

Maritimes Butterfly Atlas

Targeted surveys and general operation

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Report to
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Bog Fritillary (*Boloria eunomia*) - project surveys led to the discovery of five new sites of this species showing that it is not nearly as rare as previously thought. This specimen was photographed at a small bog near Big Bald Mountain, June 28, 2014

Introduction

The Maritimes Butterfly Atlas (MBA) is a citizen science project documenting the occurrence of butterflies in the three Maritime provinces. This is the first atlas of this scale for the Maritimes, and is the first broad-scale citizen science butterfly survey that has been undertaken in Canada. The atlas is modeled after state-level butterfly surveys that are underway or complete in Maine, Vermont, and Massachusetts and after the Maritimes Breeding Bird Atlas. The project was launched in 2010 and its final year has recently been changed from 2014 to 2015.

The purpose of the atlas is to produce a snapshot of butterfly populations in the Maritimes today, providing a baseline dataset for the future. Information gathered will be used to inform conservation decisions, especially with regards to identifying species of conservation concern and their habitats. It will be valuable in the decades to come, as scientists examine effects of climate change and other disturbances on the distribution and abundance of native animal species. In addition, the atlas fosters public education and engagement in the discovery and protection of the Maritimes' natural heritage.

Many butterfly species have specific habitat requirements and often brief flight periods that make them difficult for volunteers to detect. These species are therefore underreported. Four such species in New Brunswick are Dorcas Copper, Bronze Copper, Short-tailed Swallowtail (subspecies *gaspeensis*), and Bog Fritillary. Dorcas Copper, currently known from four locations in the province, only occurs in rich wetlands with an abundance of Shrubby Cinquefoil, the species' larval hostplant. This is a very rare habitat in New Brunswick and documenting more occurrences of this butterfly species would highlight the conservation value of rich wetland sites. Bronze copper is another species of rich wetlands. Originally discovered in New Brunswick in 1980, it is now known from a number of Ducks Unlimited impoundments and salt marshes, nearly all in southeast NB. Prior to the 2014 field season, Bog Fritillary was known from just nine bogs in central and northern NB. It is a rare species at the southern edge of its range that only flies in bogs in late June and early July. Properly documenting the extent of the species' range in the Maritimes during the atlas period is important, as it is a species that may be particularly sensitive to climate change. Short-tailed Swallowtail is species endemic to the Gulf of the St. Lawrence region and adjacent Maine. During the Atlas period the *gaspeensis* subspecies has been found at several inland sites (prior to the atlas only subspecies *bretonensis* was known from New Brunswick, and it was known only from the coast). In 2013, the *gaspeensis* subspecies was found atop two peaks - Squaw Cap and Sugarloaf Mountain. It was almost certainly "hilltopping" at these sites ("hilltopping" is the behavior of congregating at peaks to find a mate; it is exhibited by many rare insect species). Further surveys at other peaks (Big Bald Mountain, Turtle Mountain, Mount Carleton) will likely turn up additional records of subspecies *gaspeensis*. This would highlight the conservation value of such peaks, document the inland range extent of the subspecies in New Brunswick, and serve as a model for surveying in Maine where Short-tailed Swallowtail might be much more widespread than the single record of the species there indicates.

This report provides an update to general MBA progress and results of the targeted surveys for Dorcas Copper, Bog Copper, Short-tailed Swallowtail, and Bronze Copper. Because NB WTF funds were devoted to the targeted surveys emphasis is placed on them.

The Maritimes Butterfly Atlas

2014 (the fifth year of the atlas) was an excellent year. Data from 2014 is still being tallied, but it so far more than 5,500 records have been submitted, and the records total will likely top 6,000. This total was only exceeded in 2012, a year when there was a massive invasion of Red Admirals, American Ladies, and other highly photogenic species. In the first five years of the atlas, the total number of records submitted currently stands at about 25,000. In 2014 approximately 110 volunteers submitted records (the final number is yet to be tallied), similar to the 118 who submitted records in the 2013 field season. In total, about 380 participants have submitted records since the project's inception.

Because results are still being processed, a province-by-province breakdown is not possible. To date, 2014 highlights include the first ever Ocola Skipper record for the Maritimes, relatively large numbers of Hoary Elfin, Striped Hairstreak, Banded Hairstreak, and Acadian Hairstreak records, and the first Early Hairstreak record of the Atlas period.

In the spring of 2014, presentations were given at four naturalist clubs (Miramichi [April 14], Pictou [May 6], Saint John [May 12], and Halifax [June 5]) to communicate results and solicit participation.

Targeted Surveys

In total 15.25 days were spent surveying the targeted species (Bog Fritillary, Short-tailed Swallowtail, Dorcas Copper and Bronze Copper). John Klymko surveyed full days June 24, 27, and 28, July 1, 2, and 3, and August 11, 12, and 13. He surveyed a half day August 26, and a quarter day August 31. Sarah L. Robinson surveyed full days on August 11 and 12, and a half day on August 26. Sarah L. Robinson was present for the August 13 and 14 surveys, but she was collecting data for and her time was covered by a NB Environmental Trust Fund project. Records of all butterflies documented during the surveys will be maintained in the AC CDC database, and specimens collected (including specimens of target species from all locations they were documented) will be deposited in the New Brunswick Museum.

Bog Fritillary

Five days of targeted surveys were conducted for Bog Fritillary. Potentially suitable bog sites were selected from satellite photographs (primarily Google Earth), with help from Dwayne Sabine and Reggie Webster. In total, thirteen sites were visited between June 24 and July 3, and previously undocumented populations were found at five of these sites (see Map 1). Details of sites is provided in Table 1.

In 2014, four additional new populations were found by Reggie Webster and Eric Sullivan, both MBA participants. This brings the total number of known Bog Fritillary sites to 16. Prior to the MBA, Bog Fritillary was known from just six element occurrences, and prior to the 2014 field season, the species was known from just nine element occurrences.

During targeted surveys, Bog Fritillaries were found in both open bog habitat with high graminoid content, and shrub-dominated bog habitat with many hummocks. Given that there are dozens of other unsurveyed bogs within the species' known New Brunswick range extent, it appears that Bog Fritillary is fairly common in the province. It is currently ranked S1S2, however given the results of the MBA and these targeted surveys, S3 or S4 is a more suitable rank. All New Brunswick butterfly ranks are being reviewed in 2015, and a new rank will be discussed and assigned at that time.



Short-tailed Swallowtail photographed at summit of Big Bald Mountain, June 28, 2014

Short-tailed Swallowtail

Surveys for Short-tailed Swallowtail ssp. *gaspensis* were conducted at Big Bald Mountain (June 28), Mount Carleton (July 2), and Bald Peak (July 2 and 3) (see Map 1). Details are provided in Table 2. Short-tailed Swallowtail ssp. *gaspensis* was found at Big Bald Mountain, which represents a new element occurrence.

There are now six inland records of Short-tailed Swallowtail ssp. *gaspensis* in New Brunswick (though one of these, a sight record from Sugarloaf Mountain, could potentially have originated in coastal habitat, and therefore would likely be ssp. *bretonensis*). Short-tailed Swallowtail ssp. *gaspensis* is widespread at least as far south as Plaster Rock, however it is very hard detect.

The hilltop surveys carried out for this project demonstrate the utility of the technique for detecting the species. Future hilltop surveys are recommended in New Brunswick and Maine to better understand the range extent of the *gaspeensis* subspecies.

Dorcas Copper

Surveys were conducted at thirteen sites in August for Dorcas Copper (see Map 1). Three habitat types with Shrubby Cinquefoil, Dorcas Copper's larval host plant, were targeted: rich wetland with a known population of or a high potential for Shrubby Cinquefoil, and coastal barren and riparian meadow with known populations of Shrubby Cinquefoil. In the Maritimes, Dorcas Copper has only been found in rich wetlands, however given that it is found in other types of habitats with Shrubby Cinquefoil elsewhere in Canada there is potential for it away from wetlands here. Of the thirteen sites surveyed, five had Shrubby Cinquefoil in high enough abundance that the site could potentially host Dorcas Copper. Details of the surveys is presented in Table 3. Dorcas Copper was not found at any of these sites, further confirming that the species is truly rare in New Brunswick, and suggesting that it is perhaps limited to rich wetlands in New Brunswick.

Coincidentally, during NB Environmental Trust Fund-funded wetland surveys on August 28, Sarah Robinson and John Klymko stumbled upon a rich fen near Flume Ridge, Charlotte County, with an abundance of Shrubby Cinquefoil. The ensuing search for Dorcas Copper was successful. This newly discovered occurrence is 68km from the next nearest New Brunswick population. It is just the fifth known New Brunswick location for Dorcas Copper.

Bronze Copper

Surveys were conducted at three salt marshes in southwestern New Brunswick (see Map 1). Surveys were conducted late in the day, the period when this species is most active. This deviates from the original plan, which was to survey rich wetlands in the lower Saint John River valley. After consulting with Scott Makepeace and Reggie Webster, it was decided that surveys of salt marshes had a higher potential of discovering Bronze Copper populations of conservation significance. Bronze Copper is known to occur in the estuary of the Musquash River, therefore there is potential for it in saltmarshes in the southwest corner of New Brunswick, where there are no previous records of the species.

Surveys were conducted in late August at Sam Orr Pond, the Bocabec Marsh, and Castalia marsh. Bronze Copper was not located at any of these sites, although it is recommended that surveys at Castalia Marsh are repeated as the weather was not ideal (details are presented in Table 4).

Non-target Species

12 records of 8 species of conservation concern (species with an SRank below S4¹) were recorded at survey sites or incidentally between survey sites. These include single records of Barn Swallow (S3B, COSEWIC-Threatened), Chimney Swift (S2S3B, COSEWIC-Threatened), Eastern Wood-Pewee (S4B, COSEWIC-Special Concern), and Rusty Blackbird (S3B, COSEWIC-Special Concern), and three records for Olive-sided Flycatcher (S3S4B, COSEWIC-Threatened).

67 specimens of non-target butterfly species were collected for the Maritimes Butterfly Atlas, and seven sight records were recorded of uncommon butterfly species. Most significant was the documentation of Jutta Arctic (currently ranked S3). This species was recorded at every Bog Fritillary survey location. Given these results, and the results of the MBA in general (by the end of the 2013 field season it had been documented in 25 atlas squares), the species' rank will need to be reviewed in the upcoming General Status assessment of butterflies.

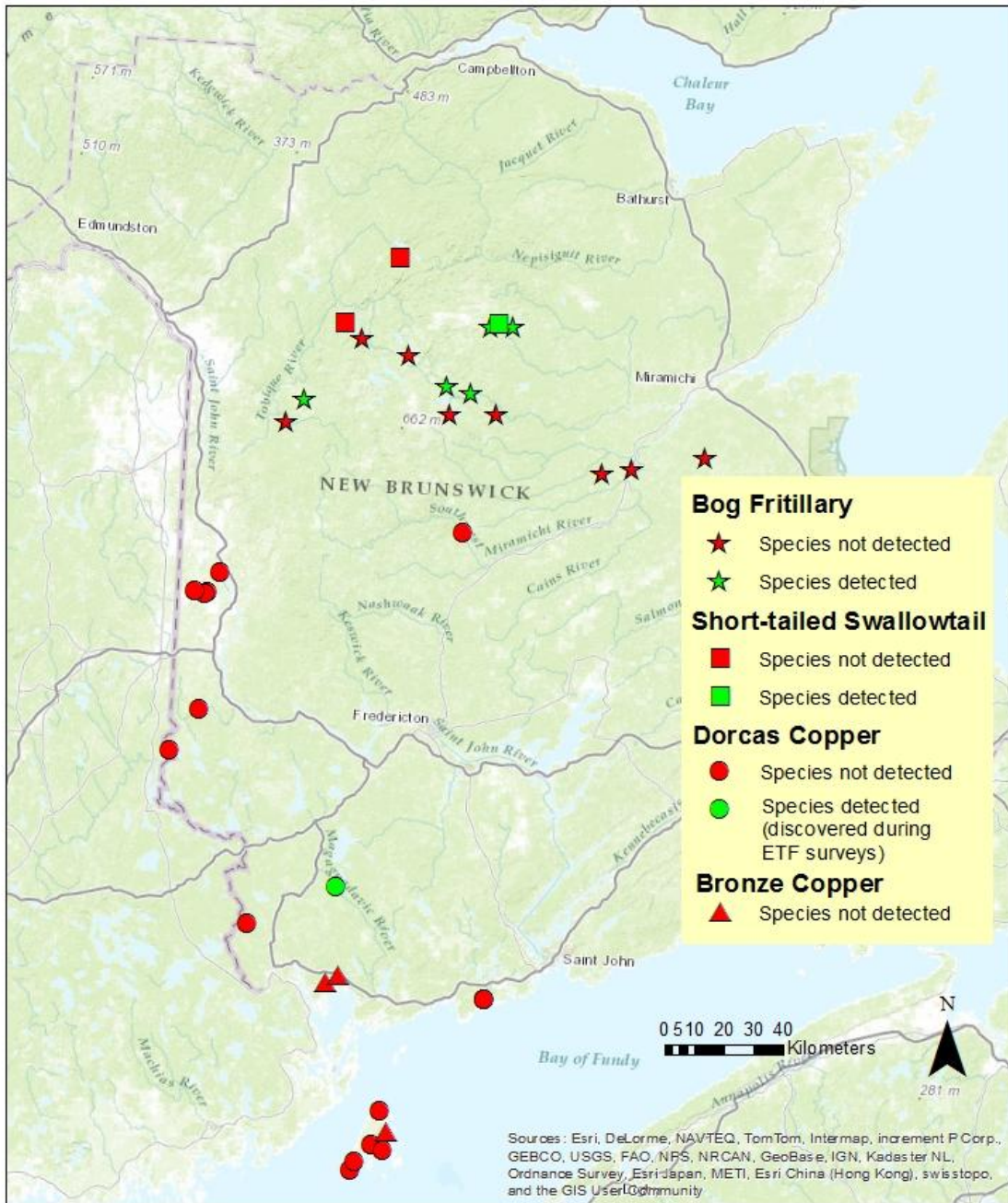
156 non-butterfly specimens from insect groups currently having their General Statuses assessed were collected. Among these are two significant flower fly records: the first ever New Brunswick record of *Dasysyrphus limatus* (found "hilltopping" at Big Bald Mountain) and the third provincial record of *Temnostoma venustum* (also found "hilltopping" at Big Bald Mountain). *Bombus terricola*, a COSEWIC candidate, was documented at four locations.

Details for all these records will be added to the AC CDC database, and insect specimens collected will be deposited in the New Brunswick Museum.

Acknowledgements

Reggie Webster, Dwayne Sabine, and Scott Makepeace assisted in selecting the species to be targeted, and helped with site selection.

¹ SRank definitions are available at <http://accdc.com/en/rank-definitions.html>



Map 1. Locations of targeted surveys.

Table 1. Details of Bog Fritillary Surveys

Date	Coordinates	Site description	Survey period	Temp (°C)	% Cloud Cover	Wind	Bog Fritillary observed	Observer(s)
24-Jun-14	46.7685°N, 65.8060°W	Small bog dominated by Tamarack, Black Spruce, Rhodora, Northern Wild Raisin, Leatherleaf, White Birch, Red Maple, Narrow-leaved Cottongrass (<i>Eriophorum angustifolium</i>).	15:20-15:35	25	0	Medium	No	J. Klymko
24-Jun-14	46.8086°N, 65.4884°W	Large ombrotrophic bog.	16:45-19:00	25	0	Medium	No	J. Klymko
27-Jun-14	46.9124°N, 66.6257°W	Bog complex with various microhabitats.	11:30-14:30	26	0	Light	No	J. Klymko
27-Jun-14	46.7499°N, 65.9374°W	Ombrotrophic bog. Quite shrubby with lots of Black Spruce, Tamarack, Kalmia, Rhodora, Tussock Cottongrass (<i>Eriophorum vaginatum</i>).	17:30-19:00	26	0	Light	No	J. Klymko
28-Jun-14	47.1847°N, 66.4608°W	Bog dominated by Tufted Clubrush (<i>Trichophorum caespitosum</i>), Black Spruce, Tamarack, Small Cranberry, Rhodora, Labrador Tea, Leatherleaf, and Few-seeded Sedge (<i>Carex oligosperma</i>). A fairly dry bog.	12:15-13:15	25	0	Light	Yes	J. Klymko
28-Jun-14	47.1858°N, 66.3574°W	Shrubby bog dominated by Sheep Laurel, Leatherleaf, Black Spruce. Open patches with Tussock Cottongrass (<i>Eriophorum vaginatum</i>) and Labrador Tea. No Tamarack present.	14:15-15:15	25	0	Light	Yes	J. Klymko
01-Jul-14	46.9162°N, 66.4192°W	Treed bog with many openings. Dominated by Tussock Cottongrass (<i>Eriophorum vaginatum</i>), Sheep Laurel, Tussock Sedge (<i>Carex stricta</i>), Leatherleaf, Tamarack, Black Spruce, Few-seeded Sedge (<i>Carex oligosperma</i>).	10:45-11:15	28	0	Light	No	J. Klymko
01-Jul-14	47.0839°N, 66.8189°W	Treed bog dominated by Leatherleaf, Tussock Cottongrass (<i>Eriophorum vaginatum</i>), Sheep Laurel, Labrador Tea, Black Spruce, and Tamarack.	16:40-17:05	28	80	Light	No	J. Klymko
01-Jul-14	46.9793°N, 66.5335°W	Bog with open areas, graminoid rich areas with Few-seeded Sedge (<i>Carex oligosperma</i>), Leatherleaf, Bog Rosemary, Small Cranberry, Black Spruce, Tamarack, Rhodora, as well as shrubby areas with taller Leatherleaf, Rhodora, and Labrador Tea. Bog Fritillary seen in both habitats.	12:10-12:40	30	0	Light	Yes	J. Klymko

Date	Coordinates	Site description	Survey period	Temp (°C)	% Cloud Cover	Wind	Bog Fritillary observed	Observer(s)
01-Jul-14	46.9955°N, 66.6436°W	Edge of large bog. Shrubby with Small Cranberry, Black Spruce, Leatherleaf, Rhodora, Narrow-leaved Cottongrass (<i>Eriophorum angustifolium</i>), Labrador Tea.	14:20- 15:00	34	30	None	Yes	J. Klymko
03-Jul-14	47.1283°N, 67.0268°W	Small, very wet bog at end of pond, with Tawny Cottongrass (<i>Eriophorum virginicum</i>), Few-seeded Sedge (<i>Carex oligosperma</i>), Leatherleaf, etc.	10:00- 10:40	22	30	None	No	J. Klymko
03-Jul-14	46.8657°N, 67.3505°W	Large bog complex including much seemingly suitable habitat.	15:20- 16:45	30	10	None	No	J. Klymko
03-Jul-14	46.9358°N, 67.2727°W	Bog complex with various microhabitats, including graminoid-dominated and shrub-dominated areas.	17:45- 18:20	30	10	None	Yes	J. Klymko

Table 2. Details of Short-tailed Swallowtail *ssp. gaspeensis* surveys

Date	Coordinates	Site description	Survey period	Temp (°C)	% Cloud Cover	Wind	Short-tailed Swallowtail observed	Observer(s)
28-Jun-14	47.1949°N, 47.3783°N	Summit of Big Bald Mountain	9:30- 11:30	24	0	Medium	Yes	J. Klymko
02-Jul-14	47.3783°N, 47.1737°N	Summit of Mount Carleton	10:00- 15:00	27	0	Medium to strong	No	J. Klymko
02-Jul-14			17:30- 18:15	25	0	Medium	No	J. Klymko
03-Jul-14	47.1737°N,	Summit of Bald Peak	12:20- 13:50	25	30	Medium	No	J. Klymko

Table 3. Details of Dorcas Copper surveys

Date	Coordinates	Site description	Survey period	Temp (°C)	% Cloud Cover	Wind	Dorcas Copper observed	Seemingly suitable habitat	Note	Observer(s)
06-Aug-14	45.1353°N, 66.3669°W	Rich fen dominated by Shrubby Cinquefoil, Tussock sedge (<i>Carex stricta</i>), Pickering's Reed Grass (<i>Calamagrostis pickeringii</i>), Sweet Gale, and Eastern White Cedar.	12:10-12:30	15	100	Light	No	Yes	Light drizzle during some of visit. Tapped bushes with net to stir up butterflies (they have been recorded flying in similar conditions in Cape Breton).	J. Klymko
11-Aug-14			18:00-18:20	20	0	Light	No	Yes		J. Klymko and S.L. Robinson
13-Aug-14			11:30-11:45	22	0	Light	No	Yes		J. Klymko and S.L. Robinson
07-Aug-14	46.3311°N, 67.6533°W	Circumneutral fen dominated Slender Sedge (<i>Carex lasiocarpa</i>) the predominant graminoid. No Shrubby Cinquefoil found.	9:45-11:20	23	0	Light	No	No		J. Klymko
07-Aug-14	46.3296°N, 67.6671°W	Circumneutral fen dominated by Slender Sedge (<i>Carex lasiocarpa</i>) the predominant graminoid. No Shrubby Cinquefoil found.	14:15-15:15	25	0	Light	No	No		J. Klymko
07-Aug-14	46.3371°N, 67.7112°W	Fen complex dominated by small patches of Shrubby Cinquefoil (totalling approximately 20 plants) surveyed.	12:00-13:00	25	0	Light	No	Potentially. Only about 20 Shrubby Cinquefoil plants found.		J. Klymko
07-Aug-14	46.3941°N, 67.6030°W	Ice scoured river shoreline. One patch of Shrubby Cinquefoil found.	15:40-16:40	25	0	Light	No	While this site has a patch of shrubby cinquefoil, the ice scour during the spring freshet may prevent this site from being colonized by Dorcas Copper.		J. Klymko

Date	Coordinates	Site description	Survey period	Temp (°C)	% Cloud Cover	Wind	Dorcas Copper observed	Seemingly suitable habitat	Note	Observer(s)
11-Aug-14	46.5530°N, 66.5448°W	Ice scoured river shoreline. Shrubby Cinquefoil very common on both sides of river.	13:50-15:30	22	0	Light	No	While this site has an abundance of shrubby cinquefoil, the ice scour during the spring freshet may prevent this site from being colonized by Dorcas Copper.		J. Klymko and S.L. Robinson
12-Aug-14	44.6011°N, 66.9053°W	Coastal shrub barren with abundance of Shrubby Cinquefoil.	10:30-11:00	20	30	Medium	No	Shrubby Cinquefoil is abundant, however Dorcas Copper is not known to occur away from wetland habitats in the Maritimes and Maine, so there may be other factors preventing Dorcas Copper from colonizing.		J. Klymko and S.L. Robinson
12-Aug-14	44.6243°N, 66.8894°W	High shrub bog, too acidic for Shrubby Cinquefoil.	12:15-12:30	22	30	Light	No	No		J. Klymko and S.L. Robinson
12-Aug-14	44.6817°N, 66.8184°W	High shrub thicket swamp. Shrubby Cinquefoil common with Sweet Gale, Speckled Alder, and Labrador Tea.	13:30-13:50	22	10	Light	No	Yes		J. Klymko and S.L. Robinson
12-Aug-14	44.6636°N, 66.7685°W	Ombrotrophic bog, far too acidic for Shrubby Cinquefoil. One Shrubby Cinquefoil plant found in alder thicket at bog margin.	15:30-17:00	24	10	Light	No	No		J. Klymko and S.L. Robinson
12-Aug-14	44.7844°N, 66.7877°W	Lacustrine shrub swamp dominated by Leatherleaf and Sweet Gale. No Shrubby Cinquefoil present.	18:00-18:30	22	10	Light	No	No		J. Klymko and S.L. Robinson
13-Aug-14	45.3349°N, 67.4011°W	Shrubby ombrotrophic bog. Shrubby Cinquefoil common along slow moving channel.	14:10-15:10	25	50	Light	No	Yes		J. Klymko and S.L. Robinson

Date	Coordinates	Site description	Survey period	Temp (°C)	% Cloud Cover	Wind	Dorcas Copper observed	Seemingly suitable habitat	Note	Observer(s)
13-Aug-14	45.8454°N, 67.7771°W	Shrub and graminoid dominated riparian swamp. No Shrubby Cinquefoil found.	18:00-19:00	23	10	Light	No	No, though shrubby cinquefoil occurs at least sparingly elsewhere on this waterway.		J. Klymko and S.L. Robinson
14-Aug-14	45.9754°N, 67.6588°W	Rich fen with various microhabitats, most promising areas dominated by Eastern White Cedar and Slender Sedge (<i>Carex lasiocarpa</i>). No Shrubby Cinquefoil found.	11:00-13:00	20	100	Medium	No	No, though this is part of a very large wetland complex and pockets with Shrubby Cinquefoil may exist within it.	There was heavy rain during survey. Survey was still relevant, as the discovery of large patches of Shrubby Cinquefoil would have identified the site as a potential Dorcas Copper location	J. Klymko and S.L. Robinson
25-Aug-14	45.4606°N, 67.0253°W	Rich fen dominated by Shrubby Cinquefoil, Broad-leaved Cattail, and Slender Sedge (<i>Carex lasiocarpa</i>).	15:00-15:40	30	0	Light	Yes	Yes	This site visit was part of an Environmental Trust Fund sponsored project.	J. Klymko and S.L. Robinson

Table 4. Details of Bronze Copper surveys

Date	Coordinates	Site description	Survey Period	Temp (°C)	% Cloud Cover	Wind	Bronze Copper Observed	Observer(s)
26-Aug-14	45.1646°N, 67.0435°W	Small saltmarsh.	17:30-18:00	22	0	Light	No	J. Klymko and S.L. Robinson
26-Aug-14	45.1911°N, 66.9938°W	Riparian salt marsh.	18:30-19:00	22	0	Light	No	J. Klymko and S.L. Robinson
31-Aug-14	44.7228°N, 66.7561°W	Small saltmarsh.	15:00-16:00	20	100	Medium	No	J. Klymko