Ecological Inventory of the Melanson Property

Final Report

February 2003

Prepared For:

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East Coast Aquatics

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Abstract

During the summer of 2002 a series of field surveys were conducted to provide an initial inventory of flora and fauna of the Melanson Property, Annapolis County, Nova Scotia. Four rare plants were identified. No rare fauna was observed. The floral species, along with key animal movement patterns and favoured habitat locations have been presented for consideration during the development and management of the property for visitation and promotion of its cultural and heritage assets. None of the ecological inventory components puts great constraint on the management of the property, but they do allow for effective mitigation of any potential impacts.

Introduction

The Melanson property is a nationally significant site because of remnant structures of, and documented history of use by, the early Acadian people of North America. This ecological inventory of the Melanson Property has been conducted as a tool to be used in the development of the site as a National Historic property. A variety of field survey techniques have been employed to inventory vegetation, avifauna, amphibians, reptiles, mammals, and lepidopteron (moths and butterflies). This current data was supplemented with the collection of historic data and observations of the same flora and fauna groups, from both on the property and the immediate area. Finally, an inventory of past and present land uses for the Melanson Property was compiled, with special attention to cultural significance.

Being an inventory, discussion in this report is generally limited to presenting the results of field surveys and data searches in a manner that paints a picture of the current natural state of the property. However, air photo analysis allowed for presentation of recent past land use activities, and more current observations. Finally, a few recommendations have been made pertaining to the interpretation and application of this report and its inventories to the management processes associated with Melanson Property.

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1.0 Site Environment

The Melanson property is a nationally significant cultural site because of its clear links to early Acadian settlement. The physical setting is undoubtedly one of the reasons these early settlers chose the location; and the less immediately apparent characteristics a reason they stayed and flourished.

1.1 Location

The Melanson property is located in Annapolis County, Nova Scotia, Canada (see Figure 1). The approximately 27 hectare property is bound to the north by the public roadway, and to the south by the Annapolis basin. It extends from sea level to an approximate 18m elevation at its highest point. It is considered to be part of the Triassic lowlands, as is all of the Annapolis Valley. The site lies in the Annapolis Minas Lowlands Ecoregion of the Atlantic Maritime Ecozone. For the purpose of this project, the property has further been broken down into a series of property features as shown in Figure 2.

Figure 1: General location of the Melanson property National Historic Site located in Annapolis County, southwest Nova Scotia.

1.2 Climate

The Melanson property is approximately 10 km from the Digby gut, through which the waters of the Annapolis Basin flow to the Bay of Fundy and Atlantic Ocean. The proximity of the property to this opening moderates the typical valley climates with marine influences. The Digby area receives less than 1200mm of total annual precipitation, and 150cm of snow. The marine influenced climate around Melanson property means that snow tends to last about 30 days longer than further east up the Annapolis Valley. However, overall winter temperatures are slightly milder than the -6^{o}C valley mean, and slightly cooler than the 18^{o}C July mean (Prov. of Nova Scotia 1996b).

1.3 Habitat Units

The detail identification of habitat types and units was not the intent of summer 2002 works. However, for discussion purposes, several very general primary habitat units on the property are presented, as are some of the smaller habitats that were observed embedded in the primary units. The latter provide a relative measure of diversity represented by a particular primary unit. No concentrated effort has been made to relate these habitats to more formal habitat segregations that may be discussed in other works. The boundaries have been established only on stage of succession of primary vegetation, and not composition or diversity. The second criteria used for establishing primary habitat unit boundaries was the presence of some form of either a physical boundary of human origin, or a break in topographic relief.

The distinct primary habitat units of the property approximately follow the locations identified in Figure 2, with smaller habitat units embedded within these large features. These location names are frequently referred to throughout the text and data of this report. The names have been based either on the primary family homestead within the location, or simply a descriptive term. Table 1 outlines the primary habitat units, and some of the embedded features.

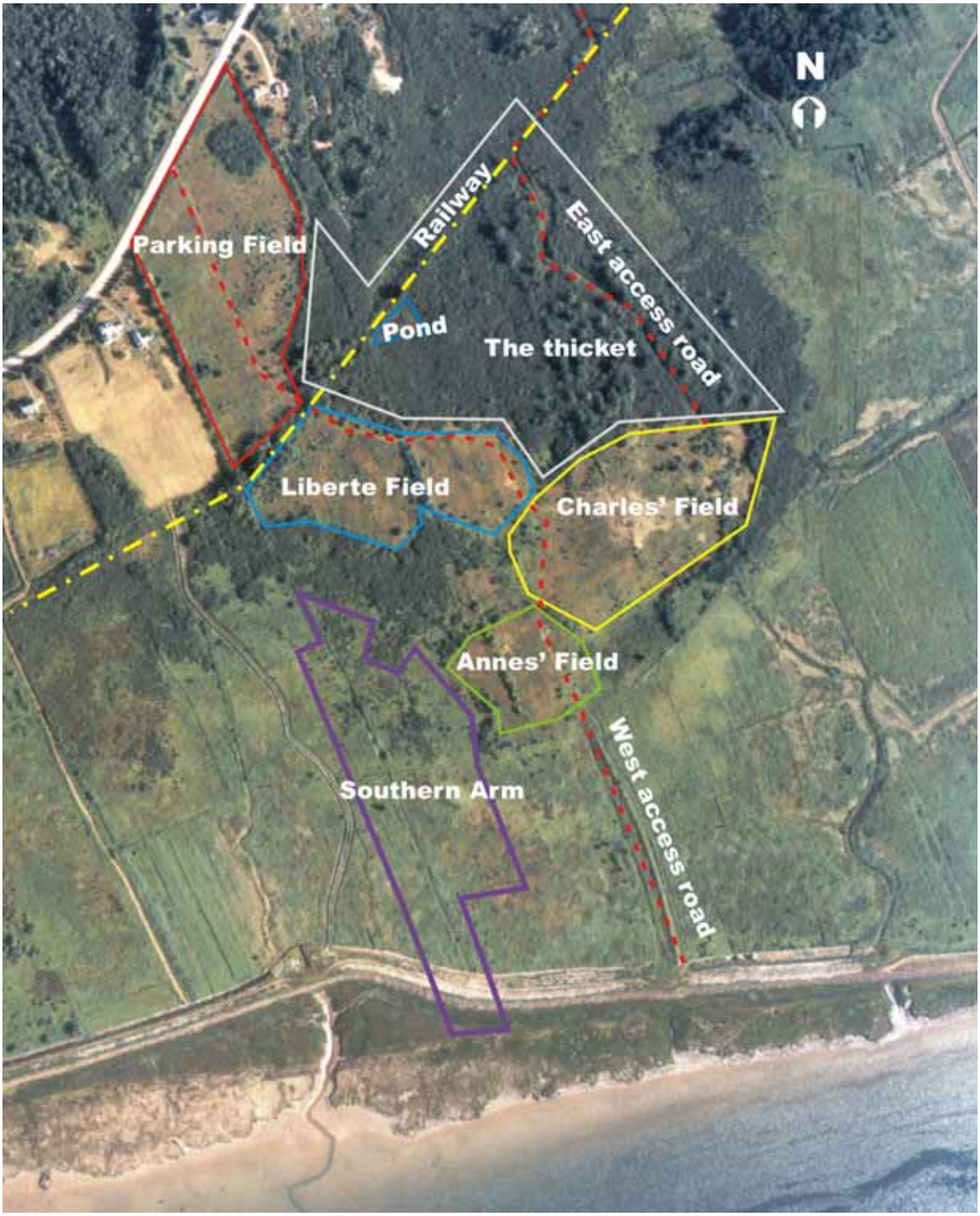

Figure 2: Ten location features of the property are regularly used in this report. They are shown on the above photo, and are referred to frequently throughout the text and data collected. The polygons also correspond to the general primary habitat units of the property.

Table 1: General description of primary and embedded habitat units of Melanson Property.

Location	Primary Habitat Unit	Embedded habitats
Parking Field	The parking field is largely a grass habitat. The west portion of this field has high visibility, whereas the east side is visually segmented by clumps of apple and hawthorn trees. Escape cover to the east is good because of the thicket. There are moderate amounts of flowering plants in the field. Visible isolation exists from the road to the north, and the adjoining home and property to the west by a thin, but dense, line of conifer and alder growth.	To the east and southeast there are several rock piles, likely field stone, which provide habitat for reptiles and small mammals. A blackberry patch exists in a unique sheltered pocket in the northeast corner. The west field is one of the few areas within more than a kilometer that aligns with wooded property to the north of the main road, and appears to be a north south movement corridor for wildlife.
La Liberte Field	La Liberte field has distinct east and west halves separated by heavy shrub, sapling growth along an old rock wall. However, both halves are quite open, grass dominated habitats with some flowering plants. The west tends to be somewhat more segmented by a greater patchwork of hawthorn clumps that are reclaiming the field. Although the field, based on a higher elevation to the west, has good visibility to the south, it has a very sheltered feel, and good escape to dense vegetation in nearly every direction.	One of the most significant embedded habitat units on the property is the poplar stand in the northwest corner of Liberte field. This appears to be the most mature stand on the property, and is well spaced with a grass under story. It appears a favored habitat by deer. From within the shelter of the stand, there is fair visibility to the north across the parking field and south east across Liberte. A rock wall starts in the poplar stand and runs to the south, adding some small mammal and possible snake habitat. A broad and deep ditch line runs north south on the west property boundary. It provides a cool damp refuge during summer and appears well utilized by deer. Easy movement along the ditch, through an otherwise dense thicket of vegetation, suggests this route may serve as a corridor to the southern arm and the marshlands to the south.
Charles' Field	The highest vantage point on the property, there is good visibility to the south from Charles' field. This heavily grassed habitat is quickly being reclaimed by apple and hawthorn clumps on the eastern side. A significant blackberry patch exists at the old homestead foundation. Deer appear to move east west along the southern edge of this field to access the more dense surrounding thickets. This field was arguably the most 'used' area of the property based solely on animal signs present during the 2002 field season.	A small area of short grasses, near the point of highest elevation, appears well utilized as an area for birds to feed on various shellfish as evidenced by discarded shells. Directly south of the old homestead, and at the base of the field is an area of aquatic reeds, ferns, and cattails that obviously collects moisture, but does not have standing water. There are numerous cultural features of rock that add habitat for smaller species of mammals, as well as snakes. An interesting open 'pocket', about the size of a baseball diamond, exists on the east side of the field. It is surrounded by very dense alder and hawthorn. The border vegetation and lower elevation of this embedded habitat, thought to be a small gravel pit, make it very sheltered.
Anne's Field	Anne's field is the smallest primary units of the property. The main field has two definite halves separated by shrub and sapling growth along an old stone wall that traverses the unit in a north south direction. It offers good escape cover in all directions, and has a relatively high vantage point in the east central area that allows viewing to the south, north, and to portions of Charles' field. The field has the lowest occurrence of flowering plants of any of those on the property, a possible indication of more recent use.	Embedded habitat units are few. Several rock structures exist at Anne's, including the north south wall, a wall and / or French drain separating it from Charles', and a significant rock pile of field stone in the south west.

Table 1: Con't

Southern Arm	The Southern Arm is a unique primary habitat area of the property in that it is the only portion of the property with access to the Annapolis Basin, and the only former marsh area converted by dykes. As such it offers a number of different grass species, and many flowering plants that appeared favored by butterfly. Grasses were 1-1.5meter high offering excellent cover. Fawn and deer were flushed from this area on several occasions. Dense escape cover exists to the north in the form of hawthorn and alder thickets.	This area is quite uniform. Embedded habitats are small, and generally take the form of changes in vegetation composition. These vegetation changes are likely because of very local elevation and moisture variances. There is a very ragged edge of encroaching alder to the north end of the arm, and a few clumps of woody vegetation that add further diversity in this area. Distance line of site is surprisingly poor given the elevated dyke areas to the south and east, and dense vegetation on higher ground to the north. A significant ditch line existing along the west boundary, extending from Liberte field to the southern end of the arm.
The thicket	The thicket is a very dense area of woody growth in the northeastern portion of the property, bounded by both the east and west access roads. Alder, Hawthorne, and to a lesser degree apple, and coniferous vegetation dominate an under story of grasses to the west of this unit. A little further to the east, mature maple and conifer dominate the canopy.	The thicket has several embedded habitats that further add to its diversity. The old rail line traverses the thicket, and has several locations of dense blackberry growth, as does the east access road. The pond lies in the thicket just south of the rail bed, and wetted areas of aquatic reeds, ferns, and cattails exist both to the north of the rail line, and along the northwest side of the east access road. The composition of the eastern side of the thicket is somewhat different than the rest, as trees in this area are older. A definite cut block line divides the two sub units of the thicket. At least two old rock walls cross the thicket; one in a north south direction in the western half of the unit, and one in a general east west direction in the southern portion. These structures would provide added small mammal habitats.

1.4 Relief

The main settlement area of the Melanson property was on a high area of land. This south central portion of the existing Melanson property is shown as Liberte, Charles', and Anne's fields in Figure 2, and remains predominantly cleared today. Charles' field was the original Melanson family homestead location, and is a high point of elevation on the property. From this vantage the settlers looked south to the Annapolis Basin, and southeast to the Saint-Charles marsh, now called the Queen Anne Marsh. To the south of the main settlement the terrain drops quickly to the grasslands that are now protected by a dyke which runs parallel to the Annapolis Basin shoreline. There is little elevation change over the approximate 300m of reclaimed marshland between the basin and the foot of the former homestead fields of Charles and daughter Anne Melanson to the north. North of Charles' field there is a gentle rise in elevation to highway 211 (see Figure 3). Through the thicket there is little change in relief. In the Parking field, the northern portion of the property, the elevation drops from north to the south and southeast toward the middle of the property and the pond.

1.5 Geological History

The Triassic lowlands of the Annapolis valley consists of sedimentary rocks referred to as the Wolfville and Blomidon formations. These are easily erodible materials when compared with the

basaltic and granite formations of the North and South mountains (Miller and Milligan, undated). Red sandstone, siltstone, conglomerate, and shale are the typical components of the Wolfville and Blomidon formations that date some 200-245 million years. Prior to the Wisconsinan glaciation, the Annapolis River met the Bay of Fundy through a fracture in the North Mountain at the Digby gut. However, as the ice sheets receded and ocean levels rose, the Bay flooded back in through the gut into the area now known as the Annapolis Basin. Fine sediments and moraines from glacial melt, and then marine deposits from the in flooding ocean, covered the area that is now Melanson property. As the area rebounded with the removal of the immense weight of the melting glaciers, these rich sediment deposits were exposed from the depths of water. This combination of processes is what produced the fertile, productive soils along the Annapolis valley floor in this area.

1.6 Drainage

The Melanson property generally drains surface flow in a north to south direction. This is in part because of the natural topography, and in part because of a number of drainage ditches that have been dug on the property over time. Ditches running in roughly a north south direction can be found along the west boundary, in Liberte field, the Southern Arm, Charles's field, and the east access road. These human made structures intercept surface flow that, in many areas of the property, would more naturally follow a southeast direction based on topography.

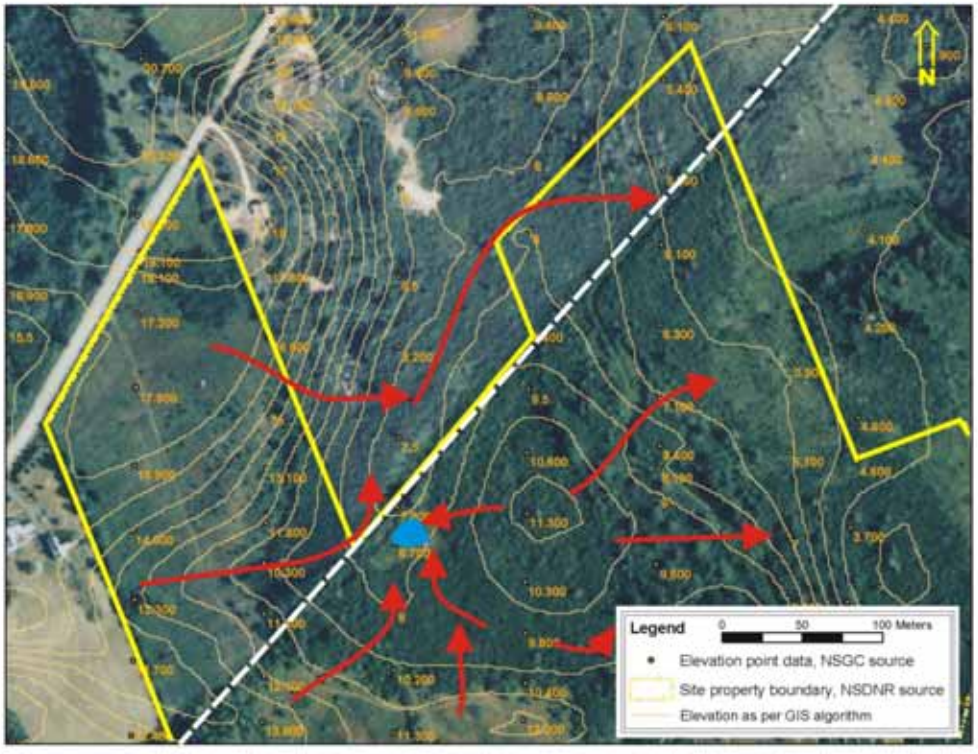

Figure 3: This contour map of the northern portion of Melanson property, based on computer algorithms from point data, shows the likely surface drainage in and around the pond site. It is also apparent how the rail line can locally alter the natural flow (map modified from Parks Canada source).

Another structure that alters natural surface flow is the abandoned rail line that traverses the property in a northeast to southwest direction. To the east the rail bed, now decommissioned of tracks and ties, is somewhat elevated. At approximately the intersection with the west access road it becomes entrenched through to the west property boundary. There is no visible surface flow that actively moves along the rail line at any location. To the south of the rail bed one small freshwater pond exists. It has likely been formed by surface flow caused dammed by the elevated rail line. Similarly, Newell and Stewart (2002) (their habitat No. 1 – Cattail, speckled Alder Marsh) noted that wet ground does exist just north of the rail bed in the central portion of the property as the natural surface drainage is further dammed by the rail bed (see Figure 3).

The east access road is the other man made structure on the property to significantly alter natural surface water flow. A ditch line on the west side of this road supports cattails and other aquatic vegetation. However, the area draining to this ditch is very small, and the quantity of water being redirected is likely minimal.

2.0 Flora

Floral surveys were conducted on the Melanson Property over the two year period 2001/02 by Ruth E. Newell and Heather Stewart. A final report on the findings, *Vegetation Inventory of the Melanson Settlement Property* (Newell and Stewart 2002), should be viewed for detail information on the properties' flora. Key findings and cross reference has been incorporated in this document where appropriate, and additional information and observations have been made for the readers consideration.

Newell and Stewart identified three rare plants as being present on the Melanson property as shown in Table 2. Rarity was primarily based on the Atlantic Canada Conservation Data Center rankings. COSEWIC has not yet evaluated these plants, and the Provincial system has not identified significance to date. As well, two noxious weeds, Poison Ivy (*Toxicodendron rydbergii*) and Stinging Nettle (*Urtica dioica* var. *dioica*) were found in limited amounts and locations.

Table 2: Confirmed rare plant species present on the Melanson Property in 2001/02 (Newell and Stewart 2002).

Scientific Name	Common Name	COSEWIC	NS Status
Spiranthes casei var. casei	Cases's Ladies'-tresses (tentative id)	Not listed	Undetermined status
Carex atlantica ssp. capillacea	Howe's sedge	Not listed	Undetermined status
Salix petiolaris	Meadow willow	Not listed	S3 green not at risk

There are several plant species identified at Melanson that have apparent significance relating to the early Acadian settlers who favoured them. These include the Apple (*Pyrus malus*), various hawthorns (*Crataegus* spp.), and Wild Black Cherry (*Prunus serotina*) (Newell and Stewart 2002).

The Atlantic Canada Conservation Data Center (ACCDC) and Nova Scotia Museum of Natural History (MNH) indicate that there are another seven rare vascular flora records in the area of the Melanson property (see Table 3). It is reasonable, however, to assume on ecological grounds that

these rare flora taxa are likely to occur nearer the site than records indicate (Gerriets pers. comm. 2002). There have been no rare non-vascular plants identified by the ACCDC.

Table 3: Rare vascular plants identified by ACCDC and MNH in the area of Melanson property.

Scientific Name	Common Name	COSEWIC	NS Status
Carex pedunculata	Sedge	Not listed	Not listed
Cypripedium pubescens	Large Yellow Lady's-Slipper	Not listed	S2 yellow sensitive
Equisetum scirpoides	Dwarf Scouring Rush	Not listed	S3S4
Eriophorum gracile	Slender Cotton-Grass	Not listed	S2 yellow sensitive
Hepatic Americana	Liver-lobed Hepatica	Not listed	Not listed
Hepatica nobilis	Round-Lobe Hepatica	Not listed	S1 [of concern]
Liparis loeselii	Loesel's Twayblade	Not listed	S3S4 indeterminate
Listera convallarioides	Broad-Leaved Twayblade	Not listed	S3 green not at-risk
Trillium erectum	Ill-Scent Trillium	Not listed	S3 green not at-risk

One of the most apparent impacts to the ecological functions of Melanson is the clearing of land, and the subsequent natural reclamation. Comparing the two pictures in Figure 4 shows the process. In 1707 the area around the homesteads, and all current non-marsh fields appear to have been wooded. Cultivation and dyke lands existed to the east on St. Charles' marsh. In 1945, and presumably for some time period before, Charles', Anne's, and Liberte field were essentially all one connected open area. There was even a large cleared area in the thicket from south of the rail line, and west of the east access road all the way north to the main road. By 1975 the thicket was becoming well vegetated again. There has been little apparent working of the land since the 1970's. In 1985, much of the property was razed by a grass fire. By 1992, and even more so today, the north central portion of the property is a heavy hawthorn and alder thicket, and all of the fields are physically and visually separated by encroaching tree growth around their perimeters, and along the old fence lines.

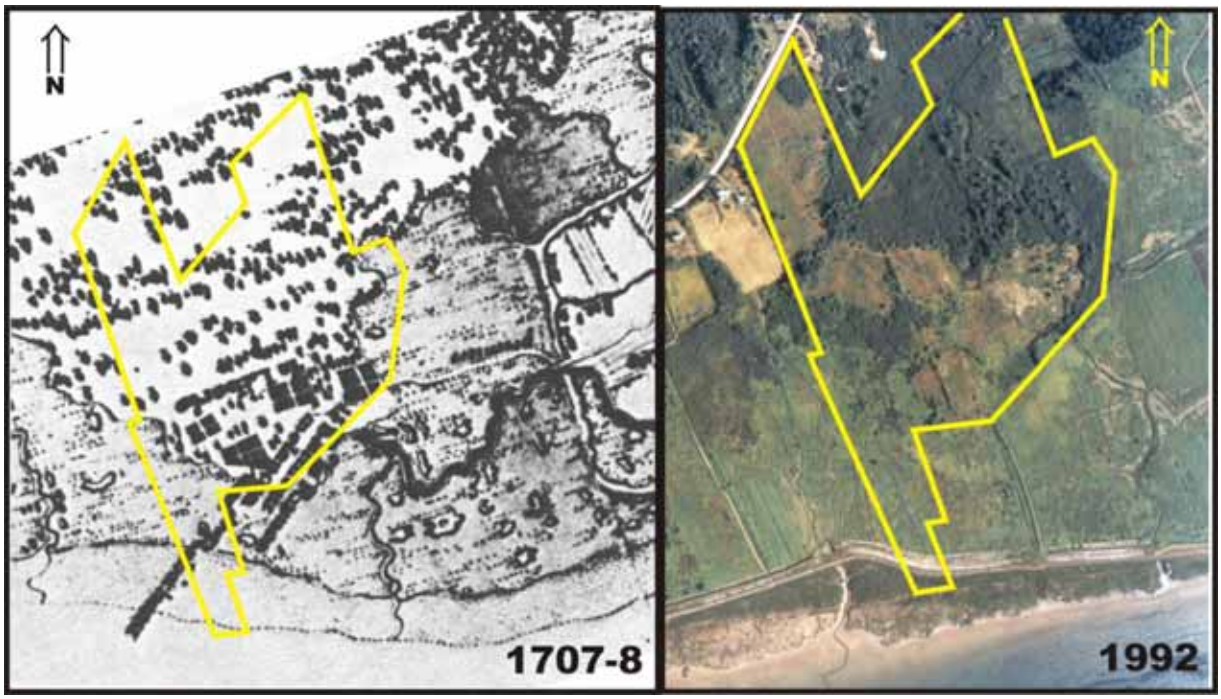

Figure 4: A comparison of a 1707 drawing and a 1992 air photo of the Melanson property, with approximate boundary locations, indicates changes in tree coverage, as well as Melanson homestead locations. Old homestead locations are shown as squares on the 1707 map.

3.0 Fauna

A series of field surveys were completed during the spring through fall period of 2002 in order to identify those faunal species currently using the Melanson Property. Six types of surveys for terrestrial fauna, and one for avifauna were carried out (see Figure 5). Details of the survey methods can be found in Appendix 1 – *Survey Methods*. The following subsections will relate some of the most notable findings from these field surveys. Details of each individual species observation made during 2002 can be found in Appendix 2 – *Raw Data*.

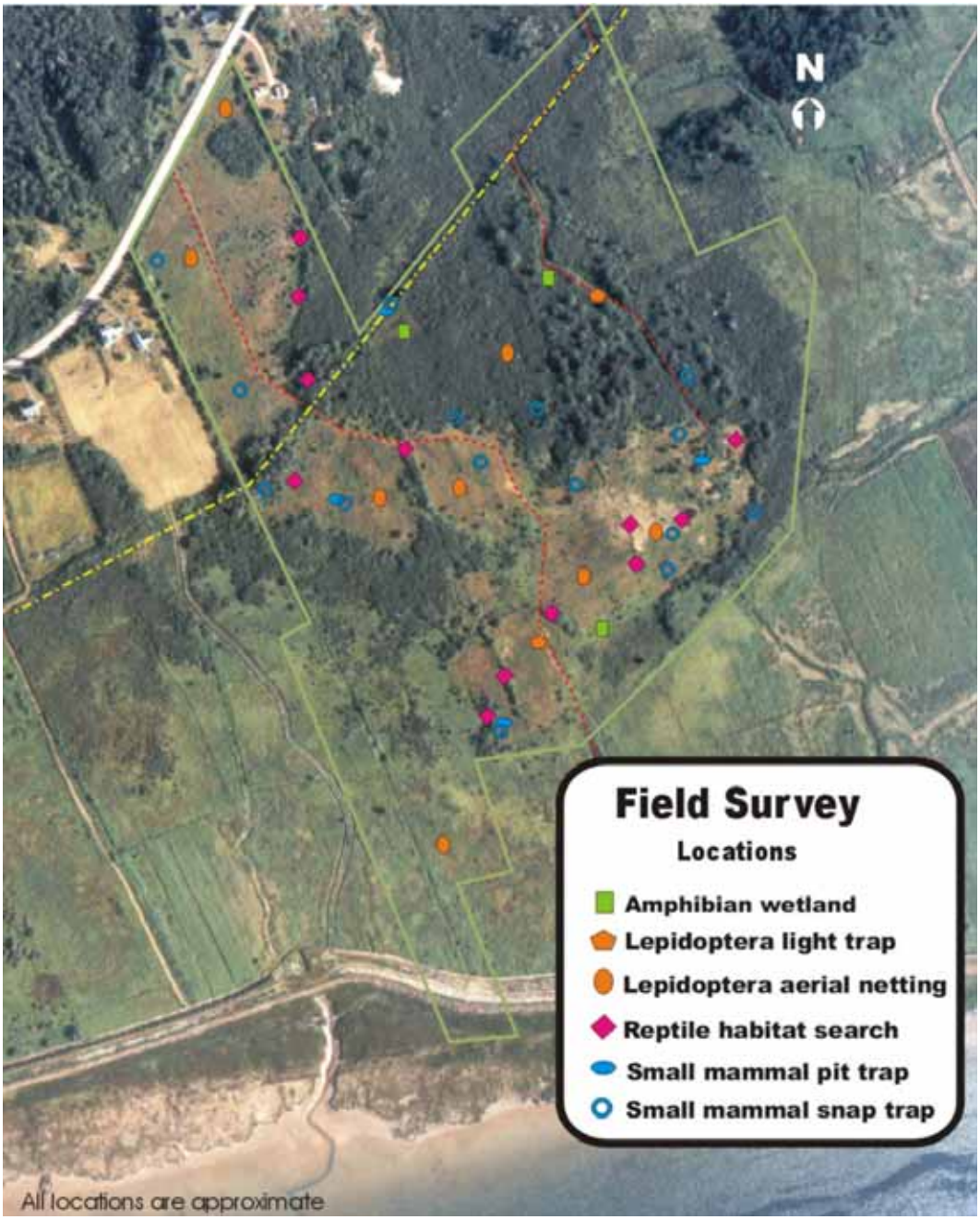

Figure 5: Six formal survey types were conducted on the Melanson Property for terrestrial fauna during the summer of 2002. The approximate location of the 44 individual sites covers most areas of the property.

3.1 Mammals

In total, eight mammal species were observed on, or left identifiable sign on, the Melanson property during summer 2002 field surveys (see Table 4). None of those identified are rare species on either provincial or national species at risk lists. There are at least two species of large mammals that use the property; black bear and white tail deer. The results of most importance related to the mammal surveys were observations of high use areas, limited habitat type, and corridors.

Several observations were made regarding animal movements, particularly ungulates, on the property. Key areas include a north south movement corridor along the western property boundary, a daytime resting area for fawn in the tall grassy areas of the southern property, and a series of well traveled east west corridors in the south central portion of the property at Charles' field.

Along the western property line, several trodden paths indicate relatively high movement in the north south direction. This area aligns with a wooded area north of the highway 211, and is therefore likely the main migration corridor in the north south direction to the north mountain and its wooded areas. No comparable alignment of sheltered areas on the north and south sides of the main road exist within at least 1 kilometer of Melanson. This corridor includes well used and well vegetated ditch depression in the middle portions of the west boundary of Melanson property. Dense shrub / sapling vegetation over the cool depression that remained moist, though not wet, during the warmest and driest portion of the season appeared to be heavily used by deer, likely as a daytime resting area. Not surprising, two older hunting stands were found in the poplar grove just south of the rail line on the western boundary of Liberte field, directly in the path of these movement corridors.

Table 4: Mammal species identified on the Melanson property in 2002.

Scientific Name	Common Name	Individuals observed	COSEWIC	NS Status
Castor canadensis	Beaver	NA	Not listed	S5
Lepus americanus	Varying Hare	2	Not listed	Not listed
Odocileus virginianus	White Tail Deer	3+	Not listed	Not listed
Procyon lotor	Raccoon	NA	Not listed	Not listed
Sorex cinereus	Masked Shrew	3	Not listed	S5
Tamiasciurus hudsonicus	Red Squirrel	1	Not listed	S5
Ursus americanus	Black Bear	NA	Not at Risk	Not listed
Vulpes rubicosa	Red Fox	NA	Not listed	Not listed

In the mid summer 2002, two fawn were observed on a number of days when they were flushed from the tall grasses, of the Southern Arm, that extend to the current dyke. An adult was similarly flushed from the grasses south of Charles' Field. Although, deer and fawn were observed in other locations, it was typically late in the day. The nearly 2m high grass and shrubs of the Southern Arm seemed to be a favored daytime location on the Melanson Property for deer.

Limited field trapping surveys for small mammals only confirmed the presence of the Masked shrew on the property (see Figure 6). It is highly likely that other species of mice, shrew and vole are present as evidenced by tunnel structures (see Appendix 2 for photos) and scat at trap sites.

Scat and or tracks of several species shown in Table 4 were the only confirmation of presence on the property. Black bear were obviously visiting the property to feed on apples and black berries that are abundant in some locations. Red Fox scat was widely distributed around the property, likely a testament to the presence of many more small mammals than were observed. Fleeting glimpses of hare and Red squirrel were caught on a very limited number of occasions.

Figure 6: The masked shrew, *Sorex cinereus*, was found at three survey locations on Melanson property.

Although there was no present indication of beaver being on the property, several signs of recent activity were observed. Just north of the rail line and east of the west access road are beaver cut stumps in an area of alder (see photo in Appendix 2). These are not of the current year, but likely had been cut within a maximum of five years previous. As well, the pond that lies south of the rail line seems to come from surface runoff south of the rail bed. A low swale in the rail bed at the point of the pond, possibly the site of a removed culvert, has been blocked by beaver cuttings to trap the northward surface flow of water, but is in a state of disrepair. This degraded dam may contribute to lower water levels, and a temporary drying of the pond as observed in September of 2002 (see Amphibians and Reptiles for further discussion). Raccoon prints were apparent in the mud of the drying pond as this species came to feed on the tadpoles being stranded by the shrinking pond.

COSEWIC (Committee On the Status of Endangered Wildlife In Canada) identifies three other mammals of interest in Nova Scotia. Both the Southern Flying Squirrel and the Gaspe Shrew are listed as species of special concern. Cougar is listed as data deficient in Nova Scotia. None of these species would be expected on the Melanson property as favoured habitat characteristics by these species are not locally present. These habitats include, but are not limited to mature growth stands of both conifers and hardwoods, rocky outcrops and talus slopes, and swift flowing stream margins.

3.2 Avifauna

A comprehensive avifauna survey was completed during the summer and fall of 2002 at the Melanson property. Field surveys were completed on three transects across the property in a northeast to southwest direction. Sharon Hawboldt conducted the primarily audible surveys by pausing at measured and timed intervals along each transect, and recording the number and species of birds both seen and heard. The results of this survey were forwarded to the Conservation Biologist at Kejimkujik National Park for data analysis and mapping. The results

of the avifauna survey were not available at the time of completing this document. Therefore, only a few incidental observations of avifauna and related behaviors are noted.

Dust baths, presumably used by pheasant, were numerous around the property. However, the southern portions of Charles' field seemed to host the most numerous and active of these types structures.

A small area at the height of land in Charles' field appears to be a feeding area for birds, likely gulls, which prey on shellfish. As shown in a photo in Appendix 2, this small area of sparse grass was lightly littered with a variety of shellfish shells, and are not believed to be discarded by fishermen who may pass through the property. Crabs were predominant, but several mollusk species were also present. No activity was ever observed on the site. However, it is probable that part of the reason for its existence is the long line of sight in all directions that would help prevent a predator from intruding.

Late in the season, September 12-18th, ducks were observed on several consecutive days on the pond. This was a short time after it had become recharged with water. Counts of 7-20 adults leaving the pond were made, but because of visual obscurity during approach to this location, no identification of species could be made.

Table 5: Rare avifauna identified by ACCDC in the area of Melanson property.

Scientific Name	Common Name	Individuals	COSEWIC	NS Status
Bucephala islandica	Barrow's Goldeneye (Eastern population)	NA	Special concern	Not listed

Only one COSEWIC listed bird species has currently been identified in the area of Melanson property by the Atlantic Canada Conservation Data Center (see Table 5). COSEWIC has listed several other Nova Scotia species, however, most of those are coastal marine birds that would not directly be supported by the habitats of Melanson. However, three additional species of special concern that may be expected on the property on occasion. They are the Short-eared owl, Ipswich Savannah sparrow, and the Bicknell's thrush.

3.3 Amphibians and Reptiles

Three species of amphibians were confirmed on the Melanson property during 2002 (see Table 6), although it is quite probable that others exist. Limited aquatic and semi aquatic habitats, combined with several recent very dry summers, may be reducing the number of amphibians on the property. By the end of the summer, all wet habitat areas were completely devoid of standing or moving water.

The pond in the central portion of the Melanson Property, south of the abandoned rail line was targeted as one of the key amphibian habitats for survey. Two additional areas of seasonal moisture and cattail vegetation were also examined, but the pond was both the largest and most diverse semi-aquatic habitat. Review of air photos show that the open water habitat of the one freshwater pond on the property significantly reduced in size between 1975 and 1992 (see Figure 10). The total footprint of the pond area, including non open water areas of cattails and aquatic vegetation, changed less. However, earlier 1945 air photos show some indication that a large portion of the thicket was at one time quite wet as land clearing activities obviously avoided the

area of the pond and a large area immediately to the south of the pond. The 1945 footprint follows the contour of the property, and that identified by Newell and Stewart (2002) as the 'Pure Canada Holly Thicket' (their habitat No. 4), This footprint was likely the result of the rail line constructed in 1906.

Based on topography, the pond is charged from sheet surface runoff south of the rail bed. No inflow could be found. This flow pattern is supported by a computer generated contour map of the property, as shown in Figure 3. A low swale in the rail bed, excavated some time after the rail line was decommissioned, likely accounts for the reduced pond area observed after the 1945 air photo. This swale has been blocked by beaver cuttings in the past, but is currently in a state of disrepair. As such it retains less surface runoff, and thereby likely contributed to the temporary drying of the pond as observed in 2002.

When surveys of amphibians began in August, few individuals were being found at the pond despite what appeared to be a relatively deep and sizable body of water. Open water area was initially estimated to be 350 sq. m. However, as the summer progressed, and the weather remained dry, the wetted area of the pond shrunk. In total only four adult frogs of three species were caught (see Table 6), and two more individuals observed. Year 2000 records from the Nova Scotia Herpetofaunal Atlas project do indicate both a Mink frog and a Pickerel frog having been found within the general region.

Table 6: Amphibians identified at Melanson property in 2002.

Scientific Name	Common Name	Individuals	COSEWIC	NS Status
Bufo Americanus	Eastern American Toad	1	Not listed	Green
Rana melanota	Green Frog	2	Not listed	Green
Rana pipiens	Leopard Frog	1	Not at risk	Green

Large numbers of unidentified tadpoles wriggled in the shallow water of the pond that maintained a surface area of about 10 sq.m for several weeks during late August and early September. Then, quickly, the remaining water evaporated, and a large kill of hundreds of tadpoles was observed. A rotting mass of individuals cover approximately a 1.5 m^2 area on September 09th. (See Figure 7), and an array of footprints in the still soft mud told of numerous predators having visited the site. This may have been a recently recurring annual event given several dry summers and a change in outlet elevation associated with a beaver structure that partially controls pond depth. If so, these events help explain the low numbers of amphibians observed.

No amphibian species of concern in Nova Scotia are listed by COSEWIC. The committee does, however, indicate that the Northern Leopard frog, Pickerel frog, and the Four-toed salamander are not at risk provincially. The Provincial listing does show the Four-toed salamander to be yellow (at some risk), but lists as green (not at risk) the other four species of salamander and newt found provincially.

Based on habitat requirements it is possible that Pickerel, Wood, and Bull frogs may be present on Melanson, and more improbable that Spring Peepers, and Mink frogs would be found. Similarly, it is possible that Red spotted newt, Eastern Red back salamander, and Yellow spotted

salamander could be found on the property. Whereas the habitat and distribution of Blue spotted and Four Toed salamanders would make it improbable that they would be found.

Figure 7: On September 09, 2002 the pond became dry, and the hundreds of tadpoles that had been trying to survive died. The mass of decaying bodies can be seen in the middle of the photo. Note the footprints of several curious predators that had been attracted, no doubt, by the smell.

Similar to amphibians, few reptiles were encountered during the summer field season. One species of snake, the Maritime Garter Snake was confirmed (see Table 7).

Reptile surveys for snakes occurred primarily at a number of rock piles, and south facing exposures where sunning could take place. Some records were made in these locations, and other opportunistic sightings were made at the pond. All positively identified snakes were Maritime Garder, with a variety of age classes apparent by size of individuals captured. The presence of the snakes on grass clumps in the drying pond leads to the speculation that the snakes were opportunistically preying on frogs and toads as their habitat area dried. Two juvenile garter snakes were observed near the pond indicating the potential importance of the gravel rail bed area for nesting.

The ACCDC (Atlantic Canada Conservation Data Centre) indicates that Wood turtles, a Nova Scotia yellow status species and COSEWIC species of special concern, have been identified within watersheds within a 5km radius of the Melanson property. Based on flowing stream habitat requirements of the Wood turtle, it is unlikely it would occur on Melanson property. Although the old rail bed would likely provide adequate gravel nesting areas directly adjacent to the pond, the limited aquatic habitat of Melanson would likely preclude presence of the Common Snapping and Eastern Painted turtles. Distance from known populations, along with appropriateness of habitats make it highly improbable that Blandings turtles would be found nearby. No turtles were observed during the summer 2002 surveys, and this may be in part

because of the likelihood that the pond has gone dry in several of the more recent years, but likely more related to limited and poor quality habitat.

Table 7: Reptiles confirmed on Melanson Property in 2002.

Scientific Name	Common Name	Individuals	COSEWIC	NS Status
Thamnophis sirtalis pallidula	Maritime Garter Snake	5	Not listed	green

Although only garter snakes were positively identified, it is probable that Green and Red Belly snakes may be found at Melanson. Particularly, Green snakes that would favour the grassland habitat that the old fields of the property presents. Ring Neck and Ribbon snakes are improbable because of habitat and food requirement, and distribution respectively. Both COSEWIC and Nova Scotia list the Ribbon snake as threatened. All others, listed only Provincially, are not at risk.

3.4 Lepidopteron

As shown in Table 8, summer 2002 field surveys of aerial netting and light trapping produced more than 90 individuals representing 34 species of lepidopteron. None of these species is listed with significance either nationally or provincially. The Monarch butterfly is the only lepidopteron species that is listed with special concern by COSEWIC for the province of Nova Scotia.

Table 8: Lepidopteron identified on Melanson Property in 2002.

Scientific Name	Common Name	Individuals	COSEWIC	NS Status
Acronita impleta	Yellow Haired Dagger	1	Not listed	Not listed
Apamea amputatrix	Yellow headed cutworm moth	4	Not listed	Not listed
Arogeia rapae	Cabbage White	2	Not listed	Not listed
Bomolocha palparia	Mottled Bomolocha	1	Not listed	Not listed
Cabera erythemaria	Yellow Dusted Cream Moth	1	Not listed	Not listed
Caenurgina crassiscula	Clover Looper Moth	5	Not listed	Not listed
Caenurgina erechtea	Forage Looper Moth	4	Not listed	Not listed
Calyptra canadensis	Canadian Owlet	1	Not listed	Not listed
Catacola ssp.	UI. Underwing	2	Not listed	Not listed
Catacola ssp.	UI. Catacola	1	Not listed	Not listed
Cercyonis pegala	Large Wood Nymph	11	Not listed	Not listed
Coenonympha inornata	Prairie Ringlet	9	Not listed	Not listed
Colias philodice	Common Sulphur	3	Not listed	Not listed
Epidelta metonalis	Pale Epidelta	3	Not listed	Not listed
Euxoa divergens	Divergent Dart	4	Not listed	Not listed
Hethemia pistasciania	Pistachio Emerald	4	Not listed	Not listed
Homorthodes furfurata	Scurfy Quaker	1	Not listed	Not listed
Horisme intestinata	Brown Bark Carpet	3	Not listed	Not listed
Hperstrotia pervertens	Dotted Graylet	1	Not listed	Not listed
Hydriomena ssp.	UI. Hydriomena	1	Not listed	Not listed
Hydriomena ssp.	UI. Hydriomena	1	Not listed	Not listed
Lomographa vestaliata	White Spring Moth	1	Not listed	Not listed
Lycaena phlaeas	American Copper	1	Not listed	Not listed
Malacosoma americanum	Eastern Tent Caterpillar Moth	1	Not listed	Not listed
Oreta rosea	Rose Hooktip	1	Not listed	Not listed
Pseudorthodes vecors	Small Brown Quaker	1	Not listed	Not listed
Renia sobrialis	Sober Renia	1	Not listed	Not listed
Scopula limboundata	Large Lace Border	2	Not listed	Not listed
Scopula purata	Chalky Wave	7	Not listed	Not listed
Spaelotis clandestina	Clandestine Dart	1	Not listed	Not listed
Tetanolita floridana	Florida Tetanolita	4	Not listed	Not listed

Table 8: con't				
Trichordesta legitima	Striped Garden Caterpillar Moth	1	Not listed	Not listed
Xestia normaniana	Normans Dart	1	Not listed	Not listed
Zanclognatha ochreipennis	Wavy Lined Zanclognatha	5	Not listed	Not listed
Totals	**34**	**90**		

The field surveys conducted in 2002 were of low intensity and duration. It is highly probable a significantly greater diversity of species would be identified with a greater effort over the relevant season of Lepidopteron activity. Many flowering types of plants are present in the fields and woods of Melanson. The apple and hawthorn trees are likely an attraction for some species, the flowering plants of the fields to others, and the roses and complex flowers on the southern arm to yet others.

The Atlantic Canada Conservation Data Center has indicated several Nova Scotia listed species of odonata (dragonflies and damselflies) have been confirmed within a 5km radius of the Melanson property (see Table 9). Surveys for odonata were not conducted during the summer of 2002, and therefore no results for such are presented.

Table 9: Species of Odonata (dragonflies and damselflies) identified in proximity to Melanson property by the ACCDC.

Scientific Name	Common Name	Individuals	COSEWIC	NS Status
Lestes unguiculatus	Lyre-Tipped Spreadwing	2	Not listed	S2 (rare)
Aeshna verticalis	Green-Striped Darner	5	Not listed	S2 (rare)
Lestes forcipatus	Sweetflag Spreadwing	2	Not listed	S2 (rare)

4.0 Cultural Features

The early cultural features of the Melanson property are discussed at some length in Crepeau and Dunn, 1986, and that document should be consulted for such information. They report on a number of features that were uncovered during the summers of 1984 - 85 archeological investigation of the property. In total eighteen structures were identified ranging from circular buildings, cellars, chimneys, and others without clear purpose (see Figure 8). Some tools, dishes, a coin, and other artifacts were uncovered at one excavation site.

Larger structures on the property include apparent rock walls, ditches, and dykes that likely were constructed at various time periods to aid in the management of land resources. The nature of these structures also suggest they were modified at various times for maintenance, repair, or enhancement. Timing of such details is not complete.

Figure 8: Comparison of the cultural site locations identified in Crepeau and Dunn (1986) (L) and a more current 1992 air photo. Along with the enumerated sites, note the dykes, and numerous northwest/southeast ditchlines that are particularly visible in the earlier photo. The newer photo also shows how the property vegetation is quickly changing, as open areas around Charles', Anne's, and Liberte fields is overtaken by woody growth.

5.0 History

The Melanson property was an early Acadian settlement from 1664 up to the time of the deportation of the Acadians in 1755. Charles Melanson and his wife Marie Dugas were thought to be the first occupants of the land, building a home in what has been referred to as Charles' field in this report. Nine daughters and five sons were born to the couple, and eventually eight occupied households at the settlement. It appears that at its height, near 1714, the settlement reached its maximum size of nine households, with 16 adults and 25 children (Crepeau and Dunn 1984).

In 1759 the lands of the Melanson settlement became part of the Granville Township, and as such was granted to New England Planters. These people continued to work the dyke lands. Between 1984 – 86 archeological works were carried out on the property. None of the excavations indicate the area was used as a domestic settlement after the deportation of 1755.

6.0 Landuse

The land area of the Melanson property has not undergone significant topographic alteration because of human uses, but management activities over time have caused significant changes in vegetative cover. The property has gone through a series of uses since the 1600's. Records show early work included cultivation along the marshes, followed by some clearing of wooded lands and creation of an apple plantation. Portions of the property were settled with constructed

homesteads in Charles', Anne's, and Liberte fields (see Figure 9) prior to the expulsion of the Acadians. The following sections provide additional detail on historic (1600's-1800's) uses and more current uses (1900's to current) of Melanson property.

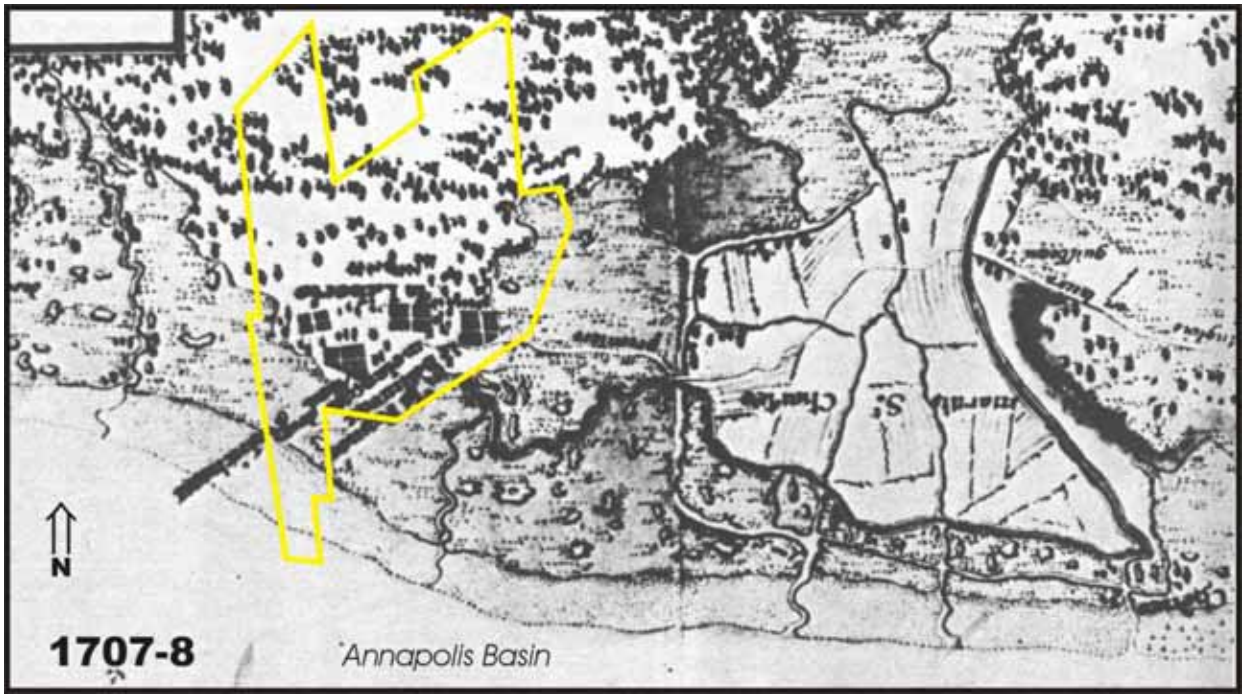

Figure 9: The Queen Anne Marsh, formerly St. Charles's marsh, is depicted in this 1707 map. Homesteads of the Melanson settlement are shown as squares to the west (picture left) of the marsh (modified from Crepeau and Dunn 1986). Approximate location of the current Melanson property boundary is shown.

6.1 Historic

In 1605, a French settlement was established at Port Royal, approximately 2km to the southwest of Melanson Property. The Acadian population there began to dyke the tidal marshes around the Annapolis Basin. This was in contrast to other early settlements, which began through clearing wooded lands. One of the marshes dyked was the Queen Anne marsh, formerly called Saint-Charles marsh (see Figure 9). Dykes in this area have been dated to the 1630's (Province of Nova Scotia 1996b), and were the foundation of the early agricultural economy. Fishing was the other main component of the early economy of the area.

By the early 1700's the families living at the Melanson settlement had 17 arpents of land under cultivation, owned 75 cattle, 48 pigs, and 106 sheep. A large apple orchard was part of the cultivated lands (Crepeau and Dunn 1984). An early 1700's map (see figure 9) shows the property to be primarily wooded, and presumably the upland fields that are now apparent were cleared at a later date.

Little else has been researched about the early uses of Melanson.

6.2 Current

Most recently the property has served as a point of access to the shoreline, with some evidence of recreational activities such as hunting, and berry gathering. Other current land uses identified in this report are primarily limited to those visible from air photos taken in 1945, '67, '75, and '92, recent observations, and anecdotal information. Additional air photo coverage to the late 1920's may be available with further search of the National archives in Ottawa.

The railway line, which was operated only for a few years, was originally laid in 1906. The ties and rails were removed some time in the 1920's, and may be visible in an air photo from that time if one can be located. In 1945, orchards were plentiful along the north and south sides of the main road throughout the Karsdale area. This includes the presence of a stand of 65+ trees in the northwest corner of the parking field at Melanson. The west access road appears to be the only regularly used access to the property in 1945, and it goes as far as an apparent 'garden' plot of tilled land in east Liberte field. From the quality of the 1945 photo it is difficult to state exact vegetation stage, but much of the 'thicket', and all areas north, including a large area north of the main road appears to have been cleared in the not too distant past.

By 1967 there appears to have again been clearing in the area of the thicket and in the northeast corner of the parking field. The orchard in the parking field has been cut, and the 'garden' plot in Liberte is no longer visible. Near the southern arm, a small body of water is apparent just to the west of the dyke that runs perpendicular to the basin shoreline. At sometime after the expulsion of the Melanson's and other Acadians, this dyke was built, being visible in the 1945 air photo as well. Some form of a boat building operation is thought to have been conducted on the northern end of this dyke in the 1800's. The site is actually described as being a canal, known as the Delap Canal (Bunbury pers. com. 2002), and therefore the use of the term dyke here is likely inappropriate. During a field visit in 2002 an apparent large wood timber was found in the vicinity of the dyke that could be related to such activities (see photo and data in Appendix 2).

In 1975 there are several additional property uses of interest. Since the 1967 photo, a significant new roadway has been pushed in to the property. This is what has been referred to as the east access road throughout this report. This road ends at the northeast corner of Charles' field at an apparent operation of a gravel pit (see Figure 10). Summer 2002 field surveys confirmed a sizeable portion of a knoll has been altered. Currently the access point and the surrounding perimeter 'berm' has become quite well vegetated. The central portion of the extraction remains largely unvegetated except by herbaceous pioneer plants, likely because of the poor nutrient qualities of the remaining surface layers. Newell and Stewart (2002) have tentatively identified this site as housing a single Cases' Ladies' –tresses (*Spiranthes cas*ei var. *casei*) (their habitat No. 9 – Small slope clearing), an extremely rare orchid. This area would have been in close proximity to several of the Melanson settlement houses, and may have been an access corridor to the dyked lands being worked on the Saint-Charles marsh to the east. As such it could have housed artifacts of the early settlement. In the 1975 photo, the west access road, in contrast, appears to be little used, and still does not provide apparent access to the shoreline. Also of note in the 1975 photo is the regrowth of the thicket area. This is particularly highlighted by the maintenance of the fence line that runs from Anne's field through Liberte field, and north through the thicket to the Parking field (see Figure 10). Water is still visible west of the perpendicular dyke south of the property. There is little vegetation encroachment of the fields,

and this corresponds with anecdotal information that the fields were last hayed at least 25 years ago. Nearly all the orchards visible in the 1945 photo throughout the local area no longer existed in 1975.

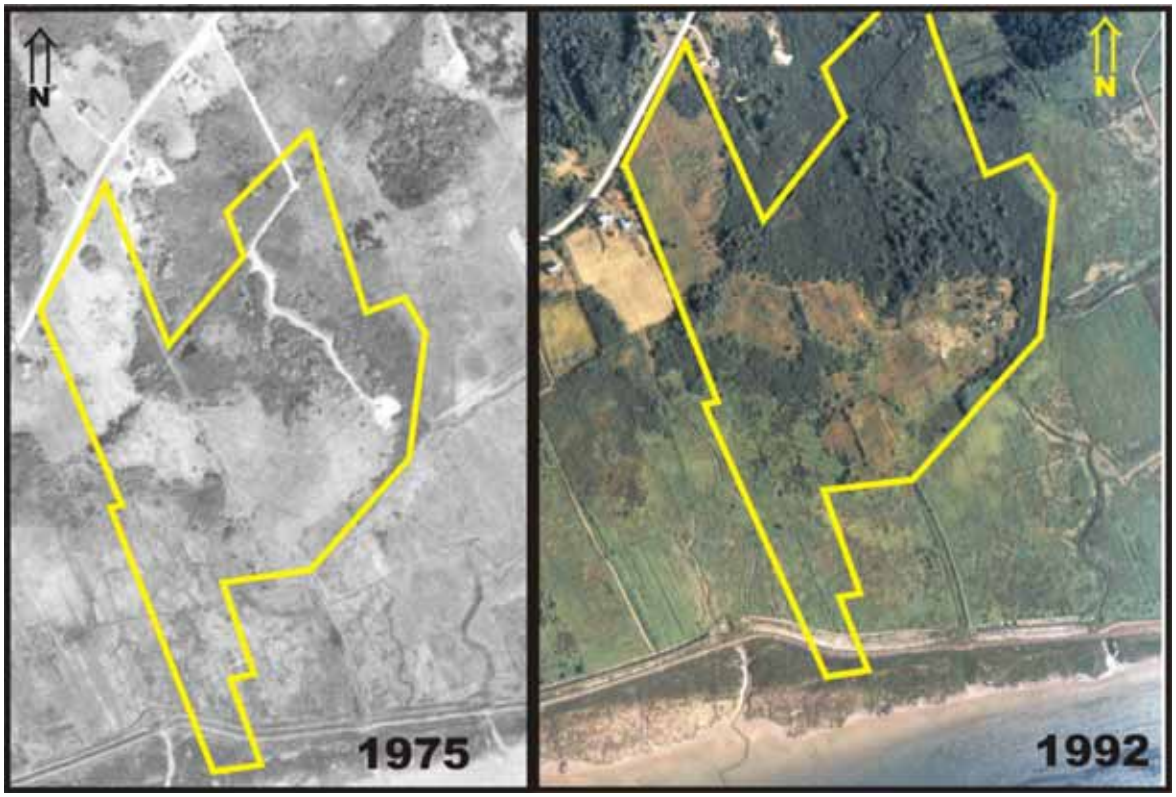

Figure 10: comparison of Melanson in 1975 and 1992 shows little vegetation encroachment and presence of a significant roadway in the east. Note the significant size difference in the surface area of the pond.

In the 1945 air photo, and again in 1967, it is apparent that the area referred to in this report as the thicket, as well as portions north of the rail bed, had recently been cleared. It is difficult to determine the reason for the clearing activity, or if any merchantable timber was harvested. Certainly in the latter cutting it is unlikely as growth was approximately 20 years old. As shown in Figure 10, one of the most significant changes between 1975 and 1992 is the encroachment of vegetation. Vegetation is even more pronounced today, given the more recent photo shown is ten years old. In 1985, a large portion of the property was burned by an accidental grass fire.

By 1992, access to the shoreline has been established from the west, and the east access road and gravel pit are obviously long inactive.

The current observed uses of the Melanson property are quite limited. Between early June and late September 2002 East Coast Aquatics staff visited the property on more than 25 days, and at hours from 8AM to 1:30AM. Only on two occasions were persons encountered on the property.

Although the west access road has been used in recent years by a number of people to reach the claming flats along the Annapolis Basin, it appears that this activity all but ceased during the 2002 season. On more than 25 dates during the summer of 2002, no vehicles or ATV's observed parked on, or traveling over, the property. At the same time, as many as 17 clam diggers were observed at once on the shoreline south of the property. The low use of the property for access is likely because of negotiation with local clam diggers, and the installation of an alternative access route to the shore front (Bunbury pers. com. 2002).

During the summer of 2002, farm tractors were observed on the property on two separate occasions. In late August a large tractor was observed traversing along the dyke at the southern extreme of the property. Large round bales of hay had been cut along the area, and were awaiting transport. In early September a man pulling a small field mower behind a tractor mowed down the east access road to the old homestead. At the top of the knoll in Charles' field, he turned and drove north back up the same road. This was likely the second mowing of that access road, as it had been mowed, though not observed, at an earlier date in the year.

The other reasonably current human uses of the property did not appear to have taken place in 2002, but were more likely 2-15 years ago. These include the construction of a small one room cabin on the abandoned rail line just north of the pond; construction of two wooden hunting stands in the poplar grove north west of Liberte field; dumping of refuse in an alder thicket north east of the parking field; and installation of a series of wooden post fences lined with barbed wire in a few locations on the property that have fallen into disrepair. Further photos and description on these observations can be found in Appendix 2.

The only other time a person was encountered on the property by ECA staff in 2002 was in late August, when a person was observed picking blackberries on the northern extent of the east access road.

7.0 Recommendations

This report must be used based on full knowledge of its limitations. All surveys were only preliminary in nature. The result is that it can not be said with confidence that a particular species does not use Melanson property, only that those encountered during the limited surveys do use the property. Further, full analysis of all the data encountered opportunistically could not be completed because of the limitations of time and budget.

As, field surveys were limited, in order to ensure a better understanding of some of the ecological interactions, additional field work ought to be completed. This includes:

- Additional survey of the pond to determine if it is a seasonal staging area for ducks in the fall.
- Additional survey of the Southern Arm to determine if this portion of the property is regularly used for rearing white tail fawn.
- Confirm the importance of the property as a north south wildlife corridor between the marshlands and the north mountain woodlands, through additional field examination of this interface, and on the ground or through recent air photo identification of the next closest potential corridors to the east and west of Melanson.
- Lepidopteron surveys, and in particular butterflies, should be carried out to cover the full season. The diverse nature of flowering plants on the property supports the potential of the property as being a locally important habitat.
- Evaluation of pond habitat to determine if continued seasonal evaporation occurs, and if the drying and large tadpole kill is a regular occurrence. The pond is the only semi aquatic habitat on the property and is thereby important in maintaining diversity of fauna. In general there are few freshwater bodies in the vicinity. The closest is Boggart Lake, about 5km west on the top of the north mountain.
- Inventory odonata. Several listed species of odonata have been found within the immediate vicinity of the Melanson property. As no surveys of this nature were carried out on the property, it is unknown if these and other species are supported.
- A more thorough inventory of mammals should be completed, focusing on identification of sign, and additional small mammal trapping. Results of the current level of effort do not adequately allow for fully informed management decisions regarding potential impact to mammals to be made.
- Completing an air photo analysis of the property. It appears likely that air photos to near 1920 exist, and that very current satellite or air photo coverage could be obtained. Comparison of all available year coverage's would provide valuable insight to the ecological components and changes that have existed on the property. This knowledge would help frame management options in a manner that would mimic past habitat or land use phases, and provide a wider variety of potentially acceptable options to the decision makers.

Some observations of the Melanson property warrant consideration in future property management planning. Consideration is warranted either because the potential for a negative influence on the ecosystem exists, or the dynamic nature of the property limits the feasibility of some options over time.

- Melanson property is not large enough to alone provide an individual territory for many larger mammals. However, it may very well be an important habitat component and a migration route that connects other territory habitats. Care should be given to not impact on the observed internal movement corridors, or the potential exterior links to neighboring properties, through property development.
- Consideration should be given to filling the low swale in the rail bed to help enhance pond area and depth, and thereby increase diversity of habitat and species at the property. Such an activity would not be rehabilitation to a more natural state, but rehabilitation to a state that likely existed from the 1906 to sometime after 1945; possibly as recently as the late 1990's.
- The vegetative state of the property has changed considerably over time. It is currently more heavily treed than it has been for at least 57 years, and likely much longer. Woody vegetation coverage is increasing rapidly in the fields, and is expected to increase as many woody plants were observed to just be reaching the height of field grasses. This will release them from competition for light and likely greatly speed the growth of these species. Deciding what vegetation state is desired to achieve future site objectives is an issue that ought to be discussed in the near future, as implementing management activities will become increasingly difficult and costly if fields are a desired component of the property.
- The gravel pit operation on the east boundary has been one of the most significant land use impacts at Melanson, and yet little is known about its operation. Efforts to determine the extent and purpose of the operation, as well as if any artifacts were uncovered by the operators, should be considered.

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Appendix 1- Survey methods

Avifauna

Bird surveys were completed by Sharon Hawboldt of Upper Granville, Nova Scotia. Three transects were established across the property to allow repetition of survey effort. Each transect was walked several times, and in different directions throughout the survey 2002 season. Counts were made by moving a set distance and then listening for, and identifying species by song at each location for a fixed amount of time.

Field data was being analyzed, and no document had been written on the findings of the bird surveys of Melanson Property at the time of completion of this report. Therefore, no reference has been made to those data. Data was submitted to, and analysis was to be completed by, the same client at Kejimkujik National Park as described on the cover of this report.

Vegetation

Vegetation surveys of Melanson Property were completed by Ruth Newell of Wolfville, Nova Scotia and Heather Stewart of Lawrencetown, Nova Scotia. Field surveys of the property were conducted on seven total days in 2001 and 2002. Their final report, *Vegetation Inventory of the Melanson Settlement Property*, was submitted in December 2002 to the same client at Kejimkujik National Park as described on the cover of this report. Detail species lists, habitats, analysis, and recommendations are presented in that report.

Some reference and cross reference is made to the Newell and Stewart (2002) document throughout this report.

Lepidopteron

Lepidopteron surveys were conducted at various times opportunistically. In such cases specimens were either caught by hand, or aerial net and placed in a killing jar. Similarly, time constrained aerial netting surveys were conducted where a portion of property would be walked for a period of two hours. Any specimens encountered would be netted and placed in a killing jar of ether for later identification. Five such time constrained searches were conducted on three dates, August 6th, 19th, and 22nd. A total of 215 minutes of active search time was completed. Locations were widespread, but included the open areas of the Melanson property down to the dykes at the southern boundary, along the middle wooded birding transect, the eastern access road, the Parking Field, Charles' field, and east and west Liberte field.

The second trapping method involved the use of light traps for specific durations of time. Light traps were used on two separate occasions for a measured time. The first survey (Lite trap #1) occurred on July 23, 2002 and lasted from approximately 10 P.M. until 2 A.M. The second (Lite trap #2) took place on August 08, and lasted from 9:30 P.M. until 12:30 A.M. A white sheet was strung perpendicular to, and approximately 2 meters above, the ground. A second sheet was placed on the ground under the first. A small battery powered incandescent light was placed centrally at the upper edge of the strung sheet. This 12volt, 21 watt light was left on continuously for the four hours.

Figure 11: Lite trap set up for demonstration. A small battery powered light is placed atop a vertically strung sheet that lies perpendicular to a ground sheet.

At site #2, a very bright Coleman lantern was used for half the survey time to see if low visitation and capture numbers could be improved. Any lepidopteron species attracted to the light were caught on or around the two sheets and placed in killing jars with ether. At the end of the evening the specimens were transferred to a freezer for later identification.

Table A1: Lepidopteron Lite Trap Locations

Location	UTM	Description
East access road south of old rail line.	20 0294652 4954895	Lite trap #1 is a woods location along the eastern access road where the bird survey transect crosses the road. It is an area of dense alder.
Anne's field at the west access road and top of knoll.	20 0294568 4954591	Lite trap #2 is an open field site in Anne's field. It is atop the knoll in this field where the west access road passes, and has a visible line of site to the Annapolis Basin.

All field collected specimens were then pinned to mounting boards for identification. A variety of identification guides were utilized to identify species. Moths were more difficult to identify and mounted specimens were taken to the Nova Scotia Museum where access to more comprehensive identification keys and labeled specimen collection aided further identification.

Amphibians

Amphibians were surveyed using a systematic habitat search format. This meant timing a field search of likely habitat locations for amphibian species. All samples were caught by hand or net during a walking survey of habitats. No trapping methods were used. A total of three locations were surveyed (see Table A2) for a total of 160 minutes of active search time over four different days between August 27th and September 17th. Breakdown of minutes by survey site is presented in *Appendix 2 – Raw Data*. No marking of captured individuals was conducted, so recapture and recount of a single individual was possible.

Table A2: Amphibian Systematic Habitat Search survey locations

Location	UTM	Description
Located just south of the old railway line in the center of the property	20 0294445 4954872	This pond is of 20-30 m^2. Open surface area is about 7-10m^2. The pond dried completely by September 09, 2002. Likely has a maximum depth of 40-50cm when full. Appears to have formed from an old beaver dam that filled a small swale through the rail line. Presumably a culvert was pulled from the location when the rail was deactivated. (Newell and Stewart 2002, Habitat No. 7).
At the southern boundary of Charles field.	20 0294621 4954592	Charles wetland is a small area with no standing water, but moderate cattail and aquatic vegetation growth. It is at the end of what appears to be a French rock drain. In mid August it was dry and no amphibians were found.
On the west side of the east access road, south of the old rail line.	20 0294566 4955052	East Access wetland is a small area of 10-12m^2. There was no standing water in mid August, and no amphibians caught. It may have standing water at wetter periods of the year, with a max depth of about 15cm. Appears to be formed in an old ditch line where the topography broadens and flattens. (Newell and Stewart 2002, habitat No. 5)

Reptiles

Reptiles were searched through a systematic habitats survey, with level of effort recorded as amount of time searched. Surveys were conducted either in late afternoon or mid morning on warm dry days during late August. Numerous likely locations such as the pond and rock piles around the Melanson property were regularly searched, as was any ground linking these habitat features. The pond was searched with spotting glass and by walk through for turtles. Snakes were sought along the access roads, south aspect slopes, and numerous rock piles (See Table A3). The term, rock piles, is used very loosely here as archeologists have identified most of these locations to be associated with the early Acadian settlement. Some ‘rock piles’ are field stone, rock fences, foundations, and other possible human constructed structures. These locations were primarily visually surveyed, although a few larger stones were lifted at several locations to see if any reptiles may be seeking cover. Not all reptile habitat survey sites are listed in Table A3 as several locations were surveyed only once. Those listed in the table were regularly visited during surveys. Several sites and lengths of rock wall were surveyed in every field of the property at some point in time.

Table A3: Reptile habitat search locations

Structure	Description	UTM / Location
Pond	Small pond to east of old rail line.	20 0294445 4954872
Rock pile	Likely a pile of field stone on western edge of Anne's field.	20 0294522 4954516
Access Road	East Access road with particular attention to south aspect portions.	Across property in a general north south direction, and on the eastern portion.
Rock knoll	Possible out cropping of an old gravel extraction operation. Just west of Charles' field at the end of the west access road.	20 0294748 4954755
Rock pile	Likely a pile of field stone north of the rail bed, but south of the parking field in the woods between the two.	20 0294370 4954037
Rock pile	Likely a pile of field stone on the western edge of the parking field.	20 0294375 4954922
Rock wall	Either a rock wall or French drain between Anne's field and Charles' field. Runs from the east access road to the south east.	20 0294594 4954600
Rock pile	This is the old homestead foundation at the highest point of ground in Charles' field. Site #8 in research bulletin.	NA

Active habitat searches, which totaled 205 active search minutes over three different days between August 22nd and 29th, did not find any reptiles. However, opportunistic sightings and capture did provide some species data. As feasible, snakes were captured either directly by hand, or with the aid of a net. Total length measurements were recorded, and in some instances an identifying photo was taken.

Mammals

Mammal surveys were conducted in two manners. First, opportunistic sightings were the only identification component for larger mammals. However, the amount of time spent traversing the property for various activities means that a large amount of time was spent actively watching for scat, tracks, species, and other signs that could be used to positively confirm presence of a particular species. Visual surveying for mammals and mammal sign during amphibian, reptile, small mammal, and lepidopteron means that the greatest amount of survey time was spent on mammals.

A second survey method was employed for small mammals; namely mice, voles, and shrews. Baited pitfall trap stations were established at four locations around Melanson property (see Table A3). Two stations were specifically chosen because of the known presence of target species. The other two were established in likely habitat locations. Each of the four trapping stations was composed of four individual pit traps constructed of a central hub location with three equidistant surrounding traps located approximately 3 meters away (see Figure A1). Early traps used containers of 19cm and 25 cm depth dug into the ground until the top lip was flush with the ground surface. Because of availability of materials two different depth trapping containers were used. At two of the locations plastic sheeting was staked as fencing between the central hub and the three surrounding pits. The literature suggests that this setup may improve catch rates.

Figure 12: A pitfall trap station set in Liberte field of Melanson Property. Three sheet walls run from individual periphery pitfall traps to a central hub trap to help increase small mammal interception and capture.

Pitfall traps were installed on September 05-06 and baited with a variety of baits including, carrots, oats, peanut butter and oats, carrot greens, and walnuts. Each pit was lined with bedding of cotton, grass, and or sawdust. At least one pit at each station had a water supply. All trap openings were 80%+ covered with a board to eliminate predation of mammals in the traps. All traps were initially made such that access and escape was possible for a period of five days. This allowed resident species to become familiar with the traps and comfortable entering and leaving the traps.

Figure 13: This photo shows an individual pitfall trap with a board and sod placed over the opening to camouflage the structure and reduce predation on any trapped animals.

Table A3: Pitfall Traps for Small mammals

Location	UTM	Description
Pitfall #1, this site is located within meters of the pond and old woods camp on the abandoned railway line.	20 0294454 4954897	Four cans were placed, with one deeper in the middle and three smaller on the periphery. Plastic fencing was used to connect the individual traps. Lots of apparent rodent use of the camp.
Pitfall #2, this site is located in west Liberte field.	20 0294414 4954706	This is a site of four containers. Again connected by plastic fencing, the site has two deep and two shallow pits.
Pitfall #3 is located in Charles field to the east of the old homestead.	20 0294731 4954703	This site again has four individual pits but no plastic fencing. It is located on a south aspect slope of the field, but is highly surrounded by apple and Hawthorne clumps.
Pitfall #4 is the most southerly site, located in west Anne's field.	20 0294549 4954516	This site of four containers has no fencing. Three containers are deep, one shallow. At the edge of an open grassy field, and near an apparent rodent den in the field.

Traps were re-baited once on September 9th and again on September 10th. On the 10th, the trap structures that allowed escape were removed. This would prohibit any species entering the pit from escaping, and thereby allow live capture and identification. Traps were monitored continuously over an eight hour period, with no more than two hours passing between checks of an individual pit. This approach was taken to reduce likelihood of stress and stress related mortality. The exact checking times are shown in Table A4.

Table A4: Pit trap station checking frequency.

Pit Trap #1	Pit Trap #2	Pit Trap #3	Pit Trap #4
Set start 16:45	Set Start 16:30	Set Start 17:00	Set Start 17:10
Checked 18:15	Checked 18:10	Checked 18:25	Checked 18:35
Checked 20:30	Checked 20:20	Checked 20:10	Checked 20:00
Checked 21:55	Checked 21:50	Checked 22:05	Checked 22:15
Checked 24:00	Checked 24:05	Checked 24:10	Checked 24:15

None of these traps captured any mammals, and no sign was apparent that mammals had been in the traps. All traps were then reconstructed with either 30 or 35cm deep pits using larger plastic containers. This setup was left overnight from September 12th to the morning of the 13th with no periodic checking. Two shrews were captured (Pitfall #1 and #2). No other traps showed sign of mammal presence.

A final method of capture was employed to try and increase capture numbers. Eight snap box traps (see Figure 7) and one commercial box trap were set on two different days (September 19th and 20th) and baited with peanut butter and oats. A total of 15 different locations were targeted using these traps (see Table A5).

Table A5: Snap box and box trap locations.

Location	UTM	Description
Snap 1, northwest of west Liberte in poplar stand.	20 0294535 4954501	This site is in about the middle of a poplar stand that has little under story other than grasses.
Snap 2 and Snap 2-1, west Liberte adjacent to Pitfall #2.	20 0294420 4954724	Under a small hawthorn clump in the middle of the west Liberte Field.
Snap 3, north of east Liberte field.	20 0294504 4954796	This trap was placed under a spruce 5m north of the field into the woods.
Snap 4 and Snap 2-4, northwest Charles' field.	20 0294613 4954727	Field edge as well as next to a brush pile in the north west portion of Charles' field.
Snap 5, middle of Charles's field.	20 0294707 4954688	This trap was placed on an old collapsed wooden structure in the middle of heavy field grass.
Snap 6, east of Charles' field.	20 0294783 4954720	Wooded site east of Charles' field. Moderately wet and heavy low ground woody cover of a variety of species.
Snap 7, east of east access road.	20 0294718 4954808	Another wooded site located along the east access road. Small stand of hawthorn with little under story.
Snap 8 and Snap 2-8, wooded location along bird transect.	20 0294555 4954802	This site is under moderately heavy woods north of the Liberte field. The trap was located just off the middle bird survey transect.
Box 1, old camp on rail bed.	20 0294454 4954897	This box trap was placed near a wall, on the floor of the abandoned camp located on the old rail bed next to the pond.
Snap 2-2, north west corner of the parking field.	20 0294245 4954950	This trap was placed next to a spruce in the corner of the Parking field. The site is moderately close to the neighboring house west of the west property boundary.
Snap 2-3, east Liberte field.	20 0294556 4954804	Placed close to a brush pile in the center of the field.
Snap 2-5, south central Charles' field.	20 0294711 4954663	In a low draw on the south aspect of Charles' field, primarily field with scattered woody clumps.
Snap 2-6, north east corner of Charles' field.	20 0294701 4954759	In a low draw that runs east west through field habitat, moderately removed from wooded edge.
Snap 2-7, is the same location as Pitfall #4 in the lower west end of Anne's' field.		Very near an apparent rodent tunnel in the field, but close to the edge of a hawthorn thicket and the lower marsh meadow.
Box 2-1, middle west parking field.	20 0294316 4954814	Placed in a low draw area in the middle of this grassy field.

On September 18th the traps showed sign in three traps, but none were triggered. Traps were reset at these same locations. Others were moved to new locations. On September 19th the traps were checked after a second night. Six of the nine traps had sign of scat or bait removal, but none had tripped resulting in no live captures.

Figure 14: Snap box baited and placed in north Charles' field

Appendix 2 - Raw data

Field Survey Effort
Additional Species Indicators
Additional Human Activity Indicators
Survey Data

Field Survey Effort

Target	Date	Search type	Start	Finish	Total Actual search time (min)	Notes
Amphibians	27-Aug	Sys. Habitats	10:00	11:00	60	1 capture pond
Amphibians	30-Aug	Sys. Habitats	9:30	10:30	60	3 captures pond
Amphibians	30-Aug	Sys. Habitats	10:50	11:00	10	No captures east road wetland
Amphibians	30-Aug	Sys. Habitats	11:10	11:15	5	no captures homestead wetland
Amphibians	5-Sep	Sys. Habitats	15:10	15:20	10	no captures at pond
Amphibians	17-Sep	Sys. Habitats	16:05	16:20	15	1 frog observed
Total Time to date (Amphibians)					**160**	
Lepidopteron	23-Jul	Lite Trap	21:35	1:45	240	Jars 3, 4, 5, 6
Lepidopteron	6-Aug	TC Aerial	9:05	10:30	60	Jar 7
Lepidopteron	8-Aug	Lite Trap	21:30	23:30	180	Jars 8, 9, 10
Lepidopteron	19-Aug	TC Aerial	14:25	15:35	60	jar 11
Lepidopteron	19-Aug	TC Aerial	15:45	16:15	30	Jar 12
Lepidopteron	22-Aug	TC Aerial	13:55	14:30	35	Jar 13
Lepidopteron	22-Aug	TC Aerial	13:25	13:55	30	Nothing captured
Total Time to date (Lepidopteron)					**635**	
Reptiles	22-Aug	Sys. Habitats	14:35	15:30	55	Nothing captured
Reptiles	27-Aug	Sys. Habitats	11:00	11:45	45	Nothing captured
Reptiles	27-Aug	Sys. Habitats	9:00	10:00	45	Nothing captured
Reptiles	29-Aug	Sys. Habitats	11:30	13:30	60	Nothing captured
Total Time to date (reptiles)					**205**	
Mammals	10-Sep	Pit fall	16:45	23:15	450	Nothing captured
Mammals	13-Sep	Pit fall	17:00	8:00	900	Two shrews captured
Mammals	19-Sep	Snap boxes	16:00	8:45	1005	Nothing captured, 3 with sign not triggered
Mammals	20-Sep	Snap boxes	9:55	8:30	1325	Nothing captured, several with sign but not tripped
Total Time to date (small mammals)					**3680**	
Total Survey Time to date (min) (hrs)					**4680**	**78.00**

Additional Species Indicators

Figure 15: Black bear scat was found in several locations over the property and consisted primarily of either apple or berry. This sample was located on the west access road just as it enters Anne's' Field.

Figure 16: Relatively recent cuttings of saplings in the area just north of the rail line and east of the west access road are evidence of beaver presence. No cuttings were expected to be from the current year.

Figure 17: This bear scat was the only one that appeared to have a heavy apple content. Apples were quite plentiful around the property.

Figure 18: Bear scat found along the old rail bed in the vicinity of the pond. Blackberries in the area appear to have been the main content of the scat.

Figure 19: Deer scat was quite common around the property. Slightly heavier use areas appeared to be east Liberte field, southern arm, and south Charles' field.

Figure 20: Fox scat was found in many locations around the Melanson property, with no apparent preferred use area.

Figure 21: Apparent grouse scat was found at several locations on the property. 'Dust' baths or pits were also found in all the fields.

Figure 22: On the west access road through Liberte field these two small holes provide indication that some species of mouse is present.

Figure 23: Another apparent mouse nest is shown in the top right of the photo. A 'honey comb' material was discarded outside the entrance to the left of the photo center. This site was in the southwest half of Anne's field.

Figure 24: Two mammal species passed through this mud in opposite directions. Likely a fox or small dog moving to the left, and a cat (possible Lynx species) moving to the right. The site was between the Parking and Liberte fields.

Figure 25: These small footprints were found adjacent to those in Figure 10. Those to the left of the lens cap appear different than those to the right. Both are of a small mammal such as a squirrel or mouse.

Figure 26: Maritime garter snakes were the only species encountered during the field surveys.

Additional Human Activity Indicators

Figure 27: A small one room cabin has been constructed on the abandoned rail line. It overlooks the pond on the Melanson Property, and has a bed and stove. There is no sign of current use, although materials used in construction are quite modern.

Figure 28: Wooden fence posts, like these in the southern arm of Melanson Property, exist at several of the old rock fence lines. Some still have wire fencing between the posts.

Figure 29: A boot provides scale to an old timber located near the dyke southwest of Melanson Property. The timber seemed roughly squared at 30cm and was more than 7 meters long making larger than nearly any wood currently standing on the property.

Figure 30: The white bucket in the upper central portion of this photo sits on an old hunting stand. This is one of two old hunting stands located in the poplar grove in the northwest corner of Liberte field.

Melanson Property

Field Survey data - 2002

Date	Survey	Survey Method	Time	Jar / Trap#	Location	Zone	UTMEX	UTMNX	Given Name	Common Name	Life Stage	No:	Habitat description	Other notes	Photos
27-Aug	Amphibian	Systematic Habitat Search	10:05	NA	Pond by old rail bed	20	294445	4954872	*Bufo Americanus*	Eastern American Toad	Adult	1	Small pond that was nearly dry. Wet mud flat area exposed. Less than 5 square meters of water surface area.	Very high numbers of tadpoles exist in the watered area.	None
30-Aug	Amphibian	Systematic Habitat Search	9:30	NA	Pond by old rail bed	20	294445	4954872	*Rana melanota*	Green Frog	Adult	1	Small pond that was nearly dry. Wet mud flat area exposed. Less than 5 square meters of water surface area.	Overcast. Approx 5 hours of light rain during previous nite. Search from 9:00 - 10:30	None
17-Sep	Amphibian	Systematic Habitat Search	16:05	NA	Pond	20	294454	4954897	*Rana melanota*	Green Frog	Adult	1	Small pond that is significantly recharged with water having a depth of over 40cm now and surface area exceeding 20m2.	Seen swimming in a small section of pond so close id was not possible.	None
30-Aug	Amphibian	Systematic Habitat Search	9:30	NA	Pond by old rail bed	20	294445	4954872	*Rana pipiens*	Leopard Frog	Adult	1	Small pond that was nearly dry. Wet mud flat area exposed. Less than 5 square meters of water surface area.	Overcast. Approx 5 hours of light rain during previous nite. Search from 9:00 - 10:30	None
6-Aug	Ecology	Opportunistic	11:12	NA	east side of the parking field, north end of property	20	294375	4954922	*NA*	NA	NA		Hawthorn and alder clumps, 50%, near edge of old field	small rock pile adjacent to the field. Rock fence just east of this location runs approx. N/S.	None
6-Aug	Ecology	Opportunistic	11:00	NA	south side of the parking field, north end of property	20	294370	4954837	*NA*	NA	NA		Hawthorn and alder clumps, 50%, near edge of old field	small rock pile adjacent to the field.	None
19-Aug	Ecology	Opportunistic	16:00	NA	Southeast Homestead Field	20	294634	4954588	*NA*	NA	NA		Grassy area with frequent bush/tree clumps. Less open than other fields. Queen Anne lace most noticeable flower, some blackberries, and other berry bushes. Numerous hawthorn, and apple trees.	From the top of the homestead field knoll to the east and south, the area seems to be a high use wildlife area. Several animal trails are visible through this area. Scat is relatively abundant, pheasant dusting pits, etc. Most 'visibly' used portion of property to date. The access road that was mowed earlier in the season and turns north from this field appears to have had little to no use and	None

														has not been mowed a second time to date.	
29-Aug	Ecology	Opportunistic	13:05	NA	Charles' field just 25 meters east of homestead foundation.	20	294678	4954688	*NA*	NA	NA	NA	Open grass field at top of knoll. Some hawthorn clumps nearby. Area of very short grasses.	This location seems to be a feeding site, likely for birds as evidenced by the presence of several crab, mussel, and clamshells.	1
15-Jul	Ecology	Opportunistic	10:30	NA	old rail bed at west access road	20	294353	4954815					edge of field and alder hawthorne thicket about 30 m north of the rail line.	Many small diameter stumps show presence of beaver in not too distance past having cut small trees.	1 from west
6-Aug	Human Ecology	Opportunistic	9:50	NA	Southern arm of property from edge of trees to dyke.	20	294512	4954426	*NA*	NA	NA	NA	Old field with herbaceous clumps, wild rose, cattails in drainage lines. Clear line of site to open water on Basin.	A line of old wooden fence posts were found opportunistically during TCS for Lepidopteran. Split tree, not manufactured.	1 facing north
6-Aug	Human Ecology	Opportunistic	11:15	NA	North property approx 20m from main road and 50 m west of east neighboring house	20	294322	4955038	*NA*	NA	NA	NA	Dense alder between main highway and old field.	There is a small amount of refuse dumped at this location, old tires, pipe, slide, children toys. Path leads to east neighbors yard. Observed a small milk carton 'bird feeder' on trail, but design may be to catch bird. Both have been inactive for an amount of time, est. 1 year.	None
6-Aug	Human Ecology	Opportunistic	10:50	NA	South of rail line, west of pond.	20	294414	4954850	*NA*	NA	NA	NA	Dense Hawthorn thicket.	At rail line, north end of rock wall and wooden staked barbed wire fence line followed from several hundred meters to the south. Does not appear to continue on north side of rail line.	None

19-Aug	Human Ecology	Opportunistic	16:00	NA	Main dyke, south property	20	none	none	*NA*	NA	NA	NA	Meadow and tidal marsh separated by dyke	Large farm tractor using the road that parallels the basin shoreline. Large round bales of hay have been cut from the north slope of the dyke, including adjacent to the Melanson property.	None
22-Aug	Human Ecology	Opportunistic	13:50	NA	Old rock wall in dense brush along middle bird transect	20	294559	4954808	*NA*	NA	NA	NA	Dense wooded alder, hawthorn.	Rock wall running approx E to W.	None
22-Aug	Human Ecology	Opportunistic	14:00	NA	East Liberte Field	20	none	none	*NA*	NA	NA	NA	Open grass field with moderate clumps of hawthorn and apple trees encroaching. Few flowers.	Approximately 5 pile of hawthorn brush have been created around the east Liberte field (a couple more on Homestead field). Apparently cut to help arrest herbaceous encroachment on fields (T. Bunbury pers. comm). Obvious cut ends and piled brush.	None
22-Aug	Human Ecology	Opportunistic	14:15	NA	West Liberte Field	20	294423	4954710	*NA*	NA	NA	NA	Open grass field with moderate clumps of hawthorn and apple trees encroaching. Few flowers.	Several ditches running north / south exist across this field. GPS location is for the largest of these.	None
22-Aug	Human Ecology	Opportunistic	14:40	na	East side of Homestead field, very near where east road comes out of woods.	20	294748	4954755	*NA*	NA	NA	NA	Small clearing in alder thicket. This is a depression approx. 20 m by 35 m long. Rock knoll is on the west side of clearing.	Almost appears to have been a gravel extraction at one time from the depression. There appears a natural ramp on the north end , and a higher berm 1-2m around most of the north and east sides of the depression.	None
22-Aug	Human Ecology	Opportunistic	14:50	na	West side of homestead field where roadway dips to head south onto the last field before the marsh.	20	294594	4954600	*NA*	NA	NA	NA	Edge of fields with narrow thicket of hawthorn and other herbaceous shrubs.	Appears to be a French drain as opposed to a rock wall because of its sunken appearance relative to the surrounding ground.	None

27-Aug	Human Ecology	Opportunistic	9:20	na	North end, west side of the short dyke that runs from the new dyke north to the Melanson property boundary.	20	294600	4954482	*NA*	NA	NA	NA	Old dyked field, roses, black berry, grasses.	There appears to be a square timber covered by much ground growth. Approx 1o inches square by 20 + feet long. Just south of property boundary marker. It is in low area to west of dyke excavated during construction of dyke. Approx 150-250 meters from open water.	2
29-Aug	Human Ecology	Opportunistic	12:00	NA	In poplar stand north west of west Liberte field. At railway and west property boundary	20	294348	4954768	*NA*	NA	NA	NA	Poplar stand with minimal understory other than grasses. Line of site to open fields to the north and south.	This is a small hunting stand found in a tree. A single board seat with a single board ladder step to gain access. A second larger stand has fallen to the ground in disrepair several meters south.	1 from south
29-Aug	Human Ecology	Opportunistic	12:45	NA	West property line	20	294397	4954561	*NA*	NA	NA	NA	Dense shrub including some hawthorn clumps. Heavy grass in areas including frequent line of cattails.	Starting at the rail line in west Liberte field and moving south, a large amount of rock forms this west boundary wall to approximately the south end of Liberte field. A 1m wide by 30-40cm deep ditch parallels the wall from about mid field south to the dyke at the properties southern boundary. Although no water in Aug. mud is soft, and vegetation dense. Appears heavy cool refuge use by deer as evidenced by tracks.	None

6-Sep	Human Ecology	Opportunistic	14:00	NA	Pitfall trap 3 near old homestead in Charles' field	20	294731	4954703	*NA*	NA	NA	NA	Charles' field to east of homestead.	A man on a tractor with a field mower came down the east access road mowing the roadway to the point of the old homestead foundation.	None
15-Jul	Human Ecology	Opportunistic	9:25	NA	Old rail bed at pond	20	294447	4954890					Raised rail bed with dense blackberry and alder adjacent to small wetland pond	A small camp that has been deserted for some time exists at this site. Reasonably modern with small wood stove, bunk beds, mattresses, metal roof and vinyl window. Overlooks the pond.	1 from west
15-Jul	Human Ecology	Opportunistic	10:20	NA	Main dyke, south property	20	none	none					Meadow and tidal marsh separated by dyke	Approximately 17 individuals clamming on flats adjacent to property. Three boats, and five vehicles. ATV impacts and access routes on tidal marsh.	None
8-Aug	Lepidopteran	Lite Trap	22:30	9	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Acronita impleta*	Yellow Haired Dagger	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. All wind has stopped by 11PM, still. Began using large Coleman lantern to see if more specimens would be drawn.	None
23-Jul	Lepidopteran	Lite Trap	21:35	3	East property road @ transect crossing	20	294653	4954898	*Apamea amputatrix*	Yellow headed cutworm moth	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, one hour in four hour session.	None
23-Jul	Lepidopteran	Lite Trap	22:40	4	East property road @ transect crossing	20	294653	4954898	*Apamea amputatrix*	Yellow headed cutworm moth	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, one hour in four hour session.	None

8-Aug	Lepidopteran	Lite Trap	21:30	8	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Apamea amputatrix*	Yellow headed cutworm moth	Adult	2	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Generally cloud free sky, although a dark cloud bank over north mountain. Air temp. cool <10C. Moderate wind. Lighted aspect primarily south.	None
27-Aug	Lepidopteran	Opportunistic	9:50	14	West access road at Liberte field	20	none	none	*Arogeia rapae*	Cabbage White	Adult femal e	1	Grass field at edge of access road.	Opportunistic during reptile survey.	None
19-Aug	Lepidopteran	Time constrained aerial sweep	15:45	12	Homestead Field	20	294645	4954706	*Arogeia rapae*	Cabbage White	Adult	1	Grassy area with frequent bush/tree clumps. Less open than other fields. Queen Anne lace most noticeable flower, some blackberries, and other berry bushes.	Total TCS aerial sweep from 3:45-4:15 with only three captures, 30+C hazy, preceded by approx 5 similar days. Mod. Wind from SW.	None
8-Aug	Lepidopteran	Lite Trap	23:30	10	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Bomolocha palparia*	Mottled Bomolocha	Adult	2	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. No wind. Lantern used. Near 12 catch rate dropped to near 0, so survey was ended for nite at 12:30.	None
23-Jul	Lepidopteran	Lite Trap	23:40	5	East property road @ transect crossing	20	294653	4954898	*Cabera erythemaria*	Yellow Dusted Cream Moth	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Full moon visible but hazy from 23:55 - 24:15, but fully overcast, one hour in four hour session.	None
8-Aug	Lepidopteran	Lite Trap	23:30	10	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Caenurgina crassiscula*	Clover Looper Moth	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. No wind. Lantern used. Near 12 catch rate dropped to near 0, so survey was ended for nite at 12:30.	None
8-Aug	Lepidopteran	Lite Trap	21:30	8	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Caenurgina crassiuscula*	Clover Looper Moth	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Generally cloud free sky, although a dark cloud bank over north mountain. Air temp. cool <10C. Moderate wind. Lighted aspect primarily south.	None

8-Aug	Lepidopteran	Lite Trap	22:30	9	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Caenurgina crassiuscula*	Clover Looper Moth	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. All wind has stopped by 11PM, still. Began using large Coleman lantern to see if more specimens would be drawn.	None
19-Aug	Lepidopteran	Time constrained aerial sweep	14:25	11	Parking field	20	294279	4955015	*Caenurgina crassiuscula*	Clover Looper Moth	Adult	2	Mostly open grassy field with Queen Anne Lace most prolific flower. Some clumps of apple, hawthorn or other herbaceous shrub.	Total TCS aerial sweep from 2:25-3:35, 1hr actual capture time. 30+C hazy, preceded by approx 5 similar days. Mod. Wind from SW.	None
8-Aug	Lepidopteran	Lite Trap	22:30	9	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Caenurgina erechtea*	Forage Looper Moth	Adult	4	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. All wind has stopped by 11PM, still. Began using large Coleman lantern to see if more specimens would be drawn.	None
23-Jul	Lepidopteran	Lite Trap	23:40	5	East property road @ transect crossing	20	294653	4954898	*Calyptra canadensis*	Canadian Owlet	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Full moon visible but hazy from 23:55 - 24:15, but fully overcast, one hour in four hour session.	None
8-Aug	Lepidopteran	Lite Trap	22:30	9	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Catacola spp.*	UI. Underwing	Adult	2	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. All wind has stopped by 11PM, still. Began using large Coleman lantern to see if more specimens would be drawn.	None
8-Aug	Lepidopteran	Lite Trap	23:30	10	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Catacola spp.*	UI. Catacola	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. No wind. Lantern used. Near 12 catch rate dropped to near 0, so survey was ended for nite at 12:30.	None

6-Aug	Lepidopteran	Time constrained aerial sweep	9:05	7	Southern arm of property from edge of trees to dyke.	20	294412	4954293	*Cercyonis pegala*	Large Wood Nymph	Adult	5	Old field with herbaceous clumps, wild rose, cattails in drainage lines. Clear line of site to open water on Basin.	TCS from 9:05-10:30, although only 1 hour active for Lepidopteran. Rained moderately nite before, very damp, overcast, approx 15C.	None
19-Aug	Lepidopteran	Time constrained aerial sweep	14:25	11	Parking field	20	294279	4955015	*Cercyonis pegala*	Large Wood Nymph	Adult	1	Mostly open grassy field with Queen Anne Lace most prolific flower. Some clumps of apple, hawthorn or other herbaceous shrub.	Total TCS aerial sweep from 2:25-3:35, 1hr actual capture time. 30+C hazy, preceded by approx 5 similar days. Mod. Wind from SW.	None
19-Aug	Lepidopteran	Time constrained aerial sweep	15:45	12	Homestead Field	20	294645	4954706	*Cercyonis pegala*	Large Wood Nymph	Adult	2	Grassy area with frequent bush/tree clumps. Less open than other fields. Queen Anne lace most noticeable flower, some blackberries, and other berry bushes.	Total TCS aerial sweep from 3:45-4:15 with only three captures, 30+C hazy, preceded by approx 5 similar days. Mod. Wind from SW.	None
22-Aug	Lepidopteran	Time constrained aerial sweep	13:55	13	Liberte fields	20	294423	4954710	*Cercyonis pegola*	Large Wood Nymph	Adult	3	Open grass field with moderate clumps of hawthorn and apple trees encroaching. Few flowers.	Bright overcast and approx 22C. From 1:55 to 2:30.	None
19-Aug	Lepidopteran	Time constrained aerial sweep	14:25	11	Parking field	20	294279	4955015	*Coenonympha inornata*	Prarie Ringlet	Adult	7	Mostly open grassy field with Queen Anne Lace most prolific flower. Some clumps of apple, hawthorn or other herbaceous shrub.	Total TCS aerial sweep from 2:25-3:35, 1hr actual capture time. 30+C hazy, preceded by approx 5 similar days. Mod. Wind from SW.	None
22-Aug	Lepidopteran	Time constrained aerial sweep	13:55	13	Liberte fields	20	294423	4954710	*Coenonympha inornata*	Prarie Ringlet	Adult	2	Open grass field with moderate clumps of hawthorn and apple trees encroaching. Few flowers.	Bright overcast and approx 22C. From 1:55 to 2:30.	None
6-Aug	Lepidopteran	Time constrained aerial sweep	9:05	7	Southern arm of property from edge of trees to dyke.	20	294412	4954293	*Colias philodice*	Common Sulphur	Adult male	1	Old field with herbaceous clumps, wild rose, cattails in drainage lines. Clear line of site to open water on Basin.	TCS from 9:05-10:30, although only 1 hour active for Lepidopteran. Rained moderately nite before, very damp, overcast, approx 15C.	None
19-Aug	Lepidopteran	Time constrained aerial sweep	14:25	11	Parking field	20	294279	4955015	*Colias philodice*	Common Sulphur	Adult male	1	Mostly open grassy field with Queen Anne Lace most prolific flower. Some clumps of apple, hawthorn or other herbaceous shrub.	Total TCS aerial sweep from 2:25-3:35, 1hr actual capture time. 30+C hazy, preceded by approx 5 similar days. Mod. Wind from SW.	None
22-Aug	Lepidopteran	Time constrained aerial sweep	13:55	13	Liberte fields	20	294423	4954710	*Colias philodice*	Common Sulphur	Adult female	1	Open grass field with moderate clumps of hawthorn and apple trees encroaching. Few flowers.	Bright overcast and approx 22C. From 1:55 to 2:30.	None

23-Jul	Lepidopteran	Lite Trap	1:00	6	East property road @ transect crossing	20	294653	4954898	*Epidelta metonalis*	Pale Epidelta	Adult	3	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, rain began at 1:30	None
8-Aug	Lepidopteran	Lite Trap	21:30	8	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Euxoa divergens*	Divergent Dart	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Generally cloud free sky, although a dark cloud bank over north mountain. Air temp. cool <10C. Moderate wind. Lighted aspect primarily south.	None
8-Aug	Lepidopteran	Lite Trap	23:30	10	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Euxoa divergens*	Divergent Dart	Adult	3	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. No wind. Lantern used. Near 12 catch rate dropped to near 0, so survey was ended for nite at 12:30.	None
23-Jul	Lepidopteran	Lite Trap	1:00	6	East property road @ transect crossing	20	294653	4954898	*Hethemia pistasciania*	Pistachio Emerald	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, rain began at 1:30	None
6-Aug	Lepidopteran	Time constrained aerial sweep	9:05	7	Southern arm of property from edge of trees to dyke.	20	294412	4954293	*Hethemia pistasciania*	Pistachio Emerald	Adult	3	Old field with herbaceous clumps, wild rose, cattails in drainage lines. Clear line of site to open water on Basin.	TCS from 9:05-10:30, although only 1 hour active for Lepidopteran. Rained moderately nite before, very damp, overcast, approx 15C.	None
23-Jul	Lepidopteran	Lite Trap	21:35	3	East property road @ transect crossing	20	294653	4954898	*Homorthodes furfurata*	Scurfy Quaker	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, one hour in four hour session.	None

23-Jul	Lepidopteran	Lite Trap	23:40	5	East property road @ transect crossing	20	294653	4954898	*Horisme intestinata*	Brown Bark Carpet	Adult	2	Mowed road surface, bordered by dense alder on both sides.	Full moon visible but hazy from 23:55 - 24:15, but fully overcast, one hour in four hour session.	None
23-Jul	Lepidopteran	Lite Trap	1:00	6	East property road @ transect crossing	20	294653	4954898	*Horisme intestinata*	Brown Bark Carpet	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, rain began at 1:30	None
8-Aug	Lepidopteran	Lite Trap	22:30	9	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Hperstrotia pervertens*	Dotted Graylet	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. All wind has stopped by 11PM, still. Began using large Coleman lantern to see if more specimens would be drawn.	None
8-Aug	Lepidopteran	Lite Trap	22:30	9	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Hydriomena Spp.*	UI. Hydriomena	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. All wind has stopped by 11PM, still. Began using large Coleman lantern to see if more specimens would be drawn.	None
8-Aug	Lepidopteran	Lite Trap	23:30	10	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Hydriomena Spp.*	UI. Hydriomena	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. No wind. Lantern used. Near 12 catch rate dropped to near 0, so survey was ended for nite at 12:30.	None

8-Aug	Lepidopteran	Lite Trap	22:30	9	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Lomographa vestaliata*	White Spring Moth	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. All wind has stopped by 11PM, still. Began using large Coleman lantern to see if more specimens would be drawn.	None
19-Aug	Lepidopteran	Time constrained aerial sweep	14:25	11	Parking field	20	294279	4955015	*Lycaena phlaeas*	American Copper	Adult	1	Mostly open grassy field with Queen Anne Lace most prolific flower. Some clumps of apple, hawthorn or other herbaceous shrub.	Total TCS aerial sweep from 2:25-3:35, 1hr actual capture time. 30+C hazy, preceded by approx 5 similar days. Mod. Wind from SW.	None
8-Aug	Lepidopteran	Lite Trap	21:30	8	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Malacosoma americanum*	Eastern Tent Caterpillar Moth	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Generally cloud free sky, although a dark cloud bank over north mountain. Air temp. cool <10C. Moderate wind. Lighted aspect primarily south.	None
23-Jul	Lepidopteran	Lite Trap	21:35	3	East property road @ transect crossing	20	294653	4954898	*NA*	UI. Micro lepidoptera	Adult	2	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, one hour in four hour session.	None
23-Jul	Lepidopteran	Lite Trap	21:35	3	East property road @ transect crossing	20	294653	4954898	*NA*	UI. Micro lepidoptera	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, one hour in four hour session.	None

23-Jul	Lepidopteran	Lite Trap	21:35	3	East property road @ transect crossing	20	294653	4954898	*NA*	Ul. Micro lepidoptera	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, one hour in four hour session.	None
23-Jul	Lepidopteran	Lite Trap	23:40	5	East property road @ transect crossing	20	294653	4954898	*NA*	Ul. Micro lepidoptera	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Full moon visible but hazy from 23:55 - 24:15, but fully overcast, one hour in four hour session.	None
23-Jul	Lepidopteran	Lite Trap	23:40	5	East property road @ transect crossing	20	294653	4954898	*NA*	Ul. Micro lepidoptera	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Full moon visible but hazy from 23:55 - 24:15, but fully overcast, one hour in four hour session.	None
23-Jul	Lepidopteran	Lite Trap	1:00	6	East property road @ transect crossing	20	294653	4954898	*NA*	Ul. Micro lepidoptera	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, rain began at 1:30	None
23-Jul	Lepidopteran	Lite Trap	1:00	6	East property road @ transect crossing	20	294653	4954898	*NA*	Ul. Micro lepidoptera	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, rain began at 1:30	None
23-Jul	Lepidopteran	Lite Trap	1:00	6	East property road @ transect crossing	20	294653	4954898	*NA*	Ul. Micro lepidoptera	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, rain began at 1:30	None

8-Aug	Lepidopteran	Lite Trap	21:30	8	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*NA*	UI. Lepidoptera	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Generally cloud free sky, although a dark cloud bank over north mountain. Air temp. cool <10C. Moderate wind. Lighted aspect primarily south.	None
8-Aug	Lepidopteran	Lite Trap	22:30	9	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*NA*	UI. Lepidoptera	Adult	2	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. All wind has stopped by 11PM, still. Began using large Coleman lantern to see if more specimens would be drawn.	None
8-Aug	Lepidopteran	Lite Trap	22:30	9	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*NA*	UI. Lepidoptera	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. All wind has stopped by 11PM, still. Began using large Coleman lantern to see if more specimens would be drawn.	None
8-Aug	Lepidopteran	Lite Trap	22:30	9	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*NA*	UI. Lepidoptera	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. All wind has stopped by 11PM, still. Began using large Coleman lantern to see if more specimens would be drawn.	None
8-Aug	Lepidopteran	Lite Trap	23:30	10	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*NA*	UI Lepidoptera	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. No wind. Lantern used. Near 12 catch rate dropped to near 0, so survey was ended for nite at 12:30.	None

8-Aug	Lepidopteran	Lite Trap	23:30	10	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*NA*	UI Micro lepidoptera	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. No wind. Lantern used. Near 12 catch rate dropped to near 0, so survey was ended for nite at 12:30.	None
8-Aug	Lepidopteran	Lite Trap	23:30	10	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*NA*	UI Micro lepidoptera	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. No wind. Lantern used. Near 12 catch rate dropped to near 0, so survey was ended for nite at 12:30.	None
15-Jul	Lepidopteran	Opportunistic	9:15	1	Parking field near hwy	20	294282	4954969	*NA*	UI. Micro lepidoptera	Adult	3	Open field, sparse shrub	caught by hand	None
19-Aug	Lepidopteran	Time constrained aerial sweep	14:25	11	Parking field	20	294279	4955015	*NA*	UI. Lepidoptera	Adult	1	Mostly open grassy field with Queen Anne Lace most prolific flower. Some clumps of apple, hawthorn or other herbaceous shrub.	Total TCS aerial sweep from 2:25-3:35, 1hr actual capture time. 30+C hazy, preceded by approx 5 similar days. Mod. Wind from SW.	None
8-Aug	Lepidopteran	Lite Trap	22:30	9	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Oreta rosea*	Rose Hooktip	Adult male	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. All wind has stopped by 11PM, still. Began using large Coleman lantern to see if more specimens would be drawn.	None
15-Jul	Lepidopteran	Opportunistic	9:35	2	East property road	20	294679	4954862	*Phyciodes tharos*	Pearly Crescentspot	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Caught by hand, roadway has recently been mowed from north property boundary south through to where it joins the west access road.	None
23-Jul	Lepidopteran	Lite Trap	21:35	3	East property road @ transect crossing	20	294653	4954898	*Pseudorthodes vecors*	Small Brown Quaker	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, one hour in four hour session.	None

8-Aug	Lepidopteran	Lite Trap	21:30	8	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Renia sobrialis*	Sober Renia	Adult female	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Generally cloud free sky, although a dark cloud bank over north mountain. Air temp. cool <10C. Moderate wind. Lighted aspect primarily south.	None
23-Jul	Lepidopteran	Lite Trap	1:00	6	East property road @ transect crossing	20	294653	4954898	*Scopula limboundata*	Large Lace Border	Adult	2	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, rain began at 1:30	None
23-Jul	Lepidopteran	Lite Trap	1:00	6	East property road @ transect crossing	20	294653	4954898	*Scopula purata*	Chalky Wave	Adult	7	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, rain began at 1:30	None
23-Jul	Lepidopteran	Lite Trap	1:00	6	East property road @ transect crossing	20	294653	4954898	*Spaelotis clandestina*	Clandestine Dart	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, rain began at 1:30	None
23-Jul	Lepidopteran	Lite Trap	23:40	5	East property road @ transect crossing	20	294653	4954898	*Tetanolita floridana*	Florida Tetanolita	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Full moon visible but hazy from 23:55 - 24:15, but fully overcast, one hour in four hour session.	None
23-Jul	Lepidopteran	Lite Trap	1:00	6	East property road @ transect crossing	20	294653	4954898	*Tetanolita floridana*	Florida Tetanolita	Adult	3	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, rain began at 1:30	None
23-Jul	Lepidopteran	Lite Trap	21:35	3	East property road @ transect crossing	20	294653	4954898	*Trichordesta legitima*	Striped Garden Caterpillar Moth	Adult female	1	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, one hour in four hour session.	None

8-Aug	Lepidopteran	Lite Trap	23:30	10	Lower field overlooking the Annapolis Basin, ~200m from shoreline.	20	294567	4954592	*Xestia normaniana*	Normans Dart	Adult	1	Open grass field on a knoll, bordered in part by clumps of herbaceous plants, hawthorn and alder. Overlooking fields, 100m away, with moderate wild rose and blackberry bushes. Approx. 200m to shoreline. Visibility ~100m min in each direction.	Cloud free sky.Air temp. cool <10C. Lighted aspect primarily south. No wind. Lantern used. Near 12 catch rate dropped to near 0, so survey was ended for nite at 12:30.	None
23-Jul	Lepidopteran	Lite Trap	23:40	5	East property road @ transect crossing	20	294653	4954898	*Zanclognatha ochreipennis*	Wavy Lined Zanclognatha	Adult	1	Mowed road surface, bordered by dense alder on both sides.	Full moon visible but hazy from 23:55 - 24:15, but fully overcast, one hour in four hour session.	None
23-Jul	Lepidopteran	Lite Trap	1:00	6	East property road @ transect crossing	20	294653	4954898	*Zanclognatha ochreipennis*	Wavy Lined Zanclognatha	Adult	4	Mowed road surface, bordered by dense alder on both sides.	Near full moon, but fully overcast, rain began at 1:30	None
27-Aug	Mammals	Opportunistic	10:00	na	Pond	20	294445	4954872	*Castor canadensis*	Beaver	NA	NA	Pond edge at the old railway line. Mostly dried up, exposed mud area with no more than 5 square meters of water surface area.	Old beaver dam works are visible at the north side of the pond where a low swale exits north across the rail bed. No water flow across this area is apparent, nor is there any channel. Sticks cut by beaver protrude from the mud.	None
6-Aug	Mammals	Opportunistic	11:07	NA	North of rail line and east of parking area in upper field.	20	294378	4954909	*Lepus americanus*	Varying hare	NA	1	At edge of old field near hawthorn and alder thickets, and old stone wall.	Opportunistic during TCS for Lepidopteran, not clearly viewed.	None
25-Aug	Mammals	Opportunistic	10:00	NA	Near foundation in Charles' field	20	294639	4954695	*Lepus americanus*	Varying hare	NA	1	In middle of field along rock of old foundation and rock wall.	Opportunistic during a site visit. Flushed from blackberry patch at top of knoll by Charles' foundation.	None
6-Aug	Mammals	Opportunistic	10:00	NA	Southern arm of property from edge of trees to dyke. Near fallen tree on west property line.	20	294459	4954442	*Odocoileus virginianus*	White Tail Deer	Fawn	2	Old field with herbaceous clumps, wild rose, cattails in drainage lines. Clear line of site to open water on Basin.	Opportunistic during TCS for Lepidopteran, two white tail fawns were flushed from bedding areas. Second was approx 50m east of given UTM.	1 (end of roll may not turn out)

6-Aug	Mammals	Opportunistic	10:30	NA	Southern arm of property from edge of trees to dyke.	20	294521	4954517	*Odocoileus virginianus*	White Tail Deer	Adult	1	Edge of old field with numerous herbaceous clumps.	Opportunistic during TCS for Lepidopteran, one adult was seen with one fawn in location near fawn sightings. Hoof prints were also observed south of the dyke on the tidal marsh area south of the property.	None
19-Aug	Mammals	Opportunistic	16:00	NA	Charles' Field	20	294634	4954588	*Odocoileus virginianus*	White Tail Deer	Adult	1	Edge of old field with numerous herbaceous clumps. Very tall grasses and some cattails nearby. Southern base of the Charles' knoll.	Opportunistic during TCS for Lepidopteran, one adult. Seen again on Sept. 10, Liberte Field.	None
20-Sep	Mammals	Opportunistic	9:30	NA	Charles' field by east access road	20	none	none	*Odocoileus virginianus*	White Tail Deer	Adult	1	Edge of old field with numerous herbaceous clumps of hawthorn and apple, and next to dense shrub brush.	Opportunistic one adult	None
22-Aug	Mammals	Opportunistic	15:30	NA	Parking field near rail bed	20	294340	4954844	*Odocoileus virginianus*	White Tail Deer	Fawn	2	Edge of old field with numerous herbaceous clumps. Southern edge of Parking field, near the access road.	Opportunistic two fawn.	None
27-Aug	Mammals	Opportunistic	9:50	NA	Pond by old rail bed	20	294445	4954872	*Procyon lotor*	Racoon	NA	NA	Small nearly dried pond with exposed mud area.	This is a footprint observation as raccoons have been very active around the edge of the remaining pond leaving prints in the soft mud.	None
30-Aug	Mammals	Opportunistic	9:10	NA	West boundary road in the parking field.	20	294319	4954859	*Sorex cinereus*	Masked Shrew	Adult	1	Middle of the roadway passing through the parking field, which is mostly grasses with some tree clumps.	This shrew was found dead. Some skin had been torn from the top of its head, presumable by a predator and not a vehicle as fresh fox scat in the road was not flattened.	2
14-Sep	Mammals	Pit Trap	8:00	1	Rail bed by the pond	20	294454	4954897	*Sorex cinereus*	Masked Shrew	Adult	1	Grassy area of the old rail bed next to blackberry patch and the pond. Old cabin to immediate east.	This shrew was found dead. It had eaten some of the bait and left scat in the trap.	1
14-Sep	Mammals	Pit Trap	9:10	2	Liberte fields	20	294414	4954706	*Sorex cinereus*	Masked Shrew	Adult	1	Middle of the Liberte field in an area of open grass with no shrub clumps within 10+m.	This shrew was dead at time of trap check.	None

29-Aug	Mammals	Opportunistic	12:10	NA	In poplar stand north west of west Liberte field. At railway and west property boundary	20	294310	4954724	*Tamiasciurus hudsonicus*	Red Squirrel	Adult	1	Poplar stand with minimal understory other than grasses. Much evidence of presence in old rail bed to the north, which is moderately treed by a variety of species, some shrubs, but still little understory vegetation. Rock walls and other rock piles in the area.	Opportunistic during reptile survey.	None
27-Aug	Mammals	Opportunistic	9:15	na	In main access road near rock drain and second light trap site most southerly field.	20	294569	4954603	*Ursus americanus*	Black Bear	NA	NA	road way in middle of grassy field, southern property.	This is a scat observation. Completely of apple.	1
27-Aug	Mammals	Opportunistic	9:50	NA	On old rail bed near cabin by the pond.	20	none	none	*Ursus americanus*	Black Bear	NA	NA	Old rail bed between thickets of alder, hawthorn and blackberry. Adjacent to the pond.	This is a scat observation. Completely of berries.	None
29-Aug	Mammals	Opportunistic	13:00	NA	Numerous locations including Charles field, Anne's field, Parking field, and Liberte field	20	none	none	*Vulpes rubicosa*	Red Fox	NA	NA	Open grassland fields.	Presence is only denoted by scat sightings in all fields, as well as a grouse kill in Liberte that may have been a fox kill.	None
27-Aug	Reptile	Opportunistic	10:00	NA	Pond	20	294445	4954872	*NA*	NA	Juvenile	1	Pond edge on exposed mud near grass clumps.	This small snake was only 10-15 cm long, very dark, almost black with very light or white pattern coloration on it's back. Capture was not possible and ID was incomplete. Possible Ribbon Snake.	None
6-Aug	Reptile	Opportunistic	10:35	NA	Northeast end of southern arm of property.	20	294522	4954516	*Thamnophis sirtalis pallidula*	Maritime Garter Snake	Adult	1	In a rock pile at the edge of an old field with numerous herbaceous clumps, hawthorn.	Opportunistic during TCS for Lepidopteran	None
30-Aug	Reptile	Opportunistic	10:00	NA	Pond	20	294445	4954872	*Thamnophis sirtalis pallidula*	Maritime Garter Snake	Adult	1	Pond edge near heavy grass clumps.	This was a good size garter about 40cm long.	None
9-Sep	Reptile	Opportunistic	12:00	NA	Pond	20	294454	4954897	*Thamnophis sirtalis pallidula*	Maritime Garter Snake	Juvenile	1	Grassy portion of old rail line near pond edge and camp.	This was small snake about 18cm total length.	1
12-Sep	Reptile	Opportunistic	15:15	NA	Pond	20	294454	4954897	*Thamnophis sirtalis pallidula*	Maritime Garter Snake	Adult	1	In the grass around the pond, sunning on one of the flattened clumps after 12 hrs of mod-heavy rain.	The total length of the snake was about 47cm.	1

17-Sep	Reptile	Opportunistic	15:30	NA	West edge of Charles' field near access road.	20	294568	4954664	*Thamnophis sirtalis pallidula*	Maritime Garter Snake	Adult	1	Grassy field adjacent to hawthorn thicket at corner of east and west access roads.	Snake was sunning in the roadway and was not captured for a measurement.	None