	x						
		x			x			x		x
				x						
x	x		x						x	x
	x		x						x	

MONA

#

Name

10308 Trichordestra liquida
 10310 Papestra quadrata
 10312 Papestra cristifera
 10322 Hadenia circumvadis
 10324 Hada sutrina
 10368 Lacinipolia meditata
 10370 Lacinipolia lustralis
 10372 Lacinipolia anguina
 10381 Lacinipolia naevia
 10394 Lacinipolia vicina
 10397 Lacinipolia renigera
 10405 Lacinipolia lorea
 10406 Lacinipolia olivacea
 10428 Dargida procincta
 10431 Faronta diffusa
 10436 Aletia oxygala
 10438 Pseudaletia unipuncta
 10442 Leucania anteoclara
 10446 Leucania multilinea
 10447 Leucania commoides
 10449 Leucania insueta
 10471 Stretchia plusiaeformis
 10490 Orthosia revicta
 10493 Orthosia segregata
 10495 Orthosia hibisci
 10501 Crocigrapha normani
 10513 Egira dolosa
 10523 Tholera americana
 10524 Nephelodes minians
 10530 Anhimella contrahens
 10532 Homorthodes furfurata
 10547 Protorthodes utahensis
 10563 Protorthodes oviduca
 10641 Agrotis vetusta
 10645 Agrotis orthogonia
 10650 Agrotis robustior
 10651 Agrotis venerabilis
 10652 Agrotis vancouverensis
 10658 Agrotis stigmata
 10659 Agrotis volubilis

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
x	x	x	x			x		x	x	
			x				x			
	x?		x							
x		x	x							
x					x					
x	x	x			x	x		x	x	
x	x	x	x	x		x	x	x		x
x	x		x	x	x	x	x			x
			x							
x		x	x		x	x			x	x
x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	x
x	x	x	x		x	x	x	x		x
x			x			x				x
x	x	x	x	x		x		x	x	x
x	x	x	x	x	x	x	x	x	x	x
						x				
			x							
x	x	x	x	x	x	x		x		x
x	x	x	x	x	x	x		x	x	x
x	x	x	x	x	x	x		x	x	
x	x	x		x		x		x	x	x
x	x	x	x	x	x	x	x	x		x
x	x	x	x	x	x	x	x	x		x
x	x	x	x	x	x	x	x	x		x
				x						
x	x	x	x	x	x	x	x	x	x	x
			x							
x	x	x	x	x	x	x	x		x	x
	x					x				
			x							
										x
x	x	x	x	x	x	x	x	x	x	x
	x									x
x	x		x			x				
			x							
x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x			x	x
	x									x
						x				

MONA

#	Name
10660	Agrotis obliqua
10663	Agrotis ipsilon
10670	Feltia jaculifera
10676	Feltia herilis
10698.2	Trichosilia mollis
10701.1	Euxoa adumbrata
10701.2	Euxoa auxiliaris
10702	Euxoa divergens
10705	Euxoa messoria
10715	Euxoa scandens
10723	Euxoa tristicula
10728	Euxoa pestula
10738	Euxoa mimallonis
10749	Euxoa intrita
10755	Euxoa declarata
10756	Euxoa campestris
10769	Euxoa nevada
10777	Euxoa aequalis
10780	Euxoa comosa
10794	Euxoa setonia
10798	Euxoa basalis
10801	Euxoa ochrogaster
10804	Euxoa plagigera
10805	Euxoa tessellata
10807	Euxoa albipennis
10813	Euxoa medialis
10817	Euxoa obeliscoides
10826	Euxoa idahoensis group
10826.1	Euxoa castanea
10830	Euxoa quadridentata
10833	Euxoa olivalis
10836	Euxoa dargo
10838	Euxoa detersa
10845	Euxoa difformis
10852	Euxoa auripennis
10854	Euxoa servita
10861	Euxoa ridingsiana
10861.1	Euxoa maimes
10864	Euxoa flavicollis
10891	Ochropleura implecta

AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
			X	X		X				X
				X		X				
X	X	X	X	X	X	X		X	X	X
X	X	X		X	X	X	X	X	X	X
			X		X					
		X				X				X
X	X	X	X	X		X			X	
X	X	X	X	X	X	X	X		X	X
X	X	X	X			X		X		X
		X				X				
X	X	X	X	X	X	X	X	X	X	X
		X								
	X	X				X				X
		X			X	X			X	X
X	X	X	X	X	X	X	X			X
X	X	X	X		X	X		X		X
			X							
X		X	X			X				
		X	X			X				
	X		X							
X	X	X	X	X		X			X	X
X	X	X	X	X	X	X	X	X	X	X
			X				X			
X	X	X	X			X				X
			X	X						
X		X	X		X	X				
			X							
X						X				X
						X				
									X	
		X								
X	X	X	X		X	X	X		X	X
		X			X					X
X									X	
X	X	X	X		X	X				

MONA**# Name**11047 *Parabagrotis exertistigma*11051 *Ufeus satyricus*11064 *Pyrrhia exprimens*11072 *Heliothis phloxiphagus*11077 *Heliothis ononis*11164 *Schinia florida*11175 *Schinia meadi*11192 *Schinia cumatilis***TOTALS (1086 overall)****Study days/nights (TOTAL 650)**

	AH	BK	BL	DI	EA	EP	ER	JC	LL	LS	RS
					x						
	x			x		x	x				x
						x					
										x	
			x								
	x		x								
		x								x	
			x	x	x						
	424	517	525	597	324	646	525	299	248	271	433
	42	25	40	41	14	167	189	17	40	29	46

SPECIES RICHNESS

Species richness is defined as the number of species within a region. Based on the totals in the above table the area with the greatest species richness is EP, followed in descending order by DI, BL, ER, BK, RS, AH, EA, JC and LS. There is, of course, a more or less direct correlation between species richness and the number of habitats present in a given area, i.e. the greater the species richness, the greater the number of habitats. It follows that the greater the number of habitats therefore the greater the number of food plants, hence the greater the potential for an area to be suitable for a larger number of moth species.

STUDY DAYS/NIGHTS

The number of study days/nights involved in each study area is shown in the last line of the above table. One would logically expect that the greater number of species will have been found in the areas with the greatest number of study nights and vice versa the least number of species will have been found in the areas with the least number of study day/nights. This has generally been found to be the case. It is clear, however, that more study of EA and JC would be beneficial and it is hoped that this will be done in 2008. In doing so, it will be important to be in the areas at times of the year when previous work may have been under-sampled.

COMMON OR WIDESPREAD SPECIES

Species can be common or widespread for many reasons, but mainly because they are polyphagous or are able to utilize a wide range of food plants.

Of the 1086 moth species encountered in this study, 40, or 3.68%, were found in all of the 11 areas - *Filatima abactella*, *Ypsolopha canariella*, *Y. dentiferella*, *Apotomis dextrana*, *Orthotaenia undulana*, *Choristoneura rosaceana*, *Clepsis persicana*, *C. clemensiana*, *Scoparia biplagiata*, *Crambus perlellus innotatellus*, *Chrysoteuchia topiaria*, *Agriphila ruficollis*, *Pediasia dorsipunctella*, *Zophodia grossulariella*, *Cabera erythemaria*, *Euchlaena tigrinaria*, *Smerinthus jamaicensis*, *S. cerisyi*,

Phragmatobia assimilians, *Grammia virgo*, *Lithacodia albidula*, *Raphia frater*, *Apamea commoda*, *A. inficita*, *Proxenus miranda*, *Platyperigea montana*, *Lacinipolia renigera*, *L. lorea*, *Aletia oxygala*, *Orthosia segregata*, *Egira dolosa*, *Protorthodes oviduca*, *Agrotis venerabilis*, *Euxoa tristicula*, *E. ochrogaster*, *Spaelotis clandestina*, *Xestia smithii*, *Agnorisma bugrai*, *Paradiarsia littoralis* and *Protolampra rufipectus*.

Of the 1086 moth species encountered in this study, 63, or 5.8%, have been found in 10 out of the 11 areas - *Gazoryctra novigannus*, *Tinea irrepta*, *Monopis spilotella*, *Glyphidocera hurlberti*, *Coleophora trifolii*, *Gelechia lynceola*, *Chionodes mediofuscella*, *C. psilopterus*, *Plutella xylostella*, *Endothenia nubilana*, *Hedya ochroleucana*, *Notocelia culminana*, *Pseudexentera oregonana*, *Epinotia nisella*, *Croesia albicomana*, *Pandemis canadana*, *Choristoneura conflictana*, *Crambus ainsliellus*, *Macaria occiduaria*, *M. loricaria*, *Lycia ursaria*, *Cabera variolaria*, *Euchlaena johnsonaria*, *Xanthotype sospeta*, *Pero morrisonaria*, *Metanema determinata*, *Metarranthus duaria*, *Sicya macularia*, *Dysstroma citrata*, *Zenophleps alpinata*, *Phyllodesma americana*, *Antheraea polyphemus*, *Clostera albosigma*, *Pheosia rimosa*, *Notodonta simplaria*, *Schizura unicornis*, *Holomelina ferruginosa*, *Platartia parthenos*, *Grammia parthenice*, *Lophocampa maculata*, *Dasychira vagans*, *Idia americalis*, *Caenurgina crassiuscula*, *Apamea sordens*, *A. scoparia*, *A. devastator*, *Amphipoea americana*, *Enargia infumata*, *Litholomia napaea*, *Brachylomia populi*, *Polia imbrifera*, *P. purpurissata*, *P. detracta*, *Lacanobia atlantica*, *Leucania commoides*, *Orthosia revicta*, *Nephelodes minians*, *Feltia jaculifera*, *F. herilis*, *Euxoa divergens*, *Eurois occulta*, *E. astricta* and *Xestia c-nigrum*.

SPECIES ENCOUNTERED IN ONLY ONE AREA

Species can be seldom encountered for many reasons, including their food plants being infrequent, their habitats being scarce, past climatic conditions, predators, etc. Some of these species may even be rare or endangered.

Of the 1086 species encountered in the present study, 229, or 21.07%, have been found in only one area - *Acanthopteroctetes bimaculata*, *Gazoryctra hyperboreus*, *Lampronia humilis*, *Lyonetia saliciella*, *Caloptilia strictella*, *Micrurapteryx salicifoliella*, *Agonopterix gelidella*, *Bibarrambula allenella*, *Nites betulella*, *Ethmia monticola*, *Brymbia quadrimaculella*, *Denisia haydenella*, *Perittia cygnodiella*, *Elachista virgatula*, *Elachista maritimella*, *Coleophora rosaevorella*, *Coleophora mcdunnoughiella*, *Coleophora maritella*, *Coleophora mayrella*, *Mompha raschkiella*, *Scythris eboracensis*, *Asymmetrura impositella*, *Scythris mixaula*, *Aristotelia rubidella*, *Evippe prunifoliella*, *Neotelphusa praefixa*, *Xanolechia aethiops*, *Lita sexpunctella*, *Chionodes lugubrella*, *Aroga near paraplutella*, *Bondia comonana*, *Wockia asperipunctella*, *Rhizognothis interrupta*, *Plutella* (Greya) *vanella*, *Ypsolopha senex*, *Schreckensteinia festaliella*, *Pennisetia marginata*, *Synanthedon fatifera*, *Synanthedon polygoni*, *Prochoreutis* sp. nr *myllerana*, *Caloreas occidentella*, *Prionoxystus robiniae*, *Barbara mappana*, *Phaneta salmicolorana*, *P. artemisiana*, *Eucosma* nr *barbara*, *E. serapicana*, *E. mediotriata*, *E. similiana*, *Pelochrista occipitana*, *Epiblema resumptana*, *Sonia* n. sp., *Proteoteras willingana*, *Epinotia columbia* sensu R.L. Brown, *E. medioplagata*, *E. cruciana*, *Ancylis nubeculana*, *Hystrichophora ochreicostana*, *H. vestaliana*, *Dichrorampha simulana*, *D. bittana*, *D. sedatana*, *Cydia prosperana*, *Croesia curvalana*, *Acleris braunana*, *A. semiannula*, *A. implexana*, *A. celiana*, *A. maximana*, *Decodes mcdunnoughi*, *Archips striana*, *A. alberta*, *Lozotaenia hesperia*, *Adoxophyes negundana*, *Xenotemna pallorana*, *Sparganothis violaceana*, *Aethes prob sexdentata*, *A. prob heleniana*, *A. prob monera*, *Platphalonidia poss. albertae*, *Cochylis nana*, *Thyralia bunteana*, *Aethes promptana*, *Eudonia albertalis*, *Munroessa icciusalis*, *Saucrobotys fumoferalis*, *Loxostege lepidalis*, *Pyrausta orphisalis*, *P. scurralis*, *Diastictis ventralis*, *Crambus awemellus*, *Platytes vobisne*, *Agriphila biarmica*, *Tehama bonifatella*, *Aglossa cuprina*, *Catastia actualis*, *Pyla aequivoca*, *P. hanhamella*, *Dioryctria pseudotsugella*, *Homoeosoma stipiticellum*, *Caudellia nigrella*, *Geina tenuidactyla*, *Paraplatyptilia albiciliata*, *Stenoptilia coloradensis*, *Oidaematophorus phaceliae*, *O.*

grisescens, *Hellinsia lactodactylus*, *Emmelina monodactyla*, *Archiearis infans*, *Macaria brunneata*, *Semiothisa ulsterata*, *M. unipunctaria perplexa*, *Digrammia decorata*, *Orthofidonia exornata*, *Ematurga amitaria*, *Eufidonia discospilata*, *Pero honestaria*, *Ennomos subsignaria*, *Spodolepis substriaria*, *Neoterpes trianguliferata*, *Besma quercivoraria*, *Lambdina fiscellaria*, *Nepytia canosaria*, *Plataea trilinearia*, *Tetracis cachexiata*, *Nemoria mimosaria*, *Chaetoscelis bistriaria*, *Scopula ancellata*, *Eustroma semiatrata*, *Thera juniperata*, *T. otisi*, *Rheumaptera hastata*, *Anticlea multiferata*, *Xanthorhoe iduata*, *Orthonama evansi*, *Trichodezia albovittata*, *Eupithecia palpata*, *E. sheppardata*, *E. ammonata*, *E. multistrigata*, *E. annulata*, *E. interruptofasciata*, *E. albicapitata*, *E. mutata*, *Ceratomia undulosa*, *Sphinx poecila*, *Hemaris diffinis*, *Hyles lineata*, *Schizura ipomeae*, *Dasychira plagiata*, *Idia lubricalis*, *Phalaenophana pyramusalis*, *Hypena deceptalis*, *Bomolocha atomaria*, *Lomanaltes eductalis*, *Hypena californica*, *Drasteria perplexa*, *D. adumbrata*, *Catocala meskei*, *Trichoplusia ni*, *Polychrisia esmeralda*, *Eosphoropteryx thyatyroides*, *Autographa sansoni*, *A. mappa*, *A. flagellum*, *Syngrapha alias*, *Leuconycta lepidula*, *Conocharis arizonae*, *Acronicta radcliffei*, *A. quadrata*, *A. sperata*, *Apamea longula*, *Amphipoea interoceanica*, *Aseptis characta*, *Trachea delicata*, *Escaria homogenea*, *Lithophane petulca*, *L. grotei*, *L. pexata*, *Eupsilia devia*, *Anathix aggressa*, *Fishia discors*, *Xylotype acadia*, *Mniotype tenera*, *Brachylomia borealis*, *Apharetra dentata*, *Oncocnemis saundersiana*, *O. viriditincta*, *O. pallidior*, *O. riparia*, *Cucullia speyeri*, *C. postera*, *Mamestra curialis*, *Polia nugatis*, *Melanchra picta*, *Lacanobia nevadae*, *Trichordestra tacoma*, *Lacinipolia naevia*, *Pseudaletia unipuncta*, *Leucania anteoclarata*, *Crocigrapha normani*, *Tholera americana*, *Homorthodes furfurata*, *Protorthodes utahensis*, *Agrotis robustior*, *A. volubilis*, *Euxoa pestula*, *E. nevada*, *E. castanea*, *E. olivalis*, *E. dargo*, *E. difformis*, *E. auripennis*, *E. servita*, *Protophygia querula*, *Euagrotis exuberans*, *Diarsia dislocata*, *Xestia oblata*, *Coenophila opaciformis*, *Aplectoides condita*, *Abagrotis trigona*, *A. alternata*, *A. orbis*, *A. nanalis*, *A. reedi*, *A. cupida*, *Pyrrhia exprimens*, *Heliothis phloxiphagus* and *H. ononis*.

SPECIES FOUND ONLY IN AREAS EP AND ER

Area reports have not yet been prepared for EP and ER, but as the species encountered in each of these areas have been mentioned above and the areas have been compared to the other areas, it has been felt important to mention below the species that have been found only in these two areas.

EP - the Bird quarter on East Poplar Creek, 8 km NW of Winfield

Moth species found only at EP (80) - *Gazoryctra hyperboreus*, *Lampronia humilis*, *Lyonetia saliciella*, *Caloptilia strictella*, *Micrurapteryx salicifoliella*, *Agonopterix gelidella*, *Bibarrambula allenella*, *Nites betulella*, *Brymbia quadrimaculella*, *Denisia haydenella*, *Elachista maritimella*, *Coleophora mayrella*, *Mompha raschkiella*, *Asymmetrura impositella*, *Neotelphusa praefixa*, *Xanolechia aethiops*, *Wockia asperipunctella*, *Rhizognothis interrupta*, *Plutella* (Greya) *vanella*, *Schreckensteinia festaliella*, *Synanthedon fatifera*, *Prochoreutis* sp. nr *myllerana*, *Caloreas occidentella*, *Prionoxystus robiniae*, *Barbara mappana*, *Epinotia medioplagata*, *Epinotia cruciana*, *Cydia prosperana*, *Acleris braunana*, *Acleris celiana*, *Decodes mcdunnoughi*, *Archips striana*, *Archips alberta*, *Lozotaenia hesperia*, *Aethes prob sextdentata*, *Thyralia bunteana*, *Eudonia albertalis*, *Munroessa icciusalis*, *Saucrobotys fumoferalis*, *Crambus awemellus*, *Agriphila biarmica*, *Tehama bonifatella*, *Caudellia nigrella*, *Geina tenuidactyla*, *Stenoptilia coloradensis*, *Oidaematophorus phaceliae*, *Archiearis infans*, *Macaria brunneata*, *Semiothisa ulsterata*, *Macaria unipunctaria perplexa*, *Orthofidonia exornata*, *Eufidonia discospilata*, *Besma quercivoraria*, *Lambdina fiscellaria*, *Eustroma semiatrata*, *Rheumaptera hastata*, *Anticlea multiferata*, *Xanthorhoe iduata*, *Orthonama evansi*, *Trichodezia albovittata*, *Eupithecia palpata*, *Eupithecia annulata*, *Sphinx poecila*, *Phalaenophana pyramusalis*, *Hypena deceptalis*, *Lomanaltes eductalis*, *Polychrisia*

esmeralda, *Eosphropteryx thyatyroides*, *Autographa sansoni*, *Autographa mappa*, *Syngrapha alias*, *Acronicta sperata*, *Lithophane petulca*, *Lithophane pexata*, *Eupsilia devia*, *Xylotype acadia*, *Lacanobia nevadae*, *Diarsia dislocata*, *Aplectoides condita* and *Pyrrhia exprimens*.

The moths of EP were most similar (50.40%) to those of the Bird residence in Erskine, and least similar (23.31%) to those of the Lowden Springs Conservation Area.

ER – the Bird residence, 5 Maple Close, Erskine

Moth species found only at ER (17) - *Ypsolopha senex*, *Pennisetia marginata*, *Proteoteras willingana*, *Acleris semiannula*, *Acleris implexana*, *Adoxophyes negundana*, *Platphalonidia poss. albertae*, *Nepytia canosaria*, *Thera juniperata*, *Eupithecia sheppardata*, *Ceratomia undulosa*, *Bomolocha atomaria*, *Hypena californica*, *Trachea delicata*, *Pseudaletia unipuncta*, *Agrotis volubilis* and *Euxoa difformis*.

The moths of ER were most similar (59.29%) to those of the Buffalo Lake Conservation Area, and least similar (33.73%) to those of the Lowden Springs Conservation Area.

TAXONOMIC WORK STILL NEEDED

While the above list of 1086 species may seem large, it should not give the impression that we know all there is to know about the moths that occur in the geographical area involved in the present research. On the contrary, much taxonomic work remains to be done, especially in the microlepidoptera. New species remain to be described and monographic work is needed to straighten out certain species complexes. Barcoding is currently being done on members of some of the problem areas and this may help (<http://www.barcodinglife.com/views/login.php>). A major problem is that there simply are not enough taxonomists to do the work, also that there is not enough government funding to hire taxonomists and to curate the museums that house the insect collections where voucher and study specimens are kept. Groups where taxonomic work is needed, and those working on them, include the following.

Incurvariidae – *Lampronia*, *Cauchas* (Dr. Donald Davis)

Lyonetiidae – *Lyonetia* (Dr. Donald Davis)

Gelechiidae – many genera including *Aroga* (no one is currently studying these)

Coleophoridae – *Coleophora* (Dr. Jean-François Landry)

Tortricidae – *Acleris* (Dr. P. T. Dang), *Sonia* (Dr. Don Wright), *Pelochrista* (Dr. Don Wright), *Eucosma* (Dr. Don Wright), *Olethreutes* (no one is currently working on this genus)

Cochylidae – several genera (Drs. Eric Metzler and John Brown)

Crambidae – *Pediasia* (no one is currently working on the species of this group)

Pterophoridae – several genera (Doug Macaulay)