

**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
Halifax, NS
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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.

Species	Foraging Distance from Colony
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 15th to July 15th.

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 15th. 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 27th 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 km² 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 21st 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

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 31st, 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
B3B 1X9

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 (NSES) 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 (NSES) 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 *Aeshna* 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

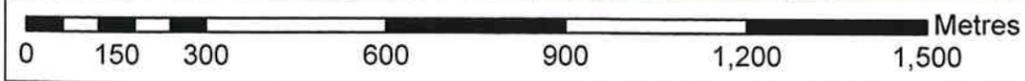
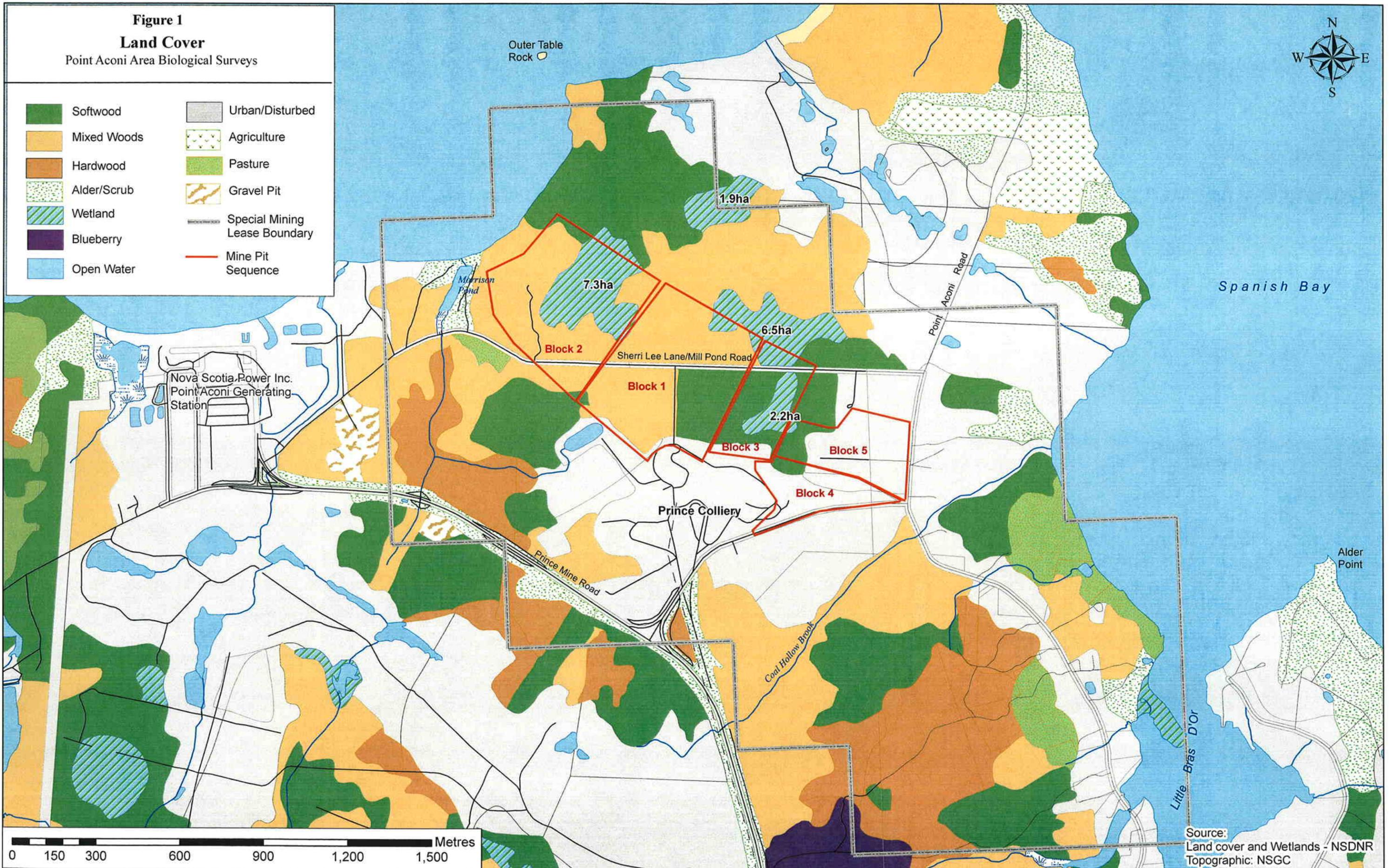
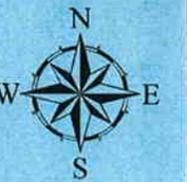
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Figure 1

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>Grappheporum (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 / SARA / NSESA Status	Habitat Preference
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/ 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 spentrionalis</i>	yellow	na	na		Dense forest and caves
Gaspe shrew	<i>Sorex gaspensis</i>	yellow	na	Special 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 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 Concern		Sydney Harbour - winter
Bicknell's thrush	<i>Catharus minimus</i>	yellow	Special Concern	Special 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 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 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 Status	NSESA	COSEWIC / 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 Concern	Rivers, riffles, sand bottom; Sydney River
Delicate lamp mussel	<i>Lampsilis ochraceae</i>	yellow	na	na	Quiet water, mud/sand bottom, near coast; 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, 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/ 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		Open bog	Treed bog	Shrub 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			Open bog	Beach	Disturbed
							Shrub bog	Treed bog				
Bog willow	<i>Salix pedicellaris</i>	yellow	May-Jun. Visible summer				✓		✓			
Seabeach groundsel	<i>Senecio pseudoarnica</i>	yellow	late Jul-Aug.								✓	
Sticky false-asphodel	<i>Toifledia (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

<i>Cephus grylle</i>	Black Guillemot	G5	S3			08.3Km +/-5	Lavender, Fulton	Activity: Confirmed breeding: adult occupying nest.		
<i>Fratercula arctica</i>	Atlantic Puffin	G5	S1B			08.3Km +/-5	Trasker, Ron R	Abundance: 3. Activity: Confirmed breeding: adult occupying nest.		
<i>Poecile 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>Fratercula 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# 34190 col#	Habitat: rich walled depression; coastal; forested.
<i>Senecio pseudoarnica</i>	Seabeach Groundsel	G5	S2			09.6Km +/-0.5	Erskine, JS		col# 65.39.	beaches, cobbly/pebbly beaches, gravel/sand beaches,
<i>Alca torda</i>	Razorbill	G5	S1B,SZN			09.7Km +/-0.5	Lock, AR (MNRS)	Count: 300 pairs.		
<i>Fratercula 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# 35419 col# 10999.	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# 41948 col# ?	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# 41909 col# 558.	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# 41900 col# 548.	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. Brunelle	Descrip.: 1 adult, 1 male. Activity: flight.	NBM	freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily	H G 2
Anax junius	Common Green Darner	G5		S3			17.3Km +/-0.1	P.M. Brunelle	Descrip.: 1 adult, 1 male. Activity: flight.	CBHNP	Habitat: pond, large size, lentic, freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily	H G 2
Dorocordulia lepida	Petite Emerald	G5		S3			17.3Km +/-0.1	P.M. Brunelle	Descrip.: 1 adult, 1 male. Activity: flight.	CBHNP	freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily	H G 2
Somatochlora walshii	Brush-Tipped Emerald	G5		S3			17.3Km +/-0.1	P.M. Brunelle	Descrip.: 1 adult, 1 male. Activity: flight.	NBM	freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily	H G 2
Leucorrhinia hudsonica	Hudsonian Whiteface	G5		S3			17.3Km +/-0.1	P.M. Brunelle	Descrip.: 1 adult, 1 male. Activity: flight.	CBHNP	freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily	H G 2
Ladona julia	Chalk-Fronted Corporal	G5		S3			17.3Km +/-0.1	P.M. Brunelle	Descrip.: 1 adult, 1 female. Activity: flight.	NBM	Habitat: pond, large size, lentic, freshwater, still, tea-coloured water, mud and marsh shoreline, mud bottom, heavy burreed and waterlily	H G 2
Sympetrum danae	Black Meadowhawk	G5		S2			17.3Km +/-0.1	P.M. Brunelle	Descrip.: 1 adult, 1 male. 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 G 2 0 0 4
Sympetrum semicinctum	Band-Winged Meadowhawk	G5		S3			17.3Km +/-0.1	P.M. Brunelle	Descrip.: 3 adult, 2 male, 1 female. 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.	H G 2 0 0 4
Argia fumipennis violacea	Variable Dancer	G5T 5		S3			17.3Km +/-0.1	P.M. Brunelle	Activity: flight.		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 G 2 0 0 4

<i>Enallagma civile</i>	Familiar Bluet	G5				S3			17.3Km +/-0.1	P.M. Brunelle	Descrip.: 1 adult, 1 male. 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 H G 2 0 0 4
<i>Enallagma hageni</i>	Hagen's Bluet	G5				S3			17.3Km +/-0.1	P.M. Brunelle	Descrip.: 1 adult, 1 male. 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 H G 2 0 0
<i>Dryopteris filix-mas</i>	Male Fern	G5				S3			17.8Km +/-5	Bissell, CH; Linder, CH	Pheno.: sterile; fertile.	col# 19429.	Habitat: clearings about a quarry; unforested.	H G
<i>Polystichum braunii</i>	Braun's Holly-Fern	G5				S3S4			17.8Km +/-5	Linder, DH	Pheno.: fertile.	col#	Habitat: alpine; forested.	H S H G
<i>Lycopodium complanatum</i>	Trailing Clubmoss	G5				S3?			17.8Km +/-5	Bissell, CH; Linder, DH	Pheno.: sterile.	ACAD col# 19594.	Habitat: spruce; hillside, across river from quarry; forested.	S H G
<i>Bucephala clangula</i>	Common Goldeneye	G5				S2B			17.9Km +/-1	Waldron, Eleanor	Activity: Confirmed breeding: fledged young.			S H G
<i>Falco columbarius</i>	Merlin	G5				S3S4B	NAR		17.9Km +/-1	Waldron, Eleanor	Activity: Probable breeding: pair observed (sexes similar).			S H G
<i>Poecile hudsonica</i>	Boreal Chickadee	G5				S3S4			17.9Km +/-1	Waldron, Eleanor	Abundance: 4. Activity: Confirmed breeding: fledged young.			S H G
<i>Dolichonyx oryzivorus</i>	Bobolink	G5				S3B			17.9Km +/-1	Waldron, Eleanor	Abundance: 3. Activity: Confirmed breeding: adult occupying nest.			S H G
<i>Aeshna canadensis</i>	Canada Darner	G5				S3			18.1Km +/-1	D. Anderson	Descrip.: 2 adult, 2 male. Activity: flight.	NSDNRB	Habitat: pond, lentic, freshwater.	H G
<i>Dorocordulia lepida</i>	Petite Emerald	G5				S3			18.1Km +/-1	D. Anderson	Descrip.: 1 adult, 1 male. Activity: flight.	NSDNRB	Habitat: pond, lentic, freshwater.	S H
<i>Enallagma hageni</i>	Hagen's Bluet	G5				S3			18.1Km +/-1	D. Anderson	Descrip.: 2 adult, 2 male. Activity: flight.	NSDNRB	Habitat: pond, lentic, freshwater.	S 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 G
Isoetes acadensis	Acadian Quillwort	G3?			S3				18.2Km +/-1	MacDonald, AC; Curry, WJ	Abundance: common. Pheno.: fertile.	ACAD acc# 43358 col# 16707.	Habitat: submerged; freshwater, wetland.	H G
Huperzia selago	Fir Clubmoss	G5			S1S3				18.2Km +/-1	Schofield, WB; Taylor,	Abundance: abundant. Pheno.: fertile.	ACAD acc# 27283 col#	Habitat: cliff of ravine; forested.	H G
Asplenium trichomanes	Maidenhair Spleenwort	G5			S2				18.4Km +/-1	Schofield, WB;	Pheno.: Fertile.	acc# 41750 col#	Habitat: sheltered cliff crevices; Unforested.	S H
Botrychium dissectum	Cutleaf Grape-Fern	G5			S3				18.4Km +/-5	Taylor, JC; Webster,	Pheno.: fertile.	acc# 39120 col#	Habitat: slope, open dry; unforested.	S H
Ophioglossum pusillum	Adder's Tongue	G5			S2S3				18.4Km +/-5	Schofield, WB;	Pheno.: fertile.	acc# 39124 col#	Habitat: meadow; freshwater, wetland.	S H
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 G
Mergus serrator	Red-breasted Merganser	G5			S2S3B				18.5Km +/-5	Ball, George	Activity: Probable breeding: pair observed (sexes similar).			H G
Accipiter gentilis	Northern Goshawk	G5			S3B				18.5Km +/-5	BBA atlasser no 1469	breeding: territorial behaviour twice in same location.			H G
Falco columbarius	Merlin	G5			S3S4B				18.5Km +/-5	BBA atlasser no 1469	Activity: Probable breeding: territorial behaviour twice in same location.			H G
Poecile hudsonica	Boreal Chickadee	G5			S3S4				18.5Km +/-5	BBA atlasser no 1469	Activity: Probable breeding: territorial behaviour twice in same location.			H G
Dolichonyx oryzivorus	Bobolink	G5			S3B				18.5Km +/-5	BBA atlasser no 1469	Activity: Probable breeding: territorial behaviour twice in same location.			H G
Euphagus carolinus	Rusty Blackbird	G5			S3S4B				18.5Km +/-5	BBA atlasser no 1469	Activity: Probable breeding: territorial behaviour twice in same location.			H G
Sterna hirundo	Common Tern	G5			S3B				18.6Km +/-1	Kent, B	Count: Colony size: 7 pair; Birds: 15 est.		Habitat: mainland coast marine.	S H
Sterna hirundo	Common Tern	G5			S3B				18.7Km +/-0.1	(MNRS)	Count: 30 pairs.			H G

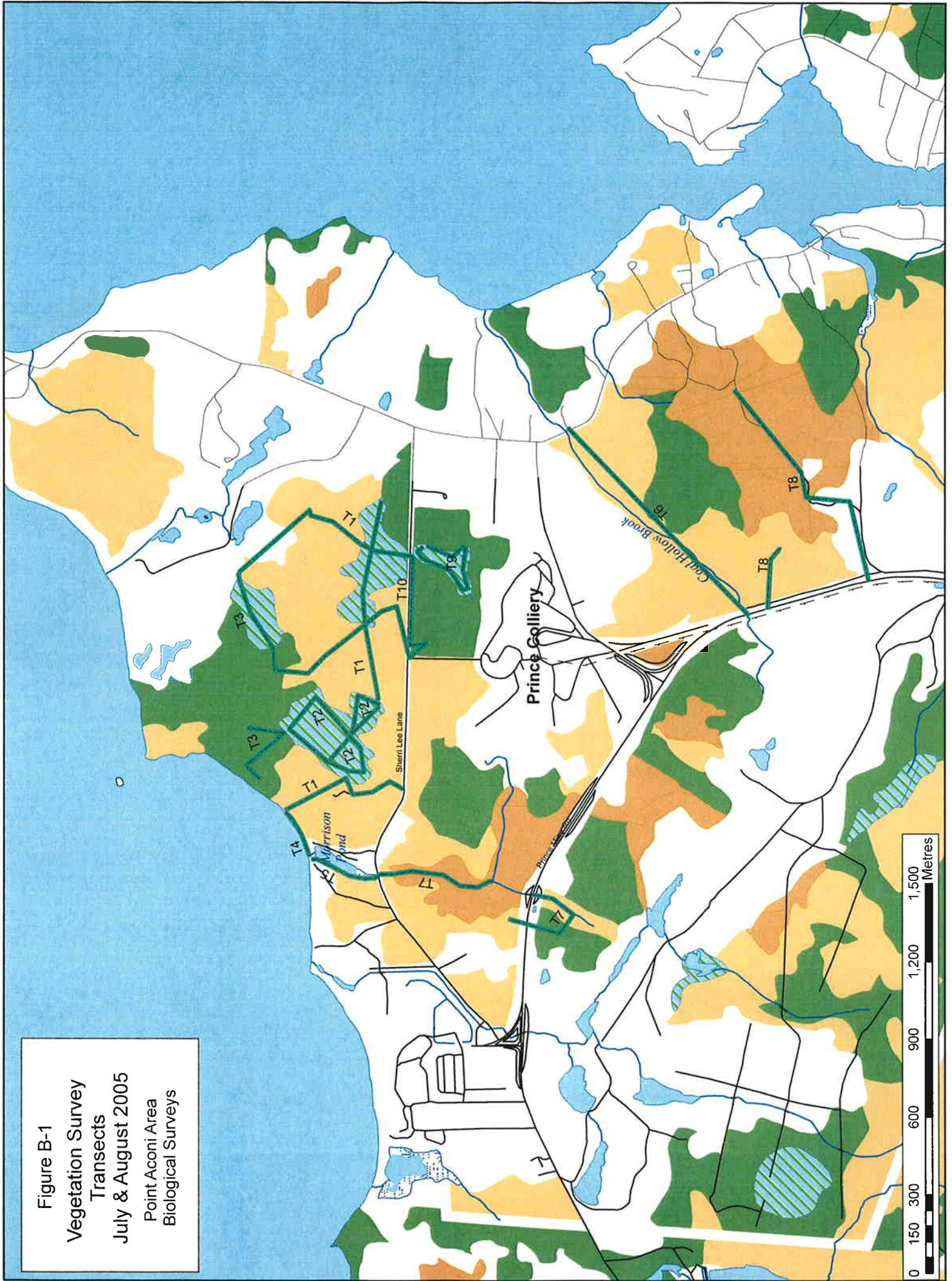
<i>Erigeron hyssopifolius</i>	Daisy Fleabane	G5						18.7Km +/-1	Rosbach, GB Smith, EC; Schofield, WB; Taylor, EC	Abundance: abundant. Pheno.: Flowering.	ACAD acc# 65462 col#	Habitat: cliff face by river; Freshwater Wetland. Drain.: poor.	H
<i>Arabis drummondii</i>	Drummond Rockcress	G5			S2S3			18.7Km +/-1		Abundance: rare. Pheno.: Fruiting.	ACAD, NSPM acc#	Habitat: dry cliff & talus; Unforested.	H
<i>Pyrola minor</i>	Lesser Wintergreen	G5			S2			18.7Km +/-1	Pick, DL; Hounsell, EC	Pheno.: Fruiting.	acc# 61614 col#	Habitat: mixed woods along trail; Forested.	H
<i>Carex atratiformis</i>	Black Sedge	G5			S2			18.7Km +/-1	Pick, DL; Hounsell, EC	Pheno.: Fruiting.	acc# 61637 col#	Freshwater Wetland. Drain.: poor.	S
<i>Dryopteris fragrans</i> var. <i>remotiuscula</i>	Fragrant Fern	G5T ?			S2			18.7Km +/-1	Schofield, WB; Taylor, EC	Pheno.: Fertile.	acc# 27361 col#	Habitat: dry cliff crevices; Unforested.	H
<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Lance-Leaf Grape-Fern	G5T 4			S2			18.7Km +/-1	Webster, DH;	Pheno.: Fertile.	acc# 39121 col#	Habitat: damp forest floor; Forested.	S
<i>Arabis hirsuta</i> var. <i>pycnocarpa</i>	Hairy Rock-Cress	G5T 5			S1S2			18.8Km +/-0.1	Erskine, JS		NSPM col#	Habitat: dry cliffs, cliff crevices, outcrops on rich hardwood	H
<i>Draba arabisans</i>	Rock Whitlow-Grass	G4			S2			18.8Km +/-0.1	Erskine, JS		NSPM col# 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.; Forwood, EC	Abundance: abundant.	UNB acc# 39084 col# 307.	Habitat: cobble beach, in <i>Zostera</i> wrack.	H
<i>Vaccinium caespitosum</i>	Dwarf Blueberry	G5			S2			18.8Km +/-0.1	Schofield, WB; Smith, EC; Webster, DH		NSPM col# 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 4T5			S1S2			18.8Km +/-0.1	Erskine, JS		NSPM col# 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 ?			S2			18.8Km +/-0.1	Smith, EC and party;		NSPM col#	Habitat: cliff shoulders, 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 Smith, EC;		NSPM col# 53.491. ACAD acc#	Habitat: spit; Coastal. Drain.: poor.	H
<i>Poa glauca</i>	White Bluegrass	G5			S2S3			18.8Km +/-0.1	Erskine, DS; Collins,	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.	H
<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

Species	Common Name	G5	S2S3	En da ng ere d	Sc 2+ Very High 50km grid	Distance	Collector	Abundance	ACAD acc#	Habitat	Other
<i>Erigeron hyssopifolius</i>	Daisy Fleabane	G5	S2S3			19.3Km +/-1	Simm, EC; Taylor, JC;	Abundance: abundant.	ACAD acc#	Habitat: rock crevices, Unforested.	H
<i>Sorex gaspensis</i>	Gaspá Shrew	G3	S2			19.4Km +/-1		Pheno.: Flowering.			H
<i>Vaccinium ovalifolium</i>	Oval-Leaf Huckleberry	G5	S1			19.6Km +/-10	Schofield, WB; Webster, DH;		ACAD acc# 39635 col# 13871.		H G
<i>Hieracium robinsonii</i>	Robinson's Hawkweed	G2	S2			19.6Km +/-5		Pheno.: fruiting.		Habitat: crevices in rock shelf. Soil: NS120526.	H G 2
<i>Charadrius melodus</i>	Piping Plover	G3	E S1B			19.6Km +/-50.1		Count: 2.		Habitat: A sloping sand beach fronting Atlantic. The rocky headlands of Port Caledonia border beach on east. Westerly, channel into Big Glace Bay Lake separates this beach from a smaller one within town of Glace Bay. The beach is situated in a.	H G 2 0 0 0 4 0 1 2
<i>Charadrius melodus</i>	Piping Plover	G3	E S1B			19.6Km +/-50.1	staff	Count: 2.		fronting Atlantic, overshadowed	H
<i>Limosella australis</i>	Mudwort	G4G5	S2S3			19.9Km +/-5					H 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)

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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)

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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? (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

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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)

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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)

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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)

Binomnial	Common Name	ACCDC/NSDNR Rank /Status
<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)

Binomnial	Common Name	ACCDC/NSDNR Rank /Status
<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

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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)

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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? (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

Binomial	Common Name	ACCDC/NSDNR Rank /Status
Agrostis perennans	Grass	Green/S4S5
Carex leptalea	Sedge	Green/S5

Morrison Pond Brook (Transects T7)

Binomial	Common Name	ACCDC/NSDNR Rank /Status
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)

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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

Binomial	Common Name	ACCDC/NSDNR Rank /Status
<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)

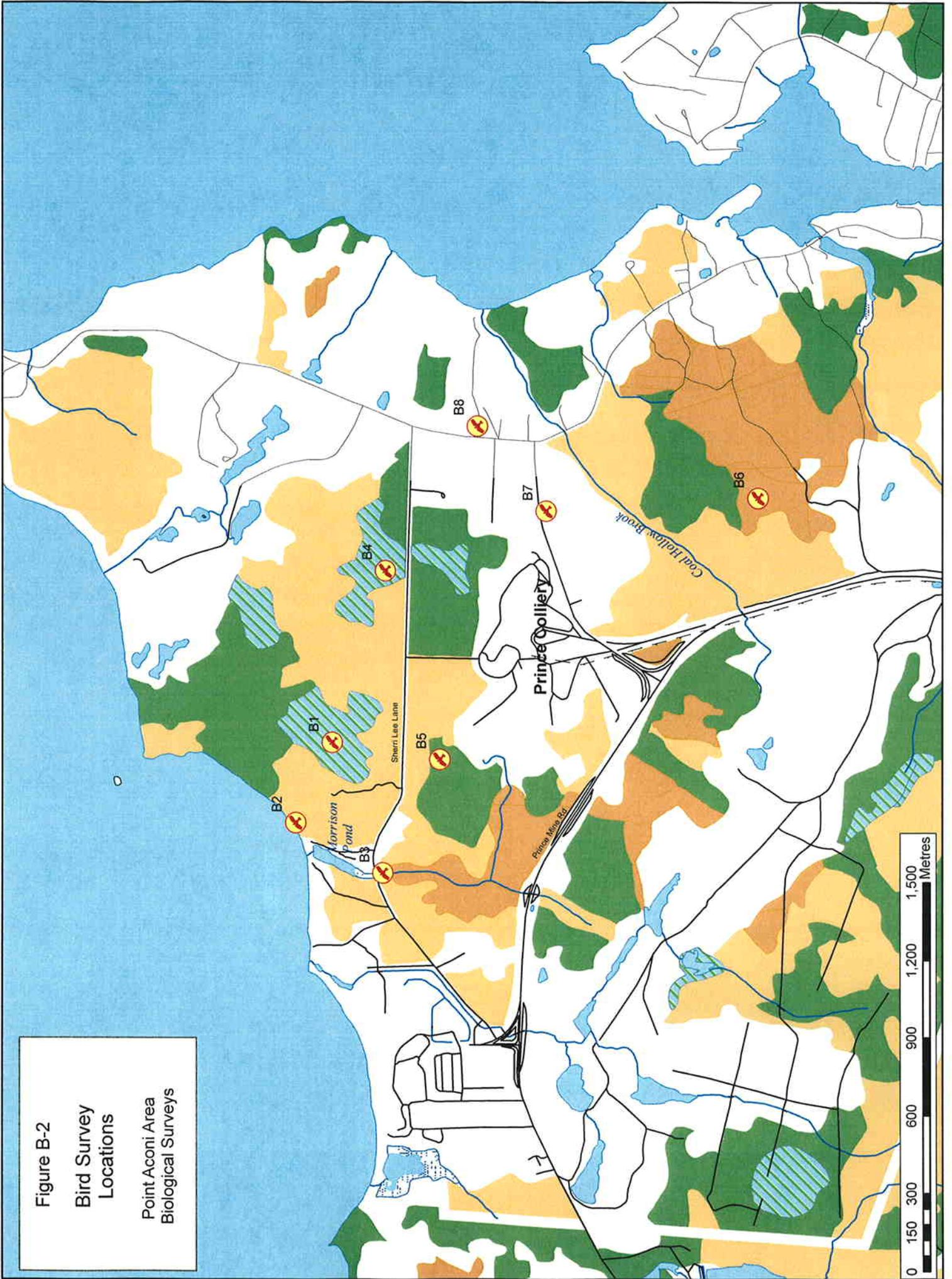
Surveyor: Fulton Lavender

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 ~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 ~8:00 am July 27; no background noise; 15-20 km South wind; 90% cloud cover ~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 ~6:40 am July 27; no background noise; light 15 km South wind; decreased overcast ~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 ~7:30 am July 27; no background noise; light 15 km South wind; 80% cloud cover ~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 ~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 ~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/ NSWA	At Risk Status	Bird	Species	Preferred Nesting Habitat (Erskine 1992)	Nesting Period (Tower 1980)	B1	B2	B3	B4	B5	B6	B7	B8	Total No. of Individuals
NSWA	No	European Starling	<i>Sturnus vulgaris</i>	Cavities in trees, structures.	Late Apr.-July							6	29	35
MBCA	No	Solitary Vireo (Blue-headed)	<i>Vireo solitarius</i>	Forest.	Late May-late July	2								2
MBCA	No	Red-eyed Vireo	<i>Vireo olivaceus</i>	Forest.	Early June- early Aug.		10							10
MBCA	No	Northern Parula Warbler	<i>Parula americana</i>	Bearded lichen in conifer.	Late May- early Aug.		3		2					5
MBCA	No	Yellow Warbler	<i>Dendroica petechia</i>	Edges and disturbed areas.	Late May-July	2			1	4		20		27
MBCA	No	Magnolia Warbler	<i>Dendroica magnolia</i>	Conifers.	Early June-late July		2							2
MBCA	No	Black-throated Green Warbler	<i>Dendroica virens</i>	Mixed or coniferous forest.	Early June-mid July			1						1
MBCA	No	American Redstart	<i>Setophaga ruticilla</i>	Small trees.	Late May-late July		2	2						4
MBCA	No	Common Yellowthroat	<i>Geothlypis trichas</i>	Brushy areas	Late May-late July				4			4	1	9
MBCA	No	Savannah Sparrow	<i>Passerculus sandwichensis</i>	Open vegetated areas, ground	mid May- 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, bogs, fields.	June-July		1							1
MBCA	No	Swamp Sparrow	<i>Melospiza georgiana</i>	Wetlands.	Late May-mid July						3			3
MBCA	No	White-throated Sparrow	<i>Zonotrichia albicollis</i>	Ground at forest edge.	Mid May-mid Aug.		7				2			9
MBCA	No	Dark-eyed Junco	<i>Junco hyemalis</i>	Forest edge.	Early May-late 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, buildings in open areas.	Late April- July								15	15
MBCA	No	Purple Finch	<i>Carpodacus purpureus</i>	Conifers.	Early June- mid Aug.						1	1		2

July 2005 Bird Survey
Birds Confirmed Breeding

MBCA/ NSWA	At Risk Status	Bird	Species	Preferred Nesting Habitat (Erskine 1992)	Nesting Period (Tower 1980)	B1	B2	B3	B4	B5	B6	B7	B8	Total No. of Individuals
MBCA	No	Pine Siskin	<i>Carduelis pinus</i>	Conifers.	Late Apr.- early Aug.		3					1		4
MBCA	No	American Goldfinch	<i>Carduelis tristis</i>	Open.	Late June-mid Sept.		4	4				10		18
SPECIES														
TOTAL						4	15	8	8	10	7	19	7	39

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

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

MBCA / NSWA	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



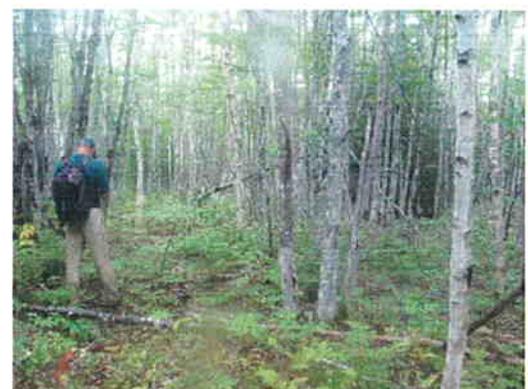
Morrison Pond Beach.JPG



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

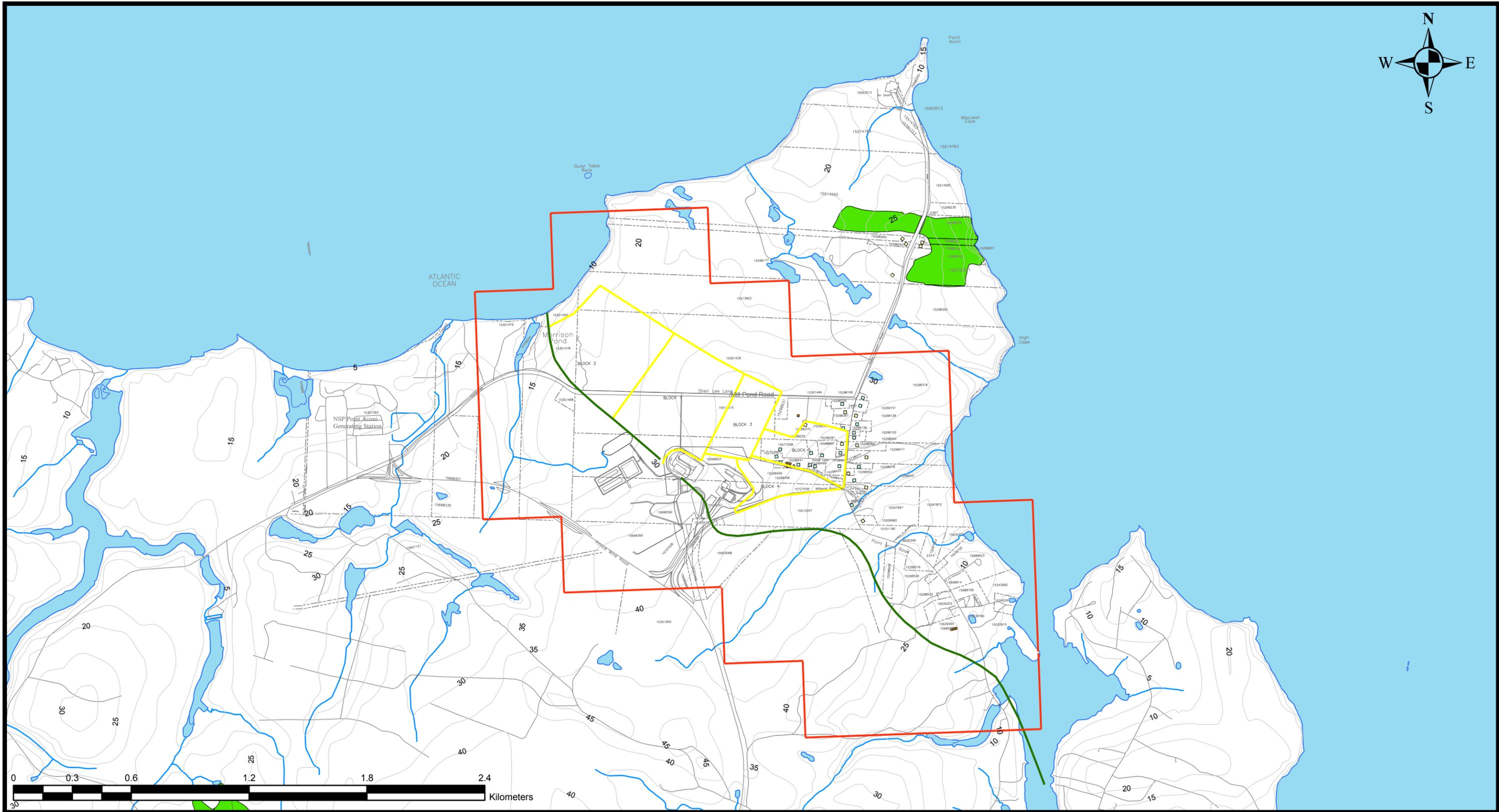
	Site Preparation					Operations and Maintenance						Reclamation				
	E&S Control	Clearing /Grubbing	Water Management	Roadway	Stockpiling	Mining Operations	Equipment	Waste Management	Wastewater Management	Transportation	Monitoring	Security	Backfilling Overburden	Contouring	Vegetation	Follow up
<i>Aquatic</i>																
Freshwater	+	-	+		-	-	-	-	+		+		-	-		+
Saltwater	+	-	+		-	-	-	-	+		+		-	-		+
Fisheries	+	-	+		-	-	-	-	+		+		-	-	+	+
Sensitive or Rare Species			+		-	-	-	-	+		+					+
<i>Terrestrial</i>																
Flora		-		-		-	-				+				+	+
Fauna		-		-		-	-								+	+
Wetlands	+	-		-	-	-	-				+		+	+	+	+
Sensitive or Rare Species																+
<i>Socio-economic</i>																
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

	Nature	Magnitude	Reversibility	Timing	Extent
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

Type of Activity:	Mine reclamation/coal extraction
Project purpose:	Mine reclamation/coal extraction
Activity description:	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
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Significance of Contribution to Regional Erosion Control/Flood Control: Low regional contribution to erosion control/flood control.

Score: Low	1
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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
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5.4 Project Benefits Component

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

Score: High	3
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Significance to Regional Development/ Employment: high

Score: High	3
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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
Overall Rating and Recommendation Component 1+2+3 (-4)		5

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/ 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	-

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, 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 ¹						Level of Significance ²					Expected Impact ³			Comment
	Y	L	P	N	U	C*	N	P	R	L	Ng	H	M	L	
Life Support															
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	
Social/Cultural															
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	
Production															
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	
TOTAL	6	1	19	36	0	1	0	1	1	33	0	0	0	33	

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 ¹						Level of Significance ²					Expected Impact ³			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	
TOTAL	6	-	-	13	-	1	-	-	3	3	-	0	2	4	

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 ¹						Level of Significance ²					Expected Impact ³			Comment
	Y	L	P	N	U	C*	N	P	R	L	Ng	H	M	L	
Life Support															
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	
Social/Cultural															
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	

Value	Presence ¹						Level of Significance ²					Expected Impact ³			Comment
	Y	L	P	N	U	C*	N	P	R	L	Ng	H	M	L	
Cultural Attribute	-	-	1	3	-	0	-	-	-	1	-	-	-	1	
Production															
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	
TOTAL	6	1	19	36	0	1	0	1	1	33	0	0	0	33	

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/ 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	-	-	-

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 ¹						Level of Significance ²					Expected Impact ³			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	
TOTAL	6	-	-	13	-	1	-	-	3	3	-	0	2	4	

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

Type of Activity:	Mine reclamation/coal extraction
Project purpose:	Mine reclamation/coal extraction
Activity description:	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
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Significance of Contribution to Regional Erosion Control/Flood Control: Low regional contribution to erosion control/flood control.

Score: Low	1
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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
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**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

Type of Activity:	Mine reclamation/coal extraction
Project purpose:	Mine reclamation/coal extraction
Activity description:	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
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Significance of Contribution to Regional Erosion Control/Flood Control: Low regional contribution to erosion control/flood control.

Score: Low	1
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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
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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
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**Significance to Regional Development/
Employment:** High.

Score: High	3
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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/ 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	-

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, 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 ¹						Level of Significance ²					Expected Impact ³			Comment
	Y	L	P	N	U	C*	N	P	R	L	Ng	H	M	L	
Life Support															
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	
Social/Cultural															
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	
Production															
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	
TOTAL	6	1	19	36	0	1	0	1	1	33	0	0	0	33	

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 ¹						Level of Significance ²					Expected Impact ³			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	
TOTAL	6	-	-	13	-	1	-	-	3	3	-	0	2	4	

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

Type of Activity:	Mine reclamation/coal extraction
Project purpose:	Mine reclamation/coal extraction
Activity description:	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
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Significance of Contribution to Regional Erosion Control/Flood Control: Low regional contribution to erosion control/flood control.

Score: Low	1
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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
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5.4 Project Benefits Component

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

Score: High	3
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Significance to Regional Development/Employment: high

Score: High	3
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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/ 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/ 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	-

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 ¹						Level of Significance ²					Expected Impact ³			Comment
	Y	L	P	N	U	C*	N	P	R	L	Ng	H	M	L	
Life Support															
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	
Social/Cultural															
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	
Production															
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	
TOTAL	6	1	19	36	0	1	0	1	1	33	0	0	0	33	

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 ¹						Level of Significance ²					Expected Impact ³			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	
TOTAL	6	-	-	13	-	1	-	-	3	3	-	0	2	4	

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.