

# Butterflies of Herschel Island and Komakuk

Maria Leung 39 Harbottle Rd. Whitehorse, Yukon Y1A 5T2 Email: Leungreid@northwestel.net

## Introduction

Butterflies are potentially good indicators of climate change because they are short-lived, highly visible, and can respond relatively rapidly to changes in habitat conditions. Range shifts of butterflies associated with regional warming have been documented (Crozier 2004; Parmesan 2006) and modeled (Hellman 2001; Peterson et al. 2004). Within the northern tundra of Canada, Herschel Island and Komakuk lie in the area with a particularly rich butterfly fauna (Layberry et al. 1998). This observation, along with the increasing use of Herschel Island as an icon for climate change (CBC 2007), make these sites suitable for establishing a database for detecting changes in butterfly species diversity. Butterfly fauna were sampled at Herschel Island and Komakuk between 2007 and 2009 to form such a database.

Map showing Komakuk and Herschel Island

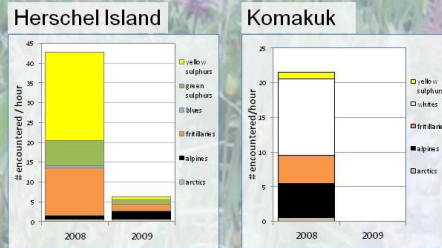


## Sampling Methods

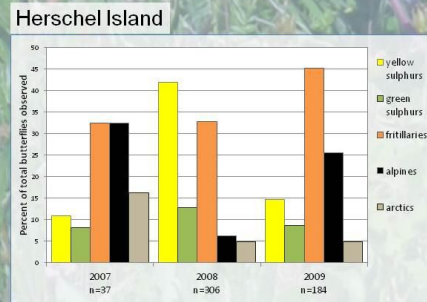
- counts of discernable taxonomic groups along transects.
- collection and identification of voucher specimens.
- documentation of vegetation communities and UTM co-ordinates associated with each specimen.

## Key Findings

1) Relative abundance was reduced with cold spring/early summer temperatures and late snow melt. The adjacent bar graphs show that the rate of butterfly encounter was much greater in 2008 than in 2009. No butterflies were detected at Komakuk in 2009 despite efforts to count them.



2) Butterfly emergence was accelerated when June/early July temperatures are relatively warm and snow persists a short time. The adjacent graph shows that the adult alpinas, which are early emerging butterflies, were likely waning by early July 2008, thus forming a comparatively small proportion of total butterflies found that year on Herschel Island.



3) A total of 21 species of butterflies have now been recorded for Herschel Island, including six newly detected ones during 2007 to 2009. The most species detected was in the warm spring/early summer of 2008 when later emerging species such as the Northern Blue had taken flight.

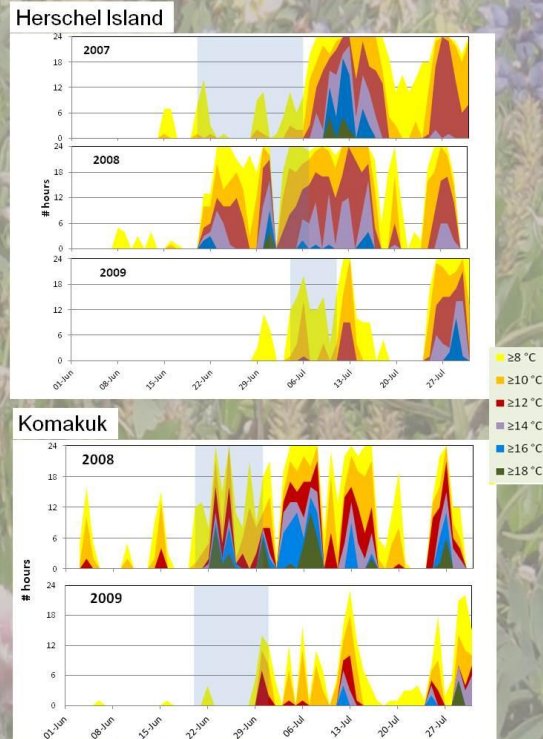
Species	Common Name	2007	2008	2009	pre-1990
<i>Boloria chariclea</i>	Arctic Fritillary	✓	✓	✓	✓
<i>Boloria frigga</i>	Frigga Fritillary	✓	✓	✓	✓
<i>Boloria improba</i>	Dingy Fritillary	✓	✓	✓	✓
<i>Boloria napaea</i>	Mountain Fritillary	✓	✓	✓	✓
<i>Boloria postaria</i>	Polaris Fritillary	✓	✓	✓	✓
<i>Colias canadensis</i>	Canada Sulphur	✓	✓	✓	✓
<i>Colias hecla</i>	Hecla Sulphur	✓	✓	✓	✓
<i>Colias nastes</i>	Labrador Sulphur	✓	✓	✓	✓
<i>Colias paleano</i>	Paleano Sulphur	✓	✓	✓	✓
<i>Colias lyche</i>	Scott's Sulphur	✓	✓	✓	✓
<i>Erebia fasciata</i>	Banded Alpine	✓	✓	✓	✓
<i>Erebia rossii</i>	Ross's Alpine	✓	✓	✓	✓
<i>Erebia youngi</i>	Four-dotted Alpine	✓	✓	✓	✓
<i>Lycæides ides</i>	Northern Blue	✓	✓	✓	✓
<i>Lycæides pholæas</i>	American Copper	✓	✓	✓	✓
<i>Nymphalis antiope</i>	Mourning Cloak	✓	✓	✓	✓
<i>Nymphalis vaualbum</i>	Compton Tortoiseshell	✓	✓	✓	✓
<i>Oeneis melissa</i>	Melissa Arctic	✓	✓	✓	✓
<i>Oeneis polixenes</i>	Polixenes Arctic	✓	✓	✓	✓
<i>Papilio machaon</i>	Old World Swallowtail	✓	✓	✓	✓
<i>Pontia occidentalis</i>	Western White	✓	✓	✓	✓

4) Butterflies on Herschel Island were most commonly found in habitats with many flowers. These were the "Arctic Willow/Dryas-Vetch" and "Arctic Willow/ Lupine Forget-me-not" vegetation types. The degree of shading in the table indicates the degree of association the butterfly species has with the particular habitat. The species are ordered from those with the largest to smaller sample size.

Species	n	Subgrasses/Moss	Arctic Willow/Dryas-Vetch	Willow/Sediment-Catclaw	Sedges/Grasses	Arctic Willow/Lupine/Forget-me-not	Grasses/Chamomile/Wormwood	Willow/Sediment/Lungwort	Sedges/Chamomile/Tar-March	Sedges/Chamomile/Wormwood
<i>Boloria chariclea</i>	40	100	100	100	100	100	100	100	100	100
<i>Boloria improba</i>	36	13.9	22.5	5.6	4.2	13.9	0.0	0.0	0.0	0.0
<i>Colias hecla</i>	33	19.7	21.2	1.5	9.1	19.4	1.5	6.1	0.0	1.5
<i>Erebia fasciata</i>	28	12.5	29.1	12.5	20.4	10.7	0.0	0.0	0.0	1.8
<i>Erebia youngi</i>	27	10.0	25.0	10.0	12.0	33.0	0.0	0.0	0.0	2.0
<i>Boloria napaea</i>	26	15.4	30.0	9.6	1.9	34.6	1.9	0.0	0.0	5.8
<i>Colias nastes</i>	23	2.2	48.7	4.3	0.0	39.1	2.2	4.3	0.0	2.2
<i>Oeneis polixenes</i>	23	17.4	29.3	8.7	6.5	39.0	0.0	4.3	0.0	2.2
<i>Boloria postaria</i>	7	14.3	42.9	14.3	0.0	7.1	0.0	0.0	0.0	0.0
<i>Colias canadensis</i>	7	7.1	50.0	7.1	0.0	35.7	0.0	0.0	0.0	0.0
<i>Oeneis melissa</i>	6	0.0	33.3	33.3	16.7	16.7	0.0	0.0	0.0	0.0
<i>Boloria frigga</i>	3	0.0	18.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Colias lyche</i>	3	0.0	33.3	0.0	33.3	33.3	0.0	0.0	0.0	0.0
<i>Pontia occidentalis</i>	3	0.0	0.0	33.3	0.0	33.3	0.0	33.3	0.0	0.0
<i>Lycæides ides</i>	2	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Lycæides pholæas</i>	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Nymphalis antiope</i>	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

## Weather Comparisons Among Years

The number of hours per day above specified temperatures. The grey areas indicate sampling periods. Note that many more hours of warm temperatures were available in 2008 for butterflies to fly, feed and find mates.



Upland percent snow cover on Herschel Island. The earliest snow melt occurred in 2008, and the latest in 2009.

