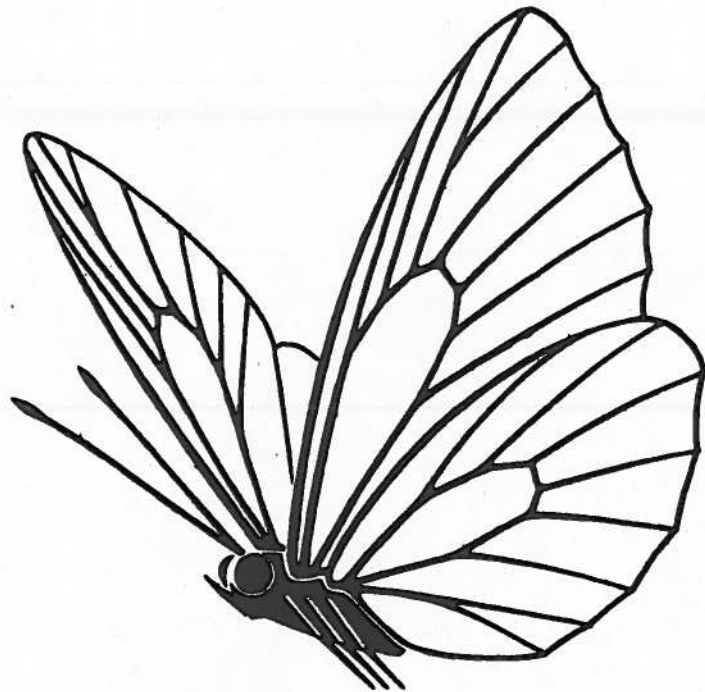


TORONTO
ENTOMOLOGISTS
ASSOCIATION

BACKUS WOODS

PROJECT

1985



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Quimby F. Hess & Alan J. Hanks

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BACKUS WOODS PROJECT

1985 INVENTORY OF FLORA AND FAUNA (INSECTS)

Quimby F. Hess & Alan J. Hanks

1. INTRODUCTION

Dr. J. Paul Prevett, Regional Ecologist, Ministry of Natural Resources, Southwestern Region (659 Exeter Road, London, Ontario, N6A 4L6) - Chairman of the Backus Committee, forwarded a letter to the senior writer dated March 19th, 1985. This letter suggested that the Committee would be willing to fund a study of the insect fauna of the Backus Woods by the Toronto Entomologists Association, if it was completed and a report submitted around November of 1985.

The proposal was accepted by the T.E.A. at a meeting held on March 23rd, 1985 and it was agreed that some members would meet with Dr. Prevett at Backus Woods on May 26th to start the project. The field studies were to include the following:

Butterflies - various T.E.A. members.

Moths - Mike Matheson & Hal Donly.

Dragonflies - Ron Lyons.

Beetles - Henry Frania (Royal Ontario Museum).

As many trips as possible would be made during the summer months in order to obtain a reasonable amount of information.

2. SCOPE OF STUDY

The study was carried out by members as noted above over the period May 18 to September 3, 1985. The methods used were as follows:

a) Butterflies:

A combination of capture and collection; capture, identification and re-release and visual observations were used. The captured specimens reside in the collections of the individual T.E.A. members.

b) Moths:

Blacklighting was carried out on two separate occasions by T.E.A. members. Daytime observations were made of day-flying types and a few species were identified after larval capture and rearing.

c) Dragonflies & Damselflies:

A number of visits were made by one T.E.A. member - mainly centered around the two ponds within the study area and the sand road that divides it. Some twenty species were recorded, of which sixteen were identifiable.

d) Beetles:

Although no specific on-site work was carried out, a member of the staff of the Royal Ontario Museum (Entomology Department) has collected in the area. His listing of Carabidae is included.

3. BACKUS WOODS

a) The Backus Woods is located within lots 14, 15 & 16 - Concessions 3 & 4 of South Walsingham township, Norfolk county, Ontario. The area is located about twenty miles to the southwest of the town of Simcoe in the Big Creek Conservation Authority.

The study area as defined by Dr. Prevett is bordered on the north by Highway # 24 and on the south by a sand road along Concession 4. This tract has an internal road system from north to south, marked trails and a network of posted reference points (refer to the map on page 4).

b) The Backus Woods is a remnant of the former extensive southern deciduous forest which covered part of southwestern Ontario when the first explorers arrived in the region. Much of the forest is dominated by stands of Sugar Maple, Beech and Oak. Also occurring is American Chestnut, Sassafras, Kentucky Coffee Tree, Tulip Tree, Flowering Dogwood, Cherry, Sour Gum, Butternut, Hickory, Basswood, Hemlock, Ash, etc... There are also some plantations.

Because of the age and density of the trees, the canopy is closed and thus during the growing season the forest floor is heavily shaded.

NAME Backus Woods	MAP NAME Long Point	MAP NUMBER 40I/9	UTM REF. 420230
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Also on 40I/10

COUNTY, DISTRICT or REGIONAL MUNICIPALITY Haldimand - Norfolk	LAT. 44° 40' N	LONG. 80° 29' W	ALT. MIN. MAX. ca. 650-700 ft.
LOCALITY 5 km northwest of Port Rowan, west of Dedrick Creek	1:50,000 NTS MAP SHOWING AREA, BOUNDARIES 1:250,000		
TOWNSHIP LOTS CONCESSIONS South Walsingham			
AREA approx. 1040 acres approx. 420 ha			
OWNERSHIP			
ADMINISTRATION			
FOREST REGION AND DISTRICT SITE REGION AND DISTRICT D-1 7-2			
MNR REGION AND DISTRICT CONSERVATION AUTHORITY SW-Simcoe Long Point C.A.			
AERIAL PHOTOGRAPHS	BASE MAP: 426802		
YEAR ROLL FLIGHT LINE NUMBERS			
1978 214 4247 101-104			
1978 214 4246 81-84			

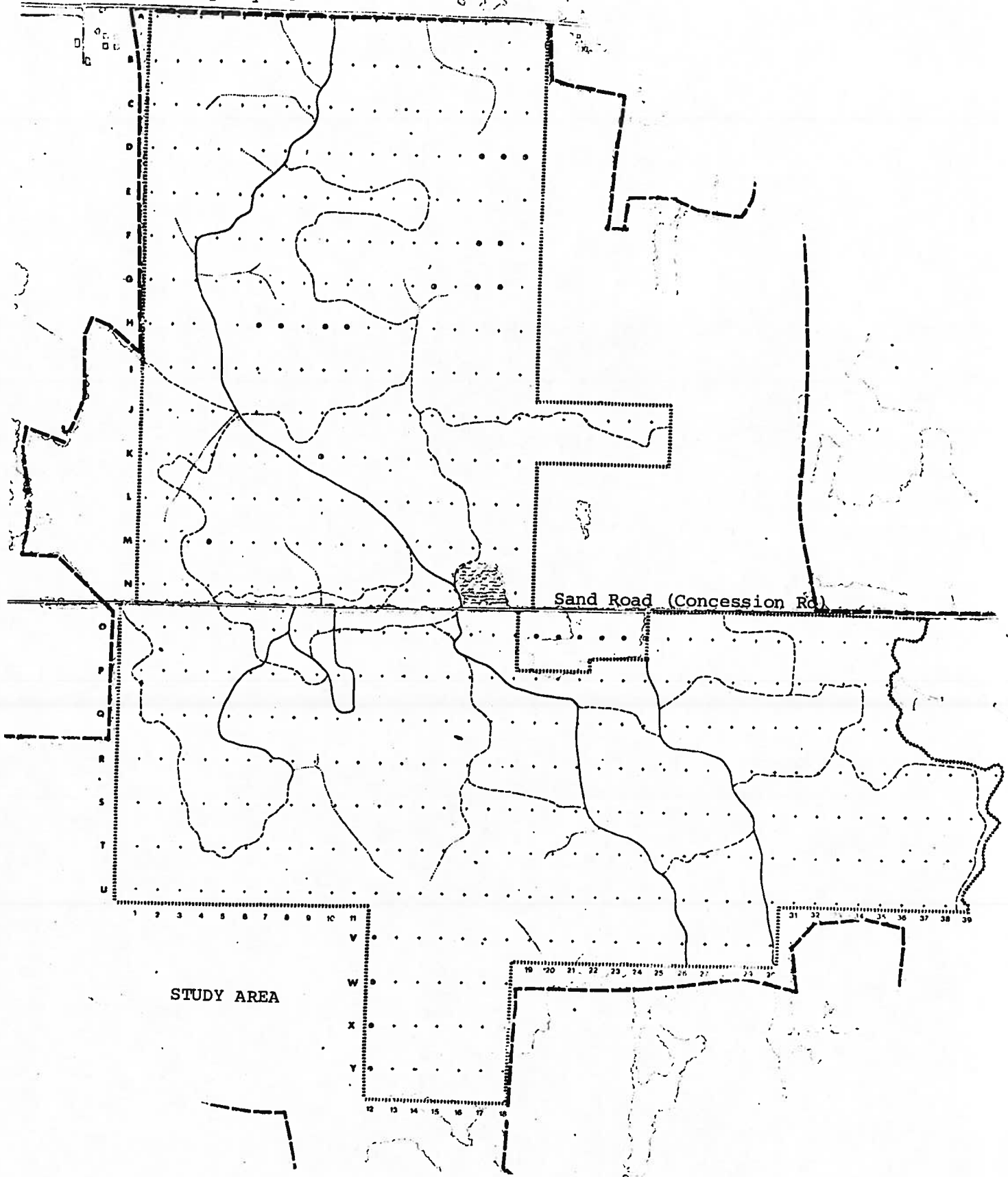
PHYSICAL AND BIOLOGICAL FEATURES

Backus Woods lies near the southern limit of the Norfolk sand plain, on gently undulating terrain composed of low ridges separated by lowlying, wetter, plains. This large forest tract is well known throughout southern Ontario to biologists and naturalists alike, for its excellent examples of Carolinian forest, flora and fauna. Stands of oak, red maple and white pine characterize the driest sandy ridges; flowering dogwood (*Cornus florida*) is a frequent understory shrub. Forests of beech and sugar maple with occasional red maple, red oak, yellow birch, white ash, basswood and tulip-tree dominate other upland sites. Between the ridges, where drainage is imperfect, are deciduous lowlands or spring swamps of silver maple-yellow birch-white elm; black gum-red maple-ash; swamp white oak-silver maple, etc. A few of the wettest depressions hold small, shallow pools ringed by shrub thickets of buttonbush (*Cephalanthus occidentalis*), winterberry (*Ilex verticillata*) and dogwood (*Cornus obliqua*).

The stream habitats found along Dedrick Creek, at the east edge of the forest where clay soils are exposed, add to the diversity of the Backus tract. Along the meandering stream course are wet sedge and herbaceous meadows, alder-dogwood thickets, ash swamp, and mixed hemlock-red maple-yellow birch-beech forest. Slopes covered with hemlock and sugar maple-beech-hemlock rise from the floodplain. Past selective

AREA DETAILS

Highway 24



Sand Road (Concession Rd)

STUDY AREA

c) Because of the shaded conditions, the butterfly fauna is pretty well confined to the edge of the woods and the few openings. Butterfly studies and collections by members were mostly along the southern edge of the study tract and mainly along the Concession 4 sand road. There are some references however, to the grid points.

d) The dragonflies and damselflies were found breeding in the two pond locations, so obviously these are important to the continued presence of these insects. Out of breeding season, they were to be found hunting and sunning along the sand road.

4. RARE - THREATENED - ENDANGERED SPECIES

At the present time, from an examination of the data gathered, no rare or threatened species appear to be among those examined. This is not to say that none will be found in future investigations.

Records are listed by date, number of specimens, location, remarks and the initials of the observer, as in the following example:

May 25 (3 - 2 C at 0.8, 3 S along sand road)(WJDE);

This means that on May 25th, 3 specimens were seen at location 0.8, 2 were caught and 3 specimens were seen along the sand road. S = seen; C = caught; R = released. The participating members are listed below:

Hal Donly	-	HD
John Eberlie	-	WJDE
Quimby F. Hess	-	QFH
Ron Lyons	-	RL
Mike Matheson	-	MM
John Prideaux	-	JPX
Jim Spottiswood	-	JS
Alan Wormington	-	AW

* * * * *

LEPIDOPTERA - A) RHOPALOCERA.

Superfamily: HESPERIOIDEA Latreille Family: HESPERIIDAE Latreille

Subfamily: Pyrginae Mabille

Epargyreus clarus (Cramer) - SILVER-SPOTTED SKIPPER
a) *c. clarus* (Cramer)

May 25 (1 fresh)(QFH); June 9 & 23 (several feeding on purple vetch along sand road)(RL); May 25 (several C & R at 0.8)(1 at 0.17)(several at 0.36)(WJDE); May 25 (2 on sand road east)(HD); June 19 (1 C & 1 S)(JS).

Thorybes pylades (Scudder) - NORTHERN CLOUDY WING

May 25 (5 - 2 C)(JS).

Erynnis icelus (Scudder & Burgess) - DREAMY DUSKYWING

May 25 (several C at 0.8)(WJDE); May 25 (4 at V.26)(JPX).

Erynnis horatius (Scudder & Burgess) - HORACE'S DUSKYWING

May 30 (1 C)(QFH).

Erynnis brizo (Boisduval & Leconte) - SLEEPY DUSKYWING

May 25 (several C & R at 0.8)(WJDE).

Erynnis juvenalis (Fabricius) - JUVENAL'S DUSKYWING

May 12 (common along the sand road)(RL); May 25 (common in many areas)(HD); May 25 (1 at E.14, 1 at G.3, 1 at H.4, 2 at 100 m down wetland trail, 1 at 50 m S. of jct. wetland trail and road, some on sand road)(JPX); June 19 (1 C on main road)(JS).

Erynnis lucilius (Scudder & Burgess) - COLUMBINE DUSKYWING

May 25 (5 C)(QFH); May 25 (1 C at 0.17 - wild columbines present)(WJDE); June 19 (1 C along main road)(JS).

Erynnis persius (Scudder) - PERSIUS DUSKYWING

May 30 (1 C)(QFH).

Subfamily: Hesperinae Latreille

Thymelicus lineola (Ochsenheimer) - EUROPEAN SKIPPER

June 25, 1984 (abundant)(JK); June 19 (4 C - many seen)(JS).

Polites mystic (W.H. Edwards) - LONG DASH
a) *m. mystic* (W.H. Edwards)

June 19 (1 C along main road)(JS).

Poanes hobomok (Harris) - HOBOMOK SKIPPER

May 25 (5 - 1 C)(QFH); May 25 (several at O.8)(WJDE); May 25 (2 male at H.4, 2 on sand road)(JPX); June 19 (2 C along main road)(JS).

Euphyes ruricola (Boisduval) - DUN SKIPPER
a) *r. metacomet* (Harris)

August 2 (10 - 2 C)(QFH).

Superfamily: PAPILIONOIDEA Latreille Family: PAPILIONIDAE Latreille

Subfamily: Papilioninae Latreille

Pterourus glaucus (Linnaeus) - TIGER SWALLOWTAIL
a) *g. glaucus* (Linnaeus)

May 25 (4 - 1 C), May 30 (2 - 1 C)(QFH); May 25 (1 female on sand road)(JPX); June 9 (at sunny spots along sand road, at pond at K.9)(RL); May 25 (1 at O.8, 2 at O.24, 1 at O.36)(WJDE); May 25 (10 - 15 males along sand road)(HD); June 19 (3 - 1 C)(JS).

Pterourus troilus (Linnaeus) - SPICEBUSH SWALLOWTAIL
a) *t. troilus* (Linnaeus)

July 11 (1), Aug. 2 (1 worn female)(QFH); May 25 (1 at F.3, 1 at H.4, 1 at parking lot, 1 on sand road)(JPX); June 23 (1 on sand road near plantation)(RL); August 31 (1 at O.0), September 1 (1 at O.29)(WJDE); May 25 (1 male on sand road)(HD); May 25 (2)(JS).

Family: PIERIDAE Duponchel Subfamily: Pierinae Duponchel

Tribe Pierini Duponchel

Artogeia rapae (Linnaeus) - EUROPEAN CABBAGE WHITE

May 25 (4 - 1 C), September 3 (9)(QFH); May 25 (1 male 50 m east of parking lot)(JPX); August 31 & September 1 (several along sand road)(WJDE).

Subfamily: Coliadinae Swainson

Colias philodice Godart - COMMON SULPHUR
a) *p. philodice* Godart

May 25 (1), May 30 (2 white females), September 3 (2)(QFH); May 12 (along sand road), June 30 (along sand road near pine plantation)(RL); May 25 (1 at N.2, 1 at O.24)(WJDE).

Colias eurytheme Boisduval - ALFALFA BUTTERFLY

August 2 (3 females - 2 C - one dwarf), September 3 (10)(QFH); August 31 & September 1 (several on sand road)(WJDE).

Family: LYCAENIDAE Leach Subfamily: Lycaeninae Fabricius

Lycaena phlaeas (Linnaeus) - AMERICAN COPPER

a) *p. americana* Harris

May 25 (1 just south of parking area)(HD).

Hyllolycaena hyllus Cramer - BRONZE COPPER

Sept. 3 (3 - 2 females C)(QFH).

Satyrium edwardsii (Grote & Robinson) - EDWARDS' HAIRSTREAK

May 25 larvae found on white oak (*Quercus alba*) at 0.8 & 0.9 - attended by ants (probably) (WJDE).

Satyrium liparops (Leconte) - STRIPED HAIRSTREAK

a) *l. strigosum* (Harris)

August 2 (1 C)(QFH).

Incisalia niphon (Hubner) - EASTERN PINE ELFIN

b) *n. clarki* T.N. Freeman

May 25 (100 m east of parking lot)(JPX).

Subfamily: Polyommatae Swainson Tribe: Everini Tutt

Everes comyntas (Godart) - EASTERN TAILED BLUE

a) *c. comyntas* (Godart)

Sept. 3 (1 C)(QFH); May 25 (in ploughed field east of jct. of sand road with dirt road)(JPX); May 12 (several along sand road)(RL); September 1 (1 at 0.25)(WJDE).

Tribe: Celastrini Tutt

Celastrina ladon (Cramer) - SPRING AZURE

a) *l. ladon* (Cramer)

June 19 (3 C)(JS).

Family: NYMPHALIDAE Swainson Subfamily: Argynninae Blanchard

Speyeria cybele (Fabricius) - GREAT SPANGLED FRITILLARY

a) *c. cybele* (Fabricius)

August 2 (2 - 1 C), September 3 (1 male)(QFH).

Subfamily: Melitaeinae Grote Tribe: Melitaeini Grote

Phyciodes tharos (Drury) - PEARL CRESCENT

a) *t. tharos* (Drury)

July 11 (3 - 1 C), August 2 (3)(QFH); May 25 (1 at V.26)(JPX); June 30 (along sand road at plantation), July 12 (along sand road)(RL); May 25 (2 on sand road)(HD); June 19 (3 - 2 C along sand road)(JS).

Subfamily: Nymphalinae Swainson Tribe: Nymphalini Swainson

Polygonia interrogationis (Fabricius) - THE QUESTION MARK

May 30 (2)(QFH); May 25 (2 at V.26)(JPX); May 25 (5 - 10 along sand road)(HD); June 19 (2 - 1 C)(JS).

Nymphalis antiopa (Linnaeus) - MOURNING CLOAK

April 21 (2 at T.25)(RL); May 25 (1 C on south road)(JS); May 25 (1 on sand road)(HD).

Vanessa virginiensis (Linnaeus) - PAINTED LADY

May 25 (1 along sand road)(JPX); May 25 (2 at O.8)(WJDE).

Vanessa atalanta (Linnaeus) - RED ADMIRAL

a) *a. rubra* (Fruhstorfer)

May 18 (8), May 25 (6), May 30 (1), Sept. 3 (1)(QFH); May 25 (7 just south of sand road, 1 in ploughed field, 1 east of parking lot)(JPX); May 12 (along sand road at bridge), June 9 (along sand road near bridge), August 31 (on path near parking lot)(RL); May 25 (2 at N.2, 3 at O.8, 2 at O.36); May 25 (20 - 30 along sand road)(HD).

Subfamily: Limenitidinae Behr Tribe: Limenitidini Behr

Basilarchia astyanax (Fabricius) - RED SPOTTED PURPLE

May 25 (4 - 2 C along sand road)(JS); June 9 (along sand road and at K.9 pond)(RL).

Basilarchia archippus (Cramer) - THE VICEROY

a) *a. archippus* (Cramer)

May 25 (6), August 2 (1 worn), September 3 (2)(QFH); June 9 (along road at pine plantation), August 3 (along sand road on creek flats)(RL); May 25 (1 & 1 larva on willow at O.8)(WJDE); May 25 (2 on sand road); June 19 (3 C on sand road)(JS).

Family: SATYRIDAE Boisduval Subfamily: Elymniinae Herrich-Schaffer

Tribe: Parargini Tutt

Enodia anthedon A.H. Clark - NORTHERN PEARLY EYE

Aug. 2 (1 by pine plantation)(QFH).

Subfamily: Satyrinae Boisduval Tribe: Euptychini L. Miller

Megisto cymela (Cramer) - LITTLE WOOD SATYR

May 30 (1), July 11 (1 C)(QFH); June 9 (common in clearings)(RL); June 19 (3 C - 23 S)(JS).

Family: DANAIIDAE Duponchel Subfamily: Danainae Duponchel

Danaus plexippus (Linnaeus) - THE MONARCH

May 25 (1 at N.2)(WJDE); June 9 (along road), June 30 (larva feeding on milkweed along road at plantation), August 3 (along sand road, on creek flats)(RL); August 2 (2), September 5 (5)(QFH).

LEPIDOPTERA - B) HETEROCERA.

Family: SATURNIIDAE Schrank - (Silkmoths).

Antheraea polyphemus (Cramer) - POLYPHEMUS MOTH

May 25 (1)(HD & MM).

Automeris io (Fabricius) - IO MOTH

May 25 (12)(HD & MM).

Dryocampa rubicunda (Fabricius) - ROSY MAPLE MOTH

May 25 (1)(HD & MM).

Callosamia promethea (Drury) - PROMETHEA MOTH

May 25 (1 larva on Sassafras at N.5)(WJDE).

Actias luna (Linnaeus) - LUNA MOTH

June 7 (1 at light)(AW).

Family: SPHINGIDAE Latreille - (Hawk Moths).

Ceratomia undulosa (Walker) - WAVED SPHINX

May 25 (3)(HD & MM).

Pachysphinx modesta (Harris) - BIG POPLAR SPHINX

May 25 (1)(HD & MM).

Deidamia inscripta (Harris) - LETTERED SPHINX

May 25 (2)(HD & MM).

Laothoe juglandis (J.E. Smith) - WALNUT SPHINX

May 25 (1)(HD & MM).

Family: NOCTUIDAE (Underwing Moths).

Alypia octomaculata (Fabricius) - EIGHT-SPOTTED FORESTER

May 25 (1)(WJDE).

Eudryas unio (Hubner) - PEARLY WOOD NYMPH

June 19 (1 C)(JS).

Family GEOMETRIDAE (Loopers).

Semiothisa aemulataria (Walker) - COMMON ANGLE

May 25 (1)(WJDE).

Erannis tiliaria (Harris) - LINDEN LOOPER MOTH

May 25 (1 larva on aspen at 0.8 reared to adult)(WJDE).

Family OECOPHORIDAE

Antaeotricha schlaegeri Zeller

May 25 (1 male and 1 female at 0.8)(WJDE).

* * * * *

COLEOPTERA.

Some ground beetles (Carabidae) of the Backus Woods - Henry Frania (Department of Entomology, Royal Ontario Museum).

Specimens were identified using "Lindroth, C.H.; The Ground Beetles (Carabidae, excl. Cicindelidae) of Canada and Alaska". Opusc. Entomol. (Suppl.) 20, 24, 29, 33, 34, 35 (1961-1969). This was also the source for distributional data.

Twenty-seven species are listed for the Backus Woods. In the list, site refers both to habitat and to location in the Backus Woods, as follows:

- a) In leaf litter at edge of woodland pools in oak, maple and beech forest along access road between Hwy. 24 and first east/west concession road S. of Hwy. 24.
- b) In leaf litter under willows and poplars growing along stream that crosses first east/west concession road S. of Hwy. 24.
- c) In leaf litter and rotted logs, dry spots in oak, maple and beech forest along access road between Hwy. 24 and first east/west concession road S. of Hwy. 24.

Distribution refers to range of each species in North America, as follows:

"t" - transcontinental; "e" - east of Rocky Mountains; "s" - southern, east of Rocky Mountains.

Most species of carabids at the Backus Tract are widespread, and in Ontario are found as far north as Algonquin Park (distributions "t" and "e"). The single exception is *Oodes amaroides* Dej, which apparently has a more southern distribution, and in Canada has only been recorded from Point Pelee. At the Backus Tract, most species of Carabidae show considerable habitat fidelity, and there are at least two distinct assemblages of species. The first assemblage is found in leaf litter at the edge of woodland pools (site "a"). Another group of species is found on the forest floor where drainage is good (site "c"), and among these species, many are typical of sandy soils (Lindroth, op. cit.). Species that occur on very sandy soils in stream bottoms (site "b") probably form a third assemblage. It should be emphasized that over a hundred species of Carabidae probably occur at the Backus Tract, thus the following list is very incomplete.

Species	Site	Distribution
<i>Agonum cincticolle</i> Say	a	e
<i>Agonum decentis</i> Say	a	t
<i>Agonum decorum</i> Say	a	e
<i>Agonum hypolithos</i> Say	a,c	e
<i>Agonum melanarium</i> Dejean	a	t
<i>Agonum piceolum</i> Leconte	a	t
<i>Agonum puncticeps</i> Casey	a	t
<i>Anisodactylus interstitialis</i> Say	c	e
<i>Anisodactylus kirbyi</i> Lindroth	a	t
<i>Bradycellus kirbyi</i> Horn	a	e
<i>Chlaenius emarginatus</i> Say	c	e
<i>Chlaenius impunctifrons</i> Say	a	e
<i>Chlaenius nemoralis</i> Say	c	e
<i>Chlaenius pennsylvanicus</i> Say	c	t
<i>Dicaelus politus</i> Dejean	c	e
<i>Diplocheila stratiopunctata</i> Leconte	a	t
<i>Notiophilus aeneus</i> Herbst	b	e
<i>Oodes amaroides</i> Dejean	a	s
<i>Patrobus longicornis</i> Say	a	t
<i>Pterostichus adstrictus</i> Eschscholtz	c	t
<i>Pterostichus corvinus</i> Dejean	a	t
<i>Pterostichus leconteianus</i> Lutshnik	a	t
<i>Pterostichus luctuosus</i> Dejean	a	t
<i>Pterostichus rostratus</i> Newman ?	c	e
<i>Pterostichus scrutator</i> Leconte	a	e
<i>Pterostichus stygicus</i> Say	b	e
<i>Stenolophus ochropezus</i> Say	a	e

* * * * *

ODONATA

This study was carried out by Ron Lyons of Richmond Hill and includes species from the Zygoptera (Damselflies) and Anisoptera (Dragonflies).

Details of the study.

The habitat requirements for the Odonata are quite diverse, depending not only on the species but also the stage of its life cycle. The Backus Tract contains a number of areas of importance. Two large permanent ponds exist - one herein called the H9 pond abuts the wetland trail in the north section. The other, herein called the K9 pond, has the north section through road along one edge. Both of these are protected on all sides by mature forest but over the ponds the canopy is fairly open. The ponds are shallow with muddy/debris covered bottoms. They contain dead wood and emergent vegetation which supply perching sites. Open water is also present. Distributed throughout the Tract are a number of temporary ponds which may or may not dry up, especially towards the end of the season, depending on the weather. Most of these are fairly enclosed although many of them are dappled with sunlight during the day. Several of these ponds occur beside the sand concession road which cuts the Tract in half. On the east side of the cultivated field in the south section is a small seepage area. (This area was not fully explored. The species found nearby tended to be those also found along the road). The south section of the study area is bounded on the east side by Dedrick Creek, a permanent, relatively narrow and fast flowing waterway which appears to have a sand bottom. Just south of the concession road, the creek flows through a cedar swamp and then a fairly open lowland meadow. The Tract has several open areas which provide protection, abundant perching sites, sunny southern exposures and good hunting. Most notable of these are the parking lot near the highway in the north section, the sand concession road splitting the Tract, the clearing just outside the study area (if posted this would have been L21) and the meadow by the creek.

The site was visited eleven times between late April and late August, 1985, with species being found on ten of these visits. (Suitable prey species in the form of mosquitos were abundant on almost all visits). The visits varied in duration from three to eight hours depending to a certain extent on success and the weather conditions. Not all sites were examined on each visit.

The identifications were based on visual observations & photographs made in situ. Two specimens were taken by JS on a visit in June but other than that no specimens were taken. The species found, abundance indication and the areas where there was breeding activity will be found in following sections. Pertinent details are given in the species listing. Where uncertainty exists in the identification either because of inconclusive photographs or unfamiliarity with certain species, this is clearly noted in the discussions.

It is clear that the two permanent ponds are important sites as far as the Odonata are concerned. The concession road that divides the Tract is also important because of the shelter that it offers, the large number of perching sites (mostly weeds, grasses and low shrubs close to the road) and the southern exposure. Excluding the minor grass cutting that occurred close to the road this summer, this edge zone seemed relatively free of disturbance and had a large variety of insect life.

The life cycle of the Odonata consists of two stages - the aquatic or nymphal stage (which for some species can be several years) and the flying stage. This normally is of the order of a few weeks but in the case of some of the larger Anisoptera, some of which migrate, can be much longer. The adult stage may be divided into three periods:

- the pre-reproductive period,
- the reproductive period,
- the post-reproductive period,

each with its own special habitat requirements. These are considered as follows:

Reproductive stage.

During this stage, which begins several days to a couple of weeks after emergence, sexually mature individuals gather at suitable mating sites. Active species, such as the Aeshnids, may be present for short periods only while species such as the Libellulids may spend hours at the site perching in suitable spots, making forays to investigate possible females or ward off intruders. For the Aeshnids, perching sites in the breeding area are only important for support during egg laying. For the Libellulids, they are very important as lookout points. Some of the Libellulids will rest on the bare ground but most prefer to perch on branches or leaves.

Preference is usually given to sunny locations so the distribution of suitable sites often depends on the time of day. Some species breed in ponds that may dry up at some point in the season while others require permanent waters, such as permanent ponds or lakes, and still others require the flowing waters of streams or rivers. However, the presence of water is not a prerequisite for a breeding site. *Lestes* lay their eggs on vegetation that will likely be in water in the spring (e.g. stalks of water plants) and a female Aeshnid I once saw laid her eggs at the bases of stalks of rushes in a dried up pond. Some species will tolerate less surrounding protection than others - the weaker fliers (e.g. most of the *Zygoptera*, *Sympettra*) generally prefer sheltered sites.

Post-reproductive stage.

During this stage, usually towards the end of the summer, individuals that have not succumbed to the trials of reproduction can be found far from their breeding sites. At this time, they usually prefer open areas or areas with southern exposures so they can soak up the sun on cooler days. Shelter should be within easy reach. There are very few species that prefer shade to sun for long periods. On cool days during this period, one might find Aeshnids hanging from the tips of the branches of evergreen trees. When the weaker fliers wander, they tend to travel in short hops moving from one sunlit patch to another. They also tend to stay closer to protective cover than the strong fliers.

In the fall, this stage should not be confused with the pre-reproductive wanderings of the immature individuals of those species which migrate south. These individuals can be very common around Long Point, however, they did not seem too common this year. Their habitat requirements are generally the same as those in the post-reproductive stage although, initially at least, the migrants rest more often and therefore stay closer to shelter.

Aquatic stage.

The length of the aquatic stage varies with the species and with the time of year the egg hatches. It can be affected by favorable or adverse weather conditions. For our species, it is generally not longer than two years and can be as short as several months. The nymphs are well adapted for their habitat, whether it be creek, river, pond or lake. Some hide in the weeds, others in debris, while still others burrow into the mud.

During this stage, they mainly eat aquatic insects (probably lots of mosquito larvae in the Tract), and their rate of growth depends on a number of factors including water temperature, amount of daylight and availability of food.

When it is time to emerge, an emergence site is selected. It may be a muddy bank, a floating log or an emergent plant, but it must be capable of supporting the young insect for a period of up to several hours in such a way that its wings are not damaged as they expand and harden. The preferred type of site depends on the species (Gomphids prefer horizontal surfaces while Aeshnids and Libellulids prefer slanted or vertical surfaces). Some protection from the elements at this stage is necessary if the insect is to survive.

Pre-reproductive stage.

After the trauma of emergence is over and the insect is strong enough, it flies away from the water. (The distance, to a certain extent, depends on the species. For instance, most damselflies do not tend to travel far, but strong fliers such as *Anax junius*, *Tramea lacerata* and *Epiaeschna heros* can be found miles from their eventual breeding sites). For the moment, it needs time to allow the wings and body to fully harden and, later, time to mature sexually. During the maturation period which, depending on the species, can vary from a few days to several weeks or more, some species undergo striking changes in their appearance. During the pre-reproductive stage, the easiest places to find dragonflies and damselflies are in sheltered clearings where protection and ample sunlight are available but that are away from potential breeding sites. During the study, a female *Agrion maculatum* was found along the through road near the north parking lot far from the stream where it would presumably breed later. Early in the season, swarms of *Epitheca* were found in the Tract along the sand road which separates the north and south halves. The only Gomphus found was in a clearing just outside the area of study. In fact, a number of species were found in the same clearing before they were seen in the study area.

A species list follows.

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Suborder: Zygoptera

Family: Agrionidae (broad-winged damselflies)

Agrion maculatum

Perhaps the most attractive damselfly in Southern Ontario, this species, often called the black-winged damselfly, has dark brown-black wings and a metallic blue (male) or green (female) body. A lone female was found in the north section through road near the parking lot on June 9 perched on a sunny patch. On June 30, several individuals were found along the concession road. On August 3, they were abundant along Dedrick Creek, especially in sunny areas among the cedars. Reproductive activity was observed. The breeding habitat is streams, especially in the wooded area.

Family: Lestidae (spread-winged damselflies)

Lestes dryas

An unidentified *Lestes* was found in the clearing outside the study area on June 9. This was probably *Lestes dryas* but it was first positively identified along the concession road at the pine plantation on June 23 resting on the grasses. On June 30, individuals were found at the K9 pond along the north section through road. It breeds in woodland ponds.

Lestes rectangularis

Recently emerged individuals were found along the concession road on June 30. They were found here on all subsequent visits. They were also found at the small woodland ponds along the concession road as well as the large ponds. On August 31, individuals were found in the parking lot near the highway. This species shows a preference for shade. It breeds in woodland ponds.

Family: Coenagriidae (narrow-winged damselflies)

Chromagrion conditum

Small numbers were found at the K9 pond and at the temporary ponds along the concession road on June 9 and 30. This species is not mentioned by Walker as occurring in Norfolk County. It breeds in woodland ponds.

Enallagma sp.

Many of the small, brightly coloured, blue and black damselflies are members of this genus. Unfortunately, at first glance and even second glance many of them look alike. A small number of these were encountered on June 9 in a sunny patch of grass at the west end of the K9 pond along the road through the north section. My photographs were not taken from quite the right angle to show the detail necessary to compare with Walker's (1953) diagrams and obtain a positive identification. I am reasonably confident I have pictures of *Enallagma civile* and I may have pictures of another species as well. On that date and later in the month, using binoculars, I saw a large number of individuals flying in tandem and laying eggs on vegetation in the pond. The peak emergence period had obviously passed. These species breed in large ponds.

Ischnura verticalis

Small numbers were found at the K9 pond on June 9, August 3 and 31. It breeds in large ponds.

Suborder: Anisoptera Family: Gomphidae (clubtails)

Gomphus sp.

A lone female was found on June 9 in the unmarked clearing just outside the study area. Because of my unfamiliarity with Gomphids, and their similarity, I am hesitant in identifying this species. Breeding habits are unknown.

Family: Aeshnidae (darners)

Anax junius

This species, also known as the green darner, was the first one found in the study area. Two individuals were found hunting along the sand road on April 21. This species is migratory, so an occurrence this early is not unusual. It was observed on several occasions around suitable breeding sites, the two permanent ponds.

Immature individuals were found, again along the sand road, at the end of the season (August 31), presumably preparing to migrate. *Anax junius* is widespread throughout southern Ontario and normally can be found in small numbers at large and small, open (marshy) and woodland ponds, and quiet backwaters.

Epiaeschna heros

A very large dark dragonfly was first seen in the unmarked clearing on June 9. Several large dark dragonflies were subsequently seen along the sand road near the pine plantation. On June 23, several were seen to hang from the ends of the branches in the plantation and one individual perched on the trunk of the sumacs along the road nearby. Pictures taken showed this to be *Epiaeschna heros*. Individuals were seen at the H9 pond on July 12. This is one of the largest dragonflies found in Ontario, measuring some 4.5 inches. It shows a distinct preference for shady places and breeds in large ponds.

Aeshna sp.

On several occasions, Aeshnids were seen. On June 23, a lone specimen was seen to plunge into the stream twice and then immediately fly up the hill away from the observer. On a later occasion (August 3), several Aeshnids were seen hawking on the flood plain of the stream. On August 31, a lone Aeshnid was seen at the K9 pond. Whether it was an acceptable reproductive site or just an area with an abundance of insect food is not clear, since it was late in the season. Aeshnids tend to spend most of their time flying and the difference in markings can be subtle. Whether or not all of these individuals represent the same species is not known.

Family: Libellulidae (skimmers)

Epitheca cynosura

Epithecids were encountered first on May 12. Swarms were present May 24 along the concession through road and in and around the unmarked clearing. Photographs taken of the few that landed showed that some at least were *E. cynosura*. Large numbers were still present June 9 and one individual was observed at the K9 pond. Mating and egg release was not observed but the pond was a suitable site and the large numbers of individuals in the swarms implied an emergence site in the area.

Leucorrhinia intacta

An immature unidentified *Leucorrhinia* was found in the unmarked clearing June 9. A mature *L. intacta* was seen later that day at the pond in the Backus Woods Conservation Area. It is a black dragonfly with a red or yellow dot on its abdomen. It seems to prefer perches on emergent vegetation away from the shore. With all the stems and branches in the ponds in the Tract, *L. intacta* is hard to pick out even early in the season when it is most abundant. I am reasonably sure that I saw it (June 9 & 30) through my binoculars at the K9 pond, but a positive identification was never made. Either of the major ponds would constitute a suitable breeding site.

Libellula quadrimaculata

This species emerges in late May or early June and can be quite abundant. I only saw one individual in the area this year, however, resting on the vegetation along the concession road near the plantation.

Libellula pulchella

This species, often called the 10-spotted or 8-spotted dragonfly because of the prominent black and white spots on the wings of the mature males, is a common pond species found throughout southern Ontario. Individuals were found resting on the vegetation along the concession road (June 9 & 30, August 30), hunting all along the road, in the unmarked clearing and on the creek meadow (August 3). Individuals were found both at the K9 (August 3) and H9 (July 12) ponds. This species is not very particular about its breeding sites and both of these ponds certainly qualify.

Libellula luctuosa

This species was first located in the unmarked clearing on June 9. Later, on June 30, a number of females were found perched on the low vegetation along the road at the pine plantation. While this is also a common pond species in southern Ontario, I never noticed any at either of the major ponds. I see no reason why they should not breed in these ponds, however.

Libellula lydia

Immature individuals were seen along the concession road near the plantation on June 9. A mature male was seen at the K9 pond resting on a log on June 30. The mature male is a striking medium sized dragonfly with a chalky white abdomen and a single broad brown-black band on each wing. Others were seen that day near the pine plantation, again perched on the low vegetation.

Sympetrum rubicundulum

The *Sympetra* are the reddish to bright red dragonflies seen around ponds in mid to late summer. The first member of this species was found in the unmarked clearing June 24. On later trips they were found along the concession road, at both permanent ponds and in the north section parking lot. Walker and Corbet state that "it is abundant only in the Lake Erie counties and the vicinity of Niagara and probably Hamilton & London".

Sympetrum vicinum

This species is one of the last species to emerge. The last trip, August 31, was taken particularly to locate this species as none had been seen on prior trips. A number of individuals were found in the north parking area perched on the vegetation and a number were found depositing eggs at the K9 pond. According to Walker and Corbet, this species requires permanent ponds (probably because it emerges so late). Individuals were also found along the concession road at the plantation. The omission of Norfolk as one of the locations for this species in Walker and Corbet is obviously an oversight as it is mentioned in the field notes. On August 31, it was the most abundant species found.

Pacydiplax longipennis

A lone individual was found in the unmarked clearing on June 30. A number were found at the H9 pond competing for perching sites on July 12. According to Walker and Corbet, this species is abundant in the counties along Lake Erie and locally common along Lake Ontario.

Tramea lacerata

According to Walker and Corbet, this species is a Carolinian visitor. The early individuals migrate in and lay their eggs. The eggs develop over the summer and the emerging individuals migrate south in the fall. A single specimen was seen at the unmarked field on June 9. The chances are good that it occurs in the study area from time to time but probably does not breed there.

The primary reference for the Odonata is the three-volume set "The Odonata of Canada and Alaska". Volume 1, covering the Zygoptera, was written by Dr. E.M. Walker and published in 1953. Volume 2, covering the Gomphidae and Aeshnidae, was also written by Walker and published in 1958. Volume 3 covers the Libellulidae and was written after Dr. Walker's death by Dr. P.S. Corbet with the aid of Walker's notes. Counties where each species had been reported are listed in most cases. Over forty species had been reported for Norfolk county. Because of the small number of people involved, these lists were probably incomplete at the time they were published and, in light of the rapid pace of environmental change, are now probably somewhat out of date. However, as far as I know, no more up-to-date list is available. The second reference used was "A Manual of the Dragonflies of North America (Anisoptera)" by Dr. J.G. Needham and Dr. M.J. Westfall.

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