

## BUTTERFLIES OF THE PEACE RIVER REGION OF ALBERTA AND BRITISH COLUMBIA

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**Introduction** Although the Peace River valley and surrounding area were explored early in Alberta's history and have been settled since the early 1900s, little has been published regarding its insect fauna.<sup>13,20</sup> Works describing various aspects of the natural history of the Peace River valley include Spalding with a general synthesis, Moss on plants, and Soper on mammals and birds.<sup>25,26,36,37,38</sup>

With respect to butterflies, Llewellyn-Jones lists 12 species from the Peace River district of British Columbia, and Bowman mentions six species from the Peace River district of Alberta.<sup>1,21</sup> Case and Bird discuss the Peace River valley as part of a larger study area and list 32 species collected along the Peace River valley of Alberta.<sup>3</sup> Ferris reports distribution records for various *Colias* species in the study area.<sup>8,9,10,11</sup> Other miscellaneous butterfly records have been reported in the *News of the Lepidopterists' Society*.<sup>31,32,33,34,35,41,42,43,44</sup>

Pike conducted extensive surveys while resident in Fairview from 1979

to 1986 and was the first to find many of the interesting butterfly taxa resident in this area. Sperling explored the region while conducting research on the genus *Papilio* from 1980 to 1986. Kondla conducted extensive surveys over eight years from 1979 to 1992. We also include records provided by K. Avery, C. Schmidt, C. Guppy, G.J. Hilchie, J. Pelham, A.W. Rupp and J. Shepard. The primary purpose of this paper is to report on the results of this increased activity since 1979.

The study area we deal with herein consists of the Peace River valley from Bullhead Mountain/ Dunlevy area west of Hudson Hope, British Columbia, to Fort Vermilion, Alberta; low elevation streams tributary to the Peace River; nearby areas which historically contained aspen parkland and grasslands;<sup>25,26</sup> most lands within 30 km of the Peace River; and a few other areas of low elevation poplar forest. Not included are Butler Ridge, British Columbia; and Mount Watt and Caribou Mountains in Alberta even though they are very close to the Peace River valley. They





*Fifth instar (Papilio Zelicaon) from Dixonville, Alberta.*

*Felix Sperling*

are excluded because they support distinctly different habitats and fauna in comparison with the remainder of the study area.

Specific study sites are listed in Table 1 and geographically displayed in Figure 1. Over 96 sites were visited and more than 6400 specimens were collected and identified in the course of researching this region since 1979. Specimens of rare or doubtful taxa collected before 1979 have been examined and identifications checked. Specimens are in the personal collections of the authors, with some voucher specimens deposited in the Strickland Museum, Department of Entomology, at the University of Alberta, Edmonton.

Butterfly nomenclature has been both fluid and controversial in recent years. Consequently there is no sin-

gle source that represents the consensus of butterfly students. Zoological names at the genus level follow Scott and we have taken species and subspecies names from a variety of published and unpublished contemporary sources.<sup>29</sup> Our use of common names is reasonably consistent with Miller.<sup>23</sup>

### **Annotated List**

#### ***Hesperiidae***

##### **Northern Cloudy Wing** *Thorybes pylades* Scudder

LOCALITIES: 1c, 1e, 1f, 2a, 3h, 4b, 4j, 5d, 5i, 5j, 6g, 7b, 7i, 8d, 8e, 8i, 8j  
Flight dates: 18 May to 12 July

##### **Dreamy Dusky Wing** *Erynnis icelus* (Scudder and Burgess)

LOCALITIES: 1c, 1e, 1i, 2a, 2h, 2j, 3e, 3g, 5d, 5e, 5i, 5u, 8d, 8e, 8i  
FLIGHT DATES: 4 May to 21 June





Beatton River valley northeast of Fort St. John, B.C.

N. Kondla

**Persius Dusky Wing** *Erynnis persius* (Scudder)

LOCALITIES: 1e, 1h, 1l, 2h, 3e, 4d, 8d, 8g, 8i

FLIGHT DATES: 16 May to 21 June

**Grizzled Skipper** *Pyrgus centaureae freija* (Warren)

LOCALITIES: 2j

FLIGHT DATES: 3 June

NOTES: This denizen of open black spruce bogs has only been found once in the study area, a few miles west of Goodlow, BC.

**Checkered Skipper** *Pyrgus communis* (Grote)

LOCALITIES: 3g, 5f, 5h, 5i, 5j, 6g

FLIGHT DATES: 17 May to 25 August 25

NOTES: Adults of this species fly over the dry grasslands along the river valley, often visiting flowers of alfalfa which are used as nectar

sources and as perching sites for males. The flight period is very long but it is unclear if this represents multiple broods or a staggered emergence. Previously, this taxon was known to occur as far north as Fort MacMurray and as far west as Edmonton.

**Arctic Skipper** *Carterocephalus palaemon mandan* (W.H. Edwards)

LOCALITIES: 1k, 2h, 2j, 3a, 3g, 4k, 5d, 5h, 5i, 5j, 5q, 5u, 5w, 8e, 8i

FLIGHT DATES: 16 May to 26 June

NOTES: Case and Bird indicate that, in their larger study, there is a great deal of variation within this species.<sup>3</sup> Kondla listed the main differences between mandan and the unnamed mountain subspecies in Alberta.<sup>16</sup>

We have found in the Peace River region that there is little phenotypic variation. All specimens collected are small and light in colour.



**Garita Skipperling** *Oarisma garita*  
(Reakirt)

LOCALITIES: 1c, 1e, 1f, 1k, 1l, 2a, 3h, 4e, 4k, 5d, 5f, 5h, 5i, 5j, 5u, 6f, 6g

FLIGHT DATES: 31 May to 3 July

NOTES: Populations of this species appear to be largely confined to native grasslands, primarily along the Peace River valley and tributary stream valleys. They have not been collected in old fields or along highways or road sides any distance from native grassland. Adults differ from those collected in other areas of Alberta in that the dark areas of the ventral hind wing are greatly extended and much darker in specimens from the Peace River valley. Based on material collected, this taxon may warrant description as a distinct subspecies.

**Assiniboia Skipper** *Hesperia assiniboia* (Lyman)

LOCALITIES: 1e, 1f, 2a, 2d, 3h, 4e, 5d, 5h, 5i, 5j, 5k, 5u, 5w, 6c, 6g

FLIGHT DATES: 4 August to 26 August

NOTES: Adults of this taxon are locally abundant on the grassy slopes of the Peace River valley, where they frequent flowers of alfalfa and *Aster* sp. The distinctive Peace River populations are assigned to this species due to their very light coloration, but they show consistent phenotypic differences from specimens of this species collected in southern Alberta. These differences include a strong tendency towards loss of silvery on the ventral surface, and a reduction of the orange colouring on the dorsal surface. The collection of *H. assiniboia* in the Peace River area is a range extension of about 550 km, from Redwater, Alberta.<sup>15</sup>

**Long Dash** *Polites mystic dacotah*  
(W.H. Edwards)

LOCALITIES: 1b, 2c, 3a, 4h, 5d, 5h, 5j, 7i, 8i

FLIGHT DATES: 19 June to 14 August

NOTES: Case and Bird report this taxon under the name *P. sonora dacotah*.<sup>3</sup> On 14 June 1981, two fresh specimens were collected at Dunvegan. Both individuals were puddling at alkali seepages at the base of a steep grassy slope locally known as Dunvegan Hill. In 1983 specimens appeared to be more abundant, and were seen or collected along margins of aspen forests.

**Roadside Skipper** *Amblyscirtes vialis* (W.H. Edwards)

LOCALITIES: 4j, 5d, 5i, 5j, 6g, 7b, 7i, 8d, 8i

FLIGHT DATES: 20 May to 23 June

NOTES: This species has not yet been found in the portion of the study area in British Columbia.

**Papilionidae**

**Old World Swallowtail** *Papilio machaon pikei* Sperling

LOCALITIES: 1a\*, 1c\*, 1e\*, 1f\*, 2a\*, 5f\*, 5g\*, 5h\*, 5j\*, 6f\*, 6g\*, 7b\*, 7i (asterisks indicate larval records)

FLIGHT DATES: 30 May to 14 July

NOTES: This race of *Papilio machaon* is endemic to the eroding valley sides and badlands of the Peace River area. It was originally reported by Llewellyn-Jones as *P. machaon oregonius*; and by Case and Bird, and Case and Case as *P. machaon hudsonianus*.<sup>3,4,21</sup> Sperling described it as a patronym of Edward M. Pike.<sup>37</sup> *P. m. pikei* is intermediate among *P. m. hudsonianus*, *P. m. aliaska* and *P. m. oregonius* in wing shape and colour markings, and is best separated by habitat and locality.

Populations can be found wherever

dense patches of its larval host plant, linear-leaved wormwood (*Artemisia dracunculus*), can be found. Small larvae have been found as early as July 8, and all instars have been found in August.<sup>40</sup> Larvae collected in early September had a high rate of parasitism by large black ichneumon wasps (*Trogus* sp.). Adults nectar at alfalfa (*Medicago sativa*). Males are easily found while they patrol for females along the upper edge of prominent, south-facing valley slopes or sometimes also at host plant patches at the base of grassy slopes.

**Zelicaon Swallowtail** *Papilio zelicaon* Lucas

LOCALITIES: 1a\*, 1d\*, 1e, 1g\*, 1l, 2h, 3a\*, 3b\*, 3e, 3f\*, 3g, 4a\*, 4c\*, 4g\*, 4h\*, 4i\*, 5f, 6a\*, 6g, 7k, 7m\* (asterisks indicate larval records)

FLIGHT DATES: 17 May to 9 July

NOTES: Larvae of all instars can be found throughout July. Adults have been reared from larvae collected on cow parsnip (*Heracleum lanatum*), heart-leaved Alexanders (*Zizia aptera*) and water parsnip (*Sium suave*). *P. zelicaon* generally flies in mixed forest and parkland. *P. zelicaon* and *P. machaon* adults have been collected together at several localities along the high, grassy slopes of the Peace River valley and a small number of hybrids have been collected.<sup>39</sup>

**Canadian Swallowtail** *Papilio canadensis* Rothschild and Jordan

LOCALITIES: 1c, 1e, 1f, 1h, 1i, 1l, 1k, 1j, 2a, 2e, 2h, 3a, 3b, 3d, 3e, 3g, 4b, 4e, 4k, 5d, 5f, 5g, 5h, 5i, 5j, 5k, 5u, 5w, 6e, 6f, 6g, 7 a, 7c, 7d, 7i, 7k, 7n, 8c, 8d, 8e, 8g, 8h, 8i

FLIGHT DATES: 15 May to 14 July

NOTES: This species seems to be generally distributed throughout the study area. Adults are found in all habitats. An adult was reared from

an egg that was observed being oviposited on a small aspen poplar leaf about one metre above the ground at La Crete ferry. Traditionally reported in the literature as a subspecies of *Papilio glaucus* but recently the taxon *canadensis* has been shown to be a distinct species.<sup>12</sup>

**Pieridae**

**Western Checkered White** *Pieris occidentalis* Reakirt

LOCALITIES: 1c, 1e, 1f, 1k, 2a, 3e, 3g, 3h, 4e, 4k, 5f, 5g, 5i, 5j, 5r, 5u, 5z, 6g, 7a, 7b, 7c, 7i, 7k, 8i, 8g

FLIGHT DATES: 4 April to 8 September

NOTES: This species was listed under the name *P. protodice occidentalis*.<sup>3</sup> It is here treated as a separate species in accordance with accepted classification.<sup>14,24</sup> There are at least two broods. Early spring brood individuals are smaller and more heavily marked with dark scales on the ventral hind wing than butterflies of the summer brood which are larger and lighter.

**Mustard White** *Pieris napi oleracea* Harris

LOCALITIES: 3g, 5d, 5e, 5i, 5q, 5u, 7i, 8a, 8g, 8h, 8i

COLLECTION DATES: 3 May to 26 July

**Cabbage Butterfly** *Pieris rapae* (Linnaeus)

LOCALITIES: 1e, 1f, 1k, 1n, 2a, 2f, 2j, 3e, 3g, 3h, 4d, 4e, 4k, 5d, 5f, 5h, 5i, 5j, 5k, 5u, 5w, 6b, 6g, 7a, 7b, 7c, 7e, 7f, 7i, 8c, 8e

FLIGHT DATES: 27 April to 29 September

NOTES: This introduced species is generally distributed throughout the Peace River valley. Adults can be



very abundant, frequently visiting flowers of alfalfa in August, and larvae are considered pests of market garden crops. There are at least two broods, and perhaps as many as four.

**Large Marble** *Euchloe ausonides*  
Lucas

LOCALITIES: 1c, 1i, 2a, 2c, 2e, 2h, 3e, 3g, 4e, 5d, 5f, 5h, 5i, 5y, 6f, 7a, 7b, 7c, 7g, 7i, 8c, 8g, 8h

FLIGHT DATES: 16 May to 9 August

NOTES: In June, if a large number of white butterflies is seen flying over an unploughed field in the Fairview area, it is certain that they are adults of this species, and not *P. rapae*. In some fields the adults are very abundant. Adults are also found in jack-pine sandhills, aspen forests, and grasslands along the Peace River. Eggs are laid on budding inflorescences of *Arabis drummondii* Gray, one egg to a plant.

**Creusa Marble** *Euchloe creusa*  
(Doubleday)

LOCALITIES: 1h

COLLECTION DATES: 26 June

NOTES: So far only found in the Dunlevy area where the Peace River enters the Rocky Mountains.

**Clouded Sulphur** *Colias philodice*  
Godart

LOCALITIES: 1c, 1e, 1f, 1j, 1k, 1l, 1n, 2a, 2e, 2h, 3a, 3b, 3e, 3g, 4e, 4k, 5d, 5f, 5h, 5i, 5j, 5k, 5u, 5y, 6g, 7d, 7i, 7m, 8e, 8g, 8i

FLIGHT DATES: 4 May to 29 September

NOTES: This species appears to have a small spring brood, at least two summer broods and sometimes a fall brood in the Peace country. Specimens of this species were reported as *C. eurytheme*.<sup>3</sup>

**Christina Sulphur** *Colias christina*  
Edwards

LOCALITIES: 1e, 1h, 1m, 2a, 2e, 2f, 2h, 2j, 3a, 4b, 4c, 5d, 5h, 5y, 7a, 7e, 7k, 7m, 8i

FLIGHT DATES: 21 June to 12 August

NOTES: Specimens of this species were misidentified as *C. eurytheme*.<sup>3</sup>

The taxon *alberta*, described from the study area by Bowman as a subspecies of *eurytheme*, has been the subject of some debate in the literature.<sup>1</sup> Besides having been viewed as a synonym of *C. christina*, it has been attached to both *C. eurytheme* and *C. philodice vitabunda*.<sup>24</sup> As well it has been referenced as a hybrid situation.<sup>6</sup> Kondla has reviewed this situation and determined that *alberta* is in fact allied with *C. christina*.<sup>17</sup> This species, while widespread, is only locally common.

**Canadian Sulphur** *Colias canadensis*  
Ferris

LOCALITIES: 1j, 7m<sup>8</sup>

FLIGHT DATES: 30 May to 4 July

NOTES: This recently described species has in the past been reported as *Colias hecla*.

**Giant Sulphur** *Colias gigantea*  
Strecker

LOCALITIES: 1j, 2j, 3a, 5d, 5g, 5j, 5y

FLIGHT DATES: 14 June to 8 July

NOTES: Adults appear to have a very short flight period, and are almost universally restricted to wet willow fens and catchment marshes with willows.

**Pink-edged Sulphur** *Colias interior*  
Scudder

LOCALITIES: 1b, 2j, 3g, 4e, 5d, 7a, 7b, 7e, 7m

FLIGHT DATES: 21 June to 5 August

**Palaeno Sulphur** *Colias palaeno*  
*chippewa* W.H. Edwards

FLIGHT DATES: June 18

NOTES: So far only found along

Highway 2, 56 km SE of Dawson Creek in Alberta.<sup>10</sup>

**Bronze Copper** *Lycaena hyllus* (Cramer)

LOCALITIES: 6c

FLIGHT DATES: 17 August

NOTES: A single battered male was collected in 1981. It could represent a local colony or a migrant. The specimen was collected while visiting alfalfa flowers near a marsh, and represents a range extension of about 320 km. Kondla reports that the species does use fens in central Alberta and since this species is easy to overlook, it may well be established in fens and marshes in the study area.<sup>18</sup>

**Purplish Copper** *Lycaena helloides* (Boisduval)

LOCALITIES: 2a, 4k, 5i, 5j, 5w, 6c

FLIGHT DATES: 29 June, 14 August to 22 August

NOTES: The taxonomy of this species and *L. dorcas* has been the subject of conflicting interpretations.<sup>7,28</sup>

Based on work in Alberta we treat these two as distinct species. Specimens appear to be differentiated from populations in southern Alberta, but series are too short to be certain of constancy of differences.

**Dorcas Copper** *Lycaena dorcas dorcas* (W. Kirby)

LOCALITIES: 2f, 2j

FLIGHT DATES: 6 July

NOTES: So far only found in a black spruce bog a few miles west of Goodlow, BC, and along Highway 64 just east of the AB/BC border.

**Mariposa Copper** *Lycaena mariposa* (Reakirt)

LOCALITIES: 1h, 4e, 7e, 7f, 7m, 8e

COLLECTION DATES: 25 June to 1 August

**Coral Hairstreak** *Harkenclenus titus*

(Fabricius)

LOCALITIES: 1c, 1e, 1f, 1k, 1l, 1n, 2a, 5d, 5j, 6g, 8c

FLIGHT DATES: 28 June to 11 August

NOTES: Adults are consistently darker than adults of other populations in western North America. They appear to be otherwise similar. Due to the difference, description as a distinct subspecies may be warranted.

Adults are associated with the edge of native grassland, where they tend to perch on saskatoon bushes. Populations in the Fort St. John area were found to frequently display hilltopping behaviour which was not observed in those from the Peace River valley in Alberta.

**Striped Hairstreak** *Satyrium liparops* (Le Conte)

LOCALITIES: 1e, 1f, 1k, 1l, 2a, 5d, 5j, 6g, 7a, 7i

FLIGHT DATES: 26 June to 26 July

NOTES: Individuals of this species, both male and female, are different from all other specimens examined from North America in that they are darker and have a more uniform wing pattern. They may be worthy of description as a distinct subspecies.

Adults perch on spreading dogbane and saskatoon and chokecherry bushes. They do not hilltop as regularly as *H. titus* but do engage in this behaviour. They also appear to be territorial, and chase individuals of any insect species out of their territory.

**Brown Elfin** *Callophrys augustinus* (Westwood)

LOCALITIES: 3e, 5c, 5d, 5e, 5o, 7j, 8e, 8g

FLIGHT DATES: 3 May to 12 June

NOTES: Adults of this species are found in wet and boggy areas near



spruce and poplar forests, and in jackpine forests.

**Hoary Elfin** *Callophrys polios obscurus* (Ferris and Fisher)

LOCALITIES: 2 a, 3e, 5d, 5e, 5j, 5o, 5y, 7a, 7c

FLIGHT DATES: 26 April to 8 June

**Eastern Pine Elfin** *Callophrys niphon clarki* Freeman

LOCALITIES: 5d, 5o, 7l

FLIGHT DATES: 13 May to 23 May

NOTES: On comparison with adults of this subspecies from Clyde, Alberta, 11 specimens clearly represent this taxon. Their collection extends the range of this species westward from Wood Buffalo National Park and Clyde, AB.

**Western Pine Elfin** *Callophrys eryphon* (Boisduval)

LOCALITIES: 2a, 4j, 5d, 5o

FLIGHT DATES: 9 May to 19 June

NOTES: The occurrence of this species sympatrically with the preceding species raises the possibility of hybridization as suggested by Reist.<sup>27</sup>

A single specimen taken north of Manning may also be referable to this species. Further study is required to clarify the relationship between these two species in northern Alberta.

**Western Tailed Blue** *Everes amyntula albrighti* Clench

LOCALITIES: 1c, 1d, 1e, 1f, 1h, 1i, 1k, 1l, 2a, 2e, 2h, 2j, 3a, 3b, 3d, 3e, 3g, 4d, 4e, 5d, 5e, 5g, 5h, 5i, 5j, 5u, 5x, 5y, 6f, 6g, 7a, 7i, 7m, 8c, 8d, 8e, 8g, 8h, 8i

FLIGHT DATES: 11 May to 1 August

**Spring Azure** *Celastrina argiolus lucia* (Kirby)

LOCALITIES: 1e, 2a, 2j, 3g, 4e, 5d, 5e, 5i, 5j, 5k, 5o, 5u, 5y, 7l, 8g

FLIGHT DATES: 7 April to 11 June

NOTES: Recent literature treats *lucia*

as a subspecies of *C. argiolus*. However recent research (H. Pavulaan, pers. comm.; Kondla, unpublished) shows that *argiolus* actually consists of a species complex and that *lucia* may be a distinct species.<sup>30</sup>

**Silvery Blue** *Glaucopsyche lygdamus couperi* Grote

LOCALITIES: 1c, 1e, 1f, 1h, 1i, 1k, 1l, 2a, 2c, 2e, 2h, 2j, 3a, 3b, 3e, 3g, 4e, 4k, 5d, 5e, 5f, 5h, 5i, 5j, 5o, 5p, 5u, 5w, 5y, 6f, 6g, 7a, 7c, 7h, 7i, 7j, 8a, 8c, 8e, 8g, 8h, 8i

FLIGHT DATES: 26 April to 14 July

NOTES: Widely distributed in most habitats. Recent work suggests that the taxon *couperi* may be a distinct species from *G. lygdamus*.<sup>5</sup>

**Northern Blue** *Plebejus idas scuderi* (Edwards)

LOCALITIES: 1e, 1h, 2j, 2h, 4e, 5d, 6g, 7e, 7f, 7m, 8c, 8e, 8f

FLIGHT DATES: 21 June to 11 August

NOTES: Case and Bird report specimens of this species as *P. melissa*.<sup>3</sup> Their specimens have been re-examined and they are all females of *P. idas*.

**Greenish Blue** *Plebejus saepiolus amica* (W.H. Edwards)

LOCALITIES: 1a, 1b, 1c, 1d, 1e, 1f, 1h, 1i, 1j, 2a, 2c, 2e, 2h, 2j, 3a, 3b, 3c, 3d, 3h, 4d, 4e, 4f, 5d, 5f, 5h, 5i, 5u, 5x, 5y, 6f, 6g, 7b, 7e, 7i, 7k, 7m, 8b, 8c, 8e, 8g, 8i, 8k

FLIGHT DATES: 30 May to 26 July

NOTES: One of the ubiquitous species in the region.

**Rustic Blue** *Plebejus rusticus* (W.H. Edwards)

LOCALITIES: 1c, 1e, 1f, 2a, 3a, 3e, 4b, 4e, 5d, 5e, 5f, 5h, 5i, 5j, 6f, 7i, 8i

FLIGHT DATES: 11 May to 12 July

NOTES: A variety of genus and species names that have been applied to this taxon in recent years.<sup>19</sup>



Populations in the study area appear most closely allied with subspecies *rusticus* but work is needed to clarify the most appropriate subspecies nomenclature.

Adults fly on the native grasslands along the Peace River valley, and can also be found in jackpine sandhills. Colonies are small and do not appear to be numerous.

### **Nymphalidae**

**Great Spangled Fritillary** *Speyeria cybele pseudocarpenteri* (F. and R. Chermock)

LOCALITIES: 1e, 1f, 1k, 2a, 2d, 2j, 3g, 4e, 5d, 5h, 5i

FLIGHT DATES: 28 June to 27 August

NOTES: This very aggressive flier can be found in shrub thickets on valley slopes, poplar draws on valley sides and upland poplar forest. Unlike individuals from more southern populations, adults in this study area very seldom nectar at flowers.

**Aphrodite Fritillary** *Speyeria aphrodite manitoba* (F. and R. Chermock)

LOCALITIES: 1e, 1f, 1h, 1k, 1l, 1m, 2a, 2j, 5d, 5e, 5g, 5h, 5i, 5j, 5u, 8i

FLIGHT DATES: 6 July to 7 September

NOTES: In the Peace River country adults of this species fly primarily in late July and early August, after the majority of adults of *S. electa* disappear. Its discovery in the Peace River region is a major range extension, and due to the habitat information provided by Kondla we expect that future field work in intervening areas will confirm that the Peace River populations are in fact disjunct from others.<sup>18</sup>

**Boreal Fritillary** *Speyeria hollandi*

(F. and R. Chermock)

LOCALITIES: 1e, 2j, 5d, 5e, 7a, 7b, 7e, 7i, 7m, 8a, 8b, 8c, 8d, 8e, 8f, 8i

FLIGHT DATES: 22 June to 21 August

NOTES: This species is usually found in boggy or heavily wooded areas. The taxonomic and nomenclatural argument provided by Kondla is followed for this and the following species.<sup>18</sup>

**Northwestern Fritillary** *Speyeria electa* (W.H. Edwards)

LOCALITIES: 1b, 1c, 1e, 1f, 1h, 1k, 1l, 1m, 2a, 2j, 3a, 3b, 3e, 3g, 3h, 4c, 4e, 5g, 5h, 5i, 5j, 5u, 5y, 6b, 6f, 6g, 7b, 7i

FLIGHT DATES: 6 June to 1 August

NOTES: Adults of this species appear in June with the flight period extending into July.

**Mormon Fritillary** *Speyeria mormonia eurynome* (W.H. Edwards)

LOCALITIES: 5u, 5w, 6g

FLIGHT DATES: 26 August

**Bog Fritillary** *Boloria eunomia dawsoni* (Barnes and McDunnough)

LOCALITIES: 2e, 2h, 5d, 5e, 5g, 5y, 8e, 8g

FLIGHT DATES: 8 June to 23 June

**Silver-bordered Fritillary** *Boloria selene* (Denis and Schiffermueller)

LOCALITIES: 1d, 2h, 3a, 3g, 4a, 5b, 5d, 5i, 5k, 5u, 5y, 6b, 7a, 7d, 7e, 7m, 8e

FLIGHT DATES: 6 June to 25 July

**Meadow Fritillary** *Boloria bellona jenistae* Stallings and Turner

LOCALITIES: 1c, 1f, 1l, 2a, 2h, 3e, 3g, 4e, 5d, 5e, 5h, 5i, 5j, 5u, 5v, 6f, 6g, 7a, 7b, 7i, 8c, 8e, 8g, 8h, 8i

FLIGHT DATES: 9 May to 28 June; 13 August to 25 August

NOTES: In the Peace River country this species is double brooded. Adults fly in old fields, forest

openings, and edges of grassland areas. Pike found that eggs are laid on violets.

**Frigga's Fritillary** *Boloria frigga saga* (Staudinger)

LOCALITIES: 2i, 2j, 3g, 5d, 5e, 5h, 5y, 8g, 8j

FLIGHT DATES: 19 May to 23 June

**Freija Fritillary** *Boloria freija* (Thunberg)

LOCALITIES: 2a, 2i, 2j, 3g, 4e, 5c, 5d, 5e, 5o, 5y, 7a, 7c, 7l, 7n, 8g, 8h

FLIGHT DATES: 26 April to 11 June

**Purple Fritillary** *Boloria titania grandis* (Barnes and McDunnough)

LOCALITIES: 2f, 2j, 5d, 5e, 7e, 7f, 7m, 8i

FLIGHT DATES: 17 June to 23 August

**Gorgone Checkerspot** *Chlosyne gorgone* (Huebner)

LOCALITIES: 5i, 5h

FLIGHT DATES: 17 May to 26 June

NOTES: An uncommon and local species in Alberta, adults are rarely collected in series. In 1980, a small colony was discovered at Green Island. Extensive investigations yielded another small colony at Dunvegan in 1983. These are the only known colonies in the Peace River region to date.

The colonies cover an area of about 1/4 ha, and within that area, adults are fairly abundant. Outside of that area, adults are rarely encountered. In over 100 hours of collecting, only one specimen has ever been seen over 100 m from a colony.

**Northern Checkerspot** *Chlosyne palla* (Boisduval)

LOCALITIES: 1c, 1k, 2a, 5f, 5h, 5j, 6g, 7a, 7i, 8c, 8i

FLIGHT DATES: 23 May to 14 July

NOTES: Although Case and Bird fail

to report this species, the first known specimen was collected by J. Belicek at Peace River town site in 1973, and a series of over 100 specimens now exists in collections. Adults primarily inhabit valley-side poplar forests where the presumed food plant, *Aster conspicuus*, grows in the understory. However, adults are best observed at the poplar forest/grassland interface where they visit flowers of alfalfa and spreading dogbane and *Senecio* sp.

There is some question as to the correct placement of this taxon. It is clearly distinct from both *C. palla* in southern Alberta and British Columbia, but it is also distinct from *C. acastus* from southern Alberta prairies. It is placed with *C. palla* largely because Alberta *C. acastus* has a monotone orange ground color on the dorsal surface, and *C. palla* has a two-toned ground color. The Peace River material has a two-toned ground color.

**Northern Crescent** *Phyciodes morphheus* (Drury)

LOCALITIES: 1a, 1b, 1d, 1e, 1f, 1h, 1k, 2b, 2e, 2h, 2j, 3a, 3b, 3e, 3g, 4c, 4e, 5d, 5f, 5g, 5h, 5i, 5j, 5k, 5u, 5x, 6b, 6f, 6g, 6h, 7a, 7c, 7e, 7i, 7k, 8b, 8c, 8e, 8f, 8g, 8i

FLIGHT DATES: 28 May to 23 August

NOTES: Adults are found in or near forested areas, and at the edges of poplar forests along river bottoms.

**Tawny Crescent** *Phyciodes batesii* (Reakirt)

LOCALITIES: 1c, 1e, 1f, 1k, 1l, 2a, 2j, 3e, 4b, 4e, 5j, 5h, 5i, 6g, 7a, 7i

FLIGHT DATES: 23 May to 14 July

NOTES: Larvae are web spinners, which is a reliable character in separating this species from the preceding one. This species is found around the shrubs of the grasslands,



and is not often found flying with *P. morpheus*.

**Field Crescent** *Phyciodes pratensis*  
(Behr)

LOCALITIES: 1h

FLIGHT DATES: 26 June

NOTES: So far only found in the Dunlevy area.

**Satyr Anglewing** *Polygonia satyrus*  
(W.H. Edwards)

LOCALITIES: 1h, 3g, 4b, 5d, 5e, 5l, 5j, 6g, 7a, 7c

FLIGHT DATES: 17 April to 30 June (hibernating generation), and 15 July to 18 August (new generation).

NOTES: Adults are found in any forested area where shaded stinging nettles are found. Pike confirmed stinging nettle as a larval food plant in this area.

**Green Comma** *Polygonia faunus*  
(W.H. Edwards)

LOCALITIES: 1f, 1h, 2a, 5d, 7b, 8a

FLIGHT DATES: 11 April to 17 August

**Hoary Comma** *Polygonia gracilis*  
Grote and Robinson

LOCALITIES: 3g, 5e, 8j

FLIGHT DATES: 21 April to 11 June

NOTES: Specimens are provisionally listed under this taxon for lack of a better available name. Individuals from most parts of the boreal forest in northern Alberta and British Columbia are black and gray on the ventral surface while nominate *gracilis* is two-toned brown on the ventral surface. More work is needed on the taxa *gracilis* and *zephyrus* in this part of the continent.<sup>18</sup>

**Gray Comma** *Polygonia progne*  
(Cramer)

LOCALITIES: 1f, 2a, 3g, 5d, 5i, 5j, 6g, 8i

FLIGHT DATES: 17 April to 26 August

NOTES: Adults are found in and near poplar forests where willow is growing.

**Compton Tortoise Shell** *Nymphalis vau-album* (Denis and Schiffermuel-ler)

LOCALITIES: 1e, 1h, 3g, 4 e, 5d

FLIGHT DATES: 24 May to 17 August

**Mourning Cloak** *Nymphalis antiopa*  
(Linnaeus)

LOCALITIES: 1e, 1f, 2a, 3g, 4b, 4e, 5d, 5h, 5i, 5j, 5k, 5w, 5z, 6g, 8c

FLIGHT DATES: 16 April to 23 August

**Milbert's Tortoise Shell** *Nymphalis milberti* (Say)

LOCALITIES: 1e, 1f, 1h, 1j, 2f, 2h, 3g, 4e, 4k, 5d, 5h, 5i, 6g, 7k, 7m

FLIGHT DATES: 25 May to 14 August

**Painted Lady** *Vanessa cardui* (Linnaeus)

LOCALITIES: 1c, 1f, 1n, 2a, 5i, 5u, 5w

FLIGHT DATES: 28 May to 8 September

NOTES: A large migration into the Peace River area occurred in 1979. Many fresh adults were seen throughout the area in August and September. Smaller migrations occurred in 1991 and 1992.

**Red Admiral** *Vanessa atalanta rubria* (Fruhstorfer)

LOCALITIES: 5w, 6g, 8c, 8e, 8h

FLIGHT DATES: 10 June to 17 June

**White Admiral** *Limenitis arthemis rubrofasciata* (Barnes and McDunnough)

LOCALITIES: 1c, 1e, 1f, 1h, 1k, 1l, 2a, 2e, 2h, 2j, 3a, 3e, 3g, 4b, 4c, 4e, 5d, 5e, 5f, 5g, 5h, 5i, 5j, 5y, 6b, 6g, 7a, 7b, 7c, 7h, 7i, 7k, 8e, 8i

FLIGHT DATES: 7 June to 11 August

**Inornate Ringlet** *Ceponympha inornata* McDunnough

LOCALITIES: 1c, 1d, 1e, 1f, 1i, 1j, 1k, 1l, 2a, 2c, 3b, 3e, 3g, 4b, 4c, 4d, 4e, 4f, 4k, 5d, 5f, 5g, 5h, 5i, 5j, 5u, 5w, 5y, 6d, 6f, 6g, 8c, 8g, 8i

FLIGHT DATES: 11 May to 16 July

NOTES: Adults of this taxon appear to be somewhat differentiated from adults of this taxon from elsewhere in Alberta. There is a tendency to be darker, and a reduction or absence of eyespots on the forewing. This, at least, is true of populations from the native grasslands. Roadside populations do not show these tendencies. Thus there may be native and introduced populations with limited interaction between them.

**Common Wood Nymph** *Cercyonis pegala ino* (Hall)

LOCALITIES: 1e, 1f, 1k, 1l, 2a, 2j, 3g, 3h, 4i, 5d, 5h, 5i, 5j, 5k, 5u, 5w, 6d, 7a, 7b, 7f, 7i

FLIGHT DATES: 28 June to 23 August

NOTES: Specimens collected from native grasslands appear darker than specimens from southern Alberta, but specimens from road sides in the Alberta part of the region are much like the rest of the Alberta populations. Here, as in the preceding species, there may be native and introduced populations interacting.

**Dark Wood Nymph** *Cercyonis oetus* (Boisduval)

LOCALITIES: 1c, 1e, 1f, 1i, 1l, 1n, 2a

FLIGHT DATES: 4 July to 11 August

NOTES: This species seems to be restricted to the BC side of the Peace River valley, and many adults are substantially darker than adults from other areas of British Columbia and Alberta.

**Disa Alpine** *Erebia disa mancina* Doubleday

LOCALITIES : 2j

FLIGHT DATES: 3 June

NOTES: So far only found in a spruce bog west of Goodlow, BC. Relatively little work was done in spruce bogs and this species is certainly more widely distributed in the region than this one record would indicate.

**Red Disked Alpine** *Erebia discoidalis macdunnoughi* Dos Passos

LOCALITIES: 1g, 1j, 2j, 3g, 5c, 5d, 5e, 5i, 5u, 5y, 7i, 7l

FLIGHT DATES: 26 April to 24 May

NOTES: This species was reared by Pike (unpublished), and the life cycle photographed and described. The most noteworthy point of the life cycle is that mature larvae spin flimsy cocoons before pupating.

**Common Alpine** *Erebia epipsodea freemani* Erhlich

LOCALITIES: 1c, 1e, 1f, 1h, 1i, 1j, 1k, 1l, 2a, 3g, 3h, 4b, 4d, 4e, 4k, 5d, 5f, 5h, 5i, 5j, 5u, 5w, 5y, 7i, 7l

FLIGHT DATES: 13 May to 28 June

**Macoun's Arctic** *Oeneis macounii* (W.H. Edwards)

LOCALITIES: 4j, 5e, 8e, 8i

FLIGHT DATES: 11 June to 20 June

NOTES: Adults fly in the vicinity of jackpine sandhills and will hilltop.

**Uhler's Arctic** *Oeneis uhleri* (Reakirt)

LOCALITIES: 1c, 1e, 1f, 1k, 1l, 2a, 4b, 4e, 5f, 5h, 5i, 5j, 6g, 7i

FLIGHT DATES: 7 May to 3 July

NOTES: Adults from the Peace River valley are distinct from adults collected in other parts of Alberta in that they are mostly larger, darker and have more eyespots.

Females oviposit on many species of grasses, and eggs take about three weeks to hatch. Mature larvae pupate in early May.



**Alberta Arctic** *Oeneis alberta* Elwes  
LOCALITIES: 2a, 4e, 5d, 5e, 5i, 5j,  
5z, 6f, 6g

FLIGHT DATES: April 26 to June 18

NOTES: First reported by Kondla from Kleskun Hill. Adults of this taxon are locally common along the Peace River in the native grasslands from Clayhurst to Peace River. They are also found occasionally in jack-pine sandhills. This is one of the first butterflies to fly in the spring. Females oviposit on many species of grasses, and eggs hatch in about 30 days. Mature larvae overwinter and pupation occurs in early April, often before the snow has completely melted.

Peace River populations may represent a distinct subspecies which is being investigated by Pike.

**Jutta Arctic** *Oeneis jutta ridingiana*  
F. and R. Chermock

LOCALITIES: 2j, 5d, 5e, 8e

FLIGHT DATES: 3 June to 13 June

**Discussion** A total of 76 species have now been documented for this study area. We have not included a number of taxa collected by K. Bowman in 1925 at an undetermined location near Fort Vermilion. Although specimens are in the collection of the University of Alberta, the exact locality where these were collected is unknown and may not be within the study area as defined herein. Efforts by the writers and G.J. Hilchie to find the source of Bowman's records, both in the field and through file information, have been unsuccessful.

Only a few species are candidates for future addition to the fauna of the study area:

**Manitoba Skipper** *Hesperia comma*

*manitoba* (Scudder) — MacNeil reports one female collected 24 August 1961 at Hotchkiss River.<sup>22</sup> We treat this as a hypothetical species at this time because we have not been able to verify the identification and this taxon is known from only one other location in the boreal forest of Alberta. The flight date strongly suggests that this specimen could be *H. assiniboia*. The taxonomy of *Hesperia* in North America needs more work, especially to determine relationships (if any) to European *Hesperia comma*.

**Peck's Skipper** *Polites peckius* (W. Kirby) — This species has been found north, south, east and west of the study area, so it is just a matter of time before it is discovered here. It should be looked for in fens, marshes and moist meadows.

**California White** *Pieris sisymbrii* (Boisduval) — Specimens were collected by K. Bowman in the vicinity of Fort Vermilion and further work may yet confirm the presence of this species in the study area.

**Melissa Blue** *Plebejus melissa* W.H. Edwards — Two males and one female collected by K. Bowman at Wembly in 1925 appear to be of this species. Genitalia have not been examined and more work is needed to clarify whether or not this species does occur in the study area.

**Yukon Blue** *Plebejus optilete yukona* (Holland) — This species has been found northwest, east and southeast of the study area. Field work in spruce bogs during early July will likely turn up populations in the study area.

**Chryxus Arctic** *Oeneis chryxus caryi* Dyar — Specimens were collected by K. Bowman in the general

area of Fort Vermilion. This species was reported by Case and Bird but we have been unable to verify their record.<sup>3</sup> Additional exploration of pine forests in June is needed to determine if this taxon occurs in the study area.

Analysis of the adult flight phenology data (Table 2) shows that two-thirds of the species are on the wing in late June. Relatively high species diversity can be observed from mid-May through early July. Substantially fewer species are on the wing in late April to early May and mid-July to late August.

The northern limit of the study area is almost as far north as Churchill, Manitoba, which is well known for its arctic and subarctic butterflies. The Peace River region is unique as a northern area due to its high species diversity and due to disjunct and range-edge populations of species that are distinctly southern in their primary distribution. Thus the study area is at the limits of the range of 23 taxa.

Taxa which are at the northern and northwestern limits of their range here are: *O. garita*, *H. assiniboia*, *P. mystic dacotah*, *A. vialis*, *H. titus*, *S. liparops*, *S. cybele pseudocarpenteri*, *C. pegala*, *O. uhleri* ssp., and *O. alberta*. *S. aphrodite manitoba*, *P. batesii* and *C. inornata* nr. *benjamini* are at their western and northwestern range limits here. The following taxa are at their northwestern range limits here: *P. communis*, *L. hyllus*, *L. helloides*, *P. rusticus* nr. *rusticus*, *C. gorgone*. Three taxa are at their northern range limits here: *P. zeli-caon*, *C. palla*, and *C. oetus*. *C. niphon* and *E. episodea freemani* are at their western range limits. It is interesting to note that none of the taxa in the study area are at their

southern or southeastern range limits here.

Ten of these taxa are also clearly disjunct for distances of 200 to 500 km from the nearest related populations to the south and southeast: *P. communis*, *O. garita*, *H. assiniboia*, *P. machaon pikei*, *H. titus*, *S. liparops*, *C. gorgone*, *C. palla*, *O. uhleri* and *O. alberta*. These same taxa also have highly circumscribed distributions within the study area, being wholly or largely confined to the Peace River valley and, in some cases, nearby tributary stream valleys. *Cercyonis oetus* is also disjunct but is limited to the western part of the study area and flies outside of the Peace River lowlands as well. Five taxa may be disjunct but additional work in areas to the east and southeast is needed to clarify this: *L. hyllus*, *L. helloides*, *P. rusticus* nr. *rusticus*, *S. aphrodite manitoba*, and *C. inornata* nr. *benjamini*.

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**Table 1. LIST OF SPECIFIC COLLECTING SITES  
WITH REFERENCE NUMBERS SHOWN ON FIGURE 1**

<p>1a 5-7 km NE of Hudson Hope  b 15 km SW of Attachie  c 3 km NW of Attachie  d 15 km W of Fort St. John  e District of Taylor  f Beaton River ENE of Fort St. John  g Cecil Lake  h Bullhead Mountain and Dunlevy areas adjacent to Williston Lake (low elevations)  i Beaton River 8 km NE of Rose Prairie  j Alaska Highway, Milepost 29  k 10 km E of Taylor  l Bear Flat  m Halfway Indian Reserve and vicinity</p>	<p>5b 3 km N of Hines Creek  c George Lake  d Sandhill Lake  e Gage  f Highland Park  g 30 km W of Fairview  h Dunvegan  i Green Island  j 16 km SE of Fairview  k 13 km S of Bluesky  l 8 km S of Bluesky  n Camp Island, 20 km S of Whitelaw  o 7 km S of Whitelaw  p 4 km SE of Whitelaw  q Whitelaw  r 5 km SW of Brownvale  s Figure 8 Lake, 13 km N of Brownvale  u 10 km SW of Fairview  w Fairview  x 3 km N of Fairview  y 11 km N of Fairview  z Fairview Ski Hill</p>
<p>2a Clayhurst Bridge  b 6.5 km S of Bear Canyon  c Bear Canyon  d Highway 64 at Clear River  e Boundary Lake  f Highway 64, 3 km E of AB/BC boundary  g 22 km N of Bear Canyon  h 30 km N of Bear Canyon  i 11 km W of Worsley  j N of Clayhurst and Goodlow area</p>	<p>6a 18 km S of Dixonville  b Lac Cardinal  c 2 km S of Lac Cardinal  d Grimshaw  e 16 km SE of Grimshaw  f Shaftsebury Ferry  g Peace River (town)  h 10 km S of Peace River</p>
<p>3a Sunset Prairie  b Bear Mountain  c Demmitt  d White Mountain fire lookout tower, 25 km SW of Spirit River  e Spirit Ridge, 14 km S of Spirit River  f 2 km E of Woking  g Codessa fire lookout tower, 14 km S of Codessa  h Pouce Coupe</p>	<p>7a 16 km E of Northstar  b 20 km E of Northstar  c 14 km E of Deadwood  d Deadwood fire tower, 10 km S of Deadwood  e 25 km S of Manning</p>
<p>4a 21 km W of Elsworth  b Beaverlodge  c Wembly  d 2 km S of Clairmont Lake  e Kleskun Hill  f Highway 34 at Smokey River  g Debolt  h 3 km W of Calais  i 25 km W of High Prairie  j 10 km S of Grande Prairie  k Grande Prairie</p>	

**Table 2. ADULT BUTTERFLY FLIGHT PHENOLOGY**

'X' = species has been found in a phenology unit, 'o' = it has not. Each month is divided into 3 phenology units; the first days 1-10, the second days 11-20 and the third days 21-end.

SPECIES	APR	MAY	JUN	JUL	AUG	SEP
<i>Thorybes pylades</i>	000	oXX	XXX	oXo	000	000
<i>Erynnis icelus</i>	000	XXX	XXX	000	000	000
<i>Erynnis persius</i>	000	oXX	XXX	000	000	000
<i>Pyrgus centaureae</i>	000	000	Xoo	000	000	000
<i>Pyrgus communis</i>	000	oXo	XXX	oXo	XXX	000
<i>Carterocephalus palaemon</i>	000	oXX	XXX	Xoo	000	000
<i>Oarisma garita</i>	000	ooX	XXX	Xoo	000	000
<i>Hesperia assiniboia</i>	000	000	000	000	XXX	000
<i>Polites mystic</i>	000	000	oXX	XXX	oXo	000
<i>Amblyscirtes vialis</i>	000	oXX	XXX	000	000	000
<i>Papilio machaon</i>	000	ooX	XXX	XXo	000	000
<i>Papilio zelicaon</i>	000	oXX	XoX	Xoo	000	000
<i>Papilio canadensis</i>	000	oXX	XXX	XXo	000	000
<i>Pieris occidentalis</i>	XoX	XXX	XXX	XXX	XXX	Xoo
<i>Pieris napi</i>	000	XXX	XXo	ooX	000	000
<i>Pieris rapae</i>	ooX	XXX	XXX	XXX	XXX	Xoo
<i>Euchloe ausonides</i>	000	oXX	XXX	000	Xoo	000
<i>Euchloe creusa</i>	000	000	ooX	000	000	000
<i>Colias philodice</i>	000	XXX	XXX	XXX	XXX	XoX
<i>Colias christina</i>	000	000	ooX	XoX	XXo	000
<i>Colias canadensis</i>	000	ooX	000	Xoo	000	000
<i>Colias gigantea</i>	000	000	oXX	Xoo	000	000
<i>Colias interior</i>	000	000	ooX	XoX	Xoo	000
<i>Colias palaeno</i>	000	000	oXo	000	000	000
<i>Lycaena hyllus</i>	000	000	000	000	oXo	000
<i>Lycaena helloides</i>	000	000	ooX	000	oXX	000
<i>Lycaena dorcas</i>	000	000	000	Xoo	Xoo	000
<i>Lycaena mariposa</i>	000	000	ooX	ooX	Xoo	000
<i>Harkenclenus titus</i>	000	000	ooX	XXX	Xoo	000
<i>Satyrrium liparops</i>	000	000	ooX	XXX	000	000
<i>Callophrys augustinus</i>	000	XXX	oXo	000	000	000
<i>Callophrys polios</i>	ooX	XXX	Xoo	000	000	000
<i>Callophrys niphon</i>	000	oXX	000	000	000	000
<i>Callophrys eryphon</i>	000	XXo	oXo	000	000	000
<i>Everes amyntula</i>	000	XXX	XXX	XXo	Xoo	000
<i>Celastrina argiolus</i>	XoX	XXX	XXo	Xoo	000	000
<i>Glaucopsyche lygdamus</i>	ooX	XXX	XXX	Xoo	000	000
<i>Plebejus idas</i>	000	000	ooX	XXo	XXo	000
<i>Plebejus saepiolus</i>	000	ooX	XXX	XXX	000	000
<i>Plebejus rusticus</i>	000	XXX	XXX	oXo	000	000
<i>Speyeria cybele</i>	000	000	ooX	XXo	XXX	000
<i>Speyeria aphrodite</i>	000	000	000	XXX	XXX	Xoo
<i>Speyeria hollandi</i>	000	000	ooX	000	XXo	000
<i>Speyeria electa</i>	000	000	XXX	XXX	Xoo	000
<i>Speyeria mormonia</i>	000	000	000	000	ooX	000
<i>Boloria eunomia</i>	000	000	XXX	000	000	000
<i>Boloria selene</i>	000	oXo	XXX	XXX	000	000
<i>Boloria bellona</i>	000	XXX	XXX	Xoo	XXX	000
<i>Boloria frigga</i>	000	oXX	XXX	000	000	000
<i>Boloria freija</i>	ooX	XXX	XXo	000	000	000
<i>Boloria titania</i>	000	000	000	ooX	XXX	000



**Table 2 (continued) ADULT BUTTERFLY FLIGHT PHENOLOGY**

SPECIES	APR	MAY	JUN	JUL	AUG	SEP
<i>Chlosyne gorgone</i>	000	oXX	XXX	000	000	000
<i>Chlosyne palla</i>	000	ooX	XXX	XXo	000	000
<i>Phyciodes morpheus</i>	000	ooX	XXX	XXo	XXo	000
<i>Phyciodes batesii</i>	000	ooX	XXX	XXo	000	000
<i>Phyciodes pratensis</i>	000	000	ooX	000	000	000
<i>Polygonia satyrus</i>	oXX	XXX	ooX	oXX	XXX	000
<i>Polygonia faunus</i>	oXX	oXX	Xoo	000	XXX	000
<i>Polygonia gracilis</i>	ooX	oXX	XXo	000	000	000
<i>Polygonia progne</i>	oXX	XXX	XXX	000	XXX	000
<i>Nymphalis vau-album</i>	000	ooX	ooX	000	XXo	000
<i>Nymphalis antiopa</i>	ooX	XXX	XXX	000	XXX	000
<i>Nymphalis milberti</i>	000	XXX	oXX	oXo	XXo	000
<i>Vanessa cardui</i>	000	ooX	XXo	000	Xoo	Xoo
<i>Vanessa atalanta</i>	000	000	XXo	000	000	000
<i>Limenitis arthemis</i>	000	000	XXX	XXo	XXo	000
<i>Coenonympha inornata</i>	000	oXX	XXX	XXo	000	000
<i>Cercyonis pegala</i>	000	000	ooX	XXX	XXX	000
<i>Cercyonis oetus</i>	000	000	000	XXX	XXo	000
<i>Erebia disa</i>	000	000	Xoo	000	000	000
<i>Erebia discoidalis</i>	ooX	XXX	000	000	000	000
<i>Erebia epipsodea</i>	000	oXX	XXX	000	000	000
<i>Oeneis macounii</i>	000	000	oXo	000	000	000
<i>Oeneis uhleri</i>	000	XXX	XXX	Xoo	000	000
<i>Oeneis alberta</i>	ooX	XXX	XXo	000	000	000
<i>Oeneis jutta</i>	000	000	XXo	000	000	000

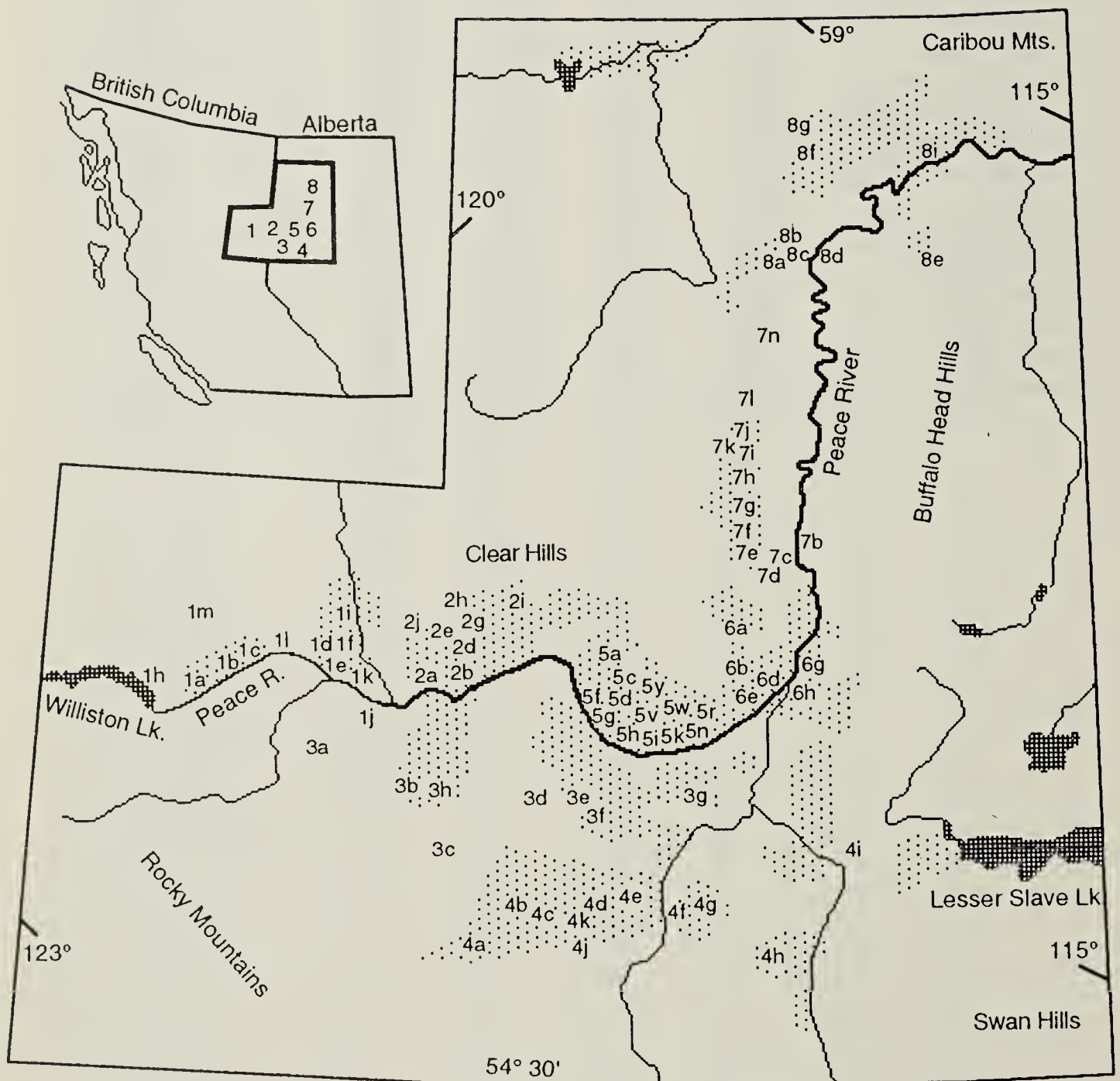


Figure 1. LOCATION OF COLLECTING SITES LISTED IN TABLE 1. Stippled portions show areas identified as containing native grasslands.<sup>25</sup> Insert shows study region within Alberta and British Columbia, with numbers showing eight general collecting areas. Some sites are not shown because they would overlap nearby sites in the figure; missing sites can be related to nearby sites by using Table 1.