

**ADDENDUM TO THE  
POINT ACONI SURFACE COAL MINE AND RECLAMATION  
ENVIRONMENTAL REGISTRATION DOCUMENT  
SUPPLEMENTAL INFORMATION  
ON FAUNA, FISHING, AND FARMING**

# **PIONEER COAL LIMITED**

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Nova Scotia Environment and Labour  
P. O. Box 2107  
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**Attention: Peter Geddes**  
**Environmental Assessment Coordinator**

Dear Mr. Geddes:

**Re: Surface Coal Mine & Reclamation Project -  
Prince Mine Site**

Please find attached an Addendum to the Environmental Registration Document. This addendum supplements the document originally submitted for Environmental Assessment Approval on June 1, 2005 and contains information on fauna, fishing and farming as requested by NSDEL in your Minister's letter dated June 27, 2005. We also enclose a cheque in the amount of \$4,473.00 for the required fees.

Yours very truly,

**PIONEER COAL LIMITED**



John W. Chisholm  
President

JWC/ct  
Encls.

**Addendum to the Point Aconi Surface Coal Mine and Reclamation Environmental  
Registration Document: Supplemental Information on Fauna, Fishing, and  
Farming**

## **INTRODUCTION**

The supplementary information provided in this document has been prepared to specifically address items noted in the NSDEL response letter of June 27, 2005 regarding the above noted project (Appendix A). The Addendum has been organized to present supplementary information to that already submitted in the Environmental Assessment Registration document (EARD) submitted by Pioneer Coal Limited in June, 2005. Where possible, the supplementary information has been referenced to the corresponding section in the original EARD. The majority of the supplementary information has been provided in Appendix B, the Supplementary Biological Data Report, prepared by Dillon Consulting Limited. Tables (6-1 Potential Impacts on VESCs Matrix and 8-1 Residual Impact Assessment) have been updated using the information collected by Dillon and are presented in their updated form in Appendix C. Where a section is new, i.e. was not in the original EARD, this has been noted as NEW SECTION AND TEXT. Where a section has had additional text, i.e. supplementary text added, this has been noted as SUPPLEMENTAL TEXT. Where a section has text that should replace the existing text, this is noted as REPLACEMENT SECTION or REPLACEMENT TEXT as appropriate. An additional Figure has been provided displaying information on local land uses including agricultural land (Appendix D). The wetland evaluation forms are provided in Appendix E.

## **SUPPLEMENTAL TEXT**

### **4.6.1 Freshwater Habitat**

There are two watercourses within the project area, Coal Hollow Brook, which drains to the east into St. Andrew's Channel, and Morrison Brook, which drains to the west into the outlet of the Bras d'Or Lakes.

Neither Coal Hollow Brook nor Morrison Brook are considered to be fish habitat by DFO owing to exposed coal seams, bootleg mining activity within the watercourses, and low pH levels. Morrison Pond was historically used as a settling pond (Crocker, pers. Comm. 2005).

Emptying westward into the Great Bras d'Or is an unnamed tributary approximately 500 m southwest of the project area that was realigned during the construction of the Point Aconi generating station. Two kilometres to the southwest of the project area, Fifes and MacAuley Brook converge into Mill Brook and empty into the Great Bras d'Or. The Mill Pond system is not part of the project area's watershed.

To the south of the site emptying eastward into the Little Bras d'Or are two unnamed watercourses north of McCreadyville, at a distance of approximately 400m and 1 km from the project, and Crawley Brook 1.5 km south of the project. These watercourses are located in the same watershed as the project.

Fifes, MacAuley, Mill and Crawley Brooks are considered by DFO to be fish habitat and are likely salmon bearing watercourses (Crocker, pers. Comm; Amiro, Pers. Comm).

## **SUPPLEMENTAL TEXT**

### **4.6.2 Marine Habitat**

A survey of fishers undertaken by DFO in 1998 identified active herring spawning locations, particularly in the spring, along the coast of Boularderie Island (Clark et al. 1999).

The area around the Bird Islands, approximately 8 km northwest from the project site, is known to be an important juvenile rearing area for resident cod during the summer (DFO 1996).

## **SUPPLEMENTAL TEXT**

### **4.6.3.1 Flora**

A variety of terrestrial habitat types are present within the proposed extraction and adjacent areas. Appendix B provides a summary of habitats identified. The majority of the habitat present within the proposed extraction area is second growth mixed forest that has been extensively disturbed by historical bootleg coal pit activities and what appears to be local firewood removal. In addition, a section of coniferous forest is located south of Sheri Lee Lane / Mill Pond Road. This area is dominated by white spruce regeneration of an old pasture area. Wetland habitats are discussed in a separate section below.

An evaluation of potential for at risk plant species is also provided in Appendix B. Potential habitats were not confirmed on site for federally or provincially protected species.

## **SUPPLEMENTAL TEXT**

### **4.6.3.2 Fauna**

The Bird Islands support the largest colonies of nesting seabirds in Nova Scotia. The area was designated as an Important Bird Area by BirdLife International, a non-governmental organization, in 1999. The two Bird Islands, Hertford and Ciboux, are located at the eastern edge of St. Anns Bay, offshore from Cape Dauphin approximately 8 km northwest of the project area (McCorquodale et. al.)

The following table shows foraging distances of birds nesting at the Bird Islands.

| <b>Species</b>           | <b>Foraging Distance from Colony</b> |
|--------------------------|--------------------------------------|
| Atlantic Puffin          | 3 to 100 km, typically 5 km          |
| Black guillemot          | 1.5 to 4 km                          |
| Black-legged kittiwake   | Up to 50 km                          |
| Double-crested cormorant | 1 to 10 km                           |
| Great black-backed gull  | Up to 100 km, typically within 20 km |
| Great cormorant          | Probably < 5 km                      |
| Herring gull             | Up to 100 km, typically within 20 km |
| Razorbill                | Probably up to 15 km                 |
| Spotted sandpiper        | Feed in intertidal, less than 200 m  |

*CEF Consultants Ltd. 2002*

*David McCorquodale*

Great cormorants, Double-crested cormorants, Herring gulls and Black-backed gulls forage and roost on the rocky islands near Point Aconi lighthouse. Razorbills and Kittiwakes are also seen regularly in the area.

Red-breasted mergansers, Common golden-eye, and Long-tail duck frequent the turbulent waters at the Point Aconi lighthouse from late October to April. The frequency of use depends on ice conditions.

Bank swallows nest along the shore in the sandy cliff edges of Boularderie Island. (McCorquodale pers. comm).

An evaluation of potential for at risk animal species is provided in Appendix B. Potential habitats were not confirmed on site for federally or provincially protected species. The site and surrounding habitat is not known to provide habitat for sensitive species. Animal species or their sensitive habitat listed under the NSNDR General Status as at risk or sensitive was not confirmed at the property. It is likely that bats use the area, although sensitive hibernating areas are unlikely. A Long-eared Owl (NSDNR sensitive) was identified a feeding in the general area, although nest sites were not identified within the proposed extraction area. Potential impacts to sensitive species such as bats or raptors include direct mortality or disruptions with potential to affect individuals or populations through alteration or loss of habitat (project footprint), disturbance of reproductive or feeding activities (generally due to noise or site activity), increased predation (natural predators, vehicle collision or hunting/trapping) due to increased traffic or disruption of migration patterns and habitat fragmentation. Accidental events could result in similar impacts.

Key potential impacts to terrestrial habitat/species relate to migratory birds. Migratory birds are protected under the *Migratory Birds Convention Act* (MCBA) which prohibits deposition of harmful substance such as oil to migratory birds or areas frequented by

migratory birds and prohibits disturbance/destruction of nests, eggs and nesting areas of migratory birds. Bird species identified at the site during July 2005 and in background data are listed in Appendix B. Migratory birds in the proposed project area reflect the habitats present. Species present are generally common throughout the regional area. No designated protected areas for migratory birds occur within the study area. No areas of high concentrations of migratory birds were observed such as breeding areas colonies, spring/fall staging area or wintering areas. As noted above, the Bird Islands are areas of higher diversity of migratory birds identified well outside of the proposed extraction area. Mature forest stands were not identified within the proposed site. There is some potential for habitat important to individual birds, such as nesting areas, snags, cavity trees within the forested area and edge feeding areas, however these habitat types are well represented outside of the proposed area of disturbance.

Potential impacts to migratory birds could include direct mortality or disruptions with potential to affect populations such as loss of habitat, habitat fragmentation or significant disruption of migration or reproduction.

Direct mortality of migratory birds could result from site development/clearing activities. Nests may be affected when trees are removed or clearing occurs.

Habitat loss may occur if present through site development/clearing activities. Accidental events may result in harmful substances entering the birds habitat. Mitigation measures associated with habitat loss are not expected to be required. Areas of habitat (breeding colonies, staging areas, areas of wintering concentrations) or other important habitat (supporting high abundance, high diversity, priority or at risk species) are not expected to occur within the proposed extraction/processing area. Mitigation/contingency for encountering nests is discussed under mortality issues. Habitat present will be removed over the extended time frame of the project. Habitat restoration will include natural regeneration and where appropriate enhanced regeneration focusing on existing native species and habitat types.

Little of the area can be determined currently to provide unfragmented habitat.

Disruption of migration is not expected due to the inland location, existing adjacent disturbed areas, limited lighting and localized activity at the site.

Disruption of reproduction is not expected to be significant at the property. Noise associated with site activities may disrupt individual birds nesting within several hundred metres of the active area, however similar habitat is available throughout the adjacent area and impacts at the population level or to at risk species are not expected.

## **REPLACEMENT SECTION**

### **4.6.4 Wetlands Habitat**

Wetland habitat have been identified for the site as outlined in Appendix 1, Dillon Supplemental Biological Data Report. Please refer to this Appendix for detail on wetland function and characterization. Appropriate wetland mitigation and replacement programs strategies have been provided in Section 6.4.2.11. Pioneer will consult with NSDNR and NSDEL with respect to wetlands to ensure that suitable programs to offset the removal of the 7.3 ha, 6.5 ha and 2.2 ha wetlands at the site as part of the mining operation. Note that the site is well suited for appropriate replacement programs for the wetlands as the site receives abundant rainfall, has a high diversity of wetland plant species present and has a number of soil types (organics and low permeability clay loam) amenable for constructing wetland habitats.

For the wetland adjacent to the proposed extraction area (1.8 ha), potential indirect impacts could include noise disturbance to resident or migratory species, changes to the groundwater and surface water regime, and related habitat changes and degradation of habitat through inputs of sediment or other contaminants (such as accidental hydrocarbon spills) carried in surface water.

Noise disturbance impacts may occur if species/populations of concern which are sensitive to noise reside in adjacent wetlands. Given this wetland is also adjacent to the Brogan Site, it is unlikely that sensitive species are present.

Changes to surface water regime may occur due to the site development, watershed changes, and discharge volume and timing. The majority of the wetland is downgradient of the site. Habitat degradation may be associated with deleterious substances or changes to surface water quality.

Potential effects to the groundwater regime in the vicinity of the wetlands noted for the site are present. The mining operations will cease after roughly 7 years with any localized groundwater effects quickly recovering to pre-mining conditions. No long term wetland, surface water or groundwater impacts are predicted.

Impacts are not predicted to the salt marsh wetland located to the south east within a separate watershed.

## **NEW SECTION**

### **4.8.9 Commercial Fisheries**

#### **4.8.9.1 Lobster**

The main commercial fishery along the shores of Boularderie Island is the Lobster fishery, in the central area of Lobster Fishing Area 27 (LFA 27). The lobster season runs annually from May 15<sup>th</sup> to July 15<sup>th</sup>.

Landings in LFA 27 remained fairly stable from 1947 until the mid 1980s when steady increases resulted in record high landings in 1990. In 1997, there were 1379 landings in LFA 27, 15% lower than in 1996. Lower lobster abundance is believed to be the main cause of landing declines (DFO, 1998).

Unofficial landings in pounds from 2002 to 2004 at the four ports surrounding the project area are as follows:

At Big Bras d'Or, to the southwest of the project, unofficial landings ranged from approximately 75,000 lbs to 110,000 lbs. To the southeast at Bras d'Or, there was a range of approximately 6000 to 18000 lbs and at Alder Point a range of approximately 200,000 to 260,000 lbs. At Point Aconi port, to the north of the project area, unofficial landings ranged from 30,000 to 70,000 lbs.

It is important to note that these numbers approximately reflect the landings at the aforementioned ports. The numbers may not represent the catch in the direct area, as lobster fished in the area may be landed at other ports, or lobster fished in other areas may be landed at the ports listed above.

Many lobster fishers fish lobster for their primary source of revenue, and then fish other species such as herring, mackerel, scallops, rock crab, smelts, gaspereau, groundfish etc. for bait or to supplement their fishing income (DFO, 2004).

#### **4.8.9.2 Rock Crab**

There is a directed exploratory rock crab fishery in Eastern Nova Scotia that began in 1993. By 1999 there were 27 active vessels. Exploratory licenses are distributed on the basis of Lobster Fishing Areas. LFA 27 has been further subdivided to encourage exploration of the potential rock crab grounds. Boularderie Island is closest to subdivided LFA 27.2. Fishing areas for rock crab include much of the Cape Breton Coast. Rock crab landings by the directed fishery increased 5-fold from 1994-1999, mainly in LFA 27.2. Total landings in 1999 in LFA 27.2 were 152 (DFO, 2000), which represents the largest directed rock crab fishery in Nova Scotia (Reeves, pers. Comm. 2005).



### **4.8.9.3 Snow Crab**

The waters surrounding Boularderie Island are in Snow Crab Fishing Area 22 (CFA 22). The Snow Crab season is July 22 to September 15<sup>th</sup>. Fishing effort in CFA 22 is not concentrated in the Boularderie Island area, but around the near shore trough shared with CFA 21 and part of CFA 20 and in and around the Glace Bay Hole (Biron et al. 2002). In 2004, in the inner region of CFA 22 there were 21 licenses, 30 traps, and a Total Allowable Catch (TAC) of 429. In the outer region of CFA 22, there were 16 licenses, 30 traps, and a TAC of 338. Catch rates (kg/th) in CFA 22 in 2004 were 100. Catch rates in the northern CFAs dropped 21% relative to 2003 and are currently at a 5 year low.

### **4.8.9.4 Sea Urchin**

There is also a small sea urchin fishery along the coasts of Cape Breton Island, but the resource has been largely untapped. In 1999-2000 season there was one active sea urchin license in Victoria County, and two active sea urchin licenses in Cape Breton County. In 1999-2000 80 tonnes of sea urchin were landed from September to April (DFO 2000b).

## **NEW SECTION**

### **4.8.10 Agriculture**

There are over 300 acres of land on Boularderie Island north of Highway 105 used for agricultural purposes (Koziel, Gary, NSDAF 2005). A large portion of this land is not owned by registered farms, but is leased short term by resident farmers (Bras d'Or Producers Co-op).

There are no Class 2 agricultural soils on Boularderie Island. The majority of Island agricultural land use occurs in Class 3 soils, which begin to be present approximately 2km south of the project (Gillis, July 27<sup>th</sup> 2005). Class 3 soils have moderately severe limitations that restrict the range of crops or require special conservation practices. The project is located in an area of Class 4 soils, which have severe limitations that restrict the range of crops or require special conservation practices (Canada Land Inventory).

In 2004-05 there were 10 registered farms in the Point Aconi/Millville area north of Highway 105, producing the following agricultural products or undertaking the following activities:

- 3 mixed vegetables (cabbage, turnip, lettuce, cauliflower, broccoli, cucumber, beans, pumpkins and others)
- 1 egg producer
- 2 greenhouse (cucumber, tomato, nursery stock, bedding plants)
- 1 forages (hayland)
- 3 small fruit/strawberry

- 1 grain
- 2 beef
- 1 provincially inspected abattoir
- 1 agritourism facility
- 2 farm markets

(Koziel, Gary, NSDAF, 2005)

There is a 12.5 hectare hayfield located on the west and east sides of Point Aconi Road just north of the former open pit mine on Lloyd Cove Seam. There is also a small hayfield (< 2 hectares) located on the north side of the Point Aconi Road south of Coal Hollow Brook within 300 metres of the project area. There are abandoned fields on both sides of Point Aconi Road between Sheri Lee Lane and Coal Hollow Brook.

South of the project area on Boularderie Island, there is an approximately 4 km<sup>2</sup> cluster of long term and rotation crop farms located north of Millville and west of Highway 162, approximately 2.5 km from the project area. There are several farms located along the shores of Mill Creek, between Mill Creek and Highway 105, as well as a concentration on either side of the local highway near Millville (CBRM 2001).

## NEW SECTION

**Note: Table 6-1 Potential Impacts on VESCs Matrix has been revised and is contained in Appendix C.**

### 6.2.1 Aquatic Potential Effects

#### 6.2.1.1 Freshwater

It is not anticipated that drawdown from mining operations will affect freshwater fish habitat. The portal to the existing underground workings and the box cut have historically affected the localized groundwater regime within the till and the bedrock creating a depression in the groundwater table centre at that location. A deepening of the existing depression will create drawdown, but will not significantly alter the existing hydrogeological system.

Evidence from the existing NSDEL well suggests that drawdown effects may extend up to 300m from the excavation and that it is unlikely that drawdown effects would occur at a distance greater than 800m. Past operations, including excavations of up to 20-25 m and dewatering operations in the underground mine resulted in a maximum 3 m drawdown, which is within the normal yearly fluctuation for the area.

The watercourses identified by DFO as fish habitat, Crawley Brook and Mill Brook, are located outside the 800m zone in which it is judged there is a potential for drawdown effects – Crawley Brook is 1.5km to the southeast of the mine site, and Mill Brook is 2km to the southwest of the mine site. Furthermore, Mill Brook is located in a different

watershed from the project and it is therefore not likely to be a discharge area for groundwater in the project area.

There are four watercourses located within 800 m of the project site. The on-site watercourses, Coal Hollow Brook and Morrison Brook, have been judged by DFO not to be fish habitat. The unnamed watercourse approximately 400 m from the site emptying eastward has an extremely low flow and may be intermittent. The unnamed watercourse approximately 500 m south of the site emptying westward was realigned during the construction of the Point Aconi generating station. It is not anticipated that drawdown from mining operations will decrease the flow rate of these watercourses. However, Pioneer Coal will monitor flow and will discuss any flow variations with the CLC and regulatory authorities. Pioneer Coal will also remain in contact with DFO to determine whether additional fish related studies will be required. Details of the comprehensive monitoring programs will be developed in consultation with DFO and NSDEL.

## **NEW SECTION**

### **6.2.1.2 Marine**

There is a potential for marine habitat to be affected by sedimentation, metals, or acidification from surface water discharge from Morrison Brook. Mitigation proposed to protect aquatic resources in section 6.2.2, including erosion control, surface water management, and acid drainage control, significantly reduces or eliminates the likelihood of adverse effects on marine habitat.

The Bird Islands are located over 5 km from the proposed site. Disturbance to nests is not expected given the similar nature of this project to past activities in this area, such as the Brogan Site.

Blasting in the immediate vicinity of marine waters if conducted will follow DFO's *1998 Guidelines for Use of Explosives In or Near Canadian Fisheries Waters* requiring written commitment to follow the *Blasting Fact Sheet - Fish and Fish Habitat Protection*.

Contingencies developed as part of Environmental Protection Planning (EPP) at the Industrial Approval stage are to prevent and minimize impact of accidental events such as hydrocarbon spills and include storm water control and wet weather shutdowns.

## **SUPPLEMENTAL TEXT**

### **6.4.1. Socio-Economic Potential Effects**

#### **6.4.1.1 Commercial Fisheries**

There is a potential for the near-shore commercial fishery at Black Rock and Point Aconi to be affected by sedimentation, metals, acidification, dust, or vibrations from blasting

activities. Mitigation proposed to protect aquatic resources in section 6.2.2, including erosion control, surface water management, and acid drainage control, significantly reduces or eliminates the likelihood of adverse effects on commercial fisheries in Black Rock and Point Aconi areas.

The project will respect provincial regulations regarding dust as well as mitigation measures proposed in section 6.4.2.1 of the report. With the implementation of these measures, dust deposition effects in the marine environment are not likely to occur. As discussed in the public consultation section, at the request of fishers, blasting will be undertaken before noon. The CLC will function as an information sharing body between fishers and Pioneer Coal.

#### **6.4.1.2 Agriculture**

Agricultural users are commercial users of groundwater on Boularderie Island. The approximately 12.5 ha hayfield located 1.5km to the northeast of the site is not expected to be affected by any drawdown effect because of its distance from the site and its location on the north side of the Brogan extraction area, a 20 – 30 m trough that disconnects the hayfield's immediate hydrogeological and hydrologic system from the proposed operation at Prince Mine.

Groundwater drawdown is not expected to impact agricultural land 2.5 km south of the project site and beyond because of the distance from the project area as well as its location outside of the project's watershed.

There is a small hayfield located approximately 300m south of the project site that was cut for hay in 2002 or 2003 and could be impacted negatively by a loss of soil moisture owing to groundwater drawdown. The field was not cut for hay in 2005 and it appears that the field is now part of a residential lot. Should the field be brought back into agricultural production, Pioneer will consult with the owner to determine whether they have any concerns relative to crop productivity and work with the owner to address any issues.

### **NEW SECTION**

#### **6.4.2.9 Terrestrial Species and Habitat Mitigation**

Mitigation measures proposed to prevent mortality of migratory birds include:

- scheduling clearing activities to occur outside the nesting period (at this location prior to early April is preferred)
- contingencies to be included as part of EPP; if ground nests encountered mechanical clearing and establish exclusion zone around nest during the breeding season; if cavity nests encountered cutting delayed until after

nesting season, consultation with NSDNR or Canadian Wildlife Service (CWS)

Generalized measures to reduce disturbance of terrestrial habitat and species could include:

- No wildlife harassment policy, limit use of ATVs
- scheduling to avoid sensitive periods
- modifications to activities
- development of blast buffers
- Limiting clearing/disturbed area at any given time.
- Avoid mechanical clearing and establish exclusion zones around bird ground nests during the breeding season.
- Salvage of merchantable timber.
- Flagging of areas to be cleared in advance.
- Maintenance of buffer zones from watercourses (permanent or intermittent) until within 1 week of clearing and grubbing.
- Topsoil stockpiling where sufficient material is present and reuse in reclamation.
- Sediment and erosion control plan including stabilization of open areas and appropriate drainage control.
- Dust control measures to reduce adverse impacts on plant and animal health.
- Waste management - removal of human waste, proper storage and removal of domestic garbage.
- Blasting to meet DFO guidelines near water.
- Petroleum, Oil and Lubricant (POL) handling procedures.
- Contingency planning.

## **NEW SECTION**

### **6.4.2.10 Potential At Risk Species Mitigation**

Although Long Eared Owl nests are not anticipated within the site area, if any raptor nests are encountered, NSDNR guidelines (Bald Eagle, Osprey, Colonial Birds, such as herons and cormorants and Woodland Hawk) will be followed.

Although bat hibernating areas are not known for the mining lease area, if encountered protection measures will include consultation with NSDNR and scientific experts to determine specific mitigation.

### **Contingency for At Risk Species**

Approaches to management of at risk species if unexpectedly encountered include prioritization of avoidance. If avoidance is not possible, mitigation measures will be implemented to minimize impact on the population. Where loss of individuals is anticipated, this will be undertaken within the context of maintaining the viability of the population and will be conducted in a manner contributing to the knowledge base of the species, its habitat, and interaction with development, in order to further long-term survival of the species.

Regulatory Consultation - As part of environmental protection planning, contingency planning and monitoring, the proponent will work with regulatory agencies such as NSDNR, Wildlife Division for on-going development of appropriate protection strategies and research initiatives where necessary. Monitoring reports will be submitted to NSDNR.

## **NEW SECTION**

### **6.4.2.11 Wetland Compensation and Mitigation**

It is recognized that avoidance of wetland impacts is a preferred approach, however, due to the location of the coal deposit, removal of the 7.3 ha, 6.5 ha and 2.2 ha wetlands is required. An assessment of these wetlands is provided in Appendix E.

Mitigation measures to limit effects to wetland 1.8 ha will include :

- minimizing disruption to surface water flow patterns
- sediment and erosion control as noted previously
- monitoring of surface water quality/quantity
- development of Environmental Protection Plans, Monitoring and Contingency Plans to limit potential for accidental discharge of contaminants as part of the Industrial Approval application

- maintenance of 30 m undisturbed buffer zone
- requirements for fuel and lubricant handling and equipment maintenance procedures such as designation of appropriate refueling and petroleum, oil and lubricants storage areas over 30 m from wetlands.

For the wetlands within the coal seam area, Pioneer is committed to a wetland compensation approach to be negotiated with NSDNR and NSDEL and other regulators as required. The general approach will be to recreate equivalent or better wetland habitat as part of the reclamation of the site. Based on the quality of the existing wetland habitat, a 1:1 ratio is proposed for the 6.5 ha wetland which was generally not evident in the field and for the 7.3 ha shrub bog which appears to be currently in transition to drier habitat. For the 2.2 ha wetland, which provides better wetland habitat, a 3 to 1 ratio is proposed. Although the priority site for wetland replacement will be on-site, Pioneer is willing to review off-site opportunities with interested parties.

## **SUPPLEMENTAL TEXT**

### **8.1 Residual Impacts**

**Note: Table 8-1 Residual Impact Assessment has been revised and is contained in Appendix C.**

#### Negative Residual Impacts

- Wetland habitats will be removed and replacement programs will take some time after mining operations to return to pre-mining functionality.

## **9.0 REFERENCES**

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Reeves, Alan. DFO, BIO. Telephone communication, July 20, 2005.

Zamora, Phil. DFO, BIO. Pers. Comm. July 21<sup>st</sup> 2005.



**APPENDIX A**

**NSDEL MINISTERS DECISION – JUNE 27, 2005**



**Department of  
Environment & Labour**

PO Box 697  
Halifax, Nova Scotia  
B3J 2T8

*Our File Number:*  
10700-40  
40100-30-91

Office of the Minister

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*Original dated June 27, 2005*

John W. Chisholm,  
President,  
Pioneer Coal Limited,  
P.O. Box 1328  
3098 Post Road  
Antigonish, N.S. B2G 2L7

Dear Mr. Chisholm:

**Re: Environmental Assessment - Surface Coal Mine and Reclamation Project -  
Prince Mine Site**

The environmental assessment of the proposed Surface Coal Mine and Reclamation Project, has been completed.

This letter is to advise that, pursuant to Section 13 (1)(a) of the *Environmental Assessment Regulations*, I have determined the registration information is insufficient to allow me to make a decision and that I require additional information.

The registration information submitted is deficient in its examination of flora, fauna and wetlands. Both Nova Scotia Department of Natural Resources (NSDNR) and Environment Canada have indicated that field studies for flora and fauna must be conducted in order to fully assess the potential environmental effects of the project. These studies must be submitted as more information. NSDNR also indicates that while the registration document indicates that no wetlands are present, existing mapping suggests that there are wetlands on the project site. Additional analysis is required to determine the presence or absence of wetlands, and if present, evaluations of their ecosystem function and significance is also required.

A number of public submissions were received with respect to potential effects on farming and fishing industries in the area. Additional information is required indicating how potential impacts to fishing and farming activities will be addressed if the project was to proceed.

Nova Scotia Environment and Labour has commissioned a study on the Cumulative Environmental Effects of Surface Coal Mines in CBRM. The study will provide an analysis of issues and recommendations for addressing concerns of all stakeholders. I will require the results of this report as a component of the more information to be submitted on this project. The study is expected to be completed by August 31<sup>st</sup>, and the final report will be considered in my decision on Pioneer Coal's proposed surface mine.

The information requested from Pioneer Coal can be submitted at your convenience, as an addendum to the original registration information. The proposed undertaking is a Category II Environmental Assessment under the Fee Schedule and will therefore require an \$4,473.00 registration fee at the time of submission of your additional information. A cheque should be made payable to the Minister of Finance.

Pioneer Coal Limited shall not commence the undertaking or any part thereof until the undertaking has been approved under Part IV of the *Environment Act*.

Yours truly,

***Original Signed By***

Kerry Morash  
Minister

**APPENDIX B**

**SUPPLEMENTARY BIOLOGICAL DATA REPORT  
PREPARED BY DILLON CONSULTING LIMITED**

September 15, 2005



MGI LIMITED  
31 Gloster Court  
Dartmouth, Nova Scotia  
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ATTENTION: Mr. Peter Oram, P.Geo.  
Project Manager

***Supplementary Biological Data Collection – Prince Mine Site***

The following provides additional information related to flora and fauna and wetlands for the Environmental Assessment – Surface Coal Mine and Reclamation Project – Prince Mine Site as requested in the Minister of Environment and Labour (NSDEL) letter (June 27, 2005). Dillon Consulting Limited (Dillon) contacted the Nova Scotia Department of Natural Resources (NSDNR) Wildlife Division to assess requirements to examine these supplemental items. This letter provides results of the supplemental biological data collection components.

**1.0 BIOLOGICAL DATA COLLECTION METHODS**

**1.1 Flora and Fauna/Potential Sensitive/At-risk Habitat Methodology**

NSDNR requirements for flora and fauna surveys were discussed with Mark Elderkin (NSDNR Wildlife Division, Species at Risk Biologist (June 30, 2005)). The approach to collecting supplemental biological data is based on the *Guide to Addressing Wildlife Species and Habitat in an EA Registration Document* (draft, NSDEL 2005). The focus of this approach is on priority species and habitats.

A review of known occurrences of species at risk and conservation concern within a broad geographic area (NSDNR has requested within 100 km) was conducted. Species considered included:

- 1) Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Federal Species at Risk Act (SARA 2003) species listed as Endangered, Threatened or Special Concern.
- 2) Nova Scotia Endangered Species Act (NESA 1999) species listed as Endangered, Threatened or Vulnerable.
- 3) Nova Scotia General Status of Wild Species listed as Species of Conservation Concern (at risk/Red or sensitive/Yellow).

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Sources of biological data included; the Nova Scotia Museum of Natural History (NS Museum), a 1989 Environmental Assessment Report (EAR) for the Point Aconi Generating Station, Atlantic Canada Conservation Data Center (ACCDC) data within 10 km of the study area and other publicly available information summarized in the previously submitted Registration Document for this Project. In addition, ACCDC data was requested for a 100 km radius of the study area and the Significant Species and Habitat Database was reviewed within this area. Appendix A (attached) provides the ACCDC data within 20 km of the study area (complete data available on request). The Wildlife Division database on the population status of flora and fauna in Nova Scotia (General Status Ranks of Wild Species in Nova Scotia) was consulted to determine priority species status.

Based on species identified in this review and on these species habitat requirements, a short list of potential priority species and related habitats was developed. Focused field investigations were undertaken within the study area. As a component of this assessment, habitats were mapped and a general description of each of the terrestrial and aquatic habitats within the study area is provided below. Field study timing is generally consistent with the optimal detection period for potential priority species. Although several potential plant species were expected to flower earlier than the field survey (July and August), the botanist could observe and identify these species without flowers being present. As well, the peak breeding bird period had passed, however, it is expected that the majority of bird species nesting in the area were observed during the July survey. Field methodology for priority species identified was based on the Canadian Wildlife Service (CWS) protocol for migratory birds and for potential at risk plants conducted targeting surveys in potential priority habitats, as well as general surveys to refine habitat characterization. Bird surveys were conducted by Fulton Lavender, an experienced avian species specialist with over 20 years experience. Plant surveys were conducted by Tom Neily, a botanist with expertise in at risk/sensitive species identification. Fish habitat was investigated by the federal Department of Fisheries and Oceans (DFO) and determined not to be present (supplemental information). Any at risk species identified were to be located with GPS coordinates.

## **1.2 Wetland Assessment Methods**

Discussions with Randy Milton (NSDNR Wetland Specialist)(June 30, 2004) identified the initial requirement to confirm presence or absence of wetland(s) habitat within the proposed extraction footprint as well as generally within the study area. NSDNR's review of property (air photos and the wetland database) indicate the presence of wetlands within the extraction footprint. Field surveys targeted these identified areas to assess wetland character (wetland vegetation, wetland soils, drainage).



## **2.0 HABITATS**

General habitats within the study area are provided on the attached Figure 1 based on NSDNR cover types. No Significant Habitats were identified in the NSDNR Significant Wildlife Habitat database for the study area. The nearest known Significant Habitat is a wetland area identified as Other Habitat approximately 1 km to the southwest of the study area. In addition, the Bird Islands (Habitat of Concern) are located over 5 km offshore to the northwest (as described in the Registration Document and supplemental information), Point Aconi/Mill Pond Brook (Habitat of Concern and Migratory Bird Habitat) is located in a separate watershed approximately 2 km to the west and Alder Point (Migratory Bird Habitat) is located approximately 2 km south of the study area.

The habitat types present within the study area are described briefly below based on airphoto interpretation and field surveys in July and August 2005. Plant lists for the areas surveyed are included in Appendix B (attached). Photographs of the various habitat types are provided in Appendix C (attached).

### **2.1 Coniferous (Softwood) Forest**

Predominately black spruce with some red spruce forest occurs in a variety of gently sloped to flat areas across the site, including interspersed with the wet coniferous forest habitat (below). Trees are typically not mature and canopy dense with little understorey other than balsam fir.

### **2.2 Wet Coniferous (Softwood) Forest**

In less well-drained areas, particularly along the coast, black spruce forest with a more lush understorey occurs. Shrubs such as Canada Holly, Wild Raisin and False Holly occur throughout. Ground cover typically is dominated by sedges and mosses (including sphagnum).

### **2.3 Abandoned Pasture Coniferous (Softwood) Forest**

Along the south side of Sheri Lee Lane/Millpond Road, north of the Prince Mine site, the coniferous forest is dominated by second growth white spruce regenerating within what appears to have once been pasture land.

### **2.4 Mixed Forest**

The majority of the forest present within the study area is second growth, mixed deciduous (hardwoods) and coniferous (softwoods). It appears that selective cutting (likely related to firewood or bootleg coal removal) has occurred over time.

### **2.5 Stream and Pondsides Mature Deciduous (Hardwoods)**

The riparian area adjacent to Morrison Pond/Brook has a more diverse habitat including more mature hardwood. Dominant tree species are red maple and yellow birch. Younger black spruce and shrubs occur in the understorey and ground cover is dominated by ferns



and sedges. The riparian area surrounding Coal Hollow Brook, although less extensive, is similar.

### **2.6 Second Growth Deciduous (Hardwoods)**

The majority of the hardwood areas have been historically cut over and are currently dominated by mid age second growth red maple, trembling aspen, white birch and minor amounts of beech. Understorey/ground cover is dominated by sarsaparilla, ferns and bunchberry.

### **2.7 Intermittent Watercourses**

Several intermittent watercourses were noted throughout the forested areas. Habitat character is typically similar to the surrounding forest. At the time of the survey no flowing water was present and bottom substrate is mud. These watercourses do not provide fish habitat.

### **2.8 Morrison Pond**

Morrison Pond is a shallow predominately sandy mud bottomed pond at the confluence of Morrison Brook with the ocean. The pond is separated from the salt water by a low cobble beach and likely receives occasional marine storm flow. Rushes, grasses and sedges dominate the shallower areas, with cattails in slightly deeper areas.

### **2.9 Morrison Brook and Coal Hollow Brook Aquatic Habitat**

Both these are small watercourses with low gentle flow, low slope and a mud/sand dominated bottom. Coal Hollow Brook is typically less than 1-2 m wide (summer flow) while Morrison Brook is slightly larger with a wider riparian floodplain area.

### **2.10 Bogs**

A variety of bog habitats are present with varying degrees of wetland character. These habitats are described further below (Section 5).

### **2.11 Recently Disturbed Areas**

A large portion of the study area consists of previously cleared areas associated with operation of the Prince and Brogan mines. These areas are typically grassy fields with low shrubs. As well, the existing Prince Mine infrastructure is generally cleared.

In addition, disturbed habitats include lawn areas associated with residential development along the Point Aconi Road.

### **2.12 Beach and Shoreline Areas**

The majority of the shoreline has steep cliffs along it with a small cobble terrace at sea-level. A small portion of cobble gravel beach is located at the mouth of Morrison Pond. Within the tidal section, little vegetation was noted. Along the cobble tidal berm, beach plants such as orach occur.





### 3.0 PRIORITY SPECIES RESULTS

Priority species and their habitat associations identified for the 100 km area are listed on Table 1 (attached) and a short-list of species with habitat potential in the study area are identified on Table 2 (attached).

#### 3.1 At Risk/Sensitive Plants

No plant species or likely habitat for species listed under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the associated federal Species At Risk Act (SARA), the Nova Scotia Endangered Species Act (NSESAs) or the NSDNR general status at risk were observed within the study area.

One possible plant listed under the NSDNR general status as sensitive was observed. A sensitive Hawkweed was tentatively identified for the Coal Hollow Brook area outside of the proposed extraction area. This identification could not be confirmed at this time due to timing of field studies. Confirmation will occur prior any disturbance in this area.

#### 3.2 At Risk/Sensitive Animals

No animal species or likely habitat for species listed under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the associated federal Species At Risk Act (SARA), the Nova Scotia Endangered Species Act (NSESAs) or the NSDNR general status at risk were observed within the study area. Species identified with potential are discussed below.

**Bats** - There is potential for bats to use the property. Bats are sensitive to disturbances within communal hibernating areas. Potential for these areas at the study area is reduced by periodic flooding of the bootleg pits/shafts that provide habitat.

**Birds** - Full bird survey results are presented in Section 4.0 below. During the birds survey, no at risk bird species was confirmed breeding in the area. One sensitive (NSDNR yellow status) bird species, the Long-eared Owl was heard foraging immediately south of the study area. Owls forage over large areas and may use the habitat at the property occasionally.

Additional sensitive (NSDNR Yellow) species recorded in the *Maritime Breeding Bird Atlas* as potentially breeding within 20 km of the study area include terns, Razorbill and puffin. These species typically nest on coastal islands and are known for the Bird Islands as noted above. Nesting habitat was not identified for these species at the study area and foraging habitat is marine of which there is a large available area. Short-eared Owls (NSDNR Yellow, COSEWIC/SARA Special Concern) and Bobolink (NSDNR Yellow) are also reported nesting in the general Sydney area, however potential habitat was not identified within the study area (pers. comm. F. Lavender, avian species specialist). Similarly habitat was not identified for additional at risk/sensitive bird species listed by



ACCDC within 100 km of the study area; Sharp-tailed Sparrow, Vespers Sparrow, Common Loon, Northern Goshawk and Piping Plover.

**Fish** – As noted in the supplementary information, fish habitat was not identified by DFO within the study area.

**Herpetiles** – Four-toed salamander were not observed during field investigations within the wetland and wet wood habitats. Sphagnum mats were generally minimal and not associated with ponds/pools. Ideal habitat was not identified for this species within the study area.

**Butterflies, Dragonflies, Damselflies** – At risk/sensitive butterflies, dragonflies or damselflies were not observed during field investigations within the riparian, wetland, disturbed or other habitat. The area around Morrison Pond may be used by dragonfly, damselfly and butterfly species although none were observed at the time of the survey. This coastal area may not be ideal. Other habitat for at risk dragonflies/damselflies was not noted. Black spruce bog habitat (Jutta arctic) occurs within the 2.2 ha bog, however, given the limited known distribution of this butterfly species (reported for Cape Breton Highlands Park in 1995 although not listed in the ACCDC 100 km list) it is unlikely.

**Freshwater Mussels** – No freshwater mussels (or shells) were observed in Morrison Pond/Brook or Coal Hollow Brook. Habitat present is not likely suitable for the at risk/sensitive species.

#### 4.0 BIRD RESULTS

Birds are protected under the federal Migratory Birds Convention Act (MBCA) and under the provincial Nova Scotia Wildlife Act. A bird survey was conducted within various habitat types within the study area in July 2005. As this period is past the peak breeding bird season, the bird data is presented in Appendix B (attached) as birds that were confirmed to be breeding at the property and a separate list for birds identified within potential breeding habitat however breeding could not be confirmed. In addition, birds listed within the *Maritime Breeding Bird Atlas* (Erskine 1992), with possible to confirmed observations within 20 km of the study area are also identified.

#### 5.0 WETLAND RESULTS

Five wetlands were identified on NSDNR mapping for the area (Figure 1 attached); a 7.3 ha treed bog; a 6.5 ha fen, a 1.9 ha shrub bog, a 2.2 ha treed bog, and a 1.8 ha salt marsh. Of these three are in or partially within and one approximately 200 m to the north of the proposed extraction area. The salt marsh area is over 1 km to the southeast of the proposed extraction area and within a separate watershed.



The 6.5 ha fen was not evident in the field. This area identified at the highpoint along Sheri Lee Lane/Millpond Road and along the adjacent slope is characterized by typical mixed forest. Portions of this area had been cleared for old roads criss-crossing throughout the area.

#### **5.1 Treed Bog (7.3 ha)**

This area is located north of Sheri Lee Lane/Millpond Road within the very gentle slope towards the ocean. No surface water was evident within this area. This area marked on Figure 1 (attached) includes drier tall shrub dominated areas with pockets of more open slightly wetter areas with low shrubs and more extensive sphagnum. Within the high shrub areas, Canada Holly is a dominant species with Wild Raisin, Rhodora and Kalmia subdominant. Sphagnum is generally less than 15 cm deep in these areas. In the more open areas leatherleaf is a dominant shrub species with rhodora and Labrador tea and larch and black spruce are scattered throughout. Sphagnum depth increases slightly to 35 cm on hummocks. Ground cover includes bunchberry and small cranberry.

This area has limited potential for wildlife habitat, supporting typical edge bird species and likely small mammals and as part of a wider foraging area for large animals.

No human use of this area was noted. Bootleg coal pits were located in the forest surrounding the area, but not within the wetland area. Historic air photos indicate the wetland habitat was likely more extensive in the past.

#### **5.2 Treed Bog (2.2 ha)**

This area is located to the south of Sheri Lee Lane/Millpond Road. The more northerly portion is an open area dominated by sedges and large cranberry with extensive sphagnum over 1 m in depth. This area grades southward to increasing amounts of black spruce and larch.

Grasshoppers were abundant within this area and several dragonfly species were noted (a red *Sympetrum* sp. And a blue *Aeshma* sp.). Two small (likely sharp shin) hawks were also observed in the area. This area likely provides foraging habitat for a variety of wildlife species.

ATV tracks were noted throughout the area and it was reported by locals to be used for cranberry picking. An old road which may have bordered a pasture was located between the more open northern section and the black spruce treed area. Historic air photos indicate agricultural activity in the area in the past.

#### **5.3 Shrub Bog (1.9 ha)**

This area is predominately coniferous black spruce forest. A small cattail and sedge area occurs at the northern edge as an extension of the ponded areas within the reclaimed Brogan Mine area. The remainder of the area identified alternates between open

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coniferous wood with little understorey or moss cover and slightly wetter areas with minor sphagnum development (generally less than 20 cm).

The area does not provide unique wildlife habitat and no at risk/sensitive species were observed.

No evidence of human use was observed.

#### **5.4 Salt Marsh (1.8 ha)**

The salt marsh is identified as predominately low salt marsh grass with 20% high salt marsh grass. This area is expected to be beyond influence from the proposed project.

If you have any questions on the data collected, please contact myself.

Yours truly,

DILLON CONSULTING LIMITED



Karen March, M.Sc.  
Biologist

KLM:jep

Attachments:

- Figure 1 Point Aconi Habitats
- Table 1 At Risk/Sensitive Species within 100km of the study area
- Table 2 Shortlist of Priority Species
- Appendix A ACCDC Data within 20 km
- Appendix B Plant List and Bird Survey Data
- Appendix C Site Photographs

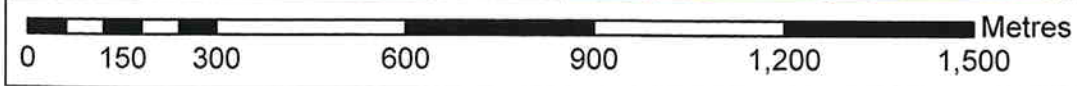
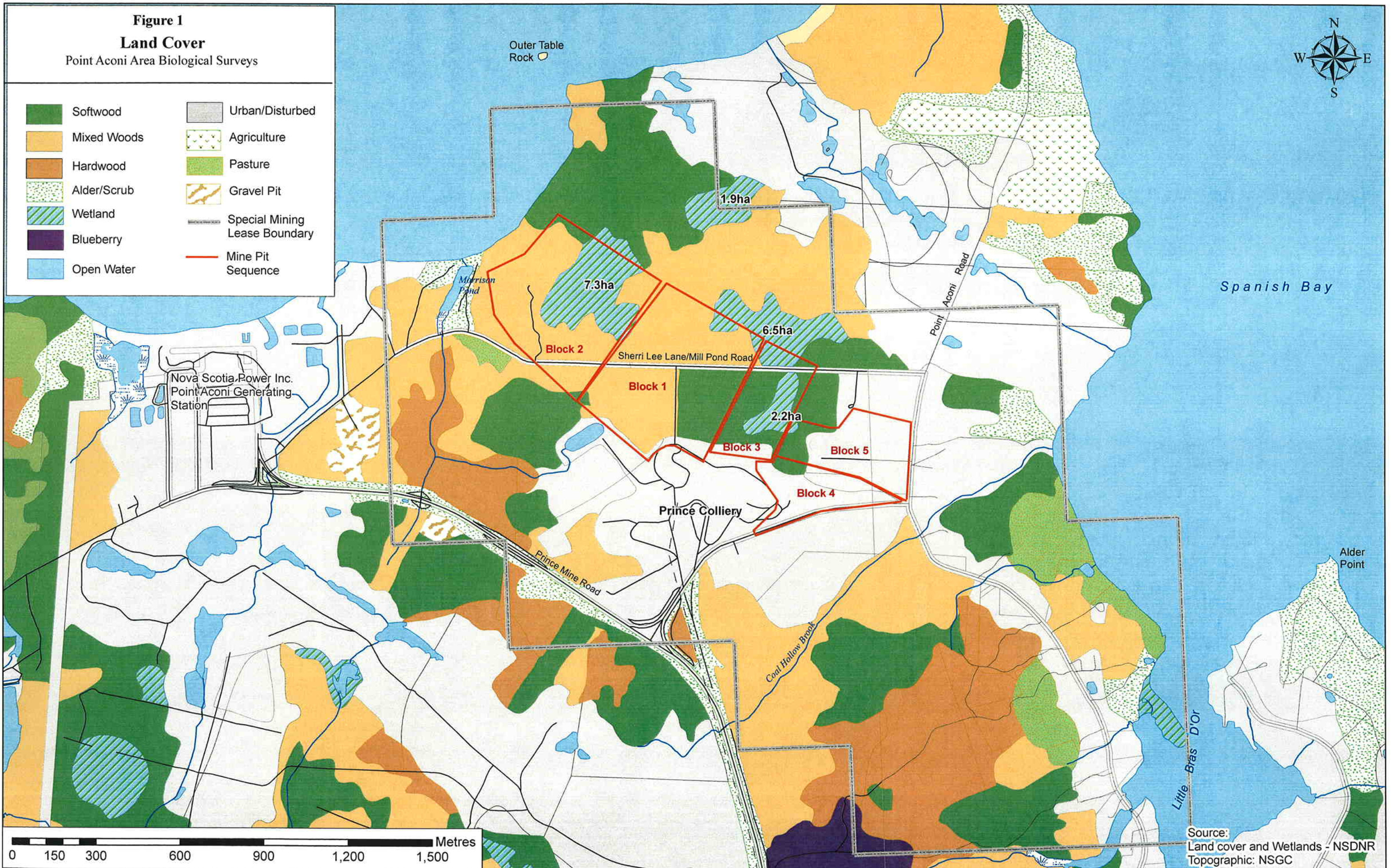
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Figure 1

Land Cover

Point Aconi Area Biological Surveys

- |   |   |
|---|---|
|  Softwood    |  Urban/Disturbed               |
|  Mixed Woods |  Agriculture                   |
|  Hardwood    |  Pasture                       |
|  Alder/Scrub |  Gravel Pit                    |
|  Wetland     |  Special Mining Lease Boundary |
|  Blueberry   |  Mine Pit Sequence             |
|  Open Water  |   |



Source: Land cover and Wetlands - NSDNR  
Topographic: NSGC

Table 1A - NSDNR Red and Yellow Plants within 100 km of Point Aconi

| Plant Name                  | Scientific Name                       | NSDNR Status | COSEWIC /           | Habitat Preference   |
|-----------------------------|---------------------------------------|--------------|---------------------|--|
|                             |                                       |              | SARA / NSESA Status |  |
| Northern maidenhair-fern    | <i>Adiantum pedatum</i>               | red          | na                  | Freshwater shore, alluvial soil, rich wood, interval                           |
| Short-awn foxtail           | <i>Alopecurus aequalis</i>            | yellow       | na                  | Muddy edge of river, shallow pond  |
| Canada anemone              | <i>Anemone canadensis</i>             | yellow       | na                  | Wet meadow/thicket, gravel shore on calcareous/alluvial soil                   |
| Early anemone               | <i>Anemone multifida</i>              | red          | na                  | Shore, rock bank on calcareous soil  |
| Small -flower anemone       | <i>Anemone parviflora</i>             | red          | na                  | Wet limestone cliff, gravelly bluff  |
| Wood Anemone                | <i>Anemone quinquefolia</i>           | yellow       | na                  | Wooded riverbank, shaded interval  |
| River anemone               | <i>Anemone virginiana</i>             | yellow       | na                  | Streamside, interval; calcareous   |
| Drummond rockcress          | <i>Arabis drummondii</i>              | yellow       | na                  | Dry slope, talus, fertile areas  |
| Hairy rock-cress            | <i>Arabis hirsuta</i>                 | red          | na                  | Dry cliff, talus, gravel   |
| Northern arnica             | <i>Arnica lonchophylla</i>            | red          | na                  | Calcareous gravel ledge, cliff   |
| Pacific wormwood            | <i>Artemisia campestris</i>           | red          | na                  | Talus slopes   |
| Green spleenwort            | <i>trichomanes ramosum</i>            | yellow       | na                  | Shaded cliff along stream on basic rocks/limestone                             |
| Swamp birch                 | <i>Betula glandulosa</i>              | yellow       | na                  | Acidic rocky barrens, summits  |
| Dwarf birch                 | <i>Betula pumila (borealis)</i>       | yellow       | na                  | Bog, bog meadow, often with alder  |
| Beck water-marigold         | <i>Bidens (megalondonata) beckii</i>  | yellow       | na                  | Shallow, quiet water, slow stream/pond   |
| Estuary beggar-ticks        | <i>Bidens hyperborea</i>              | yellow       | na                  | Estuarine tidal mud  |
| Lance-leaf grape-fern       | <i>Botrychium lanceolatum</i>         | yellow       | na                  | Rich wooded hill side  |
| Moonwort grape-fern         | <i>Botrychium lunaria</i>             | red          | na                  | Open turf/gravel slope/shore/meadow on basic soil                              |
| Least grape-fern            | <i>Botrychium simplex</i>             | yellow       | na                  | Lake/ mossy stream edge and variety  |
| New England Northern reed g | <i>Clamagrostis stricta inexpansa</i> | yellow       | na                  | Around lake, bog, wet cliff  |
| Marsh marigold              | <i>Caltha palustris</i>               | yellow       | na                  | Swamp, wet meadow, wet wood (Distribution restricted - NE CB and NS coast)     |
| Marsh bellflower            | <i>Campanula aparinoides</i>          | yellow       | na                  | Meadow, ditch, river bank  |
| Small-flower bitter-cress   | <i>Cardamine parviflora</i>           | yellow       | na                  | Dry wood, shaded ledge, sandy soil   |
| Chestnut-colored sedge      | <i>Carex castanea</i>                 | red          | na                  | Swamp, wet meadow, cliff crevice/ledge   |
| Northern bog sedge          | <i>Carex dioica (ssp. Gynocrates)</i> | red          | na                  | Sphagnum bog, coniferous swamp   |
| Ebony sedge                 | <i>Carex eburnea</i>                  | yellow       | na                  | Cliff, talus slope under conifer, espec. Calcareous soil                       |
| Livid sedge                 | <i>Carex livida</i>                   | red          | na                  | Calcareous bog/meadow  |
| Loose-flowered sedge        | <i>Carex rariflora</i>                | red          | na                  | Fens, calcareous coastal heath, bog  |
| Russet sedge                | <i>Carex saxatilis</i>                | red          | na                  | Damp, peaty gravelly soil  |
| Sparse-flowered sedge       | <i>Carex tenuiflora</i>               | red          | na                  | Wet wood and bog   |
| Little green sedge          | <i>Carex viridula</i>                 | red          | na                  | Sphagnum swale, gravel/rocky shore, low pasture near sea, border brackish pond |
| Blue cohosh                 | <i>Caulophyllum thalictroides</i>     | red          | na                  | Deciduous/interval forest  |
| Long-bract green orchid     | <i>Coeloglossum viride</i>            | yellow       | na                  | forest   |
| Hemlock parsley             | <i>Conioselinum chinense</i>          | yellow       | na                  | Swamp, mossy coniferous woods/swale, seepy slope near coast                    |
| Swedish dwarf dogwood       | <i>Cornus suecica</i>                 | yellow       | na                  | Edge of interval, streamside, wet meadow, ditch; most in alkaline soil         |
| Fragile rockbrake           | <i>Crptogramma stelleri</i>           | yellow       | na                  | Shaded calcareous (limestone, conglomerate) cliff                              |
| Large yellow lady's-slipper | <i>Cypripedium calceolus</i>          | yellow       | na                  | Calcareous soil, near gypsum/limestone outcrop                                 |
| Small yellow lady's-slipper | <i>parviflorum</i>                    | yellow       | na                  | Calcareous soil, near gypsum/limestone outcrop                                 |
| Showy lady's-slipper        | <i>Cypripedium reginae</i>            | red          | na                  | Alkaline swamp, bog  |
| Hairy swamp loosestrife     | <i>Decondon verticillatus</i>         | yellow       | na                  | Quaking margin of pond, lake   |
| Lapland diapensis           | <i>Diapensia lapponica</i>            | red          | na                  | Steep north facing slope, crevices   |
| Rock whitlow grass          | <i>Draba arabisans</i>                | yellow       | na                  | Muddy soil, calcareous rock, cliff, ledge                                      |

Based on ACCDC 100km list SARA/NSESA species habitat

Table 1A - NSDNR Red and Yellow Plants within 100 km of Point Aconi

| Plant Name                 | Scientific Name                              | NSDNR Status | COSEWIC / SARA / NSESA Status                  | Habitat Preference  |
|----------------------------|--|--------------|--|---|
| Rock whitlow-grass         | <i>Draba glabella</i>                        | red          | na   | Cliff ledge, talus  |
| Norwegian whitlow grass    | <i>Draba glabella pyconsperma</i>            | red          | na   | Cliff ledge, talus  |
| Norwegian whitlow grass    | <i>Draba norvegica clivicola</i>             | red          | na   | Calcareous ledge, gravel, turf  |
| Fragrant fern              | <i>Dryopteris fragrans</i>                   | yellow       | na   | Dry cliff, cliff along streams  |
| Wiegand's wild rye         | <i>Elymus wiegandii</i>                      | red          | na   | Streambank and meadow   |
| Purple crowberry           | <i>Empetrum rubrum (eamesii v)</i>           | yellow       | na   | Headland bog, barren  |
| Purple crowberry           | <i>Empetrum rubrum atropurpureum</i>         | yellow       | na   | Headland bog, barren  |
| Hornemann willow-herb      | <i>Epilobium hornemannii</i>                 | yellow       | na   | Damp rock, edge of rill   |
| Downy willow-herb          | <i>Epilobium strictum</i>                    | yellow       | na   | Boggy areas and meadows   |
| Meadow horsetail           | <i>Equisetum pratense</i>                    | yellow       | na   | Rich wooded bank, mossy slope, typically alkaline soil                                      |
| Daisy fleabane             | <i>Erigeron hyssopifolius</i>                | yellow       | na   | Gypsum outcrop, damp stream banks, ledges, cliff  |
| Slender cotton-grass       | <i>Eriophorum gracile</i>                    | yellow       | na   | Wet peat, inundated shore   |
| Joe-pye thoroughwort       | <i>Eupatorium dubium</i>                     | red          | na   | Rocky lakeshore, swamp, damp thicket  |
| Proliferous red fescue     | <i>Festuca rubra prolifera</i>               | yellow       | na   | marsh   |
| False mermaid-weed         | <i>Floerkea proserpinacoides</i>             | yellow       | na   | Deciduous ravine, river edge, intervalles   |
| Black ash                  | <i>Fraxinus nigra</i>                        | yellow       | na   | Low ground, damp wood, swamp  |
| Boreal bedstraw            | <i>Galium kamtschaticum</i>                  | yellow       | na   | Rich deciduous forest, ravine, fir/birch  |
| Northern gentian           | <i>Gentianella amarella</i>                  | red          | na   | Rich forest   |
| Northern comandra          | <i>Geocaulon lividum</i>                     | yellow       | na   | Sterile soil, damp sand, acid, peaty  |
| Giant rattlesnake-plantain | <i>Goodyera oblongifolia</i>                 | yellow       | na   | Deciduous climax forest, slope mixed forest/ravine  |
| Downy rattlesnake-plantain | <i>Goodyera pubescens</i>                    | red          | na   | Woodlands and thickets  |
| Purple false oats          | <i>Grapphepophorum (Trisetum) melicoides</i> | yellow       | na   | Gravel shore/bank, espec. alkaline areas  |
| Golden-heather             | <i>Hudsonia ericoides</i>                    | yellow       | na   | Dry rocky sandy barrens, disturbed sandy soil   |
| Pale jewel-weed            | <i>Impatiens pallida</i>                     | yellow       | na   | Rich alluvial soil, damp thicket, intervalles   |
| Slender blue flag          | <i>Iris prismatica</i>                       | red          | na   | Wet ground near coast   |
| Acadian quillwort          | <i>Isoetes acadensis</i>                     | yellow       | na   | Bordering lake, pond occasionally river, upto 1 m deep                                      |
| Lake quillwort             | <i>Isoetes lacustris</i>                     | yellow       | na   | Cobbly/gravel margin of water, usually deep nutrient poor lake                              |
| Prototype quillwort        | <i>Isoetes prototypus</i>                    | red          | na   | Deep water, nutrient poor acid lake   |
| Bulbous rush               | <i>Juncus bulbosus</i>                       | yellow       | na   | Freshwater pond border, ditch, roadside, espec. Alkaline soil                               |
| New Jersey rush            | <i>Juncus caesariensis</i>                   | yellow       | COSEWIC/ SARA Special Concern NSESA Vulnerable | Coastal plains fen and bog  |
| Moor rush                  | <i>Juncus stygius</i>                        | yellow       | na   | Wet moss, bog, pool   |
| Highland rush              | <i>Juncus trifidus</i>                       | yellow       | na   | Cliff, talus in northern CB   |
| Yellow Canada lily         | <i>Lilium canadense</i>                      | yellow       | na   | Meadows and stream banks  |
| Mudwort                    | <i>Limosella subulata (australis)</i>        | yellow       | na   | Low area by pond, gravel lakeshore, mud edge of pond behind barrier beach, muddy river edge |
| Southern twayblade         | <i>Listera australis</i>                     | red          | na   | Sphagnum bog  |
| Kalm's lobelia             | <i>Lobelia kalmii</i>                        | yellow       | na   | Basic bogs, shore, wet meadow   |
| Spiked wood-rush           | <i>Luzula spicata</i>                        | red          | na   | Cliff ledge, headland   |
| Adder's tongue             | <i>Ophioglossum pusillum</i>                 | yellow       | na   | Acid soil, ditch, old field   |

Based on ACCDC 100km list SARA/NSESA species habitat

Table 1A - NSDNR Red and Yellow Plants within 100 km of Point Aconi

| Plant Name                | Scientific Name                                    | NSDNR Status | COSEWIC /           | Habitat Preference  |
|---------------------------|--|--------------|---------------------|---|
|                           |  |              | SARA / NSESA Status |   |
| St. john's oxytrope       | <i>Oxytropis campestris</i>                        | red          | na                  | Exposed cliff crevice, rocky, gravelly scree, headlands                                 |
| Purple lousewort          | <i>Pedicularis palustris</i>                       | red          | na                  | Marsh, meadow, near road  |
| Mountain timothy          | <i>Phleum alpinum</i>                              | yellow       | na                  | River ledge   |
| Common butterwort         | <i>Pinguicula vulgaris</i>                         | red          | na                  | Moist ledge especially limestone shore  |
| Large round-leaved orchid | <i>Platanthera orbiculata</i>                      | yellow       | na                  | Damp woods in deep shade  |
| White bluegrass           | <i>Poa glauca</i>                                  | yellow       | na                  | Cliff crevice on shelf, talus slope   |
| Field milkwort            | <i>Polygala sanguinea</i>                          | yellow       | na                  | Poor acidic field, damp slope, open woods/bush  |
| Northern holly-fern       | <i>Polystichum lonchitis</i>                       | yellow       | na                  | Alkaline area on/near limestone/gypsum in rocky area, cool shaded                       |
| Flatstem pondweed         | <i>Potamogeton zosteriformis</i>                   | yellow       | na                  | Shallow lake,river  |
| Alderleaf buckthorn       | <i>Rhamnus alnifolia</i>                           | yellow       | na                  | Swampy woods, boggy meadow, often alkaline or rich alluvial soil; poorly drained swamps |
| Lapland azalea            | <i>Rhododendron lapponicum</i>                     | red          | na                  | Calcareous ledge in gorge   |
| Horned beakrush           | <i>Rhynchospora capillacea</i>                     | red          | na                  | Damp calcareous ledge,bog   |
| Willow dock               | <i>Rumex salicifolius</i>                          | yellow       | na                  | Beaches and along river   |
| Hoary willow              | <i>Salix candida</i>                               | red          | na                  | Alkaline bog/thicket  |
| Bog willow                | <i>Salix pedicellaris</i>                          | yellow       | na                  | Sphagnous lakeshore, acid bog   |
| Net-veined willow         | <i>Salix reticulata</i>                            | red          | na                  | Calcareous barren, cliff  |
| Rock willow               | <i>Salix vestita</i>                               | red          | na                  | Humid north facing cliff on calcareous soil   |
| Black snake-root          | <i>Sanicula gregaria (odorata)</i>                 | red          | na                  | Rich alluvial wood, intervalles   |
| Yellow mountain saxifrage | <i>Saxifraga aizoides</i>                          | red          | na                  | Dripping cliffs,ledge,waterfall   |
| White mountain saxifrage  | <i>Saxifraga aizoon (s. paniculata ss neogaea)</i> | yellow       | na                  | Cliff, mossy hill, limestone ledge  |
| Purple mountain saxifrage | <i>Saxifraga oppositifolia</i>                     | red          | na                  | Seepage on partly shaded rock face (elsewhere calcareous)                               |
| Low spike-moss            | <i>Selginella selaginoides</i>                     | red          | na                  | Dry exposed rock, sandy soil  |
| Seabeach groundsel        | <i>Senecio pseudoarnica</i>                        | yellow       | na                  | Gravel sea shore  |
| Canada buffalo-berry      | <i>Shepherdia canadensis</i>                       | yellow       | na                  | Gypsum, talus slopes, along coast   |
| Northern burreed          | <i>Sparganium hyperboreum</i>                      | yellow       | na                  | Ditches, Alkaline pool/bog  |
| Slender wedge grass       | <i>(intermedia)</i>                                | yellow       | na                  | Cliff face roots contact limestone, basalt or gypsum                                    |
| Sticky false-asphodel     | <i>Tofieldia (triantha) glutinosa</i>              | red          | na                  | Swamp, bog, rocky beach   |
| Coffe tinker's-weed       | <i>Triosteum aurantiacum</i>                       | red          | na                  | Intervale soil, rich soil along river   |
| Humped bladderwort        | <i>Utricularia gibba</i>                           | yellow       | na                  | Shallow lake edge, small pool, pond in peaty area                                       |
| Northeastern bladderwort  | <i>Utricularia resupinata</i>                      | red          | na                  | Pond, lake, river shore, beach muddy shore  |
| Northern blueberry        | <i>Vaccinium boreale</i>                           | red          | na                  | Exposed headlands, barrens  |
| Dwarf huckleberry         | <i>Vaccinium cespitosum</i>                        | yellow       | na                  | Rocky cliffs, crevices, dry or wet acidic   |
| Oval-leaf huckleberry     | <i>Vaccinium ovalifolium</i>                       | red          | na                  | Moist coniferous woods  |
| Alpine blueberry          | <i>Vaccinium uliginosum</i>                        | yellow       | na                  | Dry or wet organic or not acid soils  |
| Thyme-leaved speedwell    | <i>Veronica serpyllifolia</i>                      | yellow       | na                  | Moist soil, Pasture and damp run, creeping on grass                                     |
| Squashberry               | <i>Viburnum edule</i>                              | yellow       | na                  | Bogs, cold wood, stream, climax coniferous forest                                       |
| Northern Bog Violet       | <i>Viola nephrophylla</i>                          | yellow       | na                  | Cool mossy bog, dampwood, stream edges  |
| Northern woodsia          | <i>Woodsia alpina</i>                              | yellow       | na                  | Dry cliff   |
| Smooth woodsia            | <i>Woodsia glabella</i>                            | yellow       | na                  | Vertical cliffs and along stream in N. CB.  |

Based on ACCDC 100km list SARA/NSESA species habitat



Table 1B - NSDNR Red and Yellow Animals within 100km of Point Aconi

| Animal                                   | Scientific Name                     | NSDNR         |                    | COSEWIC /          |  | Habitat  |
|--|-------------------------------------|---------------|--------------------|--------------------|--|--|
|  |                                     | Status        | NSESA              | SARA               |  |  |
| Moose (CB)                               | <i>Alces alces</i>                  | red/<br>green | na                 | na                 |  | Forest and marshlands  |
| Lynx                                     | <i>Lynx lynx</i>                    | red           | Endangered         | na                 |  | Cape Breton Highlands  |
| American marten (CB)                     | <i>Martes americana</i>             | red           | Endangered         | na                 |  | Cape Breton Highlands  |
| Little brown bat                         | <i>Myotis lucifugus</i>             | yellow        | na                 | na                 |  | Hibernate in caves, trees near water   |
| Northern Long-eared Bat                  | <i>Myotis spetentrionalis</i>       | yellow        | na                 | na                 |  | Dense forest and caves   |
| Gaspe shrew                              | <i>Sorex gaspensis</i>              | yellow        | na                 | Special<br>Concern |  | Rock outcrop/boulders; talus highlands with steep slopes; typically yellow-birch, sugar maple, balsam fir near running water; Kellys Mtn&Inverness Co. |
| Northern goshawk                         | <i>Accipiter gentilis</i>           | yellow        | na                 | na                 |  | Forest habitats  |
| Razorbill                                | <i>Alca torda</i>                   | yellow        | na                 | na                 |  | Coastal Islands - Ciboux, Pearl Island, Margaree Island  |
| Sharp-tailed (Nelsons) sparrow           | <i>Ammodramus caudacutus</i>        | yellow        | na                 | na                 |  | Salt marshes, saline habitats; nests June to July  |
| Short-eared owl                          | <i>Asio flammeus</i>                | yellow        | na                 | Special<br>Concern |  | Open marshlands, fields  |
| Long-eared owl                           | <i>Asio otus</i>                    | yellow        | na                 | na                 |  | Woodlands  |
| Barrow's goldeneye                       | <i>Bucephala islandica</i>          | yellow        | na                 | Special<br>Concern |  | Sydney Harbour - winter  |
| Bicknell's thrush                        | <i>Catharus minimus</i>             | yellow        | Special<br>Concern | Special<br>Concern |  | High elevation fir/spruce (CB Highlands)   |
| Piping plover                            | <i>Charadrius melodus</i>           | red           | Endangered         | Endangered         |  | Sand and gravel beaches  |
| Bobolink                                 | <i>Dolichonyx oryzivorus</i>        | yellow        | na                 | na                 |  | Lush meadows; nests June to July   |
| Atlantic puffin                          | <i>Fratercula arctica</i>           | yellow        | na                 | na                 |  | Coastal Islands - Ciboux, Pearl Island   |
| Common loon                              | <i>Gavia immer</i>                  | yellow        | na                 | na                 |  | Large lakes/islands  |
| Vespers sparrow                          | <i>Poocetes gramineus</i>           | yellow        | na                 | na                 |  | Open areas, short grass, shrubs, pasture, blueberry field  |
| Common tern                              | <i>Sterna hirundo</i>               | yellow        | na                 | na                 |  | Coastal beaches, islands; nests May-mid July   |
| Arctic tern                              | <i>Sterna paradisaea</i>            | yellow        | na                 | na                 |  | Coastal islands  |
| Gaspereau                                | <i>Alosa pseudoharengus</i>         | yellow        | na                 | na                 |  | Spawn above head of tide in rivers, stillwater, lake   |
| Fourspine stickleback                    | <i>Apeltes quadracus</i>            | yellow        | na                 | na                 |  | Freshwater near coast, marine  |
| Pearl dace                               | <i>Margariscus margarita</i>        | yellow        | na                 | na                 |  | Lakes, cool bog pond; Cumberland, Pictou, Lake Ainslie   |
| Atlantic salmon (Not Inner Bay of Fundy) | <i>Salmo salar</i>                  | red           | na                 | na                 |  | Spawn in clear, cool river, rapids/pool and gravel bottom  |
| Brook trout                              | <i>Salvelinus fontinalis</i>        | yellow        | na                 | na                 |  | Variety of river, lake, brook  |
| Wood turtle                              | <i>Clemmys insculpta</i>            | yellow        | Vulnerable         | Special<br>Concern |  | Nest on gravel bank near river, overwinter in pools, clear streams   |
| Four-toed salamander                     | <i>Hemidactylum scutatatum</i>      | yellow        | na                 | na                 |  | Sphagnum bog/woods/stream edges  |
| Monarch                                  | <i>Danaus plexippus</i>             | yellow        | na                 | Special<br>Concern |  | Associated with milkweeds, wildflowers   |
| Jutta arctic                             | <i>Oeneis jutta</i>                 | red           | na                 | na                 |  | Tamarack and black spruce bogs; CB   |
| Zig zag darner                           | <i>Aeshna sitchensis</i>            | yellow        | na                 | na                 |  | High elevation sedge marsh, near water   |
| Harlequin darner                         | <i>Gomphaeschna furcillata</i>      | yellow        | na                 | na                 |  | Swamp, bog   |
| Zorro (N.Pymy) clubtail                  | <i>Lanthus parvulus</i>             | yellow        | na                 | na                 |  | Small rocky spring-fed brook in forest   |
| Brook snaketail                          | <i>Ophiogomphus aspersus</i>        | red           | na                 | na                 |  | Sand bottom stream, rapids   |
| Muskeg emerald                           | <i>Somatochlora septentrionalis</i> | yellow        | na                 | na                 |  | Mossy muskeg, fen pool, mucky edge, sedges   |

Based on ACCDC 100 km list and potential habitat for SARA, NSESA species

Table 1B - NSDNR Red and Yellow Animals within 100km of Point Aconi

| Animal                     | Scientific Name                    | NSDNR<br>Status | NSESA | COSEWIC /<br>SARA  | Habitat   |
|----------------------------|------------------------------------|-----------------|-------|--------------------|---|
| Black meadowfly            | <i>Sympetrum danae</i>             | yellow          | na    | na                 | Bog, fen, marsh, pond, lake                                   |
| Yellow lamp mussel         | <i>Lampsilis cariosa</i>           | red             | na    | Special<br>Concern | Rivers, riffles, sand bottom; Sydney River                    |
| Delicate lamp mussel       | <i>Lampsilis ochraceae</i>         | yellow          | na    | na                 | Quiet water, mud/sand bottom, near coast;<br>Sydney River     |
| Eastern lamp mussel        | <i>Lampsilis radiata</i>           | yellow          | na    | na                 | Rivers, lakes, gravel and sand to mud bottom                  |
| Eastern river pearl mussel | <i>Margaritifera margaritifera</i> | yellow          | na    | na                 | Small to medium streams, sandy shoals,<br>pools with overhang |

Table 2A - NSDNR Red and Yellow Plants within 100 km of Point Aconi With Potential Habitat at Site - Priority Shortlist

| Plant Name                  | Scientific Name                          | NSDNR Status | Flowers                            | Coniferous Woods | Mixed Woods | Hard-woods | Stream/<br>pond side | Shrub bog | Treed bog | Open bog | Beach | Disturbed |
|-----------------------------|--|--------------|------------------------------------|------------------|-------------|------------|----------------------|-----------|-----------|----------|-------|-----------|
| Northern maidenhair-fern    | <i>Adiantum pedatum</i>                  | red          | NA                                 |                  |             |            | ✓                    |           |           |          |       |           |
| Short-awn foxtail           | <i>Alopecurus aequalis</i>               | yellow       | Summer                             |                  |             |            | ✓                    |           |           |          |       |           |
| Wood Anemone                | <i>Anemone quinquefolia</i>              | yellow       | Late May-early June (visible July) |                  |             |            | ✓                    |           |           |          |       |           |
| Pacific wormwood            | <i>Artemisia campestris</i>              | red          | Jul-Aug.                           |                  |             |            |                      |           |           |          |       | ✓         |
| Dwarf birch                 | <i>Betula pumila (borealis)</i>          | yellow       | May-Jun. Visible                   |                  |             |            |                      |           |           |          |       | ✓         |
| Beck water-marigold         | <i>Bidens (megalondonata) beckii</i>     | yellow       | summer Aug-Sept.                   |                  |             |            | ✓                    |           |           |          |       |           |
| Lance-leaf grape-fern       | <i>Botrychium lanceolatum</i>            | yellow       | spr. Jul-Aug.                      |                  |             |            | ✓                    |           |           |          |       |           |
| Moonwort grape-fern         | <i>Botrychium lunaria</i>                | red          | spr. Jun-Aug.                      |                  |             |            | ✓                    |           |           |          |       | ✓         |
| Marsh bellflower            | <i>Campanula aparinoides</i>             | yellow       | Aug.                               |                  |             |            | ✓                    |           |           |          |       |           |
| Small-flower bitter-cress   | <i>Cardamine parviflora</i>              | yellow       | Apr.-Aug.                          | ✓                | ✓           |            |                      |           |           |          |       |           |
| Chestnut-colored sedge      | <i>Carex castanea</i>                    | red          | summer                             | ✓                |             |            | ✓                    |           |           |          |       | ✓         |
| Northern bog sedge          | <i>Carex dioica (ssp. Gynocrates)</i>    | red          | Jun-Aug.                           | ✓                |             |            |                      | ✓         | ✓         | ✓        |       | ✓         |
| Sparse-flowered sedge       | <i>Carex tenuiflora</i>                  | red          | summer                             | ✓                |             |            |                      | ✓         | ✓         | ✓        |       | ✓         |
| Little green sedge          | <i>Carex viridula</i>                    | red          | Jun-Sept.                          |                  |             |            | ✓                    | ✓         | ✓         | ✓        |       | ✓         |
| Blue cohosh                 | <i>Caulophyllum thalictroides</i>        | red          | Apr.-early Jun. (visible July)     |                  |             |            | ✓                    |           |           |          |       |           |
| Long-bract green orchid     | <i>Coeloglossum viride</i>               | yellow       | May-Aug.                           | ✓                |             |            | ✓                    | ✓         |           |          |       | ✓         |
| Hemlock parsley             | <i>Conioselinum chinense</i>             | yellow       | Aug-Oct.                           | ✓                |             |            |                      |           |           |          |       |           |
| Swedish dwarf dogwood       | <i>Cornus suecica</i>                    | yellow       | June-Visible summer                |                  |             |            | ✓                    |           |           |          |       |           |
| Small yellow lady's-slipper | <i>Cypripedium calceolus parviflorum</i> | yellow       | June (visible July)                |                  |             |            | ✓                    |           |           |          |       |           |
| Wiegand's wild rye          | <i>Elymus wiegandii</i>                  | red          | Jul-Aug.                           |                  |             |            | ✓                    |           |           |          |       | ✓         |

Based on ACCDC list, and SARA, NSESA potential habitats

Table 2A - NSDNR Red and Yellow Plants within 100 km of Point Aconi With Potential Habitat at Site - Priority Shortlist

| Plant Name                 | Scientific Name                       | NSDNR Status | Flowers                   | Coniferous Woods | Mixed Woods | Hard-woods | Stream/pond side |   | Shrub bog | Treed bog | Open bog | Beach | Disturbed |
|----------------------------|---------------------------------------|--------------|---------------------------|------------------|-------------|------------|------------------|---|-----------|-----------|----------|-------|-----------|
|                            |                                       |              |                           |                  |             |            |                  |   |           |           |          |       |           |
| Hornemann willow-herb      | <i>Epilobium hornemannii</i>          | yellow       | Jul-Aug.                  |                  |             |            |                  |   |           |           |          |       | ▼         |
| Downy willow-herb          | <i>Epilobium strictum</i>             | yellow       | Jul.-Sept.                |                  |             |            |                  |   | ▼         | ▼         |          |       |           |
| Slender cotton-grass       | <i>Eriophorum gracile</i>             | yellow       | ft.early summer           |                  |             |            |                  |   |           |           |          |       | ▼         |
| Joe-pye thoroughwort       | <i>Eupatorium dubium</i>              | red          | Aug-Sept.                 | ▼                |             |            | ▼                |   |           |           |          |       |           |
| Proliferous red fescue     | <i>Festuca rubra prolifera</i>        | yellow       | Jun-Jul.                  |                  |             |            |                  |   |           |           |          |       | ▼         |
| Black ash                  | <i>Fraxinus nigra</i>                 | yellow       | May-Jun. Visible summer   | ▼                |             |            |                  |   |           |           |          |       |           |
| Northern comandra          | <i>Geocaulon lividum</i>              | yellow       | Late May-early Aug.       | ▼                | ▼           |            |                  |   |           |           |          |       | ▼         |
| Downy rattlesnake-plantain | <i>Goodyera pubescens</i>             | red          | Jul-Aug.                  | ▼                | ▼           |            |                  |   |           |           |          |       |           |
| Pale jewel-weed            | <i>Impatiens pallida</i>              | yellow       | Jul-Aug.                  |                  |             |            | ▼                |   |           |           |          |       |           |
| Slender blue flag          | <i>Iris prismatica</i>                | red          | Mid-July                  |                  |             |            |                  |   |           |           |          |       | ▼         |
| Acadian quillwort          | <i>Isoetes acadensis</i>              | yellow       | spr.summer                |                  |             |            | ▼                |   |           |           |          |       |           |
| Bulbous rush               | <i>Juncus bulbosus</i>                | yellow       | late Jul-Sept.            |                  |             |            | ▼                |   |           |           |          |       |           |
| Moor rush                  | <i>Juncus stygius</i>                 | yellow       | Jul-Aug.                  |                  |             |            |                  | ▼ |           | ▼         |          |       | ▼         |
| Yellow Canada lily         | <i>Lilium canadense</i>               | yellow       | July                      |                  |             |            |                  |   |           |           |          |       |           |
| Mudwort                    | <i>Limosella subulata (australis)</i> | yellow       | late Jun-Oct.             |                  |             |            | ▼                |   |           |           |          |       | ▼         |
| Southern twayblade         | <i>Listera australis</i>              | red          | late Jun-Jul              |                  |             |            |                  | ▼ |           | ▼         |          |       | ▼         |
| Kalm's lobelia             | <i>Lobelia kalmii</i>                 | yellow       | Jul-Sept.                 |                  |             |            |                  |   |           |           |          |       | ▼         |
| Adder's tongue             | <i>Ophioglossum pusillum</i>          | yellow       | late May-Aug.             |                  |             |            |                  |   |           |           |          |       | ▼         |
| Purple lousewort           | <i>Pedicularis palustris</i>          | red          | Jul-Aug.                  |                  |             |            |                  |   |           |           |          |       | ▼         |
| Large round-leaved orchid  | <i>Platanthera orbiculata</i>         | yellow       | Aug.                      | ▼                |             |            |                  |   |           |           |          |       |           |
| Field milkwort             | <i>Polygala sanguinea</i>             | yellow       | late Jun-Oct.             | ▼                |             |            |                  | ▼ |           |           |          |       |           |
| Alderleaf buckthorn        | <i>Rhamnus alnifolia</i>              | yellow       | May/5-Jun. Visible summer | ▼                |             |            |                  |   |           |           |          |       | ▼         |
| Willow dock                | <i>Rumex salicifolius</i>             | yellow       | summer                    |                  |             |            |                  |   |           |           |          |       | ▼         |

Based on ACCDC list, and SARA, NSESA potential habitats

Table 2A - NSDNR Red and Yellow Plants within 100 km of Point Aconi With Potential Habitat at Site - Priority Shortlist

| Plant Name             | Scientific Name                       | NSDNR Status | Flowers Visible               | Coniferous Woods | Mixed Woods | Hard-woods | Stream/pond side |   | Shrub bog | Treed bog | Open bog | Beach | Disturbed |
|------------------------|---------------------------------------|--------------|-------------------------------|------------------|-------------|------------|------------------|---|-----------|-----------|----------|-------|-----------|
|                        |                                       |              |                               |                  |             |            |                  |   |           |           |          |       |           |
| Bog willow             | <i>Salix pedicellaris</i>             | yellow       | May-Jun.<br>Visible<br>summer |                  |             |            | ✓                | ✓ | ✓         | ✓         | ✓        |       |           |
| Seabeach groundsel     | <i>Senecio pseudoarnica</i>           | yellow       | late Jul-Aug.                 |                  |             |            |                  |   |           |           |          |       | ✓         |
| Sticky false-asphodel  | <i>Tofieldia (triantha) glutinosa</i> | red          | Jun-Aug.                      |                  |             |            |                  | ✓ | ✓         | ✓         | ✓        |       | ✓         |
| Oval-leaf huckleberry  | <i>Vaccinium ovalifolium</i>          | red          | late Jul-early Sept.          | ✓                |             |            |                  |   |           |           |          |       |           |
| Alpine blueberry       | <i>Vaccinium uliginosum</i>           | yellow       | summer                        | ✓                | ✓           |            |                  |   | ✓         | ✓         | ✓        |       | ✓         |
| Thyme-leaved speedwell | <i>Veronica serpyllifolia</i>         | yellow       | May 15-Oct                    |                  |             |            |                  |   |           |           |          |       | ✓         |
| Squashberry            | <i>Viburnum edule</i>                 | yellow       | Aug.                          | ✓                |             |            |                  |   | ✓         | ✓         | ✓        |       | ✓         |
| Northern Bog Violet    | <i>Viola nephrophylla</i>             | yellow       | May-Jul.                      | ✓                |             |            |                  |   | ✓         | ✓         | ✓        |       | ✓         |

Based on ACCDC list, and SARA, NSESA potential habitats

Table 2B - NSDNR Red and Yellow Animals Point Aconi - Priority Shortlist and Potential Habitats in Study Area

| Animal                         | Scientific Name                     | NSDNR Status | NSESA | COSEWIC / SARA  | Coniferous Woods | Mixed Woods | Hard-woods | Stream/pond side | Shrub bog | Treed bog | Open bog | Beach    | Disturbed |
|--------------------------------|-------------------------------------|--------------|-------|-----------------|------------------|-------------|------------|------------------|-----------|-----------|----------|----------|-----------|
| Little brown bat               | <i>Myotis lucifugus</i>             | yellow       | na    | na              | ✓                | ✓           | ✓          |                  |           |           |          |          |           |
| Northern long-eared Bat        | <i>Myotis spentrionalis</i>         | yellow       | na    | na              | ✓                | ✓           | ✓          |                  |           |           |          |          |           |
| Northern goshawk               | <i>Accipiter gentilis</i>           | yellow       | na    | na              | ✓                | ✓           | ✓          |                  |           |           |          |          |           |
| Razorbill                      | <i>Alca torda</i>                   | yellow       | na    | na              |                  |             |            |                  |           |           |          | Off Site |           |
| Sharp-tailed (Nelsons) sparrow | <i>Ammodramus caudacutus</i>        | yellow       | na    | na              |                  |             |            |                  |           |           |          |          | ✓         |
| Short-eared owl                | <i>Asio flammeus</i>                | yellow       | na    | Special Concern |                  |             |            |                  |           |           |          |          | ✓         |
| Long-eared owl                 | <i>Asio otus</i>                    | yellow       | na    | na              | ✓                | ✓           | ✓          |                  |           |           |          |          |           |
| Bobolink                       | <i>Dolichonyx oryzivorus</i>        | yellow       | na    | na              |                  |             |            |                  |           |           |          |          | ✓         |
| Atlantic puffin                | <i>Fratercula arctica</i>           | yellow       | na    | na              |                  |             |            |                  |           |           |          | Off Site |           |
| Common loon                    | <i>Gavia immer</i>                  | yellow       | na    | na              |                  |             | ✓          |                  |           |           |          |          |           |
| Vespers sparrow                | <i>Poocetes gramineus</i>           | yellow       | na    | na              |                  |             |            |                  | ✓         |           | ✓        |          | ✓         |
| Common tern                    | <i>Sterna hirundo</i>               | yellow       | na    | na              |                  |             |            |                  |           |           |          | Off Site |           |
| Gaspereau                      | <i>Alosa pseudoharengus</i>         | yellow       | na    | na              |                  |             | ✓          |                  |           |           |          |          |           |
| Fourspine stickleback          | <i>Apeltes quadracus</i>            | yellow       | na    | na              |                  |             | ✓          |                  |           |           |          |          |           |
| Atlantic salmon (other)        | <i>Salmo salar</i>                  | red          | na    | na              |                  |             | ✓          |                  |           |           |          |          |           |
| Brook trout                    | <i>Salvelinus fontinalis</i>        | yellow       | na    | na              |                  |             | ✓          |                  |           |           |          |          |           |
| Four-toed salamander           | <i>Hemidactylium scutatum</i>       | yellow       | na    | na              | ✓                |             |            | ✓                |           | ✓         | ✓        |          |           |
| Monarch                        | <i>Danaus plexippus</i>             | yellow       | na    | Special Concern |                  |             |            |                  |           |           |          |          | ✓         |
| Jutta arctic                   | <i>Oeneis jutta</i>                 | red          | na    | na              | ✓                |             |            |                  | ✓         | ✓         |          |          |           |
| Harlequin damer                | <i>Gomphaeschna furcillata</i>      | yellow       | na    | na              |                  |             |            |                  | ✓         | ✓         | ✓        |          |           |
| Zorro (N.Pymy) clubtail        | <i>Lanthus parvulus</i>             | yellow       | na    | na              |                  |             |            | ✓                |           |           |          |          |           |
| Brook snaketail                | <i>Ophiogomphus aspersus</i>        | red          | na    | na              |                  |             | ✓          |                  |           |           |          |          |           |
| Muskeg emerald                 | <i>Somatochlora septentrionalis</i> | yellow       | na    | na              |                  |             |            |                  | ✓         | ✓         | ✓        |          | ✓         |
| Black meadowfly                | <i>Sympetrum danae</i>              | yellow       | na    | na              |                  |             |            | ✓                |           | ✓         | ✓        |          | ✓         |

Based on ACCDC 100 km list and potential habitat for SARA, NSESA species

Table 2B - NSDNR Red and Yellow Animals Point Aconi - Priority Shortlist and Potential Habitats in Study Area

| Animal                     | Scientific Name                    | NSDNR Status | NSESA | COSEWIC / SARA | Coniferous Woods | Mixed Woods | Hard-woods | Stream/pond side | Shrub bog | Treed bog | Open bog | Beach | Disturbed |
|----------------------------|------------------------------------|--------------|-------|----------------|------------------|-------------|------------|------------------|-----------|-----------|----------|-------|-----------|
| Delicate lamp mussel       | <i>Lampsilis ochraceae</i>         | yellow       | na    | na             |                  |             |            | ▼                |           |           |          |       |           |
| Eastern lamp mussel        | <i>Lampsilis radiata</i>           | yellow       | na    | na             |                  |             |            | ▼                |           |           |          |       |           |
| Eastern river pearl mussel | <i>Margaritifera margaritifera</i> | yellow       | na    | na             |                  |             |            | ▼                |           |           |          |       |           |

Based on ACCDC 100 km list and potential habitat for SARA, NSESA species

**Appendix A**  
**ACCDC Data within 20 Km**



| EDITION | GENDESC | SPECIMENS | EODATA  | OBSERVER                          | DISTKM        | SPRODATAS | GRANPRT | COMNAME                   | GRA NK | SRANK     | OT | SPRODATAS | DISTKM        | OBSERVER   | EODATA | SPECIMENS | GENDESC                         |
|---------|---------|-----------|---|-----------------------------------|---------------|-----------|---------|---------------------------|--------|-----------|----|-----------|---------------|------------|--------|-----------|---------------------------------|
|         |         |           |   |                                   |               |           |         | Seabeach Groundsel        | G5     | S2        |    |           | 02.8Km +/-10  |            |        |           |                                 |
|         |         |           | Count: Colony size: 186 pair; Pairs: 186 est.                     | Elliot, RD                        | 05.5Km +/-1   |           |         | Razorbill                 | G5     | S1B,S ZN  |    |           | 05.5Km +/-1   | Harris, D; |        |           | Habitat: island marine.         |
|         |         |           | Count: Colony size: 79 pair; Nests active: 79 cnt.                | Banks, D                          | 05.5Km +/-1   |           |         | Black Guillemot           | G5     | S3        |    |           | 05.5Km +/-1   | Harris, D; |        |           | Habitat: island marine.         |
|         |         |           | Count: Colony size: 13 pair; Nests active: 13 cnt.                | Banks, D                          | 05.5Km +/-1   |           |         | Atlantic Puffin           | G5     | S1B       |    |           | 05.5Km +/-1   | Banks, D   |        |           | Habitat: island marine.         |
|         |         |           | Descrip.: 2 adult, 2 male. Activity: flight.                      | D. Anderson                       | 06.7Km +/-1   |           |         | American Emerald          | G5     | S3        |    |           | 06.7Km +/-1   |            | NSDNRB |           |                                 |
|         |         |           | Count: Colony size: 1 pair; Nests active: 1 cnt.                  |                                   | 07.2Km +/-1   |           |         | Black-legged Kittiwake    | G5     | S2B,S 3N  |    |           | 07.2Km +/-1   |            |        |           | Habitat: island marine.         |
|         |         |           | Count: Colony size: 30 pair; Nests active: 30 cnt.                | Harris, D;                        | 07.2Km +/-1   |           |         | Razorbill                 | G5     | S1B,S ZN  |    |           | 07.2Km +/-1   | Banks, D   |        |           | Habitat: island marine.         |
|         |         |           | Count: Young: 1.  |                                   | 07.2Km +/-1   |           |         | Black Guillemot           | G5     | S3        |    |           | 07.2Km +/-1   |            |        |           | Habitat: island marine.         |
|         |         |           | Count: Colony size: 1 pair; Nests active: 1 cnt.                  |                                   | 07.2Km +/-1   |           |         | Atlantic Puffin           | G5     | S1B       |    |           | 07.2Km +/-1   |            |        |           | Habitat: island marine.         |
|         |         |           | ACAD acc# 35712   | Schofield, WB; Taylor, JC;        | 08.3Km +/-0.5 |           |         | Small-Flower Bitter-Cress | G5T 5  | S2        |    |           | 08.3Km +/-0.5 |            |        |           | Habitat: local in nesting area. |
|         |         |           | ACAD acc# 35713 col#  | Smith, EC; Schofield, WB; Taylor, | 08.3Km +/-0.5 |           |         | Small-Flower Bitter-Cress | G5T 5  | S2        |    |           | 08.3Km +/-0.5 |            |        |           | Habitat: cliff slope.           |
|         |         |           | Activity: Confirmed breeding: adult occupying nest.               | Lavender, Fulton                  | 08.3Km +/-5   |           |         | Merlin                    | G5     | S3S4B NAR |    |           | 08.3Km +/-5   |            |        |           |                                 |
|         |         |           | Confirmed breeding: adult occupying nest.                         | Trasker, Ron R                    | 08.3Km +/-5   |           |         | Black-legged Kittiwake    | G5     | S2B,S 3N  |    |           | 08.3Km +/-5   |            |        |           |                                 |
|         |         |           | Abundance: 3. Activity: Confirmed breeding: adult occupying nest. | Trasker, Ron R                    | 08.3Km +/-5   |           |         | Razorbill                 | G5     | S1B,S ZN  |    |           | 08.3Km +/-5   |            |        |           |                                 |

|                                      |                           |    |         |  |  |               |  |   |                |   |
|--------------------------------------|---------------------------|----|---------|--|--|---------------|--|---|----------------|---|
| <i>Cephus grylle</i>                 | Black Guillemot           | G5 | S3      |  |  | 08.3Km +/-5   | Lavender, Fulton                           | Activity: Confirmed breeding: adult occupying nest.               |                |   |
| <i>Fringilla arctica</i>             | Atlantic Puffin           | G5 | S1B     |  |  | 08.3Km +/-5   | Trasker, Ron R                             | Abundance: 3. Activity: Confirmed breeding: adult occupying nest. |                |   |
| <i>Poecetes hudsonica</i>            | Boreal Chickadee          | G5 | S3S4    |  |  | 08.3Km +/-5   | Lavender, Fulton                           | Activity: Confirmed breeding: fledged young.                      |                |   |
| <i>Erigeron philadelphicus</i>       | Philadelphia Fleabane     | G5 | S2      |  |  | 09.3Km +/-10  |  |   |                |   |
| <i>Cardamine parviflora</i>          | Small-Flower Bitter-Cress | G5 | S2      |  |  | 09.4Km +/-1   |  |   |                |   |
| <i>Rissa tridactyla</i>              | Black-legged Kittiwake    | G5 | S2B,S3N |  |  | 09.5Km +/-0.5 |  | Count: present.   | Occupied nests |   |
| <i>Alca torda</i>                    | Razorbill                 | G5 | ZN      |  |  | 09.5Km +/-0.5 |  | Count: 186 pairs.   |                |   |
| <i>Fringilla arctica</i>             | Atlantic Puffin           | G5 | S1B     |  |  | 09.5Km +/-0.5 | Smith, EC;                                 | Count: 107 pairs.   | ACAD           | Habitat: cliff top; Freshwater Wetland.   |
| <i>Poa alpina</i>                    | Alpine Bluegrass          | G5 | SH      |  |  | 09.5Km +/-0.5 | Schofield,                                 | Pheno.: Flowering.  | acc#           |   |
| <i>Dryopteris filix-mas</i>          | Male Fern                 | G5 | S3      |  |  | 09.5Km +/-0.5 | WB; Taylor,                                | Pheno.: fertile.  | acc#           | Habitat: rich walled depression; coastal; forested.                             |
| <i>Senecio pseudoarnica</i>          | Seabeach Groundsel        | G5 | S2      |  |  | 09.6Km +/-0.5 | Erskine, JS                                |   | col#           | beaches, cobbly/pebbly beaches, gravel/sand beaches,                            |
| <i>Alca torda</i>                    | Razorbill                 | G5 | S1B,S3N |  |  | 09.7Km +/-0.5 | Lock, AR (MNRS)                            | Count: 300 pairs.   |                |   |
| <i>Fringilla arctica</i>             | Atlantic Puffin           | G5 | S1B     |  |  | 09.7Km +/-0.5 | Lock, AR (MNRS)                            | Count: 50 pairs.  |                |   |
| <i>Liparis loeselii</i>              | Loesel's Twayblade        | G5 | S3S4    |  |  |               | Smith, EC; Taylor, JC; Webster, DH; Slipp, | Abundance: rare. Pheno.: flowering.                               | ACAD acc#      | Habitat: swamp; freshwater wetland. Drain.: poor.                               |
| <i>Dryopteris filix-mas</i>          | Male Fern                 | G5 | S3      |  |  | 09.7Km +/-1   | Taylor, JC;                                | Pheno.: fertile.  | acc#           | Habitat: shaded ravine; forested.   |
| <i>Corallorhiza trifida</i>          | Early Coralroot           | G5 | S3      |  |  | 10.1Km +/-5   | Webster, DH                                | Abundance: rare. Pheno.: fruiting.                                | ACAD acc#      | Habitat: dry ledge of cliff; coastal?   |
| <i>Potamogeton zosteriformis</i>     | Flatstem Pondweed         | G5 | S2S3    |  |  | 10.1Km +/-5   | Webster, DH                                | Abundance: common. Pheno.: Vegetative.                            | ACAD acc#      | Habitat: in alkaline lake; Freshwater Wetland. Drain.: poor.                    |
| <i>Asplenium trichomanes-ramosum</i> | Green Spleenwort          | G4 | S2      |  |  | 10.1Km +/-5   | Webster, DH                                | Abundance: abundant. Pheno.: Fertile.                             | acc#           | Habitat: shady, mossy outcrop of North facing cliff, stream valley; Unforested. |

|                                  |                     |     |     |      |      |  |               |                            |  |                        |  |       |
|----------------------------------|---------------------|-----|-----|------|------|--|---------------|----------------------------|--|------------------------|--|-------|
| <i>Gallium labradoricum</i>      | Bog Bedstraw        | G5  |     | S2   |      |  | 10.9Km +/-0.1 | Schofield, WB; Taylor, JC; | Pheno.: Flowering.   | acc# 36465 col# 10896. | Habitat: swamp near pond; Freshwater Wetland. Drain.: poor.              | S H G |
| <i>Cystopteris bulbifera</i>     | Bulblet Fern        | G5  |     | S3S4 |      |  | 11.1Km +/-1   | Webster, DH                | Abundance: rare. Pheno.: fertile.                                  | acc# 41897 col# 551.   | Habitat: stream valley; base of north-facing cliff; freshwater, wetland. | S H G |
| <i>Sterna hirundo</i>            | Common Tern         | G5  | NAR | S3B  |      |  | 11.2Km +/-5   | Maybank, Blake             | Abundance: 3. Activity: Confirmed breeding: adult occupying nest.  |                        |  | H G   |
| <i>Dolichonyx oryzivorus</i>     | Bobolink            | G5  |     | S3B  |      |  | 11.2Km +/-5   | Maybank, Blake             | Abundance: 3. Activity: Confirmed breeding: adult attending young. |                        |  | S H G |
| <i>Potamogeton zosteriformis</i> | Flatstem Pondweed   | G5  |     | S2S3 |      |  | 11Km +/-0.1   | Webster, DH                |  | NSPM col# 558.         | Habitat: alkaline waters, bottom deep muck, wrack of ponds.              | S H G |
| <i>Lycopodium sitchense</i>      | Alaskan Clubmoss    | G5  |     | S3?  |      |  | 11Km +/-1     | Grant, LA                  | Pheno.: sterile.   | ACAD acc# 10977        | Habitat: forested.   | S H G |
| <i>Leucorhnia hudsonica</i>      | Hudsonian Whiteface | G5  |     | S3   |      |  | 12.2Km +/-1   | J.M. Francis               | Descrip.: 1 adult, 1 female. Activity: flight.                     | UCCB                   |  | H G   |
| <i>Isoetes prototypus</i>        | Prototype Quillwort | G2? | SC  | S2   |      |  | 12.6Km +/-0   | Goltz, J.P.; Bishop, G.    |  |                        |  | S H   |
| <i>Isoetes acadensis</i>         | Acadian Quillwort   | G3? |     | S3   |      |  | 13.5Km +/-5   | Macoun, JM                 |  |                        |  | S H   |
| <i>Isoetes prototypus</i>        | Prototype Quillwort | G2? | SC  | S2   |      |  | 13.7Km +/-0   | Goltz, J.P.; Bishop, G.    |  |                        |  | H G   |
| <i>Isoetes lacustris</i>         | Lake Quillwort      | G5  |     | S3?  |      |  | 13.8Km +/-1   |                            |  |                        | Habitat: sandy soil in a lake.   | H     |
| <i>Isoetes lacustris</i>         | Lake Quillwort      | G5  |     | S3?  |      |  | 13.8Km +/-5   |                            |  |                        | Habitat: sandy soil in a lake.   | H     |
| <i>Carex bebbii</i>              | Bebb's Sedge        | G5  |     | S1S2 |      |  | 14.2Km +/-5   | ML                         |  |                        | hillside near limestone quarries.  | H     |
| <i>Ophiogomphus carolus</i>      | Riffle Snaketail    | G5  |     | S3   |      |  | 14.4Km +/-1   | D.C. Ferguson              | Descrip.: 1 adult, 1 female. Activity: flight.                     | NSM                    |  | S H   |
| <i>Enallagma civile</i>          | Familiar Bluet      | G5  |     | S3   |      |  | 14.4Km +/-1   | C. Allison                 | Descrip.: 1 adult, 1 male. Activity: flight.                       | UCCB                   |  | H G   |
| <i>Isoetes prototypus</i>        | Quillwort           | G2? | SC  | S2   |      |  | 14.8Km +/-0   | Bishop, G.                 |  |                        |  | H     |
| <i>Sterna hirundo</i>            | Common Tern         | G5  | NAR | S3B  |      |  | 15.4Km +/-0.1 | Pearce, PA                 | Count: 32 nests.   |                        |  | H     |
| <i>Sorex gaspensis</i>           | Gaspá Shrew         | G3  | SC  | S2   | High |  | 15.5Km +/-10  | & Wright, B                | Count: 1.  | acc#                   |  | H     |
| <i>Comandra umbellata</i>        | Toad-Flax           | G5  |     | S2   |      |  | 15.5Km +/-10  |                            |  |                        |  | H     |



|                           |                        |          |  |    |  |  |               |                  |   |       |   |                            |
|---------------------------|------------------------|----------|--|----|--|--|---------------|------------------|---|-------|---|----------------------------|
| Aeshna canadensis         | Canada Darner          | G5       |  | S3 |  |  | 17.3Km +/-0.1 | P.M.<br>Brunelle | Descrip.: 1 adult, 1 male.<br>Activity: flight.           | NBM   | freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily   | H<br>G<br>2                |
| Anax junius               | Common Green Darner    | G5       |  | S3 |  |  | 17.3Km +/-0.1 | P.M.<br>Brunelle | Descrip.: 1 adult, 1 male.<br>Activity: flight.           | CBHNP | Habitat: pond, large size, lentic, freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily  | H<br>G<br>2                |
| Dorocordulia lepida       | Petite Emerald         | G5       |  | S3 |  |  | 17.3Km +/-0.1 | P.M.<br>Brunelle | Descrip.: 1 adult, 1 male.<br>Activity: flight.           | CBHNP | freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily   | H<br>G<br>2                |
| Somatochlora walshii      | Brush-Tipped Emerald   | G5       |  | S3 |  |  | 17.3Km +/-0.1 | P.M.<br>Brunelle | Descrip.: 1 adult, 1 male.<br>Activity: flight.           | NBM   | freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily   | H<br>G<br>2                |
| Leucorrhinia hudsonica    | Hudsonian Whiteface    | G5       |  | S3 |  |  | 17.3Km +/-0.1 | P.M.<br>Brunelle | Descrip.: 1 adult, 1 male.<br>Activity: flight.           | CBHNP | freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily   | H<br>G<br>2                |
| Ladona julia              | Chalk-Fronted Corporal | G5       |  | S3 |  |  | 17.3Km +/-0.1 | P.M.<br>Brunelle | Descrip.: 1 adult, 1 female.<br>Activity: flight.         | NBM   | Habitat: pond, large size, lentic, freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily  | H<br>G<br>2                |
| Sympetrum danae           | Black Meadowhawk       | G5       |  | S2 |  |  | 17.3Km +/-0.1 | P.M.<br>Brunelle | Descrip.: 1 adult, 1 male.<br>Activity: flight.           | NBM   | freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily waterplants, unshaded, mixed forest, mostly coniferous, landform narrow coastal plain.                                    | H<br>G<br>2<br>0<br>0<br>4 |
| Sympetrum semicinctum     | Band-Winged Meadowhawk | G5       |  | S3 |  |  | 17.3Km +/-0.1 | P.M.<br>Brunelle | Descrip.: 3 adult, 2 male, 1 female.<br>Activity: flight. | CBHNP | freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily   | H<br>G<br>2<br>0           |
| Argia fumipennis violacea | Variable Dancer        | G5T<br>5 |  | S3 |  |  | 17.3Km +/-0.1 | P.M.<br>Brunelle | Activity: flight.   |       | Habitat: pond, large size, lentic, freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily waterplants, unshaded, mixed forest, mostly coniferous, landform narrow coastal plain. | H<br>G<br>2<br>0<br>0<br>4 |

|                               |                    |    |  |  |  |  |  |  |  |               |                            |   |                        |   |                                 |
|-------------------------------|--------------------|----|--|--|--|--|--|--|--|---------------|----------------------------|---|------------------------|---|---------------------------------|
| <i>Enallagma civile</i>       | Familiar Bluet     | G5 |  |  |  |  |  |  |  | 17.3Km +/-0.1 | P.M. Brunelle              | Descrip.: 1 adult, 1 male.<br>Activity: flight.                   | CBHNP                  | Habitat: pond, large size, lentic, freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily waterplants, unshaded, mixed forest, mostly coniferous, landform narrow coastal plain. | S<br>H<br>G<br>2<br>0<br>0<br>4 |
| <i>Enallagma hageni</i>       | Hagen's Bluet      | G5 |  |  |  |  |  |  |  | 17.3Km +/-0.1 | P.M. Brunelle              | Descrip.: 1 adult, 1 male.<br>Activity: flight.                   | CBHNP                  | freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily waterplants, unshaded, mixed forest, mostly coniferous, landform narrow coastal plain.                                    | S<br>H<br>G<br>2<br>0<br>0      |
| <i>Dryopteris filix-mas</i>   | Male Fern          | G5 |  |  |  |  |  |  |  | 17.8Km +/-5   | Bissell, CH;<br>Linder, CH | Pheno.: sterile; fertile.   | col#<br>19429.         | Habitat: clearings about a quarry; unforested.  | H<br>G                          |
| <i>Polystichum braunii</i>    | Braun's Holly-Fern | G5 |  |  |  |  |  |  |  | 17.8Km +/-5   | Linder, DH                 | Pheno.: fertile.  | col#                   | Habitat: alpine; forested.  | H<br>S<br>H<br>G                |
| <i>Lycopodium complanatum</i> | Trailing Clubmoss  | G5 |  |  |  |  |  |  |  | 17.8Km +/-5   | Bissell, CH;<br>Linder, DH | Pheno.: sterile.  | ACAD<br>col#<br>19594. | Habitat: spruce; hillside, across river from quarry; forested.  | S<br>H<br>G                     |
| <i>Bucephala clangula</i>     | Common Goldeneye   | G5 |  |  |  |  |  |  |  | 17.9Km +/-1   | Waldron, Eleanor           | Activity: Confirmed breeding: fledged young.                      |                        |   | S<br>H<br>G                     |
| <i>Falco columbarius</i>      | Merlin             | G5 |  |  |  |  |  |  |  | 17.9Km +/-1   | Waldron, Eleanor           | Activity: Probable breeding: pair observed (sexes similar).       |                        |   | S<br>H<br>G                     |
| <i>Poecile hudsonica</i>      | Boreal Chickadee   | G5 |  |  |  |  |  |  |  | 17.9Km +/-1   | Waldron, Eleanor           | Abundance: 4. Activity: Confirmed breeding: fledged young.        |                        |   | S<br>H<br>G                     |
| <i>Dolichonyx oryzivorus</i>  | Bobolink           | G5 |  |  |  |  |  |  |  | 17.9Km +/-1   | Waldron, Eleanor           | Abundance: 3. Activity: Confirmed breeding: adult occupying nest. |                        |   | S<br>H<br>G                     |
| <i>Aeshna canadensis</i>      | Canada Darner      | G5 |  |  |  |  |  |  |  | 18.1Km +/-1   | D. Anderson                | Descrip.: 2 adult, 2 male. Activity: flight.                      | NSDNRB                 | Habitat: pond, lentic, freshwater.  | H<br>G                          |
| <i>Dorocordulia lepida</i>    | Petite Emerald     | G5 |  |  |  |  |  |  |  | 18.1Km +/-1   | D. Anderson                | Descrip.: 1 adult, 1 male. Activity: flight.                      | NSDNRB                 | Habitat: pond, lentic, freshwater.  | S<br>H                          |
| <i>Enallagma hageni</i>       | Hagen's Bluet      | G5 |  |  |  |  |  |  |  | 18.1Km +/-1   | D. Anderson                | Descrip.: 2 adult, 2 male. Activity: flight.                      | NSDNRB                 | Habitat: pond, lentic, freshwater.  | S<br>H                          |

|                        |                        |     |       |     |  |               |                                 |  |                        |   |   |
|------------------------|------------------------|-----|-------|-----|--|---------------|---------------------------------|--|------------------------|---|---|
| Potamogeton praelongus | White-Stem Pondweed    | G5  |       |     |  | 18.2Km +/-1   | Smith, EC; Curry, WJ; MacDonald | Pheno.: Vegetative.  | ACAD acc# 43481 col#   | Habitat: lake wash; Freshwater Wetland. Drain.: poor. | H |
| Isoetes acadensis      | Acadian Quillwort      | G3? | S3    |     |  | 18.2Km +/-1   | MacDonald, AC; Curry, WJ        | Abundance: common. Pheno.: fertile.  | acc# 43358 col# 16707. | Habitat: submerged; freshwater, wetland.              | G |
| Huperzia selago        | Fir Clubmoss           | G5  | S1S3  |     |  | 18.2Km +/-1   | Schofield, WB; Taylor,          | Abundance: abundant. Pheno.: fertile.                                      | acc# 27283 col#        | Habitat: cliff of ravine; forested.                   | H |
| Asplenium trichomanes  | Maidenhair Spleenwort  | G5  | S2    |     |  | 18.4Km +/-1   | Schofield, WB;                  | Pheno.: Fertile.   | acc# 41750 col#        | Habitat: sheltered cliff crevices; Unforested.        | S |
| Botrychium dissectum   | Cutleaf Grape-Fern     | G5  | S3    |     |  | 18.4Km +/-5   | Taylor, JC; Webster,            | Pheno.: fertile.   | acc# 39120 col#        | Habitat: slope, open dry; unforested.                 | H |
| Ophioglossum pusillum  | Adder's Tongue         | G5  | S2S3  |     |  | 18.4Km +/-5   | Schofield, WB;                  | Pheno.: fertile.   | acc# 39124 col#        | Habitat: meadow; freshwater, wetland.                 | S |
| Arabis drummondii      | Drummond Rockcress     | G5  | S2    |     |  | 18.5Km +/-1   | Smith, EC; Schofield, WB;       | Pheno.: Flowering; Fruiting.   | ACAD, NSPM acc#        | Habitat: cliff shelves, upper cliff; Unforested.      | H |
| Mergus serrator        | Red-breasted Merganser | G5  | S2S3B |     |  | 18.5Km +/-5   | Ball, George                    | Activity: Probable breeding: pair observed (sexes similar).                |                        |   | H |
| Accipiter gentilis     | Northern Goshawk       | G5  | S3B   | NAR |  | 18.5Km +/-5   | BBA atlasser no 1469            | breeding: territorial behaviour twice in same location.                    |                        |   | G |
| Falco columbarius      | Merlin                 | G5  | S3S4B | NAR |  | 18.5Km +/-5   | BBA atlasser no 1469            | Activity: Probable breeding: territorial behaviour twice in same location. |                        |   | 2 |
| Poecile hudsonica      | Boreal Chickadee       | G5  | S3S4  |     |  | 18.5Km +/-5   | BBA atlasser no 1469            | Activity: Probable breeding: territorial behaviour twice in same location. |                        |   | H |
| Dolichonyx oryzivorus  | Bobolink               | G5  | S3B   |     |  | 18.5Km +/-5   | BBA atlasser no 1469            | Activity: Probable breeding: territorial behaviour twice in same location. |                        |   | H |
| Euphagus carolinus     | Rusty Blackbird        | G5  | S3S4B |     |  | 18.5Km +/-5   | BBA atlasser no 1469            | Activity: Probable breeding: territorial behaviour twice in same location. |                        |   | 2 |
| Sterna hirundo         | Common Tern            | G5  | S3B   | NAR |  | 18.6Km +/-1   | Kent, B                         | Count: Colony size: 7 pair; Birds: 15 est.                                 |                        | Habitat: mainland coast marine.                       | S |
| Sterna hirundo         | Common Tern            | G5  | S3B   | NAR |  | 18.7Km +/-0.1 | (MNRS)                          | Count: 30 pairs.   |                        |   | H |

|  |                            |            |      |  |               |  |  |   |  |   |
|--|----------------------------|------------|------|--|---------------|--|--|---|--|---|
| <i>Erigeron hyssopifolius</i>                              | Daisy Fleabane             | G5         | S2S3 |  | 18.7Km +/-1   | Rosbach, GB<br>Smith, EC;<br>Schofield, WB; Taylor, EC | Abundance: abundant.<br>Pheno.: Flowering. | ACAD<br>acc#<br>65462 col#              | Habitat: cliff face by river;<br>Freshwater Wetland. Drain.: poor.   | H |
| <i>Arabis drummondii</i>                                   | Drummond Rockcress         | G5         | S2   |  | 18.7Km +/-1   | Schofield, WB; Taylor, EC                              | Abundance: rare.<br>Pheno.: Fruiting.      | ACAD,<br>NSPM<br>acc#                   | Habitat: dry cliff & talus;<br>Unforested.   | H |
| <i>Pyrola minor</i>  | Lesser Wintergreen         | G5         | S2   |  | 18.7Km +/-1   | Pick, DL;<br>Hounsell, EC                              | Pheno.: Fruiting.                          | acc#<br>61614 col#                      | Habitat: mixed woods along trail;<br>Forested.   | H |
| <i>Carex atratiformis</i>                                  | Black Sedge                | G5         | S2   |  | 18.7Km +/-1   | Pick, DL;<br>Hounsell, EC                              | Pheno.: Fruiting.                          | acc#<br>61637 col#                      | Freshwater Wetland. Drain.: poor.  | S |
| <i>Dryopteris fragrans</i> var. <i>remotiuscula</i>        | Fragrant Fern              | G5T<br>?   | S2   |  | 18.7Km +/-1   | Schofield, WB; Taylor, EC                              | Pheno.: Fertile.                           | acc#<br>27361 col#                      | Habitat: dry cliff crevices;<br>Unforested.  | H |
| <i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i> | Lance-Leaf Grape-Fern      | G5T<br>4   | S2   |  | 18.7Km +/-1   | Webster, DH;   | Pheno.: Fertile.                           | acc#<br>39121 col#                      | Habitat: damp forest floor;<br>Forested.   | S |
| <i>Arabis hirsuta</i> var. <i>pycnocarpa</i>               | Hairy Rock-Cress           | G5T<br>5   | S1S2 |  | 18.8Km +/-0.1 | Erskine, JS  |  | NSPM<br>col#                            | Habitat: dry cliffs, cliff crevices,<br>outcrops on rich hardwood  | H |
| <i>Draba arabisans</i>                                     | Rock Whitlow-Grass         | G4         | S2   |  | 18.8Km +/-0.1 | Erskine, JS  |  | NSPM<br>col#<br>53.484.                 | Habitat: cliff ledges/tops, talus slopes, damp scree, rich hardwood slopes, schist cliffs, marble cliffs, shaded thickets on boulder talus.              | H |
| <i>Atriplex franktonii</i>                                 | Frankton's Saltbush        | G?         | S2   |  | 18.8Km +/-0.1 | Iaschereau, P.R.;<br>Forwood, EC                       | Abundance: abundant.                       | UNB acc#<br>39084 col#<br>307.          | Habitat: cobble beach, in<br>Zostera wrack.  | H |
| <i>Vaccinium caespitosum</i>                               | Dwarf Blueberry            | G5         | S2   |  | 18.8Km +/-0.1 | Schofield, WB; Smith, EC;<br>Webster, DH               |  | NSPM<br>col#<br>13876.                  | Habitat: rocky cliffs, ledges, old pastures, rock crevices, old clearings, crevices of outcrops, roadsides, on cliffs above flood level.                 | H |
| <i>Anemone virginiana</i> var. <i>alba</i>                 | River Anemone              | G5T<br>4T5 | S1S2 |  | 18.8Km +/-0.1 | Erskine, JS  |  | NSPM<br>col#<br>53.486.                 | Habitat: calcareous & slate ledges, damp scree, stream edges, talus slopes, gullies.   | H |
| <i>Saxifraga paniculata</i> ssp. <i>neogaea</i>            | White Mountain Saxifrage   | G5T<br>?   | S2   |  | 18.8Km +/-0.1 | Smith, EC<br>and party;                                |  | NSPM<br>col#                            | Habitat: cliff shoulders,<br>calcareous cliffs, dry ledges, dry woods, rich hardwoods, sandy soil of spruce woods, fir woods on mountains, alder swamps, | H |
| <i>Goodyera repens</i>                                     | Dwarf Rattlesnake-Plantain | G5         | S2S3 |  | 18.8Km +/-0.1 | Erskine, JS<br>Smith, EC;                              |  | NSPM<br>col#<br>53.491.<br>ACAD<br>acc# | Habitat: spit; Coastal. Drain.: poor.  | H |
| <i>Poa glauca</i>  | White Bluegrass            | G5         | S2S3 |  | 18.8Km +/-0.1 | Erskine, DS; Collins, EC                               | Pheno.: Fruiting.                          | 16313 col#                              |  | G |

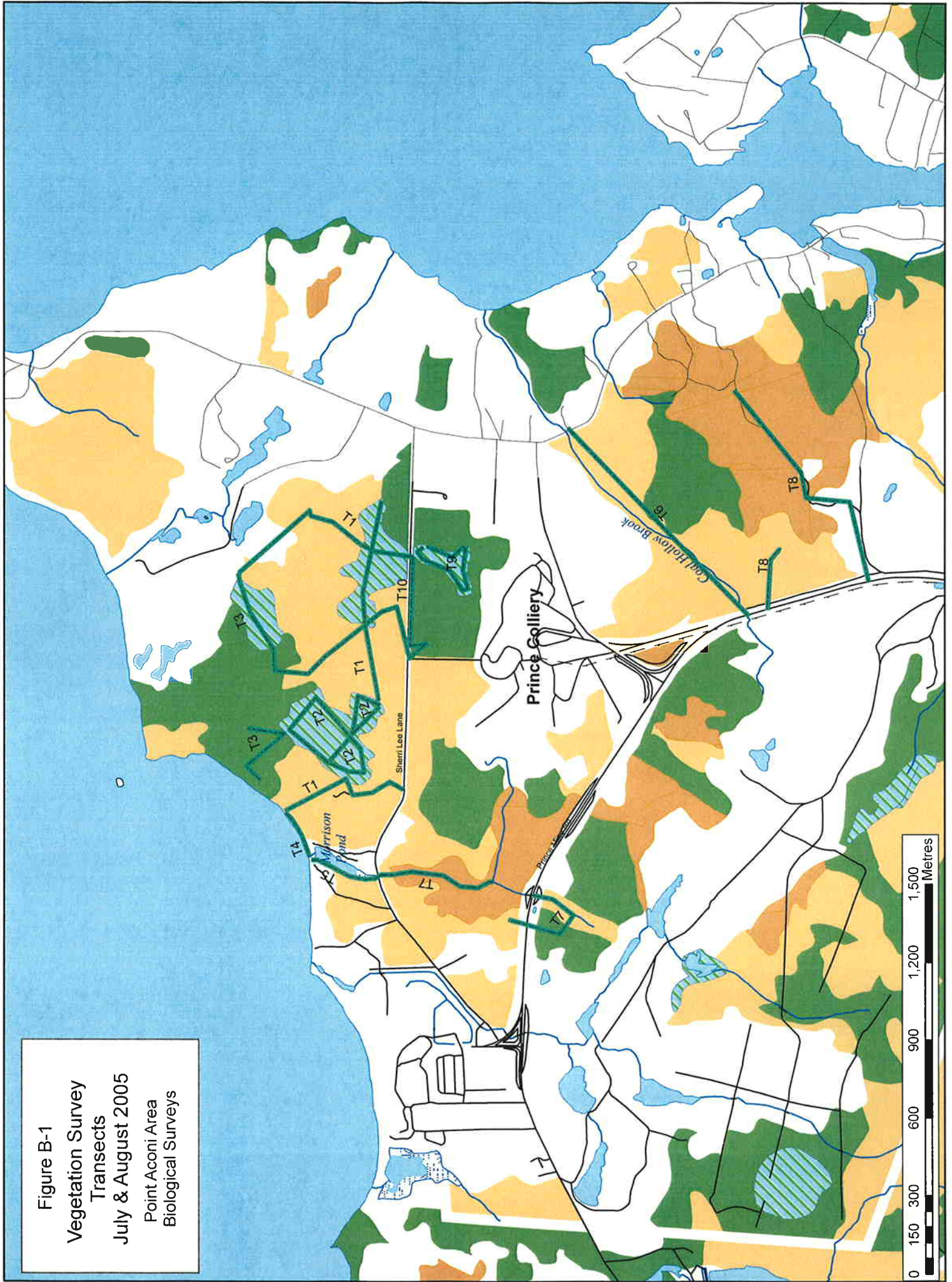


|  |                             |         |      |  |  |               |  |                        |  |   |
|--|-----------------------------|---------|------|--|--|---------------|--|------------------------|--|---|
| <i>Asplenium trichomanes</i>               | Maidenhair Spleenwort       | G5      | S2   |  |  | 18.8Km +/-0.1 | Schofield, WB; JC; Webster, LP;        | NSPM col# 13859.       | Habitat: damp shaded cliffs, rock/basalt crevices, waterfalls, talus, mountain gullies.                | H |
| <i>Polystichum lonchitis</i>               | Northern Holly-Fern         | G5      | S2   |  |  | 18.8Km +/-0.1 | Smith, EC; Schofield, WB; JC; Webster, | NSPM col# 13860.       | Habitat: roadsides, gypsum sinkholes, shaded cliff crevices, rich alkaline woods, wooded rocky slopes. | H |
| <i>Carex scirpoidea</i>                    | Bulrush Sedge               | G5      | S2   |  |  | 18.8Km +/-0.5 | Smith, EC; Taylor, JC; Webster,        | ACAD, NSPM acc#        | Habitat: dry & wet cliff ledges & crevices; Unforested.  | H |
| <i>Poa glauca</i>                          | White Bluegrass             | G5      | S2S3 |  |  | 18.8Km +/-1   | Bentley, PA;                           | acc# 40782 col#        | Habitat: cliff crevice; Unforested.  | S |
| <i>Trisetum melicoides</i>                 | Purple False Oats           | G4      | S1   |  |  | 18.8Km +/-1   | Schofield, WB; Taylor, JC;             | acc# 27924 col# 8143.  | Habitat: damp, shaded ledges; Freshwater Wetland. Drain.: poor.  | S |
| <i>Woodsia alpina</i>                      | Northern Woodsia            | G4      | S1S2 |  |  | 18.8Km +/-1   | Smith, EC; Pick, DL; Hounsell,         | ACAD acc# ECS00266     | Habitat: damp crevices & ledges of cliff; Freshwater Wetland. Drain.: poor.                            | H |
| <i>Woodsia glabella</i>                    | Smooth Woodsia              | G5      | S2   |  |  | 18.8Km +/-1   | Pick, DL; Hounsell, RW                 | acc# ECS00266 5 col#   | Habitat: wet ledges & crevices; Freshwater Wetland. Drain.: poor.                                      | S |
| <i>Botrychium lunaria</i>                  | Moonwort Grape-Fern         | G5      | S1   |  |  | 18.8Km +/-1   | Pick, DL; Hounsell, RW                 | acc# 66896 col# 21742. | Habitat: crevice at base of cliff; Unforested.   | S |
| <i>Trisetum spicatum</i>                   | Narrow False Oats           | G5      | S3   |  |  | 18.9Km +/-0.5 | Smith, EC; Taylor, JC;                 | ACAD col# 6622.        | Habitat: cliffs; Unforested.   | H |
| <i>Plathemis lydia</i>                     | Common Whitetail            | G5      | S3   |  |  | 18Km +/-1     | D. Banks                               | NSDNRB                 | Habitat: land.   | H |
| <i>Anemone virginiana</i> var. <i>alba</i> | River Anemone               | G5T 4T5 | S1S2 |  |  | 19.0Km +/-1   | Taylor, JC; Webster,                   | acc# 25343 col#        | edge; Unforested; Freshwater Wetland.  | S |
| <i>Asplenium trichomanes</i>               | Spleenwort                  | G5      | S2   |  |  | 19.1Km +/-1   | Erskine, JS                            | NSP-W col#             | Habitat: damp shaded cliffs, rock/basalt crevices, waterfalls,   | H |
| <i>Hieracium umbellatum</i>                | Hawkweed                    | G5?     | S2?  |  |  | 19.1Km +/-10  |  |                        |  | H |
| <i>Lobelia kalmii</i>                      | Kalm's Lobelia              | G5      | S1S2 |  |  | 19.1Km +/-10  |  |                        |  | H |
| <i>Cypripedium parviflorum</i>             | Small Yellow Lady's-Slipper | G5      | S2S3 |  |  | 19.1Km +/-10  |  |                        |  | H |
| <i>Liparis loeselii</i>                    | Twayblade                   | G5      | S3S4 |  |  | 19.2Km +/-1   | Schofield,                             | acc#                   | pond edge; freshwater wetland.   | H |
| <i>Dryopteris filix-mas</i>                | Male Fern                   | G5      | S3   |  |  | 19.2Km +/-1   | Schofield,                             | acc#                   | Habitat: open; forested.   | H |
| <i>Botrychium simplex</i>                  | Least Grape-Fern            | G5      | S2S3 |  |  | 19.2Km +/-1   | Schofield, WB; Taylor,                 | acc# 43230 col#        | Habitat: dry field; Unforested.  | S |

| Erigeron hyssopifolius | Daisy Fleabane           | G5       | S2S3 |     | 19.3Km +/-1    | Smith, EC;<br>Taylor, JC;                                 | ACAD<br>acc#         | Habitat: rock crevices,<br>Unforested.   | H |
|------------------------|--------------------------|----------|------|-----|----------------|---|----------------------|--|---|
| Sorex gaspensis        | Gaspá Shrew              | G3       | S2   | SC  | 19.4Km +/-1    | Pheno.: Flowering.  |                      |  | H |
| Vaccinium ovalifolium  | Oval-Leaf<br>Huckleberry | G5       | S1   |     | 19.6Km +/-10   |   | ACAD<br>acc#         |  | H |
| Hieracium robinsonii   | Robinson's<br>Hawkweed   | G2       | S2   |     | 19.6Km +/-5    | Schofield,<br>WB;<br>Webster,<br>DH;<br>Pheno.: fruiting. | 39635 col#<br>13871. | Habitat: crevices in rock shelf.<br>Soil: NS120526.  | G |
| Charadrius melodus     | Piping Plover            | G3       | E    | S1B | 19.6Km +/-50.1 |   |                      | Habitat: A sloping sand beach<br>fronting Atlantic. The rocky<br>headlands of Port Caledonia<br>border beach on east. Westerly,<br>channel into Big Glace Bay Lake<br>separates this beach from a<br>smaller one within town of Glace<br>Bay. The beach is situated in a<br>shaded area. | 2 |
| Charadrius melodus     | Piping Plover            | G3       | E    | S1B | 19.6Km +/-50.1 | staff   |                      | Count: 2.<br>Count: 2.   | H |
| Limosella australis    | Mudwort                  | G4G<br>5 | S2S3 |     | 19.9Km +/-5    |   |                      |  | G |

**Appendix B**  
**Plant Survey Field Data and Bird Survey Field Data**

Figure B-1  
Vegetation Survey  
Transects  
July & August 2005  
Point Aconi Area  
Biological Surveys



## Point Aconi Summer Plant Survey

Survey Dates: July 12, 13, 27, 28, 2005  
August 24,25, 2005

Botanist: Tom Neily

### Species List

Drier Area at Edges of NSDNR 7.3 ha Wetland and Mixed Woods (Transects T1)

| <b>Binomial</b>                | <b>Common Name</b>      | <b>ACCDC/NSDNR Rank /Status</b> |
|--------------------------------|-------------------------|---------------------------------|
| <i>Acer rubrum</i>             | Red Maple               | Green/S5                        |
| <i>Picea mariana</i>           | Black Spruce            | Green/S5                        |
| <i>Betula papyrifera</i>       | Paper Birch             | Green/S5                        |
| <i>Pinus banksiana</i>         | Jack Pine               | Green/S5                        |
| <i>Kalmia angustifolia</i>     | Lambkill                | Green/S5                        |
| <i>Rhododendron canadense</i>  | Rhodora                 | Green/S5                        |
| <i>Pteridium aquilinum</i>     | Bracken                 | Green/S5                        |
| <i>Alnus viridus</i>           | Downy Alder             | Green/S5                        |
| <i>Gaylussacia baccata</i>     | Huckleberry             | Green/S5                        |
| <i>Abies balsamea</i>          | Balsam Fir              | Green/S5                        |
| <i>Nemopanthus mucronata</i>   | False Holly             | Green/S5                        |
| <i>Ledum groenlandicum</i>     | Labrador-tea            | Green/S5                        |
| <i>Vaccinium angustifolium</i> | Lowbush Blueberry       | Green/S5                        |
| <i>Vaccinium macrocarpon</i>   | Large Cranberry         | Green/S5                        |
| <i>Myrica pensylvanica</i>     | Bayberry                | Green/S5                        |
| <i>Cornus canadensis</i>       | Bunchberry              | Green/S5                        |
| <i>Larix laricina</i>          | Larch                   | Green/S5                        |
| <i>Sorbus americana</i>        | Mountain-ash            | Green/S5                        |
| <i>Viburnum nudum</i>          | Wild raisin             | Green/S5                        |
| <i>Aralia nudicaulis</i>       | Wild Sarsaparilla       | Green/S5                        |
| <i>Trientalis borealis</i>     | Starflower              | Green/S5                        |
| <i>Maianthemum canadense</i>   | Wild Lily-of-the-valley | Green/S5                        |
| <i>Linnaea borealis</i>        | Twinflower              | Green/S5                        |
| <i>Gaultheria hispidula</i>    | Snowberry               | Green/S5                        |

| <b>Binomial</b>            | <b>Common Name</b>  | <b>ACCDC/NSDNR Rank /Status</b> |
|----------------------------|---------------------|---------------------------------|
| <i>Scirpus cyperinus</i>   | Wooly Grass         | Green/S5                        |
| <i>Picea glauca</i>        | White Spruce        | Green/S5                        |
| <i>Clintonia borealis</i>  | Clintonia-lily      | Green/S5                        |
| <i>Populus tremuloides</i> | Trembling Aspen     | Green/S5                        |
| <i>Cypripedium acaule</i>  | Pink Lady's-slipper | Green/S5                        |

Wetter Area within NSDNR 7.3 ha Wetland (Transects T2)

| <b>Binomial</b>                | <b>Common Name</b>  | <b>ACCDC/NSDNR Rank /Status</b> |
|--------------------------------|---------------------|---------------------------------|
| <i>Drosera rotundifolia</i>    | Round-leaved Sundew | Green/S5                        |
| <i>Chamaedaphne calyculata</i> | Leather-leaf        | Green/S5                        |
| <i>Picea mariana</i>           | Black Spruce        | Green/S5                        |
| <i>Larix laricina</i>          | Larch               | Green/S5                        |
| <i>Nemopanthus mucronata</i>   | False Holly         | Green/S5                        |
| <i>Myrica pensylvanica</i>     | Bayberry            | Green/S5                        |
| <i>Ledum groenlandica</i>      | Labrador-tea        | Green/S5                        |
| <i>Viburnum nudum</i>          | Wild Raisin         | Green/S5                        |
| <i>Gaylussacia baccata</i>     | Huckleberry         | Green/S5                        |
| <i>Rhododendron canadense</i>  | Rhodora             | Green/S5                        |
| <i>Amelanchier bartramiana</i> | Serviceberry        | Green/S5                        |
| <i>Rubus recurvicaulis</i>     | Bramble             | Yellow/S?<br>(To be confirmed)  |
| <i>Empetrum nigrum</i>         | Black Crowberry     | Green/S5                        |
| <i>Aronia melanocarpa</i>      | Chokeberry          | Green/S5                        |
| <i>Salix pyrifolia</i>         | Bog Willow          | Green/S5                        |
| <i>Salix discolor</i>          | Pussy Willow        | Green/S5                        |
| <i>Vaccinium macrocarpon</i>   | Large Cranberry     | Green/S5                        |
| <i>Carex limosa</i>            | Sedge               | Green/S4                        |

| <b>Binomial</b>            | <b>Common Name</b>  | <b>ACCDC/NSDNR Rank /Status</b> |
|----------------------------|---------------------|---------------------------------|
| <i>Scirpus cyperinus</i>   | Wooly Grass         | Green/S5                        |
| <i>Picea glauca</i>        | White Spruce        | Green/S5                        |
| <i>Clintonia borealis</i>  | Clintonia-lily      | Green/S5                        |
| <i>Populus tremuloides</i> | Trembling Aspen     | Green/S5                        |
| <i>Cypripedium acaule</i>  | Pink Lady's-slipper | Green/S5                        |

Wetter Area within NSDNR 7.3 ha Wetland (Transects T2)

| <b>Binomial</b>                | <b>Common Name</b>  | <b>ACCDC/NSDNR Rank /Status</b> |
|--------------------------------|---------------------|---------------------------------|
| <i>Drosera rotundifolia</i>    | Round-leaved Sundew | Green/S5                        |
| <i>Chamaedaphne calyculata</i> | Leather-leaf        | Green/S5                        |
| <i>Picea mariana</i>           | Black Spruce        | Green/S5                        |
| <i>Larix laricina</i>          | Larch               | Green/S5                        |
| <i>Nemopanthus mucronata</i>   | False Holly         | Green/S5                        |
| <i>Myrica pensylvanica</i>     | Bayberry            | Green/S5                        |
| <i>Ledum groenlandica</i>      | Labrador-tea        | Green/S5                        |
| <i>Viburnum nudum</i>          | Wild Raisin         | Green/S5                        |
| <i>Gaylussacia baccata</i>     | Huckleberry         | Green/S5                        |
| <i>Rhododendron canadense</i>  | Rhodora             | Green/S5                        |
| <i>Amelanchier bartramiana</i> | Serviceberry        | Green/S5                        |
| <i>Rubus</i> sp.               | Bramble             | S5 (not at risk species)        |
| <i>Empetrum nigrum</i>         | Black Crowberry     | Green/S5                        |
| <i>Aronia melanocarpa</i>      | Chokeberry          | Green/S5                        |
| <i>Salix pyrifolia</i>         | Bog Willow          | Green/S5                        |
| <i>Salix discolor</i>          | Pussy Willow        | Green/S5                        |
| <i>Vaccinium macrocarpon</i>   | Large Cranberry     | Green/S5                        |
| <i>Carex limosa</i>            | Sedge               | Green/S4                        |

Coniferous Wooded Area NE of NSDNR 7.3 ha Wetland (Transects T3)

| <b>Binomial</b>                 | <b>Common Name</b>                | <b>ACCDC/NSDNR Rank /Status</b> |
|---------------------------------|-----------------------------------|---------------------------------|
| <i>Picea mariana</i>            | Black Spruce                      | Green/S5                        |
| <i>Betula papyrifera</i>        | Paper Birch                       | Green/S5                        |
| <i>Abies balsamea</i>           | Balsam Fir                        | Green/S5                        |
| <i>Acer rubrum</i>              | Red Maple                         | Green/S5                        |
| <i>Carex disperma</i>           | Sedge                             | Green/S5                        |
| <i>Equisetum sylvaticum</i>     | Wood-horsetail                    | Green/S5                        |
| <i>Carex echinata</i>           | Sedge                             | Green/S5                        |
| <i>Gaultheria hispidula</i>     | Snowberry                         | Green/S5                        |
| <i>Drosera rotundifolia</i>     | Round-leaved Sundew               | Green/S5                        |
| <i>Smilicina trifolia</i>       | Three-leaved False Solomon's Seal | Green/S5                        |
| <i>Ilex verticillata</i>        | Canada Holly                      | Green/S5                        |
| <i>Viola cucullata</i>          | Blue Violet                       | Green/S5                        |
| <i>Anthyrium felix-femina</i>   | Northern Lady Fern                | Green/S5                        |
| <i>Rubus pubescens</i>          | Dwarf Raspberry                   | Green/S5                        |
| <i>Rubus hispidus</i>           | Dewberry                          | Green/S5                        |
| <i>Lycopus americana</i>        | Water-horehound                   | Green/S5                        |
| <i>Plantanthera clavellata</i>  | Northern Club-spur                | Green/S5                        |
| <i>Dryopteris cristata</i>      | Crested Shield Fern               | Green/S5                        |
| <i>Rubus idaeus</i>             | Red Raspberry                     | Green/S5                        |
| <i>Aster acuminatus</i>         | Wood Aster                        | Green/S5                        |
| <i>Epigaea repens</i>           | Mayflower                         | Green/S5                        |
| <i>Fraxinus americanus</i>      | White Ash                         | Green/S5                        |
| <i>Prunella vulgaris</i>        | Heal-all                          | Green/S5                        |
| <i>Lycopodium annotinum</i>     | Bristly Club-moss                 | Green/S5                        |
| <i>Lycopodium obscurum</i>      | Ground Cedar                      | Green/S5                        |
| <i>Osmunda cinnamomea</i>       | Cinnamon Fern                     | Green/S5                        |
| <i>Phegopteris connectilis</i>  | Northern Beech Fern               | Green/S5                        |
| <i>Orthilia secunda</i>         | One-sided Wintergreen             | Green/S5                        |
| <i>Carex intumescens</i>        | Sedge                             | Green/S5                        |
| <i>Plantanthera grandiflora</i> | Large Purple Fringed Orchid       | S3                              |



Beach Species at Morrison Pond (Transect T4)

| <b>Binomnial</b>             | <b>Common Name</b>  | <b>ACCDC/NSDNR Rank /Status</b> |
|------------------------------|---------------------|---------------------------------|
| <i>Cakile edentula</i>       | Sea-rocket          | Green/S5                        |
| <i>Elymus mollis</i>         | American Dune Grass | Green/S5                        |
| <i>Honkenya peploides</i>    | Seabeach Sandwort   | Green/S5                        |
| <i>Iris setosa</i>           | Beach Blue Flag     | Green/S5                        |
| <i>Calystegia sepium</i>     | Hedge-bindweed      | Green/S5                        |
| <i>Artemisia stelleriana</i> | Beach Wormwood      | SE                              |
| <i>Atriplex prostrata</i>    | Orach               | Green/S5                        |

Morrison Pond and Bordering Woods (Transect T5)

| <b>Binomnial</b>                 | <b>Common Name</b>   | <b>ACCDC/NSDNR Rank /Status</b> |
|----------------------------------|----------------------|---------------------------------|
| <i>Eleocharis palustris</i>      | Spikerush            | Green/S5                        |
| <i>Alisma triviale</i>           | Water Plantain       | Green/S5                        |
| <i>Polygonum sagittatum</i>      | Tear-thumb           | Green/S5                        |
| <i>Galium</i> sp                 | Bedstraw             | Not a species at risk           |
| <i>Luzula multiflora</i>         | Common Wood-rush     | Green/S5                        |
| <i>Sparganium eurycarpum</i>     | American Bur-reed    | Green/S4                        |
| <i>Juncus effusus</i>            | Soft Rush            | Green/S5                        |
| <i>Carex brunnescens</i>         | Sedge                | Green/S5                        |
| <i>Juncus bufonius</i>           | Toad Rush            | Green/S5                        |
| <i>Lolium perenne</i>            | Perennial Rye Grass  | SE                              |
| <i>Carex limosa</i>              | Sedge                | Green/S4                        |
| <i>Calamagrostis pickeringii</i> | Grass                | Green/S4S5                      |
| <i>Carex stipata</i>             | Sedge                | Green/S5                        |
| <i>Triadenum virginicum</i>      | Marsh St John's-wort | Green/S5                        |
| <i>Scutellaria galericulata</i>  | Skullcap             | Green/S5                        |
| <i>Carex crinitum</i>            | Sedge                | Green/S5                        |
| <i>Potentilla anserina</i>       | Silverweed           | Green/S5                        |
| <i>Spiraea alba</i>              | Meadow-sweet         | Green/S5                        |
| <i>Impatiens capensis</i>        | Jewelweed            | Green/S5                        |

| <b>Binomial</b>              | <b>Common Name</b>      | <b>ACCDC/NSDNR Rank /Status</b> |
|------------------------------|-------------------------|---------------------------------|
| <i>Quercus rubra</i>         | Red Oak                 | Green/S5                        |
| <i>Veronica officinalis</i>  | Common Speedwell        | Green/S5SE                      |
| <i>Hieracium lachenalli</i>  | Hawkweed                | SE                              |
| <i>Aralia nudicaulis</i>     | Wild Sarsaparilla       | Green/S5                        |
| <i>Betula papyrifera</i>     | Paper Birch             | Green/S5                        |
| <i>Picea glauca</i>          | White Spruce            | Green/S5                        |
| <i>Amelanchier sp</i>        | Serviceberry            | Not a species at risk           |
| <i>Crataegus sp</i>          | Hawthorn                | Not a species at risk           |
| <i>Clintonia borealis</i>    | Clintonia-lily          | Green/S5                        |
| <i>Viburnum nudum</i>        | Wild Raisin             | Green/S5                        |
| <i>Cornus canadensis</i>     | Bunchberry              | Green/S5                        |
| <i>Maianthemum canadense</i> | Wild Lily-of-the-valley | Green/S5                        |
| <i>Trientalis borealis</i>   | Starflower              | Green/S5                        |
| <i>Fagus grandifolia</i>     | American Beech          | Green/S5                        |
| <i>Corallorhiza maculata</i> | Spotted Coral-root      | Green/S4                        |
| <i>Typha latifolia</i>       | Broad-leaved Cat-tail   | Green/S5                        |
| <i>Carex arctata</i>         | Sedge                   | Green/S5                        |
| <i>Onoclea sensibilis</i>    | Sensitive Fern          | Green/S5                        |
| <i>Luzula acuminata</i>      | Wood-rush               | Green/S5                        |
| <i>Juncus pelocarpus</i>     | Rush                    | Green/S5                        |
| <i>Carex flava</i>           | Sedge                   | Green/S5                        |
| <i>Glyceria canadensis</i>   | Rattlesnake Grass       | Green/S5                        |
| <i>Scirpus cyperinus</i>     | Wooly Grass             | Green/S5                        |
| <i>Lysimachia terrestris</i> | Swamp Candle            | Green/S5                        |
| <i>Juncus filiformis</i>     | Rush                    | Green/S5                        |
| <i>Bidens frondosa</i>       | Common Beggar's-ticks   | Green/S5                        |
| <i>Agrostis stolonifera</i>  | Grass                   | Green/S5SE                      |
| <i>Juncus canadensis</i>     | Rush                    | Green/S5                        |

Coal Hollow Brook (Transect T6)

| <b>Binomial</b>                  | <b>Common Name</b>      | <b>ACCDC/NSDNR Rank /Status</b> |
|----------------------------------|-------------------------|---------------------------------|
| <i>Typha latifolia</i>           | Broad-leaved Cat-tail   | Green/S5                        |
| <i>Epilobium angustifolium</i>   | Fireweed                | Green/S5                        |
| <i>Alnus incana</i>              | Speckled Alder          | Green/S5                        |
| <i>Populus tremuloides</i>       | Trembling Aspen         | Green/S5                        |
| <i>Hypericum perforatum</i>      | St John's-wort          | SE                              |
| <i>Anaphalis margaritacea</i>    | Pearly Everlasting      | Green/S5                        |
| <i>Carex crinitum</i>            | Sedge                   | Green/S5                        |
| <i>Equisetum arvense</i>         | Field-horsetail         | Green/S5                        |
| <i>Tussilago farfara</i>         | Coltsfoot               | SESE                            |
| <i>Onoclea sensibilis</i>        | Sensitive Fern          | Green/S5                        |
| <i>Prunella vulgaris</i>         | Heal-all                | Green/S5                        |
| <i>Carex stipata</i>             | Sedge                   | Green/S5                        |
| <i>Carex scabrata</i>            | Sedge                   | Green/S5                        |
| <i>Ranunculus acris</i>          | Tall Buttercup          | SE                              |
| <i>Galium palustre</i>           | Common Bedstraw         | Green/S5                        |
| <i>Aralia nudicaulis</i>         | Wild Sarsaparilla       | Green/S5                        |
| <i>Acer spicatum</i>             | Mountain Maple          | Green/S5                        |
| <i>Carex intumescens</i>         | Sedge                   | Green/S5                        |
| <i>Maianthemum canadense</i>     | Wild Lily-of-the-valley | Green/S5                        |
| <i>Viburnum nudum</i>            | Wild Raisin             | Green/S5                        |
| <i>Abies balsamea</i>            | Balsam Fir              | Green/S5                        |
| <i>Populus tremuloides</i>       | Trembling Aspen         | Green/S5                        |
| <i>Pyrola elyptica</i>           | Shinleaf                | Green/S5                        |
| <i>Salix</i> sp                  | Willow                  | Not a species at risk           |
| <i>Rubus pubescens</i>           | Dwarf Raspberry         | Green/S5                        |
| <i>Thelyptris noveboracensis</i> | New York Fern           | Green/S5                        |
| <i>Phegopteris connectilis</i>   | Northern Beech Fern     | Green/S5                        |
| <i>Geum aleppicum</i>            | Geum                    | Green/S5                        |
| <i>Osmunda claytoniana</i>       | Interrupted Fern        | Green/S5                        |
| <i>Ranunculus repens</i>         | Creeping Buttercup      | SE                              |
| <i>Lycopus americana</i>         | Water-horehound         | Green/S5                        |

| <b>Binomial</b>                | <b>Common Name</b>           | <b>ACCDC/NSDNR Rank /Status</b>  |
|--------------------------------|------------------------------|--|
| <i>Scutellaria laterifolia</i> | Skullcap                     | Green/S5   |
| <i>Viola cucullata</i>         | Blue Violet                  | Green/S5   |
| <i>Anthyrium felix-femina</i>  | Northern Lady Fern           | Green/S5   |
| <i>Impatiens capensis</i>      | Jewelweed                    | Green/S5   |
| <i>Equisetum sylvaticum</i>    | Wood-horsetail               | Green/S5   |
| <i>Aster acuminatus</i>        | Wood Aster                   | Green/S5   |
| <i>Clintonia borealis</i>      | Clintonia-lily               | Green/S5   |
| <i>Dryopteris gymnocarpium</i> | Oak Fern                     | Green/S5   |
| <i>Acer pensylvanicum</i>      | Moosewood                    | Green/S5   |
| <i>Ciccaea alpina</i>          | Small Enchanter's Nightshade | Green/S5   |
| <i>Ribes glandulosum</i>       | Skunk Currant                | Green/S5   |
| <i>Brachyelytrum erectum</i>   | Grass                        | Green/S5   |
| <i>Carex gracillima</i>        | Sedge                        | Green/S5   |
| <i>Dryopteris intermedia</i>   | Evergreen Wood Fern          | Green/S5   |
| <i>Acer saccharum</i>          | Sugar Maple                  | Green/S5   |
| <i>Luzula parviflora</i>       | Small-flowered Wood-rush     | Green/S3   |
| <i>Luzula multiflora</i>       | Common wood-rush             | Green/S5   |
| <i>Polygonum cilinode</i>      | Buckwheat                    | Green/S5   |
| <i>Hieracium kalmii</i>        | Hawkweed                     | Undetermined/S2?<br>(Tentative Identification – located along Coal Hollow Brook) |
| <i>Hieracium lachenalii</i>    | Hawkweed                     | SE   |
| <i>Arenaria lateriflora</i>    | Sandwort                     | Green/S5   |
| <i>Glyceria striata</i>        | Fowl Manna-grass             | Green/S5   |
| <i>Deparia acrostichoides</i>  | Silvery Spleenwort           | Green/S4   |
| <i>Plantanthera clavellata</i> | Northern Club-spur           | Green/S5   |
| <i>Plantanthera hyperborea</i> | Northern Green Bog-orchid    | Green/S4   |
| <i>Plantanthera psycodes</i>   | Small Purple Fringe Orchid   | Green/S4   |
| <i>Rosa gallica</i>            | Rose                         | SE   |
| <i>Galium triflorum</i>        | Bedstraw                     | Green/S5   |
| <i>Deschampsia flexuosa</i>    | Grass                        | Green/S5   |

| <b>Binomial</b>    | <b>Common Name</b> | <b>ACCDC/NSDNR Rank /Status</b> |
|--------------------|--------------------|---------------------------------|
| Agrostis perennans | Grass              | Green/S4S5                      |
| Carex leptalea     | Sedge              | Green/S5                        |

Morrison Pond Brook (Transects T7)

| <b>Binomial</b>            | <b>Common Name</b> | <b>ACCDC/NSDNR Rank /Status</b> |
|----------------------------|--------------------|---------------------------------|
| Acer saccharum             | Sugar Maple        | Green/S5                        |
| Betula allegheniensis      | Yellow Birch       | Green/S5                        |
| Acer pensylvanicum         | Moosewood          | Green/S5                        |
| Thelypteris noveboracensis | New York Fern      | Green/S5                        |
| Streptopus roseus          | Rosy Twisted Stalk | Green/S5                        |
| Osmunda cinnamomea         | Cinnamon Fern      | Green/S5                        |
| Anthyrium felix-femina     | Northern Lady Fern | Green/S5                        |
| Carex intumescens          | Sedge              | Green/S5                        |
| Carex disperma             | Sedge              | Green/S5                        |
| Brachyelytrum erectum      | Grass              | Green/S5                        |
| Gymnocarpium dryopteris    | Oak Fern           | Green/S5                        |
| Rubus idaeus               | Red Raspberry      | Green/S5                        |
| Polystichum acrostichoides | Christmas Fern     | Green/S5                        |

Secondary Hardwoods – Dominant Species (Transects T8)

| <b>Binomial</b>                   | <b>Common Name</b> | <b>ACCDC/NSDNR Rank /Status</b> |
|-----------------------------------|--------------------|---------------------------------|
| <i>Acer rubrum</i>                | Red Maple          | Green/S5                        |
| <i>Acer saccharum</i>             | Sugar Maple        | Green/S5                        |
| <i>Acer spicatum</i>              | Mountain Maple     | Green/S5                        |
| <i>Betula allegheniensis</i>      | Yellow Birch       | Green/S5                        |
| <i>Thelypteris noveboracensis</i> | New York Fern      | Green/S5                        |
| <i>Fagus gradifolia</i>           | American Beech     | Green/S5                        |
| <i>Populus tremuloides</i>        | Trembling Aspen    | Green/S5                        |
| <i>Betula papyrifera</i>          | Paper Birch        | Green/S5                        |
| <i>Dennstaedia punctilobula</i>   | Hay-scented Fern   | Green/S5                        |
| <i>Aster acuminatus</i>           | Wood Aster         | Green/S5                        |

List for T9 Cranberry Bog

| <b>Binomial</b>                | <b>Common Name</b>    | <b>ACCDC/NSDNR Rank /Status</b> |
|--------------------------------|-----------------------|---------------------------------|
| <i>Picea mariana</i>           | Black Spruce          | Green/S5                        |
| <i>Chamaedaphne calyculata</i> | Leatherleaf           | Green/S5                        |
| <i>Spiraea alba</i>            | Meadowsweet           | Green/S5                        |
| <i>Salix</i> sp.               | Willow                | not at risk                     |
| <i>Larix laricina</i>          | Larch                 | Green/S5                        |
| <i>Juncus effusus</i>          | Soft Rush             | Green/S5                        |
| <i>Triadenum virginicum</i>    | Marsh St. John's-wort | Green/S5                        |
| <i>Vaccinium macrocarpon</i>   | Cranberry             | Green/S5                        |
| <i>Rhododendron canadense</i>  | Rhodora               | Green/S5                        |
| <i>Iris versicolor</i>         | Blue Flag             | Green/S5                        |
| <i>Nemophanthus mucronata</i>  | False Holly           | Green/S5                        |
| <i>Scirpus cyperinus</i>       | Bulrush               | Green/S5                        |
| <i>Ledum groenlandicum</i>     | Labrador Tea          | Green/S5                        |
| <i>Kalmia angustifolia</i>     | Lambkill              | Green/S5                        |
| <i>Acer rubrum</i>             | Red Maple             | Green/S5                        |
| <i>Carex nigra</i>             | Sedge                 | Green/S5                        |

| <b>Binomial</b>                | <b>Common Name</b>  | <b>ACCDC/NSDNR Rank /Status</b> |
|--------------------------------|---------------------|---------------------------------|
| <i>Gaylussaca baccata</i>      | Huckleberry         | Green/S5                        |
| <i>Cornus canadensis</i>       | Bunchberry          | Green/S5                        |
| <i>Lysimachia terrestris</i>   | Swamp candle        | Green/S5                        |
| <i>Ilex verticillata</i>       | Canada Holly        | Green/S5                        |
| <i>Cypripedium acaule</i>      | Pink Lady's-slipper | Green/S5                        |
| <i>Eriophorum virginicum</i>   | Tawny Cotton-grass  | Green/S5                        |
| <i>Aster radula</i>            | Aster               | Green/S5                        |
| <i>Plantanthera clavellata</i> | Northern Club-spur  | Green/S5                        |

List for White Spruce Pasture T10

| <b>Binomial</b>            | <b>Common Name</b> | <b>ACCDC/NSDNR Rank /Status</b> |
|----------------------------|--------------------|---------------------------------|
| <i>Picea glauca</i>        | White Spruce       | Green/S5                        |
| <i>Betula papyrifera</i>   | Paper Birch        | Green/S5                        |
| <i>Acer rubrum</i>         | Red Maple          | Green/S5                        |
| <i>Alnus incana</i>        | Speckled Alder     | Green/S5                        |
| <i>Trientalis borealis</i> | Starflower         | Green/S5                        |
| <i>Cornus canadensis</i>   | Bunchberry         | Green/S5                        |
| <i>Aralia nudicaulis</i>   | Wild Sarsaparilla  | Green/S5                        |

## Point Aconi Bird Survey Locations (July 26-28, 2005)

Surveyor: Fulton Lavender

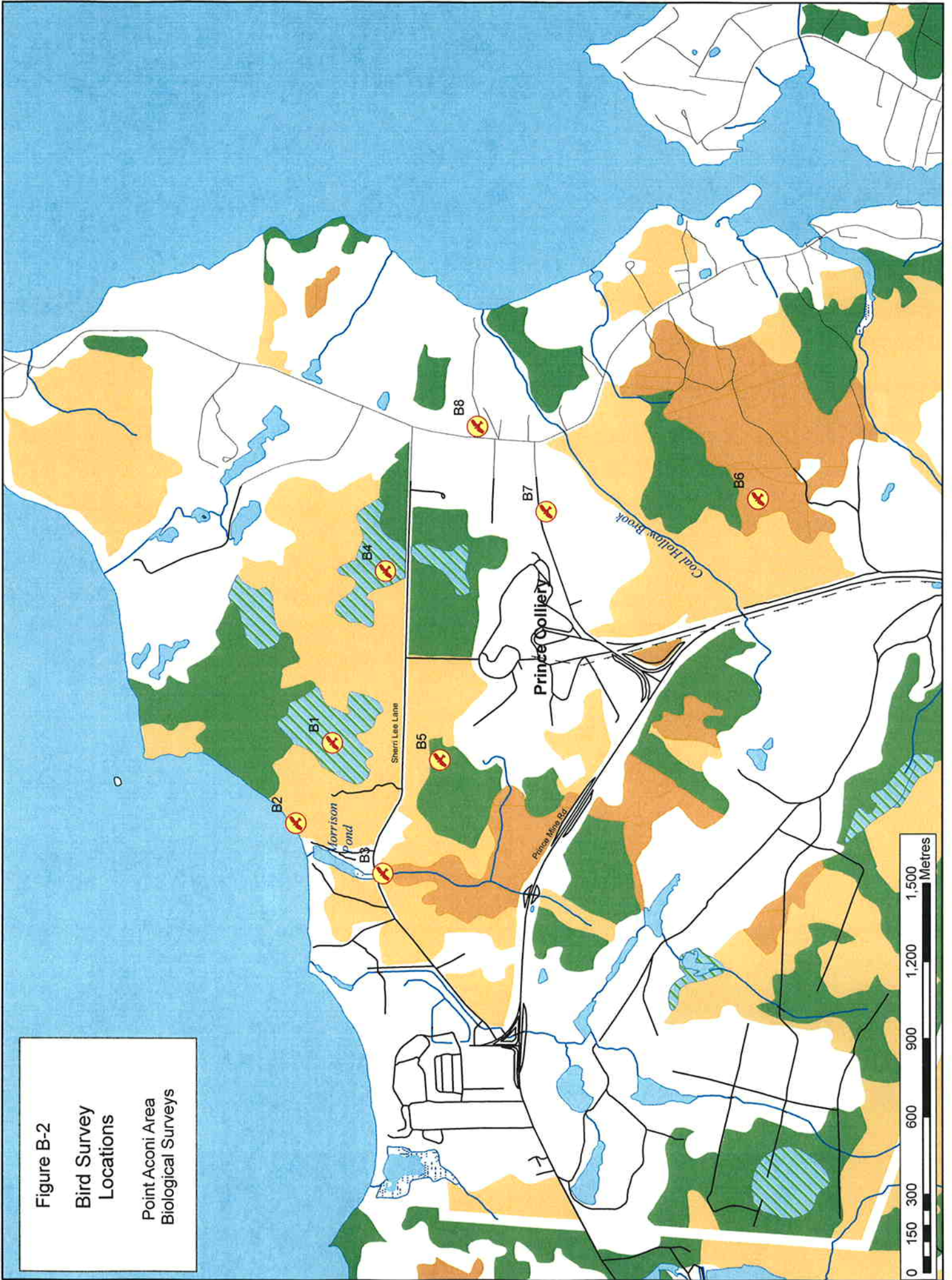
| Station No. | Habitat Type                   | Site Description  | Other Observations   |
|-------------|--------------------------------|---|--|
| B1          | Shrub Bog                      | Mixed woods and tall shrub with sphagnum  | ~6:00 am July 28; no background noise; light wind; 100% cloud cover  |
| B2          | Coastal beach, cliffs and pond | Cliffs to north and south, cobble beach at mouth of Morrison Pond                             | ~8:00 pm July 26; light ocean noise; wind calm<br>~8:30 am July 27; light ocean noise; 20 km South wind; 70% cloud cover   |
| B3          | Hardwoods                      | More mature hardwoods along Morrison Pond Brook. Maple and birch.                             | ~8:20 pm July 26; no background noise; wind calm<br>~8:00 am July 27; no background noise; 15-20 km South wind; 90% cloud cover<br>~5:30 am July 28; no background noise; light wind; 100% cloud cover       |
| B4          | Mixed Woods                    | Mixed red maple, white birch, black spruce, shrubs throughout                                 | ~8:40 pm July 26; no background noise; wind calm<br>~6:40 am July 27; no background noise; light 15 km South wind; decreased overcast<br>~6:30 am July 28; no background noise; light wind; 100% cloud cover |
| B5          | Softwoods                      | Spruce and balsam fir with minor hardwoods and shrubs   | ~8:30 pm July 26; no background noise; wind calm<br>~7:30 am July 27; no background noise; light 15 km South wind; 80% cloud cover<br>~6:20 am July 28; no background noise; light wind; 100% cloud cover    |
| B6          | Second Growth Hardwoods        | Predominately mid age red maple, white birch, bordered by mixed coniferous (red/black spruce) | ~5:30 am July 27; no background noise; light 10 km South wind; overcast, light drizzle<br>~7:30 am July 28; no background noise; light wind; 100% cloud cover  |
| B7          | Disturbed                      | Reclaimed grass and low shrubs; bordered by spruce and red maple                              | ~6:00 am July 27; no background noise; light 10 km South wind; overcast, light drizzle<br>~6:50 am July 28; no background noise; light wind; 100% cloud cover  |
| B8          | Disturbed                      | Residential area, bordered by spruce, maple, fir  | ~6:20 am July 27; no background noise; light 15 km South wind; overcast, light drizzle   |



Figure B-2

Bird Survey Locations

Point Aconi Area  
Biological Surveys





July 2005 Bird Survey  
Birds Confirmed Breeding

| MBCA/<br>NSWA | At Risk<br>Status | Bird                            | Species                              | Preferred Nesting<br>Habitat<br>(Erskine 1992) | Nesting<br>Period<br>(Tower 1980) | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | Total No. of<br>Individuals |
|---------------|-------------------|---------------------------------|--------------------------------------|--|-----------------------------------|----|----|----|----|----|----|----|----|-----------------------------|
| NSWA          | No                | European Starling               | <i>Sturnus vulgaris</i>              | Cavities in trees,<br>structures.              | Late Apr.-July                    |    |    |    |    |    |    | 6  | 29 | 35                          |
| MBCA          | No                | Solitary Vireo (Blue-headed)    | <i>Vireo solitarius</i>              | Forest.  | Late May-late<br>July             | 2  |    |    |    |    |    |    |    | 2                           |
| MBCA          | No                | Red-eyed Vireo                  | <i>Vireo olivaceus</i>               | Forest.  | Early June-<br>early Aug.         |    | 10 |    |    |    |    |    |    | 10                          |
| MBCA          | No                | Northern Parula<br>Warbler      | <i>Parula americana</i>              | Bearded lichen in<br>conifer.                  | Late May-<br>early Aug.           |    | 3  |    | 2  |    |    |    |    | 5                           |
| MBCA          | No                | Yellow Warbler                  | <i>Dendroica petechia</i>            | Edges and disturbed<br>areas.                  | Late May-July                     | 2  |    |    | 1  | 4  |    | 20 |    | 27                          |
| MBCA          | No                | Magnolia Warbler                | <i>Dendroica magnolia</i>            | Conifers.                                      | Early June-late<br>July           |    | 2  |    |    |    |    |    |    | 2                           |
| MBCA          | No                | Black-throated Green<br>Warbler | <i>Dendroica virens</i>              | Mixed or coniferous<br>forest.                 | Early June-mid<br>July            |    |    | 1  |    |    |    |    |    | 1                           |
| MBCA          | No                | American Redstart               | <i>Setophaga ruticilla</i>           | Small trees.                                   | Late May-late<br>July             |    | 2  | 2  |    |    |    |    |    | 4                           |
| MBCA          | No                | Common Yellowthroat             | <i>Geothlypis trichas</i>            | Brushy areas                                   | Late May-late<br>July             |    |    |    | 4  |    |    | 4  | 1  | 9                           |
| MBCA          | No                | Savannah Sparrow                | <i>Passerculus<br/>sandwichensis</i> | Open vegetated areas,<br>ground                | mid May-<br>August                |    |    |    | 5  | 10 | 4  |    |    | 19                          |
| MBCA          | No                | Song Sparrow                    | <i>Melospiza melodia</i>             | Shrubbery.                                     | May-Aug.                          |    | 4  | 3  |    |    | 10 | 8  |    | 25                          |
| MBCA          | No                | Lincoln's Sparrow               | <i>Melospiza lincolnhii</i>          | Shrubs and small trees,<br>bogs, fields.       | June-July                         |    | 1  |    |    |    |    |    |    | 1                           |
| MBCA          | No                | Swamp Sparrow                   | <i>Melospiza georgiana</i>           | Wetlands.                                      | Late May-mid<br>July              |    |    |    |    |    | 3  |    |    | 3                           |
| MBCA          | No                | White-throated<br>Sparrow       | <i>Zonotrichia albicollis</i>        | Ground at forest edge.                         | Mid May-mid<br>Aug.               |    | 7  |    |    |    | 2  |    |    | 9                           |
| MBCA          | No                | Dark-eyed Junco                 | <i>Junco hyemalis</i>                | Forest edge.                                   | Early May-late<br>Aug.            | 5  |    |    |    | 15 |    |    |    | 20                          |
| MBCA          | No                | Red-winged Blackbird            | <i>Agelaius phoeniceus</i>           | Marshes with cattails.                         | May-July                          |    |    |    |    |    |    | 15 | 9  | 24                          |
| NSWA          | No                | Common Grackle                  | <i>Quiscalus quisula</i>             | Trees, bushes,<br>buildings in open<br>areas.  | Late April-<br>July               |    |    |    |    |    |    |    | 15 | 15                          |
| MBCA          | No                | Purple Finch                    | <i>Carpodacus purpureus</i>          | Conifers.                                      | Early June-<br>mid Aug.           |    |    |    |    |    | 1  | 1  |    | 2                           |

July 2005 Bird Survey  
Birds Confirmed Breeding

| MBCA/<br>NSWA | At Risk<br>Status | Bird               | Species                  | Preferred Nesting<br>Habitat<br>(Erskine 1992) | Nesting<br>Period<br>(Tower 1980) | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 | Total No. of<br>Individuals |
|---------------|-------------------|--------------------|--------------------------|--|-----------------------------------|----|----|----|----|----|----|----|----|-----------------------------|
| MBCA          | No                | Pine Siskin        | <i>Carduelis pinus</i>   | Conifers.                                      | Late Apr.-<br>early Aug.          |    | 3  |    |    |    |    | 1  |    | 4                           |
| MBCA          | No                | American Goldfinch | <i>Carduelis tristis</i> | Open.  | Late June-mid<br>Sept.            |    | 4  | 4  |    |    |    | 10 |    | 18                          |
| <b>TOTAL</b>  |                   |                    |                          |  |                                   |    | 4  | 15 | 8  | 8  | 7  | 10 | 7  | 39                          |

July 2005 Bird Survey  
 Birds Observed in Habitat, Breeding not Confirmed

| MBCA / NSWA | At Risk Status | Bird                     | Species                         | Preferred Nesting Habitat (Erskine 1992) | Nesting Period (Tower 1980) | B1 | B2  | B3  | B4     | B5 | B6  | B7 | B8 |
|-------------|----------------|--------------------------|---------------------------------|--|-----------------------------|----|-----|-----|--------|----|-----|----|----|
| NSWA        | No             | Great Cormorant          | <i>Phalacrocorax carbo</i>      | Coastal sea-cliffs, islands              | Apr.-June                   |    | 2   |     |        |    |     |    |    |
| NSWA        | No             | Double-crested Cormorant | <i>Phalacrocorax auritus</i>    | Near coast, sea-cliffs, trees, islands   | May-July                    |    | 6   |     |        |    |     |    |    |
| MBCA        | No             | Great Blue Heron         | <i>Ardea herodias</i>           | colonies                                 | Mid Apr.-end June           |    | 2   |     |        |    | FO  |    |    |
| MBCA        | No             | American Black Duck      | <i>Anas rubripes</i>            | Ground near wetlands.                    | Apr.-July                   |    | 1   | 2FO |        |    |     |    |    |
| MBCA        | No             | Mallard                  | <i>Anas platyrhynchos</i>       | Wetlands                                 | May-July                    |    |     | FO  |        |    |     |    |    |
| MBCA        | No             | Ring-neck Duck           | <i>Aythya collaris</i>          | Lake,pond                                | May-July                    |    |     |     |        |    | FO  |    |    |
| MBCA        | No             | Surf Scoter              | <i>Melanitta perspicillata</i>  | Migrant                                  | na                          |    | 2FO |     |        |    |     |    |    |
| NSWA        | No             | Bald Eagle               | <i>Haliaeetus leucocephalus</i> | Large trees                              | Apr.-July                   |    | 1   |     |        |    |     |    |    |
| NSWA        | No             | Sharp-shinned Hawk       | <i>Accipiter striatus</i>       | Usually spruce trees                     | mid-May-July                |    |     |     | 1 (AY) |    |     |    |    |
| MBCA        | No             | Killdeer                 | <i>Charadrius vociferans</i>    | Open areas                               | May-July                    |    | 1   |     |        |    |     |    |    |
| MBCA        | No             | Herring Gull             | <i>Larus argentatus</i>         | Coastal colonies.                        | Apr.-July                   |    | 4   |     |        |    | 5FO |    |    |
| MBCA        | No             | Great Black-backed Gull  | <i>Larus marinus</i>            | Coastal colonies.                        | Apr.-July                   |    | 5   |     |        |    | 2FO |    |    |
| MBCA        | No             | Black Kittiwake          | <i>Rissa iridaclyla</i>         | Cliffs on islets                         | June                        |    | 3   |     |        |    |     |    |    |
| NSWA        | No             | Rock Dove                | <i>Columba livia</i>            | Structures, agriculture.                 | Jan.-Oct.                   |    |     |     |        |    |     |    | 5  |
| NSWA        | Yellow         | Long-eared Owl           | <i>Asio otus</i>                | Woodlands                                | April-June                  |    |     |     |        | 1  |     |    |    |
| MBCA        | No             | Northern Flicker         | <i>Colaptes auratus</i>         | Cavities.                                | Early May-early Aug.        |    |     |     |        | 2  | 3FO |    |    |
| MBCA        | No             | Alder Flycatcher         | <i>Empidonax alnorum</i>        | Low in shrubbery.                        | Mid June-mid Aug.           |    | 1   |     |        |    | 4   | 3  | 1  |
| MBCA        | No             | Tree Swallow             | <i>Tachycineta bicolor</i>      | Cavities near lakes.                     | May-July                    |    |     |     |        |    | 5FO |    |    |
| MBCA        | No             | Barn Swallow             | <i>Hirundo rustica</i>          | Structures, cliffs.                      | Late May-July               |    |     |     |        |    |     | 8  |    |
| NSWA        | No             | Common Raven             | <i>Corvus corax</i>             | Trees, cliffs, old building.             | Mar.-June                   |    |     |     |        |    |     |    | 1  |

July 2005 Bird Survey  
 Birds Observed in Habitat, Breeding not Confirmed

| At Risk Status | Bird                           | Species                        | Preferred Nesting Habitat (Erskine 1992) | Nesting Period (Tower 1980) | B1 | B2 | B3 | B4 | B5 | B6 | B7  | B8  |
|----------------|--------------------------------|--------------------------------|--|-----------------------------|----|----|----|----|----|----|-----|-----|
| MBCA / NSWA    |                                |                                |  |                             |    |    |    |    |    |    |     |     |
| MBCA           | Winter Wren                    | <i>Troglodytes troglodytes</i> | Damp coniferous forest.                  | Mid May-late July           |    |    | 1  |    |    |    |     |     |
| MBCA           | Swainson's Thrush              | <i>Catharus ustulatus</i>      | Tree.                                    | Late May-late July          |    |    |    | 4  |    |    |     |     |
| MBCA           | Hermit Thrush                  | <i>Catharus guttatus</i>       | Ground.                                  | Mid May-late Aug.           |    |    | 1  |    |    | 1  | 1   |     |
| MBCA           | American Robin                 | <i>Turdus migratorius</i>      | Everywhere.                              | Late Apr.-mid Sept.         |    |    |    |    |    | 1  |     | 1   |
| MBCA           | Gray Catbird                   | <i>Dumetella carolinensis</i>  | Shrubbery.                               | Late May-early Aug.         |    |    |    |    |    |    |     |     |
| MBCA           | Cedar Waxwing                  | <i>Bombycilla cedrorum</i>     | Open woods.                              | Mid June-early Sept.        |    |    |    | 1  |    |    | 6   |     |
| NSWA           | European Starling              | <i>Sturnus vulgaris</i>        | Cavities in trees, structures.           | Late Apr.-July              |    |    |    |    |    |    |     | 3   |
| MBCA           | Solitary Vireo (Blue-headed)   | <i>Vireo solitarius</i>        | Forest.                                  | Late May-late July          |    |    |    |    | 3  |    |     | 3   |
| MBCA           | Red-eyed Vireo                 | <i>Vireo olivaceus</i>         | Forest.                                  | Early June-early Aug.       |    |    | 1  | 1  |    |    |     | 8   |
| MBCA           | Nashville Warbler              | <i>Vermivora nuficapilla</i>   | Open woods/shrubs.                       | Late May-late July          |    | 1  |    |    |    |    |     |     |
| MBCA           | Yellow Warbler                 | <i>Dendroica petechia</i>      | Edges and disturbed areas.               | Late May-July               |    |    |    | 3  |    |    | 20  | 1FO |
| MBCA           | Magnolia Warbler               | <i>Dendroica magnolia</i>      | Conifers.                                | Early June-late July        |    |    |    |    |    |    |     |     |
| MBCA           | Yellow-rumped Warbler (Myrtle) | <i>Dendroica coronata</i>      | Forest with conifers.                    | Early May-early June        | 1  |    | 2  |    | 2  |    |     |     |
| MBCA           | Blackburnian Warbler           | <i>Dendroica fusca</i>         | Conifers.                                | Mid June-late July          |    |    |    |    |    | 1  |     |     |
| MBCA           | Song Sparrow                   | <i>Melospiza melodia</i>       | Shrubbery.                               | May-Aug.                    |    |    |    |    |    |    | 4   |     |
| MBCA           | Lincoln Sparrow                | <i>Melospiza lincolni</i>      | Shrubs and small trees, bogs, fields.    | June-July                   |    |    |    |    |    |    | 1FO |     |
| MBCA           | Swamp Sparrow                  | <i>Melospiza georgiana</i>     | Wetlands.                                | Late May-mid July           |    | 1  |    |    |    |    |     |     |
| MBCA           | White-throated Sparrow         | <i>Zonotrichia albicollis</i>  | Ground at forest edge.                   | Mid May-mid Aug.            |    |    | 3  |    |    |    |     |     |
| MBCA           | Dark-eyed Junco                | <i>Junco hyemalis</i>          | Forest edge.                             | Early May-late Aug.         |    |    |    |    |    |    | 1   |     |

July 2005 Bird Survey  
 Birds Observed in Habitat, Breeding not Confirmed

| MBCA /<br>NSWA | At Risk<br>Status | Bird               | Species                               | Preferred Nesting<br>Habitat<br>(Erskine 1992)  | Nesting<br>Period<br>(Tower 1980) | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 |
|----------------|-------------------|--------------------|---------------------------------------|---|-----------------------------------|----|----|----|----|----|----|----|----|
| MBCA           | No                | American Goldfinch | <i>Carduelis tritis</i>               | Open.   | Late June-mid<br>Sept.            |    |    |    |    |    |    |    | 4  |
| MBCA           | No                | Evening Grosbeak   | <i>Coccothraustes<br/>vespertinus</i> | Southern boreal forest,<br>high in spruce tree. | Late June-<br>August              |    |    |    |    |    |    | 1  |    |

Additional Birds Known to Breed Within 20km radius of Study Area (Erskine 1992) and Potential Habitat At Study Area

| MBCA / NSW | At Risk Status | Bird                     | Species                         | Preferred Nesting Habitat (Erskine 1992)                         | Nesting Period (Tower 1980) | Potential Habitat                           |
|------------|----------------|--------------------------|---------------------------------|--|-----------------------------|---|
| MCBA       | No             | Leach's Storm-petrel     | <i>Oceanodroma leucorhoa</i>    | Offshore islands   | June-Aug.                   | Outside Study Area - Bird Islands           |
| NSWA       | No             | Great Cormorant          | <i>Phalacrocorax carbo</i>      | Coastal sea-cliffs, islands                                      | Apr.-June                   | Outside Study Area - Bird Islands           |
| NSWA       | No             | Double-crested Cormorant | <i>Phalacrocorax auritus</i>    | Near coast, sea-cliffs, trees, islands                           | May-July                    | Outside Study Area - Bird Islands           |
| MCBA       | No             | Great Blue Heron         | <i>Ardea herodias</i>           | colonies   | Mid Apr.-end June           | Outside Study Area - Coastal Islands        |
| MCBA       | No             | Green-winged Teal        | <i>Anas crecca</i>              | Fertile wetlands.  | Mid May-July                | Possible near Morrison Pond                 |
| MCBA       | No             | American Black Duck      | <i>Anas rubripes</i>            | Ground near wetlands.  | Apr.-July                   | Possible near Morrison Pond                 |
| MCBA       | No             | Mallard                  | <i>Anas platyrhynchos</i>       | Wetlands   | May-July                    | Possible near Morrison Pond                 |
| MCBA       | No             | Ring-neck Duck           | <i>Aythya collaris</i>          | Lake,pond  | May-July                    | Not expected                                |
| MCBA       | No             | Common Eider             | <i>Somateria mollissima</i>     | Coastal islands  | May-July                    | Outside Study Area - Coastal Islands        |
| NSWA       | No             | Osprey                   | <i>Pandion haliaetus</i>        | Coastal or near lake.  | May-July                    | Possible along coast, but nest not observed |
| NSWA       | No             | Bald Eagle               | <i>Haliaeetus leucocephalus</i> | Large trees  | Apr.-July                   | Possible, but nest not observed             |
| NSWA       | No             | Northern Harrier         | <i>Circus cyaneus</i>           | Open marshes, meadows  | May-July                    | Not expected                                |
| NSWA       | No             | Sharp-shinned Hawk       | <i>Accipiter striatus</i>       | Usually spruce trees   | mid-May-July                | Possible, but nest not observed             |
| NSWA       | Yellow         | Northern Goshawk         | <i>Accipiter gentilis</i>       | Forest   | Apr.-June                   | Not expected                                |
| NSWA       | No             | American Kestrel         | <i>Falco sparverius</i>         | Tree or structure.   | May-July                    | Possible, but nest not observed             |
| NSWA       | No             | Merlin                   | <i>Falco columbarius</i>        | Trees, old crow nests  | mid May-June                | Possible, but nest not observed             |
| NSWA       | No             | Ruffed Grouse            | <i>Bonasa umbellus</i>          | Broadleaf forest   | Late Apr.-July              | Possible                                    |
| MCBA       | No             | Sora                     | <i>Porzana carolina</i>         | Clumps of aquatic plants.  | Late May-July               | Not expected                                |
| MCBA       | No             | Killdeer                 | <i>Charadrius vociferus</i>     | Open areas   | May-July                    | Possible                                    |
| MCBA       | No             | Common Snipe             | <i>Gallinago gallinago</i>      | Shallow marsh, bog.  | May-July                    | Possible                                    |
| MCBA       | No             | American Woodcock        | <i>Scolopax minor</i>           | Broad-leaved forests, in dense tree or shrub cover, near swamps. | Mid Apr.-late May           | Possible                                    |
| MCBA       | No             | Herring Gull             | <i>Larus argentatus</i>         | Coastal colonies.  | Apr.-July                   | Outside Study Area - Coastal Islands        |
| MCBA       | No             | Great Black-backed Gull  | <i>Larus marinus</i>            | Coastal colonies.  | Apr.-July                   | Outside Study Area - Coastal Islands        |
| MCBA       | No             | Black Kittiwack          | <i>Rissa tridactyla</i>         | Cliffs on islets   | June                        | Outside Study Area - Bird Islands ????      |
| MCBA       | Yellow         | Common tern              | <i>Sterna hirundo</i>           | Islands and coastal  | June-July                   | Outside Study Area - Coastal Islands        |
| MCBA       | Yellow         | Artic tern               | <i>Sterna paradisaea</i>        | Coastal islands  | June-July                   | Outside Study Area - Coastal Islands        |
| MCBA       | Yellow         | Razorbill                | <i>Alca torda</i>               | Coastal islands  | June-July                   | Outside Study Area - Bird Islands           |
| MCBA       | No             | Black Guillemot          | <i>Cepphus grylle</i>           | Coastal islands  | May-June                    | Outside Study Area - Bird Islands           |



Additional Birds Known to Breed Within 20km radius of Study Area (Erskine 1992) and Potential Habitat At Study Area

| MBCA / NSW | At Risk Status                  | Bird                      | Species                       | Preferred Nesting Habitat (Erskine 1992)          | Nesting Period (Tower 1980) | Potential Habitat                 |
|------------|---------------------------------|---------------------------|-------------------------------|---|-----------------------------|-----------------------------------|
| MCBA       | Yellow                          | Atlantic Puffin           | <i>Fratercula arctica</i>     | Coastal islands                                   | May-June                    | Outside Study Area - Bird Islands |
| NSWA       | No                              | Great Horned Owl          | <i>Bubo virginianus</i>       | Nest in crows nests                               | March-June                  | Not expected                      |
| NSWA       | Yellow                          | Long-eared Owl            | <i>Asio otus</i>              | Woodlands   | April-June                  | Possible                          |
| NSWA       | Yellow, COSEWIC Special Concern | Short-eared Owl           | <i>Asio flammeus</i>          | Open grassy habitat                               | April-June                  | Not expected                      |
| NSWA       | No                              | Northern Saw-whet Owl     | <i>Aegolius acadicus</i>      | Cavities  | April-June                  | Possible                          |
| MCBA       | No                              | Common Nighthawk          | <i>Chordeiles minor</i>       | Open ground, cutovers, buildings.                 | Early June – early Aug.     | Possible                          |
| MCBA       | No                              | Chimney Swift             | <i>Chaetura pelagica</i>      | Hollow trees                                      | June-July                   | Possible                          |
| MCBA       | No                              | Ruby-throated Hummingbird | <i>Archiochus colubris</i>    | Urban   | June-July                   | Possible                          |
| NSWA       | No                              | Belted Kingfisher         | <i>Ceryle alcyon</i>          | Near water  | May-June                    | Possible                          |
| MCBA       | No                              | Yellow-bellied Sapsucker  | <i>Sphyrapicus varius</i>     | Live poplar and birches and other trees decaying. | Late May-July               | Possible                          |
| MCBA       | No                              | Downy Woodpecker          | <i>Picoides pubescens</i>     | Cavities in dead trees.                           | Late May-July               | Possible                          |
| MCBA       | No                              | Hairy Woodpecker          | <i>Picoides villosus</i>      | Cavities.   | Early May – early July      | Possible                          |
| MCBA       | No                              | Black-backed Woodpecker   | <i>Picoides arcticus</i>      | Cavities  | May-June                    | Possible                          |
| MCBA       | No                              | Pileated Woodpecker       | <i>Dryocopus pileatus</i>     | Cavity nester.                                    | Late Apr. - late June       | Possible                          |
| MCBA       | No                              | Olive-sided Flycatcher    | <i>Contopus borealis</i>      | Forest edge.                                      | Mid June-mid Aug.           | Possible                          |
| MCBA       | No                              | Eastern Wood-Pewee        | <i>Contopus virens</i>        | Open forest.                                      | Early June-early Sept.      | Possible                          |
| MCBA       | No                              | Least Flycatcher          | <i>Empidonax minimus</i>      | Broad-leafed woods.                               | Early June-mid Aug.         | Possible                          |
| MCBA       | No                              | Eastern Kingbird          | <i>Tyrannus tyrannus</i>      | Open areas.                                       | June-July                   | Possible                          |
| MCBA       | No                              | Bank Swallow              | <i>Ripara ripara</i>          | Banks, cliffs                                     | May-July                    | Possible                          |
| NSWA       | No                              | Gray Jay                  | <i>Perisoreus canadensis</i>  | Mature conifers.                                  | Late Mar.-early July        | Possible                          |
| MCBA       | No                              | Ruby-crowned Kinglet      | <i>Regulus calendula</i>      | Conifers.   | Mid May-early July          | Possible                          |
| MCBA       | No                              | Veery                     | <i>Catharus fuscescens</i>    | Broad-leaf forest                                 | Late May-late July          | Possible                          |
| MCBA       | No                              | Gray-checked Thrush       | <i>Catharus minimus</i>       | Low coastal spruce                                | June-July                   | Possible                          |
| MCBA       | No                              | Gray Catbird              | <i>Dumetella carolinensis</i> | Shrubbery.  | Late May-early Aug.         | Possible                          |
| MCBA       | No                              | Cedar Waxwing             | <i>Bombycilla cedrorum</i>    | Open woods.                                       | Mid June-early Sept.        | Possible                          |
| MCBA       | No                              | Tennessee Warbler         | <i>Vermivora peregrina</i>    | Forest  | June-July                   | Possible                          |
| MCBA       | No                              | Nashville Warbler         | <i>Vermivora ruficapilla</i>  | Open woods/shrubs.                                | Late May-late July          | Possible                          |
| MCBA       | No                              | Chestnut-sided Warbler    | <i>Dendroica pensylvanica</i> | Low shrubs, raspberry canes.                      | June-July                   | Possible                          |

Additional Birds Known to Breed Within 20km radius of Study Area (Erskine 1992) and Potential Habitat At Study Area

| MBCA / NSW | At Risk Status | Bird                           | Species                           | Preferred Nesting Habitat (Erskine 1992)     | Nesting Period (Tower 1980) | Potential Habitat |
|------------|----------------|--------------------------------|-----------------------------------|--|-----------------------------|-------------------|
| MCBA       | No             | Yellow-rumped Warbler (Myrtle) | <i>Dendroica coronata</i>         | Forest with conifers.                        | Early May-early June        | Possible          |
| MCBA       | No             | Blackburnian Warbler           | <i>Dendroica fusca</i>            | Conifers.                                    | Mid June-late July          | Possible          |
| MCBA       | No             | Palm Warbler                   | <i>Dendroica palmarum</i>         | Shrub bogs.                                  | Mid May-late July           | Possible          |
| MCBA       | No             | Bay-breasted Warbler           | <i>Dendroica castanea</i>         | Conifers.                                    | June-July                   | Possible          |
| MCBA       | No             | Blackpoll Warbler              | <i>Dendroica striata</i>          | Damp spruce forest                           | June                        | Possible          |
| MCBA       | No             | Black-and-white Warbler        | <i>Mniotilta varia</i>            | Ground among tree roots.                     | Early June-mid July         | Possible          |
| MCBA       | No             | Ovenbird                       | <i>Seiurus aurocapillus</i>       | Ground.                                      | Late May-late               | Possible          |
| MCBA       | No             | Northern Waterthrush           | <i>Seiurus noveboracensis</i>     | Mixed woods                                  | May-July                    | Possible          |
| MCBA       | No             | Mourning Warbler               | <i>Oporornis philadelphia</i>     | Dense deciduous shrubs                       | June-July                   | Possible          |
| MCBA       | No             | Wilson's Warbler               | <i>Wilsonia pusilla</i>           | Coastal forest                               |                             | Possible          |
| MCBA       | No             | Canada Warbler                 | <i>Wilsonia canadensis</i>        | Mature to mid aged mixed forest.             | Early June-mid July         | Possible          |
| MCBA       | No             | Rose-breasted Grosbeak         | <i>Pheucticus ludovicianus</i>    | Mixed and broad-leaved woods.                | June-July                   | Possible          |
| MCBA       | No             | Chipping Sparrow               | <i>Spizella passerina</i>         | Edges, woods.                                | May-July                    | Possible          |
| MCBA       | No             | Fox Sparrow                    | <i>Passerella iliaca</i>          | Dense deciduous shrubs                       | June                        | Possible          |
| MCBA       | Yellow         | Bobolink                       | <i>Dolichonyx oryzivorus</i>      | Open habitat, lush grass                     | June-July                   | Not expected      |
| NSWA       | No             | Rusty Blackbird                | <i>Euphagus carolinus</i>         | Cool spruce bog, swamp, alder swale          | May-June                    | Possible          |
| NSWA       | No             | Brown headed Cowbird           | <i>Molotrus ater</i>              | Parasitic nester                             | May-July                    | Possible          |
| MCBA       | No             | Pine Grosbeak                  | <i>Pinicola enucleator</i>        | Conifers.                                    | May-June                    | Possible          |
| MCBA       | No             | White-winged Crossbill         | <i>Loxia leucoptera</i>           | Conifers.                                    | Feb.-Sept.                  | Possible          |
| MCBA       | No             | Red Crossbill                  | <i>Loxia curvirostra</i>          | Conifers.                                    | Late Jan.-late July         | Possible          |
| MCBA       | No             | Evening Grosbeak               | <i>Coccothraustes vespertinus</i> | Southern boreal forest, high in spruce tree. | Late June-August            | Possible          |
| MCBA       | No             | House Sparrow                  | <i>Passer domesticus</i>          | Urban  | Apr-August                  | Possible          |

**Appendix C**  
**Site Photographs**  
**(July, August 2005)**



Cranberry Bog.JPG



Disturbed Habitat.JPG



Mixed Woods.JPG



Morrison Brook.JPG



Morrison Brook\_Pond.JPG



Morrison Pond Beach.JPG



Morrison Pond.JPG



Open Coniferous.JPG



Second Growth Hardwoods.JPG



Shoreline.JPG



Shrub bog.JPG



Wet Coniferous.JPG

## **APPENDIX C**

### **TABLES**

**Table 6-1: Revised Potential Impacts on VESCs Matrix  
and  
Table 8-1: Revised Residual Impact Assessment**

**Table 6-1: Revised - Potential Impacts on VESCs Matrix**

|                               | Site Preparation |                    |                  |         |             | Operations and Maintenance |           |                  |                       |                |            | Reclamation |                        |            |            |           |
|-------------------------------|------------------|--------------------|------------------|---------|-------------|----------------------------|-----------|------------------|-----------------------|----------------|------------|-------------|------------------------|------------|------------|-----------|
|                               | E&S Control      | Clearing /Grubbing | Water Management | Roadway | Stockpiling | Mining Operations          | Equipment | Waste Management | Wastewater Management | Transportation | Monitoring | Security    | Backfilling Overburden | Contouring | Vegetation | Follow up |
| <b><i>Aquatic</i></b>         |                  |                    |                  |         |             |                            |           |                  |                       |                |            |             |                        |            |            |           |
| Freshwater                    | +                | -                  | +                |         | -           | -                          | -         | -                | +                     |                | +          |             | -                      | -          |            | +         |
| Saltwater                     | +                | -                  | +                |         | -           | -                          | -         | -                | +                     |                | +          |             | -                      | -          |            | +         |
| Fisheries                     | +                | -                  | +                |         | -           | -                          | -         | -                | +                     |                | +          |             | -                      | -          | +          | +         |
| Sensitive or Rare Species     |                  |                    | +                |         | -           | -                          | -         | -                | +                     |                | +          |             |                        |            |            | +         |
| <b><i>Terrestrial</i></b>     |                  |                    |                  |         |             |                            |           |                  |                       |                |            |             |                        |            |            |           |
| Flora                         |                  | -                  |                  | -       |             | -                          | -         |                  |                       |                | +          |             |                        |            | +          | +         |
| Fauna                         |                  | -                  |                  | -       |             | -                          | -         |                  |                       |                |            |             |                        |            | +          | +         |
| Wetlands                      | +                | -                  |                  | -       | -           | -                          | -         |                  |                       |                | +          |             | +                      | +          | +          | +         |
| Sensitive or Rare Species     |                  |                    |                  |         |             |                            |           |                  |                       |                |            |             |                        |            |            | +         |
| <b><i>Socio-economic</i></b>  |                  |                    |                  |         |             |                            |           |                  |                       |                |            |             |                        |            |            |           |
| Economy                       | +                | +                  | +                | +       | +           | +                          | +         | +                | +                     | +              | +          | +           | +                      | +          | +          | +         |
| Air Quality                   | -                | -                  |                  | -       | -           | -                          | -         | -                |                       | -              | +          |             | -                      | -          | +          |           |
| Noise Levels                  | -                | -                  |                  | -       | -           | -                          | -         | -                |                       | -              | +          |             | -                      | -          |            |           |
| Cultural Resources            |                  | -                  |                  |         |             |                            |           |                  |                       |                | +          |             |                        |            |            |           |
| Mi'kmaq Land and Resource Use |                  |                    |                  |         |             |                            |           |                  |                       |                |            |             | +                      | +          | +          | +         |
| Transportation                |                  |                    |                  | -       |             |                            |           |                  |                       | -              |            |             |                        |            |            |           |
| Community Resources           |                  |                    |                  |         |             |                            |           |                  |                       |                |            |             | +                      | +          | +          | +         |
| Domestic Wells                |                  |                    |                  |         |             | -                          |           |                  |                       |                | +          |             | +                      |            |            |           |
| Aesthetics                    |                  | -                  |                  | -       |             |                            |           |                  |                       |                |            |             | +                      | +          | +          |           |
| Human Health and Safety       |                  |                    |                  | +       |             | -                          |           |                  |                       |                |            | +           | +                      | +          | +          | +         |
| Climate                       |                  |                    |                  |         |             | -                          | -         |                  |                       | -              | +          |             |                        |            | +          |           |

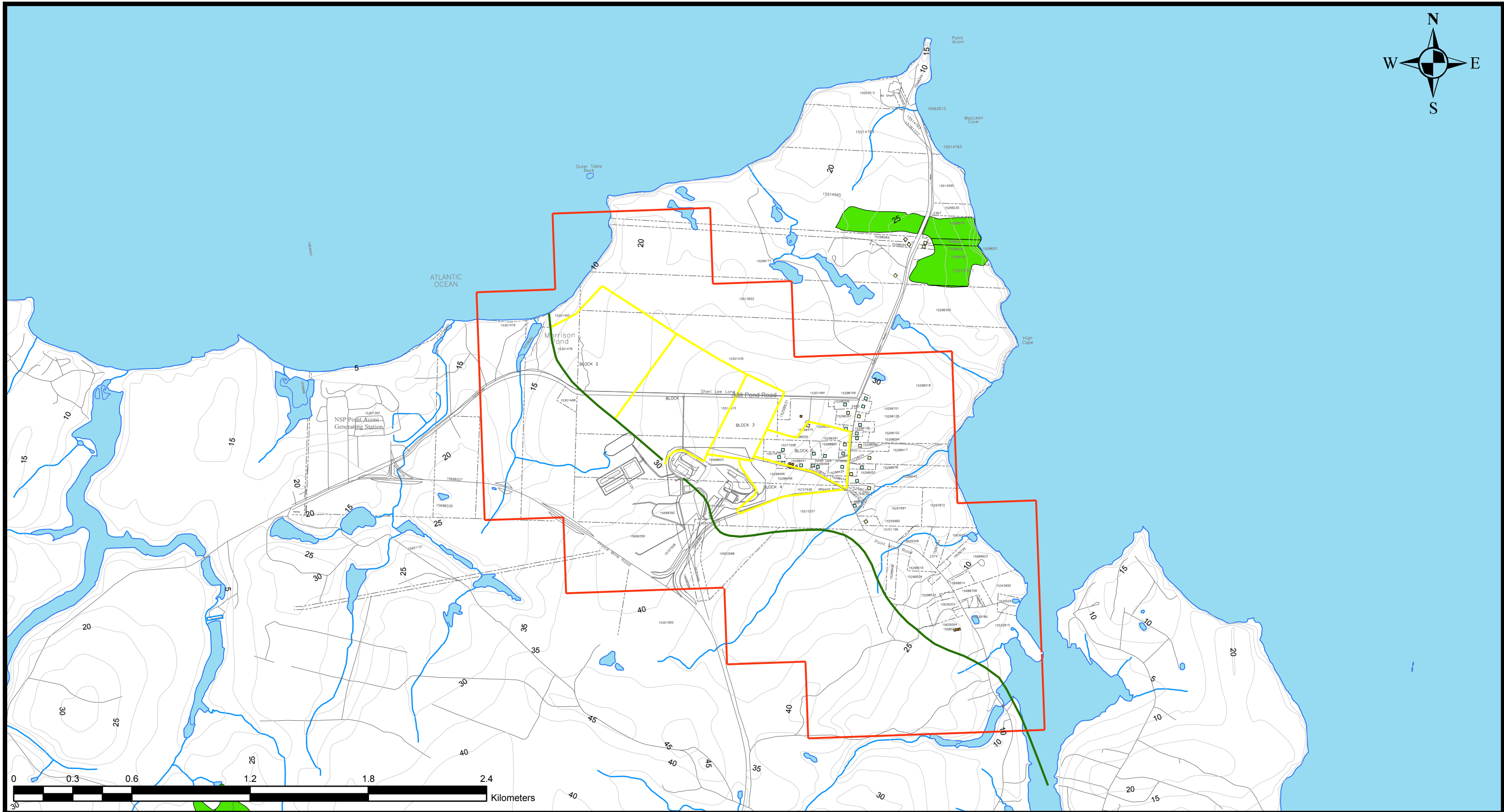
**Table 8-1: Revised - Residual Impact Assessment**

|                               | <b>Nature</b> | <b>Magnitude</b> | <b>Reversibility</b> | <b>Timing</b> | <b>Extent</b> |
|-------------------------------|---------------|------------------|----------------------|---------------|---------------|
| Fresh Water                   | -             | Moderate         | REV                  | Short         | Regional      |
|                               | +             | Moderate         | REV                  | Long          | Regional      |
| Salt Water                    | -             | Small            | REV                  | Short         | Regional      |
| Fisheries                     | -             | Small            | REV                  | Short         | Regional      |
| Flora                         | -             | Small            | REV                  | Short         | Local         |
| Fauna                         | -             | Small            | REV                  | Short         | Local         |
| Wetlands                      | -             | Moderate         | IRR                  | Long          | Local         |
| Rare / Sensitive Species      | -             | Moderate         | IRR                  | Short         | Local         |
| Economy                       | +             | Moderate         | REV                  | Short         | Regional      |
| Air Quality                   | -             | Moderate         | REV                  | Short         | Local         |
| Noise Levels                  | -             | Moderate         | REV                  | Short         | Local         |
| Mi'kmaq Land and Resource Use | +             | Small            | REV                  | Long          | Local         |
| Transportation                | -             | Small            | REV                  | Short         | Local         |
| Community Resources           | +             | Moderate         | REV                  | Long          | Local         |
| Domestic Wells                | -             | Moderate         | REV                  | Short         | Local         |
| Aesthetics                    | -             | Moderate         | REV                  | Short         | Local         |
|                               | +             | Moderate         | REV                  | Long          | Local         |
| Human Health / Safety         | -             | Small            | REV                  | Short         | Local         |
|                               | +             | Large            | IRR                  | Long          | Local         |
| Climate                       | -             | Small            | REV                  | Short         | Local         |

**APPENDIX D**

**FIGURE  
ADDENDUM - 1**





**Legend**

- Property Boundary
- Contour (masl)
- River
- Mining Blocks
- Special Mining Lease Boundary
- Hub Seam Cropline
- Cultivated Land
- Agricultural Buildings

**Title:** Agricultural Lands

**Project:** Surface Coal Mine and Reclamation Project-  
Prince Mine Site  
Point Aconi, Nova Scotia

**Date:** September 2005

**Project No.:** 50090A

**Figure No.:**  
**ADDENDUM**

**APPENDIX E**  
**WETLANDS EVALUATION FORMS**

*Based on: North American Wetlands Conservation Council (Canada) Wetland Evaluation Guide (Issue Paper No. 1992-1)*

**Conducted September 2005; Dillon Consulting/MGI**

## **1.0 WETLAND IDENTIFICATION**

- **Point Aconi Area Wetland 2.2 ha (Easting 707557, Northing 5133131)**

## **2.0 PROJECT DESCRIPTION**

### **2.1 Summary**

- i **Proponent:** Pioneer Coal Limited
- ii Land use approval: Nova Scotia Department of Environment and Labour Approval (Wetland Activity) under the Environment Act.
- iii **Location:** approximately 200 m south of Sheri Lee/Mill Pond Road, north of Prince Mine Colliery.
- iv **Work in relation to wetland:** mine reclamation/coal extraction.
- iv **Impact to wetland:** The extraction will entail approximately 2.0 ha identified as wetland by Nova Scotia Department of Natural Resources (NSDNR). The additional 0.2 ha immediately adjacent the area will also be affected.

### **2.2 Activity Summary**

|                              |  |
|------------------------------|--|
| <b>Type of Activity:</b>     | Mine reclamation/coal extraction   |
| <b>Project purpose:</b>      | Mine reclamation/coal extraction   |
| <b>Activity description:</b> | Mine reclamation and coal extraction from a surface operation at the site of a former underground operation. Appropriate sedimentation control will be undertaken. Work will generally be conducted with excavators and dozers. Work will be conducted year round. |

### **2.3 Project Status**

- i. **Jurisdiction of Approving Authority:** NSDEL (provincial).
- ii. **Type of Mandatory Review:** project with provincial environmental assessment required; wetland alteration requires wetland evaluation.
- iii. **Municipal Development Control:** No constraints
- iv. **Status of Proposal:** Under EA Review
- v. **Sources of Funding:** 100% Private by proponent
- vi. **Stage of Project:** Pre-development

- vii. **Potential for Stewardship:** Proponent may or may not be landowner at the completion of the project but is amenable to discussions with interested community groups.

**2.4 Project Production Summary**

- i. **Economic analysis:** Confidential – completed by in-house resources of the proponent
- ii. **Status of Economic Analysis:** Complete
- iii. **Project Benefits:** Reclamation of disturbed lands posing public safety hazards, employment (280-350 person years), enhanced local tax base.
- iv. **Summary of Potential Disbenefits on Wetland:** Loss of 2.0 ha and disturbance of 0.2 ha adjacent to wetland during development and extraction phases of the project with replacement during the reclamation phase.

**2.5 Summary of Expected Level of Selected Project Impacts on the Wetland**

| Biophysical                |                          |   |
|----------------------------|--------------------------|---|
| Parameter                  | Level of Expected Impact | Comment   |
| Noise                      | High                     | Medium term mining effect is high with the long term reclamation efforts creating similar habitat to current wetland. |
| Air quality                | High                     |   |
| Water quality              | High                     |   |
| Water quantity             | High                     |   |
| Habitat                    | High                     | Project will create medium term loss of 2.0 ha and disturbance of 0.2 ha.   |
| Aesthetic                  | Low-Mod                  |   |
| Recreation                 | Low-Mod.                 | Project is not on public lands, recreation activities would require trespassing.                                      |
| Economic                   |                          |   |
| Employment                 | High                     | Wetland section is an integral portion of project.  |
| Training                   | Low                      |   |
| Construction Spending      | Moderate                 |   |
| Operation Spending         | High                     |   |
| Taxes                      | High                     |   |
| Indirect Spending          | High                     |   |
| Flood Protection           | Low                      |   |
| Improved Health and Safety | High                     |   |

## 2.6 Project Summary

This project is a mine reclamation/coal extraction project with benefits including improvements to public safety, reclamation of disturbed lands, economic benefits in the form of taxes, royalties and employment. The wetland lies above a fixed coal deposit that can't be moved and the wetland removal is critical to the project. The local climate provides abundant rainfall, soils are amenable to wetland reconstruction and the proponent is familiar with wetlands reconstruction techniques.

## 3.0 WETLAND DESCRIPTION

### 3.1 Location

Nova Scotia

Point Aconi (see EA report for map)

Land Ownership – Cape Breton Development Corporation – proponent will lease or purchase lands

### 3.2 Setting

#### *3.2.1 Wetland Context*

- i. **Complexity:** mix of open cranberry bog grading to black spruce bog
- ii. **Wetland Class:** open bog with sub-class treed bog
- iii. **Previous Impact:** ATV trails, possible mine influence to surface water and groundwater and abandoned pasture access through bog.

## 4.0 RELOCATION/REDESIGN/VIABILITY

### 4.1 Potential for Project Relocation

**Importance of Existing Location:** The coal deposit is fixed and the project economics depend on extraction of those resources underlying the wetland.

### 4.2 Project Redesign

**Possibility of Redesign:** None – coal deposit can't be moved.

**Possibility of Change in Project Management:** None – project planning has been extensive and requires removal of surface soils including the wetland areas to get to the coal resources that have a fixed location.

### 4.3 Wetland Viability

**Size change in past 5 years:** None identified from surveys

**Other nearby project effects:** None identified

**Associated habitat impacts (existing):** ATV trails is primary observed impact

**Hydrologic impacts of adjacent existing activities:** Difficult to determine due to lack baseline pre-underground mining, none observed

**Potential for rehabilitation/restoration:** Good replacement potential due to local climate, soils, vegetation.

**Status re cumulative impacts:** Difficult to determine due to lack baseline pre-underground mining, none observed

**Significance:** Locally valuable for wildlife use but limited in size and frequent human disturbance due to ATVs.

## 5.0 STAGE ONE - GENERAL ANALYSIS

### 5.1 Biological Component

**Significance for Waterfowl/Wildlife:** not identified in NSDNR Significant Wildlife Habitat Database as migratory bird and other habitat. Footprint not identified as significant habitat.

|                      |   |
|----------------------|---|
| Score: Waterfowl Low | 1 |
| Wildlife Moderate    | 2 |

**Rarity/Scarcity or Uniqueness:** similar wetlands throughout area.

|                      |   |
|----------------------|---|
| Score: Waterfowl Low | 1 |
| Vegetation Moderate  | 2 |

### 5.2 Hydrological Component

**Significance of Contribution to Regional Water Quality/Groundwater:** Low contribution to regional water quality.

|            |   |
|------------|---|
| Score: Low | 1 |
|------------|---|

**Significance of Contribution to Regional Erosion Control/Flood Control:** Low regional contribution to erosion control/flood control.

|            |   |
|------------|---|
| Score: Low | 1 |
|------------|---|

**5.3 Social/Cultural Component**

**Existing, Proposed or Potential Heritage Designation or Protected Status at or adjacent Site:** Protected as wetland habitat by NSDEL legislation.

|             |   |
|-------------|---|
| Score: High | 3 |
|-------------|---|

**5.4 Project Benefits Component**

**Significance Economically:** 280-350 person years of employment, taxes and royalties are significant

|             |   |
|-------------|---|
| Score: High | 3 |
|-------------|---|

**Significance to Regional Development/ Employment:** high

|             |   |
|-------------|---|
| Score: High | 3 |
|-------------|---|

**5.5 References**

As noted.

**5.6 Stage One Overall Project Impact Rating**

**Rating Calculation**

| Current   |                        |          |
|---|------------------------|----------|
| 1   | Biological Rating      | 6        |
| 2   | Hydrological Rating    | 2        |
| 3   | Social/Cultural Rating | 3        |
| Project Status  |                        |          |
| 4   | Project Benefits       | 6        |
| <b>Overall Rating and Recommendation Component 1+2+3 (-4)</b> |                        | <b>5</b> |

**Conclusion:** Overall rating between 4 and 12; continue to Stage 2

## 6.0 STAGE TWO - DETAILED ANALYSIS

The following tables provide the detailed analysis. Note the \* denotes factors/values which are considered critical by the NAWCC.

### 6.1 Life-support Values

#### 6.1.1 Hydrological Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function  |
|--|----------|-----------------------|-----------------|--|
| *Contribution to recharge of regional water supply aquifer | no       | local                 | none            | Very small percentage of recharge and recharge still occurs if wetland is removed.                                     |
| *Flood protection benefits                                 | possibly | local                 | low             | Shrub bog receives surface water drainage from local area but small change in overall capacity.                        |
| Contribution to usable surface water                       | possibly | local                 | low             | Not a water supply.  |
| Erosion control  | likely   | local                 | low             | Shrub swamp provides some erosion control associated with modulating storm flow, but small overall change in capacity. |
| Flow augmentation (headwater)                              | possibly | local                 | low             | Shrub swamp, minor, small change in overall capacity.  |
| *Reduction of tidal impact                                 | no       | no                    | no              | Not applicable.  |

#### 6.1.2 Biogeochemical Values

| Value                              | Presence | Level of Significance | Expected Impact | Describe Function                                     |
|------------------------------------|----------|-----------------------|-----------------|---|
| *Receipt of pollutant/amelioration | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| Storage for agricultural runoff    | possibly | local                 | low             | No upgradient agricultural lands noted.               |
| *Containment of pollutants         | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| Sediment flow stabilization        | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| High nutrients supporting wildlife | possibly | local                 | low             | Some nutrients may originate from mine cleared areas. |



### 6.1.3 Habitat Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| *At risk species                                | no       | -                     | -               | None identified in 2005.   |
| *Significant habitat for migratory birds        | no       | local                 | low             | Bird species known for area include shrub species. Small proportion of overall available area.                   |
| Habitat for sport or commercial fish            | no       | local                 | low             | No aquatic habitat.  |
| Significant habitat for reptiles and amphibians | yes      | local                 | low             | Provides potential habitat for amphibians, but mine area limited proportion of overall available habitat.        |
| Significant habitat for crustaceans             | no       | not applicable        | not applicable  | No known significant crustacean habitat  |
| Significant habitat for mammals                 | no       | local                 | low             | Potential habitat for deer, hare and other wildlife, but not unique.   |
| *Significant organism in abundance              | no       | local                 | low             | No known significant abundant organisms.   |
| Protection of shorelines                        | no       | local                 | low             | Not Applicable   |
| *Ranked by CLI or other (NSDNR)                 | no       | local                 | low             | Shrub bog identified as wetland under NSDNR wetland database but not identified as significant wildlife habitat. |

### 6.1.4 Ecological Values

| Value                                   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Extensive ecosystem complex             | no       | local                 | low             | -  |
| *Regionally significant                 | no       | local                 | low             | No regionally significant habitat identified at wetland. |
| *Classic example of type                | no       | not applicable        | not applicable  | -  |
| Few remaining of this type in region    | no       | not applicable        | not applicable  | -  |
| Unique geographic feature               | no       | not applicable        | not applicable  | -  |
| Contribute to important drainage system | no       | not applicable        | not applicable  | -  |
| *Significant biological diversity       | no       | local                 | low             | -  |

## 6.2 Social/Cultural Values

### 6.2.1 Aesthetic Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function   |
|----------------------------------|----------|-----------------------|-----------------|---|
| Visible from residences          | yes      | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |
| Important Aesthetic function     | no       | -                     | -               | -   |
| Contribution to visual diversity | yes      | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |
| *Important sightseeing locale    | no       | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |

### 6.2.2 Recreational Values

| Value                         | Presence | Level of Significance | Expected Impact | Describe Function  |
|-------------------------------|----------|-----------------------|-----------------|--|
| Wildlife viewing/ photography | possible | local                 | low             | Possible wildlife view/photography location, but due to Health and Safety Risk not recommended. On private property. |
| Boating                       | no       | not applicable        | not applicable  | -  |
| Winter recreation             | no       | not applicable        | not applicable  | -  |
| Hunting/Fishing               | yes      | not applicable        | not applicable  | Possible hunting location, but due to Health and Safety Risk not recommended. On private property.                   |
| Other                         | possible | local                 | low             | May be some trapping in area, but due to Health and Safety Risk not recommended. On private property.                |

### 6.2.3 Education and Public Awareness Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function |
|----------------------------------|----------|-----------------------|-----------------|-------------------|
| Scientific research              | no       | not applicable        | not applicable  | not current.      |
| *Education/ interpretive use     | no       | not applicable        | not applicable  | not current.      |
| Near large urban population      | no       | not applicable        | not applicable  | -                 |
| Receive large number of visitors | no       | not applicable        | not applicable  | -                 |

### 6.2.4 Public Status Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function   |
|---|----------|-----------------------|-----------------|---|
| Part of settlement/<br>rural/urban lifestyle          | possible | local                 | low             | Adjacent residential areas.                                     |
| Special public interest                               | yes      | local                 | low             | Adjacent residential areas.                                     |
| *Unique national,<br>provincial, regional<br>resource | no       | not applicable        | not applicable  | -   |
| Policies to conserve                                  | yes      | provincial            | not applicable  | A provincial wetland directive is in place to protect wetlands. |
| Easy public access                                    | yes      | local                 | low             | On private property and Health and Safety considerations.       |
| Public land   | no       | not applicable        | not applicable  | -   |

### 6.2.5 Cultural Attribute Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function  |
|--|----------|-----------------------|-----------------|--|
| Contribution to<br>historical/cultural<br>heritage | no       | not applicable        | not applicable  | None identified in archaeological assessment (2005).         |
| *Archaeological/<br>paleontological<br>resources   | no       | not applicable        | not applicable  | None identified in archaeological assessment (2005).         |
| Use for cultural events                            | no       | not applicable        | not applicable  | -  |
| *Native traditional use                            | possible | local                 | low             | None currently identified in Mi'kmaq Knowledge Study (2005). |

## 6.3 Wetland Production Values

### 6.3.1 Agricultural Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function |
|---|----------|-----------------------|-----------------|-------------------|
| Livestock water   | no       | not applicable        | not applicable  | -                 |
| Forage source   | no       | not applicable        | not applicable  | -                 |
| *Crop irrigation water  | no       | not applicable        | not applicable  | -                 |
| Role in topsoil erosion<br>reduction  | no       | not applicable        | not applicable  | -                 |
| Role in soil moisture<br>and agricultural crop<br>production<br>enhancement | no       | not applicable        | not applicable  | -                 |

### 6.3.2 Renewable Resource Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function   |
|--|----------|-----------------------|-----------------|---|
| *Commercial or subsistence hunting/fishing/ trapping                   | possibly | local                 | low             | May be some trapping in area, health and safety considerations, on private lands.         |
| Opportunity for non-commercial use of fish/wildlife or water resources | possible | local                 | low             | May be local wildlife viewing however health and safety considerations, on private lands. |
| Harvestable forest resource  | possible | local                 | low             | May not be harvestable due to wet ground conditions.                                      |
| *Other commercial uses (e.g. cranberries)                              | no       | not applicable        | not applicable  | -   |

### 6.3.3 Non-renewable Resource Values

| Value                               | Presence | Level of Significance | Expected Impact | Describe Function  |
|-------------------------------------|----------|-----------------------|-----------------|--|
| *Use for commercial peat extraction | yes      | low                   | low             | Unlikely to provide sufficient peat for extraction, depth of peat no noted over 0.5 m. |
| Over known mineral/gas/oil deposits | no       | not applicable        | not applicable  | -  |

### 6.3.4 Tourism and Recreational Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function |
|---|----------|-----------------------|-----------------|-------------------|
| *Important local, regional or provincial tourism or recreation attraction | no       | not applicable        | not applicable  | -                 |
| Contribution of wetland to tourism/recreation economy                     | no       | not applicable        | not applicable  | -                 |
| Contribution to national/international tourism                            | no       | not applicable        | not applicable  | -                 |

### 6.3.5 Urban Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function  |
|----------------------------------|----------|-----------------------|-----------------|--|
| *Water for industry              | no       | not applicable        | not applicable  | Not currently used.  |
| *Sewage treatment use            | possible | local                 | low             | Highly unlikely  |
| *Domestic water supply           | no       | not applicable        | not applicable  | -  |
| Enhancement of development value | no       | not applicable        | not applicable  | -  |
| Urban flood protection role      | possible | local                 | low             | Shrub bog may have role in flood protection of local road. |

## 6.4 Summary of Values

| Value                          | Presence <sup>1</sup> |          |           |           |          |          | Level of Significance <sup>2</sup> |          |          |           |          | Expected Impact <sup>3</sup> |          |           | Comment |
|--------------------------------|-----------------------|----------|-----------|-----------|----------|----------|------------------------------------|----------|----------|-----------|----------|------------------------------|----------|-----------|---------|
|                                | Y                     | L        | P         | N         | U        | C*       | N                                  | P        | R        | L         | Ng       | H                            | M        | L         |         |
| <b>Life Support</b>            |                       |          |           |           |          |          |                                    |          |          |           |          |                              |          |           |         |
| Hydrological                   | 1                     | 1        | 3         | 1         | -        | 0        | -                                  | -        | -        | 5         | -        | -                            | -        | 4         |         |
| Biogeochemical                 | -                     | -        | 5         | -         | -        | 0        | -                                  | -        | -        | 5         | -        | -                            | -        | 5         |         |
| Habitat                        | 2                     | -        | -         | 7         | -        | 0        | -                                  | -        | -        | 7         | -        | -                            | -        | 7         |         |
| Ecological                     | 1                     | -        | -         | 6         | -        | 0        | -                                  | -        | 1        | 3         | -        | -                            | -        | 4         |         |
| <b>Social/Cultural</b>         |                       |          |           |           |          |          |                                    |          |          |           |          |                              |          |           |         |
| Aesthetic                      | 2                     | -        | -         | 2         | -        | 0        | -                                  | -        | -        | 3         | -        | -                            | -        | 3         |         |
| Recreational                   | -                     | -        | 2         | 3         | -        | 0        | -                                  | -        | -        | 3         | -        | -                            | -        | 3         |         |
| Education and Public Awareness | -                     | -        | 4         |           | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Public Status                  | 3                     | -        | 1         | 2         | -        | 0        | -                                  | 1        | -        | 3         | -        | -                            | -        | 3         |         |
| Cultural Attribute             | -                     | -        | 1         | 3         | -        | 0        | -                                  | -        | -        | 1         | -        | -                            | -        | 1         |         |
| <b>Production</b>              |                       |          |           |           |          |          |                                    |          |          |           |          |                              |          |           |         |
| Agricultural                   | -                     | -        | -         | 5         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Renewable Resources            | -                     | -        | 2         | 2         | -        | 0        | -                                  | -        | -        | 2         | -        | -                            | -        | 2         |         |
| Non-renewable Resources        | -                     | -        | -         | 2         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Tourism and Recreational       | -                     | -        | -         | 3         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Urban                          | -                     | -        | 1         | -         | -        | 0        | -                                  | -        | -        | 1         | -        | -                            | -        | 1         |         |
| <b>TOTAL</b>                   | <b>6</b>              | <b>1</b> | <b>19</b> | <b>36</b> | <b>0</b> | <b>1</b> | <b>0</b>                           | <b>1</b> | <b>1</b> | <b>33</b> | <b>0</b> | <b>0</b>                     | <b>0</b> | <b>33</b> |         |

1. Y yes L likely P possibly N no U unknown C critical \* only if listed yes
2. N national P provincial R regional L local Ng negligible
3. high M moderate L low

**Trigger Factors (3 or more critical criteria; over 50% national/provincial/regional significance and/or over one third of project impact high):** No trigger factors for significance of wetland.

## 6.5 Project Benefits Analysis

### 6.5.1 Employment Benefits

| Value   | Presence | Level of Significance | Expected Impact | Describe Function   |
|---|----------|-----------------------|-----------------|---|
| *Stimulation of new employment/ stabilization of existing in region | yes      | local                 | low             | The wetland area is a small but integral part of the project. |
| High income jobs  | no       | -                     | -               | -   |
| Stimulate employment upgrade  | no       | -                     | -               | -   |
| Stimulate research and education                                    | no       | -                     | -               | -   |

### 6.5.2 Economic Benefits

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Stimulation of local and regional economy during construction | yes      | local                 | low-moderate    | The wetland is a small but integral part of the overall project. |
| *Stimulation of local and regional economy during operation   | no       | -                     | -               | -  |
| Stimulation of value-added production                         | no       | -                     | -               | -  |
| Generation of new taxes/enhanced tax base                     | yes      | regional              | low             | The wetland is a small but integral part of the overall project. |

### 6.5.3 Production Benefits

| Value                                   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Stimulation of agricultural production  | no       | -                     | -               | -  |
| Stimulation of forest production        | no       | -                     | -               | -  |
| Stimulation of energy production        | no       | -                     | -               | -  |
| Stimulation of tourism and recreation   | yes      | regional              | low             | The wetland is a small but integral part of the overall project. |
| Stimulation of manufacturing production | no       | -                     | -               | -  |
| Stimulation of other production         | no       | -                     | -               | -  |

### 6.5.4 Urban/Industrial Infrastructure Development

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Provision of accommodations   | no       | -                     | -               | -  |
| Facilitation of major transportation link                                       | yes      | regional              | low-moderate    | The wetland is a small but integral part of the overall project. |
| Provision of harbour  | no       | not applicable        | not applicable  | -  |
| Solve waste disposal problems   | no       | -                     | -               | -  |
| Provision of alternate location for infrastructure incompatible with urban area | no       | -                     | -               | -  |
| Improvement of transportation safety  | yes      | local                 | moderate        | The wetland is a small but integral part of the overall project. |

## 6.6 Summary of Project Benefits

| Value                             | Presence <sup>1</sup> |          |          |           |          |          | Level of Significance <sup>2</sup> |          |          |          |          | Expected Impact <sup>3</sup> |          |          | Comment |
|-----------------------------------|-----------------------|----------|----------|-----------|----------|----------|------------------------------------|----------|----------|----------|----------|------------------------------|----------|----------|---------|
|                                   | Y                     | L        | P        | N         | U        | C*       | N                                  | P        | R        | L        | Ng       | H                            | M        | L        |         |
| <b>Employment Benefits</b>        | 1                     | -        | -        | 3         | -        | 1        | -                                  | -        | -        | 1        | -        | -                            | -        | 1        |         |
| <b>Economic Benefits</b>          | 2                     | -        | -        | 2         | -        | 0        | -                                  | -        | 1        | 1        | -        | -                            | 1        | 2        |         |
| <b>Production Benefits</b>        | 1                     | -        | -        | 5         | -        | 0        | -                                  | -        | 1        | -        | -        | -                            | -        | 1        |         |
| <b>Urban Development Benefits</b> | 2                     | -        | -        | 4         | -        | 0        | -                                  | -        | 1        | 1        | -        | -                            | 2        | 1        |         |
| <b>TOTAL</b>                      | <b>6</b>              | <b>-</b> | <b>-</b> | <b>13</b> | <b>-</b> | <b>1</b> | <b>-</b>                           | <b>-</b> | <b>3</b> | <b>3</b> | <b>-</b> | <b>0</b>                     | <b>2</b> | <b>4</b> |         |

1. Y yes L likely P possibly N no U unknown C critical \* only if listed yes
2. N national P provincial R regional L local Ng negligible
3. H high M moderate L low

**Trigger Factors (two critical criteria, over 50% national/provincial/regional significance and/or one third of impact on economy high):** No trigger factors for significance of project, although close to trigger limit for regional significance.

## 6.7 Overall Summary

**Wetland Key Benefits** - The wetlands have potential to contribute to regulation and filtration of surface water runoff. They also provide some habitat for wildlife including migratory birds, amphibians and minnows. At-risk were not confirmed in the proposed infill area.

**Wetland Key Disbenefits** - The wetland, which has been historically disturbed and is drying will be lost temporarily to be replaced with equivalent or better habitat during reclamation.

**Project Key Benefits** - The project is important to the local health and safety and provides some economic benefit.

**Project Key Disbenefits** - Loss of 7.3 ha of wetland to be replaced with equivalent or better habitat during reclamation.

## 6.8 Stage Two Recommendations

**Recommendation:** Proceed with project.

**Rationale:** The project will result in temporary loss of poor quality wetland to be replaced during reclamation with equivalent or better habitat. The project provides significant health and safety benefits and economic benefits are substantial.

## 7.0 STAGE TWO - DETAILED ANALYSIS

The following tables provide the detailed analysis. Note the \* denotes factors/values which are considered critical by the NAWCC.

### 7.1 Life-support Values

#### 7.1.1 Hydrological Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function  |
|--|----------|-----------------------|-----------------|--|
| *Contribution to recharge of regional water supply aquifer | no       | local                 | none            | Very small percentage of recharge and recharge so not lost if wetland is removed.                                      |
| *Flood protection benefits                                 | possibly | local                 | low             | Shrub bog receives surface water drainage from local area but small change in overall capacity.                        |
| Contribution to usable surface water                       | possibly | local                 | low             | Not a water supply.  |
| Erosion control  | likely   | local                 | low             | Shrub swamp provides some erosion control associated with modulating storm flow, but small overall change in capacity. |
| Flow augmentation (headwater)                              | possibly | local                 | low             | Shrub swamp, minor, small change in overall capacity.  |
| *Reduction of tidal impact                                 | no       | no                    | no              | Not applicable.  |



### 7.1.2 Biogeochemical Values

| Value                              | Presence | Level of Significance | Expected Impact | Describe Function                                     |
|------------------------------------|----------|-----------------------|-----------------|---|
| *Receipt of pollutant/amelioration | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| Storage for agricultural runoff    | possibly | local                 | low             | No upgradient agricultural lands noted.               |
| *Containment of pollutants         | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| Sediment flow stabilization        | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| High nutrients supporting wildlife | possibly | local                 | low             | Some nutrients may originate from mine cleared areas. |

### 7.1.3 Habitat Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| *At risk species                                | no       | -                     | -               | None identified (2005)   |
| *Significant habitat for migratory birds        | no       | local                 | low             | Bird species known for area include shrub species. Small proportion of overall available area.                   |
| Habitat for sport or commercial fish            | no       | local                 | low             | No aquatic habitat.  |
| Significant habitat for reptiles and amphibians | yes      | local                 | low             | Provides potential habitat for amphibians, but mine area limited proportion of overall available habitat.        |
| Significant habitat for crustaceans             | no       | not applicable        | not applicable  | No known significant crustacean habitat  |
| Significant habitat for mammals                 | no       | local                 | low             | Potential habitat for deer, hare and other wildlife, but not unique.   |
| *Significant organism in abundance              | no       | local                 | low             | No known significant abundant organisms.   |
| Protection of shorelines                        | no       | local                 | low             | Not Applicable   |
| *Ranked by CLI or other (NSDNR)                 | no       | local                 | low             | Shrub bog identified as wetland under NSDNR wetland database but not identified as significant wildlife habitat. |

### 7.1.4 Ecological Values

| Value                                   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Extensive ecosystem complex             | no       | local                 | low             | -  |
| *Regionally significant                 | no       | local                 | low             | No regionally significant habitat identified at wetland. |
| *Classic example of type                | no       | not applicable        | not applicable  | -  |
| Few remaining of this type in region    | no       | not applicable        | not applicable  | -  |
| Unique geographic feature               | no       | not applicable        | not applicable  | -  |
| Contribute to important drainage system | no       | not applicable        | not applicable  | -  |
| *Significant biological diversity       | no       | local                 | low             | -  |

## 7.2 Social/Cultural Values

### 7.2.1 Aesthetic Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function   |
|----------------------------------|----------|-----------------------|-----------------|---|
| Visible from residences          | yes      | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |
| Important Aesthetic function     | no       | -                     | -               | -   |
| Contribution to visual diversity | yes      | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |
| *Important sightseeing locale    | no       | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |

### 7.2.2 Recreational Values

| Value                         | Presence | Level of Significance | Expected Impact | Describe Function  |
|-------------------------------|----------|-----------------------|-----------------|--|
| Wildlife viewing/ photography | possible | local                 | low             | Possible wildlife view/photography location, but due to Health and Safety Risk not recommended. On private property. |
| Boating                       | no       | not applicable        | not applicable  | -  |
| Winter recreation             | no       | not applicable        | not applicable  | -  |

| Value           | Presence | Level of Significance | Expected Impact | Describe Function   |
|-----------------|----------|-----------------------|-----------------|---|
| Hunting/Fishing | yes      | not applicable        | not applicable  | Possible hunting location, but due to Health and Safety Risk not recommended. On private property.    |
| Other           | possible | local                 | low             | May be some trapping in area, but due to Health and Safety Risk not recommended. On private property. |

### 7.2.3 Education and Public Awareness Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function |
|----------------------------------|----------|-----------------------|-----------------|-------------------|
| Scientific research              | no       | not applicable        | not applicable  | not current.      |
| *Education/interpretive use      | no       | not applicable        | not applicable  | not current.      |
| Near large urban population      | no       | not applicable        | not applicable  | -                 |
| Receive large number of visitors | no       | not applicable        | not applicable  | -                 |

### 7.2.4 Public Status Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function   |
|---|----------|-----------------------|-----------------|---|
| Part of settlement/rural/urban lifestyle        | possible | local                 | low             | Adjacent residential areas.                                     |
| Special public interest                         | yes      | local                 | low             | Adjacent residential areas.                                     |
| *Unique national, provincial, regional resource | no       | not applicable        | not applicable  | -   |
| Policies to conserve                            | yes      | provincial            | not applicable  | A provincial wetland directive is in place to protect wetlands. |
| Easy public access                              | yes      | local                 | low             | On private property and Health and Safety considerations.       |
| Public land                                     | no       | not applicable        | not applicable  | -   |

### 7.2.5 Cultural Attribute Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function  |
|--|----------|-----------------------|-----------------|--|
| Contribution to historical/cultural heritage | no       | not applicable        | not applicable  | None identified in archaeological assessment (2005)          |
| *Archaeological/paleontological resources    | no       | not applicable        | not applicable  | None identified in archaeological assessment (2005)          |
| Use for cultural events                      | no       | not applicable        | not applicable  | -  |
| *Native traditional use                      | possible | local                 | low             | None currently identified in Mi'kmaq Knowledge Study (2005). |

## 7.3 Wetland Production Values

### 7.3.1 Agricultural Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function |
|--|----------|-----------------------|-----------------|-------------------|
| Livestock water  | no       | not applicable        | not applicable  | -                 |
| Forage source  | no       | not applicable        | not applicable  | -                 |
| *Crop irrigation water   | no       | not applicable        | not applicable  | -                 |
| Role in topsoil erosion reduction                                  | no       | not applicable        | not applicable  | -                 |
| Role in soil moisture and agricultural crop production enhancement | no       | not applicable        | not applicable  | -                 |

### 7.3.2 Renewable Resource Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function   |
|--|----------|-----------------------|-----------------|---|
| *Commercial or subsistence hunting/fishing/trapping                    | possibly | local                 | low             | May be some trapping in area, health and safety considerations, on private lands.         |
| Opportunity for non-commercial use of fish/wildlife or water resources | possible | local                 | low             | May be local wildlife viewing however health and safety considerations, on private lands. |
| Harvestable forest resource  | possible | low                   | low             | May not be harvestable due to ground conditions being moist.                              |
| *Other commercial uses (e.g. cranberries)                              | no       | not applicable        | not applicable  | -   |

### 7.3.3 Non-renewable Resource Values

| Value                               | Presence | Level of Significance | Expected Impact | Describe Function  |
|-------------------------------------|----------|-----------------------|-----------------|--|
| *Use for commercial peat extraction | likely   | low                   | low             | Unlikely to provide sufficient peat for extraction, depth of peat no noted over 0.5 m. |
| Over known mineral/gas/oil deposits | no       | not applicable        | not applicable  | -  |

### 7.3.4 Tourism and Recreational Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function |
|---|----------|-----------------------|-----------------|-------------------|
| *Important local, regional or provincial tourism or recreation attraction | no       | not applicable        | not applicable  | -                 |
| Contribution of wetland to tourism/recreation economy                     | no       | not applicable        | not applicable  | -                 |
| Contribution to national/ international tourism                           | no       | not applicable        | not applicable  | -                 |

### 7.3.5 Urban Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function  |
|----------------------------------|----------|-----------------------|-----------------|--|
| *Water for industry              | no       | not applicable        | not applicable  | Not currently used.  |
| *Sewage treatment use            | possible | local                 | low             | Highly unlikely  |
| *Domestic water supply           | no       | not applicable        | not applicable  | -  |
| Enhancement of development value | no       | not applicable        | not applicable  | -  |
| Urban flood protection role      | possible | local                 | low             | Shrub bog may have role in flood protection of local road. |

## 7.4 Summary of Values

| Value                                 | Presence <sup>1</sup> |   |   |   |   |    | Level of Significance <sup>2</sup> |   |   |   |    | Expected Impact <sup>3</sup> |   |   | Comment |
|---------------------------------------|-----------------------|---|---|---|---|----|------------------------------------|---|---|---|----|------------------------------|---|---|---------|
|                                       | Y                     | L | P | N | U | C* | N                                  | P | R | L | Ng | H                            | M | L |         |
| <b>Life Support</b>                   |                       |   |   |   |   |    |                                    |   |   |   |    |                              |   |   |         |
| <b>Hydrological</b>                   | 1                     | 1 | 3 | 1 | - | 0  | -                                  | - | - | 5 | -  | -                            | - | 4 |         |
| <b>Biogeochemical</b>                 | -                     | - | 5 | - | - | 0  | -                                  | - | - | 5 | -  | -                            | - | 5 |         |
| <b>Habitat</b>                        | 2                     | - | - | 7 | - | 0  | -                                  | - | - | 7 | -  | -                            | - | 7 |         |
| <b>Ecological</b>                     | 1                     | - | - | 6 | - | 0  | -                                  | - | 1 | 3 | -  | -                            | - | 4 |         |
| <b>Social/Cultural</b>                |                       |   |   |   |   |    |                                    |   |   |   |    |                              |   |   |         |
| <b>Aesthetic</b>                      | 2                     | - | - | 2 | - | 0  | -                                  | - | - | 3 | -  | -                            | - | 3 |         |
| <b>Recreational</b>                   | -                     | - | 2 | 3 | - | 0  | -                                  | - | - | 3 | -  | -                            | - | 3 |         |
| <b>Education and Public Awareness</b> | -                     | - | 4 |   | - | 0  | -                                  | - | - | - | -  | -                            | - | - |         |
| <b>Public Status</b>                  | 3                     | - | 1 | 2 | - | 0  | -                                  | 1 | - | 3 | -  | -                            | - | 3 |         |

| Value                    | Presence <sup>1</sup> |          |           |           |          |          | Level of Significance <sup>2</sup> |          |          |           |          | Expected Impact <sup>3</sup> |          |           | Comment |
|--------------------------|-----------------------|----------|-----------|-----------|----------|----------|------------------------------------|----------|----------|-----------|----------|------------------------------|----------|-----------|---------|
|                          | Y                     | L        | P         | N         | U        | C*       | N                                  | P        | R        | L         | Ng       | H                            | M        | L         |         |
| Cultural Attribute       | -                     | -        | 1         | 3         | -        | 0        | -                                  | -        | -        | 1         | -        | -                            | -        | 1         |         |
| <b>Production</b>        |                       |          |           |           |          |          |                                    |          |          |           |          |                              |          |           |         |
| Agricultural             | -                     | -        | -         | 5         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Renewable Resources      | -                     | -        | 2         | 2         | -        | 0        | -                                  | -        | -        | 2         | -        | -                            | -        | 2         |         |
| Non-renewable Resources  | -                     | -        | -         | 2         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Tourism and Recreational | -                     | -        | -         | 3         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Urban                    | -                     | -        | 1         | -         | -        | 0        | -                                  | -        | -        | 1         | -        | -                            | -        | 1         |         |
| <b>TOTAL</b>             | <b>6</b>              | <b>1</b> | <b>19</b> | <b>36</b> | <b>0</b> | <b>1</b> | <b>0</b>                           | <b>1</b> | <b>1</b> | <b>33</b> | <b>0</b> | <b>0</b>                     | <b>0</b> | <b>33</b> |         |

1. Y yes L likely P possibly N no U unknown C critical \* only if listed yes
2. N national P provincial R regional L local Ng negligible
3. high M moderate L low

**Trigger Factors (3 or more critical criteria; over 50% national/provincial/regional significance and/or over one third of project impact high):** No trigger factors for significance of wetland.

## 7.5 Project Benefits Analysis

### 7.5.1 Employment Benefits

| Value   | Presence | Level of Significance | Expected Impact | Describe Function   |
|---|----------|-----------------------|-----------------|---|
| *Stimulation of new employment/<br>stabilization of existing<br>in region | yes      | local                 | low             | The wetland area is a small but integral part of the project. |
| High income jobs  | no       | -                     | -               | -   |
| Stimulate employment<br>upgrade   | no       | -                     | -               | -   |
| Stimulate research and<br>education                                       | no       | -                     | -               | -   |

### 7.5.2 Economic Benefits

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Stimulation of local and regional economy during construction | yes      | local                 | low-moderate    | The wetland is a small but integral part of the overall project. |
| *Stimulation of local and regional economy during operation   | no       | -                     | -               | -  |
| Stimulation of value-added production                         | no       | -                     | -               | -  |
| Generation of new taxes/enhanced tax base                     | yes      | regional              | low             | The wetland is a small but integral part of the overall project. |

### 7.5.3 Production Benefits

| Value                                   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Stimulation of agricultural production  | no       | -                     | -               | -  |
| Stimulation of forest production        | no       | -                     | -               | -  |
| Stimulation of energy production        | no       | -                     | -               | -  |
| Stimulation of tourism and recreation   | yes      | regional              | low             | The wetland is a small but integral part of the overall project. |
| Stimulation of manufacturing production | no       | -                     | -               | -  |
| Stimulation of other production         | no       | -                     | -               | -  |

### 7.5.4 Urban/Industrial Infrastructure Development

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Provision of accommodations   | no       | -                     | -               | -  |
| Facilitation of major transportation link                                       | yes      | regional              | low-moderate    | The wetland is a small but integral part of the overall project. |
| Provision of harbour  | no       | not applicable        | not applicable  | -  |
| Solve waste disposal problems   | no       | -                     | -               | -  |
| Provision of alternate location for infrastructure incompatible with urban area | no       | -                     | -               | -  |
| Improvement of transportation safety  | yes      | local                 | moderate        | The wetland is a small but integral part of the overall project. |

## 7.6 Summary of Project Benefits

| Value                      | Presence <sup>1</sup> |          |          |           |          |          | Level of Significance <sup>2</sup> |          |          |          |          | Expected Impact <sup>3</sup> |          |          | Comment |
|----------------------------|-----------------------|----------|----------|-----------|----------|----------|------------------------------------|----------|----------|----------|----------|------------------------------|----------|----------|---------|
|                            | Y                     | L        | P        | N         | U        | C*       | N                                  | P        | R        | L        | Ng       | H                            | M        | L        |         |
| Employment Benefits        | 1                     | -        | -        | 3         | -        | 1        | -                                  | -        | -        | 1        | -        | -                            | -        | 1        |         |
| Economic Benefits          | 2                     | -        | -        | 2         | -        | 0        | -                                  | -        | 1        | 1        | -        | -                            | 1        | 2        |         |
| Production Benefits        | 1                     | -        | -        | 5         | -        | 0        | -                                  | -        | 1        | -        | -        | -                            | -        | 1        |         |
| Urban Development Benefits | 2                     | -        | -        | 4         | -        | 0        | -                                  | -        | 1        | 1        | -        | -                            | 2        | 1        |         |
| <b>TOTAL</b>               | <b>6</b>              | <b>-</b> | <b>-</b> | <b>13</b> | <b>-</b> | <b>1</b> | <b>-</b>                           | <b>-</b> | <b>3</b> | <b>3</b> | <b>-</b> | <b>0</b>                     | <b>2</b> | <b>4</b> |         |

1. Y yes L likely P possibly N no U unknown C critical \* only if listed yes

2. N national P provincial R regional L local Ng negligible

3. H high M moderate L low

**Trigger Factors (two critical criteria, over 50% national/provincial/regional significance and/or one third of impact on economy high):** No trigger factors for significance of project, although close to trigger limit for regional significance.

## 7.7 Overall Summary

**Wetland Key Benefits** - The wetlands have potential to contribute to regulation and filtration of surface water runoff. They also provide some habitat for wildlife including migratory birds, amphibians and minnows. At-risk were not confirmed in the proposed infill area.

**Wetland Key Disbenefits** - The wetland, which has been historically disturbed and is drying will be lost temporarily to be replaced with equivalent or better habitat during reclamation.

**Project Key Benefits** - The project is important to the local health and safety and provides some economic benefit.

**Project Key Disbenefits** - Loss of 7.3 ha of wetland to be replaced with equivalent or better habitat during reclamation.

## 7.8 Stage Two Recommendations

**Recommendation:** Proceed with project.

**Rationale:** The project will result in temporary loss of poor quality wetland to be replaced during reclamation with equivalent or better habitat. The project provides significant health and safety benefits and some economic benefits.



*Based on: North American Wetlands Conservation Council (Canada) Wetland Evaluation Guide (Issue Paper No. 1992-1)*

**Conducted September 2005; Dillon Consulting/MGI**

## **1.0 WETLAND IDENTIFICATION**

**Point Aconi Area Wetland 1.9 ha (Easting 707339, Northing 5133850)**

## **2.0 PROJECT DESCRIPTION**

### **2.1 Summary**

- i **Proponent:** Pioneer Coal Limited.
- ii Land use approval: Nova Scotia Department of Environment and Labour Approval (Wetland Activity) under the Environment Act.
- iii **Location:**
- iv **Work in relation to wetland:** Mine reclamation/coal extraction
- iv **Impact to wetland:** Potential to impact surface water patterns in the area.

### **2.2 Activity Summary**

|                              |   |
|------------------------------|---|
| <b>Type of Activity:</b>     | Mine reclamation/coal extraction  |
| <b>Project purpose:</b>      | Mine reclamation/coal extraction  |
| <b>Activity description:</b> | Mining reclamation and coal extraction - A surface operation at the site of a former underground operation. Appropriate sedimentation control will be undertaken. Work will generally be conducted with excavators and dozers. Work will be conducted year round. |

### **2.3 Project Status**

- i. **Jurisdiction of Approving Authority:** NSDEL (provincial).
- ii. **Type of Mandatory Review:** project with provincial environmental assessment required; wetland alteration requires wetland evaluation.
- iii. **Municipal Development Control:** no constraints
- iv. **Status of Proposal:** under EA review
- v. **Sources of Funding:** 100% private by Proponent.
- vi. **Stage of Project:** pre-development
- vii. **Potential for Stewardship:** Proponent may or may not be landowner at the completion of the project but is open to discussions with interested community groups.

## 2.4 Project Production Summary

- i. **Economic analysis:** Confidential - completed by in-house resources of the Proponent.
- ii. **Status of Economic Analysis:** Complete
- i. **Project Benefits:** Reclamation of disturbed lands posing public safety hazards, employment (280-350 person years), enhanced local tax base,
- iv. **Summary of Potential Disbenefits on Wetland:** Potential disruption, during development and extraction phases of surface water patterns in the area of the wetland and noise effects.

## 2.5 Summary of Expected Level of Selected Project Impacts on the Wetland

| Biophysical                |                          |  |
|----------------------------|--------------------------|--|
| Parameter                  | Level of Expected Impact | Comment  |
| Noise                      | Low-Mod                  | Medium term mining effect is high, with long term reclamation effects creating similar to existing habitat to current wetland. |
| Air quality                | Low                      |  |
| Water quality              | Low                      |  |
| Water quantity             | Low-Mod                  |  |
| Habitat                    | Low                      | Potential disruption of surface water patterns during development and extraction phases.                                       |
| Aesthetic                  | Low                      |  |
| Recreation                 | Low                      | Project is not on public lands. Recreation activities would require trespassing.   |
| Economic                   |                          |  |
| Employment                 | High                     |  |
| Training                   | Low                      |  |
| Construction Spending      | Moderate                 |  |
| Operation Spending         | High                     |  |
| Taxes                      | High                     |  |
| Indirect Spending          | High                     |  |
| Flood Protection           | Low                      |  |
| Improved Health and Safety | High                     |  |

## 2.6 Project Summary

The project is a mine reclamation/ coal extraction project with benefits including improvements to public safety, reclamation of disturbed lands, economic benefits in the form of taxes, royalties and employment. The wetland lies above a fixed coal deposit that can't be moved and the wetland removal is critical to the project. The local climate provides abundant rainfall, soils are amenable to wetland reconstruction, and the Proponent is familiar with wetlands reconstruction techniques.

## 3.0 WETLAND DESCRIPTION

### 3.1 Location

Nova Scotia  
Point Aconi (see EA report for map)  
Land Ownership – NSDNR, NSP

### 3.2 Setting

#### 3.2.1 Wetland Context

- i. **Complexity:** Uniform wet coniferous forest
- ii. **Wetland Class:** Marginal treed bog
- iii. **Previous Impact:** Changes to surface water patterns associated with the Brogan mine

## 4.0 RELOCATION/REDESIGN/VIABILITY

### 4.1 Potential for Project Relocation

**Importance of Existing Location:** The coal deposit is fixed and the project economics depend on extraction of those resources adjacent to the wetland.

### 4.2 Project Redesign

**Possibility of Redesign:** None. Coal deposit can't be moved.  
**Possibility of Change in Project Management:** None.

### 4.3 Wetland Viability

**Size change in past 5 years:** Possible due to completion of the Brogan mine  
**Other nearby project effects:** Possible due to completion of the Brogan mine  
**Associated habitat impacts (existing):** Not observed

**Hydrologic impacts of adjacent existing activities:** None identified.

**Potential for rehabilitation/restoration:** Good potential to recreate better wetland habitat.

**Status re cumulative impacts:** Potential for cumulative impacts due to surface water drainage pattern changes due to Prince Mine Project in addition to Brogan mine.

**Significance:** Lots of similar wetlands in the area.

## 5.0 STAGE ONE - GENERAL ANALYSIS

### 5.1 Biological Component

**Significance for Waterfowl/Wildlife:** Not identified in NSDNR Significant Wildlife Habitat Database as migratory bird and other habitat. Footprint not identified as significant habitat.

|                      |   |
|----------------------|---|
| Score: Waterfowl Low | 1 |
| Wildlife Low         | 1 |

**Rarity/Scarcity or Uniqueness:** Similar wetlands throughout area.

|                      |   |
|----------------------|---|
| Score: Waterfowl Low | 1 |
| Vegetation Low       | 1 |

### 5.2 Hydrological Component

**Significance of Contribution to Regional Water Quality/Groundwater:** Low contribution to regional water quality.

|            |   |
|------------|---|
| Score: Low | 1 |
|------------|---|

**Significance of Contribution to Regional Erosion Control/Flood Control:** Low regional contribution to erosion control/flood control.

|            |   |
|------------|---|
| Score: Low | 1 |
|------------|---|

### 5.3 Social/Cultural Component

**Existing, Proposed or Potential Heritage Designation or Protected Status at or adjacent Site:** Wetlands protected by NSDEL

|             |   |
|-------------|---|
| Score: High | 3 |
|-------------|---|

### 5.4 Project Benefits Component

**Significance Economically:** 280-350 person years of employment, taxes and royalties are significant

|             |   |
|-------------|---|
| Score: High | 3 |
|-------------|---|

**Significance to Regional Development/  
Employment: High.**

Score: High

3

## 5.5 References

As noted.

## 5.6 Stage One Overall Project Impact Rating

### Rating Calculation

| Current  |                        |   |
|--|------------------------|---|
| 1  | Biological Rating      | 4 |
| 2  | Hydrological Rating    | 2 |
| 3  | Social/Cultural Rating | 3 |
| Project Status   |                        |   |
| 4  | Project Benefits       | 6 |
| Overall Rating and Recommendation Component 1+2+3 (-4) |                        | 3 |

**Conclusion:** Overall rating between 4 and 12; continue to Stage 2

## 6.0 STAGE TWO - DETAILED ANALYSIS – NOT REQUIRED

*Based on: North American Wetlands Conservation Council (Canada) Wetland Evaluation Guide (Issue Paper No. 1992-1)*

## **Conducted September 2005; Dillon Consulting/MGI**

### **1.0 WETLAND IDENTIFICATION**

- Point Aconi Area Wetland 6.5 ha (Easting 707535, Northing 5133420)**

### **2.0 PROJECT DESCRIPTION**

#### **2.1 Summary**

- i **Proponent:** Pioneer Coal Limited.
- ii Land use approval: Nova Scotia Department of Environment and Labour Approval (Wetland Activity) under the Environment Act.
- iii **Location:** just north of Sheri Lee/Mill Pond Road, directly north of Prince Mine Colliery.
- iv **Work in relation to wetland:** Mine reclamation/coal extraction
- iv **Impact to wetland:** The extraction will encroach on approximately 2.5 ha identified as wetland by Nova Scotia Department of Natural Resources (NSDNR). The additional 4 ha immediately adjacent the area may also be affected.

#### **2.2 Activity Summary**

|                              |   |
|------------------------------|---|
| <b>Type of Activity:</b>     | Mine reclamation/coal extraction  |
| <b>Project purpose:</b>      | Mine reclamation/coal extraction  |
| <b>Activity description:</b> | Mining reclamation and coal extraction - A surface operation at the site of a former underground operation. Appropriate sedimentation control will be undertaken. Work will generally be conducted with excavators and dozers. Work will be conducted year round. |

#### **2.3 Project Status**

- i. **Jurisdiction of Approving Authority:** NSDEL (provincial).
- ii. **Type of Mandatory Review:** project with provincial environmental assessment required; wetland alteration requires wetland evaluation.
- iii. **Municipal Development Control:** no known constraints
- iv. **Status of Proposal:** under EA review
- v. **Sources of Funding:** 100% private by Proponent.
- vi. **Stage of Project:** pre-development
- vii. **Potential for Stewardship:** Proponent may or may not be landowner at the completion of the project but is open to discussions with interested community groups.

## 2.4 Project Production Summary

- i. **Economic analysis:** Confidential - completed by in-house resources of the Proponent.
- ii. **Status of Economic Analysis:** Complete
- i. **Project Benefits:** Reclamation of disturbed lands posing public safety hazards, employment (280-350 person years), enhanced local tax base
- iv. **Summary of Potential Disbenefits on Wetland:** Loss during development and extraction phases of 2 ha and disturbance of 4.5 ha adjacent to. Existing wetland function will be lost but will be replaced during reclamation phase. Noise disturbance will be for 7 years and sediment and erosion control measures will mitigate potential surface drainage impact.

## 2.5 Summary of Expected Level of Selected Project Impacts on the Wetland

| Biophysical                |                          |  |
|----------------------------|--------------------------|--|
| Parameter                  | Level of Expected Impact | Comment  |
| Noise                      | Low                      | Medium term mining effect is high, with long term reclamation effects creating habitat similar to existing to current wetland. |
| Air quality                | Low                      |  |
| Water quality              | Low                      |  |
| Water quantity             | Low                      |  |
| Habitat                    | Low                      | Project will create loss of 2.5 ha and disturbance of 4 ha.  |
| Aesthetic                  | Low-Mod                  |  |
| Recreation                 | Low-Mod.                 | Project is not on public lands. Recreation activities would require trespassing.   |
| Economic                   |                          |  |
| Employment                 | High                     | Wetland section is an integral portion of project.   |
| Training                   | Low                      |  |
| Construction Spending      | Moderate                 |  |
| Operation Spending         | High                     |  |
| Taxes                      | High                     |  |
| Indirect Spending          | High                     |  |
| Flood Protection           | Low                      |  |
| Improved Health and Safety | High                     |  |

## 2.6 Project Summary

The project is a mine reclamation/ coal extraction project with benefits including improvements to public safety, reclamation of disturbed lands, economic benefits in the form of taxes, royalties and employment. The wetland lies above a fixed coal deposit that can't be moved and the wetland removal is critical to the project. The local climate provides abundant rainfall, soils are amenable to wetland reconstruction, and the Proponent is familiar with wetlands reconstruction techniques.

## 3.0 WETLAND DESCRIPTION

### 3.1 Location

Nova Scotia

Point Aconi (see EA report for map)

Land Ownership – Cape Breton Development Corporation – Proponent will lease or purchase lands

### 3.2 Setting

#### *3.2.1 Wetland Context*

- i. **Complexity:** Primarily forest habitat, no wetland complexity.
- ii. **Wetland Class:** Primarily forest habitat.
- iii. **Previous Impact:** Existing bootleg mines.

## 4.0 RELOCATION/REDESIGN/VIABILITY

### 4.1 Potential for Project Relocation

**Importance of Existing Location:** The coal deposit is fixed and the project economics depend on extraction of those resources underlying the wetland.

### 4.2 Project Redesign

**Possibility of Redesign:** None. Coal deposit can't be moved.

**Possibility of Change in Project Management:** None. Project planning has been extensive and requires removal of surface soils including the wetland areas to get to the coal resources that have a fixed location.



### 4.3 Wetland Viability

**Size change in past 5 years:** Unlikely to have changed in the past 5 years.

**Other nearby project effects:** None identified

**Associated habitat impacts (existing):** None related to wetlands.

**Hydrologic impacts of adjacent existing activities:** None identified

**Potential for rehabilitation/restoration:** Good potential to recreate better wetland habitat.

**Status re cumulative impacts:** Wetland habitat generally not evident.

**Significance:** Wetland habitat generally not evident.

## 5.0 STAGE ONE - GENERAL ANALYSIS

### 5.1 Biological Component

**Significance for Waterfowl/Wildlife:** not identified in NSDNR Significant Wildlife Habitat Database as migratory bird and other habitat. Footprint not identified as significant habitat.

|                      |   |
|----------------------|---|
| Score: Waterfowl Low | 1 |
| Wildlife Low         | 1 |

**Rarity/Scarcity or Uniqueness:** similar wetlands throughout area.

|                      |   |
|----------------------|---|
| Score: Waterfowl Low | 1 |
| Vegetation Low       | 1 |

### 5.2 Hydrological Component

**Significance of Contribution to Regional Water Quality/Groundwater:** Low contribution to regional water quality.

|            |   |
|------------|---|
| Score: Low | 1 |
|------------|---|

**Significance of Contribution to Regional Erosion Control/Flood Control:** Low regional contribution to erosion control/flood control.

|            |   |
|------------|---|
| Score: Low | 1 |
|------------|---|

### 5.3 Social/Cultural Component

**Existing, Proposed or Potential Heritage Designation or Protected Status at or adjacent Site:** None based on 2005 surveys.

|            |   |
|------------|---|
| Score: Low | 1 |
|------------|---|

#### 5.4 Project Benefits Component

**Significance Economically:** 280-350 person years of employment, taxes and royalties paid to CBRM and Province are significant

|             |   |
|-------------|---|
| Score: High | 3 |
|-------------|---|

**Significance to Regional Development/  
Employment:** High.

|             |   |
|-------------|---|
| Score: High | 3 |
|-------------|---|

#### 5.5 References

As noted.

#### 5.6 Stage One Overall Project Impact Rating

##### Rating Calculation

| Current  |                        |    |
|--|------------------------|----|
| 1  | Biological Rating      | 4  |
| 2  | Hydrological Rating    | 2  |
| 3  | Social/Cultural Rating | 1  |
| Project Status   |                        |    |
| 4  | Project Benefits       | 6  |
| Overall Rating and Recommendation Component 1+2+3 (-4) |                        | -1 |

**Conclusion:** Overall rating between 4 and 12; continue to Stage 2

#### 6.0 STAGE TWO - DETAILED ANALYSIS – NOT REQUIRED

The following tables provide the detailed analysis. Note the \* denotes factors/values which are considered critical by the NAWCC.

## 6.1 Life-support Values

### 6.1.1 Hydrological Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function  |
|--|----------|-----------------------|-----------------|--|
| *Contribution to recharge of regional water supply aquifer | no       | local                 | none            | Very small percentage of recharge and the recharge so not lost with wetland removal.                                   |
| *Flood protection benefits                                 | possibly | local                 | low             | Shrub bog receives surface water drainage from local area but small change in overall capacity.                        |
| Contribution to usable surface water                       | possibly | local                 | low             | Not a water supply.  |
| Erosion control  | likely   | local                 | low             | Shrub swamp provides some erosion control associated with modulating storm flow, but small overall change in capacity. |
| Flow augmentation (headwater)                              | possibly | local                 | low             | Shrub swamp, minor, small change in overall capacity.  |
| *Reduction of tidal impact                                 | no       | no                    | no              | Not applicable.  |

### 6.1.2 Biogeochemical Values

| Value                              | Presence | Level of Significance | Expected Impact | Describe Function                                     |
|------------------------------------|----------|-----------------------|-----------------|---|
| *Receipt of pollutant/amelioration | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| Storage for agricultural runoff    | possibly | local                 | low             | No upgradient agricultural lands noted.               |
| *Containment of pollutants         | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| Sediment flow stabilization        | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| High nutrients supporting wildlife | possibly | local                 | low             | Some nutrients may originate from mine cleared areas. |

### 6.1.3 Habitat Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| *At risk species                                | no       | -                     | -               |  |
| *Significant habitat for migratory birds        | no       | local                 | low             | Bird species known for area include shrub species. Small proportion of overall available area.                   |
| Habitat for sport or commercial fish            | no       | local                 | low             | No aquatic habitat.  |
| Significant habitat for reptiles and amphibians | yes      | local                 | low             | Provides potential habitat for amphibians, but mine area limited proportion of overall available habitat.        |
| Significant habitat for crustaceans             | no       | not applicable        | not applicable  | No known significant crustacean habitat  |
| Significant habitat for mammals                 | no       | local                 | low             | Potential habitat for deer, hare and other wildlife, but not unique.   |
| *Significant organism in abundance              | no       | local                 | low             | No known significant abundant organisms.   |
| Protection of shorelines                        | no       | local                 | low             | Not Applicable   |
| *Ranked by CLI or other (NSDNR)                 | no       | local                 | low             | Shrub bog identified as wetland under NSDNR wetland database but not identified as significant wildlife habitat. |

### 6.1.4 Ecological Values

| Value                                   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Extensive ecosystem complex             | no       | local                 | low             | -  |
| *Regionally significant                 | no       | local                 | low             | No regionally significant habitat identified at wetland. |
| *Classic example of type                | no       | not applicable        | not applicable  | -  |
| Few remaining of this type in region    | no       | not applicable        | not applicable  | -  |
| Unique geographic feature               | no       | not applicable        | not applicable  | -  |
| Contribute to important drainage system | no       | not applicable        | not applicable  | -  |
| *Significant biological diversity       | no       | local                 | low             | -  |

## 6.2 Social/Cultural Values

### 6.2.1 Aesthetic Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function   |
|----------------------------------|----------|-----------------------|-----------------|---|
| Visible from residences          | yes      | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |
| Important Aesthetic function     | no       | -                     | -               | -   |
| Contribution to visual diversity | yes      | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |
| *Important sightseeing locale    | no       | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |

### 6.2.2 Recreational Values

| Value                         | Presence | Level of Significance | Expected Impact | Describe Function  |
|-------------------------------|----------|-----------------------|-----------------|--|
| Wildlife viewing/ photography | possible | local                 | low             | Possible wildlife view/photography location, but due to Health and Safety Risk not recommended. On private property. |
| Boating                       | no       | not applicable        | not applicable  | -  |
| Winter recreation             | no       | not applicable        | not applicable  | -  |
| Hunting/Fishing               | yes      | not applicable        | not applicable  | Possible hunting location, but due to Health and Safety Risk not recommended. On private property.                   |
| Other                         | possible | local                 | low             | May be some trapping in area, but due to Health and Safety Risk not recommended. On private property.                |

### 6.2.3 Education and Public Awareness Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function |
|----------------------------------|----------|-----------------------|-----------------|-------------------|
| Scientific research              | no       | not applicable        | not applicable  | not current.      |
| *Education/ interpretive use     | no       | not applicable        | not applicable  | not current.      |
| Near large urban population      | no       | not applicable        | not applicable  | -                 |
| Receive large number of visitors | no       | not applicable        | not applicable  | -                 |

### 6.2.4 Public Status Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function   |
|---|----------|-----------------------|-----------------|---|
| Part of settlement/<br>rural/urban lifestyle          | possible | local                 | low             | Adjacent residential areas.                                     |
| Special public interest                               | yes      | local                 | low             | Adjacent residential areas.                                     |
| *Unique national,<br>provincial, regional<br>resource | no       | not applicable        | not applicable  | -   |
| Policies to conserve                                  | yes      | provincial            | not applicable  | A provincial wetland directive is in place to protect wetlands. |
| Easy public access                                    | yes      | local                 | low             | On private property and Health and Safety considerations.       |
| Public land   | no       | not applicable        | not applicable  | -   |

### 6.2.5 Cultural Attribute Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function   |
|--|----------|-----------------------|-----------------|---|
| Contribution to<br>historical/cultural<br>heritage | no       | not applicable        | not applicable  | None identified in archaeological assessment (2005)         |
| *Archaeological/<br>paleontological<br>resources   | no       | not applicable        | not applicable  | None identified in archaeological assessment (2005).        |
| Use for cultural events                            | no       | not applicable        | not applicable  | -   |
| *Native traditional use                            | possible | local                 | low             | None currently identified in Mi'kmaq Knowledge Study (2005) |

## 6.3 Wetland Production Values

### 6.3.1 Agricultural Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function |
|---|----------|-----------------------|-----------------|-------------------|
| Livestock water   | no       | not applicable        | not applicable  | -                 |
| Forage source   | no       | not applicable        | not applicable  | -                 |
| *Crop irrigation water  | no       | not applicable        | not applicable  | -                 |
| Role in topsoil erosion<br>reduction  | no       | not applicable        | not applicable  | -                 |
| Role in soil moisture<br>and agricultural crop<br>production<br>enhancement | no       | not applicable        | not applicable  | -                 |

### 6.3.2 Renewable Resource Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function  |
|--|----------|-----------------------|-----------------|--|
| *Commercial or subsistence hunting/fishing/trapping                    | possibly | local                 | low             | May be some trapping in area, health and safety considerations, on private property.         |
| Opportunity for non-commercial use of fish/wildlife or water resources | possible | local                 | low             | May be local wildlife viewing however health and safety considerations, on private property. |
| Harvestable forest resource  | limited  | low                   | low             | May not be harvestable due to moist ground conditions.                                       |
| *Other commercial uses (e.g. cranberries)                              | no       | not applicable        | not applicable  | -  |

### 6.3.3 Non-renewable Resource Values

| Value                               | Presence | Level of Significance | Expected Impact | Describe Function   |
|-------------------------------------|----------|-----------------------|-----------------|---|
| *Use for commercial peat extraction | Yes      | Low                   | Low             | Unlikely to provide sufficient peat for extraction, depth of peat not noted over 0.5 m. |
| Over known mineral/gas/oil deposits | no       | not applicable        | not applicable  | -   |

### 6.3.4 Tourism and Recreational Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function |
|---|----------|-----------------------|-----------------|-------------------|
| *Important local, regional or provincial tourism or recreation attraction | no       | not applicable        | not applicable  | -                 |
| Contribution of wetland to tourism/recreation economy                     | no       | not applicable        | not applicable  | -                 |
| Contribution to national/ international tourism                           | no       | not applicable        | not applicable  | -                 |

### 6.3.5 Urban Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function  |
|----------------------------------|----------|-----------------------|-----------------|--|
| *Water for industry              | no       | not applicable        | not applicable  | Not currently used.  |
| *Sewage treatment use            | possible | local                 | low             | Highly unlikely  |
| *Domestic water supply           | no       | not applicable        | not applicable  | -  |
| Enhancement of development value | no       | not applicable        | not applicable  | -  |
| Urban flood protection role      | possible | local                 | low             | Shrub bog may have role in flood protection of local road but to limited extent. |

## 6.4 Summary of Values

| Value                          | Presence <sup>1</sup> |          |           |           |          |          | Level of Significance <sup>2</sup> |          |          |           |          | Expected Impact <sup>3</sup> |          |           | Comment |
|--------------------------------|-----------------------|----------|-----------|-----------|----------|----------|------------------------------------|----------|----------|-----------|----------|------------------------------|----------|-----------|---------|
|                                | Y                     | L        | P         | N         | U        | C*       | N                                  | P        | R        | L         | Ng       | H                            | M        | L         |         |
| <b>Life Support</b>            |                       |          |           |           |          |          |                                    |          |          |           |          |                              |          |           |         |
| Hydrological                   | 1                     | 1        | 3         | 1         | -        | 0        | -                                  | -        | -        | 5         | -        | -                            | -        | 4         |         |
| Biogeochemical                 | -                     | -        | 5         | -         | -        | 0        | -                                  | -        | -        | 5         | -        | -                            | -        | 5         |         |
| Habitat                        | 2                     | -        | -         | 7         | -        | 0        | -                                  | -        | -        | 7         | -        | -                            | -        | 7         |         |
| Ecological                     | 1                     | -        | -         | 6         | -        | 0        | -                                  | -        | 1        | 3         | -        | -                            | -        | 4         |         |
| <b>Social/Cultural</b>         |                       |          |           |           |          |          |                                    |          |          |           |          |                              |          |           |         |
| Aesthetic                      | 2                     | -        | -         | 2         | -        | 0        | -                                  | -        | -        | 3         | -        | -                            | -        | 3         |         |
| Recreational                   | -                     | -        | 2         | 3         | -        | 0        | -                                  | -        | -        | 3         | -        | -                            | -        | 3         |         |
| Education and Public Awareness | -                     | -        | 4         | -         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Public Status                  | 3                     | -        | 1         | 2         | -        | 0        | -                                  | 1        | -        | 3         | -        | -                            | -        | 3         |         |
| Cultural Attribute             | -                     | -        | 1         | 3         | -        | 0        | -                                  | -        | -        | 1         | -        | -                            | -        | 1         |         |
| <b>Production</b>              |                       |          |           |           |          |          |                                    |          |          |           |          |                              |          |           |         |
| Agricultural                   | -                     | -        | -         | 5         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Renewable Resources            | -                     | -        | 2         | 2         | -        | 0        | -                                  | -        | -        | 2         | -        | -                            | -        | 2         |         |
| Non-renewable Resources        | -                     | -        | -         | 2         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Tourism and Recreational       | -                     | -        | -         | 3         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Urban                          | -                     | -        | 1         | -         | -        | 0        | -                                  | -        | -        | 1         | -        | -                            | -        | 1         |         |
| <b>TOTAL</b>                   | <b>6</b>              | <b>1</b> | <b>19</b> | <b>36</b> | <b>0</b> | <b>1</b> | <b>0</b>                           | <b>1</b> | <b>1</b> | <b>33</b> | <b>0</b> | <b>0</b>                     | <b>0</b> | <b>33</b> |         |

1. Y yes L likely P possibly N no U unknown C critical \* only if listed yes
2. N national P provincial R regional L local Ng negligible
3. high M moderate L low



**Trigger Factors (3 or more critical criteria; over 50% national/provincial/regional significance and/or over one third of project impact high):** No trigger factors for significance of wetland.

## 6.5 Project Benefits Analysis

### 6.5.1 Employment Benefits

| Value   | Presence | Level of Significance | Expected Impact | Describe Function   |
|---|----------|-----------------------|-----------------|---|
| *Stimulation of new employment/<br>stabilization of existing<br>in region | yes      | local                 | low             | The wetland area is a small but integral part of the project. |
| High income jobs  | no       | -                     | -               | -   |
| Stimulate employment<br>upgrade   | no       | -                     | -               | -   |
| Stimulate research and<br>education                                       | no       | -                     | -               | -   |

### 6.5.2 Economic Benefits

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Stimulation of local<br>and regional economy<br>during construction | yes      | local                 | low-moderate    | The wetland is a small but integral part of the overall project. |
| *Stimulation of local<br>and regional economy<br>during operation   | no       | -                     | -               | -  |
| Stimulation of value-<br>added production                           | no       | -                     | -               | -  |
| Generation of new<br>taxes/enhanced tax<br>base                     | yes      | regional              | low             | The wetland is a small but integral part of the overall project. |

### 6.5.3 Production Benefits

| Value                                   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Stimulation of agricultural production  | no       | -                     | -               | -  |
| Stimulation of forest production        | no       | -                     | -               | -  |
| Stimulation of energy production        | no       | -                     | -               | -  |
| Stimulation of tourism and recreation   | yes      | regional              | low             | The wetland is a small but integral part of the overall project. |
| Stimulation of manufacturing production | no       | -                     | -               | -  |
| Stimulation of other production         | no       | -                     | -               | -  |

### 6.5.4 Urban/Industrial Infrastructure Development

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Provision of accommodations   | no       | -                     | -               | -  |
| Facilitation of major transportation link                                       | yes      | regional              | low-moderate    | The wetland is a small but integral part of the overall project. |
| Provision of harbour  | no       | not applicable        | not applicable  | -  |
| Solve waste disposal problems   | no       | -                     | -               | -  |
| Provision of alternate location for infrastructure incompatible with urban area | no       | -                     | -               | -  |
| Improvement of transportation safety  | yes      | local                 | moderate        | The wetland is a small but integral part of the overall project. |

## 6.6 Summary of Project Benefits

| Value                      | Presence <sup>1</sup> |          |          |           |          |          | Level of Significance <sup>2</sup> |          |          |          |          | Expected Impact <sup>3</sup> |          |          | Comment |
|----------------------------|-----------------------|----------|----------|-----------|----------|----------|------------------------------------|----------|----------|----------|----------|------------------------------|----------|----------|---------|
|                            | Y                     | L        | P        | N         | U        | C*       | N                                  | P        | R        | L        | Ng       | H                            | M        | L        |         |
| Employment Benefits        | 1                     | -        | -        | 3         | -        | 1        | -                                  | -        | -        | 1        | -        | -                            | -        | 1        |         |
| Economic Benefits          | 2                     | -        | -        | 2         | -        | 0        | -                                  | -        | 1        | 1        | -        | -                            | 1        | 2        |         |
| Production Benefits        | 1                     | -        | -        | 5         | -        | 0        | -                                  | -        | 1        | -        | -        | -                            | -        | 1        |         |
| Urban Development Benefits | 2                     | -        | -        | 4         | -        | 0        | -                                  | -        | 1        | 1        | -        | -                            | 2        | 1        |         |
| <b>TOTAL</b>               | <b>6</b>              | <b>-</b> | <b>-</b> | <b>13</b> | <b>-</b> | <b>1</b> | <b>-</b>                           | <b>-</b> | <b>3</b> | <b>3</b> | <b>-</b> | <b>0</b>                     | <b>2</b> | <b>4</b> |         |

1. Y yes L likely P possibly N no U unknown C critical \* only if listed yes
2. N national P provincial R regional L local Ng negligible
3. H high M moderate L low

**Trigger Factors (two critical criteria, over 50% national/provincial/regional significance and/or one third of impact on economy high):** No trigger factors for significance of project, although close to trigger limit for regional significance.

## 6.7 Overall Summary

**Wetland Key Benefits** - The wetlands have potential to contribute to regulation and filtration of surface water runoff. They also provide some habitat for wildlife including migratory birds, amphibians and minnows. At-risk were not present in the proposed infill area.

**Wetland Key Disbenefits** - The wetland, which has been historically disturbed and is drying will be lost temporarily to be replaced with equivalent or better habitat during reclamation.

**Project Key Benefits** - The project is important to the local health and safety and provides some economic benefit.

**Project Key Disbenefits** - Loss of 7.3 ha of wetland to be replaced with equivalent or better habitat during reclamation.

## 6.8 Stage Two Recommendations

**Recommendation:** Proceed with project.

**Rationale:** The project will result in temporary loss of poor quality wetland to be replaced during reclamation with equivalent or better habitat. The project provides significant health and safety benefits and significant economic benefits.

*Based on: North American Wetlands Conservation Council (Canada) Wetland Evaluation Guide (Issue Paper No. 1992-1)*

## **Conducted September 2005; Dillon Consulting/MGI**

### **1.0 WETLAND IDENTIFICATION**

- Point Aconi Area Wetland 7.3 ha (Easting 706830, Northing 5133470)**

### **2.0 PROJECT DESCRIPTION**

#### **2.1 Summary**

- i **Proponent:** Pioneer Coal Limited
- ii Land use approval: Nova Scotia Department of Environment and Labour Approval (Wetland Activity) under the Environment Act.
- iii **Location:** approximately 200 m north of Sheri Lee/Mill Pond Road, north of Prince Mine Colliery.
- iv **Work in relation to wetland:** mine reclamation/coal extraction.
- iv **Impact to wetland:** The extraction will encroach on approximately 7 ha identified as wetland by Nova Scotia Department of Natural Resources (NSDNR). The additional 0.3 ha immediately adjacent the area will also be affected.

#### **2.2 Activity Summary**

|                              |  |
|------------------------------|--|
| <b>Type of Activity:</b>     | Mine reclamation/coal extraction   |
| <b>Project purpose:</b>      | Mine reclamation/coal extraction   |
| <b>Activity description:</b> | Mine reclamation and coal extraction from a surface operation at the site of a former underground operation. Appropriate sedimentation control will be undertaken. Work will generally be conducted with excavators and dozers. Work will be conducted year round. |

#### **2.3 Project Status**

- i. **Jurisdiction of Approving Authority:** NSDEL (provincial).
- ii. **Type of Mandatory Review:** project with provincial environmental assessment required; wetland alteration requires wetland evaluation.
- iii. **Municipal Development Control:** No constraints
- iv. **Status of Proposal:** Under EA Review
- v. **Sources of Funding:** 100% Private by proponent
- vi. **Stage of Project:** Pre-development
- vii. **Potential for Stewardship:** Proponent may or may not be landowner at the completion of the project but is open to discussions with interested community groups.

## 2.4 Project Production Summary

- i. **Economic analysis:** Confidential – completed by in-house resources of the proponent
- ii. **Status of Economic Analysis:** Complete
- iii. **Project Benefits:** Reclamation of disturbed lands posing public safety hazards, employment (280-350 person years), enhanced local tax base.
- iv. **Summary of Potential Disbenefits on Wetland:** Loss of 7.0 ha and disturbance of 0.3 ha adjacent to wetland during development and extraction phases of the project with replacement during the reclamation phase.

## 2.5 Summary of Expected Level of Selected Project Impacts on the Wetland

| Biophysical                |                          |   |
|----------------------------|--------------------------|---|
| Parameter                  | Level of Expected Impact | Comment   |
| Noise                      | High                     | Medium term mining effect is high with the long term reclamation efforts creating habitat similar to current wetland. |
| Air quality                | High                     |   |
| Water quality              | High                     |   |
| Water quantity             | High                     |   |
| Habitat                    | High                     | Project will create medium term loss of 7 ha and disturbance of 0.3 ha.   |
| Aesthetic                  | Low-Mod                  |   |
| Recreation                 | Low-Mod.                 | Project is not on public lands, recreation activities would require trespassing.                                      |
| Economic                   |                          |   |
| Employment                 | High                     | Wetland section is an integral portion of project.  |
| Training                   | Low                      |   |
| Construction Spending      | Moderate                 |   |
| Operation Spending         | High                     |   |
| Taxes                      | High                     |   |
| Indirect Spending          | High                     |   |
| Flood Protection           | Low                      |   |
| Improved Health and Safety | High                     |   |

## 2.6 Project Summary

This project is a mine reclamation/coal extraction project with benefits including improvements to public safety, reclamation of disturbed lands, economic benefits in the form of taxes, royalties and employment. The wetland lies above a fixed coal deposit that can't be moved and the wetland removal is critical to the project. The local climate provides abundant rainfall, soils are amenable to wetland reconstruction and the proponent is familiar with wetlands reconstruction techniques.

### 3.0 WETLAND DESCRIPTION

#### 3.1 Location

Nova Scotia

Point Aconi (see EA report for map)

Land Ownership – Cape Breton Development Corporation – proponent will lease or purchase lands

#### 3.2 Setting

##### *3.2.1 Wetland Context*

- i. **Complexity:** single overall peat area, transitional pockets of wetter areas.
- ii. **Wetland Class:** shrub bog and open black spruce/tamarack bog.
- iii. **Previous Impact:** existing bootleg mines and transitional drying.

### 4.0 RELOCATION/REDESIGN/VIABILITY

#### 4.1 Potential for Project Relocation

**Importance of Existing Location:** The coal deposit is fixed and the project economics depend on extraction of those resources underlying the wetland.

#### 4.2 Project Redesign

**Possibility of Redesign:** None – coal deposit can't be moved.

**Possibility of Change in Project Management:** None – project planning has been extensive and requires removal of surface soils including the wetland areas to get to the coal resources that have a fixed location.

#### 4.3 Wetland Viability

**Size change in past 5 years:** Shrub wetland gradually drying.

**Other nearby project effects:** None identified

**Associated habitat impacts (existing):** Climate related increasing shrub domination

**Hydrologic impacts of adjacent existing activities:** None identified

**Potential for rehabilitation/restoration:** Good potential to recreate better habitat.

**Status re cumulative impacts:** Wetland reduced by climate factors

**Significance:** Many similar wetlands in area and region, no unique features

## 5.0 STAGE ONE - GENERAL ANALYSIS

### 5.1 Biological Component

**Significance for Waterfowl/Wildlife:** not identified in NSDNR Significant Wildlife Habitat Database as migratory bird and other habitat. Footprint not identified as significant habitat.

|                      |   |
|----------------------|---|
| Score: Waterfowl Low | 1 |
| Wildlife Low         | 1 |

**Rarity/Scarcity or Uniqueness:** similar wetlands throughout area.

|                      |   |
|----------------------|---|
| Score: Waterfowl Low | 1 |
| Vegetation Low       | 1 |

### 5.2 Hydrological Component

**Significance of Contribution to Regional Water Quality/Groundwater:** Low contribution to regional water quality.

|            |   |
|------------|---|
| Score: Low | 1 |
|------------|---|

**Significance of Contribution to Regional Erosion Control/Flood Control:** Low regional contribution to erosion control/flood control.

|            |   |
|------------|---|
| Score: Low | 1 |
|------------|---|

### 5.3 Social/Cultural Component

**Existing, Proposed or Potential Heritage Designation or Protected Status at or adjacent Site:** Protected as a wetland by NSDEL.

|             |   |
|-------------|---|
| Score: High | 3 |
|-------------|---|

### 5.4 Project Benefits Component

**Significance Economically:** 280-350 person years of employment, taxes and royalties are significant

|             |   |
|-------------|---|
| Score: High | 3 |
|-------------|---|

**Significance to Regional Development/Employment:** high

|             |   |
|-------------|---|
| Score: High | 3 |
|-------------|---|

## 5.5 References

As noted.

## 5.6 Stage One Overall Project Impact Rating

### Rating Calculation

| Current  |                        |   |
|--|------------------------|---|
| 1  | Biological Rating      | 4 |
| 2  | Hydrological Rating    | 2 |
| 3  | Social/Cultural Rating | 3 |
| Project Status   |                        |   |
| 4  | Project Benefits       | 6 |
| Overall Rating and Recommendation Component 1+2+3 (-4) |                        | 3 |

**Conclusion:** Overall rating between 4 and 12; continue to Stage 2

## 6.0 STAGE TWO - DETAILED ANALYSIS

The following tables provide the detailed analysis. Note the \* denotes factors/values which are considered critical by the NAWCC.

### 6.1 Life-support Values

#### 6.1.1 Hydrological Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function  |
|--|----------|-----------------------|-----------------|--|
| *Contribution to recharge of regional water supply aquifer | no       | local                 | none            | Very small percentage of recharge and recharge is not lost when wetland is removed.                                    |
| *Flood protection benefits                                 | possibly | local                 | low             | Shrub bog receives surface water drainage from local area but small change in overall capacity.                        |
| Contribution to usable surface water                       | possibly | local                 | low             | Not a water supply.  |
| Erosion control  | likely   | local                 | low             | Shrub swamp provides some erosion control associated with modulating storm flow, but small overall change in capacity. |
| Flow augmentation (headwater)                              | possibly | local                 | low             | Shrub swamp, minor, small change in overall capacity.  |
| *Reduction of tidal impact                                 | no       | no                    | no              | Not applicable.  |



### 6.1.2 Biogeochemical Values

| Value                              | Presence | Level of Significance | Expected Impact | Describe Function                                     |
|------------------------------------|----------|-----------------------|-----------------|---|
| *Receipt of pollutant/amelioration | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| Storage for agricultural runoff    | possibly | local                 | low             | No upgradient agricultural lands noted.               |
| *Containment of pollutants         | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| Sediment flow stabilization        | possibly | local                 | low             | Wetland may provide some stormwater control.          |
| High nutrients supporting wildlife | possibly | local                 | low             | Some nutrients may originate from mine cleared areas. |

### 6.1.3 Habitat Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| *At risk species                                | no       | -                     | -               | None (2005) survey.  |
| *Significant habitat for migratory birds        | no       | local                 | low             | Bird species known for area include shrub species. Small proportion of overall available area.                   |
| Habitat for sport or commercial fish            | no       | local                 | low             | No aquatic habitat.  |
| Significant habitat for reptiles and amphibians | yes      | local                 | low             | Provides potential habitat for amphibians, but mine area limited proportion of overall available habitat.        |
| Significant habitat for crustaceans             | no       | not applicable        | not applicable  | No known significant crustacean habitat  |
| Significant habitat for mammals                 | no       | local                 | low             | Potential habitat for deer, hare and other wildlife, but not unique.   |
| *Significant organism in abundance              | no       | local                 | low             | No known significant abundant organisms.   |
| Protection of shorelines                        | no       | local                 | low             | Not Applicable   |
| *Ranked by CLI or other (NSDNR)                 | no       | local                 | low             | Shrub bog identified as wetland under NSDNR wetland database but not identified as significant wildlife habitat. |

### 6.1.4 Ecological Values

| Value                                   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Extensive ecosystem complex             | no       | local                 | low             | -  |
| *Regionally significant                 | no       | local                 | low             | No regionally significant habitat identified at wetland. |
| *Classic example of type                | no       | not applicable        | not applicable  | -  |
| Few remaining of this type in region    | no       | not applicable        | not applicable  | -  |
| Unique geographic feature               | no       | not applicable        | not applicable  | -  |
| Contribute to important drainage system | no       | not applicable        | not applicable  | -  |
| *Significant biological diversity       | no       | local                 | low             | -  |

## 6.2 Social/Cultural Values

### 6.2.1 Aesthetic Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function   |
|----------------------------------|----------|-----------------------|-----------------|---|
| Visible from residences          | yes      | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |
| Important Aesthetic function     | no       | -                     | -               | -   |
| Contribution to visual diversity | yes      | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |
| *Important sightseeing locale    | no       | local                 | low             | View from community during extraction and after reclamation. Reclamation to be similar to existing topography and land cover. |

### 6.2.2 Recreational Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function  |
|----------------------------------|----------|-----------------------|-----------------|--|
| Wildlife viewing/<br>photography | possible | local                 | low             | Possible wildlife view/photography location, but due to Health and Safety Risk not recommended. On private property. |
| Boating                          | no       | not applicable        | not applicable  | -  |
| Winter recreation                | no       | not applicable        | not applicable  | -  |
| Hunting/Fishing                  | yes      | not applicable        | not applicable  | Possible hunting location, but due to Health and Safety Risk not recommended. On private property.                   |
| Other                            | possible | local                 | low             | May be some trapping in area, but due to Health and Safety Risk not recommended. On private property.                |

### 6.2.3 Education and Public Awareness Values

| Value                               | Presence | Level of Significance | Expected Impact | Describe Function |
|-------------------------------------|----------|-----------------------|-----------------|-------------------|
| Scientific research                 | no       | not applicable        | not applicable  | not current.      |
| *Education/<br>interpretive use     | no       | not applicable        | not applicable  | not current.      |
| Near large urban<br>population      | no       | not applicable        | not applicable  | -                 |
| Receive large number<br>of visitors | no       | not applicable        | not applicable  | -                 |

### 6.2.4 Public Status Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function   |
|---|----------|-----------------------|-----------------|---|
| Part of settlement/<br>rural/urban lifestyle          | possible | local                 | low             | Adjacent residential areas.                                     |
| Special public interest                               | yes      | local                 | low             | Adjacent residential areas.                                     |
| *Unique national,<br>provincial, regional<br>resource | no       | not applicable        | not applicable  | -   |
| Policies to conserve                                  | yes      | provincial            | not applicable  | A provincial wetland directive is in place to protect wetlands. |
| Easy public access                                    | yes      | local                 | low             | On private property and Health and Safety considerations.       |
| Public land   | no       | not applicable        | not applicable  | -   |

### 6.2.5 Cultural Attribute Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function   |
|--|----------|-----------------------|-----------------|---|
| Contribution to historical/cultural heritage | no       | not applicable        | not applicable  | None identified in archaeological assessment (2005)         |
| *Archaeological/paleontological resources    | no       | not applicable        | not applicable  | None identified in archaeological assessment (2005)         |
| Use for cultural events                      | no       | not applicable        | not applicable  | -   |
| *Native traditional use                      | possible | local                 | low             | None currently identified in Mi'Kmaq Knowledge Study (2005) |

## 6.3 Wetland Production Values

### 6.3.1 Agricultural Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function |
|--|----------|-----------------------|-----------------|-------------------|
| Livestock water  | no       | not applicable        | not applicable  | -                 |
| Forage source  | no       | not applicable        | not applicable  | -                 |
| *Crop irrigation water   | no       | not applicable        | not applicable  | -                 |
| Role in topsoil erosion reduction                                  | no       | not applicable        | not applicable  | -                 |
| Role in soil moisture and agricultural crop production enhancement | no       | not applicable        | not applicable  | -                 |

### 6.3.2 Renewable Resource Values

| Value  | Presence | Level of Significance | Expected Impact | Describe Function  |
|--|----------|-----------------------|-----------------|--|
| *Commercial or subsistence hunting/fishing/trapping                    | possibly | local                 | low             | May be some trapping in area, health and safety considerations, property is private land.    |
| Opportunity for non-commercial use of fish/wildlife or water resources | possible | local                 | low             | May be local wildlife viewing however health and safety considerations and on private lands. |
| Harvestable forest resource  | possible | local                 | low             | May not be able to harvest due to moist/wet land.  |
| *Other commercial uses (e.g. cranberries)                              | no       | not applicable        | not applicable  | -  |

### 6.3.3 Non-renewable Resource Values

| Value                               | Presence | Level of Significance | Expected Impact | Describe Function  |
|-------------------------------------|----------|-----------------------|-----------------|--|
| *Use for commercial peat extraction | yes      | low                   | low             | Unlikely to provide sufficient peat for extraction, depth of peat no noted over 0.5 m. |
| Over known mineral/gas/oil deposits | no       | not applicable        | not applicable  | -  |

### 6.3.4 Tourism and Recreational Values

| Value   | Presence | Level of Significance | Expected Impact | Describe Function |
|---|----------|-----------------------|-----------------|-------------------|
| *Important local, regional or provincial tourism or recreation attraction | no       | not applicable        | not applicable  | -                 |
| Contribution of wetland to tourism/recreation economy                     | no       | not applicable        | not applicable  | -                 |
| Contribution to national/ international tourism                           | no       | not applicable        | not applicable  | -                 |

### 6.3.5 Urban Values

| Value                            | Presence | Level of Significance | Expected Impact | Describe Function  |
|----------------------------------|----------|-----------------------|-----------------|--|
| *Water for industry              | no       | not applicable        | not applicable  | Not currently used.  |
| *Sewage treatment use            | possible | local                 | low             | Highly unlikely.   |
| *Domestic water supply           | no       | not applicable        | not applicable  | -  |
| Enhancement of development value | no       | not applicable        | not applicable  | -  |
| Urban flood protection role      | possible | local                 | low             | Shrub bog may have role in flood protection of local road. |

## 6.4 Summary of Values

| Value                          | Presence <sup>1</sup> |          |           |           |          |          | Level of Significance <sup>2</sup> |          |          |           |          | Expected Impact <sup>3</sup> |          |           | Comment |
|--------------------------------|-----------------------|----------|-----------|-----------|----------|----------|------------------------------------|----------|----------|-----------|----------|------------------------------|----------|-----------|---------|
|                                | Y                     | L        | P         | N         | U        | C*       | N                                  | P        | R        | L         | Ng       | H                            | M        | L         |         |
| <b>Life Support</b>            |                       |          |           |           |          |          |                                    |          |          |           |          |                              |          |           |         |
| Hydrological                   | 1                     | 1        | 3         | 1         | -        | 0        | -                                  | -        | -        | 5         | -        | -                            | -        | 4         |         |
| Biogeochemical                 | -                     | -        | 5         | -         | -        | 0        | -                                  | -        | -        | 5         | -        | -                            | -        | 5         |         |
| Habitat                        | 2                     | -        | -         | 7         | -        | 0        | -                                  | -        | -        | 7         | -        | -                            | -        | 7         |         |
| Ecological                     | 1                     | -        | -         | 6         | -        | 0        | -                                  | -        | 1        | 3         | -        | -                            | -        | 4         |         |
| <b>Social/Cultural</b>         |                       |          |           |           |          |          |                                    |          |          |           |          |                              |          |           |         |
| Aesthetic                      | 2                     | -        | -         | 2         | -        | 0        | -                                  | -        | -        | 3         | -        | -                            | -        | 3         |         |
| Recreational                   | -                     | -        | 2         | 3         | -        | 0        | -                                  | -        | -        | 3         | -        | -                            | -        | 3         |         |
| Education and Public Awareness | -                     | -        | 4         |           | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Public Status                  | 3                     | -        | 1         | 2         | -        | 0        | -                                  | 1        | -        | 3         | -        | -                            | -        | 3         |         |
| Cultural Attribute             | -                     | -        | 1         | 3         | -        | 0        | -                                  | -        | -        | 1         | -        | -                            | -        | 1         |         |
| <b>Production</b>              |                       |          |           |           |          |          |                                    |          |          |           |          |                              |          |           |         |
| Agricultural                   | -                     | -        | -         | 5         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Renewable Resources            | -                     | -        | 2         | 2         | -        | 0        | -                                  | -        | -        | 2         | -        | -                            | -        | 2         |         |
| Non-renewable Resources        | -                     | -        | -         | 2         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Tourism and Recreational       | -                     | -        | -         | 3         | -        | 0        | -                                  | -        | -        | -         | -        | -                            | -        | -         |         |
| Urban                          | -                     | -        | 1         | -         | -        | 0        | -                                  | -        | -        | 1         | -        | -                            | -        | 1         |         |
| <b>TOTAL</b>                   | <b>6</b>              | <b>1</b> | <b>19</b> | <b>36</b> | <b>0</b> | <b>1</b> | <b>0</b>                           | <b>1</b> | <b>1</b> | <b>33</b> | <b>0</b> | <b>0</b>                     | <b>0</b> | <b>33</b> |         |

1. Y yes L likely P possibly N no U unknown C critical \* only if listed yes
2. N national P provincial R regional L local Ng negligible
3. high M moderate L low

**Trigger Factors (3 or more critical criteria; over 50% national/provincial/regional significance and/or over one third of project impact high):** No trigger factors for significance of wetland.

## 6.5 Project Benefits Analysis

### 6.5.1 Employment Benefits

| Value   | Presence | Level of Significance | Expected Impact | Describe Function   |
|---|----------|-----------------------|-----------------|---|
| *Stimulation of new employment/<br>stabilization of existing<br>in region | yes      | local                 | low             | The wetland area is a small but integral part of the project. |
| High income jobs  | no       | -                     | -               | -   |
| Stimulate employment<br>upgrade   | no       | -                     | -               | -   |
| Stimulate research and<br>education                                       | no       | -                     | -               | -   |

### 6.5.2 Economic Benefits

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Stimulation of local<br>and regional economy<br>during construction | yes      | local                 | low-moderate    | The wetland is a small but integral part of the overall project. |
| *Stimulation of local<br>and regional economy<br>during operation   | no       | -                     | -               | -  |
| Stimulation of value-<br>added production                           | no       | -                     | -               | -  |
| Generation of new<br>taxes/enhanced tax<br>base                     | yes      | regional              | low             | The wetland is a small but integral part of the overall project. |

### 6.5.3 Production Benefits

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Stimulation of<br>agricultural production     | no       | -                     | -               | -  |
| Stimulation of forest<br>production           | no       | -                     | -               | -  |
| Stimulation of energy<br>production           | no       | -                     | -               | -  |
| Stimulation of tourism<br>and recreation      | yes      | regional              | low             | The wetland is a small but integral part of the overall project. |
| Stimulation of<br>manufacturing<br>production | no       | -                     | -               | -  |
| Stimulation of other<br>production            | no       | -                     | -               | -  |

### 6.5.4 Urban/Industrial Infrastructure Development

| Value   | Presence | Level of Significance | Expected Impact | Describe Function  |
|---|----------|-----------------------|-----------------|--|
| Provision of accommodations   | no       | -                     | -               | -  |
| Facilitation of major transportation link                                       | yes      | regional              | low-moderate    | The wetland is a small but integral part of the overall project. |
| Provision of harbour  | no       | not applicable        | not applicable  | -  |
| Solve waste disposal problems   | no       | -                     | -               | -  |
| Provision of alternate location for infrastructure incompatible with urban area | no       | -                     | -               | -  |
| Improvement of transportation safety  | yes      | local                 | moderate        | The wetland is a small but integral part of the overall project. |

## 6.6 Summary of Project Benefits

| Value                             | Presence <sup>1</sup> |          |          |           |          |          | Level of Significance <sup>2</sup> |          |          |          |          | Expected Impact <sup>3</sup> |          |          | Comment |
|-----------------------------------|-----------------------|----------|----------|-----------|----------|----------|------------------------------------|----------|----------|----------|----------|------------------------------|----------|----------|---------|
|                                   | Y                     | L        | P        | N         | U        | C*       | N                                  | P        | R        | L        | Ng       | H                            | M        | L        |         |
| <b>Employment Benefits</b>        | 1                     | -        | -        | 3         | -        | 1        | -                                  | -        | -        | 1        | -        | -                            | -        | 1        |         |
| <b>Economic Benefits</b>          | 2                     | -        | -        | 2         | -        | 0        | -                                  | -        | 1        | 1        | -        | -                            | 1        | 2        |         |
| <b>Production Benefits</b>        | 1                     | -        | -        | 5         | -        | 0        | -                                  | -        | 1        | -        | -        | -                            | -        | 1        |         |
| <b>Urban Development Benefits</b> | 2                     | -        | -        | 4         | -        | 0        | -                                  | -        | 1        | 1        | -        | -                            | 2        | 1        |         |
| <b>TOTAL</b>                      | <b>6</b>              | <b>-</b> | <b>-</b> | <b>13</b> | <b>-</b> | <b>1</b> | <b>-</b>                           | <b>-</b> | <b>3</b> | <b>3</b> | <b>-</b> | <b>0</b>                     | <b>2</b> | <b>4</b> |         |

1. Y yes L likely P possibly N no U unknown C critical \* only if listed yes
2. N national P provincial R regional L local Ng negligible
3. H high M moderate L low

**Trigger Factors (two critical criteria, over 50% national/provincial/regional significance and/or one third of impact on economy high):** No trigger factors for significance of project, although close to trigger limit for regional significance.

## 6.7 Overall Summary

**Wetland Key Benefits** - The wetlands have potential to contribute to regulation and filtration of surface water runoff. They also provide some habitat for wildlife including migratory birds, amphibians and minnows. At-risk were not confirmed in the proposed infill area.

**Wetland Key Disbenefits** - The wetland, which has been historically disturbed and is drying will be lost temporarily to be replaced with equivalent or better habitat during reclamation.



**Project Key Benefits** - The project is important to the local health and safety and provides some economic benefit.

**Project Key Disbenefits** - Loss of 7.3 ha of wetland to be replaced with equivalent or better habitat during reclamation.

## **6.8 Stage Two Recommendations**

**Recommendation:** Proceed with project.

**Rationale:** The project will result in temporary loss of poor quality wetland to be replaced during reclamation with equivalent or better habitat. The project provides significant health and safety benefits and economic benefits.