PIERIS VIRGINIENSIS Edwards

IN ONTARIO
Foreword

TEA Occasional Publications No. 5 brings together the data of interest in respect of *Pieris virginiensis* Edwards in Ontario to March 1975.

Particular attention is paid to the history of the Toronto Entomologists' Association endeavours to secure the future of the butterfly in Ontario. As far as is known these endeavours are the first for Canada for lepidoptera.

Acknowledgements

The co-operation of the Toronto Entomologists' Association members who contributed to this publication is gratefully acknowledged. Grateful acknowledgment for the special assistance of members Dr. A. G. Edmund and J.C.E. Riotte and to the Departments of Photography and Arts, all of the Royal Ontario Museum.

Q.F. Hess

(Secretary, TEA)
PIERIS VIRGINIENSIS Edwards IN ONTARIO

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PIERIS VIRGINIENSIS Edwards IN THE HALTON COUNTY FOREST
(by A. M. Holmes (TEA) - January 1975)

The earliest record of Pieris virginiensis in Ontario appears to be that in Edwards 1868-72 (3), who states:

"I have received specimens of virginiensis from Mr. Wm. Saunders of London, Canada and am informed by him that it is there a rare insect."

I have not been able to trace whether any specimens from this time are still preserved in any American museum but there is a specimen labeled by H.S. Saunders in the Royal Ontario Museum dated 28 April 1900, from London, that is undoubtedly Pieris virginiensis so that this statement may well be true and not a confusion with Pieris oleracea.

The next major reference seems to be that of Bethune 1894 and 1896 (1 & 2). In his check list and additions thereto he gives Pieris napi, form virginiensis as occurring at Fort William, Hamilton and Orillia. Since he refers to Pieris napi separately and in other terms, it may be assumed that he appreciated some difference between them. His omission of London is curious since other of his published reports refer to Saunders and to butterflies taken by the latter. His reference to Fort William may not be far fetched or mistaken. Sherman Moore, 1960 (6) gives several counties in northern Michigan where virginiensis is found and it may thus occur north of Lakes Huron or Superior (See: Manitoulin Island).

Scudder 1889 (7) considers virginiensis as a form of oleracea which itself he felt was different from the European Pieris napi. Some of the relations of this complexity are also discussed in Hovanitz 1963 (4) who considered it a matter of personal preference whether napi oleracea and napi virginiensis were separate species or merely subspecies. Hovanitz records oleracea with virginiensis tendencies from London, Huntsville, Sydney Field Station, Marmora, Trenton, Aylmer, Bells Corners, Brittania, South March, Merivale, Constance Bay and Ottawa West; he records virginiensis with oleracea tendencies only from Hamilton.

The early knowledge of virginiensis from Hamilton is substantiated by a specimen in the Canadian National Collection, Ottawa dated May 1881, and two specimens without further data in the Coll. of the Ent. Soc. Ont., University of Guelph.

Without having any precise knowledge of location but inspired by Bethune's reference I studied topographic maps of the Hamilton area and was attracted by the large wooded area indicated around Campbellville. On the 9 May 1965, I visited this area and soon found toothwort (Dentaria) abundant. After only a little exploration, I came on Pieris virginiensis in some numbers. Its occurrence and abundance in this locality has since been established by myself and a number of other collectors and it is generally common over an area of some hundreds of acres.
Specimens in the Royal Ontario Museum and a personal communication from David Dunlop indicate that it was also taken at Bloorvale in Etobicoke in May 1955. This area has now been built over and virginiensis has of course vanished from there. It has also been believed to occur near Manitoulin Island on Great Cloche Island. (Specimen very probably in Brit. Mus. N.H.) (8,9). This now has to some extent been substantiated by its reported occurrence on Manitoulin Island in the 1973 Field Season Summary (5).

It is evident from this brief synopsis that the occurrence of Pieris virginiensis in Ontario is both complex and not well understood. There is a critical need to preserve the established habitat and to determine its possible further range and relation with Pieris oleracea.
REFERENCES


Section 2

PIERIS VIRGINIENSIS Edwards IN THE MANITOULIN ISLAND AREA
(by R. R. Tasker, TEA, January 1975)

Specimens:

1 British Museum "Grand La Cloche Island (Great Cloche) reported by Warren, BCS, 1963. Entomol. Ts. 84: 1-4


3 ♀ coll. R. R. Tasker May 18, 1974 and photographed.

Status:

Most of the soil of the Manitoulin District is so shallow that only a few sites can support the growth of hardwood forest of sufficient luxuriance to contain Dentaria ssp. Nevertheless, there are hundreds of such woodlots in the district, usually small in area, all on Manitoulin and the other small islands, none to my knowledge on Great Cloche. Despite this, Soper, in his botanical survey of the District could find Dentaria diphylla (and no other species) at only 4 stations, only 1 of which was on the main island. The others were on Cockburn and Great Duck Island (which I have never visited). Inner and Western Duck I have examined and contain no suitable habitat. Middle and Outer Duck almost certainly contain no suitable habitat. My observations on the main island support Soper in that Dentaria ssp. are missing from half a dozen apparently suitable areas of forest that I have examined. I was shown an additional station for Dentaria containing both D. diphylla and laciniata by local residents. This site produced all my specimens of Pieris virginiensis. I have not looked for butterflies in the main island station whose location was given me by Jim Soper.

However, not only are suitable sites limited, and Dentaria absent apparently from most of that area, but also from the hardwood forest in general. The habitat so far known to produce Pieris virginiensis in particular is of limited size and heavily exploited for firewood cutting and clearing for farming. The Pieris virginiensis and Dentaria producing woods is at most one square mile, extending on both sides of a concession road, and heavily impinged upon on all sides by clearing/farming. One of my 1974 specimens was taken 1½ miles from this limited site in a fine hardwood stand (also being cut) in which Dentaria was not to be found.

Thus, in summary, the status of Pieris virginiensis is precarious in the Manitoulin District.
PIERIS VIRGINIENSIS Edwards IN THE MANITOULIN ISLAND AREA

It is of interest that Manitoulin is the only Ontario County or District currently boasting all species of white butterflies regularly occurring in Ontario - oleracea - (1 specimen Burpee Twp.); olympia - (Great Cloche Is.); ausonides - (Burpee, Robinson Twps.); rapae, virginiensis and protodice - (Great Cloche Is.).
Section 3

A Preliminary Checklist of the Vascular Plants of the Currie Tract, Halton County Forest, Ontario

(by P. M. Catling, K. L. McIntosh, and S. M. McKay)

In a letter of 30 June 1971, the director of the Parks Branch, Department of Lands and Forests (now the Ministry of Natural Resources) indicated that in order to set aside a part of the Halton Co. Forest, as a protection reserve for the West Virginia White Butterfly (Pieris virginiana) it was important to know the "exact habitat requirements of the butterfly" and "what management steps should be taken to ensure perpetuation of the necessary conditions."

The exact habitat requirements of an organism are sometimes difficult to establish, but a simple listing of the plant species present in the area where the organism is found, is certainly a very useful step in defining its requirements.

The portion of Halton Co. Forest where P. virginiana is most abundant lies within the Currie Tract (southern two-thirds of eastern half of lot 9, conc. IV, Nassagaweya Twp., ca. 43° 40' N.L., 79° 59' E.L.). This entire region is wooded as is much of the surrounding area, so that forest is essentially continuous over an area of at least two square miles. In the eastern section of the Currie Tract, the woodland is composed of Sugar Maple (Acer saccharum) with Black Maple (Acer nigrum), American Elm (Ulmus americana) and Bur Oak (Quercus macrocarpa) frequent in moist low areas, and Ulmus thomasi frequent in some drier areas. White Ash (Fraxinus americana), Bitternut Hickory (Carya cordiformis), Black Cherry (Prunus serotina), Butternut (Juglans cinerea), Basswood (Tilia americana), Ironwood (Ostrya virginiana), Blue Beech (Carpinus caroliniana), and to a much lesser extent Beech (Fagus grandifolia) are scattered (occasionally as small stands) throughout. The shrub layer is not well developed, consisting of widely scattered Leatherwood (Dirca palustris) and occasional Choke Cherry (Prunus virginiana). The herb layer is remarkable for its great diversity (over small distances) and its large biomass values. The early spring ephemerals are so abundant that the forest floor is entirely green during mid-May. The extensive and dense stands of Toothwort (Dentaria diphylla) are especially notable here, since the larvae of P. virginiana are specific to this host plant. Not only does Toothwort grow in large stands in these Maple woods, but it is also very frequent and widespread in the form of single plants and smaller patches. Such an extensive continuous distribution of this plant is unusual.

The woodland vegetation is of the climax or sub-climax type and would probably be best maintained through no manipulation at all. Any clearing of forest would certainly bring about changes that could have a serious effect on the
Equisetum arvense L.
Adiantum pedatum L.
Camptosorus rhizophyllus (L.) Link
Cystopteris bulbifera (L.) Bernh.
Cystopteris fragilis (L.) Bernh.
Dryopteris austriaca (Jacq.) Woynar
Dryopteris marginalis (L.) Gray
Polystichum acrostichoides (Michx.) Schott.
Festuca obtusa Brehler
Schizachne purpurea (Torr.) Swallen
Hystrix paëula Moench.
Milium effusum L. var. cisatlanticum Fern.
Oryzopsis asperifolia Michx.
Oryzopsis racemosa (J.E.Smith) Ricker
Carex arctata Boott.
Carex blanda Dewey.
Carex communis Bailey
Carex convoluta Mack.
Carex deweyana Schw.
Carex formosa Dewey.
Carex gracillima Schw.
Carex hirtifolia Mack.
Carex hitchcockiana Dewey.
Carex laxiflora Lam.
Carex peckii Howe
Carex pedunculata Willd.
Carex plantaginea Lamb.
butterfly population, either through isolation effects (e.g., roads, powerlines, etc.) or through direct destruction of large areas (urban development, fire, etc.). It is important to note that the biological integrity of an area depends largely on the continuing displacement and replacement of both plants and animals across the area. Once an area is made discontinuous through roadway construction or powerlines, etc., the natural mobility of animals and dispersal and replacement of vegetation may be drastically reduced. In isolated communities local extinctions may occur without the possibility of recruitment of new individuals, resulting in a gradual loss of diversity and productivity and a change in species composition.

The following list is very nearly complete with respect to the wooded areas where *P. virginiensis* is most abundant. Some other prominent species of the minor wetland and open habitats have been included.
Carex platyphylla Carey
Carex spargaroides Willd.
Carex sprenglii Dewey
Carex woodii Dewey
Arisaema triphyllum (L.) Schott.
Allium tricoccum Ait.
Erythronium americanum Ker.
Smilacina racemosa (L.) Desf.
Polygonatum pubescens (Willd.) Pursh
Trillium erectum L.
Trillium grandiflorum (Michx.) Salisb.
Orchis spectabilis L.
Epipactis helleborine (L.) Crantz.
Juglans cinerea L.
Carya cordiformis (Wang.) K.Koch.
Carpinus caroliniana Walt.
Ostrya virginiana (Mill.) K.Koch.
Corylus cornuta Marsh
Fagus grandifolia Ehrh.
Quercus macrocarpa Michx.
Ulmus thomasi Sarg.
Ulmus americana L.
Asarum canadense L.
Chenopodium hybridum L.
Claytonia caroliniana Michx.
Caltha palustris L.
Aquilegia canadensis L.
Hepatica acutiloba D.C.
Ranunculus abortivus L.
Thalictrum dioicum L.
Caulophyllum thalictroides (L.)Michx.
Lindera benzoin (L.)Blume
Sanguinaria canadensis L.
Dicentra canadensis (Goldie)Walp.
Dicentra cucullaria (L.)Bernh.
Dentaria diphylla Michx.
Dentaria laciniata Muhl.
Dentaria maxima Nutt.
Tiarella cordifolia L.
Mitella diphylla L.
Geum canadense Jacq.
Geranium robertianum L.
Zanthoxylum americanum Mill.
Prunus serotina Ehrh.
Prunus virginiana L.
Rhus radicans L.
Euonymus obovatus Nutt.
Acer saccharum L.
Acer nigrum Michx.f.
Tilia americana L.
Cubelium concolor Raf.
Viola adunca Sm.
Viola canadensis L.
Viola conspersa Reichenb.
Viola eriocarpa Schw.
Viola papilionacea Pursh.
Viola pubescens Ait.
Viola rostrata Pursh.
Viola sororia Willd.
Dirca palustris L.
Circaea lutetiana L. ssp. canadensis (L.) Ashers & Magnus
Panax trifolium L.
Sanicula marilandica L.
Cornus alternifolia L.f.
Fraxinus americana L.
Phlox divaricata L.
Hydrophyllum virginianum L.
Veronica officinalis L.
Galium aparine L.
Galium circaezans Michx.
Eupatorium rugosum Houtt.
Solidago caesia L.
Solidago flexicaulis L.
Erigeron pulchellus Michx.

Bryophytes
Anomodon attenuatus (Hedw.) Hub.
Atrichum undulatum (Hedw.) P. Beauv.
Grimmia apocarpa Hedw.
Mnium cuspidatum Hedw.
Orthotrichum anomalum Hedw.
**Conocephalum conicum** (L.) Dumort

**Marchantia polymorpha** L.

**Radula complanata** (L.) Dumort

**Early Spring Fungi** (ident. by R. F. Cain and V. Ziuraitus)

**Urnula craterium** (Schw.) Fr.

**Sarcosypha coccinea** (Jacq.) Pers.

**Morchella angusticeps** Peck

**Verpa bohemica** (Krambh.) Schrot.

**Peziza repanda** Pers. ex Fr.

**Scutellinea scutellata**
Section 4

LIFE HISTORY OF PIERIS VIRGINIENSIS Edwards
- BASED ON OBSERVATIONS FROM 1969 to 1974
IN THE HALTON COUNTY FOREST AREA
(by Walter Plath, Jr. (TEA) - April 1975)

The flight period of P. virginiensis begins at the end of April with the peak around May 10, depending on the weather conditions, and ends about May 20 to 25. The females appear about one week later than the males. The species is single brooded.

Two species of Dentaria are common and are the possible foodplants in the Halton County Forest. These are Dentaria diphylla and Dentaria laciniata. But Dentaria diphylla only seems to be the foodplant. Every effort has been made to find the eggs on Dentaria laciniata, but none were found. On some plants of Dentaria diphylla up to ten eggs were laid. The reason for this seems the earlier disappearance of Dentaria laciniata, about end of May to beginning of June, while D. diphylla stays green fourteen days longer.

Another important factor is the weather conditions in early May. If early May has sunshine, eggs are found in any area of the forest. In other years with a cold and rainy season, eggs are not to be found till mid May. When the leaves of trees and shrubs start to develop, eggs are found in areas only where sunshine still hits the ground. Sunshine seems to be necessary for the females to lay their eggs.

The larval life tends to be short, not longer than three to four weeks. Under different conditions (indoor rearing) it took sixteen days from the egg to the pupa stage.

On the larvae collected outdoors, no parasitic wasps were observed such as breed in great numbers on Pieris rapae.

No pupa were found in the forest. In Europe you always will find the pupa of Pieris rapae and Pieris brassicae in great numbers on the bark of trees surrounding cabbage fields. As there were no pupa found on the bark of the trees, the only possibility is the limestone. Probably beneath, where the rocks cover the ground very loosely, it gives the pupa which spends almost eleven months in the pupal stage good protection against birds.

The Egg

The eggs are elongate, spindle-shaped, and marked with fine ribs, which are finer than in Pieris oleracea and Pieris rapae. The colour is whitish-yellow. The eggs are laid on the underside of the leaves of the foodplant, Dentaria diphylla. The egg-stage is about three to four days, not longer.
The Larva

The small larva partly eats the eggshell. The colour is whitish-yellow. After the larva has eaten some plant tissue, it appears to be green in colour. But coloration of the larva takes place after the second moulting (third instar). From the first to the fourth instar the larva has many small white wartlets, each one having a tubular bristle that secrets liquid, probably very attractive to ants. In the last and fifth instar the larva appears downy with short white hair. The coloration is dark yellowish green with many tiny darker green spots.

The Pupa

The pupa is suspended by both the cremaster and a girdle. The pupa appears as whitish yellow and green partly spotted with black. The pupa is very slender with a frontal prominence longer than in other species of Pieridae.
Section 5
Records of Pieris virginiensis Edwards in Museums and Private Collections

1. Canadian National Collection, Ottawa
(Please refer to letter of December 31, 1974, to J.C.E. Riotte from J. Donald Lafontaine which is attached.)

2. Royal Ontario Museum, Toronto

<table>
<thead>
<tr>
<th>No. of Specimens</th>
<th>Locality</th>
<th>Date</th>
<th>Collector</th>
</tr>
</thead>
<tbody>
<tr>
<td>*2</td>
<td>Etobicoke Twp., Ont.</td>
<td>1 &amp; 15.V.1955</td>
<td>ex. coll. Dunlop</td>
</tr>
<tr>
<td>*1</td>
<td>St. Hilaire, Quebec</td>
<td>24.V.1900</td>
<td>ex. coll M.C.Nielsen</td>
</tr>
<tr>
<td>1</td>
<td>Emmet Co., Michigan</td>
<td>11.V.1965</td>
<td>coll. Holmes, Riotte,</td>
</tr>
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<td>27</td>
<td>Campbellville</td>
<td>27.IV to 16.V, 1965 to 1969</td>
<td>Catling, Thornycraft</td>
</tr>
<tr>
<td>2</td>
<td>Manitoulin Island</td>
<td>20.V.1973</td>
<td>coll. Tasker</td>
</tr>
<tr>
<td>*</td>
<td>now extinct at this locality</td>
<td></td>
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</tr>
</tbody>
</table>

3. British Museum Collection, England

1 Grand La Cloche Island reported by Warren, 1963
Entomol. Ts. 84: 1-4

4. University of Guelph Collection, Guelph

2 Hamilton, Ontario (reported by Dr. Pengelly on Feb. 5, 1975)

5. Collection of Dr. A. G. Edmund, Toronto

2 Campbellville, (Halton County Forest) April 28, 1968
2 "            May 28, 1968
    "        April 20, 1968
    "        May 4, 1969
    "        May 16, 1967

6. Collection of S. M. Daniels, Toronto

Campbellville, (Halton County Forest) April 30, 1968
" April 26, 1969
" May 16, 1969
" April 25, 1970
" April 28, 1970
" May 5, 1971
" May 10, 1971
none seen April 29, 1972
40 + seen May 8, 1972
Still Abundant Campbellville May 21, 1973
7. **Collection of R. R. Tasker, Toronto**
   
   4 - ♀ Manitoulin Island, May 20, 1973
   3 - ♂ Manitoulin Island, May 18, 1974

8. **Observations of W. W. Wodek, Oakville**
   
   300 + seen, Campbellville, May 5-10, 1974
   (Halton County Forest)
December 31, 1974.

Very Reverend J. C. E. Riotte,
Entomology Section,
Royal Ontario Museum,
100 Queen's Park,
Toronto, Ontario.
M5S 2C6

Dear Father Riotte:

I have enclosed a list of the specimens of *Pieris virginiensis* in the C.N.C.

Mr. Sheppard at the Lyman Museum in Montreal makes a special trip each year to try to collect *P. virginiensis* but has not seen any for quite a few years. You would have to contact him to find out when the species was last known to occur there.

It would certainly appear that this species is indeed endangered in Canada for even suitable, unexplored habitat is skimpy and is disappearing rapidly.

Sincerely yours,

J. Donald Lafontaine,
Lepidoptera-Trichoptera Section.

JDL:er

Encl. (1)
Ontario:

Hamilton - May 1881
Halton Co. Forest
Nassagaweya Twp.
Lot 10 Line IV
P. D. Syme 396

Quebec:

Montreal
2 May 1903
Chas. Stevenson

Montreal
2 May 1903

Montreal
17 May 1903

Montreal 1898
Brainerd

Ile Perrot, Que.
26 May 1950
D. F. Hardwick
26 May 1950
T. N. Freeman
12 April 1945
E. G. Munroe
Section 7

PIERIS VIRGINIENSIS Edwards IN ONTARIO

by Quimby F. Hess, Toronto Entomologists' Association
(for The Xerces Society)

Status of the Butterfly

The status of the white butterfly, Pieris virginiensis, in Ontario has been of concern to certain lepidopterists since 1969. Despite a recent organized search, it is believed to exist in Ontario at present in only two localities, both within the Niagara Escarpment region. A viable colony is present in Halton County about 20 miles west of Toronto near Campbellville, and a smaller precarious colony has been located on Manitoulin Island. Both finds were made by members of the Toronto Entomologists' Association.

According to specimens in the Royal Ontario Museum, Toronto, and the Canadian National Museum, Ottawa, the butterfly has occurred in Ontario in Hamilton (1881); London (1900); Etobicoke (1955); Campbellville (Halton County Forest) (1965 to 1974); and Manitoulin Island (1973, 1974). The insect has also been collected near Montreal, (Province of Quebec) (1898, 1903), Ile Perrot, Quebec (1945, 1950) and St. Hilaire, Quebec (1900). It is now considered extinct in the Ontario and Quebec localities, excepting Halton County Forest and Manitoulin Island. According to Bethune 1894 and 1896 (1 & 2) form virginiensis also occurred at Fort William and Orillia.

How the Butterfly was Found in Ontario

It is of interest that A.M. Holmes, on the basis of Bethune's reference, studied topographic maps of the Hamilton area and was attracted by the large (2 square miles) wooded area around Campbellville. On May 9, 1945, he visited the area and soon found Toothwort (Dentaria) abundant. After only a little exploration he came upon Pieris virginiensis. Similarly, R. Tasker noted the occurrence record for P. virginiensis in the British Museum for "Grand La Cloche Island" reported by Warren, BCS 1963, Entomol. Ts. 84: 1-4. Gathering local knowledge in the Manitoulin region of the occurrence of Toothwort (Dentaria ssp.) and checking out such information he found one area of Dentaria in which he collected four specimens on May 20, 1973 and three specimens the following year on May 18, 1974. This is in an area of one square mile being heavily exploited for firewood and also being cleared for farming.
PIERIS VIRGINIENSIS Edwards IN ONTARIO

Protection of the Butterfly

By 1969 heavy collecting pressure on the virginiensis colony near Campbellville, as well as the surrounding urbanization developments, began to alarm certain members of the Toronto Entomologists' Association. Fortunately, the main part of the butterfly colony was centered in a portion of the Halton County Agreement Forest (owned by Halton County and managed under agreement by the Minister of Natural Resources) known as the Currie Tract. This is in the southern two-thirds of eastern half of lot 9, concession IV, Nassagaweya township, ca. 43° 40'N.L., 79° 59' E.L. This entire region is wooded as is much of the surrounding area, so that forest is essentially continuous over an area of at least two square miles.

The woodland vegetation is of a climax hardwood type, mainly maple, but with other species also. The area is notable for its extensive and dense stands of Toothwort (Dentaria diphylla) which is the host plant for virginiensis. Not only does Toothwort grow in large stands in these maple woods, but it is frequent and widespread in the form of single plants and smaller patches (3). Any clearing of the forest would bring about changes that could have a serious effect on the butterfly population, either through isolation effects, e.g., roads, transmission lines, etc., or through direct destruction through urban development, fire, pesticide application, etc.

In 1969 the writer, through his work (as a forester) with the Ministry of Natural Resources, suggested to the Toronto Entomologists' Association that the Minister be made aware of the value of maintaining the Currie Tract, in part, as the habitat of Pieris virginiensis. Key personnel in the Ministry were advised of the special interest and they co-operated in protecting the habitat. In 1971, Dr. Paul M. Catling followed up the contact with the Ministry of Natural Resources in respect of protecting the habitat of virginiensis. The result, during the period 1969 to 1974, was that Ontario government officials became aware of the special interest in the Halton County Forest and the Association received assurances that the special habitat requirements would be protected and maintained which was, in fact, the case.

With the passing of The Endangered Species Act, 1971, the Association decided unanimously in 1974 to work towards the Ontario Government placing Pieris virginiensis on the list of endangered species under a regulation of that Act. The achievement of this endeavour, through the submission of a brief to the Minister of Natural Resources in March 1975 over the signature of Association President, Dr. A. Gordon Edmund, coupled with the assistance of other interested people, should result in success.
PIERIS VIRGINIENSIS Edwards IN ONTARIO

Thus, the citizens of Ontario, through their government, will provide the butterfly, Pieris virginiensis, with a better chance for survival against the encroachment of man.

References:


3. Catling, P.M., McIntosh, K.L., McKay, S.M. A preliminary checklist of the Vascular plants of the Currie Tract, Halton County Forest, Ontario
Ref: Your letter of June 26, 1974

Dear Mr. Bernier:

This is a tardy response to your letter in which you requested more information regarding the endangered butterfly commonly known as the Virginia White. The need for its conservation appears to be more pressing than ever, and I have spent some time amassing data for your consideration.

STATEMENT OF THE PROBLEM

The small white butterfly, *Pieris virginiensis* has been the subject of concern for many Ontario naturalists for several years. As mentioned in my letter of June 10th, 1974, to you, the only remaining viable population of this early spring species is confined to the Halton County Forest. We understand that this area is menaced by the construction of power transmission lines and gravel quarries, and urge you to arrange its preservation. We believe this could be done most effectively under the Endangered Species Act. Preservation of the forest would provide a haven not only for *Pieris virginiensis* but also many other animals and plants.

In your letter you asked for documentation regarding the problem. Members of the Toronto Entomological Society, in cooperation with the Royal Ontario Museum and other organizations have amassed a considerable amount of data which is summarized below. The raw data is, of course, available on request.
HISTORICAL RECORDS OF P. VIRGINIENSIS in CANADA

There is a mention in the literature of a specimen collected near London, Ontario, around 1870. The earliest known specimen in a museum is in the Canadian National Collection, and was collected near Hamilton in May 1881. The R.O.H. has one from near London, Ontario, dated 28th April, 1900. Two specimens were taken on May 1st and May 15th in Etobicoke Twp., Ontario in 1955. No further specimens have been found since in any of these areas. Because of extensive commercial development, the habitats have been drastically altered and we assume the butterfly is extinct in Southern Ontario except in the Halton County Forest.

Outside Ontario, P. virginiensis is known from Montreal (nine individuals only, dated between 1898 and 1903), Ile Perrot, Quebec (eleven individuals dated 1945 to 1950), and St. Hilaire, Quebec, dated 1900. Because of the paucity of these older records and complete absence of more recent reports, despite intensive searching, it is assumed that the species is now extinct in Quebec. It has not been reported from any other Canadian province.

RECENT RECORDS

Practically all records in recent years are labelled either Campbellville or Halton County Forest, and the dates for the adults range from April 20th to May 28th. The area has been visited annually by several members of the Toronto Entomological Association since 1968 and fairly good numbers of P. virginiensis were seen each year.

The other part of Ontario currently supporting a small population of P. virginiensis is in the Manitoulin area, where it was first reported in 1963. Despite considerable effort, only seven specimens were collected in 1973 and 1974. The areas where the larve food plant is found are severely restricted and are rapidly being altered by logging and agriculture. Clearly the status of P. virginiensis in the Manitoulin area is precarious, and this population will almost certainly disappear in the very near future.

Pieris virginiensis is not a well-studied butterfly. It is closely related to Pieris napi and P. oleracea, and demands intensive genetic and ecological study. The adult lives only a few weeks, and most of the life cycle is spent as the pupa. The flying time of the adults and the feeding time of the larvae coincide with the brief life of the host plant, the toothwort Dentaria diphylla. Our current knowledge indicates that this is the only plant which is both edible to the larva and which persists long enough to permit development to the pupal stage.

The conditions in the Halton County Forest apparently are ideal for P. virginiensis. There are dense stands of Dentaria diphylla in the predominantly maple woods. While the exact requirements of the butterfly in all its life stages are not thoroughly known, it is obvious that they are uniquely met in this area, and that the conditions have been destroyed elsewhere.
The portion of Halton County Forest where *P. virginiiensis* is most abundant lies within the Currie Tract (southern two thirds of the eastern half of lot 9, conc. IV, Nassagaweya Township, approximately 43° 40' N, 75° 59' E). This area of forest is essentially continuous over an area of at least two square miles.

The woodland vegetation is of the climax or sub-climax type and would probably best be maintained through no manipulation at all. Any major disturbance would certainly bring about changes that would have a serious effect on the *P. virginiiensis* population. It is important to maintain the biological integrity of the area, especially in view of the small size of the community. If it were cut by roadways, powerlines, quarries or logging on any scale, the natural mobility and dispersal of the animals and plants would be drastically reduced. The fragile balance making possible the continuing existence of *P. virginiiensis* would almost certainly be upset.

Members of the Toronto Entomological Association have studied the wooded areas where this butterfly is most abundant, and the consensus is that the best management would be to declare the area described above as a nature preserve, with no logging or other interference permitted. This decision is proposed since the area is a typical mixed hardwood forest at or near climax stage. If any other type of management (e.g. thinning) were to be considered, it should be undertaken only after careful study. The gravest threat to the stability of the fauna and flora is not in leaving the forest untended, but in permitting it to be disturbed.

The recommendation of the Association, therefore, is that the area be declared a nature preserve. Further, a buffer zone in which no interference is permitted should be set aside. A one-mile wide surrounding strip would be minimal, and a two-mile strip would be more desirable.

As a further step, we ask that the butterfly *Pieris virginiiensis* be immediately given protection under the *Endangered Species Act*. Such protection should specify not only the protection of the butterfly in all its life stages, but also of the habitat as described above.

Your close attention to this request in view of the construction currently being considered for the area will be most welcome. We respectfully ask you to examine current proposals regarding power lines, quarries and other projects, and to use your good offices to find alternative sites for such projects.

The data on which this proposal is based was gathered over several years by many members of the Toronto Entomological Association and by other professional and amateur biologists. If you have need of detailed ecological, life history, historical or distributuional data, please do
not hesitate to let me know. We are most eager to see this rare and unusual Ontario resident saved from extinction.

Sincerely,

Dr. Gordon Edmund
President
Toronto Entomological Association.
June 26th, 1974.

Dr. Gordon Edmund,
President,
Toronto Entomological Association,
Royal Ontario Museum,
100 Queen’s Park,
Toronto, Ontario.
M5S 2C6

Dear Dr. Edmund:

Thank you very much for your letter of June 10th suggesting that consideration be given under The Endangered Species Act to the status of the butterfly species, *Pieris virginiensis*.

One or two people have mentioned this species of butterfly to members of our fish and wildlife staff upon occasion but none have provided documentation up to now, which is necessary for us to consider when setting out the regulation.

With reference to documentation, I am sure that you will appreciate that in order to maintain the degree of authenticity which is essential to the success of The Endangered Species Act and Regulations, good scientific reasons for the protection of any species should be advanced. A number of suggestions have been made to protect relatively common species, particularly plants such as the trillium, and while there may be merit in some of these suggestions, the majority have never been of the type which dealt with known species whose existence was endangered.

I am sure that you appreciate too that we do not have on our Ministry staff people who are sufficiently expert with respect to many species that they can develop the documentation on their own. For this reason, we do depend upon suggestions of people like yourself. Is it possible that you could forward
to Mr. K. K. Irizawa, Executive Director, Division of Fish and Wildlife, the scientific material which you may have on hand and which would support your recommendation. Copies of these will then be placed in our Endangered Species Record Book and will form the basis for a Regulation after consideration by those of my staff who are charged with this responsibility.

Once again I would like to thank you very much for your interest in this matter.

Yours sincerely,

Leo Bernier,
Minister.
The Honourable Leo Bernier
Minister
Ministry of Natural Resources
Whitney Block
Queen's Park
Toronto, Ontario

Dear Sir:

At a meeting of the Toronto Entomologists' Association it was resolved that an application should be made to you concerning the status of the butterfly species Pieris virginiana. This is a small white butterfly appearing mostly during May. Research by members of the Toronto Entomological Association and by others has determined that, in Ontario, it's occurrence is confined to the Halton County Agreement Forest near Campbellville. This habitat is now threatened by the encursion of power transmission lines and quarries. We therefore, respectfully request that Pieris virginiana be accorded protection under the Endangered Species Act, R.S.O. Because of the very restricted range of this butterfly, and because of the value of this area as a relatively intact natural feature, every effort should be made to preserve the forest and to give specific legal protection to the butterfly.

To be scientifically precise, mention should be made of a very few individuals of Pieris virginiana caught on Manitoulin Island. Intense surveying by several individuals has failed to yield any evidence of a secure breeding colony. Because of accelerating deterioration of the environment in the Manitoulin area we feel confident that the Halton County Forest represents the last foothold of Pieris virginiana.

Your cooperation in aiding in this conservation project will be gratefully appreciated.

Sincerely,

Dr. Gordon Edmund
President
Toronto Entomological Association
Dr. Paul H. Catling,  
104 Victoria Pk. Ave.,  
Toronto 13, Ontario.

Dear Sir:

Please accept this as further confirmation that the colony of Pieris virginiana, centred in the Currie tract of the Halton Co. Forest, is a phenomenon that is fully appreciated and will not be destroyed.

We shall be happy to set the area aside as a Nature Reserve when we know: A. What are the exact habitat requirements of this butterfly.

B. How much of the area has to be set aside in order to preserve the habitat (including buffer).

C. What management steps can be taken to ensure perpetuation of the necessary conditions (consider doing no manipulation at all as a form of management).

Obviously, the latter is the most difficult to answer but is also the area in which we are most likely to be in trouble. May we have your assistance in determining a logical management plan if the area is formally established? Any assistance you can give us in this matter would be very much appreciated. In the meantime, we consider non-disturbance as the only protective device at our disposal, but this is not likely to be a permanent solution.

Yours truly,

P. Addison, Director  
Parks & Recreation Areas Branch.
Dear Sir:

Re: Your phone call of May 8, 1969-Pieris virginiensis Reserve - Currie Tract, Halton County - S2/3 of E½ of Lot 9, Concession IV, Nassagaweya Township

As requested please find herewith 2 copies of a plan of the above area on which is indicated the boundary of the 67 acres proposed as a protection reserve for the maintenance of the gene pool of this only breeding colony in Ontario of this early spring Lepidoptera. It would be very much appreciated if your executive could indicate their views and further proposals with respect to this matter by letter and map to the District Forester, Mr. F. L. Hall, Department of Lands and Forests, Hespeler, Ontario.

Mr. Hall showed me aerial photos of the area taken some years apart. A comparison of the tree growth on the basis of these photos indicates that the area in question has had a considerable closing of the tree canopy which may have an effect on the food-plant of the insect, i.e. toothwort. It may therefore be necessary to remove trees in accordance with the management plan for the area but this should be helpful to the maintenance of the toothwort. Pesticides will not be used in the area.

Continued...
We are pleased to be of assistance in this matter and also that your organization is concerned with the maintenance of this bit of unique fauna in Ontario, especially since it is part of the Niagara Escarpment.

Yours very truly,

A. J. Herridge, Chief, Timber Branch.

c.c. District Forester,
Hespeler, Ontario.
c.c. H. N. Middleton,
Timber Section.
Pieris virginianiensis Edw.
1 Adult on food plant
2 Egg
3 Larva
4 Pupa
5 Habitat at Campbellville

Photographs:
1-4 W. Plath
5 J.C.E. Riotte