



# **Survey of the Lepidoptera Fauna in Willmore Wilderness Park**

**Prepared for:**

**Alberta Natural Heritage Information Centre,  
Resource Management Coordination Branch,  
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**Title Page: Rustic Blue in Willmore Wilderness Park. (photo by D. Macaulay)**

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## INTRODUCTION

Willmore Wilderness Park (about 4596 km<sup>2</sup> in size) is located in the northern portion of Alberta's Rocky Mountains just west of Grand Cache and north of Jasper National Park. The park encompasses four main Subregions within its boundaries – the Alpine, Subalpine, Montane and Upper Foothills.

Over the past eight years lepidoptera surveys were a part of the biophysical inventories conducted by Alberta Parks within their wildland parks. Most of these inventories focused on parks located in northern Alberta's Boreal Forest and Canadian Shield Natural Regions. However, in 2006 the first of two surveys for the Rocky Mountain Natural Region began. The 2006 survey was in Kakwa Wildland Park and then in 2007 a survey was conducted in Willmore Wilderness Park.

The purpose of the lepidoptera survey in Willmore WP was to provide an annotated summary of the species that occur within the park, including notes on such parameters as relative abundance, distribution patterns, range extensions and any other relevant biological or behavioural information. This information will contribute towards an increased understanding of the species occurring in the park as well as in a broader context of Alberta.

## METHODS

The survey conducted within Willmore WP occurred in June and July 2007. For the June survey, the participants were Gerald Hilchie, Jim Hilchie and Wayne Nordstrom. For the July survey work was conducted by Gerald Hilchie, Wayne Nordstrom, and the author. This report includes data collected during the 2007 survey as well as specimen data from the Macaulay personal collection (DAM) and other known data for the area (e.g., collections along the Big Berland River and at Adam's Lookout).

Specimens were collected via hand-netting during daylight hours. At night, specimens were collected using four 25-Watt 12V DC battery-powered ultraviolet light traps (Figure 1). Attempts were made to sample as many habitats as possible. Day collecting and light trapping occurred in alpine, subalpine and montane meadows as well as the forested areas in the park. Coordinates for all the collection sites are listed in Table 1.



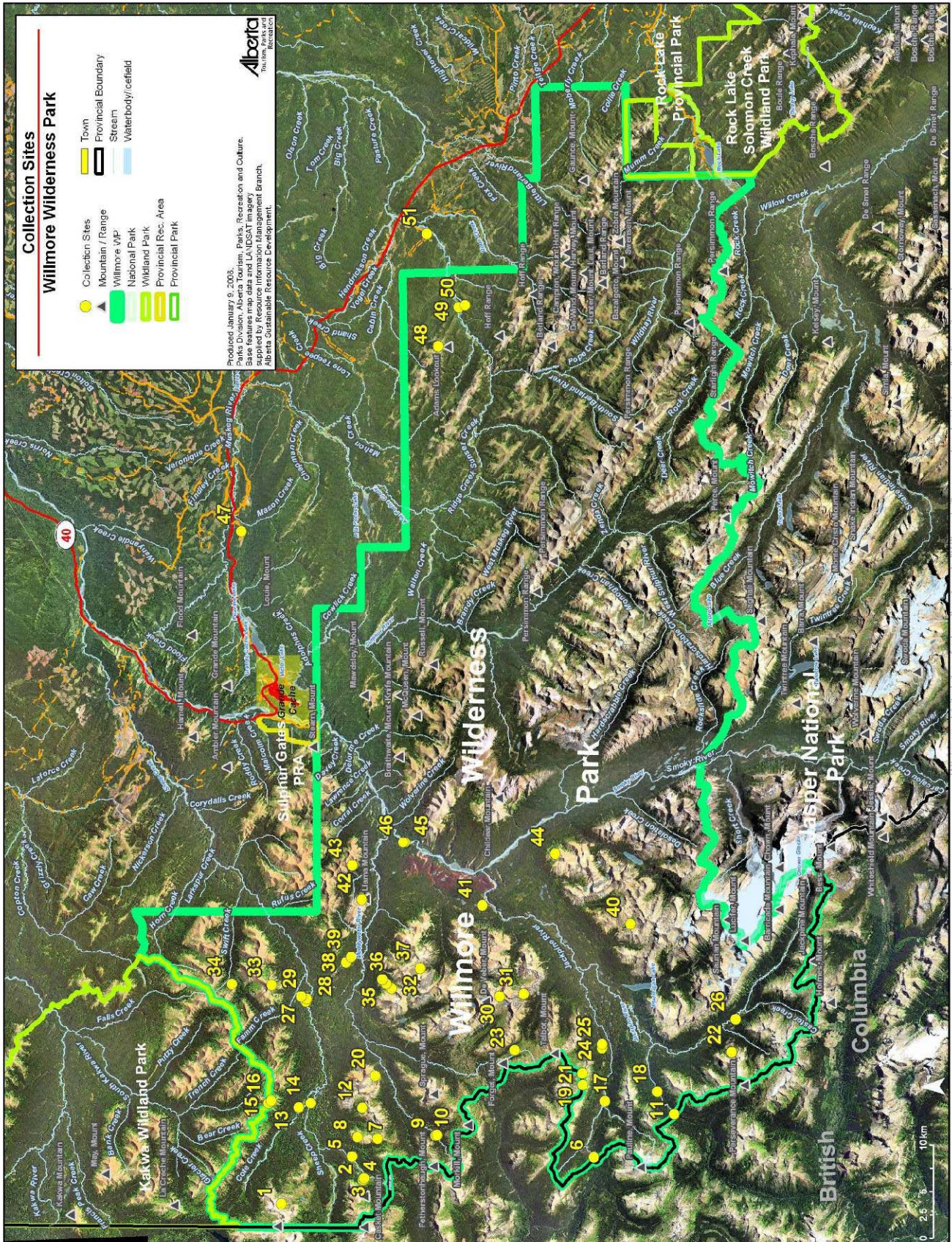
Fig. 1. UV light trap in an alpine meadow in Willmore.

Table 1. Habitats and locations of collection sites in Willmore Wilderness Park (see Figure 2 for map showing collection locations).

Site #	Location	Coordinates (decimal degrees)	
		°N	°W
1	Ridge at base of Mount Cote	53.88008	-119.96331
2	Casket Mountain	53.80211	-119.92396
3	Meadow beside Casket Creek	53.80087	-119.92339
4	Casket Creek	53.80062	-119.92049
5	Casket Creek Falls	53.81236	-119.88561
6	Beaverdam Pass	53.57887	-119.88444
7	Ridge overlooking Casket Pass	53.78789	-119.85613
8	Ridge east of Casket Creek	53.80715	-119.85397
9	Fetherstonhaugh Creek	53.73192	-119.85083
10	Meadow beside Fetherstonhaugh Creek	53.73046	-119.85036
11	Headwaters of Meadowland Creek	53.50149	-119.81460
12	basin facing Sheep Creek valley	53.80276	-119.80666
13	Cote Creek in Sheep Creek burn	53.86396	-119.80602
14	Meadow beside Sheep Creek	53.85245	-119.79935
15	Ridge overlooking Sheep Creek	53.89318	-119.79911
16	Ridge overlooking Sheep Creek	53.89075	-119.79553
17	Beaverdam Creek near Pauline Creek	53.56836	-119.79359
18	Meadow beside Meadowland Creek	53.51786	-119.77813
19	Ridge overlooking Pauline Creek	53.58996	-119.76791
20	Valley overlooking Fetherstonhaugh Creek	53.79026	-119.75454
21	Ridge N of Beaverdam Creek	53.59014	-119.74901
22	Perseverance Mountain north Ridge overlooking Spider Creek	53.44609	-119.71406
23	Muddywater Creek Headwaters	53.65585	-119.71172
24	north of Pauline Creek	53.57125	-119.70826
25	Meadow beside Pauline Creek	53.57145	-119.70195
26	Meadow beside Jackpine River	53.44252	-119.66068
27	Meadow beside 'marl pond' N of Sheep Creek	53.85759	-119.63367
28	Meadow beside Sheep Creek	53.85673	-119.62908
29	Small lake N of Sheep Creek	53.86211	-119.62528
30	Ridge at Mount De Veber	53.67025	-119.62503
31	La Fabre Mountain	53.64730	-119.62068
32	Ridge in Mount De Veber complex	53.77453	-119.61217
33	Ridge overlooking Famm Creek	53.89061	-119.60674
34	Paradise Basin at Headwaters of Swift Creek	53.92915	-119.60578
35	Mount De Veber complex	53.78005	-119.60444
36	Mount De Veber complex	53.78372	-119.59756
37	Mount De Veber complex	53.74711	-119.57925
38	Dry Canyon	53.81896	-119.57034
39	Lake shoreline in Dry Canyon	53.81378	-119.56087
40	Ridge overlooking Smoky River in Resthaven Mountain complex	53.54412	-119.50776
41	Jackpine Lake "fuel cache"	53.68719	-119.47750
42	Llama Mountain	53.80380	-119.46791
43	Turret Ridge	53.81263	-119.41184
44	Ridge overlooking Smoky River	53.61700	-119.39378
45	Smoky River	53.76196	-119.37437
46	Smoky River 'outfitter camp'	53.76350	-119.37405
47	Airport ASRD tanker base	53.91832	-118.86490
48	Adam's Lookout, east off Hwy. 40 along Big Berland River	53.72651	-118.56616
49	Willmore Wilderness, along Big Berland River	53.70600	-118.50300
50	Big Berland River at Hwy 40, about 15 km west along river	53.70000	-118.50000
51	Big Berland River at Hwy 40, about 4 km west along river	53.73570	-118.38280



Figure 2. Map of collection sites in Willmore Wilderness Park.





Collected specimens were identified using Covell (1984), Handfield (1999), Heinrich (1923, 1926), Rockburne and Lafontaine (1976), McGuffin (1977), Lafontaine and Poole (1991), Lafontaine (1998), and Schmidt (2000). In addition, several pertinent taxonomic publications were used, including the reference collections possessed by the Canadian Forest Service at the Northern Forestry Centre, and the E. H. Strickland Museum at the University of Alberta. Members of the Alberta Lepidopterists' Guild were also consulted. The MONA numbers referred to in Appendix 1 refer to the species' numbers listed in Hodges *et al.* (1983).

## RESULTS

A total of 841 lepidoptera specimens belonging to 20 families and 235 species were collected in Willmore WP and area. Of these, 45 were butterflies, 152 were macro-moths and 38 were micro-moths (Appendix 1). Out of the 235 species collected, 17 were ranked as 'rare' and 29 as 'uncommon' (Appendix 1). Collection sites are shown in Figure 2.

## DISCUSSION

### Taxa of Particular Interest

The following is an annotated list of some of the significant species' records for Willmore WP that are of interest. For each species discussed, comments are included about relative abundance, collection location, range extensions, and any other relevant biological or behavioural information.

#### (A) BUTTERFLIES:

Range and biological information is from Bird *et al.* (1995), Layberry *et al.* (1998) and Guppy and Shepard (2001). Also, butterfly occurrence data from both the E. H. Strickland Entomology Museum ([www.entomology.ualberta.ca](http://www.entomology.ualberta.ca)) and the Global Biodiversity Information Facility, the GBIF Data Portal ([www.gbif.net](http://www.gbif.net)), were used to evaluate species' scarcity and to determine the ranges of particular species. Nomenclature follows that of Layberry *et al.* (1998).

#### Papilionidae

**Hudsonian Old World Swallowtail** (*Papilio machaon hudsonianus*) is known from a number of localities throughout the province but never in high numbers. It tends to be much rarer in the Foothills and Rocky Mountain Natural Regions. The species is ranked as S2S3 by the Alberta Natural Heritage Information Centre (ANHIC), meaning there are between six to 100 known occurrences in the province. Its rank should probably be S3 (i.e., between 20 to 100 occurrences) to reflect the increasing numbers of known occurrences. In the Willmore area this subspecies is known from Adam's Lookout (site 48) and from a meadow beside the Big Berland River near Hwy 40 (site 51).

#### Pieridae

**Canada Sulphur** (*Colias canadensis*) is an uncommon species most often found in the Boreal, Foothills and Rocky Mountain Natural Regions. There are 17 documented localities for this species in Alberta with the seventeenth population found in Willmore WP during this survey. A single specimen was hand netted in the Mount De Veber complex (site 36).

## **Lycaenidae**

**Little Copper** (*Lycaena phlaeas arethusa*) is found throughout Alberta's Rocky Mountain Natural Region. Even though populations are known from several localities the species tends to be rarely collected. It is currently listed as an S2 species by ANHIC, meaning there are between 6 to 20 known occurrences provincially. However, in Alberta it is likely an S3 species because a number of new populations of this species have been found. In the Willmore area it was collected along the Big Berland River (site 50), at Adam's Lookout (site 48) and in the Mount De Veber complex (site 36).

**Henry's Copper** (*Lycaena cupreus henryae*) is found throughout Alberta's Rocky Mountain Natural Region. Even though populations are known from several localities the species tends to be rarely collected. It is currently listed as an S2S3 species by ANHIC. That rank could be changed to S3 since there are now more than 20 populations known for the province. In 2007, specimens were collected at Adam's Lookout (site 48) and in the Mount De Veber complex (site 36).

## **Nymphalidae**

**Napaea Fritillary** (*Boloria napaea alaskensis*) is an uncommon species mostly found in the subalpine of the Rocky Mountain Natural Region. It is currently ranked as S2 by ANHIC. There are nine documented localities for this species in Alberta – Kakwa WP (five sites), Mount Stearn near Grande Cache (one site), Mount Hamell near Grande Cache (one site), and Willmore WP (two sites). In Willmore it was found at Adam's Lookout (site 48) and at a ridge overlooking the Smoky River (site 44). Adam's Lookout in Willmore is the furthest known southern locality for this species in Alberta; it may be found elsewhere in Willmore in suitable habitat.

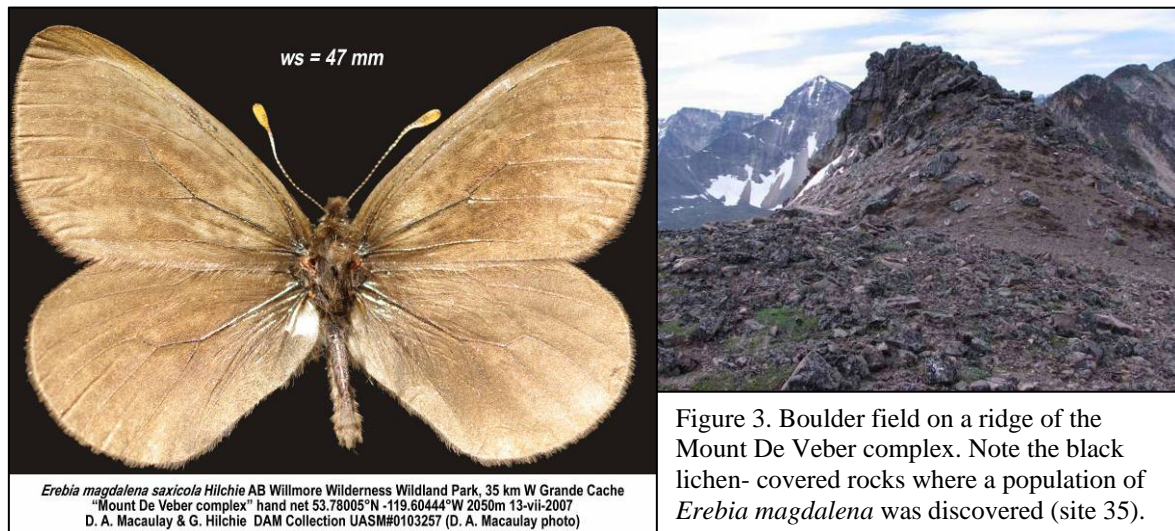
**Dingy Arctic Fritillary** (*Boloria improba youngi*) is an uncommon species found in the high alpine of the Rocky Mountain Natural Region. The species is currently ranked as S2 by ANHIC. There are eight documented localities for this species – Southesk Pass of Jasper National Park, Prospect Mountain near Cadomin, Mount Stearn & Mount Hamell near Grande Cache, and from Mount May & Horn Ridge in Kakwa WP. In Willmore WP populations exist at Adam's Lookout (site 48) and in the Mount De Veber complex (site 36).

**Pacific Fritillary** (*Boloria epithore*) is a common butterfly of the Montane Subregion but is rarely collected in Alberta. In the province, it is found throughout the mountains south of the North Saskatchewan River but is also known from Kakwa Wildland Park and from Willmore. It is currently ranked as an S2 species by ANHIC, however, it could be elevated to an S3 because well over 20 populations are now known for Alberta. Nine new localities were discovered in Willmore as part of this survey where it was one of the most common butterflies.

**Astarte Fritillary** (*Boloria astarte*) is an uncommon species most often found in the subalpine of the Rocky Mountain Natural Region. It is ranked as an S2 species by ANHIC, however, it could be elevated to an S3 because well over 20 populations are now known in Alberta. Bird *et al.* (1995) shows over 30 localities from which the species has been collected. In addition it has been collected from both Kakwa Wildland Park and from within Willmore. In Willmore it was collected at Adam's Lookout (site 48), and from a ridge east of Casket Creek (site 7).

## Satyridae

**Magdalena Alpine** (*Erebia magdalena saxicola*) is likely one of the rarest butterflies in Alberta. It is ranked as an S1 species by ANHIC, meaning there are fewer than five known occurrences provincially. Prior to this survey there were only two known localities for this butterfly – Mount Hamell near Grande Cache and at Adam’s Lookout in Willmore WP. However, we were able to locate a third population in the Mount De Veber complex. A number of adults were observed just below a ridge peak as they flew amongst lichen-covered boulders (Figure 3). We observed at least ten adults in this area. Lower down on the ridge we netted two adult females in an alpine meadow approximately a kilometre from where the main population was observed. Another adult was found in a nearby basin in a pit trap which was set to collect other insects.



## **(B) MACRO-MOTHS:**

Range and biological information for the macro-moths is from Bowman (1951), McGugan (1958), Prentice (1962, 1963), and Tuskes *et al.* (1996), except as noted. Also, occurrence data from both the E. H. Strickland Entomology Museum ([www.entomology.ualberta.ca](http://www.entomology.ualberta.ca)) and Global Biodiversity Information Facility, the GBIF Data Portal ([www.gbif.net](http://www.gbif.net)) were used to determine scarcity as well as species’ ranges. Nomenclature follows that of Layberry *et al.* (1998).

## Geometridae

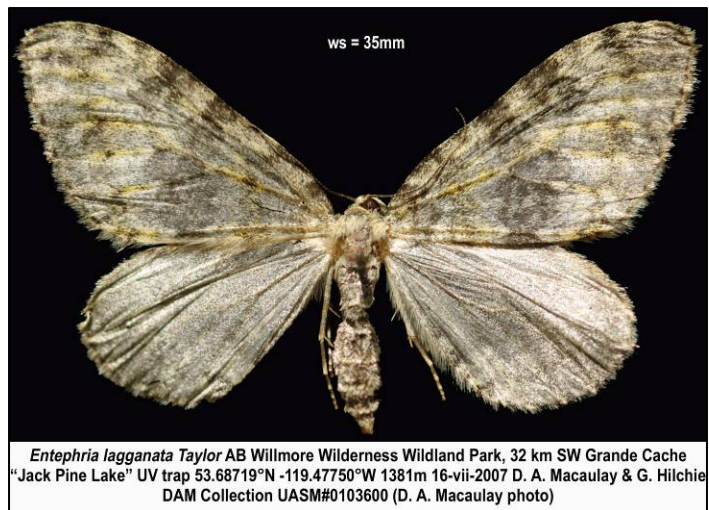
**Northern Brindle** (*Thallophaga hyperborea*) is a rare species found in mesic coniferous forests. A lone specimen was collected in Willmore WP during this survey in a UV trap just north of Pauline Creek in a mesic meadow surrounded by spruce and fir (site 24). This specimen represents the second known population for this species. The only other known locality is at Window Mountain Lake in the Crowsnest Pass area where Ted Pike collected a specimen in 2003.

**The Canary Thorn** (*Neoterpes trianguliferata*) is an uncommon species found in dry open forests. This record is a significant range extension with next closest being 400 km south near Banff. The specimen collected in Willmore WP was collected at site 46 in a UV light trap.



**Mountain Girdle** (*Enypia griseata*) is an uncommon species found in montane coniferous forest. There are five other records for Alberta with the sixth coming from Willmore WP. The lone specimen from Willmore was collected at site 14.

*Entephria lagganata* is an uncommon mountain species found in alpine and subalpine habitats. This species is known from seven localities in Alberta. It has been collected at Nordegg, Kootenay Plains (Whirlpool Point), Banff National Park, Bow Pass, Kananaskis Country, Picklejar Lakes (18 km SE of Highwood Pass), Kananaskis Country, Hailstone Butte and Kakwa WP. Five specimens were collected in Willmore WP at sites 40, 41, and 44.



*Xanthorhoe macdunnoughi* is a rare species found in open areas of mountain forests. In Alberta it is known from Lake Louise and Coleman. In 2007 an additional locality was discovered in Willmore WP at site 24.

*Xanthorhoe ramaria* is an uncommon species found in the boreal region. It has been collected at Water Valley, Camp Harmattan near Olds and at five localities in Caribou Mountains WP. During the survey in Willmore, two specimens were collected from a site north of Pauline Creek (site 24).

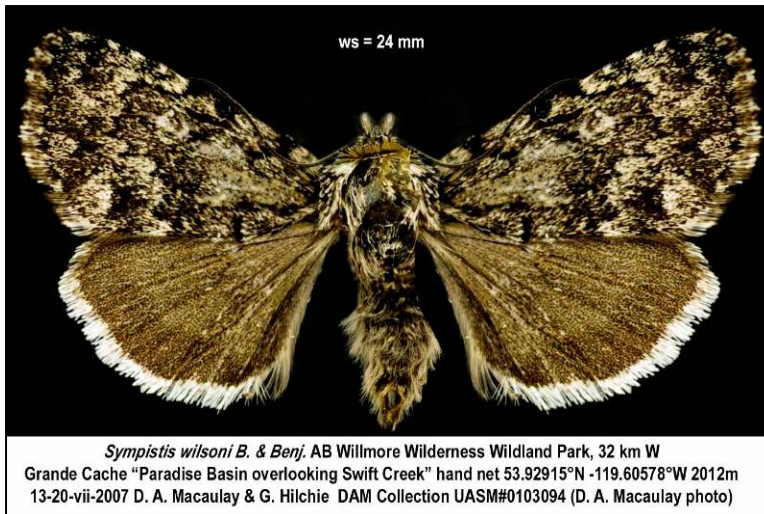


*Psychophora suttoni* is a rare species found in the alpine. In Alberta it has been collected at Nordegg and Lake Louise, and in Kakwa Wildland Park. In Willmore Wilderness Park, during this survey, a single specimen was netted in an alpine meadow at site 36.

## Arctiidae

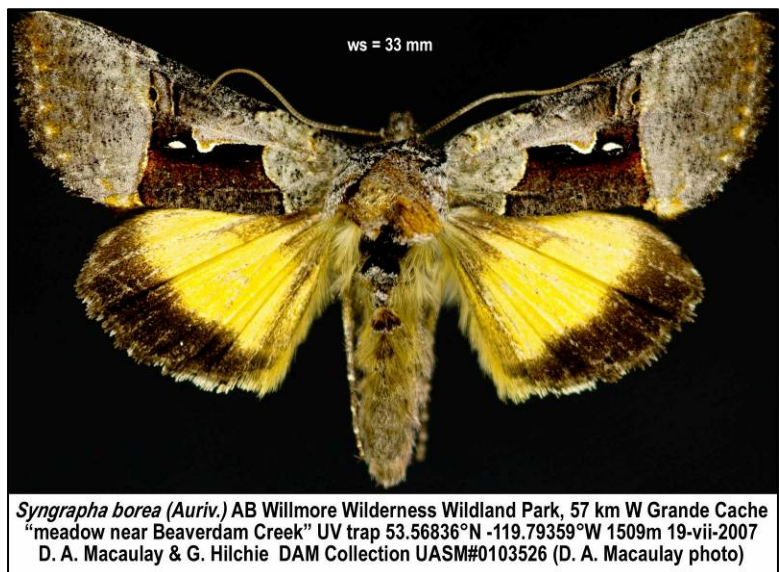
**Mountain Tiger** (*Pararctia yarrowii*) is an uncommon species known from the alpine and subarctic regions in Alberta. The species has also been collected from Caribou Mountains WP. In Willmore WP the species was collected from the Adam's Lookout area (site 48) by Ted Pike in 1982.

## Noctuidae

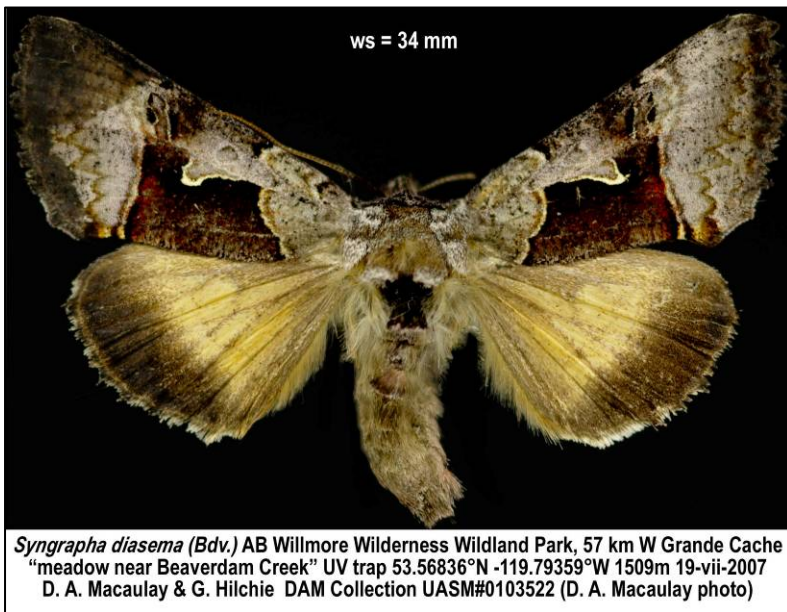


*Sympistis wilsoni* is a rare moth known from only a few localities in North America. In Alberta it has been collected near Banff and from Willmore WP. The Willmore specimen was netted by Gerald Hilchie in an alpine meadow located in Paradise Basin (site 34).

*Syngrapha borea* is an uncommon species known from the subalpine and subarctic regions in Alberta. Three new populations were discovered in Willmore WP – at Cote Creek in the Sheep Creek burn area (site 13), Beaverdam Creek near Pauline Creek (site 17), and at the Smoky River 'outfitter camp' (site 46).



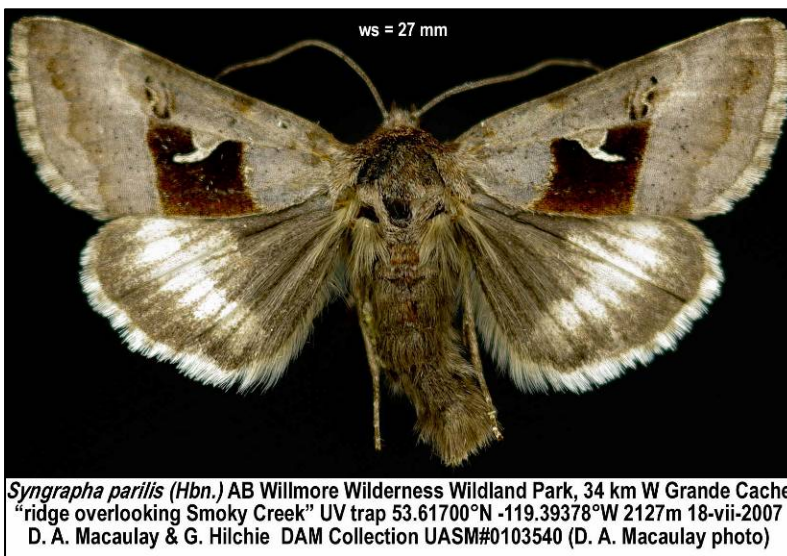




*Syngrapha diasema* is an uncommon species in Alberta. It has been collected at Caribou Mountains WP (Schmidt *et al.* 2004) and at Nordegg. The seventeen Caribou Mountains records noted in Schmidt *et al.* (2004) helped to fill in a large distribution gap that existed between Nordegg and Great Slave Lake, NWT, where it also has been collected (Lafontaine & Poole 1991). Further records were obtained in July

2004 from Birch Mountains WP where five specimens were collected from two locations on Gardiner Lake (Macaulay and Pohl 2005). Three localities for this species were discovered in 2006 in Kakwa WP and specimen data for those sites are available on the E. H. Strickland Entomological Museum website (<http://www.entomology.ualberta.ca/>). In Willmore WP, during this survey, the species was collected at two localities – sites 17 and 40.

*Syngrapha interrogationis* is an uncommon species previously known from five localities in the subalpine region of Alberta. One new population was discovered during this survey in Willmore WP at the Jack Pine Lake "fuel cache" (site 41).

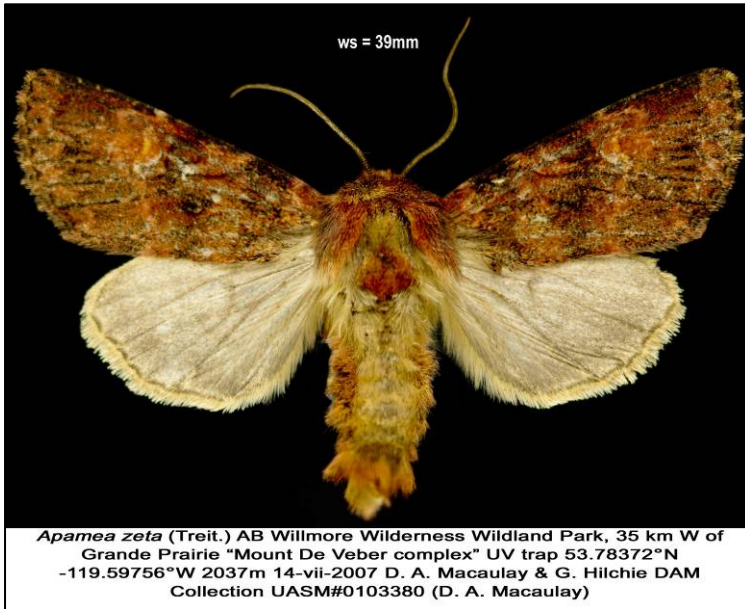


*Syngrapha parilis* is an uncommon species previously known from three other localities in the alpine region of Alberta. Two of these localities were in Kakwa WP and the other was from Nordegg. A new population was discovered during this survey in Willmore WP on a ridge overlooking the Smoky River (site 44).



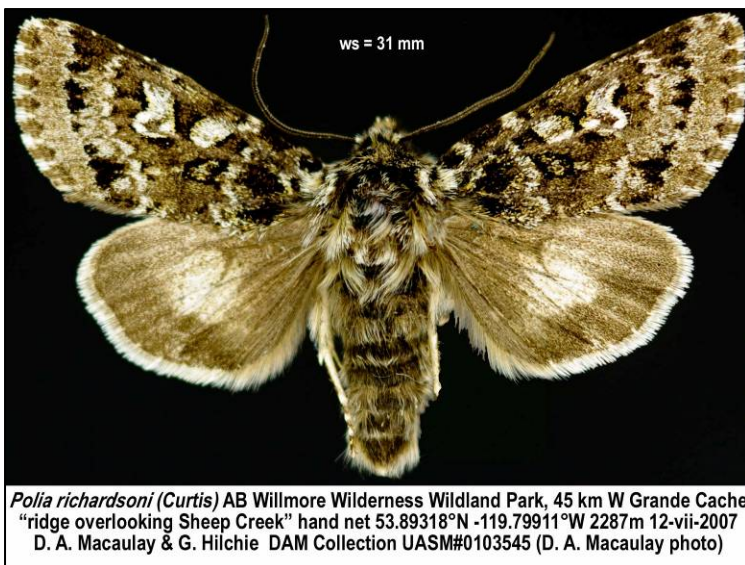
*Plusia magnimacula* is a rare species known from only a few other places in Alberta. It prefers mesic and boggy forests and is not often found in large numbers. One specimen was collected from Willmore WP during this survey, from a UV trap set in a mesic meadow beside Beaverdam Creek (site 17). This record is the most northerly one for Alberta; the two other documented localities being Wagner Natural Area (15 km W of Edmonton) and Bow Pass in Banff National Park.

*Merolonche lupini* is an uncommon species previously known from six other localities in Alberta – all from the alpine. The specimen found in Willmore Wilderness at site 44 represents the furthest north known population for this species.



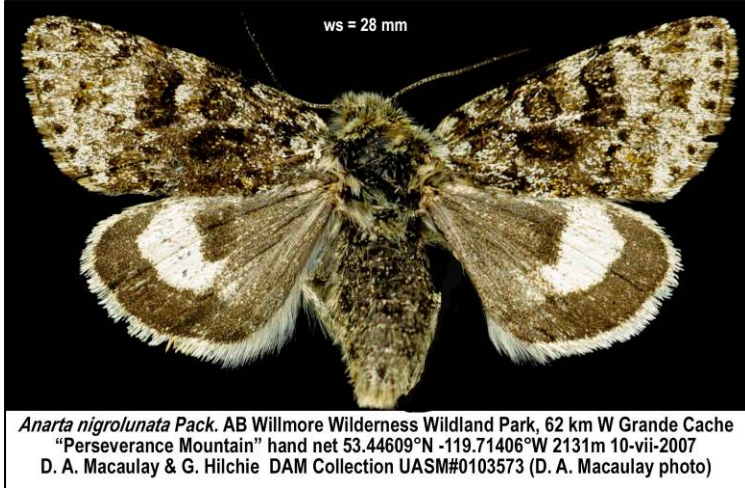
*Apamea zeta* is an uncommon species previously known from six localities in alpine areas of Alberta. Four additional populations were discovered in Willmore Wilderness Park – at sites 36, 40, 43 and 46.

*Polia piniae* is a rare species found in openings in mountain forests. Two localities were previously known for this species – one from Waterton National Park and another population from the foothills around Hinton. A single specimen was collected during this survey in Willmore WP from an open meadow beside Cote Creek (site 13).

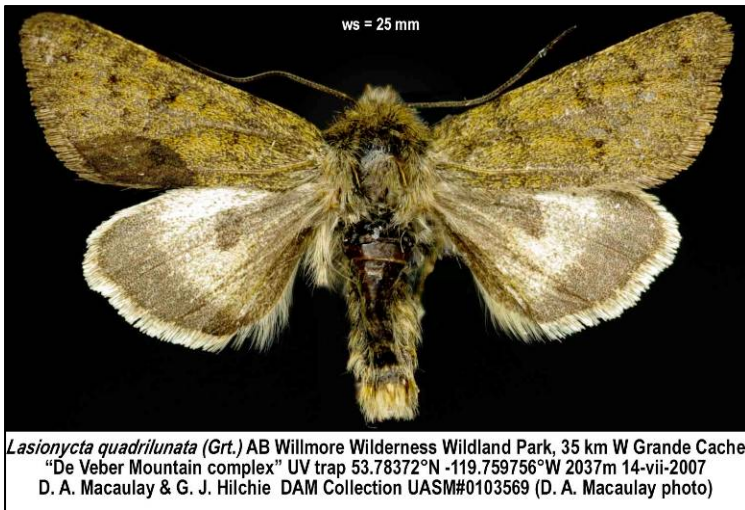


*Polia richardsoni* is a rare species found on high alpine slopes. Three other localities were previously known for the species – one from Nordegg and another two from within Kakwa WP. The lone specimen taken in Willmore during this survey was netted on a ridge overlooking Sheep Creek (site 15).

*Papestra brenda* is an uncommon species of boreal and mountain forests. This species is rarely collected. It was previously known from four other localities, ranging from the Wagner Natural Area near Edmonton to the mountains of Banff National Park. Two sites for this species were discovered in Willmore Wilderness Park – one in an open meadow beside Cote Creek (site 13) and the other at the Jack Pine Lake "fuel cache" (site 41).



*Anarta nigrolunata* is an uncommon species found on alpine slopes. This diurnal species is rarely collected. Two localities are documented for the species, one from the Nordegg area and the other from Kakwa WP.

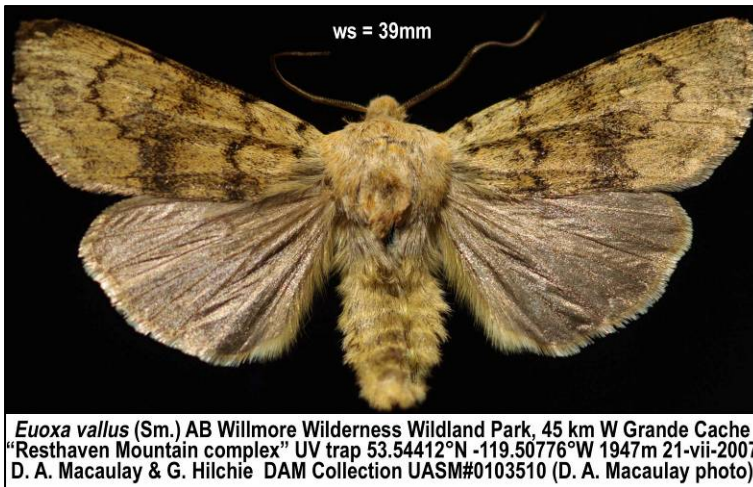


*Lasionycta quadrilunata* is a rare alpine species. Prior to this survey it was known from only one other locality in Alberta – Horn Ridge north of Kakwa Wildland Park. In Willmore, it was collected from two localities – the Mount De Veber complex (site 36) and an alpine ridge overlooking Sheep Creek (site 15). Specimens were collected at night in UV traps and by day with hand nets.



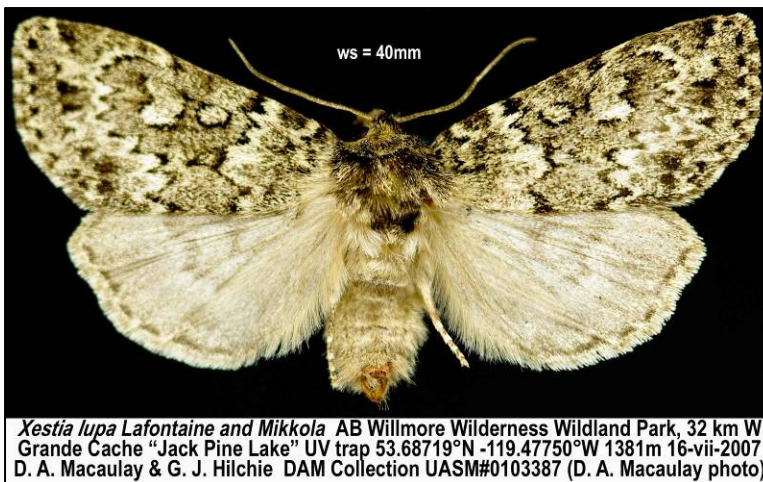
*Lasionycta mutilata* is an uncommon subalpine and alpine species. It was previously known from only three other localities – the Limestone Mountain area, Banff National Park at Bow Pass and Parker Ridge west of Sundre. An additional eight localities were discovered during this survey in Willmore Wilderness Park -- at sites 13, 17, 24, 36, 37, 40, 41, and 44.



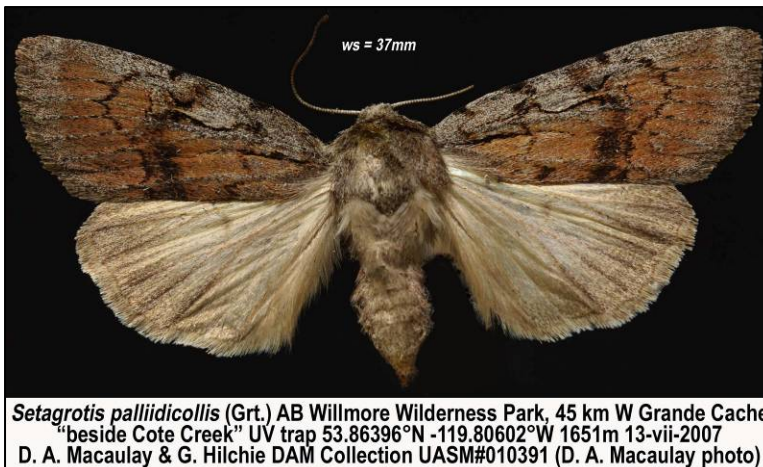


*Euxoa vallus* is a rare subalpine species that likes a mixture of shrubs and open meadows. Five localities were previously known for this species -- Kakwa WP, Parker Ridge west of Sundre, Kananaskis Country at Hailstone Butte, Cardinal Divide and Lake Louise. In Willmore Wilderness Park, during this survey, several specimens were collected from a ridge overlooking the Smoky River in the Resthaven Mountain complex (site 40).

*Xestia okakensis* is a rare alpine and subalpine species. Specimens have been collected from the Prospect Creek area near Cadomin, the Cardinal Divide area and from Mount Compton in Kakwa WP. A fourth locality was discovered in Willmore as part of this survey, that being from a subalpine area in the Mount De Veber Mountain complex (site 36).



*Xestia lupa* is an uncommon species found in the highlands of the boreal forest and in high elevation coniferous forests. The species is known from eight localities in Alberta including Kakwa WP. The most recent record came from Willmore WP, from the Jack Pine Lake "fuel cache" (site 41).



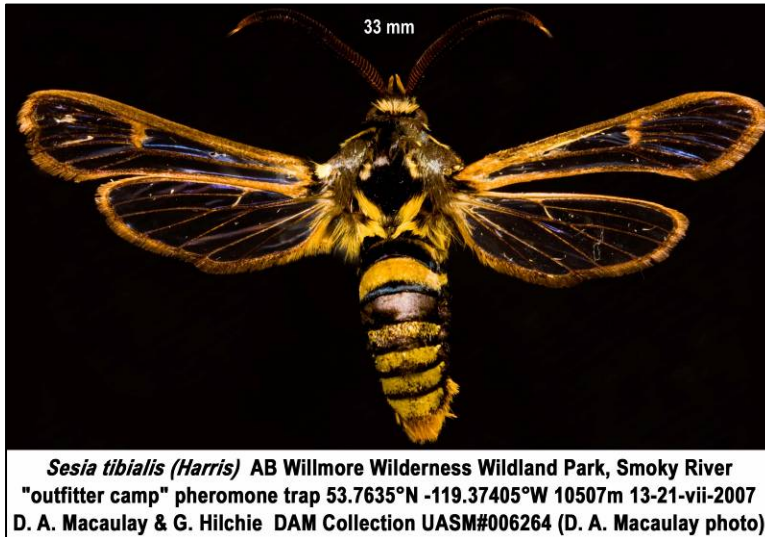
*Setagrotis pallidicollis* is an uncommon species found in the montane subregion. There are six known locations for this species in Alberta. Two of those localities were discovered in Willmore WP as part of this survey -- at Cote Creek in the Sheep Creek burn area (site 13) and at the Smoky River 'outfitter camp' (site 46).



### (C) MICRO-MOTHS:

Range and biological information is from Bowman (1951) and Prentice (1965), except as noted.

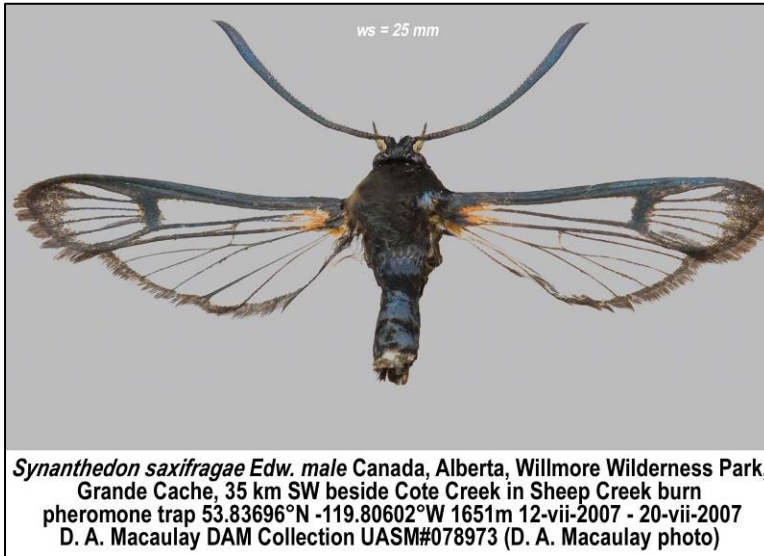
#### Sesiidae



*Sesia tibialis* is an uncommon species found in the boreal, parkland and mountain regions of Alberta. It has been collected from Cold Creek (10 km S of Hinton), Banff National Park, Canmore (Kuhn's Pond), Peace River and in Jasper National Park (Palisades Research Station). Within Willmore WP, during this survey, the species was collected in a pheromone trap beside the Smoky River near the 'outfitter camp' (site 46).



*Synanthedon canadensis* is a rare species found in the Rocky Mountain Natural Region of Alberta. According to Eichlin and Duckworth (1988) only a few records for this species are known for North America – two from Alberta, one from British Columbia and the other from Utah. Banff and Waterton Lakes National Parks were the localities for the two Alberta records. Willmore WP can be added as a third locality since three male specimens were collected here in a pheromone trap set in a streamside meadow beside Cote Creek (site 13). The meadow was near a lodgepole pine forest that burned in 2006.



*Synanthedon saxifragae* is an uncommon species found in Alberta's Rocky Mountain Natural Region. There are six localities documented for this species in Alberta – Banff NP, Frank, Prospect Creek, Limestone Mountain, Limestone Creek and Nordegg. The species was also collected in Willmore Wilderness Park during this survey. It came from a pheromone trap set in a streamside meadow beside Cote Creek (site 13). The meadow was near a lodgepole pine forest that burned in 2006.

## Tortricidae



*Olethreutes albiciliana* is a rare species found in the Rocky Mountain Natural Region. A lone specimen was collected in Willmore WP as part of this survey. This is the first documented record for this species in the province. The specimen was collected beside the Smoky River in a white spruce-dominated riparian forest (site 46).

*Olethreutes coruscana* is an uncommon species found in both the Rocky Mountain and Boreal Forest Natural Regions. It was previously known from the Edmonton and Nordegg areas. In Willmore WP two additional localities for this species were discovered – one in a dry canyon (site 38) and the other in a meadow beside Fetherstonhaugh Creek (site 9).



*Olethreutes bowmanana* is an uncommon species found in both the Rocky Mountain and Boreal Forest Natural Regions. In Alberta this species has been collected at Caribou Mountains WP, Birch Mountains WP and at Nordegg. In Willmore WP the species was collected with hand nets from four localities, all on alpine ridges – a ridge in the Mount De Veber complex (site 30), a ridge overlooking Sheep Creek (site 15), a ridge overlooking Casket Creek (site 8) and a ridge overlooking Pauline Creek (site 19).

*Olethreutes costimaculana* is a rare species found in the Rocky Mountain Natural Region. In Willmore Wilderness Park a lone specimen was hand netted on an alpine ridge overlooking Pauline Creek (site 19). This is the first documented record of this species for the province.

*Phaneta* nr. *formosana* is a rare undescribed species found in Alberta's Rocky Mountain Natural Region. A lone specimen was collected in Willmore as part of this survey. It was taken in a Sessidae pheromone trap set beside Cote Creek in the Sheep Creek burn area (site 13). This specimen is likely a new species for the province.



*Phaneta* nr. *influana* is a rare undescribed species found in Alberta's Rocky Mountain Natural Region. Two specimens were collected with hand nets from two different localities in Willmore during this survey, the first from a meadow beside Casket Creek (site 3) and the second from a ridge in the Mount De Veber complex (site 30). These two specimens likely represent a new species for the province.

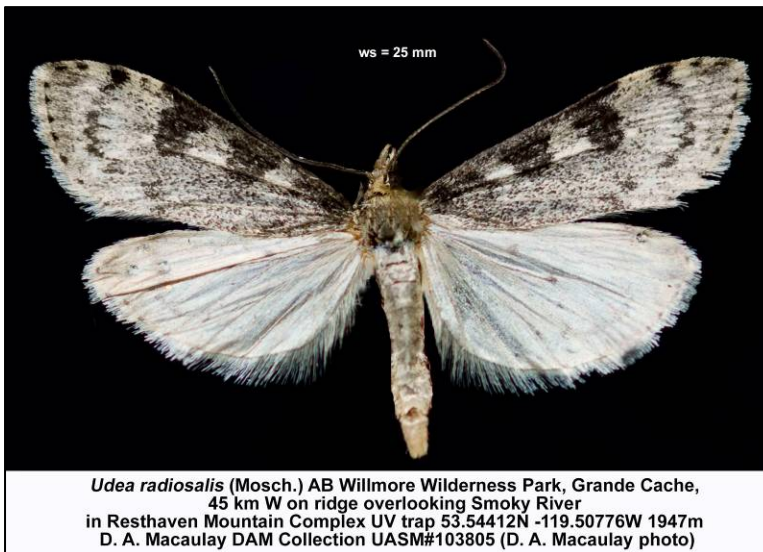


*Archips alberta* is a rare species found in Alberta's Rocky Mountain and Boreal Forest Natural Regions. It was previously known from the Edmonton and Nordegg areas as well as from the Birch Mountains WP. During this survey, in Willmore Wilderness Park, a lone specimen was collected in a UV trap beside Jack Pine Lake (site 41).



*Aethes deutschiana* is a rare species that is known to occur in subalpine and alpine areas. In Alberta, it has been collected in the Nordegg area, Kakwa WP and from Willmore WP. In Willmore the species was collected from Paradise Basin at the headwaters of Swift Creek (site 34), on a ridge overlooking the Smoky River (site 44), in the Mount De Veber complex (site 36) and on a ridge overlooking Casket Creek (site 3). Another specimen was collected at the ASRD airport tanker base near Grande Cache (site 47) but this is a questionable locality for an alpine species.

### Pyralidae



*Udea radiosalis* is an uncommon species found in both the Rocky Mountain and Boreal Forest Natural Regions. There are populations known from around Red Deer, Nordegg and Redwater, as well as from Waterton National Park. In Willmore, specimens were collected in a UV trap on a ridge overlooking the Smoky River in the Resthaven Mountain complex (site 40).

*Mecyna mustelinalis* is an uncommon species found in both the Rocky Mountain and Boreal Forest Natural Regions. There are populations known from around Nordegg, Edmonton and Hillcrest. In Willmore, specimens were collected in a UV trap beside the Smoky River in a white spruce dominated riparian forest (site 46). This is likely a common species even though there are currently only a few documented localities.

## SUMMARY AND CONCLUSIONS

Overall, surveying for lepidoptera species in Willmore was a success. Many new localities for species were discovered. A total of 235 lepidoptera species were found during this survey (Appendix 1). This number represents 45 butterfly, 152 macro-moth and 38 micro-moth species. Many species found were the common ones that have wide distributions across Canada. However, there were a significant number of rare (17 species) and uncommon (29 species) mountain species. Of the rare to uncommon butterfly species, several are mountain specialists. These include the Little Copper (*Lycaena phlaeas arethusa*), Henry's Copper (*Lycaena cupreus henryae*), Napaea Fritillary (*Boloria napaea alaskensis*), Dingy Arctic Fritillary (*Boloria improba youngi*), Astarte Fritillary (*Boloria astarte astarte*) and Magdalena Alpine (*Erebia magdalena saxicola*). The rare moth species are as follows: *Synanthedon canadensis*, *Olethreutes albiciliana*, *Olethreutes costimaculana*, *Phaneta* nr. *formosana*, *Phaneta* nr. *influana*, *Aethes deutschiana*, *Thallopaga hyperborean*, *Xanthorhoe macdunnoughi*, *Psychophora suttoni*, *Plusia magnimacula*, *Sympistis wilsoni*, *Polia piniae*, *Polia richardsoni*, *Lasionycta quadrilunata*, *Euxoa vallus*, and *Xestia okakensis*.

Weather conditions had an impact on collecting success in Willmore WP. Bad weather on some days led to poor collecting success for diurnal lepidoptera species. Though this is discouraging it is to be expected in the Rocky Mountain and Foothills Natural Region. It was to our advantage that we had two and half weeks to work in the park so that we could wait out weather systems.

Access to this northwestern region of the park made surveying for Lepidoptera difficult. Due to this challenge species numbers were much lower than in previous years especially for micromoths. We were not able to employ the MV sheet-trapping method for capturing micromoths. When able to use this method it is an effective way to capture these tiny and delicate specimens. The UV light trapping system that we used for capturing specimens worked well since we were able to anchor the traps and leave them overnight. UV traps were responsible for the collection of over 50% of the specimens obtained and nearly 80% of the species found during the survey. In comparison, hand-collecting was responsible for 40% of the specimens collected and around 20% of the species found. Most (63%) of the rare and uncommon species listed in this report were captured through the use of UV traps.

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## LITERATURE CITED

- Bird, C.D., G.J. Hilchie, N.G. Kondla, E.M. Pike and F.A.H. Sperling. 1995. *Alberta Butterflies*. Provincial Museum of Alberta, Edmonton, AB. 347 pp.
- Bowman, K. 1951. *Annotated list of Lepidoptera of Alberta*. Can. J. Zool. 29:121-165.
- Covell, C.V. Jr. 1984. *A Field Guide to the Moths of Eastern North America*. Houghton Mifflin, Boston, MA. 496 pp.
- Eichlin, T.D. and Duckworth, W.D. 1988. Sesiodea: *Sesiidae*. Fasc. 5.1 in Dominick, R.B., *et al.* The Moths North of Mexico. E. W. Classey Ltd. and the Wedge Entomological Research Foundation. London, UK. 166pp.
- Government of Alberta. 2005 (June). *Natural Regions and Subregions of Alberta*. Prepared by Alberta Sustainable Resource Development, Alberta Environment, Alberta Community Development and Agriculture and Agri-Food Canada. [[http://www.cd.gov.ab.ca/preserving/parks/ahic/natural\\_regions\\_map.asp](http://www.cd.gov.ab.ca/preserving/parks/ahic/natural_regions_map.asp)]
- Guppy, C. and Shepard, J. 2001. *Butterflies of British Columbia*. The Royal British Columbia Museum. 41 pp.
- Handfield, L. 1999. *Le guide des papillons du Quebec*. Version populaire. Broquet. Ottawa. 536 pp. + 123 plates.
- Heinrich, C. 1923. *Revision of the North American moths of the subfamily Eucosminae of the family Olethreutidae*. Bull. U.S.N.M. 123:1-298.
- Heinrich, C. 1926. *Revision of the North American moths of the subfamilies Laspeyresinae and Olethreutinae*. Bull. U.S.N.M. 132:1-216.
- Hodges, R.W. 1978. *Gelechioidea: Cosmopterigidae*. Fasc. 6.1 in Dominick, R.B., *et al.* The Moths North of Mexico. E. W. Classey Ltd. and the Wedge Entomological Research Foundation. London, UK. 166pp.
- Hodges, R.W., T. Dominick, D.R. Davis, D.C. Ferguson, J.G. Franclemont, E.G. Munroe, and J.A. Powell 1983. *Check list of the Lepidoptera of America North of Mexico*. E. W. Classey Ltd. and the Wedge Entomological Research Foundation. London, UK. 284pp.
- Kristensen, N.P. (editor) 1999. *Arthropoda: Insects, part 35: Lepidoptera; Moths and Butterflies*. in Handbook of Zoology, Vol. IV. Walter de Gruyter, Berlin, Germany.
- Lafontaine, J.D. 1998. *Noctuidea, Noctuidae (part), Noctuinae - (Part - Noctuini)*. Fasc. 27.3 in Dominick, R.B., *et al.* The Moths North of Mexico. Wedge Entomological Research Foundation, Washington, DC.

- Lafontaine, J.D., R. Poole. 1991. *Noctuidea, Noctuidae (part)*, Fasc. 25.1 in Dominick, R.B., *et al.* The Moths North of Mexico. Wedge Entomological Research Foundation, Washington, DC.
- Layberry, R.A., P.W. Hall, and J.D. Lafontaine. 1998. *The Butterflies of Canada*. University of Toronto Press, Toronto, ON. 280 pp.
- Macaulay, D.A. and G.R. Pohl. 2002. *Survey of Lepidoptera in the Canadian Shield Natural Region of Northeastern Alberta. II. 2001 Survey of the La Butte Creek and Fidler-Greywillow Wildland Parks*. Unpubl. Report, Alberta Natural Heritage Information Centre, Parks and Protected Areas Division, Alberta Natural Resource Service, Edmonton, AB.
- Macaulay, D.A. and G.R. Pohl. 2003. *Survey of Lepidoptera in the Canadian Shield Natural Region of Northeastern Alberta. II. 2002 Survey of the Colin-Cornwall Wildland Park*. Unpubl. Report, Alberta Natural Heritage Information Centre, Parks and Protected Areas Division, Alberta Natural Resource Service, Edmonton, AB.
- Macaulay, D.A. and G.R. Pohl. 2005. *Survey of the Lepidoptera Fauna in Birch Mountains Wildland Provincial Park*. Unpubl. Report, Alberta Natural Heritage Information Centre, Parks and Protected Areas Division, Alberta Community Development, Edmonton, AB.
- McGuffin, W.C. 1973. The *Rheumaptera* of North America (Lepidoptera: Geometridae) *Can. Ent.* 105: 383-398.
- McGuffin, W.C. 1977. *Guide to the Geometridae of Canada (Lepidoptera). II. Subfamily Ennominae. 2.* *Memoirs of the Entomol. Soc. Can.* #101. 191 pp.
- McGugan, B.M. 1958. *Forest Lepidoptera of Canada recorded by the Forest Insect Survey. Vol. 1 - Papilionidae to Arctiidae*. Canadian Department of Agriculture, Ottawa, ON. 76 pp.
- Pohl, G.R., Bird, C.D., Landry, J.-F., and Anweiler, G.G. 2005. *New records of microlepidoptera in Alberta, Canada*. *Journal of the Lepidopterists' Society* 59(2):61-82.
- Poole, R.W. 1996. *Nomina Insecta Nearctica. A checklist of the insects of North America, Vol. 3: Diptera, Lepidoptera, Siphonaptera*. Entomological Information Services, Rockville, MD. (4 Volume set and CD-ROM).
- Prentice, R.M. 1962. *Forest Lepidoptera of Canada recorded by the Forest Insect Survey. Vol. 2 - Nycteolidae Notodontidae Noctuidae Liparidae*. Canada Department of Forestry, Ottawa, ON. 281 pp.
- Prentice, R.M. 1963. *Forest Lepidoptera of Canada recorded by the Forest Insect Survey. Vol. 3 - Lasiocampidae Drepanidae Thyatiridae Geometridae*. Canada Department of Forestry, Ottawa, ON. 543 pp.

- Prentice, R.M. 1965. *Forest Lepidoptera of Canada recorded by the Forest Insect Survey. Vol. 4 - Microlepidoptera*. Canada Department of Forestry, Ottawa, ON. 840 pp.
- Rockburne, E.W. and J.D. Lafontaine. 1976. *The Cutworm Moths of Ontario and Quebec*. Printing and Supply Services of Canada, Ottawa, ON. 164 pp.
- Schmidt, B.C. 2000. *The Tiger Moths (Arctiidae) of Alberta*. Published by the author.
- Schmidt, Chris and Greg Pohl. 2000 (December). *The Butterflies and Moths (Lepidoptera) of the Canadian Shield Natural Region of Alberta. Preliminary Survey of the Richardson Dunes, Maybelle River, and Marguerite Crag & Tail Wildland Parks*. Prepared for Parks and Protected Areas Division, Alberta Environmental Protection, Edmonton, AB.
- Schmidt, B.C. 2003. *The Geometridae of Alberta. Part I: Ennominae - Sterrhinae*. University of Alberta. Strickland Virtual Museum.  
<http://www.entomology.ualberta.ca/>
- Schmidt, B.C., Macaulay, D.A. and G.R. Pohl. 2004. *Survey of Lepidoptera in the Sub-arctic Ecoregion of northeastern Alberta. I. 2003 Survey of the Caribou Mountains Wildland Park*. Prepared for the Alberta Natural Heritage Information Centre, Parks and Protected Areas Division, Alberta Community Development, Edmonton, AB.
- Tuskes, P.M., J.P. Tuttle and M.M. Collins. 1996. *The Wild Silkmoths of North America. A natural history of the Saturniidae of the United States and Canada*. Cornell University Press. Ithaca, NY. 246. pp.



Appendix 1. Species list for Willmore Wilderness Park.

\*Abundance rankings: A = abundant, ~over 100 populations documented and authors opinion; C = common, ~20 to 50 documented populations and authors opinion; U = uncommon, ~5 to 20 documented populations and authors opinion; R = rare, ~1 to 5 documented populations and authors opinion. Collections references in the following list are as follows: University of Alberta Strickland Museum collection (UASM), Douglas Allan Macaulay private collection (DAM), Canadian National Collection (CNC), and Gerald Hilchie (GH) private collection.

#	Abundance	MONA#	Family	Species	Collection
1	UNCOMMON	906.00	Elachistidae	Depressariodes nivalis Braun	UASM
2	COMMON	2243.00	Gelechiidae	Anacampsis niveopulvella (Cham.)	UASM
3	COMMON	2365.00	Plutellidae	Plutella vanella Wlsm.	UASM
4	COMMON	2457.00	Yponomeutidae	Argyresthia goedartella (L.)	UASM
5	UNCOMMON	2543.00	Sesiidae	Sesia tibialis (Harris)	UASM
6	RARE	2560.00	Sesiidae	Synanthedon canadensis Duck. & Eich.	UASM, DAM
7	UNCOMMON	2568.00	Sesiidae	Synanthedon saxifragae (Edw.)	DAM
8	COMMON	2767.00	Tortricidae	Apotomis infida Heinrich	UASM
9	COMMON	2768.00	Tortricidae	Apotomis removana (Kearfott)	UASM
10	RARE	2832.00	Tortricidae	Olethreutes albiciliana (Clemens)	UASM
11	UNCOMMON	2838.00	Tortricidae	Olethreutes coruscana Clemens	UASM
12	COMMON	2839.00	Tortricidae	Olethreutes metallicana (Hübner)	UASM
13	COMMON	2847.00	Tortricidae	Olethreutes glaciana (Möschler)	UASM
14	COMMON	2848.00	Tortricidae	Olethreutes bipartitana (Clemens)	UASM
15	UNCOMMON	2854.00	Tortricidae	Olethreutes bowmanana (McDunnough)	UASM
16	RARE	2856.00	Tortricidae	Olethreutes costimaculana Fernald	UASM
17	COMMON	2900.00	Tortricidae	Retinia burkeana (Kear.)	UASM
18	RARE	2916.00	Tortricidae	Phaneta nr. formosana Clemens	UASM
19	COMMON	2937.00	Tortricidae	Phaneta parmatana (Clem.)	UASM
20	RARE	2947.00	Tortricidae	Phaneta nr. influana Heinrich	UASM
21	COMMON	3344.00	Tortricidae	Epilotia medioplagata (Walsingham)	UASM
22	COMMON	3568.00	Tortricidae	Eana argentana (Clerck)	UASM
23	UNCOMMON	3570.00	Tortricidae	Eana osseana (Scopoli)	UASM
24	ABUNDANT	3638.00	Tortricidae	Choristoneura fumiferana (Clemens)	UASM
25	COMMON	3664.00	Tortricidae	Archips striana Fernald	UASM
26	UNCOMMON	3665.00	Tortricidae	Archips alberta (McD.)	UASM
27	COMMON	3667.00	Tortricidae	Archips packardiana (Fernald)	UASM
28	COMMON	3682.00	Tortricidae	Clepsipersis persicana (Fitch)	UASM
29	COMMON	3684.00	Tortricidae	Clepsipersis clemensiana (Fernald)	UASM
30	RARE	3757.00	Tortricidae	Aethes deutschiana (Zett.)	UASM
31	COMMON	3961.00	Hesperiidae	Erynnis persius borealis (Cary)	UASM, GH

32	COMMON	3962.00	Hesperiidae	Pyrgus centaureae loki Evans	GH
33	COMMON	3982.00	Hesperiidae	Carterocephalus palaemon magnus (Mattoon & Tilden)	UASM
34	COMMON	4166.00	Papilionidae	Papilio machaon hudsonianus Clarke	DAM, CNC
35	COMMON	4167.00	Papilionidae	Papilio z. zelicaon Lucas	UASM, GH
36	COMMON	4176.00	Papilionidae	Papilio c. canadensis Roth.	GH
37	COMMON	4194.00	Pieridae	Pontia o. occidentalis (Reak.)	UASM, GH
38	COMMON	4195.20	Pieridae	Pieris m. marginalis Scudd.	UASM, GH
39	COMMON	4200.00	Pieridae	Euchloe ausonides mayi Cherm.	DAM
40	COMMON	4201.00	Pieridae	Euchloe creusa (Doubleday)	GH
41	COMMON	4209.00	Pieridae	Colias philodice Godart	UASM
42	COMMON	4211.10	Pieridae	Colias c. christina Edw.	UASM, GH, DAM
43	COMMON	4213.00	Pieridae	Colias meadii elis Strecker	UASM, GH, DAM
44	UNCOMMON	4215.10	Pieridae	Colias canadensis Ferris	UASM
45	COMMON	4216.00	Pieridae	Colias nastes streckeri Grum-Grschmailo	UASM, GH, DAM
46	COMMON	4251.00	Lycaenidae	Lycaena phlaeas arethusa (Dod)	UASM, DAM
47	COMMON	4252.00	Lycaenidae	Lycaena cuprea henryae (Gup. & Shep.)	UASM, DAM
48	COMMON	4264.00	Lycaenidae	Lycaena mariposa penrosae Field	DAM
49	COMMON	4362.00	Lycaenidae	Everes amyntula albrighti Clench	UASM, GH
50	COMMON	4376.00	Lycaenidae	Plebejus saepiolus amica (Edw.)	UASM, GH
51	COMMON	4384.00	Lycaenidae	Agriades glandon megallo (McD.)	UASM, GH, DAM
52	COMMON	4432.00	Nymphalidae	Nymphalis a. antiopa (L.)	UASM
53	COMMON	4433.00	Nymphalidae	Aglais m. milberti (Godt.)	UASM
54	COMMON	4459.00	Nymphalidae	Speyeria atlantis hollandi (Chem.)	UASM
55	COMMON	4459.00	Nymphalidae	Speyeria hesperis beani (Barnes & Benj.)	UASM, GH
56	COMMON	4461.00	Nymphalidae	Speyeria mormonia eurynome (Edw.)	UASM, GH
57	UNCOMMON	4462.00	Nymphalidae	Boloria napaea alaskensis (Holland)	UASM, DAM
58	COMMON	4463.00	Nymphalidae	Boloria eunomia nichollae (B. & Benj.)	UASM, GH
59	COMMON	4466.00	Nymphalidae	Boloria frigga saga (Staud.)	UASM
60	UNCOMMON	4467.00	Nymphalidae	Boloria improba youngi Holland	UASM
61	UNCOMMON	4469.00	Nymphalidae	Boloria epithore chermocki (Perk.)	UASM, GH
62	COMMON	4471.00	Nymphalidae	Boloria f. freija (Thunb.)	UASM
63	COMMON	4473.00	Nymphalidae	Boloria a. astarte (Doubleday)	UASM, GH, DAM
64	COMMON	4475.00	Nymphalidae	Boloria chariclea grandis (B. & McD.)	UASM, GH
65	COMMON	4481.10	Nymphalidae	Phyciodes cocyta (Cram.)	UASM
66	COMMON	4483.00	Nymphalidae	Phyciodes pratensis owimba (Scott.)	UASM, GH
67	COMMON	4517.00	Nymphalidae	Euphydryas anicia anicia (Dbldy.)	UASM, DAM
68	COMMON	4522.00	Nymphalidae	Limenitis arthemis rubrofasciata (Barnes & McD.)	UASM, GH
69	RARE	4594.00	Satyridae	Erebia magdalena saxicola Hilchie	UASM, GH, DAM
70	COMMON	4599.00	Satyridae	Erebia epipsodea fremani Ehrlich	UASM, GH
71	COMMON	4606.00	Satyridae	Oeneis chryxus chryxus (Dbldy. )	UASM, DAM
72	COMMON	4610.00	Satyridae	Oeneis bore edwardsi dos Passos	DAM

73	COMMON	4611.00	Satyridae	<i>Oeneis jutta chermocki</i> Wyatt	UASM, DAM
74	COMMON	4612.00	Satyridae	<i>Oeneis melissa beanii</i> Elwes	UASM, GH, DAM
75	COMMON	4613.00	Satyridae	<i>Oeneis polixenes brucei</i> (Edw.)	UASM, GH, DAM
76	COMMON	4703.00	Pyralidae	<i>Gesneria centuriella</i> (D. & S.)	UASM, GH
77	COMMON	5099.00	Pyralidae	<i>Udea itysalis</i> (Wlk.)	UASM, GH
78	UNCOMMON	5101.00	Pyralidae	<i>Udea radiosalis</i> (Mosch.)	UASM, GH
79	COMMON	5128.00	Pyralidae	<i>Choristostigma plumbosignalis</i> (Fern.)	UASM, GH
80	UNCOMMON	5137.00	Crambidae	<i>Mecyna mustelinalis</i> (Pack.)	GH
81	COMMON	5347.00	Crambidae	<i>Crambus awemellus</i> McD.	GH
82	COMMON	5605.00	Pyralidae	<i>Pococera aplastella</i> (Hulst)	UASM
83	COMMON	5718.00	Pyralidae	<i>Myelopsis subtetricella</i> (Ragonot)	UASM
84	COMMON	6235.00	Drepanidae	<i>Habrosyne scripta</i> (Gosse)	UASM
85	COMMON	6286.00	Geometridae	<i>Macaria brunneata</i> (Thunb.)	UASM
86	COMMON	6292.00	Geometridae	<i>Macaria exauspicata</i> (Wlk.)	UASM, GH
87	COMMON	6303.00	Geometridae	<i>Macaria subcessaria</i> (Wlk.)	UASM
88	COMMON	6321.00	Geometridae	<i>Macaria truncataria</i> (Wlk.)	GH
89	COMMON	6349.00	Geometridae	<i>Macaria banksianae</i> Fgn.	UASM, GH
90	COMMON	6575.00	Geometridae	<i>Iridopsis clivinaria</i> (Gn.)	GH
91	COMMON	6677.00	Geometridae	<i>Cabera erythemaria</i> Gn.	GH, UASM
92	COMMON	6796.00	Geometridae	<i>Campaea perlata</i> (Gn.)	GH, UASM
93	RARE	6809.00	Geometridae	<i>Thalophaga hyperborea</i> (Hulst.)	UASM
94	COMMON	6819.00	Geometridae	<i>Metanema inatomaria</i> Gn.	UASM
95	COMMON	6820.00	Geometridae	<i>Metanema determinata</i> Wlk.	UASM
96	UNCOMMON	6860.00	Geometridae	<i>Neoterpes trianguliferata</i> (Pack.)	UASM
97	COMMON	6867.00	Geometridae	<i>Caripeta angustiorata</i> Wlk.	GH, UASM
98	UNCOMMON	7006.00	Geometridae	<i>Enypia griseata</i> Grossb.	UASM
99	COMMON	7166.00	Geometridae	<i>Scopula frigidaria</i> (Mosch.)	UASM
100	COMMON	7185.00	Geometridae	<i>Dysstroma suspectata</i> (Mosch.)	UASM
101	COMMON	7188.00	Geometridae	<i>Dysstroma walkerata</i> (Pears.)	UASM
102	COMMON	7191.00	Geometridae	<i>Dysstroma formosa</i> Hulst.	UASM
103	COMMON	7194.00	Geometridae	<i>Dysstroma brunneata</i> (Pack.)	UASM
104	COMMON	7204.00	Geometridae	<i>Eulithis destinata</i> (Mosch.)	UASM
105	COMMON	7212.00	Geometridae	<i>Eustroma atrifasciata</i> (Hulst)	UASM
106	COMMON	7255.00	Geometridae	<i>Hydriomena macdunnoughi</i> Swett.	GH
107	COMMON	7264.00	Geometridae	<i>Hydriomena morosata</i> B. & McD.	UASM
108	COMMON	7294.00	Geometridae	<i>Rheumaptera subhastata</i> (Nolcken)	UASM, GH
109	UNCOMMON	7303.00	Geometridae	<i>Entephria lagganata</i> (Taylor)	UASM, DAM
110	COMMON	7313.00	Geometridae	<i>Spargania luctuata</i> (D.; S.)	UASM
111	COMMON	7349.00	Geometridae	<i>Stamnodes topazata</i> (Stkr.)	UASM
112	COMMON	7370.00	Geometridae	<i>Xanthorhoe abrasaria</i> (H. - S.)	UASM, GH
113	RARE	7372.00	Geometridae	<i>Xanthorhoe macdunnoughi</i> Swett	GH



114	UNCOMMON	7373.00	Geometridae	Xanthorhoe ramaria Swett & Cassino	GH
115	COMMON	7380.00	Geometridae	Xanthorhoe fossaria Tayl.	UASM, GH
116	COMMON	7385.10	Geometridae	Xanthorhoe decoloraria Esper	UASM
117	RARE	7411.00	Geometridae	Psychophora suttoni Heinrich	UASM
118	COMMON	7533.00	Geometridae	Eupithecia cretacea (Pack.)	UASM
119	COMMON	7538.00	Geometridae	Eupithecia gelidata Mosch.	UASM
120	COMMON	7540.00	Geometridae	Eupithecia perfusca (Hulst)	UASM
121	COMMON	7552.00	Geometridae	Eupithecia niphadophilata (Dyar)	UASM
122	COMMON	7643.00	Geometridae	Lobophora magnoliatoidata (Dyar)	GH
123	COMMON	7687.00	Lasiocampidae	Phyllodesma americanum (Harr.)	UASM
124	COMMON	7698.00	Lasiocampidae	Malacosoma disstria Hbn.	UASM
125	COMMON	7822.00	Sphingidae	Smerinthus cerisyi Kby.	GH
126	COMMON	7853.00	Sphingidae	Hemaris thysbe (F.)	GH
127	COMMON	7893.00	Sphingidae	Hyles galli (Rott.)	UASM
128	COMMON	7922.00	Notodontidae	Pheosia rimosa Pack.	UASM
129	COMMON	7928.00	Notodontidae	Notodonta simplaria Graef	UASM
130	COMMON	7939.00	Notodontidae	Furcula occidentalis (Lint.)	UASM
131	COMMON	8043.00	Noctuidae	Eilema bicolor (Grote)	UASM
132	COMMON	8127.00	Noctuidae	Parasemia plantaginis (L.)	UASM
133	UNCOMMON	8165.20	Noctuidae	Pararctia yarrowii (Stretch)	UASM
134	COMMON	8175.00	Noctuidae	Grammia speciosa (Mosch.)	UASM
135	COMMON	8186.00	Noctuidae	Grammia williamsii (Dodge)	GH
136	COMMON	8306.00	Noctuidae	Dasychira griseifacta (Dyar.)	UASM
137	COMMON	8319.00	Noctuidae	Leaucoma salicis (L.)	UASM
138	COMMON	8323.00	Noctuidae	Idia sp. nr. aemula (Gn.)	UASM
139	COMMON	8356.00	Noctuidae	Chytolita petrealis Grt.	UASM
140	COMMON	8362.00	Noctuidae	Phalaenostola metonalis (Wlk.)	UASM
141	COMMON	8631.00	Noctuidae	Drasteria petricola (Walker)	UASM
142	COMMON	8901.00	Noctuidae	Polychrysia esmerelda (Oberthur)	UASM
143	COMMON	8910.00	Noctuidae	Autographa sansoni Dod	UASM
144	COMMON	8914.00	Noctuidae	Autographa californica (Speyer)	UASM
145	COMMON	8919.00	Noctuidae	Autographa mappa (G.; R.)	UASM
146	COMMON	8923.00	Noctuidae	Autographa ampla (Wlk.)	UASM
147	COMMON	8926.00	Noctuidae	Syngrapha octoscripta (Grt.)	UASM
148	COMMON	8930.00	Noctuidae	Syngrapha orophila (Hamp.)	UASM
149	UNCOMMON	8934.00	Noctuidae	Syngrapha borea (Auriv.)	UASM
150	UNCOMMON	8935.00	Noctuidae	Syngrapha diasema (Bdv.)	UASM
151	UNCOMMON	8937.00	Noctuidae	Syngrapha interrogationis (Linnaeus)	UASM
152	COMMON	8939.00	Noctuidae	Syngrapha alias (Ottol.)	UASM, GH
153	COMMON	8943.00	Noctuidae	Syngrapha angulidens (Sm.)	UASM
154	UNCOMMON	8948.00	Noctuidae	Syngrapha parilis (Hbn.)	UASM

155	COMMON	8949.00	Noctuidae	<i>Syngrapha ignea</i> (Grt.)	UASM
156	RARE	8951.10	Noctuidae	<i>Plusia magnimacula</i> Rebel	UASM
157	COMMON	9203.00	Noctuidae	<i>Acronicta dactylina</i> Grt.	GH
158	COMMON	9212.00	Noctuidae	<i>Acronicta grisea</i> Wlk.	UASM
159	COMMON	9261.00	Noctuidae	<i>Acronicta impressa</i> Wlk.	UASM
160	UNCOMMON	9275.00	Noctuidae	<i>Merolonche lupini</i> (Grt.)	UASM
161	COMMON	9318.00	Noctuidae	<i>Alypia langtoni</i> Couper	GH
162	COMMON	9339.10	Noctuidae	<i>Apamea sora</i> (Smith)	UASM
163	COMMON	9359.00	Noctuidae	<i>Apamea commoda</i> (Wlk.)	UASM
164	COMMON	9367.10	Noctuidae	<i>Apamea cogitata</i> (Sm.)	UASM
165	COMMON	9369.00	Noctuidae	<i>Apamea inficta</i> (Wlk.)	GH
166	UNCOMMON	9385.10	Noctuidae	<i>Apamea zeta</i> (Treitschke)	UASM
167	COMMON	9394.00	Noctuidae	<i>Apamea contradicta</i> (Smith)	UASM
168	COMMON	9412.00	Noctuidae	<i>Neoligia subjuncta</i> (Sm.)	UASM
169	COMMON	9437.00	Noctuidae	<i>Chortodes inquinata</i> (Gn.)	UASM
170	COMMON	9550.00	Noctuidae	<i>Enargia infumata</i> (Grt.)	UASM
171	COMMON	9581.00	Noctuidae	<i>Hyppa indistincta</i> Sm.	UASM
172	COMMON	9660.99	Noctuidae	<i>Caradrina montana</i> (Grt.)	UASM
173	COMMON	9987.00	Noctuidae	<i>Mniotype ducta</i> (Grt.)	UASM
174	COMMON	10056.90	Noctuidae	<i>Sympistis anweileri</i> (Troubridge)	UASM
175	RARE	10158.00	Noctuidae	<i>Sympistis wilsoni</i> Barnes & Benjamin	UASM
176	COMMON	10159.00	Noctuidae	<i>Sympistis zetterstedti</i> labradoris (Staud.)	UASM
177	COMMON	10229.00	Noctuidae	<i>Anarta alta</i> (B.; Benj.)	UASM
178	COMMON	10232.00	Noctuidae	<i>Anarta farnhami</i> (Grt.)	UASM
179	RARE	10274.00	Noctuidae	<i>Polia piniae</i> Buckett and Bauer	UASM
180	COMMON	10277.00	Noctuidae	<i>Polia rogenhoferi carbonifera</i> Hamp.	UASM
181	RARE	10279.00	Noctuidae	<i>Polia richardsoni</i> (Curtis)	UASM
182	COMMON	10280.00	Noctuidae	<i>Polia purpurissata</i> (Grt.)	GH
183	COMMON	10292.00	Noctuidae	<i>Melanchra adjuncta</i> (Bdv.)	UASM
184	COMMON	10294.00	Noctuidae	<i>Melanchra pulverulenta</i> (Sm.)	UASM
185	COMMON	10296.00	Noctuidae	<i>Lacanobia nevadae</i> (Grt.)	UASM
186	COMMON	10298.00	Noctuidae	<i>Lacanobia radix</i> (Wlk.)	UASM
187	COMMON	10312.00	Noctuidae	<i>Papestra cristifera</i> (Wlk.)	UASM
188	UNCOMMON	10313.00	Noctuidae	<i>Papestra brenda</i> (B. & McD.)	UASM
189	COMMON	10315.00	Noctuidae	<i>Lasionycta secedens</i> (Wlk.)	UASM
190	COMMON	10324.00	Noctuidae	<i>Hada sutrina</i> (Grt.)	UASM
191	UNCOMMON	10327.00	Noctuidae	<i>Anarta nigrolunata</i> Pack.	UASM
192	COMMON	10332.00	Noctuidae	<i>Coranarta luteola</i> Grote & Robinson	UASM
193	RARE	10335.00	Noctuidae	<i>Lasionycta quadrilunata</i> (Grt.)	UASM
194	COMMON	10336.00	Noctuidae	<i>Lasionycta leucocycla albertensis</i> (McD.)	DAM
195	COMMON	10339.00	Noctuidae	<i>Lasionycta impingens</i> (Wlk.)	UASM

196	COMMON	10342.00	Noctuidae	<i>Lasionycta luteola</i> (Sm.)	UASM
197	COMMON	10346.00	Noctuidae	<i>Lasionycta uniformis</i> (Sm.)	UASM
198	COMMON	10347.00	Noctuidae	<i>Lasionycta infuscata</i> (Sm.)	UASM
199	COMMON	10352.00	Noctuidae	<i>Lasionycta perplexa</i> (Sm.)	UASM
200	UNCOMMON	10360.00	Noctuidae	<i>Lasionycta mutilata</i> (Sm.)	UASM
201	COMMON	10362.00	Noctuidae	<i>Lasionycta conjugata</i> (Sm.)	UASM
202	COMMON	10397.00	Noctuidae	<i>Lacinipolia renigera</i> (Steph.)	GH
203	COMMON	10405.00	Noctuidae	<i>Lacinipolia lorea</i> (Gn.)	UASM
204	COMMON	10406.00	Noctuidae	<i>Lacinipolia olivacea</i> (Morr.)	UASM
205	COMMON	10449.00	Noctuidae	<i>Leucania insueta</i> Gn.	UASM
206	COMMON	10647.00	Noctuidae	<i>Agrotis patula</i> Wlk.	UASM
207	COMMON	10652.00	Noctuidae	<i>Agrotis vancouverensis</i> Grt.	DAM
208	COMMON	10660.00	Noctuidae	<i>Agrotis obliqua</i> (Sm.)	UASM
209	COMMON	10701.10	Noctuidae	<i>Euxoa adumbrata</i> (Ev.)	UASM
210	COMMON	10702.00	Noctuidae	<i>Euxoa divergens</i> (Wlk.)	UASM
211	RARE	10709.00	Noctuidae	<i>Euxoa vallus</i> (Sm.)	UASM
212	COMMON	10916.00	Noctuidae	<i>Diarsia calgary</i> (Sm.)	UASM
213	COMMON	10917.00	Noctuidae	<i>Diarsia rubifera</i> (Grt.)	UASM
214	COMMON	10918.00	Noctuidae	<i>Diarsia dislocta</i> (Sm.)	DAM
215	COMMON	10921.00	Noctuidae	<i>Diarsia rosaria</i> (Grt.)	UASM, GH
216	COMMON	10924.00	Noctuidae	<i>Actebia fennica</i> (Tauscher)	UASM
217	COMMON	10928.00	Noctuidae	<i>Graphiphora augur</i> (F.)	UASM
218	COMMON	10929.00	Noctuidae	<i>Eurois occulta</i> (L.)	UASM
219	COMMON	10930.00	Noctuidae	<i>Eurois stricta</i> Morr.	UASM
220	COMMON	10931.00	Noctuidae	<i>Eurois nigra</i> (Sm.)	UASM
221	RARE	10939.00	Noctuidae	<i>Xestia okakensis</i> (Pack.)	GH
222	COMMON	10947.00	Noctuidae	<i>Xestia oblata</i> (Morr.)	UASM
223	COMMON	10958.00	Noctuidae	<i>Xestia fabulosa</i> (Fgn.)	UASM
224	COMMON	10960.00	Noctuidae	<i>Xestia speciosa</i> (Hbn.)	UASM
225	COMMON	10962.00	Noctuidae	<i>Xestia perquiritata</i> (Morr.)	UASM
226	UNCOMMON	10963.00	Noctuidae	<i>Xestia lupa</i> Laf.; Mikkola	UASM
227	COMMON	10965.00	Noctuidae	<i>Xestia imperita</i> (Hbn.)	UASM
228	UNCOMMON	10975.00	Noctuidae	<i>Setagrotis palliicollis</i> (Grt.)	UASM
229	COMMON	10992.00	Noctuidae	<i>Paradiarsia littoralis</i> (Pack.)	UASM, GH
230	COMMON	11000.00	Noctuidae	<i>Anaplectoides prasina</i> ([D.; S.])	UASM
231	COMMON	11001.00	Noctuidae	<i>Anaplectoides pressus</i> (Grt.)	UASM
232	COMMON	11004.00	Noctuidae	<i>Protolampra rufipectus</i> (Morr.)	UASM
233	COMMON	11012.00	Noctuidae	<i>Cryptocala acadensis</i> (Bethune)	UASM
234	COMMON	11041.00	Noctuidae	<i>Abagrotis placida</i> (Grt.)	UASM
235	COMMON	11064.00	Noctuidae	<i>Pyrrhia exprimens</i> (Wlk.)	GH