Ministry of Natural Resources

Ministère des Richesses naturelles

Ontario

Kemptville District

10 Campus Drive,
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Kemptville, ON K0G 1J0
Tel: (613)-258-8204
Fax: (613)-258-3920

April 1, 2011

Max Frable
Penn Energy Renewables Ltd,
620 Righters Ferry Road,
Bala Cynwyd, PA
19004

To Max Frable,

In accordance with the Ministry of the Environment's (MOE's) Renewable Energy Approvals (REA) Regulation (O.Reg.359/09), the Ministry of Natural Resources (MNR) has reviewed the natural heritage assessment and environmental impact study for Edwardsburgh_Morrisburg-1 Solar Energy Facility in the Township of Edwardsburgh/Cardinal submitted by Penn Energy Renewables Ltd.

In accordance with Section 28(2) and 38(2)(b) of the REA regulation, MNR provides the following confirmations following review of the natural heritage assessment:

1. The MNR confirms that the determination of the existence of natural features and the boundaries of natural features was made using applicable evaluation criteria or procedures established or accepted by MNR.
2. The MNR confirms that the site investigation and records review were conducted using applicable evaluation criteria or procedures established or accepted by MNR, if no natural features were identified.
3. The MNR confirms that the evaluation of the significance or provincial significance of the natural features was conducted using applicable evaluation criteria or procedures established or accepted by MNR (if required).
4. The MNR confirms that the project location is not in a provincial park or conservation reserve.
5. The MNR confirms that the environmental impact assessment report has been prepared in accordance with procedures established by the MNR.

This confirmation letter is valid for the project as proposed in the natural heritage assessment and environmental impact study, including those sections describing the

Environmental Effects Monitoring Plan and Construction Plan Report. Should any changes be made to the proposed project that would alter the NHA, MNR may need to undertake additional review of the NHA.

Where specific commitments have been made by the applicant in the NHA with respect to project design, construction, rehabilitation, operation, mitigation, or monitoring, MNR expects that these commitments will be considered in MOE's Renewable Energy Approval decision and, if approved, be implemented by the applicant.

In accordance with S.12 (1) of the Renewable Energy Approvals Regulation, this letter must be included as part of your application submitted to the MOE for a Renewable Energy Approval.

If you wish to discuss any part of this confirmation or additional comments provided, please contact Heather Zurbrigg at Heather.Zurbrigg@ontario.ca or at (613)-258-8366.

Sincerely,

Ken Durst
District Manager
Kemptville District MNR

cc. Jim Beal, Renewable Energy Provincial Field Program Coordinator, Regional Operations Division, MNR
Narren Santos, Environmental Assessment and Approvals Branch, MOE

Ministry of Natural Resources

Southern Region
Planning Unit
P.O Box 7000
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Ontario

June 21, 2013

Mr. Victor Contract
Edwardsburgh Solar Farm Partnership
1 Young Street
Suite 1801
Toronto ON
M5E 1W7

RE: Modifications to Edwardsburgh_Morrisburg-1 Solar Energy Facility

Dear Mr. Contract,

The Ministry of Natural Resources (MNR) has received the document dated June 13, 2013 that describes modifications to the Edwardsburgh_Morrisburg-1 Solar Energy Facility made subsequent to MNR's letter confirming the Natural Heritage Assessment in respect of the project.

Upon review of the modifications, MNR is satisfied that the Natural Heritage Assessment requirements of Ontario Regulation 359/09 have been met. Please add this letter as an addendum to the confirmation letter issued April 1, 2011 for the Edwardsburgh_Morrisburg-1 Solar Energy Facility.

If you wish to discuss this matter further, please contact Eric R. Prevost at Eric.Prevost@Ontario.ca or 705-755-3134.

Sincerely,

Kathy Woeller
Regional Land Use Planning Supervisor
Southern Region MNR

cc Glen Tomkinson, Penn Energy Renewables Ltd.
Andrea Fleishauer, Southern Region Renewable Energy Coordinator, MNR
Ken Durst, Kemptville District Manager, MNR
Narren Santos, Environmental Approvals Access & Service Integration Branch, MOE
Zeljko Romic, Environmental Approvals Access & Service Integration Branch, MOE

Penn Energy - Edwardsburgh_Morrisburg-1
SOLAR ENERGY FACILITY

In the Township of

EDWARDSBURGH/CARDINAL

FIT Contract No. F-000628-SPV-130-505
FIT Application No. FIT-F46NQGB
COD: April 2012

Natural Heritage Assessment

DRAFT

Prepared for:
Penn Energy Renewables Ltd.
620 Righters Ferry Road, Bala Cynwyd, PA 19004

Prepared by:
Bowfin Environmental Consulting
168 Montreal Road, Cornwall, ON K6H 1B3

February 2011
(Revised March 2011)

Table of Contents

List of Figures

List of Tables

List of Photographs

1.0 INTRODUCTION

Penn Energy Renewables Ltd. (Penn) has obtained a Feed-in-Tarriff (FIT) contract from the Ontario Power Authority (OPA) for the construction of a 10 MW (peak AC) solar energy facility near the Town of Prescott (Figure 1). The subject lands are located in part of Lots 34 and 35 Concession 1 of the Township of Edwardsburgh/Cardinal former Township of Edwardsburgh. The proposed Renewable Energy Generation Facility (REGF) would consist of a collection of solar photovoltaic (PV) modules (each approximately 1.00 m x 1.67 m in dimension) that are grouped into arrays tilted and facing south. These stationary arrays are strung together forming a series of rows oriented east to west. The Environmental Protection Act (EPA) administered by the Ministry of the Environment (MOE) regulates Renewable Energy Approvals (REA) under Part V.0.1 of the act. As part of this act, a Natural Heritage Assessment (NHA) is required in order to identify potential impacts to the natural area. Bowfin Environmental Consulting Inc. (Bowfin) has been retained by Penn to conduct the NHA.

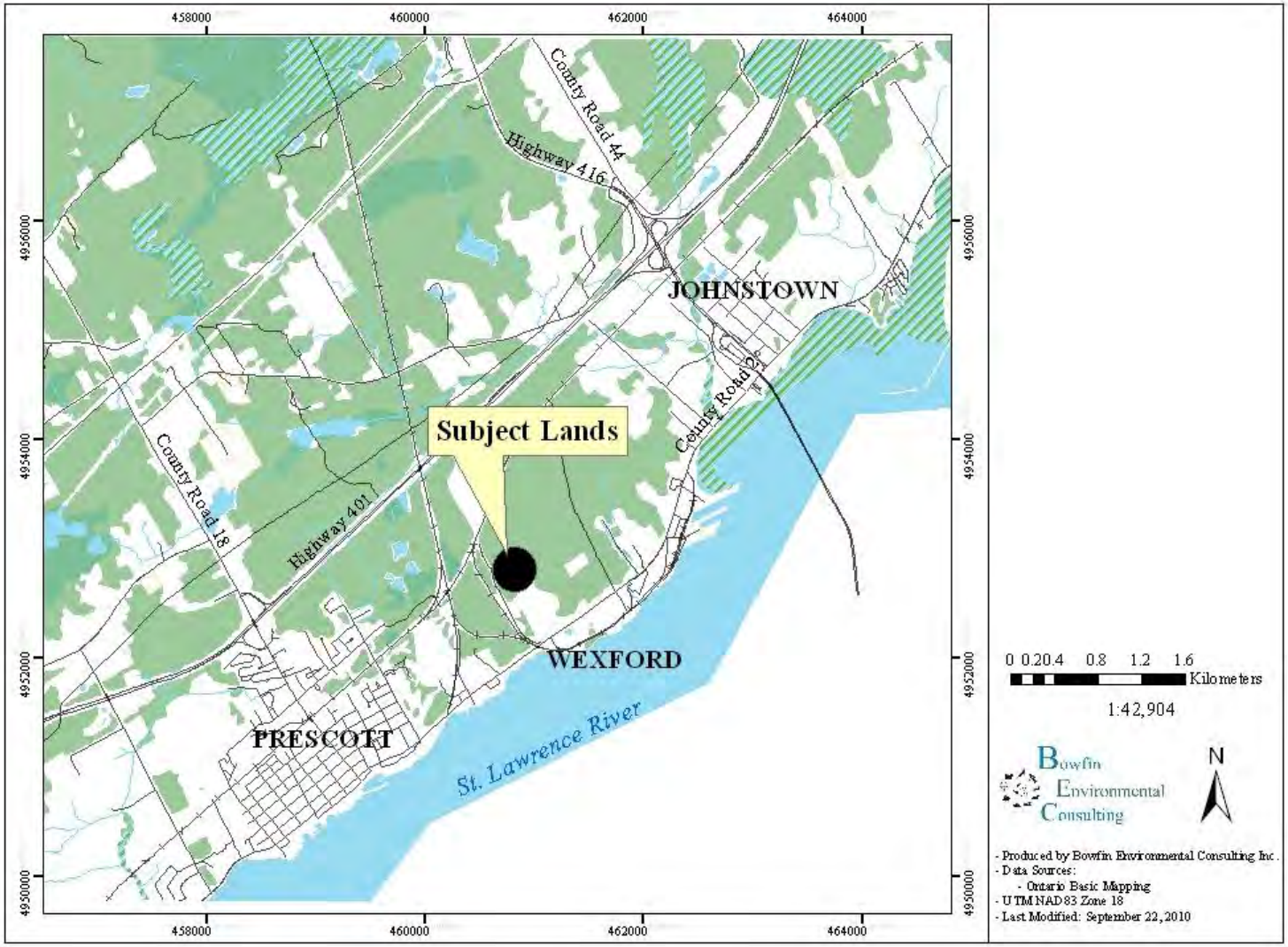
A NHA study includes three activities: a review of records (background information), a site investigation and an evaluation of the significance of each natural feature identified. The decisions on the significance of the natural feature are based on methods accepted by the Ontario Ministry of Natural Resources (OMNR). The records review includes the identification of the presence of natural features on or up to 120 m (depending on the feature) from the REGF project location. These features would include:

- Areas of natural and scientific interest (ANSI) (earth or life science);
- wetland (coastal, northern, southern);
- valleyland;
- wildlife habitat;
- woodland;
- Certain additional Natural features in the Oak Ridges Moraine Conservation Plan Area;
- Certain additional Natural features in the Greenbelt Plan's Protected Countryside;
- Provincial parks; or
- Conservation Reserves.

Should any significant natural features be found within the REGF project location or the appropriate adjacent lands, then an Environmental Impact Study (EIS) may be required to identify and assess the potential environmental effects of the project on the natural feature, Provincial Park or conservation reserve.

The following report provides a summary of the records review, site investigations and an evaluation of the significance of the natural features identified, followed by an EIS where required.

Figure 1 Location of the Subject Lands



2.0 METHODOLOGY

2.1 Records Review

Preliminary mapping of the vegetation communities was completed through the use of satellite imaging. The records review was conducted in order to identify potential environmental concerns and included identifying natural heritage features within the project area. The natural heritage features which were examined included: wetlands, areas of natural and scientific interest (ANSIs), woodlands, valleylands and wildlife habitat. This would include the identification of sand barrens, savannah, tallgrass prairie and alvars. Background information had been requested from the Kemptville District of the Ontario Ministry of Natural Resources (OMNR) and South Nation Conservation (SNC) and provided to Bowfin by Penn (Appendix A). Numerous records related to provincial parks, conservation reserves and natural features were searched and analyzed, including those maintained by OMNR, the Crown in right of Canada such as: Natural Heritage Information Centre (NHIC) (Appendix C), Land Information Ontario (LIO), Ontario Crown Land Use Atlas, Ontario Wind Resource Atlas, MNR species at risk website, species at risk in Ontario, Conservation Ontario, Edwardsburgh/Cardinal Glengarry Official Plan (OP), Niagara Escarpment Plan, *Ontario Breeding Bird Atlas* (OBBA) (2005) (Appendix D) and the Ontario herpetofaunal summary atlas. This study area is not located within the jurisdiction of any planning boards, municipal planning authority, local roads boards, local services board or the Niagara Escarpment Plan. Information on the fish habitat and communities are provided in a separate Water Assessment Report submitted to the Ministry of the Environment (MOE). It is noted that species and/or their habitats that are protected under the Provincial *Endangered Species Act* are dealt with in a separate report.

2.2 Site Investigation/Plant Inventories

The project study area for this proposed solar facility includes the portion of subject lands where any construction activities, including support facilities and staging areas, would take place (the ~~"R~~REGF Project Location") as well as all adjacent lands within 120 m (the ~~"S~~tudy Area") (Figure 2). It should be noted that initially the investigations occurred over a much larger area which included not only the subject lands, but also two other contiguous parcels and the 120 m adjacent lands surrounding them. For clarity, this larger area is referred to as the ~~"I~~nitial Surveyed Area" and information collected on flora and fauna species within this area is included in this report (Figure 2).

Preliminary mapping completed during the records review was corrected through ground truthing during the site investigation. The site was visited several times. Site investigations were completed on May 4th, June 4th, 8th, and 11th and July 6 and 7th, September 3rd and December 30th 2010 and March 1st, 2011. A total of 81 man hours were spent on site in order to physically investigate the air, land and water throughout the Study Area (Table 1).

Resumes for key personnel are provided in Appendix H. Field notes are included in Appendix I.

Table 1 Summary of Dates, Times of Site Investigations

Date	Start time	End time	Staff	Total No. of Staff Hours	Air Temp. (min-max) °C	Comments
May 4, 2010	0930	1600	Shaun St. Pierre Michelle Lavictoire	15	6.0-18.9	Overcast in the morning with little wind. Clearing mid day. Thunderstorm at 1600 hours
June 4, 2010	1030	1630		10	10.9-24.0	Sunny with scattered clouds, light wind.
June 8, 2010	0900	1615		14.5	8.4-19.0	Overcast with sunny breaks
June 11, 2010	0900	1330		9	7.6-22.5	sunny with scattered clouds, slight wind
July 6, 2010	0500	1100		12	21.0-33.2	sunny, no wind
July 7, 2010	0800	1100		6	20.3-32.9	sunny, little wind.
September 3, 2010	1000	1430		9	18.1-29.8	sunny, humid, light wind.
December 30, 2010	1000	1230	Shaun St.Pierre	2.5	-3.0- -0.4	Overcast, no wind
March 1, 2011	1015	1315		3	-2.3- -12.1	sunny, no wind

Shaun St. Pierre: B. Sc and Fisheries and Wildlife Technologist
Michelle (Nunas) Lavictoire : M. Sc.

Min-Max Temp taken from: Environment Canada. 2010. National Climate Data and Information Archive - Brockville Climate Ontario [Online] Available: http://www.climate.weatheroffice.gc.ca [November 23, 2010].

Resumes for key personnel are found in Appendix H

2.2.1 Habitat Description and Flora Observations

The site investigations were completed by systematically cruising the study area. Specific habitat types identified during the preliminary mapping exercise were also targeted for community description. Habitat descriptions were based on the appropriate methodologies such as: *Ontario Wetland Evaluation System, Southern Manual* (OWES) for wetland habitats and the *Ecological Land Classification for Southern Ontario V.2* (ELC) for terrestrial habitats. The minimum community size described was 0.5 ha. Smaller habitats were only described if they contained rare vegetation communities. Sufficient level of detail was collected in order to provide a general habitat description and identify the presence/absence of any of the natural environmental features.

Representative plant species were recorded within the communities and a running list of plants observed within the study area was kept. Specific attention was paid to locating species of conservation concern[1] listed as potentially occurring within the study area. Any species of conservation value observed was photographed and its coordinates were recorded on a hand held GPS using NAD83. Plants that could not be identified in the field were collected for a more detailed examination in the laboratory. Nomenclature used in this report follows the Southern Ontario Plant List (Bradley, 2007) for both common and scientific names which are based on Newmaster *et al.* (1998). Authorities for scientific names are given in Newmaster *et al.* (1998).

2.2.2. Breeding Bird Surveys

Bird surveys were completed during the morning beginning in the early hours (typically by 0500hours) terminating before the afternoon (in response to the decrease in the amount of singing). The morning visits were completed on days with little wind. Breeding bird surveys were completed by travelling through the area by foot and stopping periodically for 5 minutes to listen and observe. Birds were identified by sound and/or sight. These surveys were completed within the initial surveyed area (Figure 2). A search for raptor nests was completed by looking for evidence of nesting (such as stick nests, whitewashing of branches and foliage, food caches, accumulation of feathers/fur or prey remains as per Appendix O of the *Significant Wildlife Habitat Technical Guide* (SWHTG) as well as the raptors themselves. While walking the site special attention was paid at identifying flushed grassland species and/or their nest. This site was visited on 8 occasions between May 4th and December 30th, 2010 and once on March 1st, 2011 and any incidental sightings were recorded. A focused effort to observe birds was made on May 4th, June 11th and July 6th by Michelle Lavictoire.

[1] "Species of conservation concern" are those species listed as S1-S3 or as Special Concern (provincially or federally) or endangered or threatened federal species that are not listed as endangered or threatened provincially.

2.2.3. Incidental Wildlife Observations and Winter Surveys

During all site visits any wildlife observations were included. Incidental observations included observations of an individual, its tracks, burrows, feces and/or kill sights. Special attention was paid to wetted areas, rocky habitats and potential nesting sites which may provide habitat for amphibians and reptiles. Within the wetted areas searches for eggs, larvae and adult amphibians were made. Logs in the forests were overturned to look for salamanders and reptiles.

Winter wildlife activities were recorded during the December 30th 2010 and March 1st, 2011 trips. These visits focused on identifying wildlife movement corridors and identifying tracks, pellets/scat and evidence of browsing.

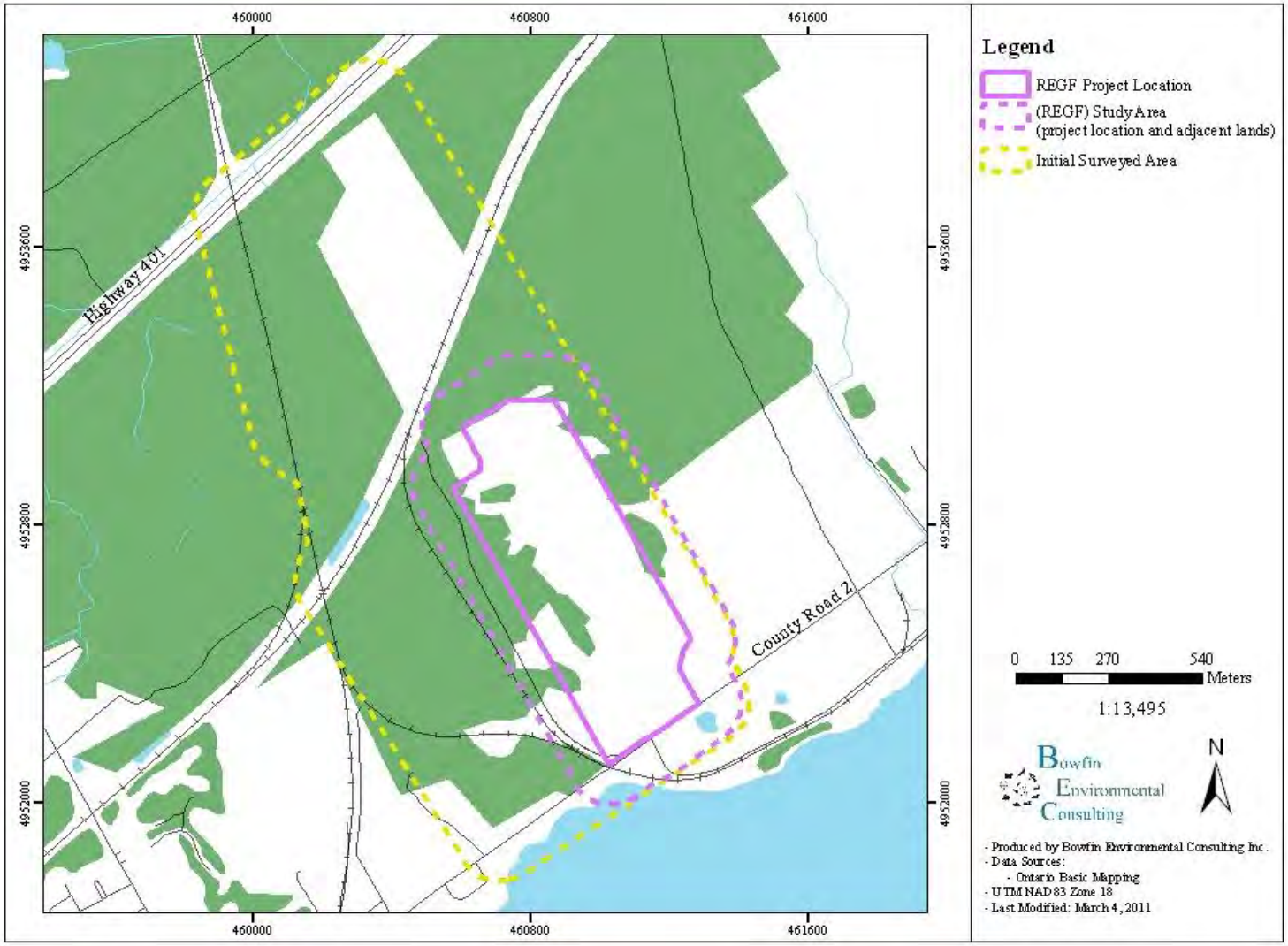
2.3 Evaluation of Significance

The evaluation of the significance of the natural heritage features was completed using methods developed by OMNR such as the OWES for the evaluation of wetlands, and the PPS for the evaluation of valleylands and woodlands. Note that the January 1, 2011 ammended REA definition of a woodland was followed. The significance of wildlife habitat (SWH) was determined through the use of several references including the PPS, *Natural Heritage Reference Manual* (NHRM), SWHTG and the *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules* created by OMNR. The habitat descriptions gathered during the site investigations (following the ELC) were used to cross-reference with the habitat requirements of the species listed in Appendices G and Q of the SWTHG as well as those species of conservation concern listed as potentially occurring within the project area. The following items were looked for:

- Seasonal concentrations of animals;
- Rare vegetation communities or specialized habitats for wildlife;
- Habitats of species of conservation concern; and
- Wildlife movement corridors.

It is noted that species and/or their habitats that are protected under the Provincial *Endangered Species Act* are dealt with in a separate report.

Figure 2 Comparison of Initial Surveyed Area and (REGF) Study Area (including adjacent lands)



3.0 RECORDS REVIEW

The proposed REGF Project Location is in the Township of Edwardsburgh/Cardinal to the East of the Town of Prescott. It is located outside of the Oak Ridges Moraine, the Greenbelt Protected Countryside and the Niagara Escarpment. There are no planning boards, municipal planning authority, local roads boards or local services boards within this study area. The project location is not in (nor within 120 metres of) a provincial park or conservation reserve. The site is bordered by the CN railway to the north, County Road #2 to the south, and natural areas to the west and east. The habitat consisted primarily of fallow fields and wooded areas that were historically used for grazing. Aquatic features included a closed wayside pit, small ponded areas and ditches. No named or unnamed watercourses were located on or adjacent to the subject lands. No residential areas are located on or adjacent to the subject lands. The land use designation of the subject lands is Industrial Park Policy Area (Schedule A of the Township of Edwardsburgh/Cardinal Official Plan (OP)). There are no constraints listed on the OP. There are active railroads located near the western and northern edges of the REGF project location as well as an abandoned railways and several dirt and overgrown roadways primarily on the west side of the study area.

3.1. Natural Heritage Features

A summary of the record review results pertaining to the presence of known or candidate significant natural heritage features in the study area is provided in Table 2 (Figure 3). These results provide only the preliminary identification of candidate features. These features are updated in the following section (site investigations) of this report. Candidate natural heritage features that occur within the study area require a natural heritage evaluation of significance.

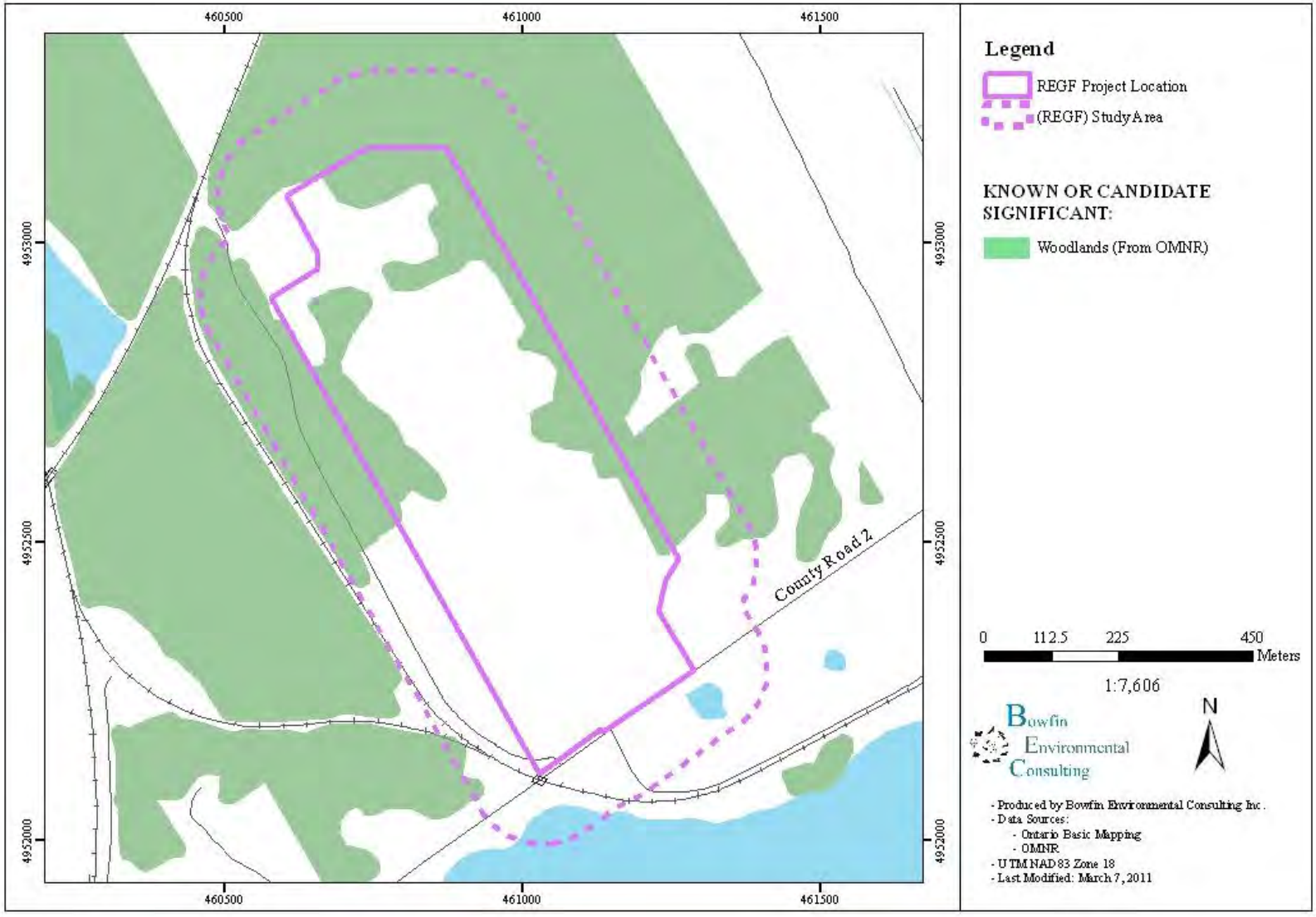
Table 2 Summary of Known Candidate Significant Natural Features Located within the REGF Project Location or the Adjacent Lands (based on the records review)

Natural Heritage Feature	In or within 120 m of Project Location?	Records Review Findings
Wetlands	Unknown	• No provincially significant wetlands (PSW) are identified within the project location or within the 120 m of the project location on the OP or the OMNR records review. • An unevaluated wetland located immediately south of Highway 401 was identified during the OMNR records review. This unevaluated wetland is located outside of the 120 m of the project location.

Natural Heritage Feature	In or within 120 m of Project Location?	Records Review Findings
Woodlands	Yes (Figure 3)	• OP does not list any significant woodlands as occurring. • OMNR records review identified that there are unevaluated woodlands located within the study area.
Valleylands	Unknown	• No significant valleylands are listed as occurring within the study area on the OP or by OMNR.
ANSIs –Earth Science	No	• No ANSIs are listed as occurring in or within 50 m of the project location on the OP or by OMNR.
ANSIs – Life Science	No	• No ANSIs are listed as occurring in or within 120 m from the project location on the OP or by OMNR.
Wildlife Habitat	Unknown	• More information in required in order to assess the potential for significant wildlife habitat to occur. This is addressed in sections 3.2, 4.0 & 5.0 of this report.
Sand Barrens, Savannah, Tallgrass Prairie and/or Alvars	Unknown	• None were identified during the records review. • The presence/absence of these features was addressed during the site investigations.

NHIC = natural heritage information centre
OP = official plan of Edwardsburgh/Cardinal, June 2010

Figure 3 Known and Candidate Significant Natural Features (based on Records Review)



4.0 SITE INVESTIGATIONS

4.1 Habitat Descriptions

The site investigations confirmed that the habitat consisted of agricultural lands, ash plantations, thickets, deciduous woodland, windrows and forests and swamps. These areas have been classified, at a minimum, to the ELC Community Ecosite level for the upland habitats or using OWES for the wetland habitats as discussed in section 2.2.1 of this report (Figure 4). A description of each ecosite, series or vegetation type is provided below outlining the canopy cover, dominant species in the different layers and any species of conservation value that were observed. The descriptions are based on observations completed following leaf-out. The polygon identifiers (number) and size of the polygon located within the study area are listed below the community type. This is followed by a listing of the candidate significant natural features (Figure 5). A photograph is included for each polygon.

It is noted that aerial photograph from May 1958 shows that all of the lands within the study area were historically used for grazing and pasture land (Appendix B).

Figure 4 Habitat Mapping of Study Area

4.1.1 Upland Communities

Mixed Meadows (MEM) (with deciduous treed windrows) (polygon 9, measuring 23.6 ha within the study area)

Candidate significant: wildlife habitat for grassland area-sensitive species, habitat for species of special concern (monarch)

Photo 1 – Cultural meadow, May 4, 2011

Meadows are areas that have less than 25% tree and shrub cover. The mixed meadows (MEM) polygon covers much of the land within the study area. MEM signifies that the vegetative community is dominated by both grass-like and broadleaf species. Some of the MEM polygon has undergone cutting and portions of it were left fallow during 2010. With the exception of some deciduous windrows, there was little canopy cover within the meadow habitats. Shrub and tree species such as hawthorn, tartarian honeysuckle, common buckthorn, white ash and American elm were present but provided less than 25% cover. The ground cover consisted of primarily of grasses (fringe brome, Canada bluegrass, and Kentucky bluegrass), Canada goldenrod, rough goldenrod and common vetch, bird's foot trefoil, and common milkweed.

Extraction (CVC-4) (polygon 3, measuring 2.2 ha within the study area)

Candidate significant: reptile hibernacula and maternity sites, bullfrog concentration area

Photo 2 – Closed wayside pit, May 4, 2010

A closed wayside pit is located to the north of the meadow polygon. This extraction zone (CVC-4) includes the pit, berm and staging area. With the exception of the berm and the wayside pit itself, the remainder of this polygon was used for loading trucks when the pit was in operation. Consequently this area consisted of exposed bedrock and gravel. There was also lots of garbage within the gravel area. The vegetation community was typical of disturbed areas and included: Manitoba maple, tartarian honeysuckle, wild red raspberry, staghorn sumac, prickly gooseberry, common blackberry, wild parsnip, reed canary grass, tall buttercup, wild carrot, ox-eye daisy, silverweed, smooth bedstraw, goldenrod, Virginia creeper,

burdock, black medick, and bladder campion. Regenerating white ash and sugar maple were also present.

The wayside pit was isolated from any other water feature by a tall and very steep berm. The pit was deep and the offshore gradient was very steep; the water was over 1 m deep within 1 m of the shoreline. The substrate consisted of rock and bedrock. The very limited aquatic vegetation consisted of a few scattered cattails (<0.5 m thick) on the edge of some portions of the pit. There some algae on the surface. This area is limited in its potential wildlife habitat due to the steep banks, steep offshore gradient, bedrock substrate and lack of connectivity with other water bodies and basking areas. No amphibians or reptiles were observed within this feature.

Treed Agriculture (TAG) (Plantation)
(polygons 8 (3.9 ha) and 13 (1.0 ha))
Candidate significant: shrub/early successional breeding bird habitat

Photo 3 – Treed agriculture, May 4, 2010

Located on the west side of the study area was an area that appeared to have been planted with white ash. Shallow trenches were dug throughout this area. Plant species that are more water tolerant were located within the trenches. The 10 m tall canopy of white ash provided 2% cover. The sub-canopy was 4-8 m tall and consisted primarily of white ash that was much greater than willow which was greater than gray birch and balsam poplar (40% cover). The understory was 0.5-1.5m tall and consisted of white ash which was much greater than grey dogwood which was greater than red osier which was greater than meadowsweet (10% cover). The ground layer consisted of grasses and sedges followed by Canada goldenrod, silverweed and Virginia bower.

Deciduous Thickets (THD) (polygons 4 (6.0 ha), 10 (6.9 ha), and 15 (0.2 ha, within the study area)
Candidate shrub: shrub/early successional bird breeding habitat

Photo 4 – Deciduous thicket in foreground, June 4, 2010

Thickets are areas where shrub species provide over 25% cover and tree species less than 25% cover. Deciduous thickets indicate that deciduous shrub species provide 75% or more of the cover.

The thickets located within the study area were primarily Hawthorn Deciduous Shrub

Thicket Type. Some of the thickets had a low percentage of shrubs and were described as having a 4 m tall shrub layer that was dominated by hawthorn and apples (10%) and a 0.5-2.0 m tall shrub layer that was dominated by tartarian honeysuckle, hawthorn, and common buckthorn. The ground cover was represented by grasses, smooth bedstraw, goldenrods and common milkweed (100% cover). Others contained a 10-12 m tall layer of white ash (DBH 10-20 cm) and trembling aspen (DBH 20cm) (5%) and a 5-8 m tall layer of hawthorn which was much greater than white ash which was much greater than black cherry (80%) and a 0.5-1.0 m tall layer of prickly goose berry which was greater than tartarian honeysuckle which was greater than white ash (30%). The ground layer was dominated by common strawberry, common burdock, and Canada goldenrod.

Deciduous Woodlands (polygons 16 (0.04 ha) and 17 (0.9 ha))

Candidate significant: woodlands

Woodlands are areas where the tree species, regardless of their age, provide 35-60% canopy cover. Again, the deciduous designation signifies that deciduous tree species provide 75% or more of the canopy cover. There were two woodland community types observed; white ash deciduous woodland (WODM4-2, polygon 16) and Manitoba maple deciduous woodland (WODM5-3, polygon 17). Both communities were located in the southwest corner of the study area; along County Road 2.

Photo 5 – Deciduous woodland, June 11, 2010.

The WODM4-2 (polygon 16) community had a 10-12 m tall white ash (diameter at breast height (DBH) average 20; 20-35 cm) and black cherry (DBH 20-25 cm) canopy layer that provided 40% cover. The sub-canopy layer was 4-6 m tall and was represented by Manitoba maple, black cherry and hawthorn (50% canopy cover). The understory was 0.5-1.0 m tall and was dominated by prickly gooseberry, wild red raspberry and red-berried elderberry (80%). The ground layer contained dwarf raspberry, goldenrod and grasses.

The WODM5-3 (polygon 17) community had a 4-6m tall white ash (DBH under 5cm), Manitoba maple and American elm canopy layer that also provided 40% cover. The understory layer was 0.5-1m tall and consisted primarily of wild red raspberry (25% cover). Ground layer included rough goldenrod, pink phlox, wild grape and spotted jewelweed (80% cover).

Deciduous Forests

Forested areas contain tree species, regardless of their age, which provide over 60% canopy cover. Again, the deciduous designation signifies that deciduous tree species provide 75% or more of the canopy cover. The majority of land within 120 m of the REGF Project Location (~~–a~~djacent lands") consisted of forest habitats of various ages. The present and past land-use practices (i.e. pasture, railways, trails and ditching) have greatly affected the types of communities observed. On the north and east sides of the study area much of the habitat was characterized by a fresh-moist poplar deciduous forest type (FODM8-1, polygon 1) and a dry-fresh white ash-hardwood forest type (FODM4-2, polygon 6). On the west side the study area was primarily a FODM8-1 (polygon 7) but also included other deciduous forest communities which were hard to distinguish on the satellite imaging; as such, the polygon description heading below is simply labelled FOD.

Poplar Deciduous Forest (FODM8-1) (polygon 1, 5.1 ha, within the study area)

Candidate significant: woodland, amphibian woodland breeding ponds and forest area-sensitive species, wildlife movement corridor

The poplar deciduous forest had a canopy layer that was 20-25 m tall and was dominated by trembling aspen (average DBH 30 cm) and white ash (average DBH 20 cm) (75% cover). The sub-canopy was 6-8 m tall and dominated by American elm, white ash and common buckthorn (30% cover). The understory was 0.5-2.0 m tall and represented by white ash, white oak and ironwood (15%). The ground layer included grasses, sensitive fern, barren strawberry rough goldenrod, waterhore hound, and Virginia creeper (75% cover). Potential amphibian woodland ponds were located within this polygon. An old rock wall was observed within this polygon in the north end near the railway.

Other portions of the polygon had a canopy that was 8-15 m tall and was represented by white birch (DBH 4-6 cm) which was much greater than trembling aspen (DBH 15-34 cm). The understory was 2-5 m tall and dominated by grey birch, hawthorn, common buckthorn, tartarian honeysuckle, apple and nannyberry. The ground layer contained

Photo 6 – Poplar deciduous forest located in the northeast side of the study area, May 4, 2010.

Photo 7 – Poplar deciduous forest located in the northeast side of the study area, May 4, 2010.

grasses, goldenrod, violet species, strawberry and sensitive fern.

White ash – Hardwood Forest (FODM4-2) (polygons 5 (0.4 ha), 6 (4.3 ha) and 11 (1.3 ha))

Candidate significant: woodland, amphibian woodland breeding ponds, forest area-sensitive species, wildlife movement corridor

Photo 8 – White ash forest, June 4, 2010.

A large white ash – hardwood forest was located on the east side of the study area (polygon 6). The canopy layer was 15-25 m tall and was dominated by white ash (DBH average 20 cm; range 15-20 cm), white birch (DBH average 30 cm; range 25-30 cm), red maple (DBH 25 cm) and black cherry (DBH 30 cm) (65% cover). Sub-canopy was 4-8 m tall and consisted primarily of common hawthorn, common buckthorn and paper birch (75% cover). The understory was 0.5-2.0 m tall and was represented by nannyberry, dogwood and white oak (30% cover). Some portion of this polygon contained abundant ironwood in the upper canopy with little sub-canopy or understory cover. Other portions contained large white oak or white pine. Exposed boulders were present. Potential amphibian woodland ponds were located within this polygon.

A smaller white ash-hardwood forest also located on the east side, south of the polygon described above (polygon 11), had a canopy layer was 15 m tall and was dominated by white ash (DBH average 15 cm; range 10-20 cm) and American elm (DBH average 17 cm; range 10-18 cm) (60% cover). The sub-canopy was 3-8 m tall and was represented by common buckthorn and white ash (80% cover). The understory was 0.5-2.0 m tall and consisted primarily of common buckthorn, tartarian honeysuckle and sugar maple (25% cover). The ground layer contained ground ivy, goldenrod, and Virginia creeper (25% cover).

A third white ash – hardwood forest was located to the south of the closed wayside pit (polygon 5). This site was wetter than the dry-fresh upland habitat described in the ELC. The site was greatly disturbed by the presence of dirt piles which created a pit and mound topography permitting plants typical of wetter environments to become established within the pits. The site had a 10-12 m tall canopy layer dominated by white ash (DBH average 15 cm; range 10-30 cm) which was greater than Manitoba maple (DBH 26 cm) which was greater than American elm (DBH 20 cm) (70% cover). The sub-canopy layer was 4-8 m tall and was represented by white ash and common buckthorn (30%). The understory was 0.5-2 m tall and composed primarily of wild red raspberry which was greater than tartarian honeysuckle. The ground cover was dominated by tall and Canada goldenrod, common strawberry and Virginia creeper.

FOD (polygon 7, measuring 7.9 ha within the study area)

Candidate significant: woodland, amphibian woodland breeding ponds and forest area-sensitive species

Polygon 7, primarily located west of the REGF project location, was dominated by white ash and could be classified as a poplar deciduous forest (FODM8-1) but it also included other forest types such as oak-maple deciduous forest (FODM9-2) and sugar maple-ironwood forest (FODM5-4). These areas could not be distinguished from each other using the satellite imaging and as such are not labelled on Figure 4.

The poplar deciduous forest was variable. Some areas had a canopy that was 15-20 m tall and dominated by white ash (DBH 17-20 cm) which was greater than trembling aspen (DBH 20-25 cm) and American elm (DBH 5-10 cm,). The sub-canopy was 8-10 m tall and dominated by white ash with an understory that was 1-2 m tall of black cherry, nannyberry, common buckthorn and American elm. The ground cover was primarily white avens, grasses, moss and sedges. Other areas had a canopy layer that was 15 m tall and dominated by white ash (DBH 20 cm), white birch (DBH 13 cm) which were much greater than tamarack (DBH 20 cm) (40% cover). The sub-canopy was 4-8 m tall and dominated by white ash, red maple (DBH 20 cm), white birch and white oak (40% cover). The understory was 1-2 m tall and consisted of white ash, red-osier dogwood and balsam poplar (10% cover). The ground layer was dominated by Canada goldenrod and sensitive fern (80% cover).

Photo 9 – Poplar deciduous forest located in FOD polygon, May 4, 2010.

The sugar maple and ironwood forest (FODM5-4) was located on the hill to the west of the closed wayside pit. The canopy layer was 12-20 m tall and was dominated by sugar maple (DBH average 30 cm; range 26-40 cm), American elm and ironwood (DBH 20 cm) (85% cover). The sub-canopy was 6-8 m tall and consisted primarily of ironwood (DBH 10 cm) and common buckthorn (15% cover). The understory was 0.5-2 m tall and was represented by white ash, sugar maple, common buckthorn and tartarian honeysuckle (40% cover). The ground

Photo 10 – Sugar maple and ironwood forest located west of the closed wayside pit, June 4, 2010.

layer included grasses, Virginia creeper, and white avens (10% cover). The soil was bare over much of the area. During the May visit the ground cover included trout lily, barren strawberry, white trillium and purple trillium. There was a rock fence line observed on top of the slope. A tree stand for hunting was also seen.

The oak –maple deciduous forest (FODM9-2) was located in the northwest corner (south of the CN railway) of the study area. The canopy layer consisted of white ash and white birch which were greater than red maple which was greater than American elm and white oak. The understory included common buckthorn, and regenerating white oak, shagbark hickory and white ash. Potential amphibian woodland ponds were located within this polygon

4.1.2 Wetland Communities

Tall Shrub Swamp (polygons 12 (2.4 ha) and 14 (0.6 ha))

Candidate significant: wetland, wildlife habitat (polygon 14 for bullfrog concentration areas)

There were two tall shrub swamps communities. The first one, polygon 12, was located on the southwest side of the study area and consisted of a tall shrub swamp with low shrub, herbaceous and mosses (Photo 12). The dominant vegetation was narrow-leaf meadowsweet, slender willow, sandbar willow, white ash, purple loosestrife, cattails, awl-fruited sedge and Bebb's sedge. Some of this area was created as a result of land-use activities which left small furrows allowing for vegetation which is more tolerant of wet conditions to grow.

The second site, polygon 14, was much smaller and was located to the east of the community described above (Photos 11 & 12). This tall shrub swamp also contained robust emergents (cattails) and herbaceous vegetation and low shrubs. There was standing water but no fish habitat. Vegetation included willow, cattail, purple loosestrife and awl-fruited sedge, red-osier, meadowsweet and grey dogwood.

Photo 11 – Looking at the larger tall shrub swamp on the southwest side of the study area, June 4, 2010

Photo 12 – Looking at the smaller tall shrub swamp in the south end of the study area, June 4, 2010.

Deciduous Treed Swamp *(polygon 2, measuring 0.6 ha within the study area)*
Candidate significant: woodland, wetland, amphibian woodland breeding ponds, forest area-sensitive species

Photo 13 – Looking at the pond associated with the treed swamp, June 4, 2010

A small isolated ponded area was located at the north end of the study area, on the south side of the CN railway (Photo 13). The site was dominated by deciduous trees and had an herbaceous, low shrub and tall shrub layer. The tree layer contained green ash, trembling aspen and white ash. The tall shrub layer included green ash, balsam poplar and American elm. The low shrub layer was dominated by meadowsweet, gray dogwood green ash, and balsam poplar. The herbaceous layer was dominated by sedges (awl-fruited sedge) and grasses and woolgrass. This site included the only ponded area that was wet throughout the year. No reptiles and only a few amphibians (5) were observed at this pond.

4.2. Birds

Bird surveys were completed as described in Section 2.2.2 of this report. A total of 52 bird species were observed within the initial surveyed area (Appendix E). The majority of the sightings included singing males on one or more occasions. The few area-sensitive species that were observed (species requiring >10 ha based on habitat requirements outlined in Appendix G of the SWHTG) are listed below (Table 3). <u>All species that were observed are considered to be common species within the general area.</u>

Table 3 List of Area Sensitive Bird Species (requiring more than 10 ha), their requirements and Location where they were observed

Species	Min. Area Required (ha) (SWHTG)	Preferred Habitat	Observed			Comments
			REGF Project Location (polygon number if available)	REGF Study Area	Initial Surveyed Area	
Pileated woodpecker	40-260	mature, mixed forests	✓ (6)			
Least flycatcher	>100	open deciduous woodlands, forest edges, open thickets and overgrown pastures			✓	Observed nesting over 540 m from study area
Red-breasted nuthatch	10	coniferous or mixed forests			✓	Heard calling, over 300 m from study area (north of railway tracks)
White-breasted nuthatch	10	deciduous or mixed forests			✓	heard calling >300m from study area (May 4th visit).
Veery	10	cool, moist mixed coniferous forests	✓ (8)			Heard calling from treed plantation, suitable habitat is likely present to the west of the study area
Black-and-white warbler	>100	found on edges of large stands of mature or second growth deciduous or mixed forests, cedar swamps or bogs.	✓ (10)			Heard calling on June 4th visit.
Ovenbird	>70	undisturbed open mature deciduous mixed forests			✓	Heard calling to the northeast of the study area (recorded call from 55 m from study area)

4.3. Plants

Plant surveys were completed during the site investigations as per Section 2.2.1 of this report. A list of the plant species that were recorded within the REGF study area is provided in Appendix F. A total of 162 species were identified of which 72% were native and all but one was ranked at a value higher than S4. The butternut is a S3? ranked species (note that the question mark indicates that the ranking is uncertain). Butternut is dealt with in a separate document on Species at Risk. While the percent native species would indicate an area that was not heavily disturbed this is the result of including all species from the initial surveyed area, which included several large wetland and woodland habitats located outside of the study area. Within the study area many of the polygons showed signs of disturbances including: polygons 3 (old wayside pit and gravel turn-around), 4, 10 and 15 (hawthorn shrub, overgrown pastureland), 5, 16, and 17 (woodland area that were previously cut), 8 and 13 (ash plantation), and 9 (cultural meadow, periodically cut). The Co-efficient of Conservatism (CC) of the species recorded provides information on the species' tolerance to disturbance; those species with a high CC (maximum of 10) are highly sensitive. The average CC for this site was 4.07 which would place it in the moderate side of the sensitivity. The majority of the species had a CC value of 5 or lower (75%). Only three species or 1% of the plants had a CC value of 8 or higher. These species were true wood-sorrel, showy mountain-ash and shrubby cinquefoil. None of these species were observed within the REGF project location. The plant species found indicated that the vegetation communities consist of common communities for the area. No remnants of rare vegetation communities were found.

4.4 Incidental Fauna Observations

The methods used to record incidental fauna observations are provided in section 2.2.3 of this report. A list of wildlife observations (other than bird species) for the initial surveyed area is located in Appendix G. The list includes 11 species: 4 insects, 3 amphibians, 1 reptile and 3 mammals. The early and late winter visits identified the location of the wildlife movement corridor as well as a deer overwintering habitat (Figure 5). The deer overwintering habitat was located 40 m to the east of the study area (160 m from the REGF project location) and as such is outside of the study area. Snowshoe hare tracks and coyote tracks and scat were observed within the study area. The only species of conservation value observed was the monarch butterfly. All species that were observed are considered to be common species.

4.5 Site Investigation Conclusions

The site investigations found that there were additional natural heritage features in and within 120 m of the REFG project location but confirmed the absence of valleylands, sand barrens, savannah, tallgrass prairie and alvars. A summary of these corrections is found in Table 4 and Figure 5).

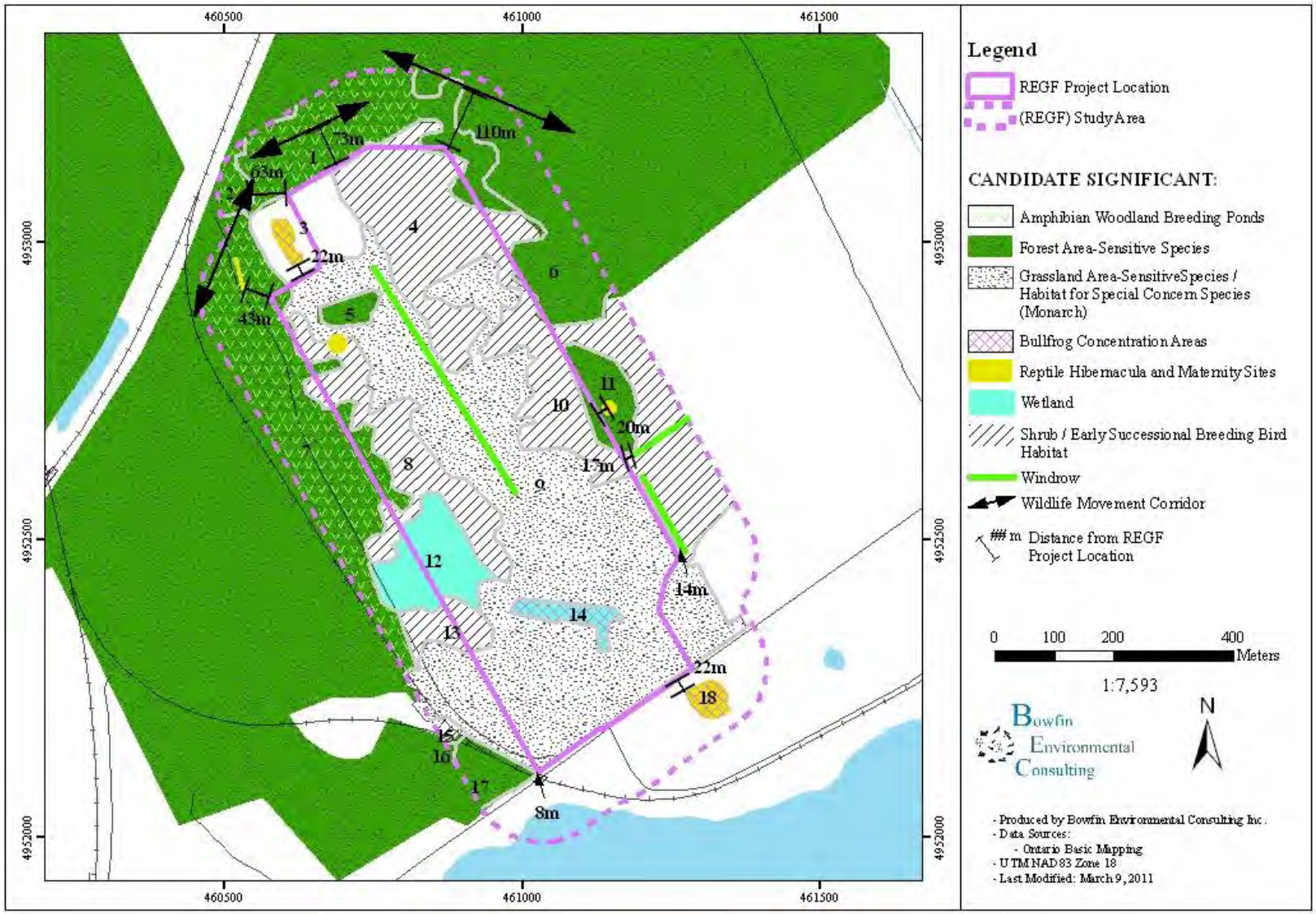
Table 4 Summary of Candidate Significant Natural Features Located within the REGF Project Location or the Adjacent Lands (based on Site Investigations)

Candidate Significant Natural Heritage Feature	Findings		Changes (Corrections to Records Review and Additional Natural Features)	In or within 120 m of Project Location?
	Records Review	Site Investigations		
Wetlands	• No provincially significant wetlands (PSW) are identified within the project location or within the 120 m of the project location on the OP or the OMNR records review. • An unevaluated wetland located immediately south of Highway 401 was identified during the OMNR records review. This unevaluated wetland is located outside of the 120 m of the project location.	• Three small wetlands were located within the study area (polygons 2, 12 & 14). Other aquatic habitats included the old wayside pit (polygon 3) and the old quarry (polygon 18). These are not included as wetland habitat as the water depth was over 2 m deep and there were no wetland vegetation communities associated with either polygon. • A description of these features is provided above and their significance is discussed in Section 5.0	addition of three small wetlands	**Yes (Figure 5, polygons 2, 12 & 14)**
Woodlands	• OP does not list any significant woodlands as occurring. • OMNR records review identified that there are unevaluated woodlands located within the study area.	• Woodlands were confimred within the study area (polygons 1, 5, 6, 7, 8, 11, 13, 16, & 17). • A description of these features is provided above and their significance is discussed in Sections 5.0 of this report.	no change	**Yes (Figure 5, polygons 1, 5, 6, 7, 8, 11, 13, 16 &17)**

Candidate Significant Natural Heritage Feature	Findings: Records Review	Findings: Site Investigations	Changes (Corrections to Records Review and Additional Natural Features)	In or within 120 m of Project Location?
Valleylands	• No significant valleylands are listed as occurring within the study area on the OP or by OMNR.	• None found	no change	No
ANSIs – Earth Science	• No ANSIs are listed as occurring in or within 50 m of the project location on the OP or by OMNR.			
ANSIs – Life Science	• No ANSIs are listed as occurring in or within 120 m from the project location on the OP or by OMNR.			
Wildlife Habitat	• More information in required in order to assess the potential for significant wildlife habitat to occur.	• Almost all of the study area has the potential to provide wildlife habitat. Figure 5). The specific types of habitat being considered based on the SWHTG are: amphibian woodland breeding ponds (polygons 1, 2, 6, 7, 11), area sensitive species (forest – polygons 1, 2, 6, 7, 11. Grassland – polygon 9, shrub/early successional bird breeding habitat – polygons 4, 10, 12 & 15), bullfrog concentration areas (polygons 3, 14, 18), reptile hibernacula and maternity sites (polygons 3, 5, 7, 11, 18) and wildlife movement corridor (polygons 1 & 6). Fencerows in polygon 9. The	Much of the study area was added as candidate wildlife habitat	**Yes (Figure 5)**

Candidate Significant Natural Heritage Feature	Findings: Records Review	Findings: Site Investigations	Changes (Corrections to Records Review and Additional Natural Features)	In or within 120 m of Project Location?
		significance of this feature is addressed in Section 5.0 of this report.		
Sand Barrens, Savannah, Tallgrass Prairie and/or Alvars	• None were identified during the records review.	• None found.	no	no

Figure 5 Location of Candidate Significant Natural Features (based on Site Investigations)



5.0 EVALUATION OF SIGNIFICANCE

The records review (section 3.1. of this report) indicated that there was insufficient information to determine the significance of three features: an unevaluated wetland, an unevaluated woodland and wildlife habitat. During the multiple site investigations particular attention was paid at gathering additional information in order to comment on these natural features. Site investigations confirmed the following candidate significant features within the study area: wetland, woodland, and wildlife habitat. The site investigations confirmed that there were no sand barrens, savannah, tallgrass prairie, alvars or valleylands within or adjacent to the subject lands. The study area is also located outside of the Oak Ridges Moraine, the Greenbelt Protected Countryside and the Niagara Escarpment. The following section provides an evaluation of the natural features documented as occurring within the study area during the site investigations. A site concept plan which shows location of the solar modules, perimeter fence and maintained grass area is provided in Appendix J. The locations of the significant natural features are shown on Figure 7 of this report. Evaluation of significance was completed by Michelle Lavictoire who is certified by OMNR to conduct wetland evaluations and ecological land classifications. The evaluation of significance was completed during the site investigations, specific dates, where applicable, are indicated in the sections below.

5.1 Wetlands

Ontario Regulation 359.09 defines a wetland as:

> *"Lands such as a swamp, marsh, bog, or fen, other than land that is being used for agricultural purposes and no longer exhibits wetland characteristics, that,*
> *a) is seasonally or permanently covered by shallow water or has the water table close to or at the surface and*
> *b) has hydric soils and vegetation dominated by hydrophytic or water-tolerant plants.*

Following the site investigations three polygons were identified as wetlands (polygons 2, 12 & 14). An evaluation of the significance of the wetland was completed by Michelle Lavictoire who is certified by the OMNR to conduct wetland evaluations using the Ontario Wetland Evaluation System (OWES) (OMNR 2002) on the July 5th and August 9th visits (Appendix I). In general, wetland habitat includes swamps, marshes and open water habitats. Based on OWES a wetland habitat is characterized as:

> *"Lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface; in either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants".*

There are three, small wetlands located within the study area; two are tall shrub swamp (ts) (polygons 12 & 14) and one is a deciduous treed swamp (h) (polygon 2) (Figure 4). The total sizes (inside and outside of the study area as appropriate) of the tall shrub swamps are 2.5 ha (polygon 12) and 0.7 ha (polygon 14). The deciduous treed swamp (h) is 0.9 ha (polygon 2). Based on OWES wetlands that are less than 2 ha are usually not evaluated. As such only the larger (2.5 ha) tall shrub swamp needs to be evaluated; however, this wetland should be complexed with the smaller one. The deciduous treed wetland (h) should not be complexed with the two southern wetlands due to its distance from them and because it is segregated by the topography (the northern wetland flows towards the north and the two southern wetlands to the south).

As discussed above, this wetland being evaluated consists of a wetland complex formed by polygons 12 and 14. The total wetland complex size is 3.2 ha (2.5+0.7 ha). The two wetlands were contained by the topography and by an active railway spur. The railway spur creates a drainage divide from lands located to the west. The small basin to which this complex belongs drains towards the St. Lawrence River. There was no surface water present in polygon 12 during any of the field visits. The little surface water present in polygon 14 does not provide fish habitat and contained no concentrations of amphibians and no reptiles. Both wetlands are isolated. The wetland types included swamp and marsh (swamp covering 80% of the complex). The vegetation communities contained three to four forms (total of two communities). In polygon 12, the community was a tall shrub community dominated by narrow-leaf meadowsweet, slender willow, sandbar willow, white ash and green ash. Polygon 14 consisted primarily of a robust emergent community (dominated by cattails). Note that the robust emergent community was bordered by tall shrubs, however these provided insufficient cover (size for mapping, <0.5 ha) and as such were simply included in the robust emergent community. Dominant vegetation in Polygon 14 included cattail, purple loosestrife, awl-fruited sedge, willow red-osier, meadowsweet and grey dogwood. The surrounding habitat contained row crops, pasture, abandoned agricultural land, deciduous forest, abandoned pit and quarries, open lake or deep river, and fence rows. The St. Lawrence River is located within 0.75 km of the complex. The only open water was associated with polygon 1 (<1 m^2) and was of insufficient size to provide much habitat. The site was trapped with minnow traps and no fish were captured. No furbearers were observed at the wetland but fox/coyote scat was observed in the nearby upland areas. These sites are not used for hunting. The entire property is located on private land.

The evaluation of this small complex would give it a score of 308 points (biological component 93; social component 38; hydrological component 174; special features component 3). This is not unexpected due to the small size and land use disturbances (much of polygon 12 is the result of wetland species growing in the bottoms of an abandoned tilled field). A minimum total score of 600 points or 250 points in either the special features or biological components is required for a wetland to be considered as significant. **The wetland complex is not considered significant following the OWES standards.** Therefore, no provincially significant wetlands are located within the project study area and this feature will not be brought forward.

5.2 Woodlands

The confirmation/documentation of woodlands was completed by Michelle Lavictoire (certified by OMNR to conduct Ecological Land Classifications) during the June, July and September visits. A woodland is defined in the REA as:

> *"treed area, woodlot or forested area, other than a cultivated fruit or nut orchard or plantation established for the purpose of producing Christmas trees…"* O. Reg 359/09 (amended January 1, 2011)

and in the Provincial Policy Statement (PPS) as:

> *"treed areas that provide environmental and economic benefits to both the private landowner and the general public such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels"*

The woodland habitats encountered included those that are identified as plantation (polygons 8 & 13), white ash deciduous woodlot (polygon 16), Manitoba maple deciduous woodlot (polygon 17), deciduous forest (polygon 7), white ash hardwood deciduous forest (polygons 5, 6 & 11) poplar deciduous forest (polygon 1), windrows (part of polygon 9) and the deciduous treed swamp (polygon 2). Of these polygons 5, 7, 8, 11 & 13 are partially or entirely located within the REGF project location. The remaining polygons are located on the edge to 100 m from the REGF project location (Figure 4). All of the polygons (1, 2, 5, 6, 13, 16 and 17) with the exception of polygon 11 form part of a single woodland patch (woodland patch A) and will be evaluated together. Polygon 11 is separated by a minimum distance of 25 m and will be evaluated separately (Patch B on Figure 6).

Woodlands located within the Township of Edwardsburgh/Cardinal are evaluated in the Official Plan (OP) based on the guidelines identified in the PPS. A desktop exercise was used in which satellite imaging and the Ontario Base Mapping (OBM) data were combined to locate the extent of the forest patch. The delineation of the woodland patches was based on the PPS. The PPS evaluates significant woodlands in context of their size, ecological functions, uncommon characteristics and economic and social functional values. The *Natural Heritage Assessment Guide for Renewable Energy Projects* (OMNR 2010) was utilized in evaluation the significance of the woodland features. A woodland that meets the minimum standards for one or more criteria is considered significant in the PPS. Each of the criteria and how they relate to the forest patch located within the study area discussed below.

Woodland Size

Patch A is located within the study area forms part of a larger patch that has a total size of roughly 152 ha. Forest patch B (polygon 11) is 1.3 ha in size. The municipality has a forest cover of approximately 50% and as such any forest stand that is ≥50 ha should be considered significant. Only Patch A meets the minimum size requirements.

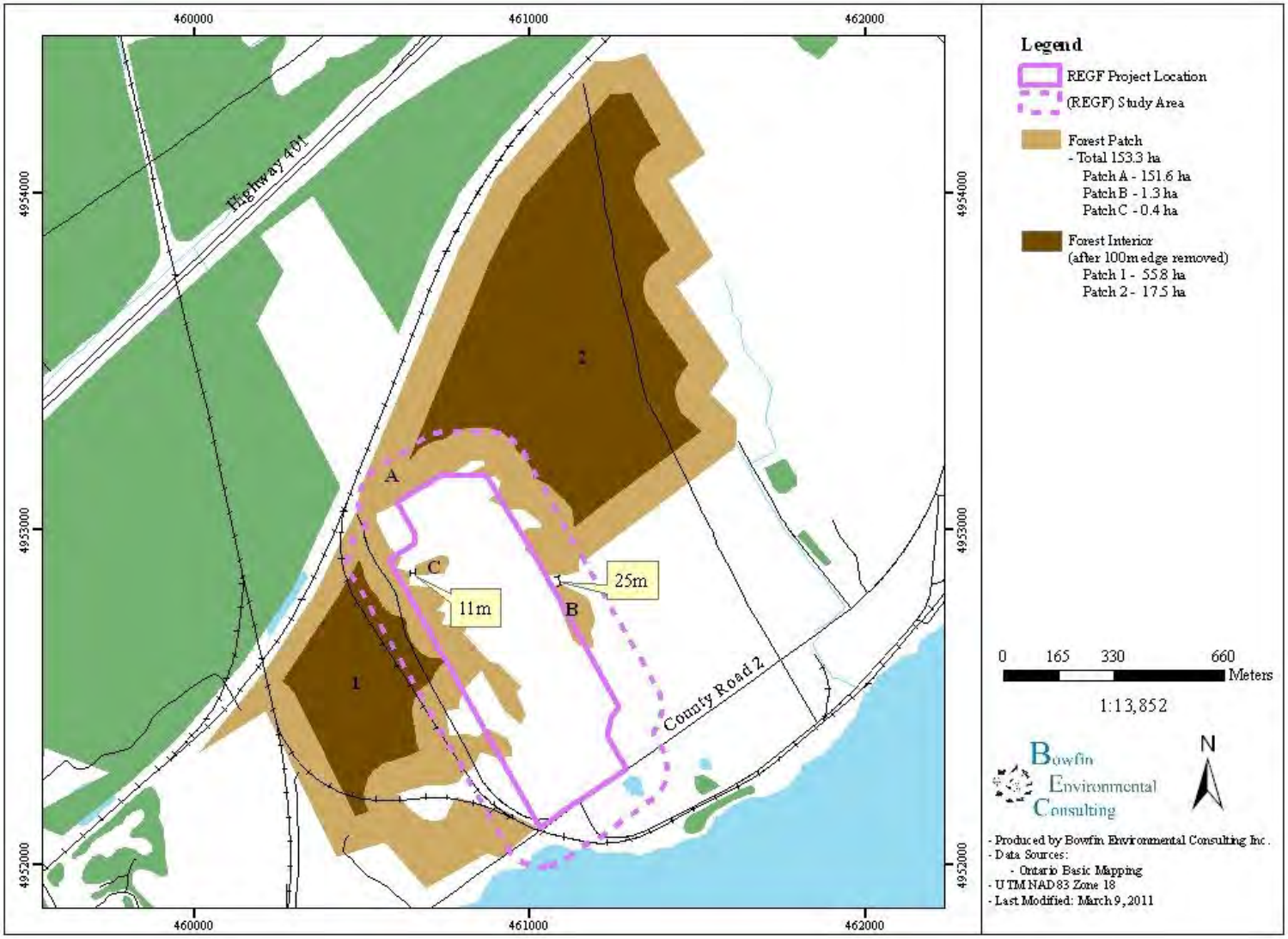
Ecological Functions Criteria

This criterion is based on five factors. Patch A meets all but the last criteria (lacks woodland diversity) and patch B meets none of the criteria (Table 5).

Table 5 Presence/Absence of Woodland Ecological Functions

Factor	Comments	Meets Minimum Requirements	
		Patch A	Patch B
Woodland interior (includes all forest located at least 100 m from the woodland's perimeter) **Minimum size – 8 ha**	There are two interior woodland patches, which are isolated from each other, located within the study area. The eastern interior patch is approx. 55.8 ha and the patch that includes the western side of the study area is approx. 17.5 ha	Yes	No
Proximity to other woodlands or other significant natural heritage features **Minimum size – 10 ha**	Patches A and B are separated by 25 m. Patch A is separated by over 20 m from a large woodland patch to the north (active railway lines fragment project area from the forest to the north by a distance >20m)	Yes	No
Linkages **Minimum size – 10 ha**	Patch A is located near the St. Lawrence River and to the south of a large complex of wetlands and woodlands	Yes	No
Water protection **Minimum size – 4 ha**	A small intermittent and seasonal watercourse is located within the Patch A (outside of the study area) and flows into the St. Lawrence River. No waterbodies associated with Patch B.	Yes	No
Woodland diversity **Minimum size – 10 ha**	Both patches are young and became established within the past 40 years following intensive grazing practices.	No	No

Figure 6 Delineation of Forest Patch (based on PPS and desktop exercise, ground truthed within the study area)



Uncommon Characteristics
This criterion refers to woodland stands that are considered uncommon based on the composition, cover type, age or structure. As mentioned above these patches consist of young (approximately 45 years old) stand that have become re-established following intensive grazing practices. These stands do not contain unique species compositions, vegetation communities, or habitat. Patch B is less than the minimum 4 ha required for this criterion. As such these stands do not meet this criterion.

Economic and Social Functional Values
This criterion gives high value to those stands with a high productivity, high special services or importance in terms of education, cultural or historical values. These stands do not meet this criterion.

Summary
Patch A meets two of the four PPS criteria and as such should be considered significant and will be brought forward. Patch B does not meet any of the criteria and will not be brought forward.

5.3 Wildlife Habitat

Wildlife habitat is defined in both the REA (O. Reg 359/09) and the PPS as:

> *"…where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory of non-migratory species."*

OMNR recommends that wildlife habitat be evaluated based on information provided in the SWHTG and the recently released *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules* (January 2009) created by OMNR. A summary of the habitat types discussed in these documents and their presence/absence from the REGF Project Location and the adjacent lands (120 m from project location) is provided in the table below (Table 6). The habitat within the study area consisted of young deciduous forests with vernal pools, thickets, immature white ash plantations, fallow fields (many which undergo periodic cutting), small wetlands and a closed wayside pit and a closed quarry. The site is fragmented by active and abandoned railways as well as several trails/dirt roads. Based on the guidelines regarding species specific requirements (Appendix G and Q of SWHTG), the *Significant Wildlife Habitat Ecoregion Criteria Schedules* (Draft) (OMNR 2009) and the available habitat, there is considered to be a potential for the following significant wildlife habitat: reptile hibernacula and maternity sites, habitat of area-sensitive species, habitat of species of conservation concern (monarch), amphibian woodland breeding ponds and/or wildlife corridor (Table 6). Each of these features is evaluated on its significance in the paragraphs below.

Table 6 Presence/Absence of Significant Wildlife Habitat

Feature	Present/Absent REGF Project Location	Present/Absent Adjacent Lands	Comments	Brought Forward (yes/no)
Seasonal Concentrations of Animals				
White-tailed deer wintering habitats			OMNR mapping does not indicate any white-tailed deer wintering habitats in the area. No potential deer overwintering habitats (typically forests dominated by conifers) located within study area. One overwintering habitat was confirmed to be used by deer during winter 2010. This area was located outside of the study area.	no
Moose late winter habitat			No significant numbers of moose are known to occur within this area	no
Colonial bird nesting sites			Site was visited during May and June 2010. Typically applies to bird species such as gulls, terns, cormorants. These species nest on islands, shoals, peninsulas and shorelines. None present. Other species include swallows and herons. While individuals of both these were observed within the project area, none were nesting. Nests for both were observed over 500 m from the REGF project location. Only two heron nests were observed at this location, so few nests are not considered significant. Regardless, this small colony is located adjacent to HWY 401 and is habituated too much higher disturbances from the highway than any that could be expected from the construction, operation or decommissioning of this project. Furthermore, a much larger heron colony is located >1000m from the REGF project location. The REGF project location is outside of the 300m minimum buffer zone for all heron nests (Bowman and Siderius 1984).	no

Feature	Present/Absent REGF Project Location	Present/Absent Adjacent Lands	Comments	Brought Forward (yes/no)
Waterfowl habitat (sites known and mapped, sites not mapped and based on population status, sites not mapped and based on landform type)			Tend to require large wetlands and water bodies with emergent vegetation and grassy/shrubby areas for nesting. The wayside pit and abandoned quarry are the most appropriate habitat but both lack emergent vegetation and had very steep banks. No waterfowl or their nests were observed. Also use cultural meadows and thickets during the spring which are flooded from the spring melt. The topography within this site does not create flooding, no evidence of flooding was observed during the early May site visit.	no
Waterfowl stopover and staging areas				
Waterfowl nesting				
Shorebird migratory stopover area			No shorebirds were observed within the study area. The only aquatic habitat within the study area consisted of the old wayside pit and the abandoned quarry, both with steep banks. The shorelines were rocky and did not provide habitat suitable for the attraction of shorebirds. None were observed.	no
Landbird migratory stopover area			Study area is not located within 5km of the Great lakes.	no
Raptor winter feeding and roosting areas			The study area does not contain any large trees for roosting. No raptors were observed during the early and late winter visits.	no
Wild turkey winter range			Wild turkey was observed within the study area during the site investigation however, no seeps or coniferous forests are present. No individuals and no tracks were observed during the winter visits.	no
Turkey vulture summer roosting			No turkey vultures were observed during the site investigations.	no

Feature	Present/Absent REGF Project Location	Present/Absent Adjacent Lands	Comments	Brought Forward (yes/no)
areas				
Reptile hibernacula and maternity sites	✓		Reptile hibernaculas can include those utilized by snakes and turtles. The maternity sites refer primarily to snakes. Site visits were completed during May and September 2010. While no hibernaculas or maternity sites were observed, the documentation of use is notoriously difficult and as such habitat potential remains possible. It has been noted that snakes can utilize a wide variety of habitats as hibernation or maternity sites ranging from rotting logs, sand piles, compost, boards, old building, foundations and rock walls. Old rock walls/piles were observed within the study area, locations and distances are provided on Figure 5. No snakes or their shedded skins were observed within the study area during any of the site visits. One garter snake was observed over 500 m from the study area. No congregations of snakes were observed within the study area or the initial surveyed area. The old wayside pit and the quarry could provide potential overwintering habitat for turtles however this is considered unlikely due to the very steep banks and bedrock shores and substrate. No turtles were observed. The lack of observations or evidence of use despite the multiple site visits between spring and fall would indicate that no significant reptile hibernacula and maternity sites occur within the study area.	no
Bats hibernacula and maternity sites			No caves were observed.	no
Bullfrog concentration areas			Site was visited on several occasions between May and July which would have allowed for observations of adults, egg	no

Feature	Present/Absent REGF Project Location	Present/Absent Adjacent Lands	Comments	Brought Forward (yes/no)
			masses or tadpoles. Tadpoles are often captured in minnow traps when sampling for fish. Minnow traps were placed in polygons 3 & 14, no tadpoles were captured. No bullfrogs (eggs, tadpoles or adults) were observed within the study area.	
Migratory butterfly stopover areas			Study area is not located within 5 km of Lakes Ontario, Erie or Huron.	no
Rare Vegetation Communities				
Alvars			These habitats were not observed within the study area.	no
Sand Barrens				
Savannahs				
Rare forest types				
Talus slopes				
Rock barrens				
tall-grass prairies			Not applicable to this area.	no
Great lakes sand dunes				
Specialized Wildlife Habitats				
Habitat for area-sensitive species	✓	✓	The forest habitat within the study area is less than <60 years old (based on air photo see Appendix B) as such this is not considered habitat for area-sensitive species (as per the *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules* (OMNR 2009). During the site investigations no grassland area-sensitive species or their nests were observed within the study area (despite the breeding bird surveys and walking through the meadow habitat on several occasions).	no

Feature	Present/Absent REGF Project Location	Present/Absent Adjacent Lands	Comments	Brought Forward (yes/no)
			The site was visited 6 times between May 4th and July 7th 2010 during which time breeding bird surveys were completed and the areas were searched for signs of bird presence (i.e. nests, white-washing, food catches, pellets/fur). While field sparrow was observed within the study area, indicator species, or special concern species were not.	
Forests providing a high diversity of habitats			These habitats were investigated for and were found not to be present within the study area. See habitat descriptions and woodland evaluation for details	no
Old-growth or mature forest stands				
Foraging areas with abundant mast				
Amphibian woodland breeding ponds	✓	✓	Vernal pools/depressions were observed throughout the area (polygons 1, 2, 7 and 11). However all except the one located within polygon 2 were dry by mid spring. No concentrations of amphibians were observed and no eggs were observed within any of the areas walked during the visits. While the woodland pond located within polygon 2, outside of the REGF project location, could be considered significant in that it was present all year, the low number of amphibians (<20 individuals), and lack of egg masses and tadpoles indicates that this pond is not significant based on the *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules* (OMNR 2009).	no
Turtle nesting			Site visits were completed during early spring and fall. The	no

Feature	Present/Absent REGF Project Location	Present/Absent Adjacent Lands	Comments	Brought Forward (yes/no)
habitat			painted turtle was observed within a wetland located over 500 m from the project location. The old wayside pit and quarry are not considered good turtle habitats due to the very steep banks, bedrock and lack of basking features. The shorelines did not provide suitable nesting habitat in terms of substrate type. No turtles were observed within the study area and no nests were observed despite the multiple site visits.	
Specialized raptor nesting habitat			Site visits were completed during early May, prior to leaf-out and again during winter. No raptor nests (abandoned or in use) were observed. It is noted that the first site visit occurred prior to leaf-out, facilitating the location of raptor nests.	no
Moose calving areas			Not applicable to this area.	no
Moose feeding areas				
Mineral licks				
Mink, otter, marten and fisher denning sites			No evidence of use observed (no individuals, tracks, feces or dens)	no
Highly Diverse Areas				
Cliffs			None observed.	no
Seeps and springs				
Habitats of Species of Conservation Concern (excluding habitat of provincially endangered and threatened species)				
Habitat of rare or declining species			With the exception of the few monarchs observed, no species that is considered rare or declining was present. Monarchs	no

Feature	Present/Absent REGF Project Location	Present/Absent Adjacent Lands	Comments	Brought Forward (yes/no)
Habitat of species with a large percentage of their global range in Ontario			are a commonly observed species within Eastern Ontario. Milkweed was observed within polygon 9 searches for caterpillars conducted during July did not reveal any monarch caterpillars.	
Wildlife Movement Corridors				
Wildlife movement corridors	✓	✓	The presence of a small coniferous forest located to the east and outside of the study area necessitated the evaluation of wildlife movement corridors for deer. Should the coniferous forest patch be utilized by deer; then there would be the potential for deer to move between the study area and forest patches north of the railway (however wildlife must first traverse the 20m active railway), between the two interior patches through the adjacent lands to the north of the REGF project location and there between the St. Lawrence River and the project area (here the wildlife will need to cross over Highway 2 and avoid residential housing). The study area was walked during the early winter (following the first large snow storm) and during the late winter (when snow started melting). The offsite wintering area was confirmed to be in use and a wildlife movement corridor was observed in the northeast corner of the study area.	**yes (polygons 1 & 6)**

✓ Indicates presence or potential to occur

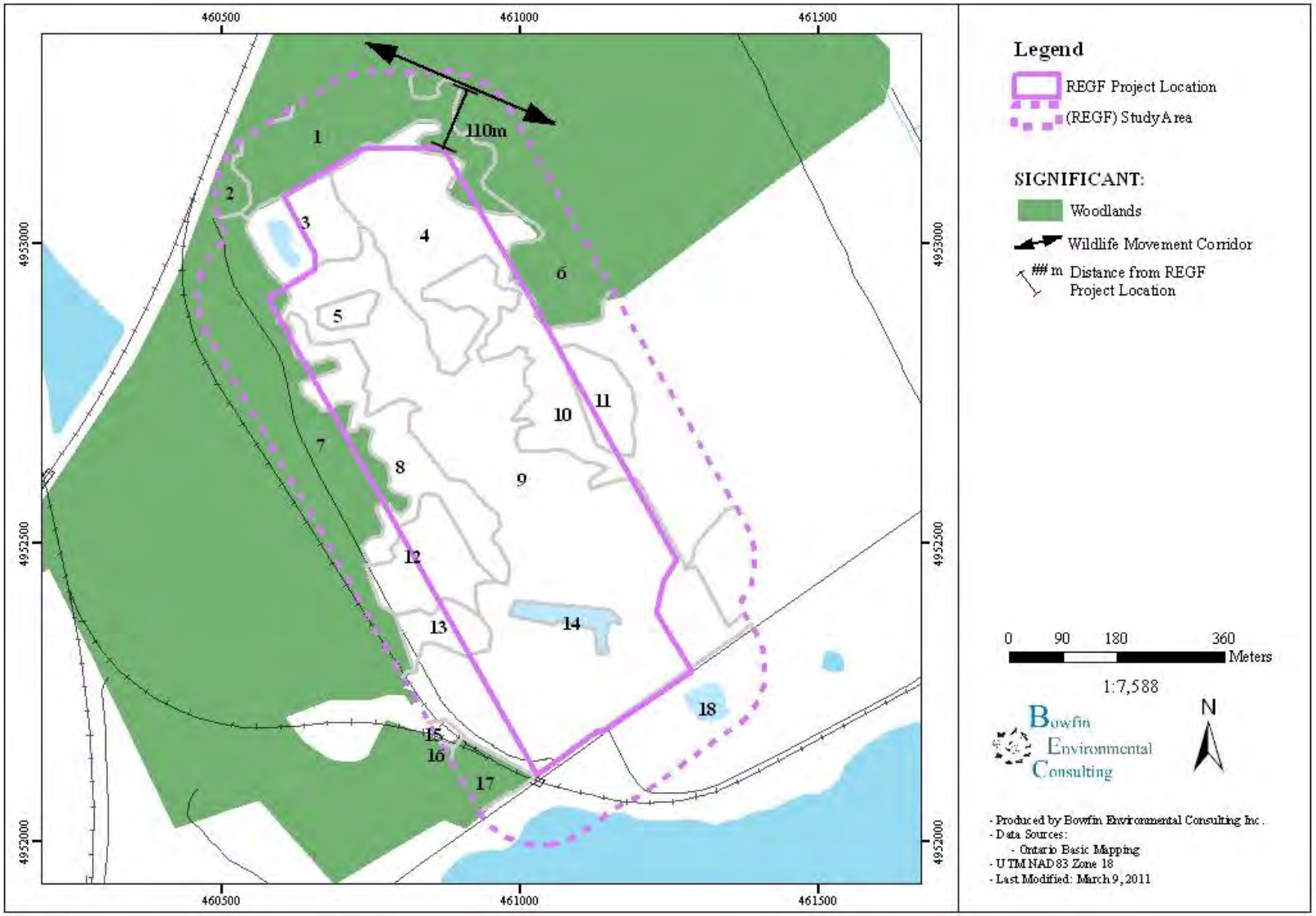
5.4 Summary of the Evaluation of Significance

Based on the accepted methods for determining significance of natural features (i.e. PPS, SWTHG, NHRM, OWES), the only NHF that is considered significant is the woodland forest Patch A (Table 7). This feature requires an Environmental Impact Study which is provided in the following below (Section 6.0).

Table 7 Summary of Significance of Natural Heritage Features Identified within the Study Area

Natural Heritage Feature	Present in or within 120 m of Project Location?	Significant? (yes/no)	EIS Required (yes/no)
Wetlands (coastal, northern, southern)	Yes (polygons 12 & 14)	No	No
Woodlands	Yes (polygons 1, 2, 5, 6, 7, 11, 13, 16 & 17)	Yes (forest Patch A, polygons 1, 2, 7, 13, 16 & 17)	Yes
Valleylands	No	No	No
ANSIs (earth or life science)	No	No	No
Wildlife Habitat	Yes (throughout)	No (only the wildlife corridor movement area, polygons 1 & 6)	Yes

Figure 7 Significant Natural Features Located within the Study Area



6.0 ENVIRONMENTAL IMPACT STUDY (EIS) REPORT

The evaluation of these natural heritage features was completed by Michelle Lavictoire. Pursuant to O.Reg 359/09 section 38, the applicant must prepare an Environmental Impact Study report if they wish to construct, install or expand a renewable energy generation facility in or within 120 m of any of the following locations (among others that not applicable to this project):

- A significant woodland
- Significant wildlife habitat (wildlife movement corridor)

The records review (section 3.1. of this report) indicated that there was insufficient information to determine the significance of three features: an unevaluated wetland, unevaluated woodland and candidate significant wildlife habitat. During the site investigation particular attention was paid at gathering additional information in order to comment on these natural features. The site investigations confirmed that there were no sand barrens, savannah, tallgrass prairie, alvars or valleylands within or adjacent to the subject lands. The study area is also located outside of the Oak Ridges Moraine, the Greenbelt Protected Countryside and the Niagara Escarpment. The site investigations confirmed that wetland, woodland and wildlife habitats were present within the study area. The evaluation of significance (Section 5.0 of this report) found that the following features were significant: woodland and wildlife habitat (wildlife movement corridor) and that the unevaluated wetland and other candidate significant wildlife habitats were not significant. The boundaries of these features and the nearest distance to the REGF project location are identified in Figure 7. The site concept plans are provided in Appendix J.

The following section provides a description of the proposed solar facility and its construction methods, operation and decommissioning phases. This is followed by an evaluation of the two significant natural heritage features (woodland and wildlife habitat). The features are discussed in terms of their significance, the proposed solar facility's potential to impact the feature, any re-design which was implemented as part of the site plan development process, recommended mitigation measures and residual impacts (following re-design and mitigation measures). Similar to the information provided in this EIS, a Construction Plan Report will also be available to address the potential negative environmental effects that may result from construction or installation activities on the woodland and animal movement corridor. The Construction Plan Report also addresses the mitigation measures described in this EIS.

When negative environmental effects of a project on the significant natural features are identified, then the EIS report needs to describe how the Environmental Effects Monitoring Plan addresses them. A description of the potential impacts, re-design, mitigation measures and residual impacts are provided in the sections below. For this project, the potential to impact natural features has been minimized or eliminated through re-design (i.e. moving the project away from significant features). The level of impact to the significant woodlands has been reduced to local, repetitive and negligible and no impacts to the wildlife corridor are anticipated. An Environmental Effects Monitoring Plan will be created by Penn and will include the mitigation measures outlined in this EIS. No monitoring is required.

6.1 Solar Facility Project Description

The project's potential to impact the natural environment was evaluated for the construction, operation and decommissioning phases. The proposed REGF would consist of a collection of solar photovoltaic (PV) modules (each approximately 1.00 m x 1.67m in dimension) that are grouped into arrays. These stationary arrays are strung together forming a series of rows oriented east to west. Electricity collection and distribution lines would link the PV modules to a collection house with inverter and transformer equipment. For this size of facility 10-15 collection houses are anticipated. Laneways would provide access to each collection house. The entire operation (solar modules, collection houses and access lanes) would be fenced in order to provide for safety and security, in accordance with applicable requirements. The fence will be constructed as per applicable legislation (such as Ontario Energy Board requirements). A perimeter lane would be constructed inside of the fence. The access lanes (perimeter lane and lane ways to collection houses) would consist of a typical farm lane, they would not be paved. These activities would require clearing of vegetation and minor grading. The solar modules are placed above the ground and as such allow for low growing herbaceous vegetation to be planted underneath. The securing of the modules to the ground, primarily to prevent uplift from wind, would be completed by pile driving or core drilling pipes into the ground. The exact methods will be decided following geotechnical investigations. The construction period would take approximately 6 months to complete. The expected operational lifespan of the solar modules is 20-30 years.

During the operation of the solar facility, routine maintenance would include regular mowing, as frequently as weekly, of an area that is a maximum of 5 m wide on the outside of the perimeter fence. This is to ensure that no woody vegetation would become established where it could cause damage to the fence or shade the solar modules. Regular mowing, as needed, will also be conducted within the facility.

The decommissioning of the site would include the removal of the modules, collection house and the pipes used to secure the modules in place. The site could then be reverted back into grazing lands or natural features.

The potential impacts of these activities are discussed in the sections below (sections 5.2 and 5.3). The significance of the potential impacts is measured using three different criteria: area affected, duration of impacts and magnitude. The area affected may be local in extent signifying that they will only be impacted within the project area or regional signifying that they may impact an area outside the immediate project area. The duration of the impact was rated as short term (1-2 years), medium term (2-4 years) or long term (>4 years). The magnitude of the impact may be negligible signifying that the impact is not noticeable, minor signifying that the project's impacts are perceivable and suggests minor mitigation measures, moderate signifying that the project's impacts are perceivable and require mitigations as well as monitoring and/or compensations or major signifying that the project's impacts would destroy the environmental component within the project area.

It should be noted that the initial concept plan included the removal of the entire woodland area between the north end of the currently proposed REGF project area and the CN railway. As a direct result of the proponent's extensive due-diligence and early consultation with OMNR,

South Nation Conservation and the municipality, the proposed design was modified. For example, the entire project was moved to the south in order to significantly reduce the amount of woodland clearing and to avoid severing the connection between forest areas to the east and west of the project location.

6.2 Significant Woodlands

The evaluation of significance found that the woodland located within the project study area formed part of a large 153.3 ha woodland. The woodland is deemed to be significant based on its size and in that it meets four of the five ecological function requirements (Table 5). Potential impacts to the forest patch could occur during the construction, operation and decommission phases of the project. The construction activities which could affect the woodland include clearing, grubbing, grading, fencing and construction of the perimeter lane. The operational impacts would be limited to maintenance of the fence and lane. During decommissioning the woodland could be impacted during the removal of the fence. These activities could result in the direct impact of the loss of trees and could result in the indirect impact of the loss or harm of surrounding trees, not designated to be removed. The impacts of the activities are discussed based on their potential to cause direct or indirect impacts to the woodland.

Direct Impact – Construction Phase

The direct impacts include the removal of trees which would only occur during the construction phase. This impact has the potential to affect the woodland significance through the decrease in size and impacts on the ecological functions. The proposed project will require the removal of approximately 5.2 ha of woodland habitat. The communities that would be affected are the polygon 5 (0.5 ha of white ash deciduous forest), ash plantation (polygon 8) and a tiny sliver of polygons 7 (deciduous forest) and 13 (ash plantation) (Figure 8). The forest size would be reduced by less than 5%, from approximately 153.3 ha to 148.0 ha. The resulting slightly smaller woodland would still meet the PPS size requirements for significance.

The existing ecological functions that meet the PPS requirements were woodland interior, proximity to other woodlands or significant natural features, linkages and water protection. There would be no change to the latter three. There would be a small reduction of woodland interior. The value of the interior habitat is dependent on the amount of interior habitat available, the type of habitat and the habitat requirements of area-sensitive species that could potentially occur. There are two isolated woodland interiors which could be impacted by the proposed REGF project. The woodland interior in the eastern patch (55.8 ha) would not change; the interior habitat of the western patch would decrease by approximately 1.6 ha (from 17.5 ha to 15.9 ha). No area-sensitive species were seen or observed during the site visits. The forest is young (less than 45 years based on air photos) to very young (trees are less than 6m tall). In its existing condition, the western interior patch is smaller than the 30 ha minimum typically required to support many species. The western patch is also fragmented with several railway lines and trails (all less than 20 m wide). Area-sensitive forest species anticipated to occur within the area often require mature habitats as well as large parcels. As such, while the amount of interior habitat available in the western parcel will decrease slightly when the proposed REGF is constructed, it is anticipated to continue to function as it does currently.

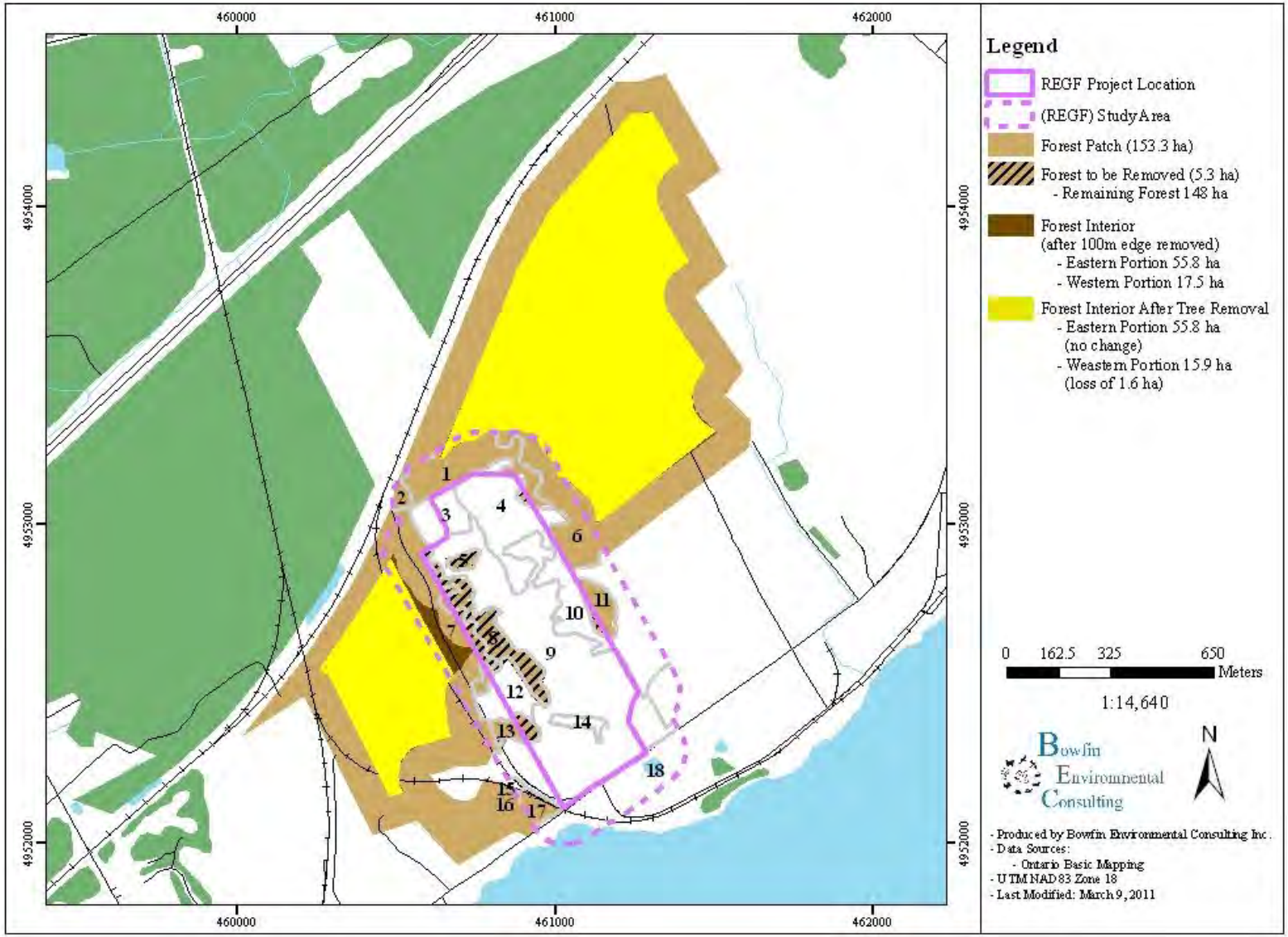
Indirect Impacts - Construction, Operation and Decommissioning Phases

The potential indirect impacts to the woodland associated with this project include possible harm to trees not intended for removal. Harm could occur during any of the three stages of the project. During construction the activities which could inadvertently harm additional trees include clearing, grubbing, grading, installation of fencing and the perimeter lane. It is noted that there is little grading associated with this proposal along the REGF's perimeter. During operation the potential to cause impacts to the woodland would be limited to maintenance activities such as repairs to the fence or lane as well as the regular mowing, as often as weekly, of the narrow area outside (within 5 m) of the perimeter fence. Note that this mowing is required to ensure that no woody growth damages the fence and to ensure accessibility for inspection and maintenance of the fence. During the decommissioning phase, the fence will be removed; the machinery used for this activity has the potential to harm the woodland.

6.2.1 Re-Design

As noted above, that the initial concept plan included the removal of the woodland on the north end of the study area, which would have resulted in the loss of 4.6 ha of interior habitat from the eastern patch. By leaving the northern section of the woodland untouched, impacts to the eastern patch of the interior habitat will now be avoided. Furthermore, based on comments received from OMNR, the wayside pit is now being avoided which eliminates indirect impacts to the woodlands in polygons 1 and 2.

Figure 8 Woodland Habitat to be Removed



6.2.2 Initial Impact Analysis

Following this re-design (but prior to mitigation) the potential impacts are considered to be local, permanent and minor. Those impacts associated with the maintenance activities are local, repetitive and negligible.

6.2.3 Mitigation Measures

These potential direct and indirect impacts may be minimized or eliminated through the use of the following mitigation measures:

During Construction

- Clearly delineate the area to be cleared to prevent the loss of woody vegetation not intended for removal;
- No removal of woody vegetation (trees or shrubs) between April 15th and July 31st, inclusive, unless a biologist has walked the site no earlier than five days prior to the planned clearing and has indicated that no nesting activity is occurring within the area to be cleared;
- Establish a 5 m wide allowance between the location of the perimeter fence and the edge of the woodland to remain;
- Utilize small machinery (such as a small backhoe) for the removal of woody vegetation along the perimeter (outside the fence) to minimize harm to the root system of trees not intended for removal;
- All stockpiling or infilling activities will be confined to within the fenced in area and will not extend more than 5 m of the outside of the fence in order to minimize potential to damage root systems of trees not intended for removal and to prevent sedimentation from entering the wetland;
- All topsoil removal will be confined to within the fenced area and will not extend more than 5 m outside of the fence to minimize potential to damage root systems of trees not intended for removal and to prevent sedimentation from entering the wetland;
- The perimeter lane should be left as a farm lane (i.e. unpaved, gravel or dirt road);

During Operation and Maintenance

- Initial mowing around the perimeter fence should commence before April 15th or after July 31st, unless a biologist has walked the site no earlier than five days prior to the planned clearing and has indicated that no nesting activity is occurring within the area to be cleared;
- Clearly indicate width of area to be mowed around the perimeter fence;
- Utilize small machinery (such as a small tractor) to repair any damage to the fence or perimeter lane.

During Decommissioning

- Utilize small machinery (i.e. small backhoe) to remove the fencing;

- All stockpiling or infilling activities will occur within the drip lines in order to minimize potential to damage root systems of trees not intended for removal and to prevent sedimentation from entering the wetland; and
- Depending on the proposed land-use following decommissioning, the site could be reverted back into grazing lands or naturalized with native trees, shrubs or grasses or allowed to naturalize on its own.

6.2.4 Residual Impact Analysis

Following the removal of this very small portion of the woodland, the forest patch will continue to meet PPS criteria for significant woodland based on both size and ecological functions. Despite the loss of 1.6 ha of the woodland interior habitat from the western interior patch, the interior habitat is anticipated to function as it currently does, prior to the proposed REGF project, since the area is limited in its pre-existing condition by its size, lack of maturity and fragmentation. Provided that the mitigation measures are implemented and that best practices are utilized during construction, the potential impacts to the woodland during all phases are considered to be local, permanent to repetitive, and negligible.

6.3 Wildlife Movement Corridor

The winter site visits identified one deer movement corridor located in polygons 1 and 6, this movement corridor is located 110 m from the REGF project location. Construction activities will occur during the daylight and access to the site originates from the south (and does not cross the wildlife corridor). Furthermore, this corridor is located adjacent to an active CN Railway and as such, any deer utilizing the corridor will be habituated to loud noises and disruptions to movement. All fencing will be limited to the perimeter of the REGF project location and will not cross the corridor. No impacts to the wildlife movement corridor are anticipated.

6.4 Conclusions

The proposed REGF project is located within an area that was once used as grazing lands. Site investigations found that the habitats consisted of fallow fields, windrows, plantations, deciduous thickets, woodlands and forests and all well as three small (non-significant) wetlands. The only confirmed significant natural features are significant woodlands and wildlife movement corridor. While the significant woodland is located within the project study area, following re-design of the site plan and the use of properly implemented mitigation measures **there are no anticipated measurable negative impacts to these features**. The wildlife movement corridor is located 110 m from the REGF project location and is not anticipated to be impacted by any of the phases of this project. Since no significant natural feature will be measurably impacted, no monitoring plan is recommended.

7.0 ADDITIONAL MEASURES AND BEST MANAGEMENT PRACTICES

The following section provides suggestions that are above and beyond the requirements of the EIS.

Table 8 Summary of Additional Enhancement and Mitigation Measures to be Implemented during Construction and Decommissioning and Residual Effect

Natural Feature	Potential Project – Environmental Interactions	Mitigation Measures	Residual Effect
Wetland (polygons 2, 3, 12)	Construction activities will include the removal of a portion of polygon 12 and all of polygon 14 and will occur immediately adjacent to polygon 2. • Introduction of sediment from the construction activities into wetland habitats not intended for removal (portion of polygon 12, all of polygon 2).	Sediment control strategies would be implemented. These would include the use of keyed in sediment fencing (i.e. geotextile fabric held up with stakes) when working within 30 m of the wetland. The bottom of the fabric needs to be buried into the ground in order to prevent the rain water from going under the fabric). Sediment fencing would need to be installed around any fill as well as on the down slope side of any area to be cleared of vegetation or excavated within 30 m of the wetland. Sediment fencing would also need to be maintained (i.e. holes repaired) throughout construction. Minimize the removal of vegetation (only clear vegetation where needed) in vicinity of wetland. Clearly delineate the boundaries of areas not intended for clearing and/or grading on the construction plans and in the field.	Net Gain provided that the mitigation measures are properly installed and maintained until there is no exposed soil.

Natural Feature	Potential Project – Environmental Interactions	Mitigation Measures	Residual Effect
		Re-seed any exposed soil and allow the vegetation to grow BEFORE removing the sediment fence. **Enhancement measures:** The wayside pit is not providing good habitat in its current condition. This habitat could be improved by providing a gentle slope in the riparian area (to facilitate animal movement between the terrestrial area and the wetted area) and a littoral zone with shallow water and soft substrate (to allow aquatic vegetation to become established). This can be completed by: - remove the woody vegetation on the east and south portions of the berm. - push the berm into the pit creating a very gentle slope (both in-water and offshore). Aim to have water depths increase from 0.0-0.5 m along a distance of 5 m. - revegetate the riparian area with native shrubs (such as grey dogwood, red-osier dogwood and willows)	
Wildlife and Wildlife Habitat (all polygons)	Construction activities will include the removal of woody vegetation and minor grading. • Loss of vegetation • Disruption of nesting activities • Disruption to species as a result of noise or light from project activities	Clearly delineated the area where vegetation will be removed on the construction plans and in the field. Use small machinery outside of perimeter fence within 30 m of outer edge of work area. Where possible, do not disturb rock walls or rock piles. Removal of rock walls should occur outside of the hibernation period, preferably between late May and September.	Negligible

Natural Feature	Potential Project – Environmental Interactions	Mitigation Measures	Residual Effect
		No clearing of vegetation between April 15th and July 31st, inclusive, unless a biologist has walked the site no earlier than five days prior to the planned clearing and has indicated that no nesting activity is occurring within the area to be cleared. Ensure that properly operating mufflers (i.e. standard OEM or similar) are used on all project machinery and vehicles to minimize noise impacts. Conduct construction activities during daylight hours whenever possible to minimize light impacts to wildlife. **Enhancement Measures:** During the clearing activities several trees will need to be cleared. The surrounding woodlands can be enhanced for reptile habitat by placing portions or all of the trunk and/or stumps within the woodlands. Woody material should be scattered within the forested areas, away from the perimeter lane.	
Significant Woodland (woodland Patch A)	Construction activities will include the removal of a very small portion of Patch A and minor grading. • loss of woody vegetation	Clearly delineate on the construction drawings and in the field the area to be protected. No stockpiling or infilling should occur within 30 m of wooded areas not intended for removal. Minimize removal of topsoil within 30 m of woodland not intended for removal and from wetland	

Natural Feature	Potential Project – Environmental Interactions	Mitigation Measures	Residual Effect
		Perimeter lane and interior laneways should be left as a farm lane (i.e. unpaved gravel or dirt road).	
Accidents or Malfunctions	• Spills from project machinery	All machinery should remain outside of the wetland and the 30 m boundary (with exception of small machinery for the mowing of the perimeter land). Fueling and maintenance activities should occur within an area where sediment erosion control measures and all precautions have been made to prevent oil, grease, antifreeze or other materials from inadvertently entering the ground or the surface water flow. This area should be at a minimum 30 m away from the wayside pit and polygons 2 and 12 (portion that is not intended for removal). Monitor area for leakage, in the unlikely event of spillage halt all construction activities and corrective measures must be implemented. Any spills must be immediately reported to the MOE Spills Action Centre (1.800. 268.6060)	Considered unlikely to occur

Table 9 Summary of Additional Mitigation Measures to be Implemented during Operation and Residual Effect

Natural Feature	Potential Project – Environmental Interactions	Mitigation Measures	Residual Effect
Wetland (polygon 2, remaining portion of polygon 12 and newly enhanced wayside pit) Wildlife and Wildlife Habitat (all areas outside of perimeter land) Significant Woodland (Patch A)	During operation regular maintenance of the vegetation adjacent to the perimeter lane and within the REGF project location will be required. • Loss of vegetation	Ensure that mowing activities only occur in designated areas (i.e. inside REGF project location and within the 5 m perimeter apron located outside of the fencing). Use small machinery outside of the fenced area. Initial mowing should commence before April 15th or after July 31st, inclusive, unless a biologist has walked the site no earlier than five days prior to the planned clearing and has indicated that no nesting activity is occurring within the area to be cleared. Ensure that properly operating mufflers (i.e. standard OEM or similar) are used on all project machinery and vehicles to minimize noise impacts. Conduct construction activities during daylight hours whenever possible to minimize light impacts to wildlife.	Negligible
Accidents or Malfunctions	• Spills from project machinery	All machinery should remain outside of the wetland and the 30 m boundary (with exception of small machinery for the mowing of the perimeter land). Fueling and maintenance activities should occur within an area where sediment erosion control measures and all precautions have been made to prevent oil, grease, antifreeze or other materials from inadvertently entering the ground or the surface water flow. This area should be at a minimum 30 m away from the wetland.	Considered unlikely to occur

Natural Feature	Potential Project – Environmental Interactions	Mitigation Measures	Residual Effect
		Monitor area for leakage, in the unlikely event of spillage halt all construction activities and corrective measures must be implemented. Any spills must be immediately reported to the MOE Spills Action Centre (1.800. 268.6060)	

8.0 REFERENCES

Bowman, Irene and Joanne Siderius. Management Guidelines for the Protection of Heronries in Ontario. OMNR April 1984. 38p.

Bradley, David. (2007). Southern Ontario Vascular Plant Species List. Prepared by Southern Science and Information Section, Ontario Ministry of Natural Resources, Peterborough, Ontario. 57pp.

Brownell, V. R. and P.M. Castling. (2000). Update COSEWIC status report on Eastern Prairie Fringed-orchid (Platanthera leucophaea). COSEWIC.

Newmaster, S.G., A. Lehela, P.W.C Uhlig, S. McMurray and M.J. Oldham. (1998). Ontario plant list. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, ON, Forest Research Information Paper No. 123. 550 pp. + appendices.

OMNR (1999). Natural Heritage Reference Manual for policy 2.3 of the Provincial Policy Statement.

OMNR (2000). Significant Wildlife Habitat Technical Guide. Fish and Wildlife Branch Wildlife Section. Science Development and Transfer Branch. Southcentral Sciences Section.

OMNR (2001). Ecological land Classification for Southern Ontario: Training Manual SCSS TM 01, March 2001.

OMNR (2009). *Draft Significant Wildlife Habitat Ecoregion Criteria Schedules Addendum to Significant Wildlife Habitat Technical Guide*. January 2009. Ontario Provincial Policy Statement. 2005.

Official Plan of the Township of Edwardsburgh/Cardinal. Final Draft for Adoption September 22, 2010.

OWES (1993). Ontario Wetland Evaluation System. Southern Manual NEST Technical Manual TM-002 March 1993.

Swiecki, T. J.; Bernhardt, E. A. (2001). Guidelines for Developing and Evaluating Tree Ordinances. http://www.isa-arbor.com/publications/ordinance.aspx

Appendix A – Correspondence from OMNR and SNC

SOUTH NATION CONSERVATION
DE LA NATION SUD

Tel: (613) 984-2948 • Fax: (613) 984-2872 • Toll Free: 1-877-984-2948 • 38 rue Victoria Street, Finch, ON K0C 1K0 • www.nation.on.ca

Via Email Transmission

Marc 22, 2010

Penn Energy Trust
620 Righters Ferry Rd
Bala Cynwyd, PA, 19004
Attn: Robert Gray

Re: Property Inquiry
Potential Solar Farms
Concession 1, Part Lots 34, 35
Township of Edwardsburgh/Cardinal
Former Edwardsburgh Township

Dear Mr. Gray,

South Nation Conservation (SNC) received a property inquiry for the above location via email on March 8, 2010 from Penn Energy Trust.

It is SNC's understanding that the proposed project involves the potential development of solar farms at the above mentioned location.

SNC has reviewed the proposed project considering any potential environmental impacts and possible regulatory restrictions. The review consisted of an investigation of SNC Regulatory Mapping, Municipal Drain Reports, Natural Area Reports, MNR Base Maps, Aerial photos, and SNC inventory. We offer the following information:

Site Restrictions:

Ontario Regulation 170/06

It is the obligation of SNC to implement Ontario Regulation 170/06, *Development Interference with Wetlands and Alterations to Shorelines and Watercourses*, developed under Section 28 of the Conservation Authorities Act.

According to SNC's Regulation mapping, a section of the northern parcel does fall within the Regulated Area. The Regulation Limit is the result of several components, each of which addresses a specific hazard. The final Regulation Limit for each system is taken as the greater of the applicable hazard limits, plus a minimum 15 meter allowance.

Specifically, the Regulation Limit at the subject location has been determined as 15 metres from the top of bank of the watercourse. Therefore, SNC staff have determined that if any development and/or site alterations are proposed within the identified area, a permit will be required and restriction may apply.

Page 1 of 2

Our Local Environment. We're in it Together. Notre environnement. Nous le partageons.

The following are brief descriptions of the Natural Heritage involved:

Fish Habitat

The northern parcel does contain a watercourse that has been identified in Schedule A2 of the Township of Edwardsburgh/Cardinal Official Plan as Fish Habitat. SNC recommends a 30 metre setback from the top of bank of the watercourse for any new development in order to reduce the risk of property damage and to protect fish habitat.

Significant Woodlands

All three parcels fall within or 50 metres adjacent to an area that has been identified in Schedule A2 of the Township of Edwardsburgh/Cardinal Official Plan as Significant Woodlands. SNC recommends that an Environmental Impact Assessment be prepared demonstrating that there will be no negative impacts on the natural features or on the ecological functions for which the area is identified. In addition, the Official Plan Policies of Section 5.1.7 (Significant Woodlands) state that any new development may be subject to an Impact Assessment where the development will require clearing, tree cutting, drainage works or waterway alteration in or adjacent to woodlands.

Endangered Species

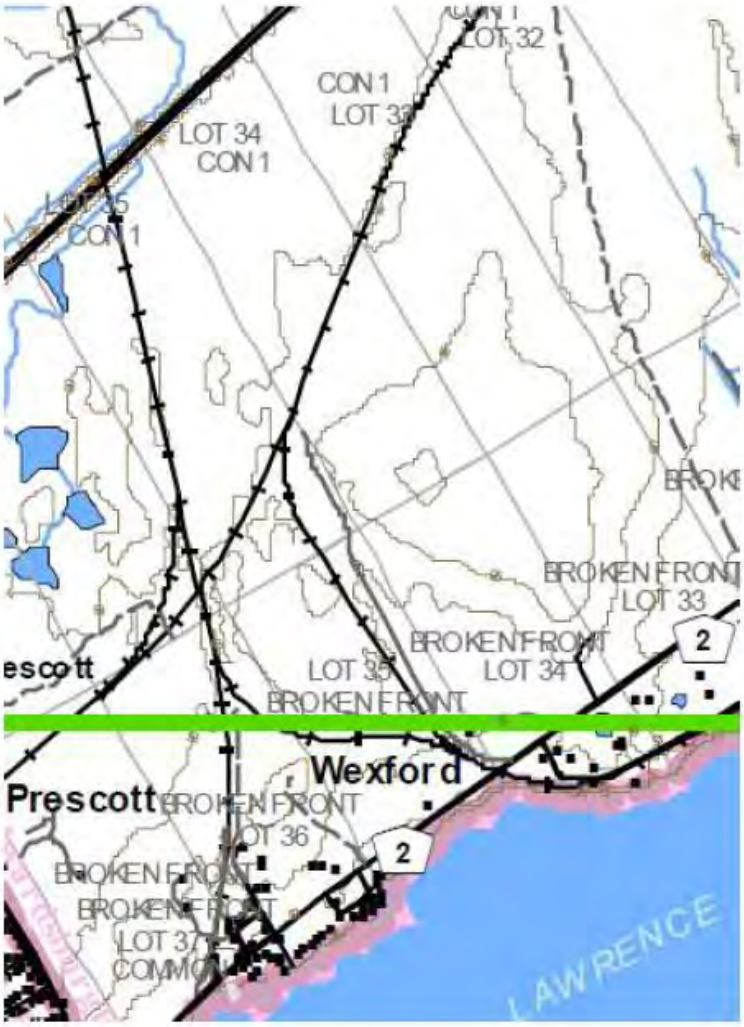
The Ontario Ministry of Natural Resources' (OMNR) Biodiversity Explorer shows three historic or extirpated element occurrences in close proximity to the parcels in question. Specifically, the Honey-locust, the Heart-leaved Alexanders and the Puttyroot, all types of plants, are at high risk of extinction within the province but have a secure global population. OMNR should be contacted for further information.

I trust this document meets your requirements. Should you have any further questions or concerns, please contact our office.

Sincerely,

Mathieu Leblanc
Planning Assistant
(613) 984-2948 ext. 303
mleblanc@nation.on.ca

SNC-713-2010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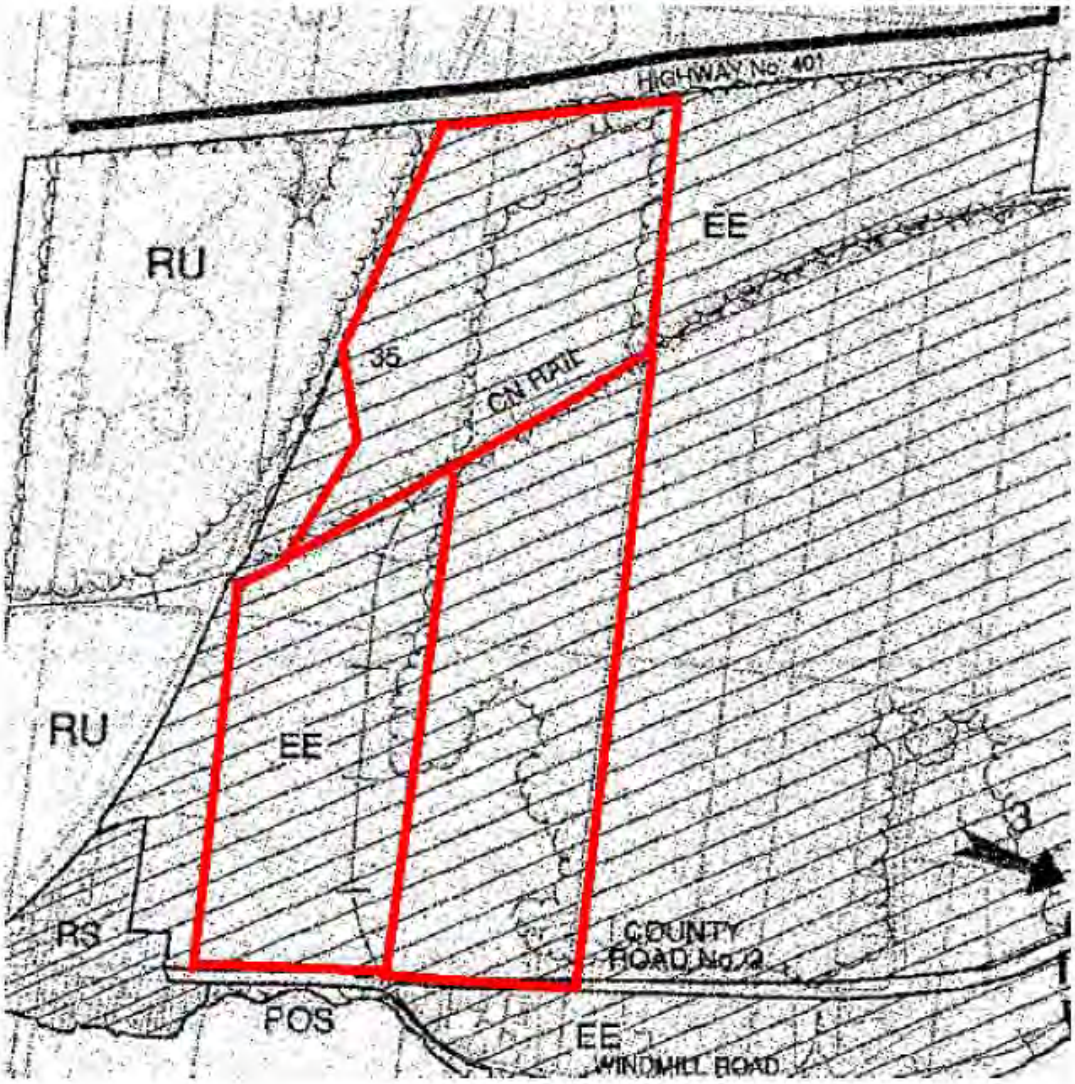
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COUNTY ROAD No. 2
WINDMILL ROAD

Ontario

Ministry of Natural Resources

Kemptville District
P.O. Box 2002
10 Campus Drive
Kemptville, ON K0G 1J0

Tel.: (613) 258-8470
Fax.: (613) 258-3920

Ministère des Richesses naturelles

District de Kemptville
CP 2002
10 Campus Drive
Kemptville, ON K0G 1J0

Tél.: (613) 258-8470
Téléc.: (613) 258-3920

May 10, 2010

Penn Energy Trust LLC
620 Righters Ferry Road
Bala Cynwyd, PA 19004
United States

Attention: Bob Gary

RE: Information Request – Solar Project – Edwardsburgh Parcels
Our File No.: 2010_EDW-839

Dear Mr. Gray,

The Ministry of Natural Resources (MNR) Kemptville District has carried out a review of the area in order to identify any potential natural resource and natural heritage values in the area of the identified site – Concession 1, partial Lot 34 and 35, Edwardsburgh Geographic Township.

The MNR must clearly indicate that this is an initial records review and does not form part of the MNR review and confirmation process.

Our records review indicates that there is unevaluated wetland identified on portions of the lots. As these wetlands have not been evaluated, and with the presence of Species at Risk, the MNR strongly recommends that if works are proposed within these features or within the setback distance (120 meters) that the significance of these features be evaluated. Furthermore, portions of the lots are identified as woodland, and therefore have the potential to be Significant Woodlands. Under the Provincial Policy Statement (PPS) and the Planning Act, the identification and delineation of significant woodlands is a responsibility of the Municipality. The MNR recommends that you contact the municipality and review their Official plan to determine if they have identified this area as such. If Significant Woodlands are not identified in the Official Plan, the proponent is required to evaluate the significance of the feature in accordance with MNR guidance if works are proposed within the feature or the setback distance (120 meters).

There are some watercourses located on the property and a small waterbody. MNR has identified these areas as potential for fish and fish habitat. It is important to work with the Conservation Authority and the DFO with regards to identifying and protecting fish habitat. Certain works adjacent to or in water may require various permits from these other agencies or the MNR.

Lastly, the MNR oversees the provincial Endangered Species Act (2007) and thus following a review of the information obtained from Natural Heritage Information Centre (NHIC) and a search of SAR records which exist at the MNR Kemptville District office, the MNR can advise that there is a high potential for **Butternut** (Endangered Species) and **American Ginseng** (Endangered), as well as known occurrence records for provincially tracked rare species – Honey Locust, Puttyroot and Heart-leaved Alexander. While provincially tracked rare species are not protected by the Endangered Species Act, under the PPS, the identification of

Significant Wildlife Habitat is (like Significant Woodlands) a delegated responsibility of the municipality. As such, if Significant Wildlife Habitat is not identified by the Municipality, the proponent is required to evaluate the significance of the feature.

Although this data represents the MNR's best current available information, it is important to note that a lack of occurrence at a site does not mean that there are no Species at Risk (SAR) at the location. The MNR continues to encourage ecological site assessments to determine the potential for other SAR occurrences. When a SAR does occur on a proposed site, it is recommended that the proponent contact the MNR for technical advice and to discuss what activities can occur without contravention of the Act. If an activity is proposed that will contravene the Act (such as Section 9 or 10), the proponent must contact the MNR to discuss the potential for application of certain permits (Section 17) or agreement (Regulation 242/08). For specific questions regarding the Endangered Species Act (2007) or species at risk, please contact Species at Risk Biologist, Paula Norlock at paula.norlock@ontario.ca . Not only is the ecological site assessment vital for assessing those Species at Risk on and adjacent to the site, however, it can also serve as the foundation for evaluating Significant Habitat of Endangered and Threatened species within the identified study area.

For the purposes of the required Natural Heritage Assessment report, the MNR recommends the following sources of direction and information as areas by which to begin the desktop portion of your review:

- Natural Heritage Reference Manual (2010) – the newly published NHRM is a key document for understanding the importance of and the criteria for evaluating the various Natural Heritage Values on the landscape (including Significant Woodlands). This document can be accessed via: http://www.mnr.gov.on.ca/en/Business/LUEPS/Publication/249081.html
- Significant Wildlife Habitat Technical Guide (1999) – this document provides further technical direction and information as it relates to Significant Wildlife Habitat: http://www.mnr.gov.on.ca/en/Business/FW/Publication/MNR_E001285P.html
- Ontario Wetland Evaluation System: http://www.mnr.gov.on.ca/en/Business/Biodiversity/2ColumnSubPage/STEL02_176756.html

If you have any questions, please do not hesitate to contact me.

Sincerely,

Laura Melvin
A/ District Planner
Resource Management Planner
laura.melvin@ontario.ca

Appendix B – Air photo of project area (1958)

Appendix C – Potential Species of Conservation Value based on Records Review

Common Name	Scientific Name	SRANK	Status*	Preferred Habitat
Dragonflies and Damselflies				
green-striped darner	*Aeshna verticalis*	S3		Spring-fed ponds and marshy meadows and marshy or swampy lakes, ponds and slow streams.
mottled darner	*Aeshna clepsydra*	S3		Found within small lakes or in bays of large rivers that have marsh or bog habitat along the shoreline. Often associated with water lilies and clear soft water.
horned clubtail	*Arigomphus cornutus*	S3		Ponds or watercourses with no noticeable flow. Frequently with marsh or bog habitat along the shoreline.
lilypad clubtail	*Arigomphus furcifer*	S3		Marshy lakes.
ebony boghaunter	*Williamsonia fletcheri*	S2		Sphagnum bogs.
amber-winged spreadwing	*Lestes eurinus*	S1		Ponds, bogs and lakes.
azure bluet	*Enaillagma aspersum*	S3		Shallow ponds, lakes and bogs.
Butterflies				
gorgone crescentspot	*Chlosyne gorgone*	S2		Open habitat, abandoned fields, dry roadsides. Prefers sandy soil over limestone.
early hairstreak	*Erora laeta*	S2		Mature beech-maple forest
monarch	*Danaus plexippu*	S2N, S4B	SC	Old fields, meadows, roadsides.
Reptiles				
northern map turtle	*Graptemys geographica*	S3	SC	Large waterbodies.
eastern ribbonsnake	*Thamnophis sauritus*	S1	SC	Prefers meadows or forest edge, often around permanent waterbodies
milksnake	*Lampropeltis triangulum*	S3	SC	Found within open forest, forest edges, meadows, and cultivated areas.

Common Name	Scientific Name	SRANK	Status*	Preferred Habitat
common five-lined skink (Southern Shield population)	*Plestiodon fasciatus pop. 2*	S3	SC	Rocky outcrops in mixed coniferous and deciduous forests.
Birds				
bald eagle	*Haliaeetus leucocephalus*	S2N, S4B	SC	Associated with large lakes and rivers. Frequently observed on dead branches overlooking water.
black tern	*Chlidonias niger*	S3B	SC	Breed in freshwater marshes
red-headed woodpecker	*Melanerpes erythrocephalus*	S4B	SC	Open deciduous woodland.
golden-winged warbler	*Vermivora chrysoptera*	S4B	SC	Damp abandoned fields, wooded swamps, and alder bogs.
cerulean warbler	*Dendroica cerulea*	S3B	SC	Deciduous forest, especially in river valleys.
prairie warbler	*Dendroica discolor*	S3B		Brush habitat such as areas that have been slashed, pastures and low pines.
Louisiana waterthrush	*Seiurus motacilla*	S3B	SC	Brooks, ravines and wooded swamps.
Mammals				
Northern long-eared bat	*Myotis septentrionalis*	S3?		Found in treed or shrubbed habitat near water.
Eastern small-footed bat	*Myotis leibii*	S2S3		Found within deciduous or coniferous forests in hilly areas.
eastern pipistrelle	*Pipistrellus subflavus*	S3?		Prefers shrub habitat or open woodland near water.
Plants				
a moss	*Bryum blindii*	S2		Seep area along the creek.
a moss	*Bryum gemmiparum*	S1		Low-elevation and subalpine sites.
a moss	*Grimmia olneyi*	S2		Cracks and exposed faces of dry to occassionally wet rocks.
lance-leaved grapefern	*Botrychium lanceolatum*	S3?		Meadows and barrens.
purple-stemmed cliffbrake	*Pellaea atropurpurea*	S3		Found along limestone-rich cliffs and outcroppings.

Common Name	Scientific Name	SRANK	Status*	Preferred Habitat
broad beech fern	*Phegopteris hexagonoptera*	S3	SC	Wooded slopes.
eastern mosquito-fern	*Azolla caroliniana*	S1?		Aquatic habitats with mud substrate.
pitch pine	*Pinus rigida*	S2?		Upland or lowland, dry to boggy sites.
honey-locust	*Gleditsia triacanthos*	S2		River banks and floodplains.
panicled hawkweed	*Hieracium paniculatum*	S2?		Sandy forest, often with oaks.
downy goldenrod	*Solidago puberula*	S2		Edges of deciduous and coniferous woods, clearings, also margins of ponds and streams.
heart-leaved alexanders	*Zizia aptera*	S1		Dry shaded bluffs.
lake-cress	*Neobeckia aquatica*	S3?		Found in quiet, shallow water along lake margins and back water areas of slowly moving streams.
Fogg's goosefoot	*Chenopodium foggii*	S2		Woodlands, forest openings, and rock outcrops.
buttonbush dodder	*Cuscuta cephalanthi*	S2		Parasitic with many viable host.
prostrate tick-trefoil	*Desmodium rotundifolium*	S2		Oak woods, dry thickets and openings.
stiff gentian	*Gentianella quinquefolia*	S2		Bluffs, wooded hillsides, wet meadows, creeks, and river banks.
bee-balm	*Monarda didyma*	S3		Moist open woods, thickets, and stream banks.
halberd-leaved tearthumb	*Polygonum arifolium*	S3		Shaded swamps, ponds, tidal marshes along rivers, wet ravines in forests.
rue-anemone	*Thalictrum thalictroides*	S3		Deciduous woods, banks, and thickets.
hairy bedstraw	*Galium pilosum*	S3		Dry sandy woodland with oak or jack pine, clearings, fields and grasslands
round-leaved yellow violet	*Viola rotundifolia*	SH		Rich woods.

Common Name	Scientific Name	SRANK	Status*	Preferred Habitat
arrow-arum	*Peltandra virginica*	S2		Shallow water and muddy banks at edges of rivers and lakes, swamp forest along river.
sedge	*Carex albicans var. albicans*	S3		Wooded slopes, woodland clearings.
field sedge	*Carex conoidea*	S3		From moist to open situations including fens, wet prairies, meadows, borders, usually in calcareous or neutral substrates
long's sedge	*Carex longii*	SH		Borders of marshes and open woodlands, moist sandy sites.
nerveless muhlenberg's sedge	*Carex muehlenbergii var. enervis*	S1S2		Dry sandy sites: fields, banks, edge of woods.
one-sided rush	*Juncus secundus*	S3		Exposed sites, generally with well-drained sandy soil.
puttyroot	*Aplectrum hyemale*	S2		Rich forest, such as upland beech-maple and more swampy woods.
ram's-head lady's-slipper	*Cypripedium arietinum*	S3		Dunes, along shores, or inland under Jake pine and oak and also in coniferous swamps.
slender muhly	*Muhlenbergia tenuiflora*	S2		Found on wooded dunes, hillsides and riverbanks.
cypress witchgrass	*Panicum dichotomum*	S2		Dry to moist oak, oak-hickory, or mixed forests; stream banks; pine groves.
Torrey's manna grass	*Torreyochloa pallida*	S2		Variety of wetland and open-water habitats
slender eight-flowered fescue	*Vulpia octoflora*	S2		Sandy often disturbed places; dunes and shores, roadsides, oak forests.

* For the purposes of this report the status includes species designated as special concern provincially or are listed as endangered, threatened or special concern federally AND not listed as endangered or threatened provincially.

SRANK DEFINITIONS

SH: **Possibly Extirpated (Historical)**—Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate

Common Name	Scientific Name	SRANK	Status*	Preferred Habitat

occurrences, rather than simply using this status for all elements not known from verified extant occurrences.

S1: **Critically Imperiled**—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2: **Imperiled**—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3: **Vulnerable**—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

SNR: **Unranked**—Nation or state/province conservation status not yet assessed.
SNA: **Not Applicable** —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#: **Range Rank** —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

Additional older Sranks being replaced in 2006

SZB : **Breeding migrants/vagrants.**

SARA STATUS DEFINITIONS
Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Appendix D – Ontario Breeding Bird Atlas Data for Study Area (Records Review)

Common Name	Scientific Name	OBBA Category	Status*	SRank
Common Loon	*Gavia immer*	probable		S5B, S5N
Pied-billed Grebe	*Podilymbus podiceps*	probable		S4B, S4N
Double-crested Cormorant	*Phalacrocorax auritus*	confirmed		S5B
Great Blue Heron	*Ardea herodias*	possible		S4
Green Heron	*Butorides virescens*	probable		S4B
American Bittern	*Botaurus lentiginosus*	possible		S4B
Canada Goose	*Branta canadensis*	confirmed		S5
Mallard	*Anas platyrhynchos*	probable		S5
Gadwall	*Anas strepera*	probable		S4
Wood Duck	*Aix sponsa*	probable		S5
Turkey Vulture	*Cathartes aura*	probable		S5B
Sharp-shinned Hawk	*Accipiter striatus*	confirmed		S5
Cooper's Hawk	*Accipiter cooperii*	possible		S4
Red-shouldered Hawk	*Buteo lineatus*	confirmed		S4B
Red-tailed Hawk	*Buteo jamaicensis*	probable		S5
Northern Harrier	*Circus cyaneus*	possible		S4B
Osprey	*Pandion haliaetus*	confirmed		S5B
American Kestrel	*Falco sparverius*	possible		S4
Ruffed Grouse	*Bonasa umbellus*	confirmed		S4
Wild Turkey	*Meleagris gallopava*	probable		S5
Virginia Rail	*Rallus limicola*	possible		S5B
Sora	*Porzana carolina*	confirmed		S4B
Common Moorhen	*Gallinula chloropus*	possible		S4B
Killdeer	*Charadrius vociferus*	confirmed		S5B, S5N
Spotted Sandpiper	*Actitis macularia*	probable		S5
American Woodcock	*Scolopax minor*	possible		S4B
Common Snipe	*Gallinago delicata*	probable		S5B
Herring Gull	*Larus argentatus*	possible		S5B, S5N
Ring-billed Gull	*Larus delawarensis*	possible		S5B, S4N
Common Tern	*Sterna hirundo*	confirmed		S4B

Common Name	Scientific Name	OBBA Category	Status*	SRank
Caspian Tern	*Hydroprogne caspia*	observed		S3B
Rock Pigeon	*Columba livia*	probable		SNA
Mourning Dove	*Zenaida macroura*	confirmed		S5
Yellow-billed Cuckoo	*Coccyzus americanus*	possible		S4B
Black-billed Cuckoo	*Coccyzus erythropthalmus*	possible		S5B
Barred Owl	*Strix varia*	possible		S5
Chimney Swift	*Chaetura pelagica*	possible	THR	S4B, S4N
Ruby-throated Hummingbird	*Archilochus colubris*	possible		S5B
Belted Kingfisher	*Ceryle alcyon*	probable		S4B
Northern Flicker	*Colaptes auratus*	probable		S4B
Yellow-bellied Sapsucker	*Sphyrapicus varius*	probable		S5B
Hairy Woodpecker	*Picoides villosus*	probable		S5
Downy Woodpecker	*Picoides pubescens*	confirmed		S5
Pileated Woodpecker	*Dryocopus pileatus*	probable		S5
Eastern Kingbird	*Tyrannus tyrannus*	confirmed		S4B
Great Crested Flycatcher	*Myiarchus crinitus*	probable		S4B
Eastern Phoebe	*Sayornis phoebe*	confirmed		S5B
Willow Flycatcher	*Empidonax traillii*	probable		S5B
Alder Flycatcher	*Empidonax alnorum*	possible		S5B
Least Flycatcher	*Empidonax minimus*	probable		S4B
Eastern Wood-Pewee	*Contopus virens*	probable		S4B
Tree Swallow	*Tachycineta bicolor*	confirmed		S4B
Bank Swallow	*Riparia riparia*	confirmed		S4B
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	confirmed		S4B
Barn Swallow	*Hirundo rustica*	confirmed		S4B
Cliff Swallow	*Petrochelidon pyrrhonota*	confirmed		S4B
Purple Martin	*Progne subis*	confirmed		S4B
Blue Jay	*Cyanocitta cristata*	confirmed		S5
American Crow	*Corvus brachyrhynchos*	confirmed		S5B
Black-capped Chickadee	*Poecile atricapilla*	probable		S5
White-breasted Nuthatch	*Sitta carolinensis*	possible		S5
Red-breasted Nuthatch	*Sitta canadensis*	probable		S5

Common Name	Scientific Name	OBBA Category	Status*	SRank
House Wren	*Troglodytes aedon*	confirmed		S5B
Marsh Wren	*Cistothorus palustris*	probable		S4B
Gray Catbird	*Dumetella carolinensis*	probable		S4B
Brown Thrasher	*Toxostoma rufum*	possible		S4B
American Robin	*Turdus migratorius*	confirmed		S5B
Wood Thrush	*Hylocichla mustelina*	confirmed		S4B
Veery	*Catharus fuscescens*	probable		S4B
Cedar Waxwing	*Bombycilla cedrorum*	probable		S5B
European Starling	*Sturnus vulgaris*	confirmed		SNA
Red-eyed Vireo	*Vireo olivaceus*	confirmed		S5B
Warbling Vireo	*Vireo gilvus*	confirmed		S5B
Black-and-white Warbler	*Mniotilta varia*	confirmed		S5B
Nashville Warbler	*Vermivora ruficapilla*	possible		S5B
Yellow Warbler	*Dendroica petechia*	probable		S5B
Pine Warbler	*Dendroica pinus*	probable		S5B
Magnolia Warbler	*Dendroica magnolia*	possible		S5B
Yellow-rumped Warbler	*Dendroica coronata*	probable		S5B
Black-throated Green Warbler	*Dendroica virens*	probable		S5B
Chestnut-sided Warbler	*Dendroica pensylvanica*	probable		S5B
Ovenbird	*Seiurus aurocapillus*	probable		S4B
Northern Waterthrush	*Seiurus noveboracensis*	probable		S5B
Mourning Warbler	*Oporornis philadelphia*	probable		S4B
Common Yellowthroat	*Geothlypis trichas*	confirmed		S5B
Canada Warbler	*Wilsonia canadensis*	possible		S4B
American Redstart	*Setophaga ruticilla*	probable		S5B
House Sparrow	*Passer domesticus*	confirmed		SNA
Bobolink	*Dolichonyx oryzivorus*	probable		S4B
Eastern Meadowlark	*Sturnella magna*	probable		S4B
Red-winged Blackbird	*Agelaius phoeniceus*	confirmed		S4
Baltimore Oriole	*Icterus galbula*	confirmed		S4B
Common Grackle	*Quiscalus quiscula*	confirmed		S5B
Scarlet Tanager	*Piranga olivacea*	probable		S4B
Brown-headed Cowbird	*Molothrus ater*	probable		S4B

Common Name	Scientific Name	OBBA Category	Status*	SRank
Northern Cardinal	*Cardinalis cardinalis*	confirmed		S5
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	confirmed		S4B
Indigo Bunting	*Passerina cyanea*	probable		S4B
Purple Finch	*Carpodacus purpureus*	confirmed		S4B
House Finch	*Carpodacus mexicanus*	confirmed		SNA
American Goldfinch	*Carduelis tristis*	probable		S5B
Eastern Towhee	*Pipilo erythrophthalmus*	probable		S4B
Savannah Sparrow	*Passerculus sandwichensis*	probable		S4B
Chipping Sparrow	*Spizella passerina*	confirmed		S5B
Field Sparrow	*Spizella pusilla*	possible		S4B
White-throated Sparrow	*Zonotrichia albicollis*	confirmed		S5B
Swamp Sparrow	*Melospiza georgiana*	probable		S5B
Song Sparrow	*Melospiza melodia*	confirmed		S5B

* For the purposes of this report the status includes species designated as special concern provincially or are listed as endangered, threatened or special concern federally AND not listed as endangered or threatened provincially.

SRANK DEFINITIONS

S3: **Vulnerable**—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4: **Apparently Secure**—Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5: **Secure**—Common, widespread, and abundant in the nation or state/province.
SNA: **Not Applicable** —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#: **Range Rank** —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

Additional older Sranks being replaced in 2006

S?: **Not Ranked Yet**; or if following a ranking, Rank Uncertain (e.g. S3?). S? species have not had a rank assigned.

SZB : **Breeding migrants/vagrants.**

SARA STATUS DEFINITIONS

Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Appendix E – List of bird species observed within initial survey area

(observations made by Michelle Lavictoire)

Common Name	Scientific Name	Status*	SRANK
Great Blue Heron	*Ardea herodias*		S4
Green Heron	*Butorides virescens*		S4B
Canada Goose	*Branta canadensis*		S5
Wood Duck	*Aix sponsa*		S5
Mallard	*Anas platyrhynchos*		S5
Ruffed Grouse	*Bonasa umbellus*		S4
Wild Turkey	*Meleagris gallopava*		S5
Killdeer	*Charadrius vociferus*		S5B, S5N
Belted Kingfisher	*Ceryle alcyon*		S4B
Downy Woodpecker	*Picoides pubescens*		S5
Hairy Woodpecker	*Picoides villosus*		S5
Northern Flicker	*Colaptes auratus*		S4B
Pileated Woodpecker	*Dryocopus pileatus*		S5
Eastern Wood-Pewee	*Contopus virens*		S4B
Alder Flycatcher	*Empidonax alnorum*		S5B
Least Flycatcher	*Empidonax minimus*		S4B
Great Crested Flycatcher	*Myiarchus crinitus*		S4B
Warbling Vireo	*Vireo gilvus*		S5B
Red-eyed Vireo	*Vireo olivaceus*		S5B
Blue Jay	*Cyanocitta cristata*		S5
American Crow	*Corvus brachyrhynchos*		S5B
Common Raven	*Corvus corax*		S5
Tree Swallow	*Tachycineta bicolor*		S4B
Black-capped Chickadee	*Poecile atricapilla*		S5
Red-breasted Nuthatch	*Sitta canadensis*		S5
White-breasted Nuthatch	*Sitta carolinensis*		S5
House Wren	*Troglodytes aedon*		S5B
Marsh Wren	*Cistothorus palustris*		S4B
Ruby-crowned Kinglet	*Regulus calendula*		S4B
Veery	*Catharus fuscescens*		S4B
Wood Thrush	*Hylocichla mustelina*		S4B
American Robin	*Turdus migratorius*		S5B
Gray Catbird	*Dumetella carolinensis*		S4B
European Starling	*Sturnus vulgaris*		SNA
Cedar Waxwing	*Bombycilla cedrorum*		S5B

Common Name	Scientific Name	Status*	SRANK
Yellow Warbler	*Dendroica petechia*		S5B
Chestnut-sided Warbler	*Dendroica pensylvanica*		S5B
Black-and-white Warbler	*Mniotilta varia*		S5B
Ovenbird	*Seiurus aurocapillus*		S4B
Common Yellowthroat	*Geothlypis trichas*		S5B
American Tree Sparrow	*Spizella arborea*		S4B
Field Sparrow	*Spizella pusilla*		S4B
Song Sparrow	*Melospiza melodia*		S5B
Swamp Sparrow	*Melospiza georgiana*		S5B
White-throated Sparrow	*Zonotrichia albicollis*		S5B
White-crowned Sparrow	*Zonotrichia leucophrys*		S4B
Dark-eyed Junco	*Junco hyemalis*		S5B
Rose-breasted Grosbeak	*Pheucticus ludovicianus*		S4B
Red-winged Blackbird	*Agelaius phoeniceus*		S4
Common Grackle	*Quiscalus quiscula*		S5B
Baltimore Oriole	*Icterus galbula*		S4B
American Goldfinch	*Carduelis tristis*		S5B

* For the purposes of this report the status includes species designated as special concern provincially or are listed as endangered, threatened or special concern federally AND not listed as endangered or threatened provincially.

SH: **Possibly Extirpated (Historical)**—Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.
S1: **Critically Imperiled**—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2: **Imperiled**—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3: **Vulnerable**—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4: **Apparently Secure**—Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5: **Secure**—Common, widespread, and abundant in the nation or state/province.

SNR: **Unranked**—Nation or state/province conservation status not yet assessed.
SNA: **Not Applicable** —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#: **Range Rank** —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

Additional older Sranks being replaced in 2006
S?: **Not Ranked Yet**; or if following a ranking, Rank Uncertain (e.g. S3?). S? species have not had a rank assigned.

SZB : **Breeding migrants/vagrants.**

SARA STATUS DEFINITIONS
Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Appendix F – List of flora observed within the study area (observations completed by Michelle Lavictoire and Shaun St. Pierre)

Common Name	Scientific Name	Status*	SRANK
Mnium	Mniaceae		
Northern Lady Fern	*Athyrium filix-femina var. angustum*		S5
Ostrich Fern	*Matteuccia struthiopteris*		S5
Sensitive Fern	*Onoclea sensibilis*		S5
Field Horsetail	*Equisetum arvense*		S5
Scouring-rush	*Equisetum hyemale ssp. affine*		S5
Eastern White Cedar	*Thuja occidentalis*		S5
Tamarack	*Larix laricina*		S5
White Pine	*Pinus strobus*		S5
Scotch Pine	*Pinus sylvestris*		SNA
Manitoba Maple	*Acer negundo*		S5
Red Maple	*Acer rubrum*		S5
Silver Maple	*Acer saccharinum*		S5
Sugar Maple	*Acer saccharum*		S5
Western Poison-ivy	*Rhus radicans ssp. rydbergii*		S5
Staghorn Sumac	*Rhus typhina*		S5
Water-hemlock	*Cicuta virosa*		S4S5
Wild Carrot	*Daucus carota*		SNA
Wild Parsnip	*Pastinaca sativa*		SNA
Common Milkweed	*Asclepias syriaca*		S5
Common Yarrow	*Achillea millefolium ssp. millefolium*		SNA
Common Burdock	*Arctium minus ssp. minus*		SNA
Ox-eye Daisy	*Chrysanthemum leucanthemum*		SNA
Bull Thistle	*Cirsium vulgare*		SNA
Philadelphia Fleabane	*Erigeron philadelphicus ssp. philadelphicus*		S5
Spotted Joe-pye-weed	*Eupatorium maculatum ssp. maculatum*		S5
Orange Hawkweed	*Hieracium aurantiacum*		SNA
Field Hawkweed	*Hieracium caespitosum ssp. caespitosum*		SNA
Tall White Lettuce	*Prenanthes altissima*		S5
Black-eyed Susan	*Rudbeckia hirta*		S5
Balsam Ragwort	*Senecio pauperculus*		SNR
Goldenrod sp.	*Solidago sp.*		

Common Name	Scientific Name	Status*	SRANK
Tall Goldenrod	*Solidago altissima*		SNR
Canada Goldenrod	*Solidago canadensis*		S5
Gray Goldenrod	*Solidago nemoralis ssp. nemoralis*		S5
Rough Goldenrod	*Solidago rugosa ssp. rugosa*		S5
Common Tansy	*Tanacetum vulgare*		SNA
Common Dandelion	*Taraxacum officinale*		SNA
Meadow Goat's-beard	*Tragopogon pratensis ssp. pratensis*		SNA
Spotted Jewel-weed	*Impatiens capensis*		S5
Japanese Barberry	*Berberis thunbergii*		SNA
Blue Cohosh	*Caulophyllum thalictroides*		S5
Mayapple	*Podophyllum peltatum*		S5
Speckled Alder	*Alnus incana spp. rugosa*		S5
White Birch	*Betula papyrifera*		S5
Gray Birch	*Betula populifolia*		S5
Blue Beech	*Carpinus caroliniana ssp. Virginiana*		S5
Ironwood	*Ostrya virginiana*		S5
Garlic Mustard	*Alliaria petiolata*		SNA
Field Mustard	*Brassica rapa*		SNA
Field Penny-cress	*Thlaspi arvense*		SNA
Tartarian Honeysuckle	*Lonicera tatarica*		SNA
Common Elderberry	*Sambucus canadensis*		S5
Red-berried Elderberry	*Sambucus racemosa ssp. pubens*		S5
Horse-gentian	*Triosteum aurantiacum*		S5
Maple-leaved Viburnum	*Viburnum acerifolium*		S5
Nannyberry	*Viburnum lentago*		S5
Downy Arrow-wood	*Viburnum rafinesquianum*		S5
Southern Arrow-wood	*Viburnum recognitum*		S4
Bladder Campion	*Silene latifolia*		SNA
Alternate-leaved Dogwood	*Cornus alternifolia*		S5
Gray Dogwood	*Cornus foemina ssp. racemosa*		S5
Red-osier Dogwood	*Cornus stolonifera*		S5
Wild Cucumber	*Echinocystis lobata*		S5
Trailing Crown-vetch	*Coronilla varia*		SNA
Bird's-foot Trefoil	*Lotus corniculatus*		SNA
Black Medick	*Medicago lupulina*		SNA

Common Name	Scientific Name	Status*	SRANK
Alfalfa	*Medicago sativa ssp. sativa*		SNA
White Sweet-clover	*Melilotus alba*		SNA
Black Locust	*Robinia pseudo-acacia*		SNA
Red Clover	*Trifolium pratense*		SNA
White Clover	*Trifolium repens*		SNA
Cow Vetch	*Vicia cracca*		SNA
White Oak	*Quercus alba*		S5
Bur Oak	*Quercus macrocarpa*		S5
Red Oak	*Quercus rubra*		S5
Wild Black Currant	*Ribes americanum*		S5
Prickly Gooseberry	*Ribes cynosbati*		S5
Shagbark Hickory	*Carya ovata var. ovata*		S5
Butternut	*Juglans cinerea*	END	S3?
Ground Ivy	*Galeopsis hederacea*		SNA
Cut-leaved Water-horehound	*Lycopus americanus*		S5
Selfheal	*Prunella vulgaris ssp. vulgaris*		S5
Purple Loosestrife	*Lythrum salicaria*		SNA
White Ash	*Fraxinus americana*		S5
Black Ash	*Fraxinus nigra*		S5
Canada Enchanter's Nightshade	*Circaea lutetiana ssp. canadensis*		S5
True Wood-sorrel	*Oxalis acetosella ssp. montana*		S5
Bloodroot	*Sanguinaria canadensis*		S5
Phlox sp.	*Phlox sp.*		
Round-leaved Pyrola	*Pyrola americana*		S4?
White Baneberry	*Actaea pachypoda*		S5
Red Baneberry	*Actaea rubra*		S5
Canada Anemone	*Anemone canadensis*		S5
Wood Anemone	*Anemone quinquefolia var. quinquefolia*		S5
Marsh Marigold	*Caltha palustris*		S5
Virgin's Bower	*Clematis virginiana*		S5
Tall Buttercup	*Ranunculus acris*		SNA
Tall Meadow-rue	*Thalictrum pubescens*		S5
Common Buckthorn	*Rhamnus cathartica*		SNA
Downy Serviceberry	*Amelanchier arborea*		S5
Round-leaved Serviceberry	*Amelanchier sanguinea*		S5?
Hawthorn sp.	*Crataegus sp.*		
Common Strawberry	*Fragaria virginiana ssp.*		S5

Common Name	Scientific Name	Status*	SRANK
	virginiana		
White Avens	*Geum canadense*		S5
Silverweed	*Potentilla anserina ssp. anserina*		S5
Shrubby Cinquefoil	*Potentilla fruticosa ssp. floribunda*		S5
Rough-fruited Cinquefoil	*Potentilla recta*		SNA
Black Cherry	*Prunus serotina*		S5
Choke Cherry	*Prunus virginiana ssp. virginiana*		S5
Smooth Wild Rose	*Rosa blanda*		S5
Common Blackberry	*Rubus allegheniensis*		S5
Wild Red Raspberry	*Rubus idaeus*		S5
Purple Flowering Raspberry	*Rubus odoratus*		S5
Sparse-flowered Thimbleberry	*Rubus parviflorus*		S4
Dwarf Raspberry	*Rubus pubescens*		S5
Showy Mountain-ash	*Sorbus decora*		S5
Narrow-leaved Meadowsweet	*Spiraea alba*		S5
Barren Strawberry	*Waldsteinia fragarioides*		S5
Rough Bedstraw	*Galium asprellum*		S5
Smooth Bedstraw	*Galium mollugo*		SNA
Balsam Poplar	*Populus balsamifera ssp. balsamifera*		S5
Largetooth Aspen	*Populus grandidentata*		S5
Trembling Aspen	*Populus tremuloides*		S5
Pussy Willow	*Salix discolor*		S5
Sandbar Willow	*Salix exigua*		S5
Crack Willow	*Salix fragilis*		SNA
Slender Willow	*Salix petiolaris*		S5
Common Speedwell	*Veronica officinalis*		SNA
Bittersweet Nightshade	*Solanum dulcamara*		SNA
American Basswood	*Tilia americana*		S5
American Elm	*Ulmus americana*		S5
Wood Nettle	*Laportea canadensis*		S5
European Stinging Nettle	*Urtica dioica ssp. dioica*		SNA
Violet sp.	*Viola*		
Marsh Blue Violet	*Viola cucullata*		S5

Common Name	Scientific Name	Status*	SRANK
Downy Yellow Violet	*Viola pubescens*		S5
Virginia-creeper	*Parthenocissus inserta*		S5
Riverbank Grape	*Vitis riparia*		S5
Jack-in-the-pulpit	*Arisaema triphyllum ssp. triphyllum*		S5
Sedge sp.	*Carex sp.*		
Bebb's Sedge	*Carex bebbii*		S5
Yellow Sedge	*Carex flava*		S5
Bladder Sedge	*Carex intumescens*		S5
Lakebank Sedge	*Carex lacustris*		S5
Awl-fruited Sedge	*Carex stipata*		S5
Hardstem Bulrush	*Scirpus acutus*		SNR
Black Bulrush	*Scirpus atrovirens*		S5
Wool-grass	*Scirpus cyperinus*		S5
Softstem Bulrush	*Scirpus validus*		S5
European Frog's-bit	*Hydrocharis morsus-ranae*		SNA
Northern Blue-flag	*Iris versicolor*		S5
Path Rush	*Juncus tenuis*		S5
Lesser Duckweed	*Lemna minor*		S5
Great Duckweed	*Spirodela polyrhiza*		S5
Yellow Trout Lily	*Erythronium americanum*		S5
False Solomon's Seal	*Maianthemum racemosum ssp. racemosum*		S5
Red Trillium	*Trillium erectum*		S5
White Trillium	*Trillium grandiflorum*		S5
Grass	Poaceae		
Fringed Brome	Bromus ciliatus		S5
Reed Canary Grass	*Phalaris arundinacea*		S5
Canada Blue Grass	*Poa compressa*		SNA
Kentucky Bluegrass	*Poa pratensis ssp. pratensis*		S5
Herbaceous Carrion Flower	*Smilax herbacea*		S4
Giant Bur-reed	*Sparganium eurycarpum*		S5
Broad-leaved Cattail	*Typha latifolia*		S5

* For the purposes of this report the status includes species designated as special concern provincially or are listed as endangered, threatened or special concern federally AND not listed as endangered or threatened provincially.

SRANK
S3: **Vulnerable**—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4: **Apparently Secure**—Uncommon but not rare; some cause for long-term concern due to declines or other factors.

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Common Name	Scientific Name	Status*	SRANK

SNR: **Unranked**—Nation or state/province conservation status not yet assessed.
SNA: **Not Applicable** —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#: **Range Rank** —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

Additional older Sranks being replaced in 2006
S?: **Not Ranked Yet**; or if following a ranking, Rank Uncertain (e.g. S3?). S? species have not had a rank assigned.

SARA STATUS DEFINITIONS

Endangered (END) - A species facing imminent extirpation or extinction.
Special Concern (SC) - A species that may become threatened or endangered because of a combination of biological characteristics and identified threats.

Appendix G – List of wildlife observed within the initial surveyed area

(observations made by Shaun St. Pierre and Michelle Lavictoire)

Common Name	Scientific Name	Status*	SRANK
Butterflies			
Canadian Tiger Swallowtail	*Papilio canadensis*		S5
Monarch	*Danaus plexippu*	SC	S2N S4B
Dragonflies			
Common Whitetail	*Libellula lydia*		S5
Common Green Darner	*Anax junius*		S5
Amphibians			
Spring Peeper	*Pseudacris crucifer*		S5
Green Frog	*Rana clamitans*		S5
Northern Leopard Frog	*Rana pipiens*		S5
Reptiles			
Midland Painted Turtle	*Chrysemys picta marginata*		S5
Mammals			
Red Squirrel	*Tamiasciurus hudsonicus*		S5
Snowshoe hare	*Lepus americanus*		S5
Coyote/Fox (feces)	*Canidae sp.*		
White-tailed Deer	*Odocoileus virginianus*		S5

* For the purposes of this report the status includes species designated as special concern provincially or are listed as endangered, threatened or special concern federally AND not listed as endangered or threatened provincially.

SRANK

S2: **Imperiled**—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S4: **Apparently Secure**—Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5: **Secure**—Common, widespread, and abundant in the nation or state/province.

S#S#: **Range Rank** —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

Additional older Sranks being replaced in 2006

S?: **Not Ranked Yet**; or if following a ranking, Rank Uncertain (e.g. S3?). S? species have not had a rank assigned.

SZB : **Breeding migrants/vagrants.**

SZN: **Non-breeding migrants/vagrants.**

SARA STATUS DEFINITIONS

Endangered (END) - A species facing imminent extirpation or extinction.

Special Concern (SC) - A species that may become threatened or endangered because of a combination of

Common Name	Scientific Name	Status*	SRANK

biological characteristics and identified threats.

Appendix H – Resumes

MICHELLE L. (NUNAS) LAVICTOIRE, M. Sc.

EDUCATION

M.Sc. Natural Resources, Environmental Assessment of Best Management Practices for Cattle Pasturing near Small Streams, Macdonald Campus, McGill University – Supervisor Dr. Curtis
B.Sc. Wildlife Biology, Macdonald Campus, McGill University, 1997

LANGUAGES

Fluent in English, French, Spanish and novice Indonesian.

PROFESSIONAL AFFILIATIONS

American Fisheries Society (AFS), Ontario Association of Certified Engineering Technicians and Technologists (O.A.C.E.T.T.), Association Québécoise pour l'évaluation d'impacts (AQEI), International Association for Impact Assessment (AIAI), World Sturgeon Conservation Society.

POSITIONS HELD

2002-:	Bowfin Environmental Consulting Inc., Principal/Biologist
2000-2002:	Self-employed, Biologist
1999-2000	Tera Environmental Consultants, Calgary, AB, Environmental Planner
1998-1999:	Enviroconsult Inc. Calgary, AB, Biologist
1998:	Golder Associates Ltd., Calgary, AB, Contract Technician
1997-1998:	Envirowest Consultants Ltd., Prince George, BC, Biologist
1996:	Heritage Laurentien, Montreal, PQ, Naturalist
1996:	Martineau-Walker, Montreal, PQ, Naturalist
1995:	Ottawa-Carleton Wildlife Centre, Ottawa, ON, Wildlife Intern

CERTIFICATIONS/COURSES

OACETT rcjii Graduate Technologist, Class 1 WSC Electroshocking Certification, first aid, CPR, PADI Instructor, marine radio operator, Pleasure Craft Operator Card. Ontario Fishes course offered by the Centre for Biodiversity and Conservation Biology at the Royal Ontario Museum. Ontario Freshwater Mussel Identification Workshop, Ontario Wetland Evaluation Training, Ecological Land Classification, Butternut Health Assessor. MTO R.A.Q.S. Fisheries Assessment, Environmental Inspection during Construction and Fisheries Compliance during Contracts

EXPERIENCE

Experience in environmental assessments, peer reviews, terrestrial habitat assessment, freshwater and marine habitat assessment, route selection, watershed studies and terrestrial and fisheries inventories including habitat mapping, stream classification, underwater surveys, electroshocking, and development of mitigation and compensation measures, including obtaining extensions to OMNR in-water timing constraints and DFO Authorizations and DFO Permits for Killing Fish by Means other than Fishing.

Aquatic and Terrestrial Environmental Impact Assessments

- Completed EIS for proposed WPCP expansion in the Town of Greater Napanee, ON
- Currently working on a terrestrial and aquatic component for the evaluation of proposed small hydroelectric options for a Cree community in northern Quebec.
- Currently responsible for the aquatic component for the Cataraqui Bridge Crossing, Kingston, ON.
- Currently completing the aquatic and terrestrial assessments for the proposed Clear Point small hydroelectric facility in Renfrew, ON.
- Currently completing the aquatic and terrestrial assessments for three proposed solar farms located in Port Hope, Prescott and Martintown.
- Currently working on an aquatic assessment for a proposed quarry near Rockland, ON.
- Completed aquatic environmental impact assessment for proposed sand pit operations in Greely and Bourget.
- Completed an environmental assessment for a proposed development along Heb Gordon Drain, Manotick, ON.
- Evaluated wetland boundaries for Doran Creek Wetland following OWES, Iroquois Ontario.
- Evaluated wetland boundary and significant woodland features for several single lot developments in the United Counties of SD&G and City of Ottawa.
- Completed the Environmental Impact Statement for the route selection and the Environmental Impact Assessment for the preferred option for the Caron Street Expansion in Rockland, ON.
- Completed the aquatic impact assessment and terrestrial species at risk evaluation for a proposed expansion to a small hydroelectric facility in Douglas, ON.
- Completed terrestrial EIS for proposed WTTP expansion in Iroquois, ON.
- Completed a terrestrial and aquatic route selection assessment for the Simcoe WPCP.
- Completed a Level 1 and Level 2 aquatic and terrestrial assessments for a proposed quarry expansion near Cornwall, ON
- Completed Level 2 fisheries report for Gagne Pit expansion near Rockland, Ontario.
- Completed wetland assessment following OWES for the proposed Morrisburg Industrial Park
- Completed aquatic impact assessment for PTTW, Apple Hill Quarry.
- Currently working on Aquatic and Terrestrial Environmental Impact Assessments for First Chute small hydroelectric facility projects on the Bonnechere River, ON.
- Completed the aquatic habitat and community assessment for a permit to take water for the Amberwood Golf Course, Ottawa ON
- Complete fish community and habitat impact assessment for the Morrisburg Waste water tunnel
- Prepared aquatic impact assessment for the construction of the Clarkson WWTP outfall, Lake Ontario.
- Created artificial reef design for the Town of Saugeen Shores WPP.
- Conducted assessment of fish habitat use and determined potential impacts for the Town of Saugeen Shores WPP.
- Developed and conducted a study to assess fish kills within the Town of Saugeen Shores WWP.
- Fish habitat assessment along Stagecoach Road, Ottawa ON.
- Complete aquatic habitat and community impact assessment for a permit to take water for the Summersheights Golf Course.
- Prepared impact assessment and monitoring plan for the Burloak Water Purification Tunnel project (Burlington, ON).
- Completed aquatic habitat and community assessments for the permit to take water for the Riverbend Golf Course, Ottawa ON
- Conducted aquatic field assessments and reports for EA for vermiculite Canada project near Bobcaygeon.

- Terrestrial screening level habitat assessment of Ferguson Lake development.
- Designed fish habitat compensation and monitoring plans for Cataraqui River Drilling Project.
- Assessed fish habitat within the Ottawa River near L'Orignal for the Wastewater treatment plant environmental screening report.
- Assessed fish habitat within Lake St. Lawrence (St. Lawrence River) near Morrisburgh for the wastewater treatment plant environmental screening report.
- Conducted level 1 terrestrial impact assessment for Vermiculite Canada project near Bobcaygeon.
- Conducted Environmental Screening Report for South Dundas between Morrisburg and Iroquois.
- Fish habitat assessment Foster Drain, Jock River, Ottawa ON
- Fish habitat assessment on drains on HWY 417 in Casselmen, ON
- Conducted fisheries habitat assessment and designed artificial embayments and fish habitat enhancements for the Chat Falls Boat By-pass.
- Conducted environmental assessment for the proposed South River Hydroelectric Facility including an assessment of impacts on aquatic and terrestrial habitats and communities.
- Wrote Environmental Screening Report and conducted environmental inspections for Cataraqui River Drilling Project.
- Conducted Alexandria Wastewater treatment Plant Expansion Environmental Impact Study.
- Conducted Westley's Point terrestrial and Aquatic Environmental Screening Report for a sewer and watermain.
- Fish habitat assessment on Poole Creek near Stittsville, ON.
- Conducted field work for the environmental screening for the Harbour Front Trunk Sewer Overflow Control – Environmental Assessment.
- Fish habitat assessment Sawmill Creek, Cahill Tributary and Brown's Inlet, Ottawa ON
- Conducted fish habitat assessment and prepared environmental impact statement investigating the potential impacts of a lowering and realignment on the aquatic habitat on Spratt Municipal Drain.
- Conducted terrestrial and aquatic field assessment and wrote Environmental Screening Report for a development project on Loughborough Lake.
- Identified and mitigated potential fish habitat impacts as a result of a proposed increase in water level of the Garry River System, Alexandria, Ontario.
- Fish habitat assessment of Hosaic Creek within the Dupont Nature Reserve, Morrisburg ON.
- Assisted with terrestrial environmental impact assessments, in identification of environmental features to identify constraints and opportunities in support of a proposed Official Plan amendment in Tatlock, Ontario.
- Conducted the marine aquatic impact assessment for the Strait of Georgia Pipeline Crossing, BC.
- Assisted with environmental impact assessments, environmental field reports and fieldwork for various pipeline projects in Alberta.
- Wrote Environmental Overview for Tanglewood Residential Development in Calgary.
- Wrote Environmental Overview for Creekside Mills Residential Development in Calgary.
- Wrote Environmental Overview and Environmental Protection Plan for Beddington Trail, Calgary.
- Wrote Environmental Overview for Elbow Valleye Environmental Protection Plan in Calgary.

Aquatic Inventories

- Completed fish community sampling for the Third Crossing on the Cataraqui River (boat electrofishing and seine netting).
- Completed fish community sampling on Lafontaine drain in Rockland for a proposed subdivision.

- Completed backpack electrofishing and minnow trapping on watercourses at proposed sand pit expansions in Greely, and Bourget Ontario.
- Completed backpack electrofishing and minnow trapping on tributaries to Brook Creek in Port Hope, on a tributary to the St. Lawrence River near Prescott and Wood Drain in South Glengarry for proposed solar farms.
- Completed walleye spawning monitoring (night surveys and egg traps) in and around the chute between Lakes Opemisca and Barlow in northern Quebec.
- Completed a fish kill monitoring of the recently upgraded water treatment facility in Southampton, ON.
- Completed fish community sampling on a tributary to Gray's Creek in Cornwall, Ontario for a proposed subdivision.
- Conducted young-of-the-year walleye monitoring on the Raisin River and Lake St. Francis using boat electrofishing, Cornwall ON.
- Conducted boat electrofishing sampling on the Cataraqui River for a proposed dredging program, Kingston ON.
- Completed boat elecrofishing and habitat mapping for Port of Prescott proposed expansion.
- Conducted fish community sampling within an unnamed drain in Russell, ON.
- Conducted fish community sampling within Feedmill Creek for a proposed development Ottawa, ON.
- Conducted fish community sampling within a tributary to the St. Lawrence River, Brockville, ON.
- Conducted fish community sampling and pike monitoring on the Eastman Drain, Cornwall ON.
- Conducted fish community monitoring and pike surveys on the Heb Gordon Drain, Manotick, ON.
- Conducted fish community sampling on tributaries to Shirley's Creek Kanata, ON.
- Conducted fish community sampling on Foster Drain, Ottawa ON.
- Designed and conducted walleye larvae survey of Hoople Creek and Raisin River (neuston net).
- Collected and analyzed fish and benthic macroinvertebrates from Pattingale and Hoople Creeks for a comparison study of impacted and non-impacted sites for the Raisin Region Conservation Authority.
- Developed and conducted first year of sampling for a benthic macroinvertebrate monitoring program for PTTW, Riverbend Golf Course, near Ottawa, ON.
- Completed R.I.N. (OMNR) gill netting protocol on Reach 1 of the Bonnechere River, Renfrew ON.
- Collected fish community and benthic macroinvertebrate information within tributaries to Clarence Creek for a proposed subdivision, Rockland, ON.
- Collected fish community and benthic macroinvertebrate information within tributaries to Lafontaine Creek for a proposed subdivision, Rockland, ON.
- Collected fish community information from two tributaries to the Ottawa River, Wendover, ON.
- Sampled fish communities within Adams Pond (Ottawa, ON).
- Completed first year of fish community monitoring for the Poole Creek re-alignment at Huntmar Road, Ottawa (backpack electrofishing multi-season)
- Completed the first year of a three year monitoring project for the Cataraqui Utilities Crossing project within the Cataraqui River (boat shocking, seine netting, habitat assessment)
- Completed a three year monitoring project of the new wetland channel created in the Little Cataraqui River, Kingston ON (seine netting).
- Assessment of benthic macroinvertebrates and fish communities within tributaries of the Bonnechere River (Renfrew ON) (seine netting, gill netting, backpack electrofishing, minnow

trapping, multi-season).
- Conducted fish removal on a tributary to Trout Lake for Cruickshank on HWY 60
- Conducted young-of-the-year muskie seining within the Ganonoque area for Muskies Canada and OMNR (seine netting)
- Fish community sampling Mosquito Creek, Carp River and its tributaries. Ottawa, ON (backpack shocking)
- Provided fish removal services for Poole Creek at Huntmar, Kanata Ontario.
- Conducted young-of-the-year muskie and walleye seining within Lake St. Francis (Cornwall, ON).
- Assisted the City of Ottawa in locating and identifying potential walleye spawning grounds in the Rideau River.
- Conducted boat electrofishing on the Cataraqui River (Kingston, ON).
- Collected and analyzed walleye eggs from the spawning grounds at on the Raisin River and Hoople Creek.
- Conducted shoreline boat and beach seining along Lake St. Francis for the Lake St. Francis Fish Habitat Plan.
- Conducted and analyzed data from a stream assessment project of Hoople, Hoasic and Sutherland Creeks (OSAP protocol).
- Conducted boat electrofishing along the shoreline of Lake St. Francis and Raisin River, Cornwall ON with the RRCA.
- Designed, collected and analyzed the results for benthic macroinvetebrate community surveys on several watercourses within Ontario including: South River (Village of South River), tributary to the Beaudette River (Alexandria), Hoasic and Hoople Creeks (Morrisburgh), Sutherland Creek and Raisin River (Cornwall), Jock River (Ottawa) and a tributary to Feedmill Creek (Ottawa).
- Collected information on aquatic habitat, including inventory of fish communities and spawning survey to support proposed water taking from the Tay River (backpack shocking).
- Conducted boat electrofishing along the shoreline of Raisin River, Cornwall ON.
- Lake St. Francis (Cornwall, ON) and on the Cataraqui River (Kingston, ON).
- Developed and conducted fish habitat and community study on the Lower Raisin River (backpack shocking, seine netting, boat eletrofishing multi-season).
- Developed, organized and conducted marine field work, gathered environmental information, located contacts and assisted in writing the draft report for the Strait of Georgia Pipeline Crossing.
- Developed and conducted a fish survey on West Nose Creek, Alberta.
- Assisted in a fry monitoring project at the NOVA pump house on Red Deer River, Alberta. Responsibilities included setting and monitoring fry traps, and data collection.
- Conducted FRBC stream inventorying for Lakeland Mills, British-Columbia.
- Project Director: Realized, developed and presented a population study on the host sea anemones and anemonefishes in Sulawesi, Indonesia in cooperation with McGill University, Ecosurveys Ltd (UK) and Newman Biomarine Pte Ltd (Singapore). The study involved coral habitat mapping and fish surveys.

Environmental and Fisheries Inspections
- Completed inspections during construction and fish salvage on Meade Creek at HWY 7, near Peterborough, ON.
- Designed fish salvage operations for a small hydro facility in Ontario.
- Clarkson's wastewater tunnel inspection design and quality control
- Burloak water purification tunnel blasting fish kill monitoring design and implementation
- Burloak water purification tunnel suspended sediments inspection design and implementation

- Provided environmental and fisheries inspections for the construction of the Poole Creek Re-alignment/Huntmar Drive Crossing.
- Conducted fish removal for MTO project on HWY 125.
- Provided fish removal services on the Trans-Northern Pipeline near Cornwall
- Provided fish removal services for a culvert replacement on Green's Creek near Maynooth, ON.
- Provide environmental and fisheries inspections for MTO projects in Napanee and Vankleek Hill, Lancaster and Ottawa Ontario.
- Conducted Environmental inspection of the dewatering process for the Elbow Valley Residential sanitary sewer system, Calgary Alberta.

Species at Risk Inventories

- Completed SAR assessment for the Colborne Effluent forcemain.
- Completed Protection of SAR assessment for MTO Contract 2010-4028 near Perth, ON.
- Completed butternut assessments in Port Hope, Prescott, and Martintown for proposed solar farms.
- Completed butternut assessments for a proposed sand pit expansion near Bourget, ON.
- Completed butternut assessment for proposed quarry near Moose Creek, ON.
- Completed SAR habitat assessment and search for butternut and American ginseng inventories along Thorps-Ellis Drain, S, D & G
- Completed SAR habitat assessment for proposed WPCP expansion in Greater Napanee, ON.
- Completed butternut assessment on butternuts located on a proposed property to be subdivided in Stittsville.
- Completed butternut inventory for the proposed Clear Point Hydroelectric facility, Renfrew, ON.
- Completed visual surveys for turtle species at risk along the Bonnechere River, Renfrew, ON.
- Completed visual survey for Eastern musk turtle near Kemptville, ON

Other

- Currently co-authoring the Walleye Management Plan for Lake St. Francis with the Raisin Region Conservation Authority and OMNR.
- Assisted in the peer review of the Talston Hydroelectric project, NWT Canada.
- Presented a talk on monitoring walleye larvae and BMPs at the IAGLR Conference, May 2006.
- Presented *How to Develop a Monitoring Program for BMPs* at the Great Lakes Sustainability Non Point Source Symposium, March 2006
- Co-authored Lake St. Francis Fish Habitat Plan for Raisin Region Conservation Authority.
- Coordinated the 2003 Strategic Habitat Restoration Working Group workshop for the Raisin Region Conservation Authority.
- Co-authored a paper on the Effects of Marine Pipelines on the Benthic Environment, presented at the 7th International Symposium on Environmental Concerns in Right-of-Way Management.
- Created and conducted environmental education programs in French for children and the general public.

SHAUN M. ST.PIERRE, B.Sc.

EDUCATION
B.Sc. Biology, Trent University 2007
Fisheries and Wildlife Technology, Frost Campus, Sir Sandford Fleming College, 2005
Fisheries and Wildlife Technician, Frost Campus, Sir Sandford Fleming College, 2004

LANGUAGES
Fluent in French and English

POSITIONS HELD

2006-:	Bowfin Environmental Consulting Inc., Field Assistant/Environmental Site Inspector
2005:	St. Lawrence River Institute of Environmental Sciences, Field Research Assistant
2004:	MNR Kawartha Lakes, Field Research Assistant
2003:	DFO- Experimental Lake Area, Field Research Assistant
2001:	Resource Stewardship S, D &G, Stewardship Ranger

CERTIFICATIONS
Ontario Benthos Biomonitoring Network, Ontario Stream Assessment Protocol, Butternut Health Assessor, Class 2 Electroshocking, first aid, CPR, Pleasure Craft Operator Card, Marine Radio Operator, WHMIS, All Terrain Vehicle Riders Course (issued by the Manitoba Safety Council), Water Safety Training (Bronze Cross), Ontario Trapping Course and Snowmobile Licenses.

EXPERIENCE
Experience assisting in environmental monitoring, environmental assessments, terrestrial habitat assessment, freshwater habitat assessment, fish behavioral studies, winter bat hibernaculum inventories and fisheries inventories including habitat mapping, electroshocking, FWIN and RIN. Other experience include GIS.

Aquatic Inventories
- Assisted with boat electrofishing along the shoreline of the Cataraqui River (Kingston, ON), South Nation River (Casselman, ON), Raisin River (Lancaster, ON), and Lake St.Francis (South Lancaster, ON).
- Assisted in collecting and data entry for benthic macroinvetebrate community surveys on several watercourses within Ontario including: Bonnechere River (Renfrew, ON), tributaries of the Bonnechere River (Renfrew, ON), the Jock River (Ottawa, ON) and tributary to the Beaudette River (Alexandria, ON).
- Assisted in collecting and data entry for several fish community surveys using backpack electrofisher including: Bonnechere River (Renfrew and Douglas, ON), tributaries of the Bonnechere River (Renfrew, ON), tributary to the Beaudette River (Alexandria, ON), tributaries to the South Nation River (Jessup Falls, ON), Butler's Creek (Brockville, ON), Black Creek (Westminster, ON) and Lac Opemisca (Ouje-Bougoumou, QC).
- Mapped fish habitat in many watercourses including: tributaries to the South Nation River (Jessup Falls, ON), Butler's Creek (Brockville, ON), Black Creek (Westminster, ON).

- Assisted in YOY sampling on the Raisin River (Lancaster, ON).
- Assisted in conducting riverine index netting on the Bonnechere River (Renfrew, ON).
- Assisted in conducting larvae surveys on Hoople Creek, Raisin River and the Bonnechere River.
- Assisted in collecting walleye eggs from the spawning grounds on the Raisin River and Hoople Creek.
- Assisted in the monitoring of a new wetland channel created in the Little Cataraqui River.
- Marsh monitoring program breeding amphibian survey at Hoople Creek and the Bonnechere River.
- Assisted in conducting fall walleye index netting for the MNR in Kawartha Lakes

Species at Risk Inventories

- Butternut survey and assessment for proposed development (Brockville, ON).
- Butternut survey and assessment for proposed development (South Lancaster, ON).
- Butternut survey and assessment for quarry expansion (Moosecreek, ON).
- Butternut survey and assessment for quarry expansion (Westminster, ON).
- Butternut survey along the Bonnechere River near Renfrew Ontario.
- American Eel survey on the South Nation River (Casselman, ON)
- American Ginseng survey for proposed development (South Lancaster, ON).
- American Ginseng survey along the Bonnechere River near Renfrew Ontario.

Terrestrial Inventories

- Plant community inventories for proposed development (Ouje-Bougoumou, QC)
- Plant community inventories for proposed development (Brockville, ON)
- Plant community inventories for proposed development (Hamilton, ON)
- Plant community inventories for proposed development (Simcoe, ON)
- Plant community inventories for proposed development (South Lancaster, ON).
- Plant community inventories for quarry expansion (Moosecreek, ON).
- Plant community inventories for quarry expansion (Westminster, ON).
- Plant community inventories along the Bonnechere River (Renfrew)
- Plant community inventories for the Caron street extension (Rockland)

Environmental and Fisheries Inspections

- Conducted environmental inspections for the construction of the Clarkson WWTP outfall, Lake Ontario.
- Assisted in providing environmental and fisheries inspections for the blasting and drilling operation for the Burloak Water Purification Tunnel project (Burlington, ON).
- Assisted in providing environmental and fisheries inspections for the construction of the Poole Creek Re-alignment/Huntmar Drive Crossing.

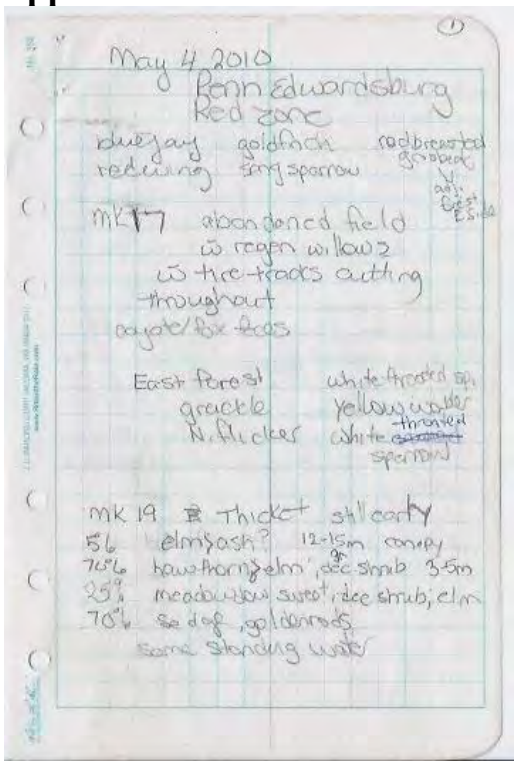
Aquatic Habitat Mapping for Municipal, City Roads and Provincial Highways

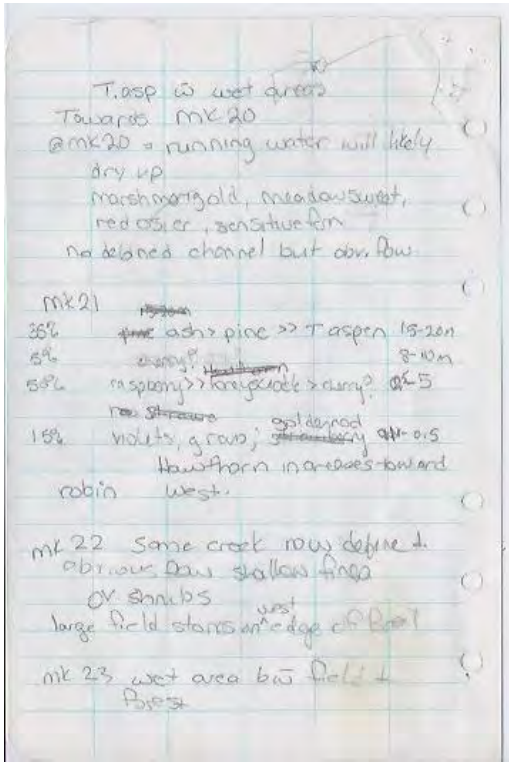
- Conducted MTO habitat assessments at Prince of Wales, Fernbank road, Fallowfield road, HWY 115, Arbuckle drain, the Carp river, tributaries to the Carp river and tributaries to Mud creek.

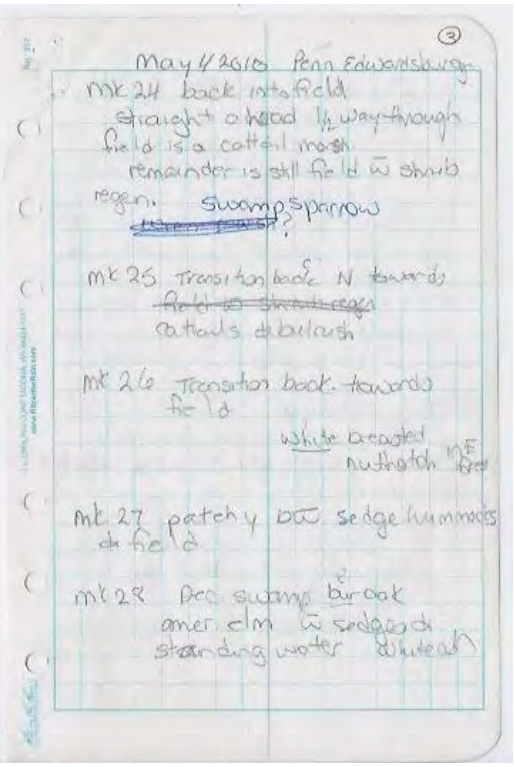
Other

- Assisted in conducting a winter bat hibernaculum inventory (Plantagenet)
- Field research assistant for the Metalicuus study and EDC study (Experimental Lakes Area)
- Captured, pit tagged and tracked Northern Pike (Experimental Lakes Area)
- Construction and maintenance of nature trail (the Cornwall Outdoor Recreational Area)
- Conducted frog deformities surveys (Glengarry)

Appendix I – Field Notes







mk 29 ROW for HTO, pipeline?
deer tracks

mk 31 stickleback & NRB? stuck
in road rut,
flow from wetland flowing under
dirt road into cattail into ditch

mk 32 ~~Treed~~ thicket swamp mostly standing
dead w ash regen
spring peepers & redwings

mk 33 mallards
old tracks water breached
across road; gravel & sand for road
~~tree~~ swallows

mk 34 old ditch intermittent already
Painted turtle East wetland
Treed swamp
frog - see pictures

may 4 2010
Penn Edwardsburgh
mk 35 still ditch along road
heading back towards field
(E → W)

mk 36 ditch ~~NNF~~ NNF almost
defined ~~path~~ channel

flicker

mk 37 20-25m depression
35% ash >> T aspen
40% Elm >> ash > red maple 8-12m
10% ~~dogwood~~ meadowsweet > elm > raspberry 1-2m
50% sensitive fern >> goldenrod, fern wood?
standing water
swamp?
hairy?

mk 38
25% T aspen > ~~ash~~ 15-20
40% ash >> silver maple 8-12 m
50% hawthorn: ash, viburnum?
55% grass >> sens. fve fern > bedstraw
cherry tree

mk 39 back into field
mk 40 CN Tracks

GREEN ZONE

mk 41 Treed swamp w frogs
ash

mk 42 thicket dogwood?
deciduous 90% 2-3m
hawthorn
grass >> goldenrod
ruby? bright (30 tape)

PurPLE?
mk 43 top of hill ~~rock~~ old rock wall

35% ironwood >> sugar maple 12-15m
50% hawthorne > honeysuckle > ironwood 3-5m
40% dec shrubs w for brecks >> buckthorn > ash 0.5-1
35% trout lily ~~[illegible]~~ aster, yellow violets
trillium white & purple

old tree stand

Penn Edwardsburgh May 4 2010 Too early to trust %

mk 44 2 ditch on each side of road
~~[illegible]~~ w standing water
both sides

mk 45
15-20m
40% ash > T aspen = elm?
35% ash nannyberry 8-10m
25% cherry? buckthorn elm 1-2m
50% w. grass, grass, moss, sedges
depressions already dry

Sandy hump mk 46 w
depression on N side = standing
water

mk 47
40% iron. p. birch elm ash 12-15m
5-15% elm ash 8-10
~~50~~ hawthorn oak 1-5m
50-60 grey dogwood?
50% violet aster
areas w thick sensitive fern

mk50 dn slope to swamp
elm oak 25-25
red maple
50% red maple ash 10-15
30 ironwood; gr. dogwood 1-4
40% Y. avens; sens. fern, fern [illegible]

mk 51
Treed swamp ash.

crows

mk 53 wet area, water mostly
dry ash
good amount of deadfall

mk 54 Hawthorne thicket
honeysuckle
cherry

May 4 2010
Penn - Edwardsburgh
9

bedrock outcrop mk56 West
Side of tracks

mk 57 abandoned field
w hawthorns scattered
close to 60%

mk 58 bedrock outcropping
South; < 60% shrub?
N = 60%?

mk 59 "Treed" white ash 2-3m tall
meadowsweet [illegible]
0.5-1m
willows
mk60 purple loosestrife
willows & red osier

mk61 ditch, almost dry

Garbage piles, paint cans

MK62 culvert nothing u/s
d/s water
intermittent NNF

mk65
40% W. birch [illegible] 8-15m
40% birch hawthorn 2-5
honeysuckle

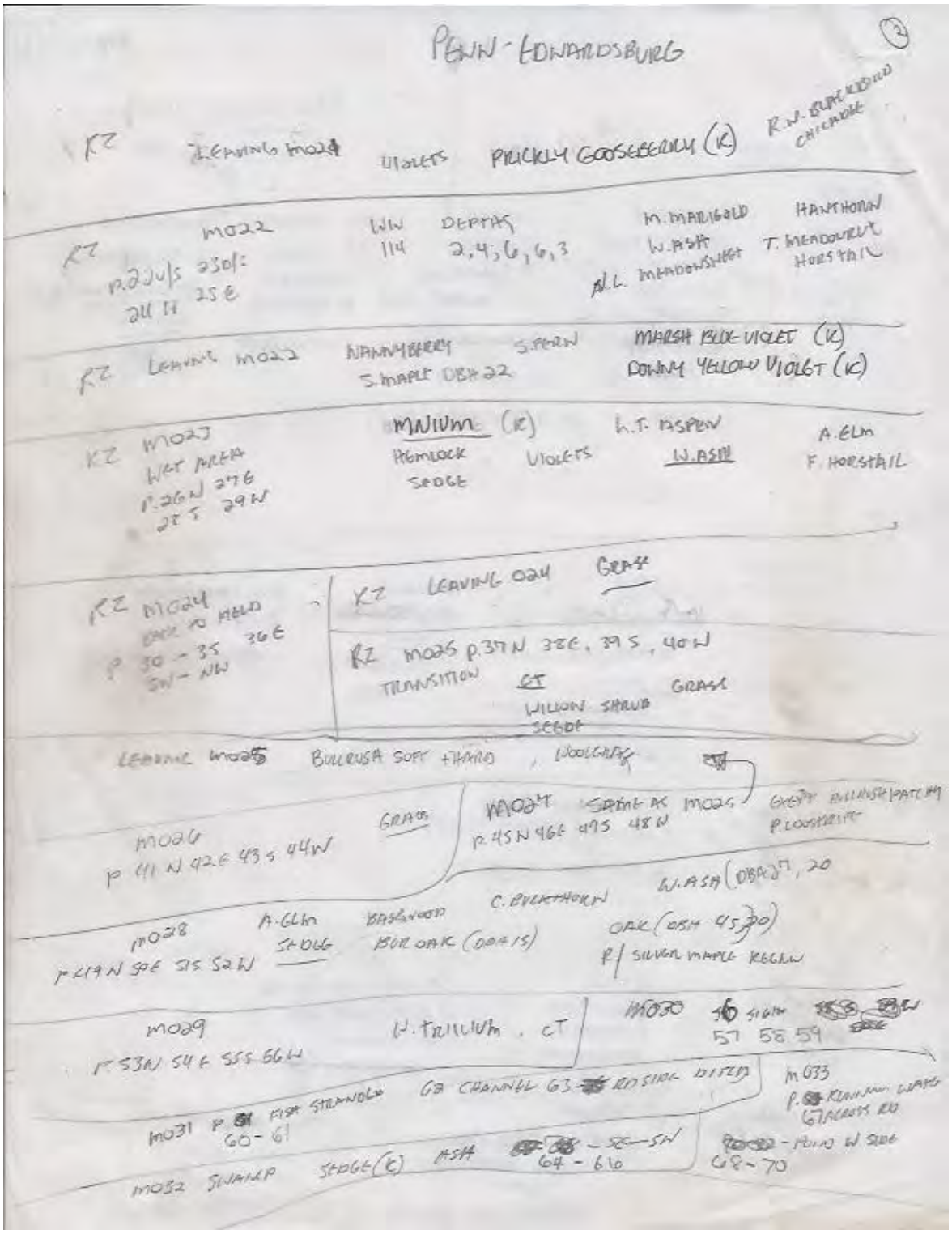
40% goldenrod, grasses, strawberry

mk 66 15m-20m
rock walls /
40% → (+ aspen) sugar maple
ash
Red raspberry
buckthorn
ironwood

40% + aspen ash 15m-20m
[illegible] ash hawthorn 10-20m
40% buckthorn, ash, raspberry 2-3m

40% sensitive fern, grass [illegible]


May 4/10 (1)
SS
PENN - EDWARDSBURGH
PACHYD SCAT
REDZONE
M017
ABD. FIELD
C. ANEMONE
WR. RASPBERRY
GRASS SP
GOLDENROD SP.
SEDGE SP. (K)
F. HORSTAIL
ASTER SP.
C. VETCH
E. MEDICK
C. DANDELION
R. CANARY GRASS
FERN SP. (K)
W. ASH REGEN
WILD CARROT
W. CLOVER
HAWTHORN
P. PARSNIP
P. LOOSESTRIFE
HAWTHORN
C. STRAWBERRY
PUSSY WILLOW (K)
GRASS SP
HEAL-ALL
SOME CT ON S.E CORNER (P.5)
REDZONE
M019
P6N
THICKET
P.10 STANDING WATER
W. ASH
N.L. MEADOWSWEET (K)
ELM
HAWTHORN
SUGAR MAPLE REGEN
R. GRAPE
GRAY DOGWOOD (K)
SEDGE
GOLDENROD
V. BOWER
RED BANEBERRY (K)
C. STRAWBERRY
MARSH BLUE VIOLET
REDZONE
TRANSITIONAL
M019 – M020
T. ASPEN (DBH 27, 28, 28)
W. ASH (DBH 24, 25, 30)
A. ELM (DBH 16,
M020
S. FERN
M. MARIGOLD
F. HORSTAIL
MEADOWRUE
T. ASPEN DBH 24, 25
A. ELM DBH 28
HAWTHORN
RASPBERRY SP.
M021
N.R. RASPBERRY
DOWNY SERVICEBERRY
TALLTARIAN HONEYSUCKLE
N. GRAPE
W. ASH DBH 26, 30, 12
W. PINE DBH 60, 45
SMOOTH
DOGWOOD
HAWTHORN
T. ASPEN DBH 32


PENN - EDWARDSBURG
KZ
LEAVING M029
VIOLETS
PRICKLY GOOSEBERRY (K)
M022
DEPTHS
2,4,6,6,3
M. MARIGOLD
W. ASH
T. MEADOWRUE
HORSETAIL
KZ LEAVING M022
NANNYBERRY
S. MAPLE DBH 22
S. FERN
MARSH BLUE-VIOLET (K)
DOWNY YELLOW VIOLET (K)
KZ M023
WET AREA
MNIUM (K)
HEMLOCK
SEDGE
VIOLETS
W.T. ASPEN
W. ASH
A. ELM
F. HORSTAIL
KZ M024
KZ LEAVING 024
GRASS
KZ M025 P.37N 38E, 39S, 40W
TRANSITION
CT
WILLOW SHRUB
SEDGE
GRASS
LEAVING M025
BULRUSH SOFT STEMMED
M026
GRASS
M027
SPRING AT M026
M028
A. ELM
SEDGE
BASSWOOD
BUR OAK (DBH 15)
C. BUCKTHORN
W. ASH (DBH 17, 20
OAK (DBH 45, 70)
R/ SILVER MAPLE REGEN
M029
W. TRILLIUM, CT
M030
M031
M032 SEDGE (K) ASH
M033

PENN-EDWARDSBURG MAY 4/10 (3)

m034 RD DITCH P.71 S 72 N WN 113 DEPTHS 3,4,8,4,5 S. PEEPER PAINTED TURTLE ~~BULLFROG~~

P.73-74 GREEN FROG

KZ

LEAVING 034 FROGS BITE L. DUCKWEED CHOKECHERRY (K)

KZ W. BIRCH C. ANEMONE W + R. TRILLIUM

RED BANEBERRY P.75-76

KZ m035 P. 77 S, 78 N

KZ LEAVING 035 SILVER MAPLE, S. JEWELWEED

m036 P. 79 S 80 S IRONWOOD WN 166 DEPTH 6,8,12,8,5

KZ JACK N PULPIT R MAPLE M. MAPLE

m037 P. 81 S 82 W, 83 S, 84 E W. ASH DBH 20, 27 ELM DBH 5 R. MAPLE DBH 42 T. ASPEN 26 DBH IRONWOOD MEADOWSWEET BLUEBERRY SP. GOLDENROD FERN SP. (K) S. FERN WHITE AVENS (K)

KZ

~~LEAVING m037~~ m038 P. 85 N 86 W 87 S 88 E W. AVENS R. MAPLE T. ASPEN SILVER MAPLE W. TRILLIUM JACK N PULPIT HAWTHORN T. LILY

BLACK CHERRY - P. 89 → BURNT CORN FLAKE BARK

KZ

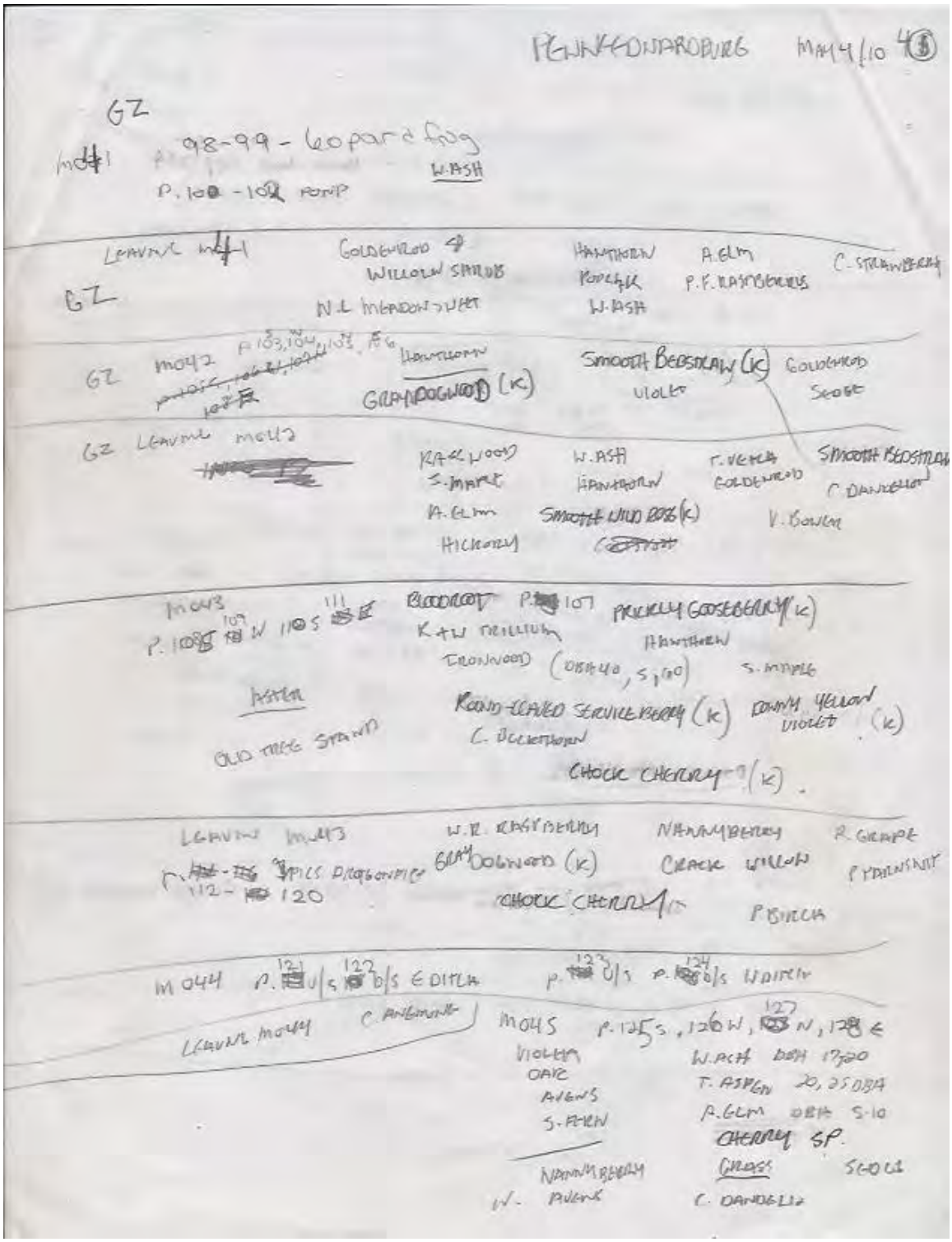
LEAVING 38 B. ASH MAY-APPLE (P. 90-91) CHOKE CHERRY (K)

KZ

m039 P. 92 S, 93 N, 94 E, 95 N

KZ

KZ m040 P. 96 W P. 97 E TRAIN TRACK DITCH


EDWARDSBURGH MAY 4/10
GZ
mo#1
98-99 - leopard frog
W.ASH
P. 100 - 102 PUMP
LEAVING mo#1
GZ
GOLDENROD
WILLOW SHRUB
N.L. MEADOW-WET
HAWTHORN
POPLAR
W.ASH
A.ELM
P.F. RASPBERRIES
C. STRAWBERRY
GZ
mo#2
P. 103, 104, 105, 106
HAWTHORN
GRAY DOGWOOD (K)
SMOOTH BEDSTRAW (K)
VIOLET
GOLDENROD
SEDGE
GZ LEAVING mo#2
RASPBERRY
S. MAPLE
A. ELM
HICKORY
W.ASH
HAWTHORN
SMOOTH WILD ROSE (K)
T. VETCH
GOLDENROD
SMOOTH BEDSTRAW
C. DANDELION
V. BOWER
mo#3
P. 108 109 W 110 S 111 E
BLOODROOT P. 107
PRICKLY GOOSEBERRY (K)
K+W TRILLIUM
IRONWOOD (OBH 40, S, 120)
HAWTHORN
S. MAPLE
WATER
OLD MEC STAND
RAISED-LEAVED SERVICEBERRY (K)
C. DOGWOOD
COMMON YELLOW VIOLET (K)
CHOKE CHERRY (K)
LEAVING mo#3
P. 112 - 120 SPICE DISCONTINUE
W.R. RASPBERRY
GRAY DOGWOOD (K)
CHOKE CHERRY
NANNYBERRY
CRACK WILLOW
R. GRAPE
P. BIRCH
mo#4
P. 121 O/S 122 O/S EDITH
P. 123 O/S P. 124 O/S WDITCH
LEAVING mo#4
C. ANEMONE
mo#5
P. 125 S, 126 W, 127 N, 128 E
VIOLET
OAK
AVENS
S. FERN
W.ASH DBH 17,20
T. ASPEN 20, 25 DBH
A. ELM DBH 5-10
CHERRY SP.
GRASS
SEDGE
NANNYBERRY
W. AVENS
C. DANDELION

PENN - EDWARDSBURG MAY 4/10 (5)

PAIR MALLARDS

MO46 P. 129 - 130 HUMP (SAND)

PZ MO47 OAKS W. ASH DBH 25 VIOLET SP ASTER
P. 131 S 132 W 133 N 134 E IRONWOOD 20 DBH HAWTHORN RIBES SP
W. BIRCH DBH 24 GRAY DOGWOOD AVENS SP
R. MAPLE REGEN S. FERN T. HONEYSUCKLE

MO48 DITCH P. 135 U/S 136 D/S RAIL DITCH
MO49 DITCH P. 137 U/S 138 D/S " "

LEAVING 049 S. JEWELWEED, G. DOGWOOD, BARBERRY JACK N PULPIT
TALL WHITE LETTUCE (P. 139, 140, 141) S. FERN W. AVENS

MO50 (W) OAK DBH 50, 40, A. ELM
P. 142 S 143 W 144 N 145 E R. MAPLE DBH 28 NANNYBERRY
W. ASH DOWNY YELLOW VIOLET W. AVENS
S. FERN HAWTHORN IRONWOOD
F. SOLOMON SEAL G. DOGWOOD TRILLIUM

MO51 SWAMP LANDBANK SHOLE S. FERN
146, 147, 148 S. JEWELWEED G. DOGWOOD
W. AVENS

M 052 P. 149 U/S 150 D/S DITCH

LEAVING 052 K. OAK | MO53 P. 151 - 155

MO54 P. 156 N, 157 E, 158 S, 159 W HAWTHORN T. HONEYSUCKLE
CHOKECHERRY
GOLDENRODS

MO55 P. 160 U/S 161 D/S
MO56 BEDROCK P. 162

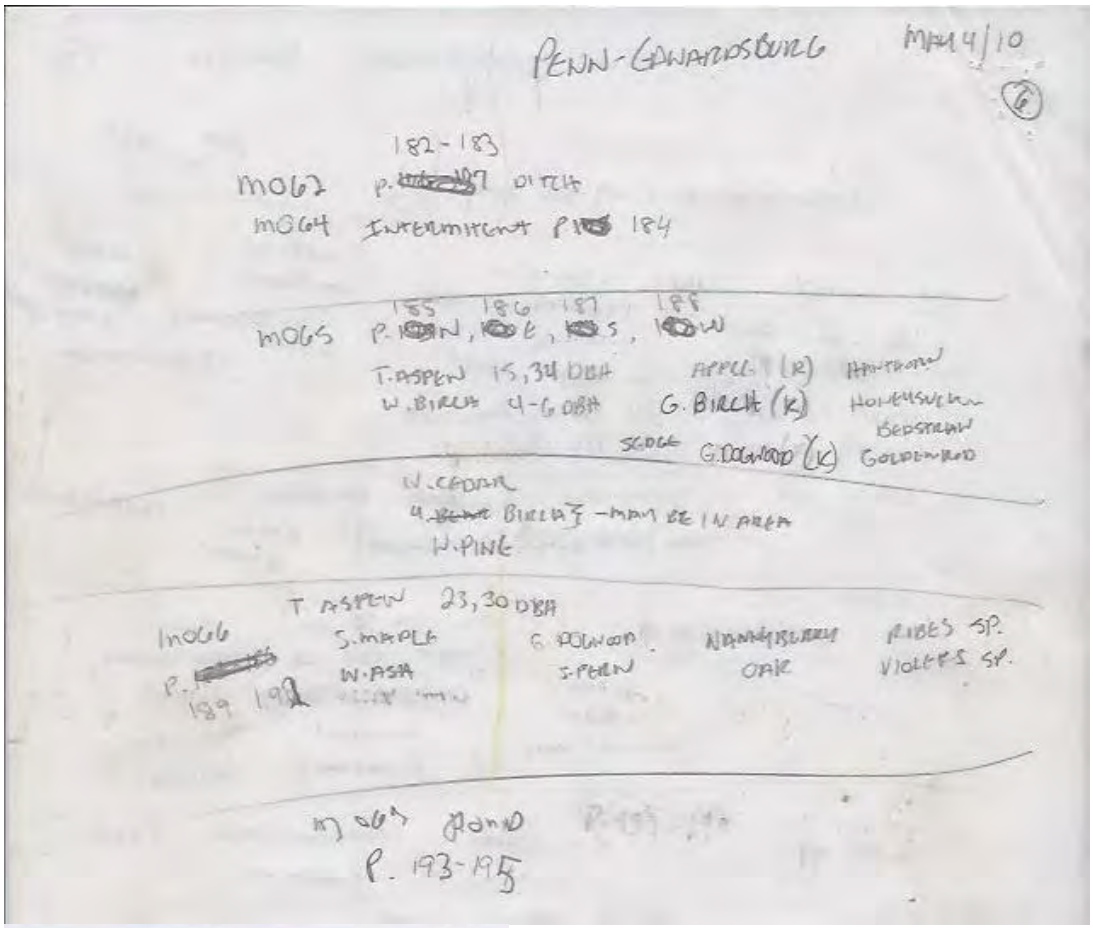
MO57 P. 163 N 164 E 165 S 166 W
HAWTHORN, GRASS, GOLDENROD, P. PARSNIP
SMOOTH BEDSTRAW

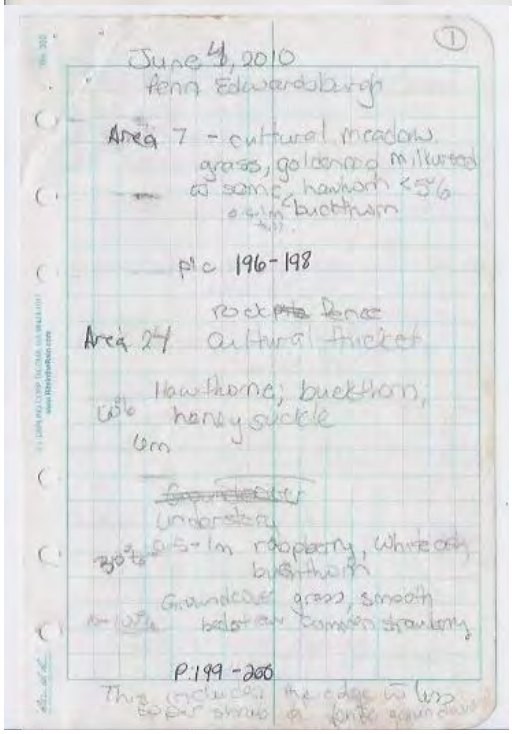
MO58 P. 167-170 P. 175 N ASH

MO59 P. 171 - 174 GRASS W. ASH MEADOW SWEET BEDSTRAW
HAWTHORN
GOLDENROD
CURRY 1-3cm

MO60 P. 176 - 179
CLOUDBERRY
WILLOW

MO61 DITCH P. 180-181


PENN-EDWARDSBURG
MM 4/10
182-183
MO62
DITCH
MO64
INTERMITTENT
184
MO65
185
186
187
188
T.ASPEN 15,34 DBH
W.BIRCH 4-6 DBH
APPLE (R)
G. BIRCH (K)
HAWTHORN
HONEYSUCKLE
BEDSTRAW
GOLDENROD
SCRUB
G.DOGWOOD (K)
W.CEDAR
W.PINE
T ASPEN 23,30 DBH
MO66
S.MAPLE
W.ASH
G.DOGWOOD
S.PERN
BLACK RASPBERRY
OAK
RIBES SP.
VIOLETS SP.
189
MO67 POND
P. 193-195


June 4, 2010
Penn Edwardsburgh
Area 7 - cultural meadow
grass, goldenrod milkweed
a some hawthorn <5%
buckthorn
pic 196-198
Area 24 cultural thicket
Hawthorne, buckthorn,
honeysuckle
Understory
Groundcover grass, smooth
P:199-200

Area 12
Ts thicket
meadowsweet, Salix
Tsdr Ls
purple loosestrife
white ash 3-4m <10%
awl-fruited sedges, bedstraw
moss
p236 + 237 blueflag
hummocky some surface in
bottom; lots of rain last few
days

area 4
cult. meadow
grass >> golden >> milkweed
100% = bedstraw
surrounded by hawthorn
& old fence rows lilacs
p238 + 239

bedrock at surface

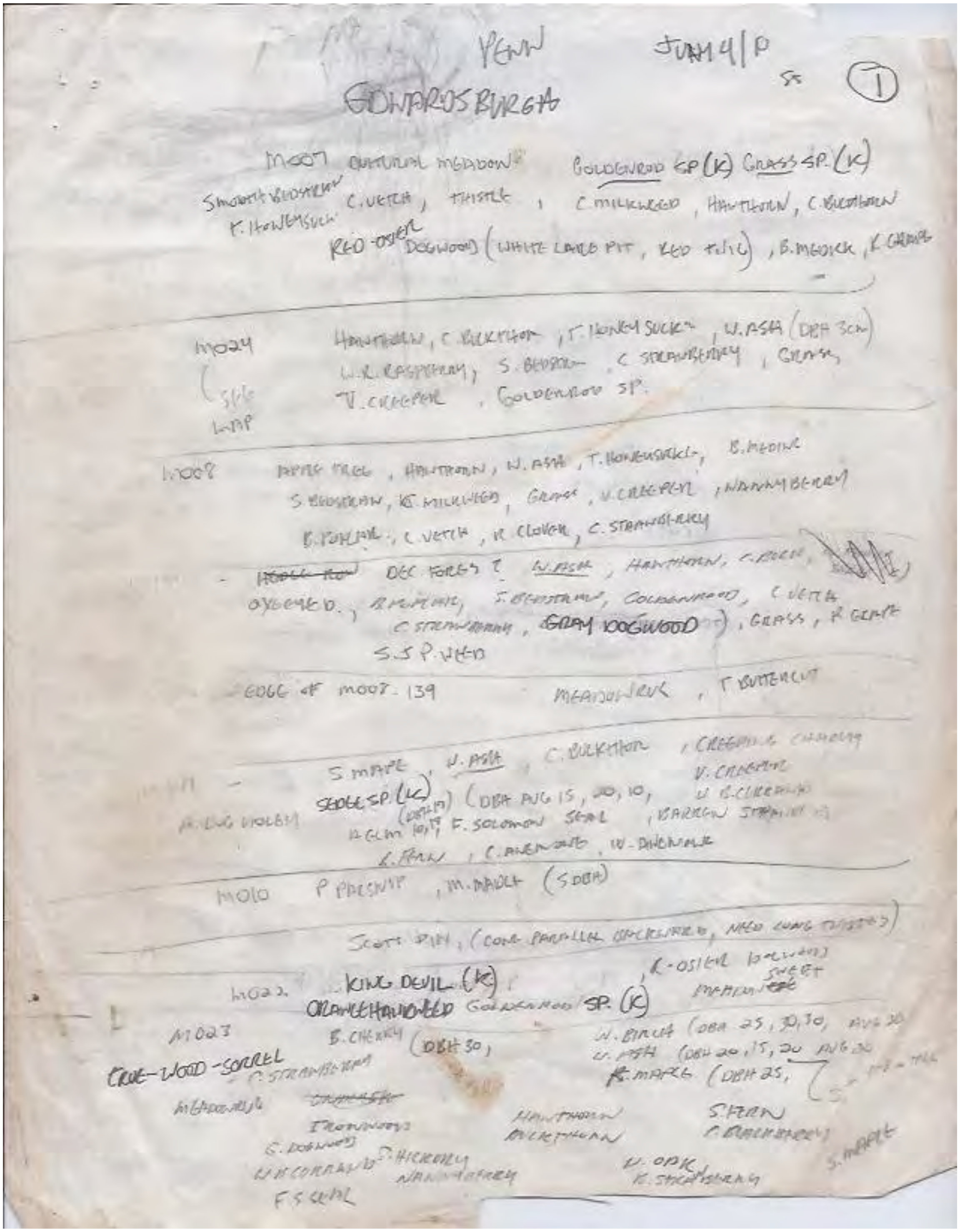
June 4 2010 Penn edwards (11)
Area 1 Still cultural meadow
w/ pockets of trees/shrub
windrows

grouse p240 + 241
redwing
swamp sparrow
cedar waxwing

mk161 p242-243
244 + 245 N + S
meadow thicket
cattail willow inclusion
standing water
purple loosestrife
awl fruited sedge
mineral marsh?
10% shrub
red osier meadowsweet
gray dogwood

mk162 south edge of ash
thicket to meadowsweet
P246-247 & goldenrod

mk163
p248-252 looking South
S, S, W, N



PENN JUN 4 | P

EDWARDSBURGH ①

M007 CULTURAL MEADOW GOLDENROD SP (K) GRASS SP. (K)
SMOOTH BROME C. VETCH, THISTLE, C. MILKWEED, HAWTHORN, C. BUCKTHORN
T. HONEYSUCKLE
RED-OSIER DOGWOOD (WHITE LAND PIT, RED TAIL), B. MEDICK, R. GRAPE

M024 HAWTHORN, C. BUCKTHORN, T. HONEYSUCKLE, W. ASH (DBH 3cm)
W.R. RASPBERRY, S. BROME, C. STRAWBERRY, GRASS,
V. CREEPER, GOLDENROD SP.
(SEE MAP)

M008 APPLE TREE, HAWTHORN, W. ASH, T. HONEYSUCKLE, B. MEDICK
S. BROME, C. MILKWEED, GRASS, V. CREEPER, NANNYBERRY
B. POPLAR, C. VETCH, R. CLOVER, C. STRAWBERRY

DEC FOREST W. ASH, HAWTHORN, C. BUCK...
OXEYE D., R. MAPLE, S. BROME, COTTONWOOD, C. VETCH
C. STRAWBERRY, GRAY DOGWOOD), GRASS, R. GRAPE
S.J.P. WEED

EDGE OF M007. 139 MEADOWRUE, T. BUTTERCUP

S. MAPLE, W. ASH, C. BUCKTHORN, CREEPING CHARLIE
SEDGE SP. (K) (DBH 17) (DBH AVG 15, 20, 10, V. CREEPER
A. ELM (DBH 10, 17) F. SOLOMON SEAL, B. CREEPER, BARREN STRAWBERRY
L. FERN, C. AVENS, W. ...

M010 P. PARSNIP, M. MAPLE (5 DBH)

SCOTS PINE, (CONE PARALLEL BUCKTHORN, MED LONG TWIGS)

M022 KING DEVIL (K), R-OSIER DOGWOOD
ORANGE HAWKWEED GOLDENROD SP. (K) SWEET MEADOWRUE
M023 B. CHERRY (DBH 30), W. BIRCH (DBH 25, 30, 30, AVG 30)
CREE-WOOD-SORREL W. ASH (DBH 20, 15, 20 AVG 20)
C. STRAWBERRY R. MAPLE (DBH 25,
MEADOWRUE
IRONWOOD HAWTHORN S. FERN
G. DOGWOOD BUCKTHORN C. BLACKBERRY
W. CORRAND? HICKORY NANNYBERRY W. OAK S. MAPLE
F. S. SEAL R. STRAWBERRY

PENN - EDWARDSBURGH
JUNE 4/10 SS
(2)

M142 - SAME FOREST AS M023
R SQUIRREL
BLOODROOT, ROSE SP
W. PINE, J. BARBERRY (K)
MOUNTAIN ASH (K) - WARTY BARK } ALT

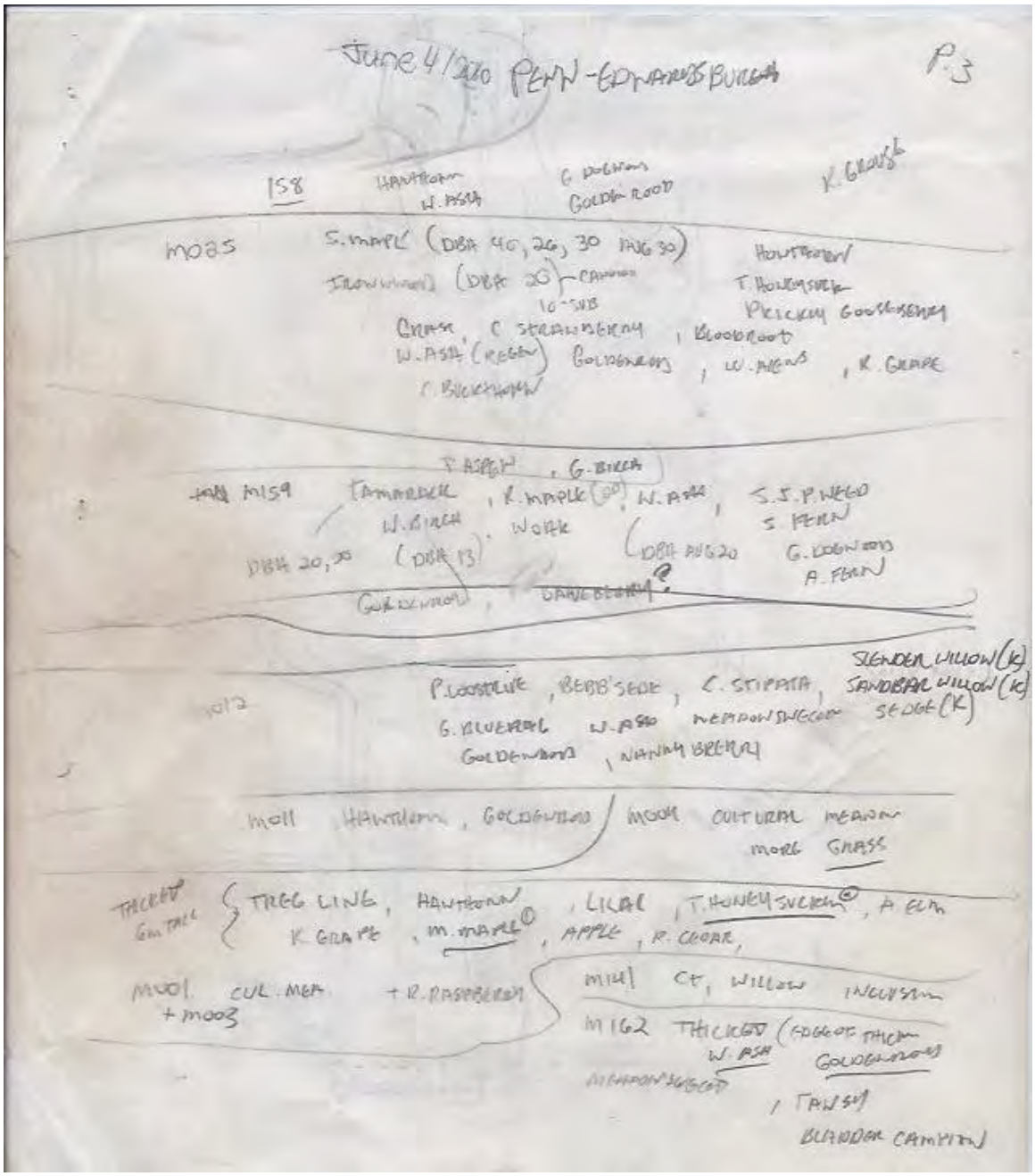
M146 AREA 26 -
S. FERN
G. DOGWOOD
C. BUCKTHORN
C. ARROWWOOD
C. STRAWBERRY
GOLDENROD
V. BURDEN
R. GRAPE
W. ASH (DBH 10, 10, 10, 22 AUG 10)
W. OAK (DBH AUG 5) ←-
A ELM "
W. OAK
NANNYBERRY, MEADOWSWEET
SEDGE (K)
BUR OAK

M027
OSTRICH FERN
S. BRACKEN
W. ASH (AUG 20 / DBH 30)
W.B. CHOKECHERRY
W.B. CURRANT
R GOLDENROD
IRONWOOD
T. ASPEN (32, AUG 30)
J IN PULPIT
W OAK
A ELM
W.R RASPBERRY
S. HICKORY
T. HONEYSUCKLE
V. CREEPER
R GRAPE
S. ARROWWOOD
C STRAWBERRY
SEDGE
S. J. WEED
ADVENTITIOUS
C.L. WATER HORE
S. FERN
BUCKTHORN

M151 SUR PIT

HERBACEOUS CARRION FLOWER p. 225-228

SILVERWEED
C STINKWEED
WOOLGRASS
G. BIRCH
M157
SEDGE GRASS
S. DOGWOOD
W. ASH (DBH 30, 30, 10 AUG 25)
A ELM, R POPLAR, R OAK
R. GRAPE
V CREEPER, C BUCKTHORN


June 4/2010 PENN - EDWARDSBURGH
P.3
158
HAWTHORN
W. ASH
G. DOGWOOD
GOLDEN ROD
K. GRASS
MOBS
S. MAPLE (DBH 40, 26, 30 AVG 30)
IRONWOOD (DBH 20)
HAWTHORN
T. HONEYSUCKLE
PRICKLY GOOSEBERRY
GRASS, C. STRAWBERRY, BLOODROOT
W. ASH (REGEN)
GOLDENROD, W. ASTERS, R. GRAPE
C. BUCKTHORN
T. ASPEN, G. BIRCH
M159
TAMARACK, R. MAPLE (20), W. ASH, S.J.P. WEED
W. BIRCH (DBH 13), WORK
S. FERN
DBH 20, 20
(DBH AVG 20)
G. DOGWOOD
A. FERN
GOLDENROD, DANDELION?
SLENDER WILLOW (K)
SANDBAR WILLOW (K)
P. LOOSESTRIFE, BEBB'S SEDGE, C. STIPATA, SEDGE (K)
G. BLUEBERRY, W. ASH
MEADOWSWEET
GOLDENROD, NANNY BERRY
M011
HAWTHORN, GOLDENROD
M004 CULTURAL MEADOW
MORE GRASS
THICKET
GRASS
TREE LINE, HAWTHORN, LILAC, T. HONEYSUCKLE, A. ELM
K. GRAPE, M. MAPLE, APPLE, R. CEDAR,
M001 CUL. MEA + MOOS
+ R. RASPBERRY
M141 CT, WILLOW INCLUSION
M162 THICKET (EDGE OF THICK
W. ASH
GOLDENROD
MEADOWSWEET
TANSY
BLADDER CAMPION

(1)
Penn edwardsburgh
June 8, 2010

near 11 – ditch N–S, dry, intermittent channel
p.253-255 → MK 139

Area 11 → planted? white ash or field regenerating

10m 2% — white ash

4-8m 10% — white ash >> a. elm > grey birch

2-3m 40% — white ash >> willow > gray birch = b. poplar

0.5-1.5m 10% — white ash >> grey dogwood > red osier > meadowsweet

ground — grass/sedge > goldenrod, silverweed = virgin bower

p. 256-258

(2)
PENN – EDWARDSBURGH JUNE 8/10

mk 20
12m 70% — white ash > m. maple > A. elm

4-8m 30% — white ash = buckthorn

0.5-2m 20% — red raspberry > honeysuckle

ground 0.1-1m
70% goldenrod, goldenrod > a. strawberry ~~virginia creeper~~ > v. creeper
p. 259-260
old dirt piles creating mounds

p. 261-262 damselfly

p. 263, 264
mk 21 cultural
5-10m tall 5% — white ash

1-4m 15% — hawthorn > white ash > ~~buckthorn~~ meadowsweet, buckthorn
average for drainage pockets

(3)
Penn edwardsburgh June 8, 2010
ground 20cm-60cm
90% grass > can. goldenrod >> milkweed

field sparrow?

old quarry
around pond] p. 265-268
no outlet low point
has ruts on bare soil

mucky? – black fine

p. 269-274 took photo of pool
mk 140

not connected

PENN EDWARDSBURGH JUNE 8/10 (4)

p. 280-282 agriculture w/ regen willows
mk 144
Bore 119cm
A 28cm stones
B 75cm > not well defined
C >119 \ maybe not hit C
no water gravel
mottling 27cm

pileated woodpeck
white ash regen > b. poplar regen
dom. woody = willow

area (swamp)
28 thicket meadowsweet
gray dogwood
Ts Ls h white ash
p 283-284

mk30 area P
12-15m T aspen > ~~b. poplar~~ = white ash > b. poplar
70%
4-6m buckthorn = A. elm > t. aspen
4%

PENN EDWARDSBURGH JUNE 8/10 (5)

0.50-2m white ash = grey dogwood
40% nannyberry
ground 75% sensitive fern, can. goldenrod,
grass

mk149 p 285-286 creek still water

MK029 p 287-288
20m white ash >> T. aspen
80%
Bog forest, band,
10m white ash > A. elm
20%
3-4m A elm
40%
0.5-2m buckthorn = nannyberry = ~~red maple~~ w. blue currant
35%
ground 95% can. goldenrod, lakebank sedge

PENN EDWARDSBURGH JUNE 8/10. (6)

p 289-296 mk 145
marsh marigold at surface water
not flowering
red maple

p 297 WHITE baneberry, 298-299 HORSE-GENTIAN

mk 30 boulders mapr?
15m sugar maple = T aspen = w. ash
60%
3-6m buckthorn > hawthorn =
40% sugar maple
0.5-2m buckthorn > sugar > nannyberry
>> basswood
ground 10% too small; strawberry, violet
jewelweed?
jack in pulpit

Penn Edwards June 8/10 (7)

mk 156
79cm core A 30
B 79
can't see water table but
see water in soil @ 79cm
mottling 34cm

mk 157 p. 300-302

mk 28 (May mk)
p 303 POISON IVY
p 304 forest
20-25m white ash red maple sugar
80%

mk 158 p. 305
25-30m (2) red oak > (1) white ash
30-40% (3) red maple
6-10m ironwood >> white ash
85%
2-4m ironwood > white ash
10%
ground ~~violets~~ jack in pulpit
~~violets~~ > sensitive fern
> violets

PENN EDWARDSBURGH JUNE 8/10 (8)

mk 159 where water now overflowing broken culvert

mk 160 p 306 – 307
cattail & purple loosestrife
marsh w/ o/w duckweed
250 stridgelee frogbit
Ash hab
meadowsweet (TS) dead white ash (TS) west side
10% tree: Some TS → Tree white ash inside

mk 161 west side
o/w, breached over pad
cattails encroaching standing
dead willow shrub (TS) + whiteash surrounding
blue flag
5% tree cover
some white ash Tree
PIC 308 – 311

Penn edwardsburgh June 8/2010 (9)

20m 20% — white ash
12m - 15m 40% — white ash > black cherry >> black ash = red maple >> silver maple
4-8m 25-30% — white ash > black ash >> a elm = red maple
0.5–1m 60% — blackberry > red raspberry > black ... — Pic 312-315
ground 25% — sensitive fern, dwarf raspberry, grass

mk 162
core 110 cm
A 20cm
B 53 cm
C 110
mottling 30cm
no water
lots cm

PENN EDWARDSBURGH JUNE 8/10 (10)

mk 86 wetland
substrate = train gravel
p. 316 - gravel
317 – 320 surrounding
leopard frog, fish hab
marsh greenfrog
broken standing dead wood duck?
nesting killdeers, tree sparrow
occasional LS willow, spotted ...
pockets of standing water

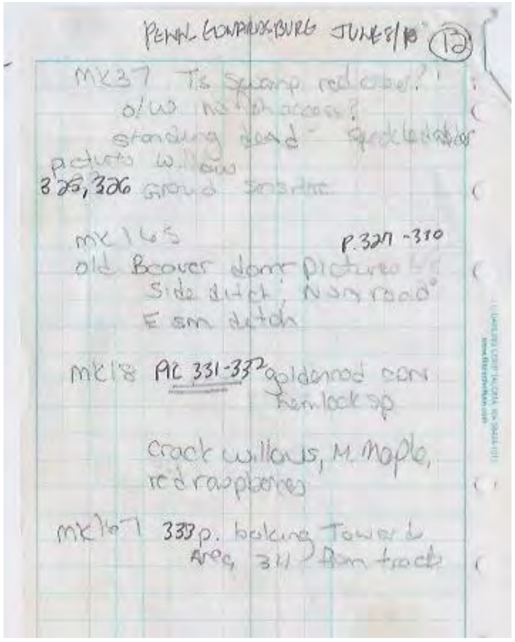
mk 163 swamp dying w. ash
a elm, bur oak quad
meadowsweet, lake bank sedge
30% Tree cover
p 321, 322

Penn Energy June 8/2010 (11)

15-18m 20% — white ash >> T aspen
3-6m 25-30 — black ash > T. aspen > a elm = white oak
0.5-2m 40% — red osier = meadowsweet > red maple > alder
ground 70% — grasses >> horsetail > goldenrod

P. 323 - 324

mk 164 Core 89cm
A 15 — mottling 19 cm
B 89 — water @ 12cm


PENN EDWARDSBURG JUNE 8/10 (12)

MK37 T's Swamp red osier?
o/w no fish access?
standing dead - speckled alder
pictures willow
325, 326 ground sedge

MK145 P.327-330
old Beaver dam pictures
Side ditch, N on road
E sm ditch

MK18 AC 331-332 goldenrod corn
hemlock sp

crack willows, M. maple,
red raspberries

MK167 333 p. looking Toward
Area, 311 from track


(M139) PENN EDWARDSBURGH JUNE 8/10 (1)

M011 W.ASH (DBH 15, GOLDENROD, V.BOWER, R.GRAPE, S.J.P.WEED, R.C.GRASS
W. ASH PENNWAY K.OSIER, MEADOWSWEET, A.ELM, C.VETCH
WILLOW SP. (K), G.DOGWOOD, GOLDENROD GREEN HERON
SHRUB SP. (K), SILVERWEED, C.STRAWBERRY
S.BEDSTRAW, OXEYE D, T.BUTTERCUP, P.LOOSESTRIFE

M020 (DEC) OSTRICH FERN W.ASH (DBH 24, 10, AVG 15, 30)
C.STRAWBERRY A.ELM (DBH 20) M.MAPLE (DBH 26
GOLDENROD V.CREEPER C.BUCKTHORN T.HONEYSUCKLE
B.STRAWBERRY T. WOOD SORREL, B.STRAWBERRY, W.R.RASPBERRY
T.BUTTERCUP P.PLANTAIN, J.BERBERRY, R.GRAPE.

M021 TRAILING CROWN VETCH
GOLDENROD S.BEDSTRAW, T.BUTTERCUP
W.ASH C.STRAWBERRY C.MILKWEED
C.VETCH A.ELM C.BUCKTHORN
SAME AS M007/OBS HAWTHORN MEADOWSWEET
ORANGE HAWKWEED GRASS
MEADOWSWEET

NEW MARK FOR TODAY START @ M139
038 DISTURBED GRAVEL

WAYSIDE POND M039 F.PENNYCRESS C.BLACKBERRY B.CAMPION
S.SUMAC T.C.VETCH W.PARSNIP
R.GRAPE SILVERWEED K-F CINQUEFOIL T.HONEYSUCKLE
W.ASH S.BEDSTRAW, W.R.RASPBERRY, R.C.GRASS W.CARROT
OXEYE M.MAPLE, V.BOWER, T.BUTTERCUP
SHRUB - HONEYSUCKLE (K) C.BUCKTHORN, B.MEDICK, P.GOOSEBERRY
S.MAPLE REGEN, V.CREEPER, BURDOCK

M031 AKI FIEL W WILLOW REGROWTH, SOME DENSE SHRUBS
SHRUB COVER 30%
SLENDER WILLOW, PUSSY WILLOW, BLADDER SEDGE (K)
W.ASH REGEN B.POPLAR S.BEDSTRAW TALL GOLDENROD (K)
DWARF RASPBERRY (K)
WOOLGRASS (K)
DUDLEY'S RUSH (K)

PENN_EDWARDSBURGH JUNE 8/10

(2)

008 THICKET
G. DOGWOOD
T. MEADOWSWEET
A. ELM
C. VETCH
C.L. WATER HOREHOUND
W. ASH
GOLDENROD
LAKEBANK SEDGE

MAY 19, 20, 21 (OLD MARKER) M030 S. SIDE DEC.
G. DOGWOOD
NANNYBERRY
P. LOOSESTRIFE
S. FERN
C BUCKTHORN
A. ELM
B. POPLAR (DBH AVG 20
T. ASPEN (DBH AVG 25
W. ASH (DBH AVG 20

DOGWOOD, C. BLACKBERRY

009 DEC
W. ASH (DBH AVG 25, 20, 07, 25)
A. ELM (DBH AVG 15)
T. ASPEN (28)
LAKEBANK SEDGE
NANNYBERRY
WOOD ANEMONE
S. MAPLE
K. MAPLE KEGG
C. BUCKTHORN
S. HICKO

WHITE BANEBERRY P297 HORSE-GENTIAN P. 298-299

M030 DEC
COHOSH (K)
SUGAR MAPLE (DBH AVG 20)
T. ASPEN (DBH AVG 30)
W. ASH
W. R. RASPBERRY
JEWELWEED
HAWTHORN
C. BUCKTHORN
NANNYBERRY
C. STAW-
J.N. PULPIT
AM. O VIOLET
W. B. CURRANT

L.T. ASPEN
POISON IVY
OLD MARKER 28 (MAY)
W. ASH
(DBH 15, AVG 15)
R. MAPLE (DBH 30)

M158
W. ASH (DBH 30, 40)
K. OAK (DBH 50, 80, AVG 50)
RED (DBH 40)
IRONWOOD
BLOODROOT
B. LETTUCE
J.N. PULPIT
S. FERN
VIOLETS

M160 SWAMP
B.L. CT
P. LOOSESTRIFE
FROGS BIRL
DICKWEED

M032 SWAMP
N. LADY FERN
STANDING WATER
M033 MAYAPPLE
W OAK (30 DBH
SILVER MAPLE (DBH 10,
R. MAPLE (DBH
SUGAR MAPLE
B. ASH (DBH 20, 30,
B. CHERRY (DBH 20, 25
S. FERN
W. ASH (DBH 40, 40,
A. ELM
W. B. CURRANT
C. BLACKBERRY
BRADON SEDGE (K)
C. ELDERBERRY (

PENN – EDWARDSBURGH JUNE 8/10
②

MO36 WETLAND B.G. BULLRUSH LAKEBANK SEDGE B.I. CT. S. ALDER S. WILLOW

MO34 SWAMP S. ALDER U.B. CORNMINT W. ASH (DBH 20, 30 AVG 20) B. ASH (DBH 5, 5 AVG 5) MEADOWSWEET W. OAK R. MAPLE GRAY DOGWOOD T. ASPEN (DBH 30) R. MAPLE HAWTHORN S. FERN S.J.P. WEED

SWAMP GRAY DOGWOOD G. BULLRUSH S. ALDER S.J.P. WEED C. WILLOW R. GRAPE NANNYBERRY S. MILKWEED (COPPED) FROG P. LOOSESTRIFE S. FERN LAKEBANK SEDGE

MO18 C. WILLOW GOLDENROD M. MAPLE HEMLOCK N.R. RASPBERRY R. GRAPE

T. ASPEN UNTIL M 166
L THEN AREA MO36
L THEN " M 034 (M167)

①
Penn Energy - edwardsburgh
June 10, 2010

east side of road, recycling plant cultural meadow + manicured grass

P 334 - 335
P 336 - west side cultural meadow

West side - bedrock outcrop
p. 337

MK 170 p 338 w/s p 339 d/s
dry drain pics substrate

p 340 - 345 west side of track
[illegible]

MK 171 P 346 - 348
4-6 m ~40% white ash, manitoba maple, A. elm
0.5-1 m 25% red raspberry
grams 80% rough goldenrod, [illegible], phlox, "[illegible]" grape vine, [illegible]


PENN_EDWARDS JUNE 11/10.
Penn Edward June 11/10
PENN EDWARDS JUNE 11/10
Penn Edward. June 11/10

JUNE 11/10

PENN EDWARDSBURG

M168 MEADOW
K.C.GRASS, C.GOLDENROD, KENTUCKY BLUEGRASS (K)
R.CINQUEFOIL, C.VETCH, W.S.CLOVER, C.MILKWEED, W.PARSNIP
GOAT'S BEARD, YARROW, R.CLOVER, B.CAMPION, B.F.TREFOIL

M171 (WOODLAND)
THIMBLEBERRY, M.MAPLE, W.R.RASPBERRY
W.ASH (DBH UNDER 5cm), A.ELM, PHLOX SP. (K)
B.JEWELWEED, GOLDENROD, W.HEMLOCK, R.GRAPE, T.HONEYSUCKLE

C. GLOSSBERRY

M013
PRICKLY GOOSEBERRY, C.GLOSSBERRY, DOGWOOD
W.R.RASPBERRY, HAWTHORN, S.JEWELWEED
W.ASH (DBH 35, AVG 20), R.GRAPE, B.CHERRY (DBH 25, 20)
M.MAPLE, G.GOLDENROD (K), RASPBERRY VINE (DWARF)
PRICKLY GOOSEBERRY (K), W.CUCUMBER

M122
V.CREEPER, BLACK LOCUST (THORNS, 2I LEAFLET K BEANS)
K.C.CINQUEFOIL, M.MAPLE, A.ELM, GOLDENROD
R.GRAPE, W.PARSNIP, W.CEDAR, OXEYE DAISY
K.C.GRASS
D.MUSTARD, IN DITCH M122, S.SUMAC
ROUND-LEAVED PYROLA

M014 (CUL MEADOW W/M.MAPLE)
C.VETCH, M.MAPLE, S.JEWELWEED, W.PRIMROSE
GOLDENROD, W.ASH, B.THISTLE
F.PENNYCRESS, S.NETTLE, W.CUCUMBER
G.MUSTARD, F.MUSTARD, R.OSIER
W. SIDE, C.S.NETTLE, GLOSSBERRY, S.JEWELWEED, HAWTHORNS
P.GOOSEBERRY, W.ASH, M.MAPLE 30, 20 (AVG 20), C.BURDOCK

M015
T.HONEYSUCKLE, W.ASH (DBH 20) (10), C.BURDOCK
P.GOOSEBERRY, T.ASP (DBH 20), C.STRAW
HAWTHORN, B.CHERRY, GOLDENROD
B.EYED SUSAN, R.OSIER, M.L.VIBURNUM

PENN EDWARDSBURGH JUNE 11/10 (2)

176
M177

MOUNTAIN ASH
PINK CORONELLA M.ASH (CROWN DAMAGE) R.GRAPE
A.ELM T.ASPEN (DBH 10, 20, 25 AVG 20) (10) HAWTHORN
B.POPLAR R.OSIER (W PITH) EQUISETUM C.VETCH
N.ASH (REGEN) W.CEDAR/REGEN (S RUSH) TAMARACK
P.STRAW S.MAPLE (REGEN) MEADOWSWEET

W.PINE C.BIRCH
J.PINE (2 TWISTED)

M016
S.ALDER V.CREEPER Common/SPEEDWELL (K)
S.SEQUELWEED P.GRAPE
P.LOOSESTRIFE R.STRAW D.RASPBERRY GOLDENROD
E.BUCKTHORN ~~R.OSIER~~ V.GREEPERE
V.BOWER S.DOGWOOD (BROWN PITH
C.L.WATERHOREHOUND N.ARROWHEAD

S.FERN P.FERN ALTERNATIVE DOGWOOD (ALT, WALLED CENTER)
B.CHERRY F.SOLOMON SEAL

ALT. DOGWOOD B.CHERRY (30 DBH P.TRILLIUM
W.MAPLE (20 DBH) P.IVY
T.ASPEN

183 RED BANEBERRY

M017
ALT. DOGWOOD C.BLACKBERRY D.RASPBERRY W.AVENS
GLOBEBERRY P.GOOSEBERRY J.N.PULPIT S.BLOODROOT
S.FERN R.MAPLE (REGEN) B.CHERRY W.SORREL
F.S.SEAL W.ASH (DBH 25, 30) A.ELM

WOODNETTLE S.HICKORY
W.LETTUCE

M189 RESIDENTIAL + MOWED / M190 RESIDENTIAL / MOWED / RUNNING HOME

(1)

Penn edwardsburgh
July 6 2010

cattail Pond SW side of project area
catbird
red wing
yellow warbler
house wren
a. gold finch
grackles
Veery
Robin
white throated sparrow
blue jay
green heron flying
chickadee
crow
baltimore oriole
common yellowthroat
red-eyed vireo
field sparrow
pileated woodpecker
cedar waxwing
song sparrow
N. Flicker

yellow butterfly
orange butterfly
green frog

(2)

raven
phoebe
downy woodpecker
chestnut warbler
dark eyed junco
snipe? check ASE
Swamp sparrow
ovenbird
green heron west pond
least flycatcher
wood thrush
N. water thrush
pewee
Northern or barn swallow check tip
great crested flycatcher
GBH

mk 39 side ditch
dry
tamaracks
grenadier?
Painted turtles
more cautious
in west
pond!

mk 40 ponded
water in ditch
flow N→S
N almost dry

mk41 vernal pool
w H2O
no eggs

mk 42 ditch dry
no ditch on
west side

(3)

July 6 2010
Penn Edwardsburgh
mk43
ditch on W side of trail
stagnant.

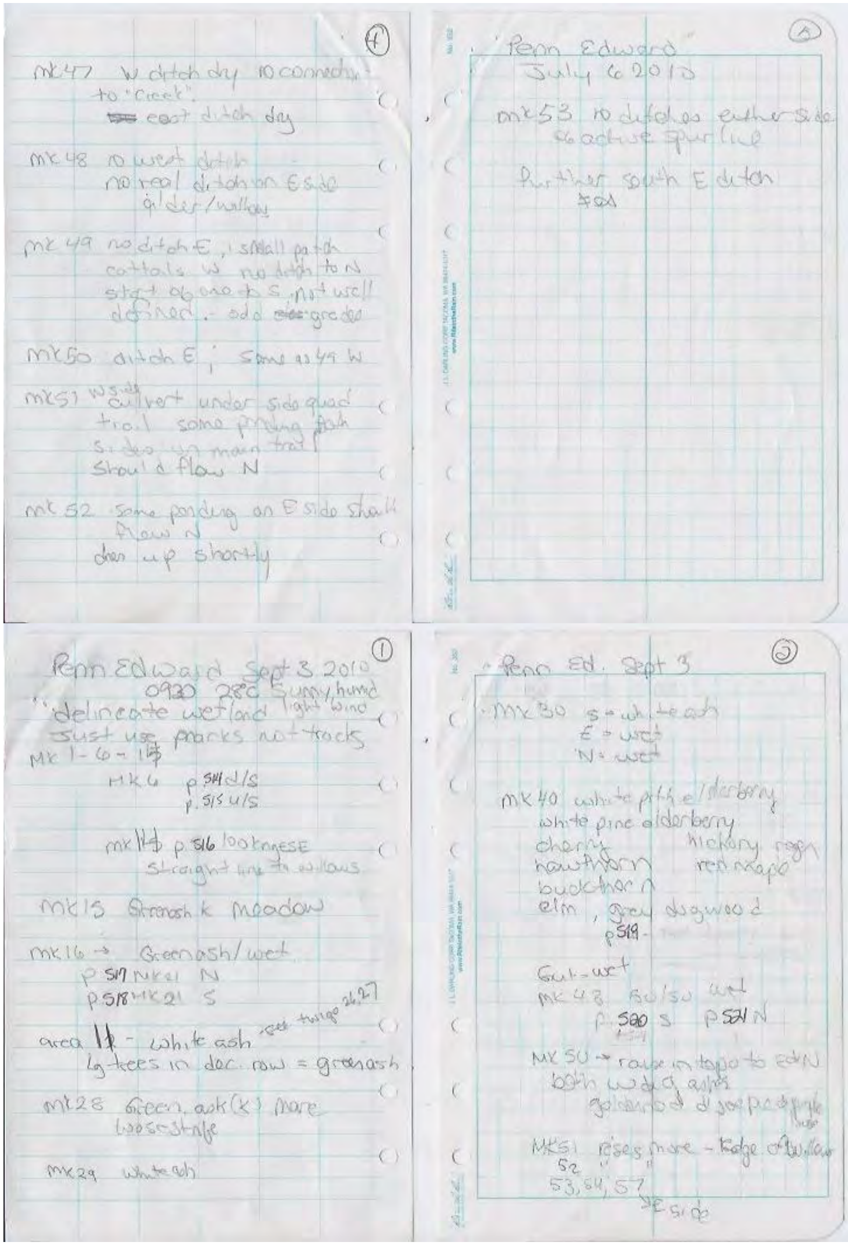
cross road - stickleback obs.
Slight flow to east

mk44 minnow trap set @ 1009
mk45 E ditch has water
now flowing south
(not enough to sample

mk 46 W ditch cross rd
& flows to E + south

at railroad another
ditch coming in from E
from along tracks, little
water but is flowing
No ditch on west side
anymore

tiger swallowtail!



4

mk47 W ditch dry 10 connect to "creek". east ditch dry

mk 48 10 west ditch
no real ditch on E side
alder/willow

mk 49 no ditch E, small patch cattails W no ditch to N start of one to S, not well defined. odd grades

mk50 ditch E; same as 49 W

mk51 W side culvert under side road trail some ponding both sides in main trail should flow N

mk 52 some ponding on E side should flow N
dries up shortly

A

Penn Edward
July 6 2010

mk53 10 ditches either side
no active spur line

further south E ditch
#54

1

Penn Edward Sept 3 2010
0930 28°C sunny, humid light wind
"delineate wetland"
Just use marks not tracks
Mk 1-6-14
MK6 p 514 d/s
p 515 u/s

mk 14 p 516 100 km E SE
straight line to willows

mk15 Green ash k meadow

mk16 → Green ash/wet
p 517 mk 21 N
p 518 mk 21 S

area 14 - white ash
lg trees in dec. row = green ash

mk28 Green ash (k) more loosestrife

mk29 white ash

5

Penn Ed. Sept 3

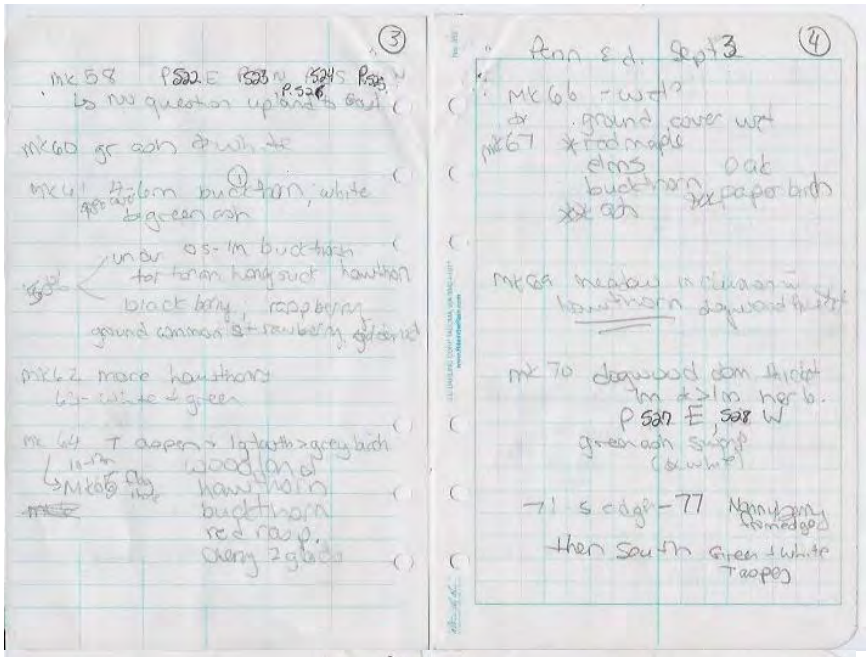
mk 30 S = white ash
E = wet
N = wet

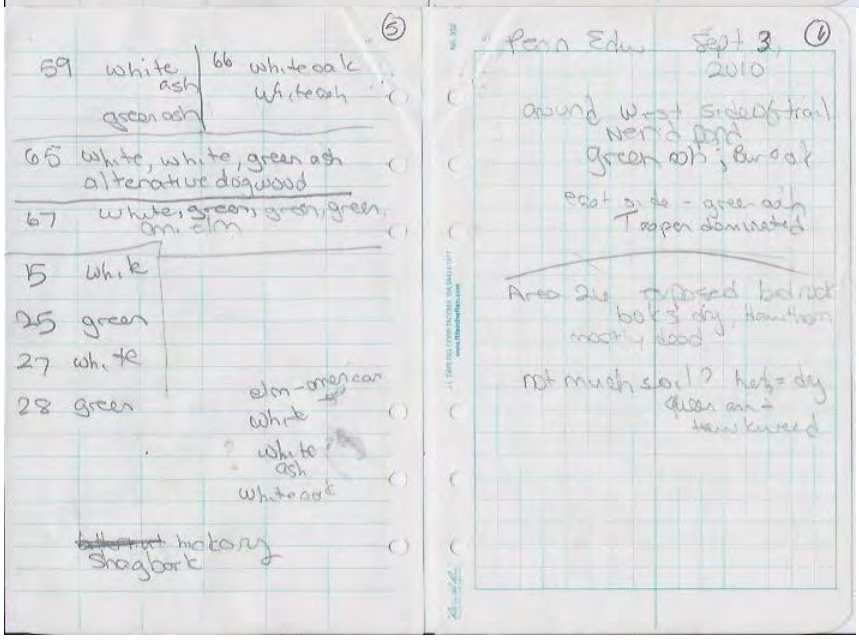
mk 40 white pine / elderberry
white pine elderberry
cherry hickory
hawthorn red maple
buckthorn
elm, grey dogwood
p 519

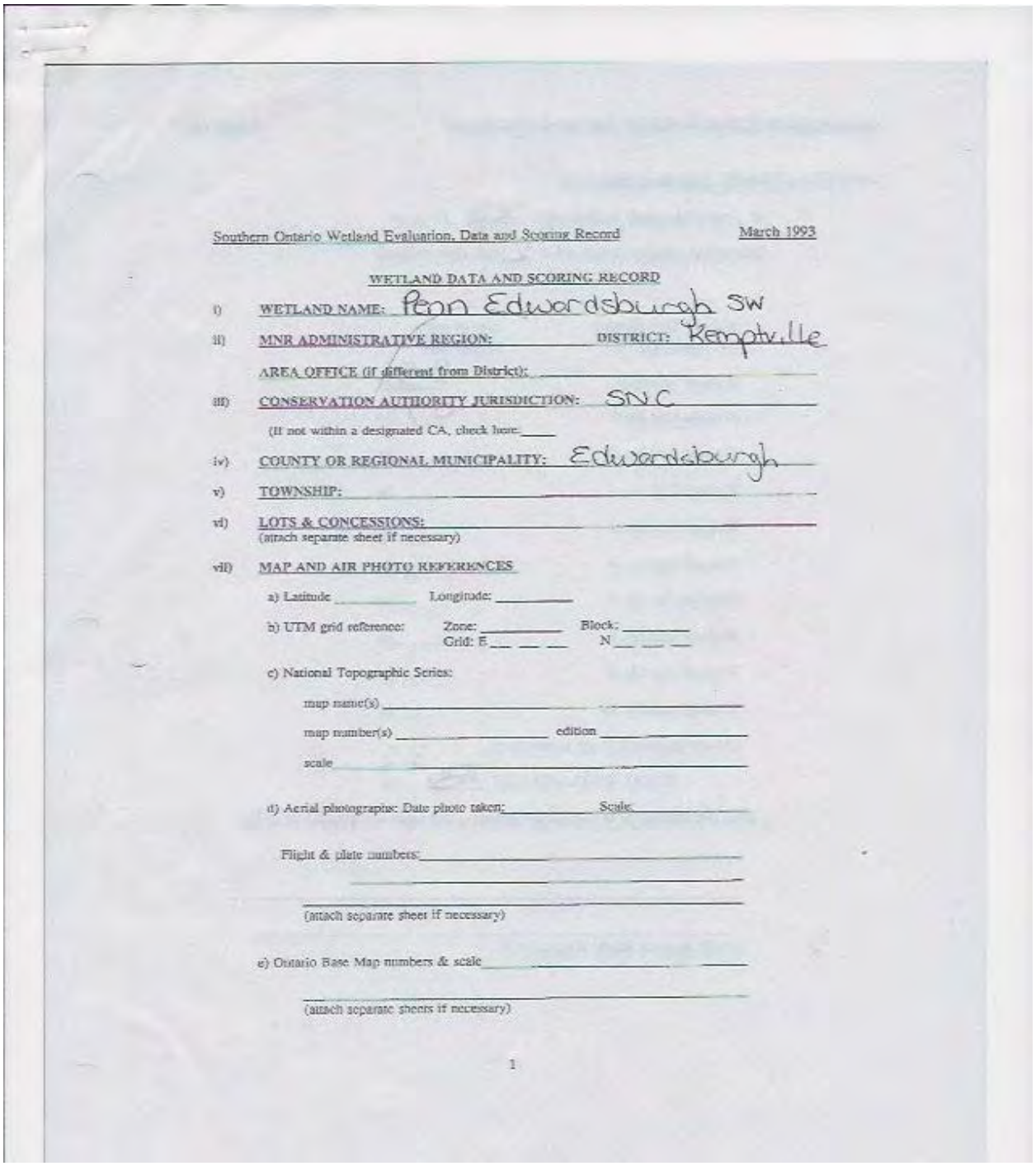
Gut-wet
mk 48 50/50 wet
p 520 S p 521 N

MK 50 → rise in topo to E & N
both wood and ash
goldenrod

MK51 rises more - edge of
52
53, 54, 57
E side







Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

WETLAND DATA AND SCORING RECORD

i) WETLAND NAME: Penn Edwardsburgh SW

ii) MNR ADMINISTRATIVE REGION: _____ DISTRICT: Kemptville

AREA OFFICE (if different from District): _____

iii) CONSERVATION AUTHORITY JURISDICTION: SNC

(If not within a designated CA, check here: ____

iv) COUNTY OR REGIONAL MUNICIPALITY: Edwardsburgh

v) TOWNSHIP: _____

vi) LOTS & CONCESSIONS: _____
(attach separate sheet if necessary)

vii) MAP AND AIR PHOTO REFERENCES

a) Latitude _____ Longitude: _____

b) UTM grid reference: Zone: _____ Block: _____
Grid: E ___ ___ ___ N ___ ___ ___

c) National Topographic Series:

map name(s) _____

map number(s) _____ edition _____

scale _____

d) Aerial photographs: Date photo taken: _____ Scale: _____

Flight & plate numbers: _____

_____

_____
(attach separate sheet if necessary)

e) Ontario Base Map numbers & scale _____

_____
(attach separate sheets if necessary)

1

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

viii) WETLAND SIZE AND BOUNDARIES

a) Single contiguous wetland area: ~~2.5~~ hectares

b) Wetland complex comprised of 2 individual wetlands:

Wetland Unit Number (for reference)	Size of each wetland unit
Wetland Unit No.1	2.5 ha
Wetland Unit No. 2	0.7 ha
Wetland Unit No. 3	ha
Wetland Unit No. 4	ha
Wetland Unit No. 5	ha
Wetland Unit No. 6	ha
Wetland Unit No. 7	ha
Wetland Unit No. 8	ha
Wetland Unit No. 9	ha
Wetland Unit No. 10	ha

(Attach additional sheets if necessary)

TOTAL WETLAND SIZE ~~2.5~~ 3.2 ha

c) Brief documentation of reasons for including any areas less than 0.5 ha in size:

(Attach separate sheets if necessary)

2

Southern Ontario Wetland Evaluation, Data and Scoring Record May 1994

1.0 BIOLOGICAL COMPONENT

1.1 PRODUCTIVITY

1.1.1 GROWING DEGREE-DAYS/SOILS

GROWING DEGREE DAYS

(check one)

1) _____ <2800
2) _____ 2800 - 3200
3) __Y__ 3200 - 3600
4) _____ 3600 - 4000
5) _____ >4000

SOILS

Estimated Fractional Area

_____ clay/loam
_____ silt/marl
_____ limestone
_____ sand
_____ humic/mesic
_____ fibric
_____ granite

ON 12 Soil map Farmington loam

Core samples in Projected area SCL

SCORING:

Growing Degree-Days	Clay-Loam	Silt-Marl	Lime-stone	Sand	Humic-Mesic	Fibric	Granite
<2800	15	13	11	9	8	7	5
2800-3200	18	15	13	11	9	8	7
3200-3600	22	18	15	13	11	9	7
3600-4000	26	21	18	15	13	10	8
>4000	30	25	20	18	15	12	8

(maximum score 30; if wetland contains more than one soil type, evaluate based on the fractional area)

Steps required for evaluation: (maximum score 30 points)

1. Select GDD line in evaluation table applicable to your wetland;
2. Determine fractional area of the wetland for each soil type;
3. Multiply fractional area of each soil type by score;
4. Sum individual soil type scores (round to nearest whole number).

In wetland complexes the evaluator should aim at determining the percentage of area occupied by the categories for the complex as a whole.

Final Score Growing Degree-Days/Soils (maximum 30 points) 22

3

Southern Ontario Wetland Evaluation, Data and Scoring Record May 1994

1.1.2 WETLAND TYPE (Fractional Area = area of wetland type/total wetland area)

	Fractional Area		Score
Bog		x 3	
Fen		x 6	
Swamp	0.81	x 8	6.5
Marsh	0.19	x 15	2.7

Wetland type score (maximum 15 points) 9

1.1.3 SITE TYPE (Fractional Area = area of site type/total wetland area)

	Fractional Area		Score
Isolated	100	x 1 =	1
Palustrine (permanent or intermittent flow)		x 2 =	
Riverine		x 4 =	
Riverine (at rivermouth)		x 5 =	
Lacustrine (at rivermouth		x 5 =	
Lacustrine (on enclosed bay, with barrier beach)		x 3 =	
Lacustrine (exposed to lake)		x 2 =	

Site Type Score (maximum 5 points) 1

1.2 BIODIVERSITY

1.2.1 NUMBER OF WETLAND TYPES

(Check only one)		Score	
1)	one	9 points	cattail marsh
2) 2	two	13	swamp
3)	three	20	
4)	four	30	

Number of Wetland Types Score (maximum 30 points) 13

4

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

1.2.2 VEGETATION COMMUNITIES

Attach a separate sheet listing community (map) codes, vegetation forms and dominant species.
Use the form on the following page to record percent area by dominant vegetation form. This information will be used in other parts of the evaluation.

Communities should be grouped by number of forms. For example, 2 form communities might appear as follows:

2 forms

Code	Forms	Dominant Species
M6	re, ff	re, *Typha latifolia*; ff, *Lemna minor, Wolffia*
S1	ts, gc	ts, *Salix discolor*; gc, *Impatiens capensis, Thelypteris palustris*

Note that the dominant species for each form are separated by a semicolon. The dominant species (maximum of 2) within a form are separated by commas.

Scoring:

Total # of communities with 1-3 forms	Total # of communities with 4-5 forms	Total # of communities with 6 or more forms
1 = 1.5 points	1 = 2 points	1 = 3 points
2 = 2.5	2 = 3.5	2 = 5
3 = 3.5	3 = 5	3 = 7
4 = 4.5	4 = 6.5	4 = 9
5 = 5	5 = 7.5	5 = 10.5
6 = 5.5	6 = 8.5	6 = 12
7 = 6	7 = 9.5	7 = 13.5
8 = 6.5	8 = 10.5	8 = 15
9 = 7	9 = 11.5	9 = 16.5
10 = 7.5	10 = 12.5	10 = 18
11 = 8	11 = 13	11 = 19
+.5 each additional community = 1.5	+.5 each additional community = 2	+1 each additional community = 0

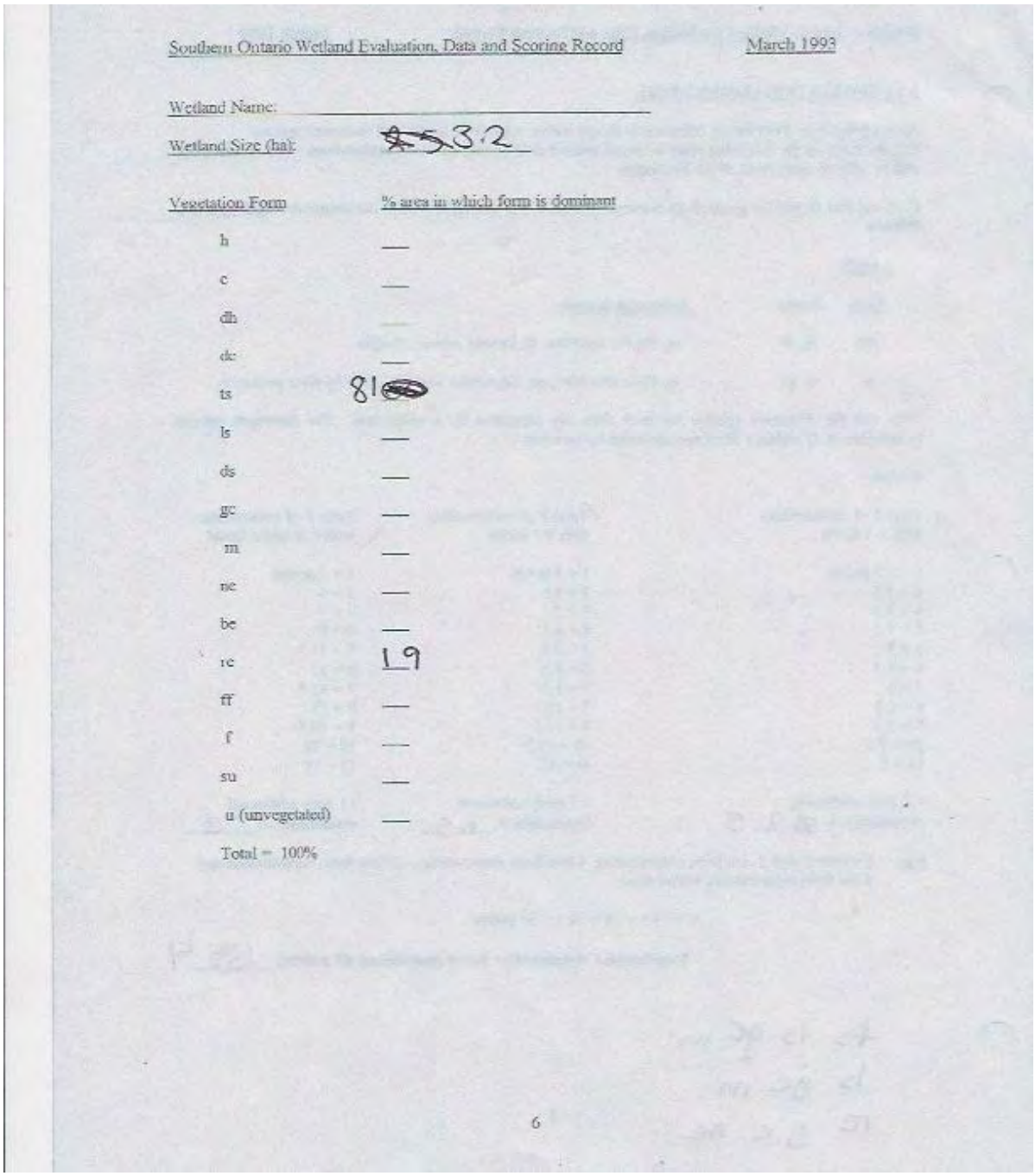
e.g., a wetland with 3 one form communities, 4 two form communities, 12 four form communities and 8 six form communities would score:

6 + 13.5 + 15 = 34.5 = 35 points

Vegetation Communities Score (maximum 45 points) 1 3 5 4

ts ls gf m
[redacted]
re g e ne

5



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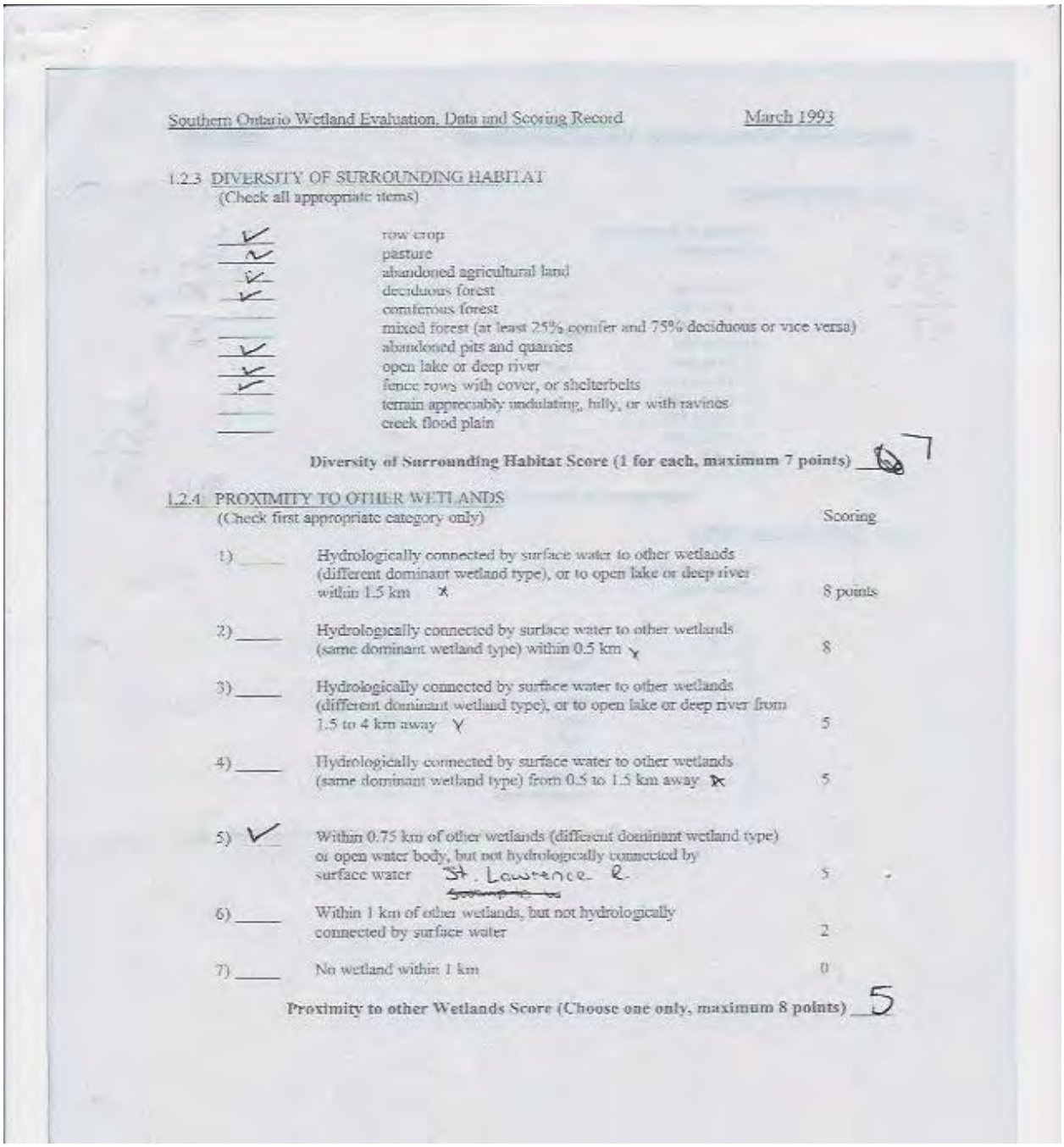
Wetland Name: _____

Wetland Size (ha): ~~532~~

Vegetation Form	% area in which form is dominant
h	—
c	—
dh	—
dc	—
ts	81
ls	—
ds	—
gc	—
m	—
nc	—
be	—
re	19
ff	—
f	—
su	—
u (unvegetated)	—

Total = 100%

6



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1.2.3 DIVERSITY OF SURROUNDING HABITAT
(Check all appropriate items)

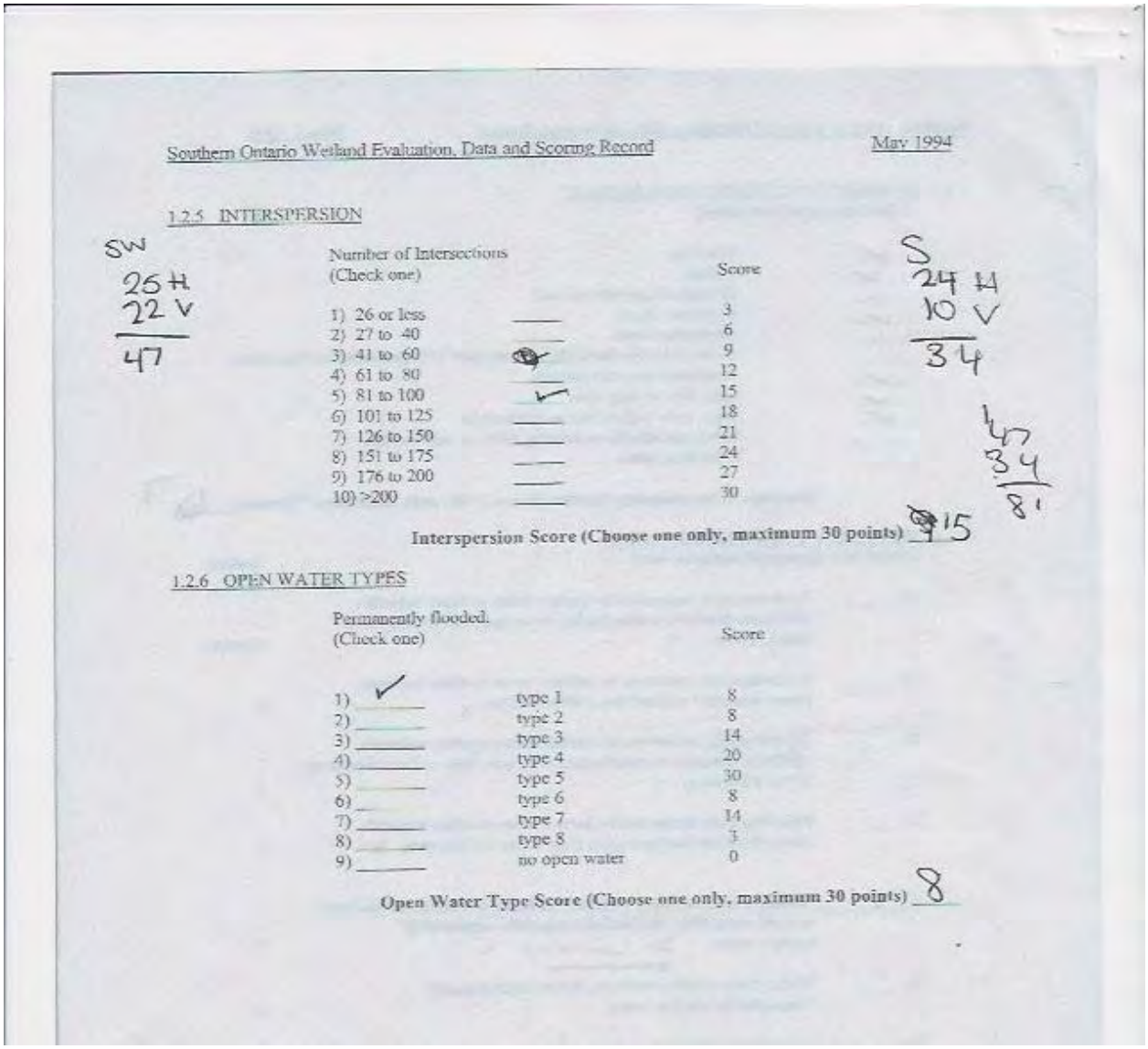
✓	row crop
✓	pasture
✓	abandoned agricultural land
✓	deciduous forest
	coniferous forest
	mixed forest (at least 25% conifer and 75% deciduous or vice versa)
✓	abandoned pits and quarries
✓	open lake or deep river
✓	fence rows with cover, or shelterbelts
	terrain appreciably undulating, hilly, or with ravines
	creek flood plain

Diversity of Surrounding Habitat Score (1 for each, maximum 7 points) 7

1.2.4 PROXIMITY TO OTHER WETLANDS
(Check first appropriate category only)

			Scoring
1)		Hydrologically connected by surface water to other wetlands (different dominant wetland type), or to open lake or deep river within 1.5 km	8 points
2)		Hydrologically connected by surface water to other wetlands (same dominant wetland type) within 0.5 km Y	8
3)		Hydrologically connected by surface water to other wetlands (different dominant wetland type), or to open lake or deep river from 1.5 to 4 km away Y	5
4)		Hydrologically connected by surface water to other wetlands (same dominant wetland type) from 0.5 to 1.5 km away	5
5)	✓	Within 0.75 km of other wetlands (different dominant wetland type) or open water body, but not hydrologically connected by surface water St. Lawrence R.	5
6)		Within 1 km of other wetlands, but not hydrologically connected by surface water	2
7)		No wetland within 1 km	0

Proximity to other Wetlands Score (Choose one only, maximum 8 points) 5



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1.2.5 INTERSPERSION

SW
25 H
22 V
47

Number of Intersections (Check one)		Score
1) 26 or less	____	3
2) 27 to 40	____	6
3) 41 to 60	✓	9
4) 61 to 80	____	12
5) 81 to 100	____	15
6) 101 to 125	____	18
7) 126 to 150	____	21
8) 151 to 175	____	24
9) 176 to 200	____	27
10) >200	____	30

S
24 H
10 V
34

45
34
81

Interspersion Score (Choose one only, maximum 30 points) 15

1.2.6 OPEN WATER TYPES

Permanently flooded. (Check one)		Score
1) ✓	type 1	8
2) ____	type 2	8
3) ____	type 3	14
4) ____	type 4	20
5) ____	type 5	30
6) ____	type 6	8
7) ____	type 7	14
8) ____	type 8	3
9) ____	no open water	0

Open Water Type Score (Choose one only, maximum 30 points) 8

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

1.3 SIZE

3.2 hectares

Size Score (Biological Component) (maximum 50 points) 9

Evaluation Table Size Score (Biological Component)

Wetland size (ha)	Total Score for Biodiversity Subcomponent									
	<37	37-48	49-60	61-72	73-84	85-96	97-108	109-120	121-132	>132
<21 ha	1	5	7	8	9	17	25	34	43	50
21-40	5	7	8	9	10	19	28	37	46	50
41-60	6	8	9	10	11	21	31	40	49	50
61-80	7	9	10	11	13	23	34	43	50	50
81-100	8	10	11	13	15	25	37	46	50	50
101-120	9	11	13	15	18	28	40	49	50	50
121-140	10	13	15	17	21	31	43	50	50	50
141-160	11	15	17	19	23	34	46	50	50	50
161-180	13	17	19	21	25	37	49	50	50	50
181-200	15	19	21	23	28	40	50	50	50	50
201-400	17	21	23	25	31	43	50	50	50	50
401-600	19	23	25	28	34	46	50	50	50	50
601-800	21	25	28	31	37	49	50	50	50	50
801-1000	23	28	31	34	40	50	50	50	50	50
1001-1200	25	31	34	37	43	50	50	50	50	50
1201-1400	28	34	37	40	46	50	50	50	50	50
1401-1600	31	37	40	43	49	50	50	50	50	50
1601-1800	34	40	43	46	50	50	50	50	50	50
1801-2000	37	43	47	49	50	50	50	50	50	50
>2000	40	46	50	50	50	50	50	50	50	50

9

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

2.0 SOCIAL COMPONENT

2.1 ECONOMICALLY VALUABLE PRODUCTS

2.1.1 WOOD PRODUCTS

Area of wetland forested (ha), i.e. dominant form is h or c. Note that this is not wetland size. (Check one only)

		Score
1) ✓	<5 ha	0
2) ____	5 - 25 ha	3
3) ____	26 - 50 ha	6
4) ____	51 - 100 ha	9
5) ____	101 - 200 ha	12
6) ____	>200 ha	18

Source of information: pers. obs

Wood Products Score (Score one only, maximum 18 points) Ø

2.1.2 WILD RICE

(Check one) Score (Choose one)

Present (minimum size 0.5 ha) 1) ____ 6 points

Absent 2) ✓ 0

Source of information: pers. obs. ~~[illegible]~~

Wild Rice Score (maximum 6 points) Ø

2.1.3 COMMERCIAL FISH (BAIT FISH AND/OR COARSE FISH)

(Check one) Score (Choose one)

Present 1) ____ 12 points

Habitat not suitable for fish 2) ✓ 0

Source of information: pers. obs. ~~[illegible]~~

Commercial Fish Score (maximum 12 points) Ø

2.1.4 BULLFROGS

(Check one) Score (Choose one)

Present 1) ____ 1 points

Absent 2) ✓ 0

Source of information: pers obs

Bullfrog Score (maximum 1 point) Ø

/Ø

10

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

2.1.5 SNAPPING TURTLES

(Check one)		Score (Choose one)
Present	1) ____	1 point
Absent	2) Ø	0

Source of information: pesobs.

Snapping Turtle Score (maximum 1 point) Ø

2.1.6 FURBEARERS
(Consult Appendix 9)

Name of furbearer	Source of information
1) fox, coyote	scat obs. in upland area nearby
2)	
3)	
4)	
5)	

Scoring: 3 points for each species, maximum 12

Furbearer Score (maximum 12 points) 3

1/3

2.2 RECREATIONAL ACTIVITIES

Intensity of Use	Type of Wetland-Associated Use: Hunting	Nature Enjoyment/ Ecosystem Study	Fishing
High	40 points	40 points	40 points
Moderate	20	20	20
Low	8	8	8
Not Possible/Not known	0	0	0

(score one level for each of the three wetland uses; scores are cumulative; maximum score 80 points)

Sources of information:

Hunting: private land no evidence of hunting (cartridges or blinds)

Nature: _____

Fishing: _____

Recreational Activities Score (maximum 80 points) Ø

1/3

11

Southern Ontario Wetland Evaluation, Data and Scoring Record May 1994

2.3 LANDSCAPE AESTHETICS

2.3.1 DISTINCTNESS

(Check one)		Score (Choose one)
Clearly distinct	1) ____	3 points
Indistinct	2) Ø	0

Landscape Distinctness Score (maximum 3 points) Ø

2.3.2 ABSENCE OF HUMAN DISTURBANCE

(Check one)		Score (Choose one)
Human disturbances absent or nearly so	1) ____	7 points
One or several localized disturbances	2) ✓	4
Moderate disturbance; localized water pollution	3) ____	2
Wetland intact but impairment of ecosystem quality intense in some areas	4) ____	1
Extreme ecological degradation, or water pollution severe and widespread	5) ____	0

Source of information: pers obs.

Absence of Human Disturbance Score (maximum 7 points) 4

2.4 EDUCATION AND PUBLIC AWARENESS

2.4.1 EDUCATIONAL USES

(Check one)		Score (Choose one)
Frequent	1) ____	20 points
Infrequent	2) ____	12
No visits	3) ✓	0

Source of information: private land

Educational Uses Score (maximum 20 points) Ø

2.4.2 FACILITIES AND PROGRAMS

(check one)		Score (Choose one)
Staffed interpretation centre	1) ____	8 points
No interpretation centre or staff, but a system of self-guiding trails or brochures available	2) ____	4
Facilities such as maintained paths (e.g., woodchips), boardwalks, boat launches or observation towers but no brochures or other interpretation	3) ____	2
No facilities or programs	4) Ø	0

Source of information: private land pers obs

Facilities and Programs Score (maximum 8 points) Ø

12

Southern Ontario Wetland Evaluation, Data and Scoring Record May 1994

2.4.3 RESEARCH AND STUDIES

(check appropriate spaces)		Score
Long term research has been done	____	12 points
Research papers published in refereed scientific journal or as a thesis	____	10
One or more (non-research) reports have been written on some aspect of the wetland's flora, fauna, hydrology, etc.	____	5
No research or reports	0	0

Attach list of known reports by above categories

Research and Studies Score (Score is cumulative, maximum 12 points) 0

2.5 PROXIMITY TO AREAS OF HUMAN SETTLEMENT

Circle the highest applicable score

Distance of wetland from settlement	1) population >10,000	2) population 2,500 - 10,000	3) population <2,500 or cottage community
1) Within or adjoining settlement	40 points	(26)	16
2) 0.5 to 10 km from settlement	26	16	10
3) 10 to 60 km from settlement	12	8	4
4) >60 km from settlement	5	2	0

Name of settlement: Prescott & new Wexford

Proximity to Human Settlement Score (maximum 40 points) 26

2.6 OWNERSHIP (FA = fractional area)

	Fractional Area	Score
FA of wetland in public or private ownership, held under contract or in trust for wetland protection	____	x 10 = ____
FA of wetland area in public ownership, not as above	____	x 8 = ____
FA of wetland area in private ownership, not as above	1.00	x 4 = 4

Source of information: pers. hired by landowner.

Ownership Score (maximum 10 points) 4

13

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

2.7 SIZE 3.2 hectares

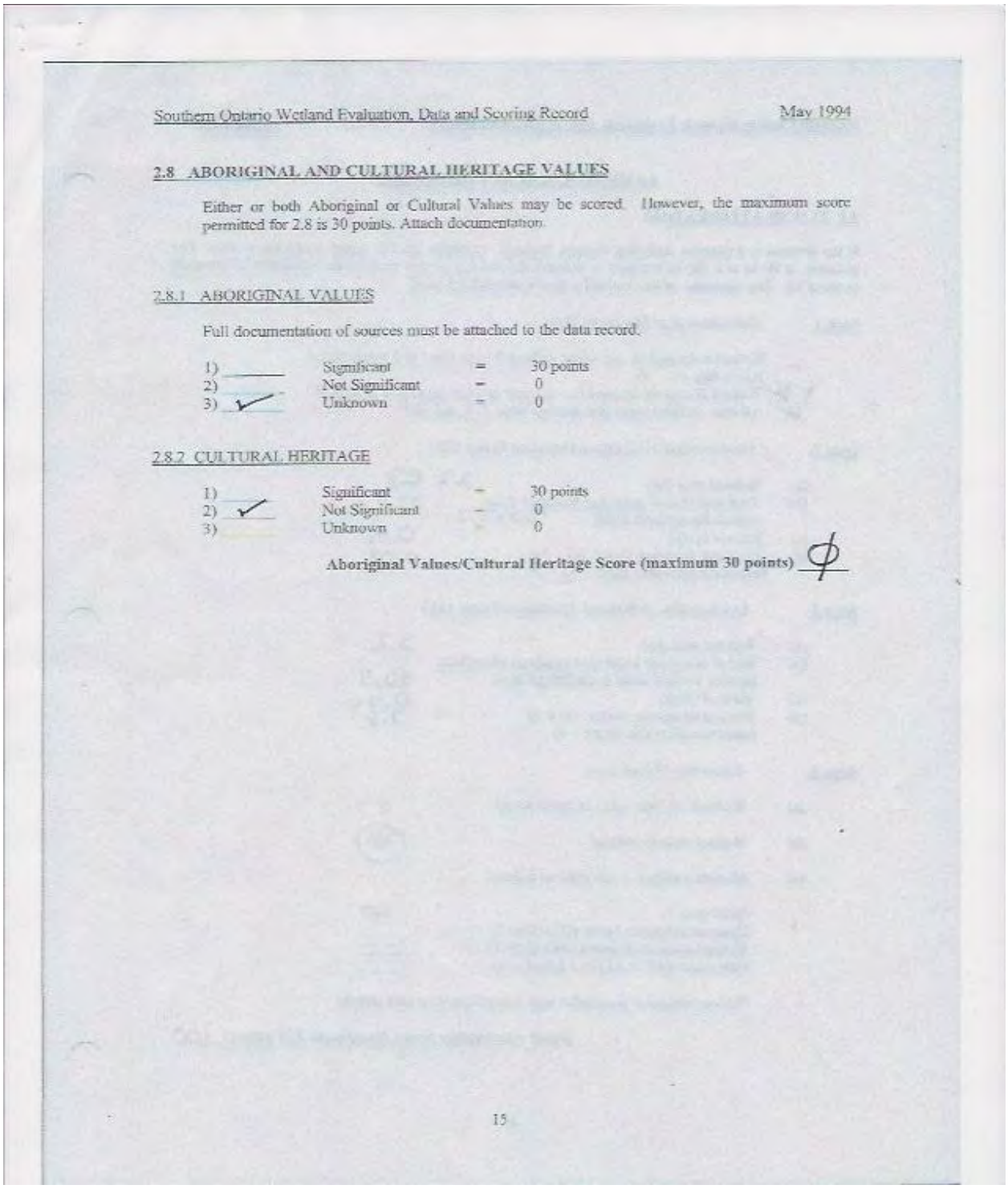
Evaluation Table for Size Score (Social Component)

Wetland size (ha)	Total for Size Dependent Score									
	<31	31-45	46-60	61-75	76-90	91-105	106-109	121-135	136-150	>150
<2 ha	1	2	4	8	10	12	14	14	14	15
2-4	1	2	4	8	12	13	14	14	15	16
5-8	2	2	5	9	13	14	15	15	16	16
9-12	3	3	6	10	14	15	15	16	17	17
13-17	3	4	7	10	14	15	16	16	17	17
18-28	4	5	8	11	15	16	16	17	17	18
29-37	5	7	10	13	16	17	18	18	19	19
38-49	5	7	10	13	16	17	18	18	19	20
50-62	5	8	11	14	17	17	18	19	20	20
63-81	5	8	11	15	17	18	19	20	20	20
82-105	6	9	11	15	18	18	19	20	20	20
106-137	6	9	12	16	18	19	20	20	20	20
138-178	6	9	13	16	18	19	20	20	20	20
179-233	6	9	13	16	18	20	20	20	20	20
234-302	7	9	13	16	18	20	20	20	20	20
303-393	7	9	14	17	18	20	20	20	20	20
394-511	7	10	14	17	18	20	20	20	20	20
512-665	7	10	14	17	18	20	20	20	20	20
666-863	7	10	14	17	19	20	20	20	20	20
864-1123	8	12	15	17	19	20	20	20	20	20
1124-1460	8	12	15	17	19	20	20	20	20	20
1461-1898	8	13	15	18	19	20	20	20	20	20
1899-2467	8	14	16	18	20	20	20	20	20	20
>2467	8	14	16	18	20	20	20	20	20	20

Total Size Score (Social Component) 1

2.1 = 3
2.2 = 0
2.5 = 26
29

14



Southern Ontario Wetland Evaluation, Data and Scoring Record May 1994

2.8 ABORIGINAL AND CULTURAL HERITAGE VALUES

Either or both Aboriginal or Cultural Values may be scored. However, the maximum score permitted for 2.8 is 30 points. Attach documentation.

2.8.1 ABORIGINAL VALUES

Full documentation of sources must be attached to the data record.

1) ____	Significant	=	30 points
2) ____	Not Significant	=	0
3) ✓	Unknown	=	0

2.8.2 CULTURAL HERITAGE

1) ____	Significant	=	30 points
2) ✓	Not Significant	=	0
3) ____	Unknown	=	0

Aboriginal Values/Cultural Heritage Score (maximum 30 points) Ø

15

Southern Ontario Wetlands Evaluation, Data and Scoring Record March 1993

3.0 HYDROLOGICAL COMPONENT

3.1 FLOOD ATTENUATION

If the wetland is a complex including isolated wetlands, apportion the 100 points according to area. For example, if 10 ha of a 100 ha complex is isolated, the isolated portion receives the maximum proportional score of 10. The remainder of the wetland is then evaluated out of 90.

Step 1 Determination of Maximum Score

___ Wetland is located on one of the defined 5 large lakes or 5 major rivers (Go to Step 4).
✓ Wetland is entirely isolated (i.e. not part of a complex) (Go to Step 4)
___ All other wetland types (Go through steps 2, 3, and 4B)

Step 2. Determination of Upstream Detention Factor (DF)

(a)	Wetland area (ha)	3.2
(b)	Total area (ha) of upstream detention areas (include the wetland itself)	23.2 (20+3.2)
(c)	Ratio of (a):(b)	0.14
(d)	Upstream detention factor: (c) x 2 = (maximum allowable factor = 1)	0.28

Step 3 Determination of Wetland Attenuation Factor (AF)

(a)	Wetland area (ha)	3.2
(b)	Size of catchment basin (ha) upstream of wetland (include wetland itself in catchment area)	40.9
(c)	Ratio of (a):(b)	0.78
(d)	Wetland attenuation factor: (c) x 10 = (maximum allowable factor = 1)	7.8

Step 4. Calculation of final score

(a)	Wetlands on large lakes or major rivers	0
(b)	Wetland entirely isolated	(100)
(b)	All other wetlands -- calculate as follows:	
	Initial score	100*
	Upstream detention factor (DF) (Step 2)	___
	Wetland attenuation factor (AF) (Step 3)	___
	Final score: ((DF + AF)/2) x Initial score =	___

*Unless wetland is a complex with isolated portions (see above).

Flood Attenuation Score (maximum 100 points) 100

16

Southern Ontario Wetlands Evaluation, Data and Scoring Record May 1994

3.2 WATER QUALITY IMPROVEMENT

3.2.1 SHORT TERM WATER QUALITY IMPROVEMENT

Step 1: **Determination of maximum initial score**

Wetland on one of the 5 defined large lakes or 5 major rivers (Go to Step 5a)
All other wetlands (Go through Steps 2, 3, 4, and 5b)

Step 2: **Determination of watershed improvement factor (WIF)**

Calculation of WIF is based on the fractional area (FA) of each site type that makes up the total area of the wetland.

(FA – area of site type/total area of wetland)

	Fractional Area
FA of isolated wetland	1 x 0.5 = 0.5
FA of riverine wetland	____ x 1.0 = ____
FA of palustrine wetland with no inflow	____ x 0.7 = ____
FA of palustrine wetland with inflows	____ x 1.0 = ____
FA of lacustrine on lake shoreline	____ x 0.2 = ____
FA of lacustrine at lake inflow or outflow	____ x 1.0 = ____

Sum (WIF cannot exceed 1.0) 0.5

Step 3: **Determination of catchment land use factor (LUF)**

(Choose the first category that fits upstream landuse in the catchment.)

1)	Over 50% agricultural and/or urban	1.0
2)	Between 30 and 50% agricultural and/or urban	0.8
3) ✓	Over 50% forested or other natural vegetation	0.6

LUF (maximum 1.0) 0.6

Step 4: **Determination of pollutant uptake factor (PUT)**

Calculation of PUT is based on the fractional area (FA) of each vegetation type that makes up the total area of the wetland. Base assessment on the dominant vegetation form for each community except where dead trees or shrubs dominate. In that case base assessment on the dominant live vegetation type. (FA = area of vegetation type/total area of wetland)

	Fractional Area
FA of wetland with live trees, shrubs, herbs or mosses (c,h,s,ls,gc,m)	1.0 x 0.75 = 0.75
FA of wetland with emergent, submergent or floating vegetation (re,be,ne,su,f,ff)	____ x 1.0 = ____
FA of wetland with little or no vegetation (u)	____ x 0.5 = ____

Sum (PUT cannot exceed 1.0) 0.75

17

Southern Ontario Wetlands Evaluation, Data and Scoring Record May 1994

Step 5: **Calculation of final score**

(a)	Wetland on large lakes or major rivers	0
(b)	All other wetlands - calculate as follows	
	Initial score	60
	Water quality improvement factor (WQF)	
	Land use factor (LUF)	0.5
	Pollutant uptake factor (PUT)	0.75

Final score: 60 x WQF x LUF x PUT = 13.5

Short Term Water Quality Improvement Score (maximum 60 points) 13.5

3.2.2 LONG TERM NUTRIENT TRAP

Step 1:

	Wetland on large lakes or 5 major rivers	0 points
✓	All other wetlands (Proceed to Step 2)	

Step 2: Choose only one of the following settings that best describes the wetland being evaluated

1) ____	Wetland located in a river mouth	10 points
2) ____	Wetland is a bog, fen, or swamp with more than 50% of the wetland being covered with organic soil	10
3) ✓	Wetland is a bog, fen, or swamp with less than 50% of the wetland being covered with organic soil	3
4) ____	Wetland is a marsh with more than 50% of the wetland covered with organic soil	3
5) ____	None of the above	0

Long Term Nutrient Trap Score (maximum 10 points) 3

18

Southern Ontario Wetland Evaluation. Data and Scoring Record March 1993

3.2.3 GROUNDWATER DISCHARGE

(Circle the characteristics that best describe the wetland being evaluated and then sum the scores. If the sum exceeds 30 points assign the maximum score of 30.)

Wetland Characteristics	Potential for Discharge		
	None to Little	Some	High
Wetland type	1) Bog = 0	2) Swamp/Marsh = 2	3) Fen = 5
Topography	1) Flat/rolling = 0	2) Hilly = 2	3) Steep = 5
Wetland Area:Upslope Catchment Area	Large (>50%) = 0	Moderate (5-50%) = 2	Small (<5%) = 5
Lagg Development	1) None found = 0	2) Minor = 2	3) Extensive = 5
Seeps	1) None = 0	2) = or < 3 seeps = 2	3) > 3 seeps = 5
Surface marl deposits	1) None = 0	2) = or < 3 sites = 2	3) > 3 sites = 5
Iron precipitates	1) None = 0	2) = or < 3 sites = 2	3) > 3 sites = 5
Located within 1 km of a major aquifer	N/A = 0	N/A = 0	Yes = 10

(Scores are cumulative, maximum score 30 points)

Groundwater Discharge Score (maximum 30 points) 2

3.3 CARBON SINK

Choose only one of the following

1) _____ Bog, fen or swamp with more than 50% coverage by organic soil 5 points
2) _____ Bog, fen or swamp with between 10 to 49% coverage by organic soil 2
3) _____ Marsh with more than 50% coverage by organic soil 3
4) ✓ Wetlands not in one of the above categories 0

Carbon Sink Score (maximum 5 points) Ø

19

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

3.4 SHORELINE EROSION CONTROL

Step 1:

		Score
✓	Wetland entirely isolated or palustrine	0
	Any part of the wetland riverine, or lacustrine (proceed to Step 2)	

Step 2:

Choose the one characteristic that best describes the shoreline vegetation (see text for a definition of shoreline)

		Score
1)	Trees and shrubs	15
2)	Emergent vegetation	8
3)	Submergent vegetation	6
4)	Other shoreline vegetation	3
5)	No vegetation	0

Shoreline Erosion Control Score (maximum 15 points) Ø

3.5 GROUND WATER RECHARGE

3.5.1 WETLAND SITE TYPE

		Score
(a)	Wetland > 50% lacustrine (by area) or located on one of the five major rivers	0
(b)	Wetland not as above. Calculate final score as follows: (FA – area of site type/total area of wetland)	

	Fractional Area	
FA of isolated or palustrine wetland	1.0 x 50 =	50
FA of riverine wetland	____ x 20 =	____
FA of lacustrine wetland (wetland <50% lacustrine)	____ x 0 =	____

Ground Water Recharge, Wetland Site Type Component Score (maximum 50 points) 50

20

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

3.5.2 WETLAND SOIL RECHARGE POTENTIAL

(Circle only one choice that best describes the hydrologic soil class of the area surrounding the wetland being evaluated.)

Dominant Wetland Type	1) Sand, loam, gravel, till	2) Clay or bedrock
1) Lacustrine or on a major river	0	0
2) Isolated	10	5
3) Palustrine	7	4
4) Riverine (not a major river)	5	2

? Double check

Ground Water Recharge, Wetland Soil Recharge Potential Score (maximum 10 points) 5

21

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

4.0 SPECIAL FEATURES COMPONENT

4.1 RARITY
4.1.1 WETLANDS

Site District 6E

Presence of wetland type (check one or more)

- ___ Bog
- ___ Fen
- ✓ Swamp
- ___ Marsh

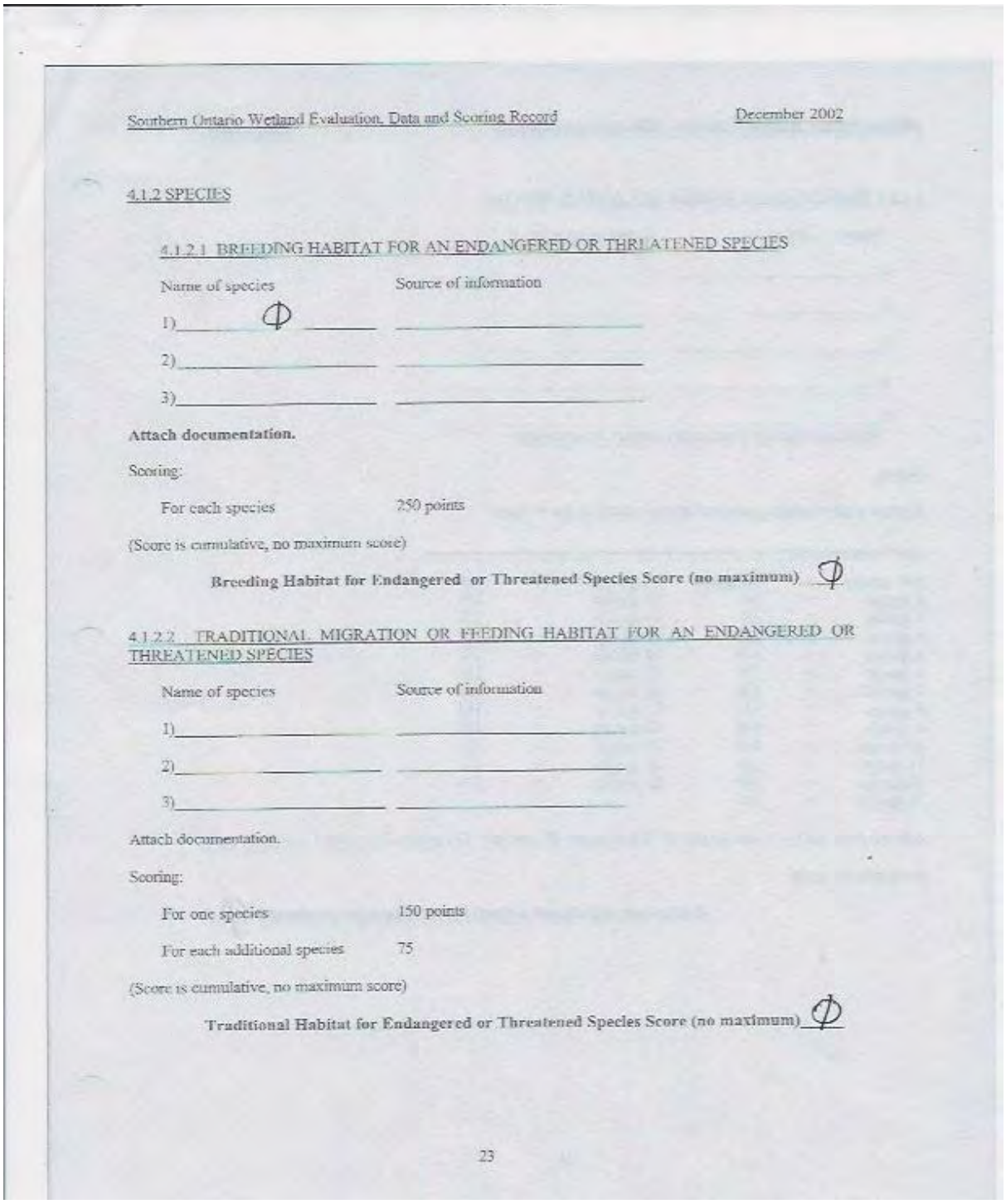
Score for rarity within the landscape and rarity of the wetland type. Score for rarity of wetland type is cumulative (maximum 80 points) based on presence or absence.

Site District	Score for Rarity within the Landscape	Score for Rarity of Wetland Type			
		Marsh	Swamp	Fen	Bog
6-1	60	40	0	80	80
6-2	60	40	0	80	80
6-3	40	10	0	40	80
6-4	60	40	0	80	80
6-5	20	40	0	80	80
6-6	40	20	0	80	80
6-7	60	10	0	80	80
6-8	20	20	0	80	80
6-9	0	20	0	80	80
6-10	20	0	20	80	80
6-11	0	30	0	80	80
6-12	0	30	0	60	80
6-13	60	10	0	80	80
6-14	40	20	0	40	80
6-15	40	0	0	80	80
7-1	60	0	60	80	80
7-2	60	0	0	80	80
7-3	60	0	0	80	80
7-4	80	0	0	80	80
7-6	80	30	0	80	80

Rarity within the Landscape Score (maximum 80 points) 8

Rarity of Wetland Type Score (Maximum 80 points) 0

22



Southern Ontario Wetland Evaluation, Data and Scoring Record December 2002

4.1.2 SPECIES

4.1.2.1 BREEDING HABITAT FOR AN ENDANGERED OR THREATENED SPECIES

Name of species	Source of information
1) Ø	
2)	
3)	

Attach documentation.

Scoring:

For each species 250 points

(Score is cumulative, no maximum score)

Breeding Habitat for Endangered or Threatened Species Score (no maximum) Ø

4.1.2.2 TRADITIONAL MIGRATION OR FEEDING HABITAT FOR AN ENDANGERED OR THREATENED SPECIES

Name of species	Source of information
1)	
2)	
3)	

Attach documentation.

Scoring:

For one species 150 points

For each additional species 75

(Score is cumulative, no maximum score)

Traditional Habitat for Endangered or Threatened Species Score (no maximum) Ø

23

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

4.1.2.3 PROVINCIALLY SIGNIFICANT ANIMAL SPECIES

Name of species	Source of information
1)	
2)	
3)	
4)	
5)	

Attach separate list if necessary; Attach documentation

Scoring:

Number of provincially significant animal species in the wetland:

One species	=	50 points	14 species	=	154
2 species	=	80	15 species	=	156
3 species	=	95	16 species	=	158
4 species	=	105	17 species	=	160
5 species	=	115	18 species	=	162
6 species	=	125	19 species	=	164
7 species	=	130	20 species	=	166
8 species	=	135	21 species	=	168
9 species	=	140	22 species	=	170
10 species	=	143	23 species	=	172
11 species	=	146	24 species	=	174
12 species	=	149	25 species	=	176
13 species	=	152			

Add one point for every species past 25 (for example, 26 species = 177 points, 27 species = 178 points etc.)

(no maximum score)

Provincially Significant Animal Species Score (no maximum) ϕ

24

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

4.1.2.4 PROVINCIALLY SIGNIFICANT PLANT SPECIES

(Scientific names must be recorded)

	Common Name	Scientific Name	Source of information
1)			
2)			
3)			
4)			
5)			

Attach separate list if necessary. Attach documentation.

Scoring:

Number of provincially significant plant species in the wetland:

One species	=	50 points	14 species	=	154
2 species	=	80	15 species	=	156
3 species	=	95	16 species	=	158
4 species	=	105	17 species	=	160
5 species	=	115	18 species	=	162
6 species	=	125	19 species	=	164
7 species	=	130	20 species	=	166
8 species	=	135	21 species	=	168
9 species	=	140	22 species	=	170
10 species	=	143	23 species	=	172
11 species	=	146	24 species	=	174
12 species	=	149	25 species	=	176
13 species	=	152			

Add one point for every species past 25 (for example, 26 species = 177 points, 27 species = 178 points etc.)

Provincially Significant Plant Species Score (no maximum) Ø

25

Southern Ontario Wetland Evaluation, Data and Scoring Record December 2002

4.1.2.5 REGIONALLY SIGNIFICANT SPECIES (SITE REGION)

Scientific names must be recorded for plant species. **Lists of significant species must be approved by MNR.**

SIGNIFICANT IN SITE REGION:

	Common Name	Scientific Name	Source of information
1)			
2)			
3)			
4)			
5)			
6)			
7)			
8)			

Attach separate list if necessary. Attach documentation

Scoring:

No. of species significant in Site Region

One species	=	20	6 species	=	55
2 species	=	30	7 species	=	58
3 species	=	40	8 species	=	61
4 species	=	45	9 species	=	64
5 species	=	50	10 species	=	67

Add one point for every species past 10. (No maximum score)

Regionally Significant Species Score (Site Region) (no maximum) 0

26

Southern Ontario Wetland Evaluation, Data and Scoring Record December 2002

4.2.1.6 LOCALLY SIGNIFICANT SPECIES (SITE DISTRICT)

Scientific names must be recorded for plant species. **Lists of significant species must be approved by MNR.**

	Common Name	Scientific Name	Source of information
1)			
2)			
3)			
4)			
5)			
6)			
7)			
8)			
9)			
10)			

Attach separate list if necessary. Attach documentation.

Scoring:

No. of species significant in Site District

One species	=	10	6 species	=	41
2 species	=	17	7 species	=	43
3 species	=	24	8 species	=	45
4 species	=	31	9 species	=	47
5 species	=	38	10 species	=	49

For each significant species over 10 in the wetland, add 1 point.

Locally Significant Species Score(Site District) (no maximum)

27

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

4.2 SIGNIFICANT FEATURES AND/OR FISH & WILDLIFE HABITAT

4.2.1 NESTING OF COLONIAL WATERBIRDS

Status	Name of species	Source of Information	Score
1) Currently nesting			50 points
2) Known to have nested within past 5 years			25
3) Active feeding area (Do not include feeding by great blue herons)			15
4) None known			0

Attach documentation (nest locations, etc., if known)

Score highest applicable category only; maximum score 50 points.

Score for Nesting Colonial Waterbirds (maximum 50 points) Ø

4.2.2. WINTER COVER FOR WILDLIFE

(Check only highest level of significance) (one only)		Score
1) _____	Provincially significant 100	
2) _____	Significant in Site Region	50
3) _____	Significant in Site District	25
3) _____	Locally significant	10
4) _____	Little or poor winter cover present	0

Source of information: _____

Winter Cover for Wildlife Score (maximum 100 points) Ø

28

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

4.2.3 WATERFOWL STAGING AND/OR MOULTING

(Check only highest level of significance for both staging and moulting; score is cumulative across columns, maximum score 150)

	Staging	Score (one only)	Moulting	Score (one only)
1) Nationally significant		150		150
2) Provincially significant		100		100
3) Regionally significant		50		50
4) Known to occur		10		10
5) Not possible		0		0
6) Unknown		0		0

Source of information: pers

Waterfowl Moulting and Staging Score (maximum 150 points) 0

4.2.4 WATERFOWL BREEDING

(Check only highest level of significance)		Score
1)	Provincially significant	100
2)	Regionally significant	50
3)	Habitat suitable	10
4)	Habitat not suitable	0

Source of information: pers

Waterfowl Breeding Score (maximum 100 points) 0

4.2.5 MIGRATORY PASSERINE, SHOREBIRD OR RAPTOR STOPOVER AREA

(check highest applicable category)		Score
1)	Provincially significant	100
2)	Significant in Site Region	50
3)	Significant in Site District	10
4)	Not significant	0

Source of information: pers

Passerine, Shorebird or Raptor Stopover Score (maximum 100 points) 0

29

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

4.2.7 FISH HABITAT

4.2.7.1 Spawning and Nursery Habitat

Table 5. Area Factors for Low Marsh, High Marsh and Swamp Communities.

No. of ha of Fish Habitat	Area Factor
< 0.5 ha	0.1
0.5 - 4.9	0.2
5.0 - 9.9	0.4
10.0 - 14.9	0.6
15.0 - 19.9	0.8
20.0+ ha	1.0

Step 1:

✓ Fish habitat is not present within the wetland (Score = 0)

___ Fish habitat is present within the wetland (Go to Step 2)

Step 2: Choose only one option

1) ___ Significance of the spawning and nursery habitat within the wetland is known (Go to Step3)

2) ___ Significance of the spawning and nursery habitat within the wetland is not known (Go through Steps 4, 5, 6, and 7)

Step 3: Select the highest appropriate category below, attach documentation:

1) ___	Significant in Site Region	100 points
2) ___	Significant in Site District	50
3) ___	Locally Significant Habitat (5.0+ ha)	25
4) ___	Locally Significant Habitat (<5.0 ha)	15

Score for Spawning and Nursery Habitat (maximum score 100 points) Ø

30

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

Step 4: Proceed to Steps 4 to 7 only if Step 3 was not answered.

(**Low Marsh** marsh area from the existing water line out to the outer boundary of the wetland)

✓ Low marsh not present (Continue to Step 5)
____ Low marsh present (Score as follows)

Scoring for Presence of Key Vegetation Groups

Scoring is based on the one most clearly dominant plant species of the dominant form in each Low Marsh vegetation community. Check the appropriate Vegetation Group (see Appendix 16, Table 16-2) for each Low Marsh community. Sum the areas of the communities assigned to each Vegetation Group and multiply by the appropriate size factor from Table 5.

Vegetation Group Number	Vegetation Group Name	Present as a Dominant Form (check)	Total Area (ha)	Area Factor (see Table 5)	Score	Final Score (area factor x score)
1	Tallgrass				6 pts	
2	Shortgrass-Sedge				11	
3	Cattail-Bulrush-Burreed				5	
4	Arrowhead-Pickerelweed				5	
5	Duckweed				2	
6	Smartweed-Waterwillow				6	
7	Waterlily-Lotus				11	
8	Waterweed-Watercress				9	
9	Ribbongrass				10	
10	Coontail-Naiad-Watermilfoil				13	
11	Narrowleaf Pondweed				5	
12	Broadleaf Pondweed				8	
Total Score (maximum 75 points)						

Step 5: (**High Marsh** area from the water line to the inland boundary of marsh wetland type. This is essentially what is commonly referred to as a wet meadow, in that there is insufficient standing water to provide fisheries habitat except during flood or high water conditions.)

✓ High marsh not present (Continue to Step 6)
____ High marsh present (Score as follows)

31

Southern Ontario Wetland Evaluation, Data and Scoring Record March 1993

Scoring for Presence of Key Vegetation Groups

Scoring is based on the one most clearly dominant plant species of the dominant form in each High 1Marsh vegetation community. Check the appropriate Vegetation Group (see Appendix 16, Table 16-2) for each High Marsh community. Sum the areas of the communities assigned to each Vegetation Group and multiply by the appropriate size factor from Table 5.

Vegetation Group Number	Vegetation Group Name	Present as a Dominant Form (check)	Total Area (ha)	Area Factor (see Table 5)	Score	Final Score (area factor x score)
1	Tallgrass				6 pts	
2	Shortgrass-Sedge				11	
3	Cattail-Bulrush-Burreed				5	
4	Arrowhead-Pickerelweed				5	
Total Score (maximum 25 points)						

Step 6: (**Swamp**: Swamp communities containing fish habitat, either seasonally or permanently Determine the total area of seasonally flooded swamps and permanently flooded swamps containing fish habitat.)

✓ Swamp containing fish habitat not present (Continue to Step 7)
____ Swamp containing fish habitat present (Score as follows)

Swamp containing fish habitat	Present (check)	Total area (ha)	Area Factor (see Table 5)	Score	TOTAL SCORE (factor x score)
seasonally flooded				10	
permanently flooded				10	
SCORE (maximum 20 points)					

Step 7: Calculation of final score

Score for Spawning and Nursery Habitat (Low Marsh) (maximum 75) = ____

Score for Spawning and Nursery Habitat (High Marsh) (maximum 25) = ____

Score for Swamp Containing Fish Habitat (maximum 20) = ____

Sum (maximum score 100 points) = Ø

32

Southern Ontario Wetlands Evaluation, Data and Scoring Record March 1993

4.2.6.2 Migration and Staging Habitat

Step 1:

1) ✓ Staging or Migration Habitat is not present in the wetland (Score = 0)

2) ___ Staging or Migration Habitat is present in the wetland, significance of the habitat is known (Go to Step 2)

3) ___ Staging or Migration Habitat is present in the wetland, significance of the habitat is not known (Go to Step 3)

NOTE: Only one of Step 2 or Step 3 is to be scored.

Step 2: Select the highest appropriate category below, attach documentation:

			Score
1)	___	Significant in Site Region	25 points
2)	___	Significant in Site District	15
3)	___	Locally Significant	10
4)	___	Fish staging and/or migration habitat present, but not as above	5

Score for Fish Migration and Staging Habitat (maximum score 25 points)

Step 3: Select the highest appropriate category below based on **presence** of the designated site type (does not have to be dominant). See Section 1.1.3. Note name of river for 2) and 3).

			Score
1)	___	Wetland is riverine at rivermouth or lacustrine at rivermouth	25 points
2)	___	Wetland is riverine, within 0.75 km of rivermouth	15
3)	___	Wetland is lacustrine, within 0.75 km of rivermouth	10
4)	___	Fish staging and/or migration habitat present, but not as above	0

Score for Staging and Migration Habitat (maximum score 25 points) Ø

33

Southern Ontario Wetlands Evaluation, Data and Scoring Record March 1993

4.3 ECOSYSTEM AGE

(Fractional Area = area of wetland/total area of wetland area)

	Fractional Area	Scoring	
Bog	_____	x 25	_____
Fen, treed to open on deep soils, floating mats or marl	_____	x 20	_____
Fen, on limestone rock	_____	x 5	_____
Swamp	1.0	x 3	3
Marsh	_____	x 0	_____

Ecosystem Age Score (maximum 25 points) 3

4.4 GREAT LAKES COASTAL WETLANDS

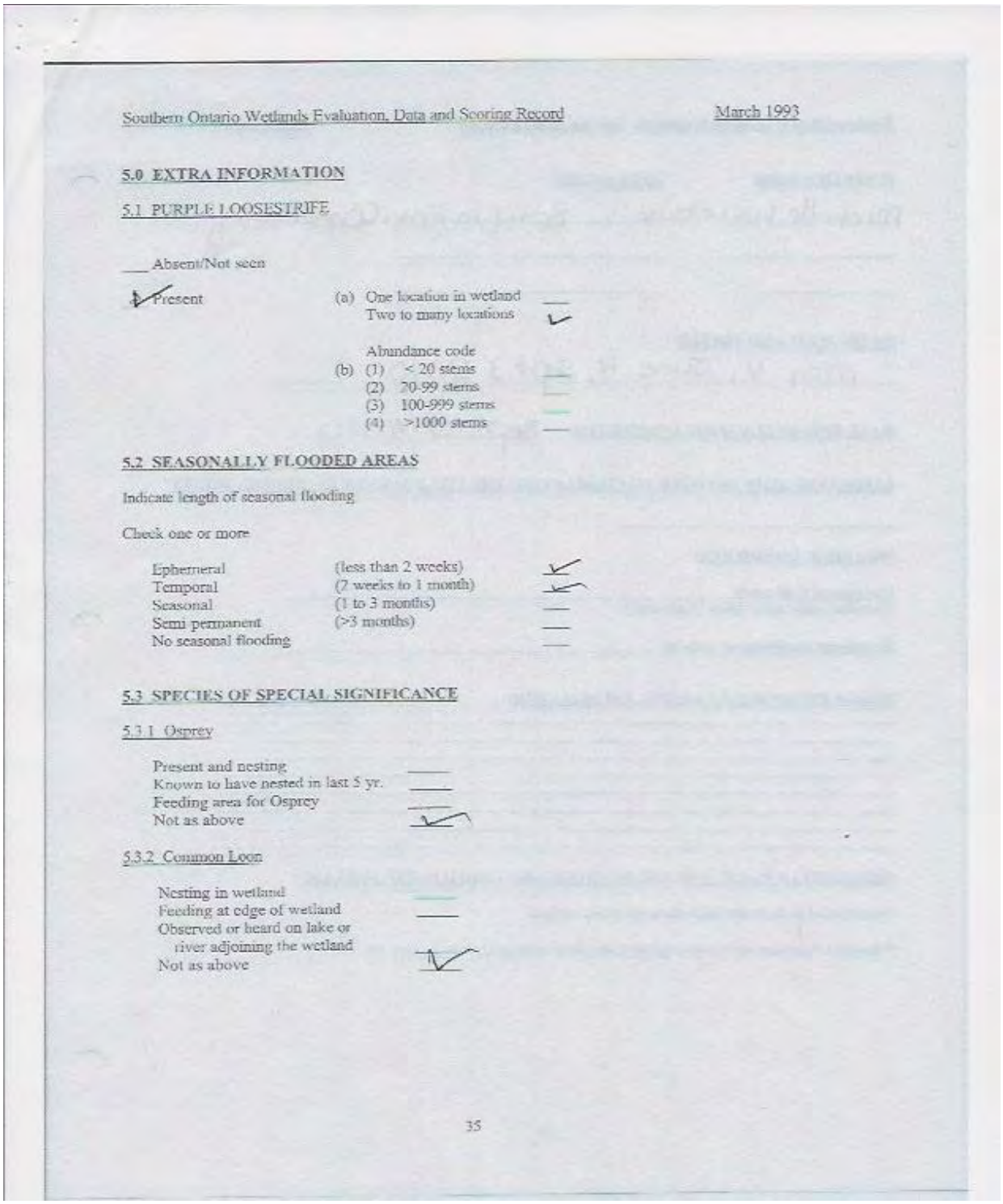
Score for coastal (see text for definition) wetlands only

Choose one only

____ wetland <10 ha	= 10 points
____ wetland 10-50 ha	= 25
____ wetland 51-100 ha	= 50
____ wetland >100 ha	= 75

Great Lakes Coastal Wetlands Score (maximum 75 points) 0

34



Southern Ontario Wetlands Evaluation, Data and Scoring Record March 1993

5.0 EXTRA INFORMATION

5.1 PURPLE LOOSESTRIFE

___ Absent/Not seen

✓ Present

(a) One location in wetland ___
Two to many locations ✓

Abundance code
(b) (1) < 20 stems ___
(2) 20-99 stems ___
(3) 100-999 stems ___
(4) >1000 stems ___

5.2 SEASONALLY FLOODED AREAS

Indicate length of seasonal flooding

Check one or more

Ephemeral	(less than 2 weeks)	✓
Temporal	(2 weeks to 1 month)	✓
Seasonal	(1 to 3 months)	___
Semi permanent	(>3 months)	___
No seasonal flooding		___

5.3 SPECIES OF SPECIAL SIGNIFICANCE

5.3.1 Osprey

Present and nesting	___
Known to have nested in last 5 yr.	___
Feeding area for Osprey	___
Not as above	✓

5.3.2 Common Loon

Nesting in wetland	___
Feeding at edge of wetland	___
Observed or heard on lake or river adjoining the wetland	✓
Not as above	___

35

Southern Ontario Wetlands Evaluation, Data and Scoring Record March 1993

INVESTIGATORS AFFILIATION

Michelle Lawrence Bowfin Env. Consulting

DATES WETLAND VISITED

May 4, June 4, Sept 3 2010

DATE THIS EVALUATION COMPLETED: Sept 15 /2010

ESTIMATED TIME DEVOTED TO COMPLETING THE FIELD SURVEY IN "PERSON HOURS"

WEATHER CONDITIONS

i) at time of field work
(Continue in the space below if necessary)

ii) summer conditions in general

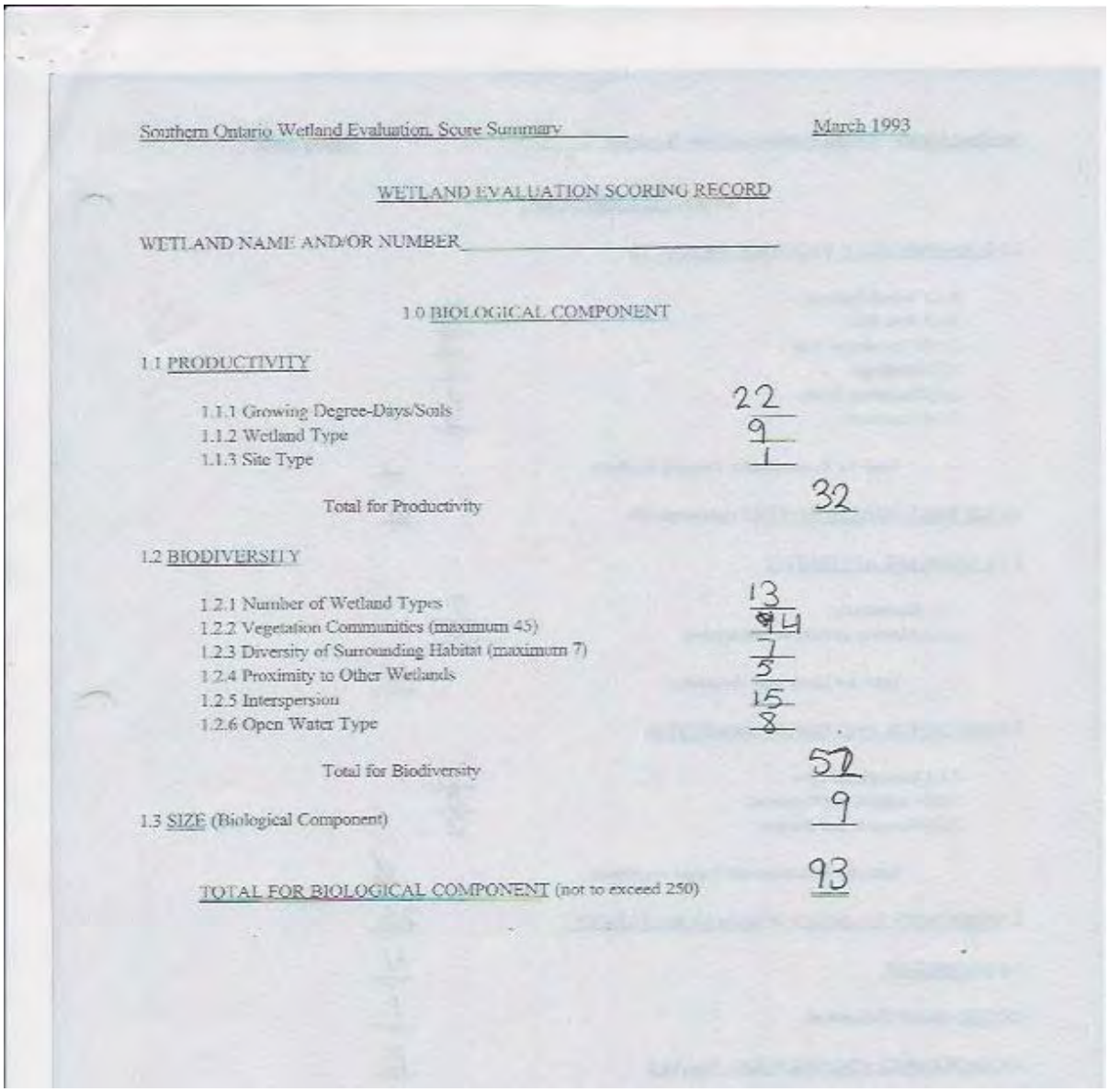
OTHER POTENTIALLY USEFUL INFORMATION:

CHECKLIST OF PLANT AND ANIMAL SPECIES RECORDED IN THE WETLAND:

Attach list of all flora and fauna observed in the wetland.

* Indicate if voucher specimens or photos have been obtained, where located, etc.

36



Southern Ontario Wetland Evaluation, Score Summary March 1993

WETLAND EVALUATION SCORING RECORD

WETLAND NAME AND/OR NUMBER _____

1.0 BIOLOGICAL COMPONENT

1.1 PRODUCTIVITY

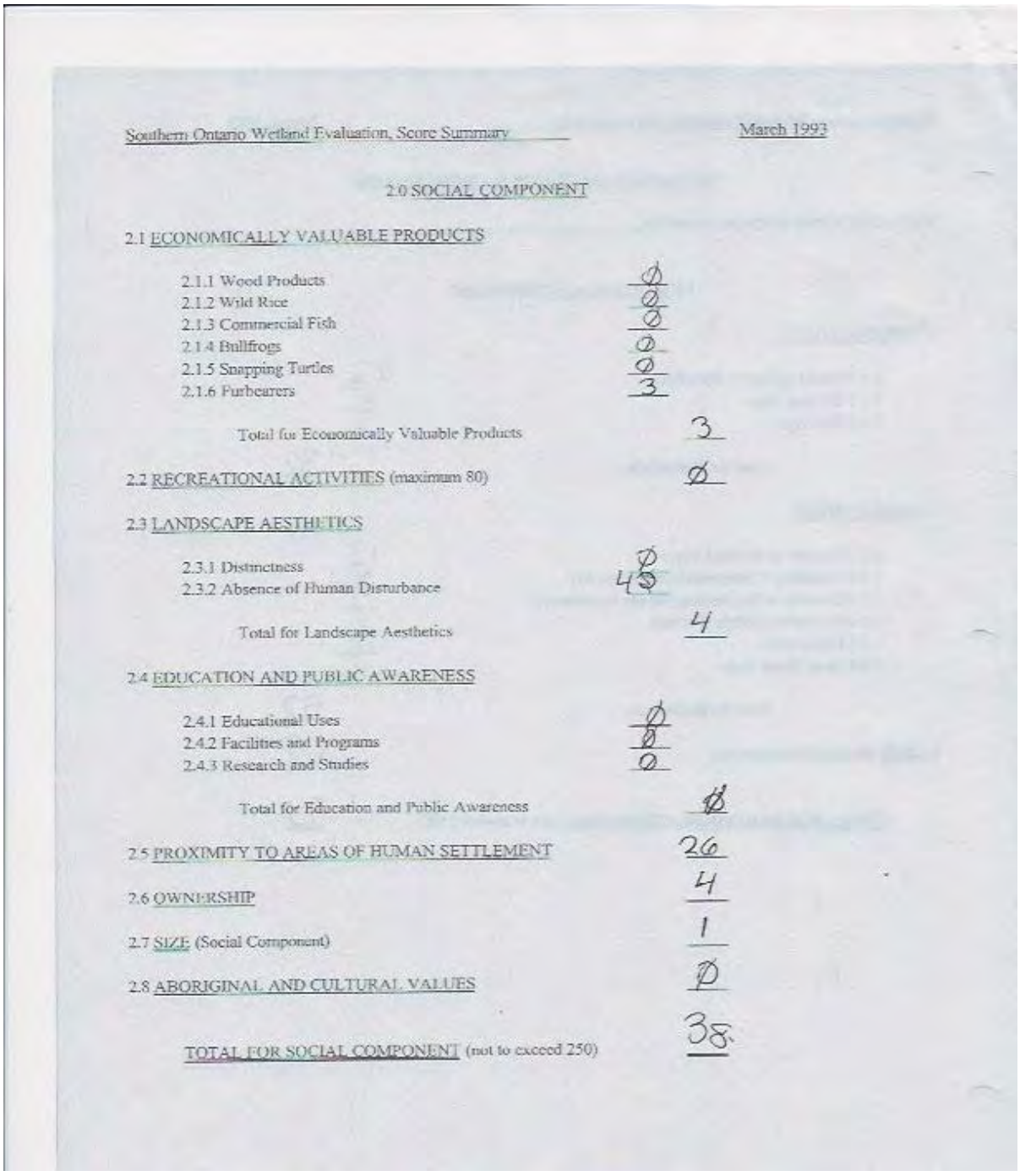
1.1.1 Growing Degree-Days/Soils	22
1.1.2 Wetland Type	9
1.1.3 Site Type	1
Total for Productivity	32

1.2 BIODIVERSITY

1.2.1 Number of Wetland Types	13
1.2.2 Vegetation Communities (maximum 45)	14
1.2.3 Diversity of Surrounding Habitat (maximum 7)	7
1.2.4 Proximity to Other Wetlands	5
1.2.5 Interspersion	15
1.2.6 Open Water Type	8
Total for Biodiversity	52

1.3 SIZE (Biological Component) 9

TOTAL FOR BIOLOGICAL COMPONENT (not to exceed 250) 93



Southern Ontario Wetland Evaluation, Score Summary March 1993

2.0 SOCIAL COMPONENT

2.1 ECONOMICALLY VALUABLE PRODUCTS

2.1.1 Wood Products	Ø
2.1.2 Wild Rice	Ø
2.1.3 Commercial Fish	Ø
2.1.4 Bullfrogs	Ø
2.1.5 Snapping Turtles	Ø
2.1.6 Furbearers	3
Total for Economically Valuable Products	3

2.2 RECREATIONAL ACTIVITIES (maximum 80) Ø

2.3 LANDSCAPE AESTHETICS

2.3.1 Distinctness	Ø
2.3.2 Absence of Human Disturbance	4
Total for Landscape Aesthetics	4

2.4 EDUCATION AND PUBLIC AWARENESS

2.4.1 Educational Uses	Ø
2.4.2 Facilities and Programs	Ø
2.4.3 Research and Studies	Ø
Total for Education and Public Awareness	Ø

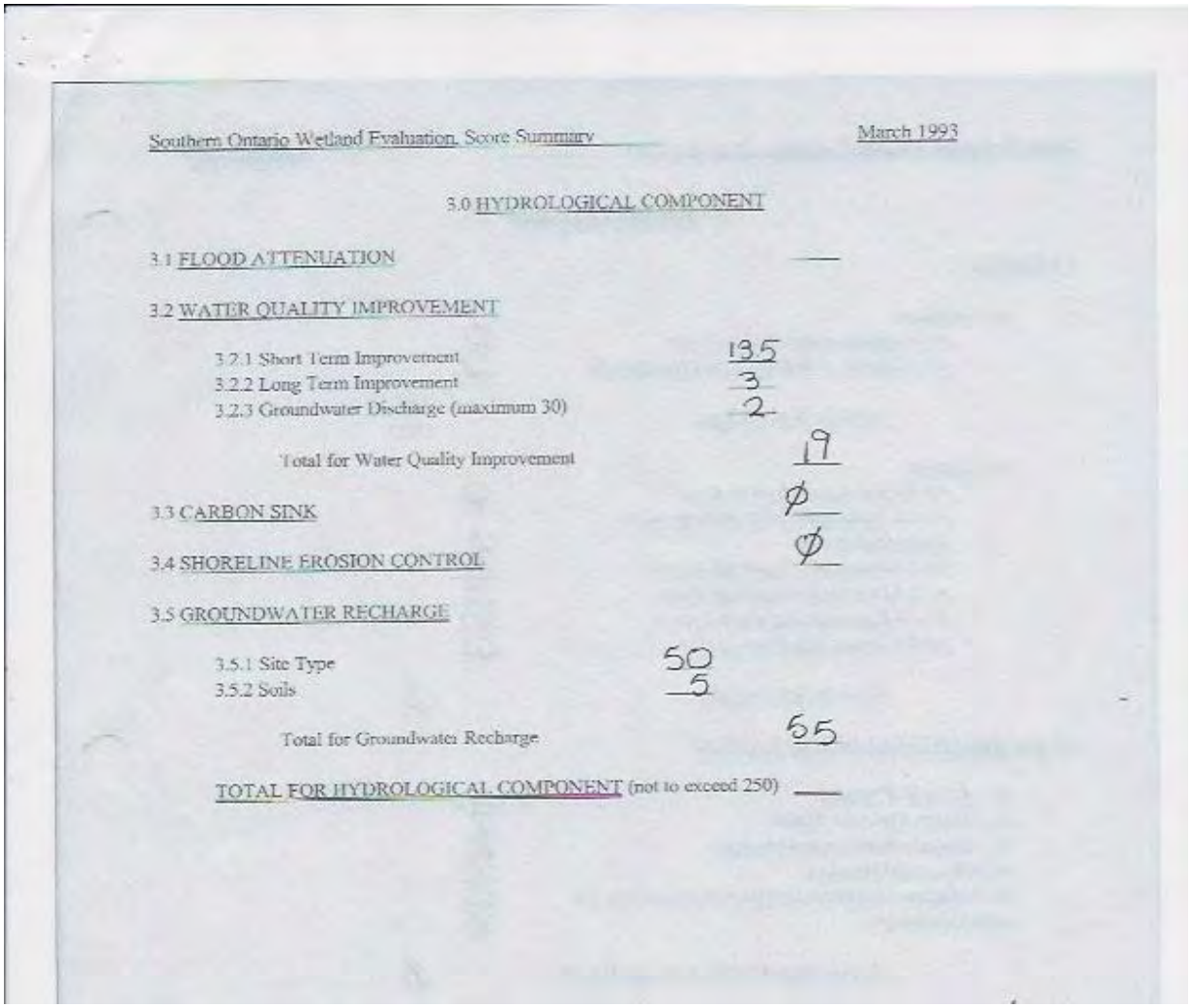
2.5 PROXIMITY TO AREAS OF HUMAN SETTLEMENT 26

2.6 OWNERSHIP 4

2.7 SIZE (Social Component) 1

2.8 ABORIGINAL AND CULTURAL VALUES Ø

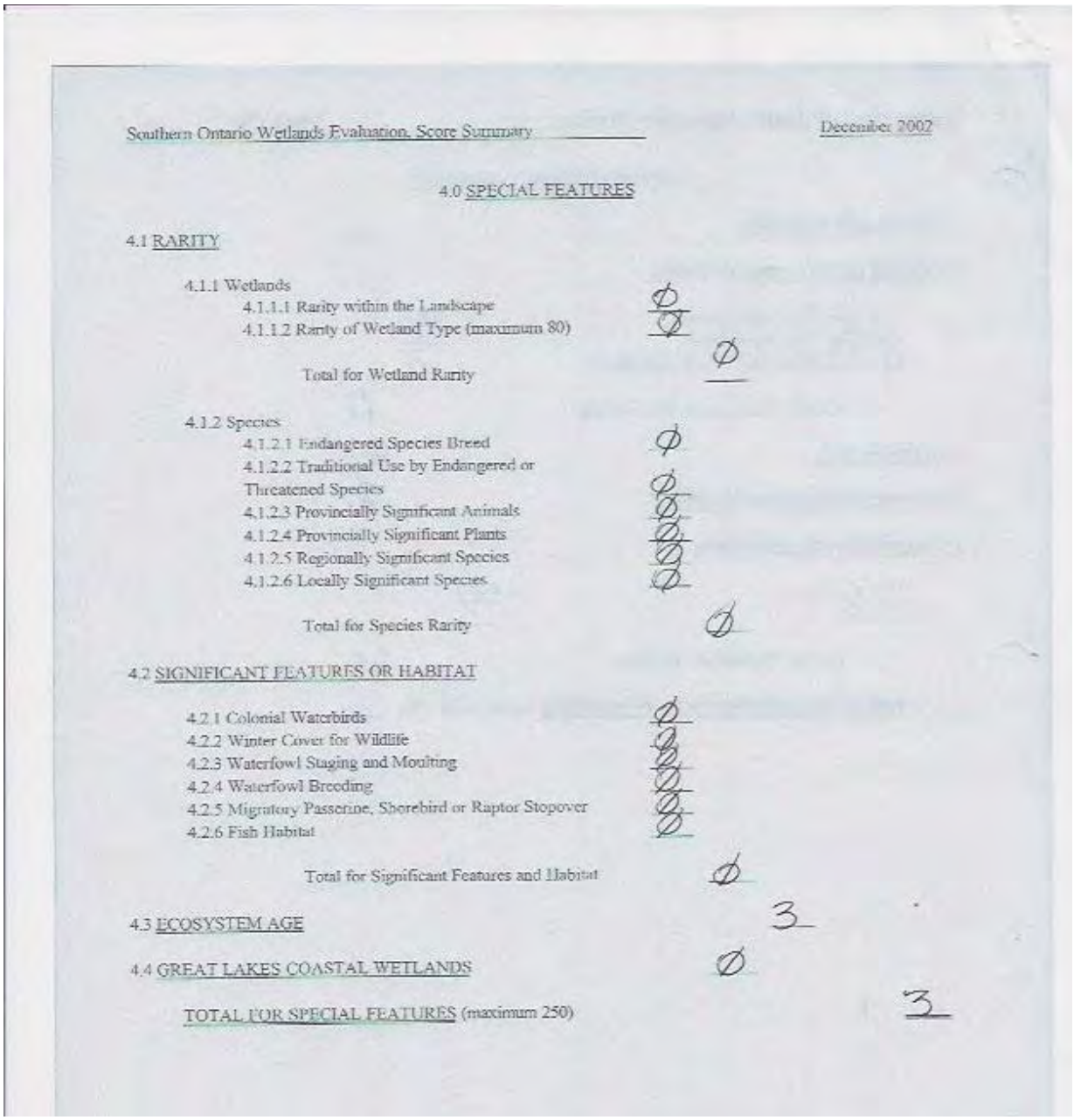
TOTAL FOR SOCIAL COMPONENT (not to exceed 250) 38



Southern Ontario Wetland Evaluation, Score Summary March 1993

3.0 HYDROLOGICAL COMPONENT

3.1 FLOOD ATTENUATION		—
3.2 WATER QUALITY IMPROVEMENT		
3.2.1 Short Term Improvement	13.5	
3.2.2 Long Term Improvement	3	
3.2.3 Groundwater Discharge (maximum 30)	2	
Total for Water Quality Improvement		19
3.3 CARBON SINK		ϕ
3.4 SHORELINE EROSION CONTROL		ϕ
3.5 GROUNDWATER RECHARGE		
3.5.1 Site Type	50	
3.5.2 Soils	5	
Total for Groundwater Recharge		55
TOTAL FOR HYDROLOGICAL COMPONENT (not to exceed 250)		—



Southern Ontario Wetlands Evaluation, Score Summary December 2002

4.0 SPECIAL FEATURES

4.1 RARITY

4.1.1 Wetlands
- 4.1.1.1 Rarity within the Landscape: Ø
- 4.1.1.2 Rarity of Wetland Type (maximum 80): Ø

Total for Wetland Rarity: Ø

4.1.2 Species
- 4.1.2.1 Endangered Species Breed: Ø
- 4.1.2.2 Traditional Use by Endangered or Threatened Species: Ø
- 4.1.2.3 Provincially Significant Animals: Ø
- 4.1.2.4 Provincially Significant Plants: Ø
- 4.1.2.5 Regionally Significant Species: Ø
- 4.1.2.6 Locally Significant Species: Ø

Total for Species Rarity: Ø

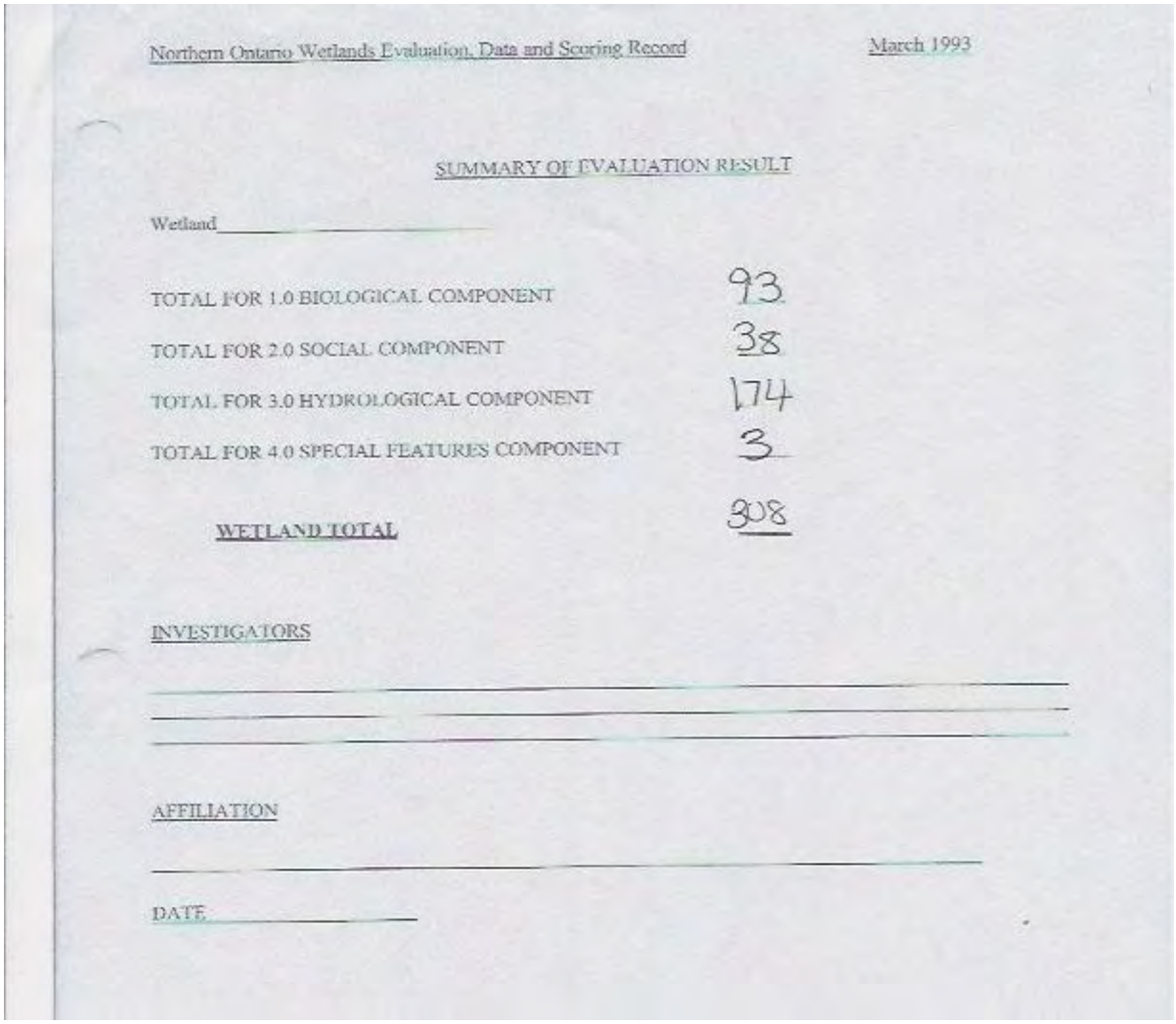
4.2 SIGNIFICANT FEATURES OR HABITAT
- 4.2.1 Colonial Waterbirds: Ø
- 4.2.2 Winter Cover for Wildlife: Ø
- 4.2.3 Waterfowl Staging and Moulting: Ø
- 4.2.4 Waterfowl Breeding: Ø
- 4.2.5 Migratory Passerine, Shorebird or Raptor Stopover: Ø
- 4.2.6 Fish Habitat: Ø

Total for Significant Features and Habitat: Ø

4.3 ECOSYSTEM AGE: 3

4.4 GREAT LAKES COASTAL WETLANDS: Ø

TOTAL FOR SPECIAL FEATURES (maximum 250): 3



Northern Ontario Wetlands Evaluation, Data and Scoring Record March 1993

SUMMARY OF EVALUATION RESULT

Wetland _____

TOTAL FOR 1.0 BIOLOGICAL COMPONENT	93
TOTAL FOR 2.0 SOCIAL COMPONENT	38
TOTAL FOR 3.0 HYDROLOGICAL COMPONENT	174
TOTAL FOR 4.0 SPECIAL FEATURES COMPONENT	3
WETLAND TOTAL	308

INVESTIGATORS

_____

_____

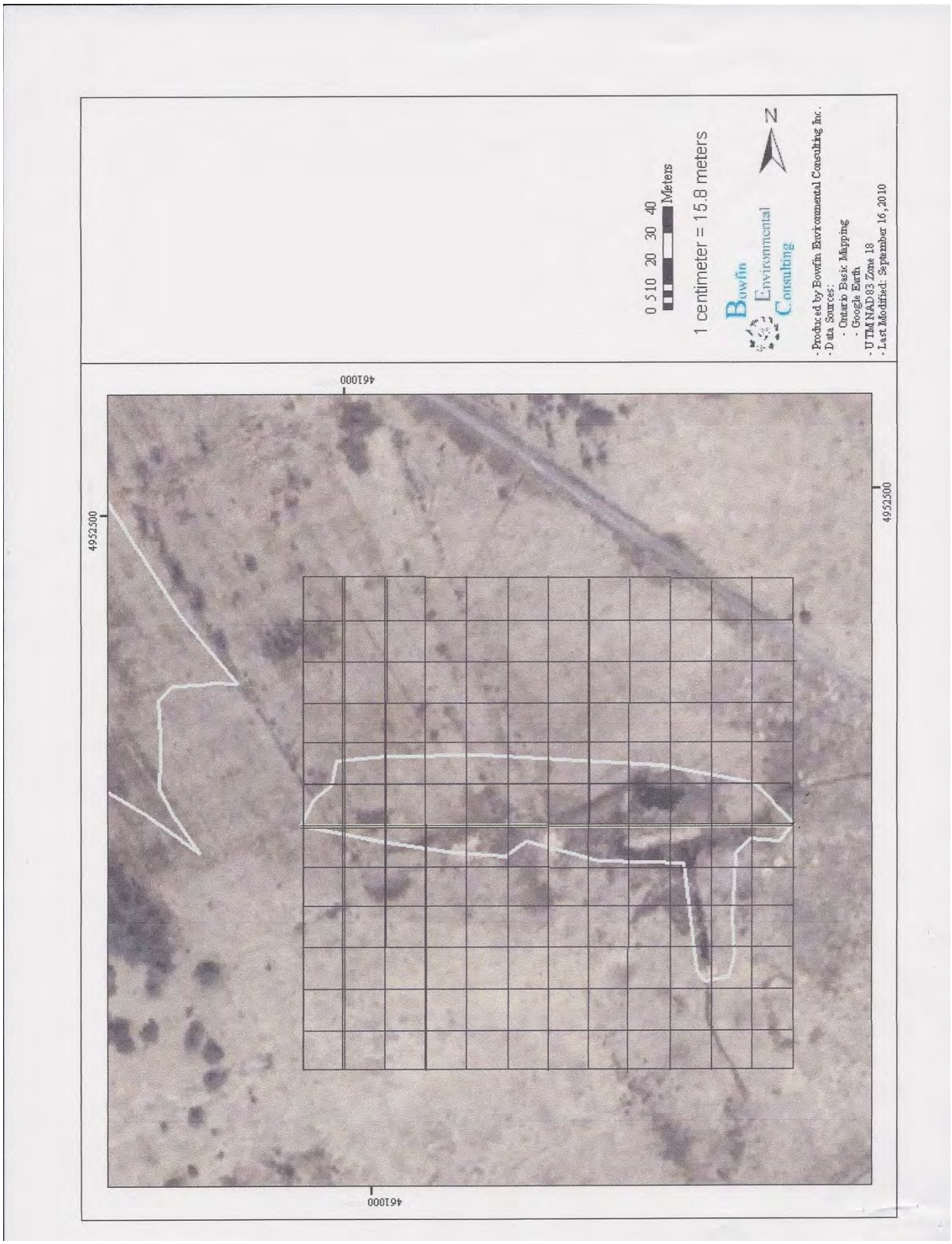
_____

AFFILIATION

_____

DATE _____


4952000
460000
4953000
461000
460000
4952000
462000
4954000
461000
4953000
462000
4954000
90
85
25
Legend
Basin (40.9 Hectares)
Upstream Basin (19.9 Hectares)
Wetland
0 65 130 260 390 520
Meters
1:12,084
Bowfin Environmental Consulting
- Produced by Bowfin Environmental Consulting Inc.
- Data Sources:
- Ontario Basic Mapping
- UTM NAD 83 Zone 18
- Last Modified: September 16, 2010


0 5 10 20 30 40
Meters
1 centimeter = 15.8 meters
N
Bowfin Environmental Consulting
- Produced by Bowfin Environmental Consulting Inc.
- Data Sources:
- Ontario Basic Mapping
- Google Earth
- UTM NAD 83 Zone 18
- Last Modified: September 16, 2010
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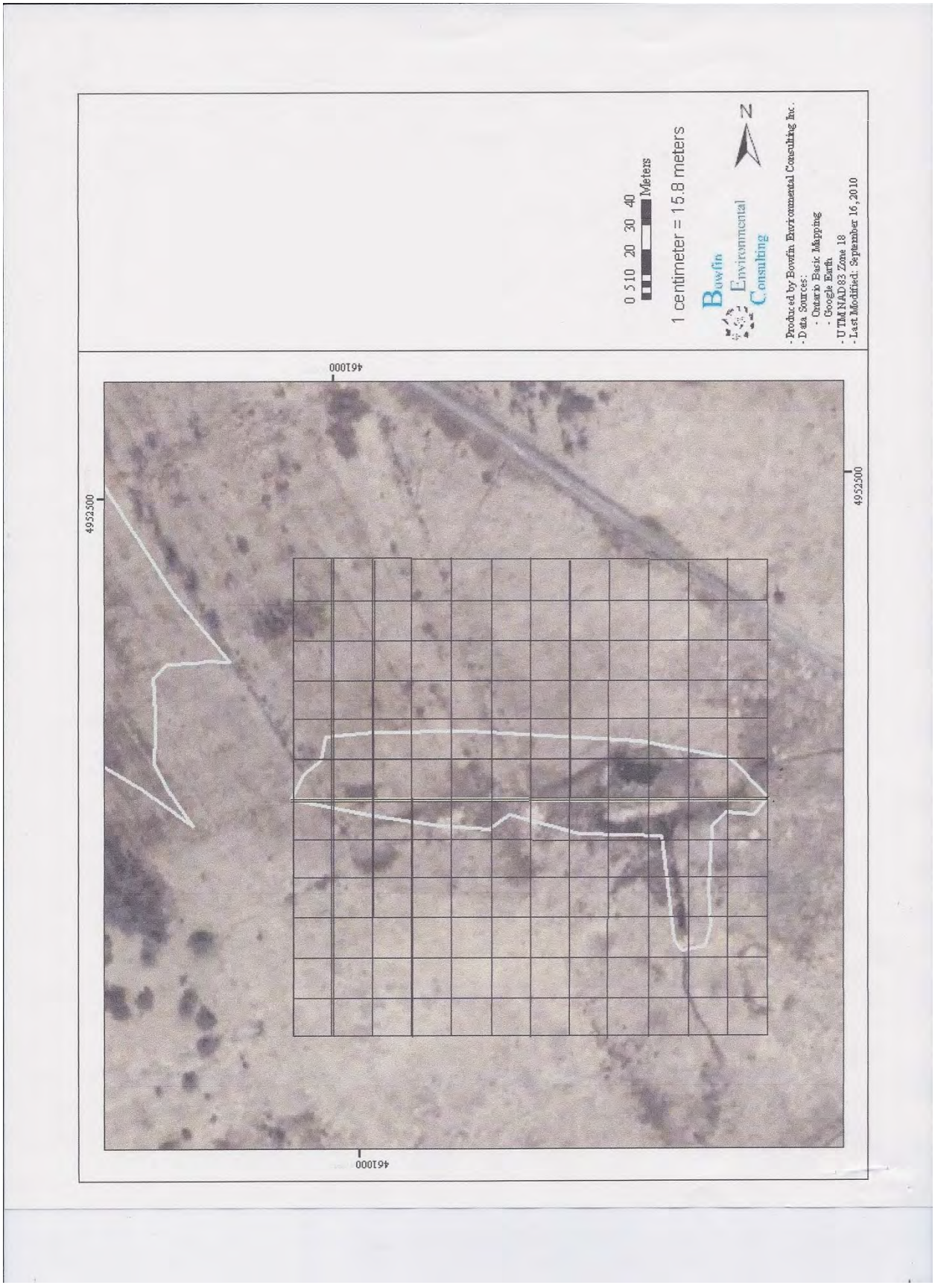
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Appendix J – Site Concept Plan