

APPENDIX H
AMEC 2014 Moose Survey

Black Point Quarry Project
Guysborough County, NS
SLR Project No.: 210.05913.00000



**BLACK POINT
FALL 2014 MAINLAND MOOSE SURVEYS
SUMMARY REPORT**

Prepared for:

Morien Resources Corp. (Morien)
Metropolitan Place
Suite 1480, 99 Wyse Road
Dartmouth, Nova Scotia,
Canada, B3A 4S5

Submitted by:

AMEC Earth & Environmental
a Division of AMEC Americas Ltd.
50 Troop Ave., Unit 300
Dartmouth, NS B3B 1Z1

October 2014

Project No.: TV144003

TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION AND BACKGROUND	2
2.0 APPROACH AND METHODOLOGY	3
3.0 RESULTS AND DISCUSSION	5
3.1 MOOSE OBSERVATIONS	5
3.2 INCIDENTAL OBSERVATIONS.....	7
4.0 CONCLUSIONS AND RECOMMENDATIONS	9
5.0 REFERENCES	10

List of Figures

Figure 2.1	Previous Moose Sightings Within 5 km of Project Location	4
Figure 3.1	September 2014 Moose Survey Locations and Observations	6

APPENDIX A: Photos

1.0 INTRODUCTION AND BACKGROUND

Vulcan Materials Company and Morien Resources Corp. (the Proponent) proposes the development, operation, decommissioning and abandonment of a granite quarry and marine terminal at Black Point in Guysborough County, Nova Scotia. The Black Point Quarry Project consists of aggregate production (drilling, blasting, processing and stockpiling) on a 354.5 ha property, along with the construction and operation of a 200 m long marine terminal adjacent to the quarry in Chedabucto Bay. The aggregate will be loaded into bulk carriers up to 70,000 DWT and transported to ports along the US eastern and Gulf coasts and potentially to markets in Canada and the Caribbean.

The Black Point Quarry Project (the Project) is located on the south shore of Chedabucto Bay in the District of Guysborough, Nova Scotia. The proposed Project Site is approximately 2 km from the community of Half Island Cove in the west, and 2.5 km from Fox Island Main in the east. The Project is situated between Highway 16 and the Atlantic coast, in an area dominated by coniferous forests, coastal barrens, as well as various types of wetlands, including bog, fen, swamp and marsh. A power transmission line corridor runs along the south end of the property and with the exception of a few ATV trails, skidder tracks and property cut lines, the area is relatively undisturbed.

Following the discovery of moose sign (tracks and scat) during wetland surveys conducted by AMEC Environment & Infrastructure (AMEC) in August of 2014, discussions were initiated between Mr. Russell Dmytriw of SLR and NSDNR to design a survey plan for mainland moose (*Alces alces americana*). The purpose of the survey was to confirm presence of moose on the site and develop an understanding of the numbers and sex of moose present during the fall rutting season, including which areas and habitats they may be using. The survey is intended to supplement winter track surveys and spring pellet surveys that will be conducted in early 2015. This summary report presents the results of the fall survey for mainland moose conducted in late September 2014 by AMEC.

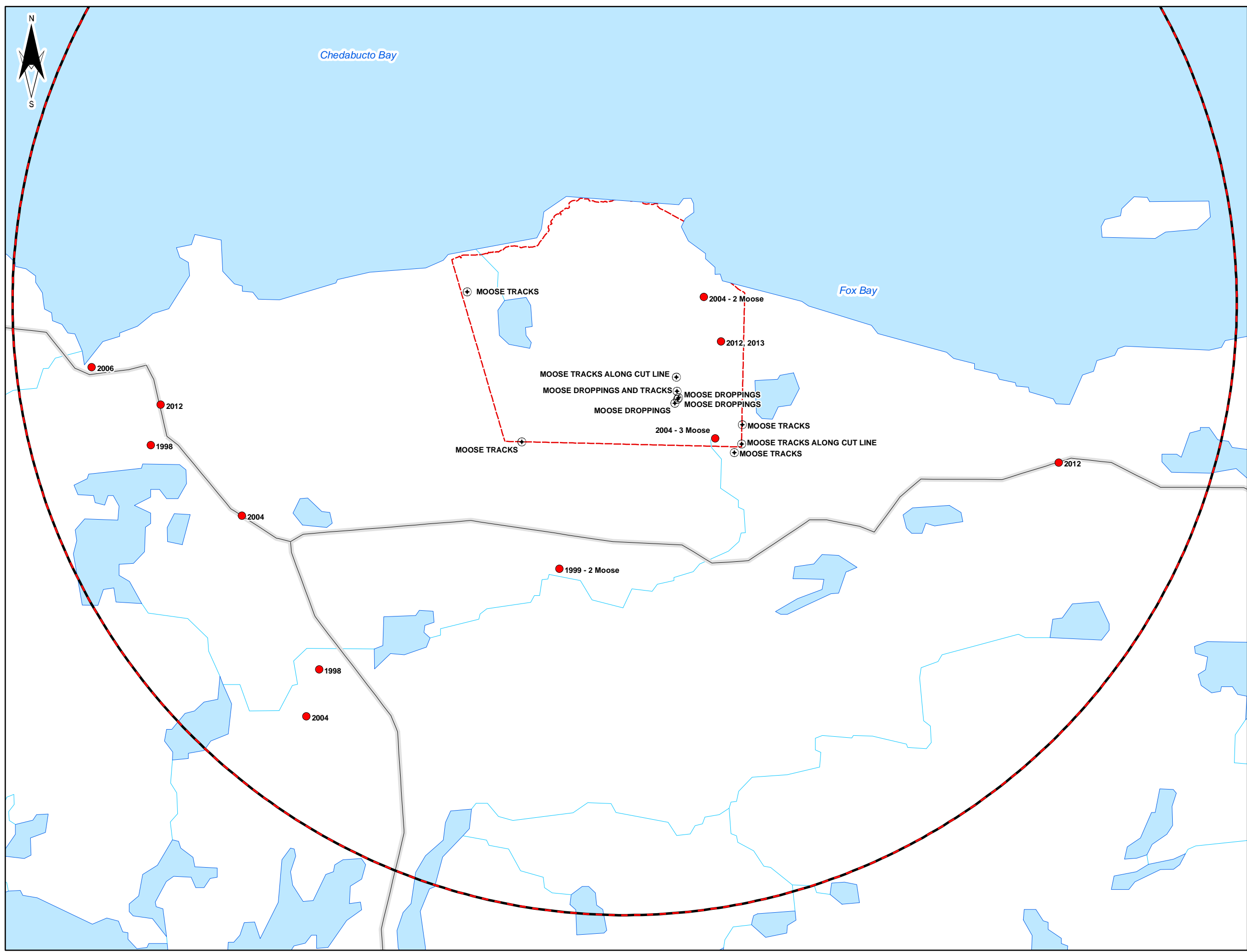
2.0 APPROACH AND METHODOLOGY

For the surveys, an AMEC field biologist familiar with the Project site was accompanied by an experienced moose hunter from the nearby Paq'tnkek First Nation, Mr. Kerry Prosper. Mr. Prosper is a member of the provincial Mainland Moose Recovery Team, who has hunted moose in Cape Breton Island since the mid-1990s and is very familiar with moose tracking and identification of moose sign. Prior to the survey, AMEC field staff reviewed the locations and nature of previous moose sightings reported by NSDNR as well as by AMEC during previous field surveys (August 2014) conducted on site (Figure 2.1 Previous Moose Sightings Within 5 km of Project Location Figure 2.1). The layout of the Project site and the locations of likely suitable habitat were reviewed by all field personnel at the start of the survey program. Survey effort was focussed in areas of high-potential moose habitat on the site, particularly Fogherty Lake and the large bogs near Fogherty Lake (WL11) and on the east side of the property (WL1 and WL14), as well as in likely corridors for moose travel, particularly along the power transmission line and over the barrens between Fogherty Lake and the bogs on the east side of the property.

Surveyors accessed the site from the southwest corner and walked along likely areas of moose corridors, such as the power transmission line along the south of the Project site, carefully looking for signs of moose presence including (but not limited to) tracks, scat, evidence of browsing, and game trails. In areas of suitable moose habitat, including bog edges and the shore of Fogherty Lake, moose calling interspersed with a period of silent observation was conducted over a period of 30 to 90 minutes. Scent markers intended to attract moose were deployed in three locations on the first morning of the survey. Calling stations and scent markers were established in areas where tracks would be evident (e.g. in muddy areas), so that if these sites are visited by moose after the surveyors leave, evidence of moose presence would be obvious upon returning to the location.

In addition to signs of moose, incidental sightings and evidence of other terrestrial fauna were noted, including birds and other mammal species. Efforts were made to detect migrating shorebird species that may utilize the bog and barrens habitats for feeding and staging during high tide; shoreline surveys for shorebirds were conducted in 2010 (AMEC 2014).

Path: \\h1\1s\project\50300_PROJECTS\2014\TV144003 - Black Point Quarry EA Support\CAD\Moose Survey\Figure 2.1 - Previous Moose Sightings Within 5 km of Project Location.mxd User: derrick.schulz Date: 10/8/2014



TITLE: **Figure 2.1
Previous Moose Sightings
Within 5 km of Project Location**

PROJECT: **BLACK POINT
FALL 2014 MAINLAND MOOSE SURVEYS**

CLIENT: **Morien Resources Corp. (Morien)
Metropolitan Place
Suite 1480, 99 Wyse Road
Dartmouth, Nova Scotia,
Canada, B3A 4S5**

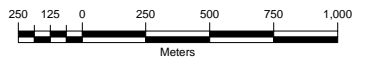
LOCATION: **Guysborough County
Nova Scotia**

DATE: **September 2014**

DATUM & PROJECTION: **NAD83 CSRS UTM Zone 20N**

AMEC PROJECT NO: **TV144003**

- LEGEND:
- Site Boundary
 - NSDNR Moose Sightings Within 5km of Project Location
 - ⊕ Moose Sightings (August 2014 AMEC)
 - 5 km Radius
 - Roads
 - ~ River / Stream
 - Waterbody



**AMEC Environment & Infrastructure
A Division of AMEC Americas Ltd.**

50 Troop Avenue, Unit 300
Dartmouth, N.S., B3B 1Z1
(P) 902-468-2848 (F) 902-468-1314



3.0 RESULTS AND DISCUSSION

Surveys were conducted during the early and late parts of the day, when moose are most active. On September 24th, surveys were conducted from sunrise to early afternoon, and from late afternoon until shortly after sunset. On September 25th, additional surveys were conducted in the morning to early afternoon, and the previous day's scent marker stations and calling points were examined for evidence of recent moose presence. Weather conditions were favourable on both days of the survey, with cool morning temperatures (approximately 10°C), no precipitation and calm to light breezes. Winds became fairly gusty in the later morning and early afternoon of September 24th; however, moose are less active at this time of day and as such survey effort was focussed on finding moose sign rather than on attempting to attract moose by calling and scent.

3.1 MOOSE OBSERVATIONS

A total of seven calling stations were established and three scent markers were deployed on the Project site (Figure 3.1); however, no moose were observed during the surveys, and no recent evidence of moose was noted when surveyors returned to the calling stations and scent markers. Evidence of past moose presence was noted in the Project site; tracks were observed at several locations, and there was some moose scat and possible scrapes (Figure 3.1). These observations are further discussed below.

Fogherty Lake and WL11

Two areas identified as possible moose scrapes were noted in the area between Fogherty Lake and WL11 (Appendix A, Photo 1); however, Mr. Prosper noted that a tree with rubbed bark would typically be seen in close proximity to a moose scrape, and no such trees were found near either of these locations. These possible scrapes were not recent, and no additional sign was noted in the area. Moose tracks were observed by AMEC northwest of Fogherty Lake in August 2014 (Figure 2.1), indicating that moose occasionally use this part of the Project site.

WL1 and WL14

Moose activity was evident in the bogs in the southeastern portion of the Project site. A trail made by moose was identified in WL1, running in a north-south direction and appearing to link WL1 and WL14 (Appendix A, Photo 2). Because the individual tracks could not be distinguished, the size and number of individuals using the trail could not be estimated; however, Mr. Prosper noted that the trail did not appear to be heavily used. Old moose scat (likely from the previous year) was observed in two locations near WL14 (Appendix A, Photo 3). Although the scat was fairly decomposed, one pile was identified by Mr. Prosper as being from a bull moose.

The majority of sightings of moose tracks and scat by AMEC field personnel in August 2014 were in this southeastern portion of the site (Figure 2.1). The scat observed in August was very recent, indicating that moose were present in the area in late summer.



Chedabucto Bay

Fox Bay



TITLE: **Figure 3.1
September 2014 Moose
Survey Locations and Observations**

PROJECT: **BLACK POINT
FALL 2014 MAINLAND MOOSE SURVEYS**

CLIENT: **Morien Resources Corp. (Morien)
Metropolitan Place
Suite 1480, 99 Wyse Road
Dartmouth, Nova Scotia,
Canada, B3A 4S5**

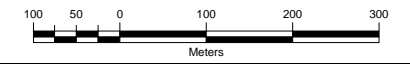
LOCATION: **Guysborough County
Nova Scotia**

DATE: **September 2014**

DATUM & PROJECTION: **NAD83 CSRS UTM Zone 20N**

AMEC PROJECT NO: **TV144003**

- LEGEND:
- Calling Station
 - Scent Marker
 - Old track (3-4 year old male)
 - Old track (adult male)
 - Recent track (3-4 year old male)
 - Possible scrape
 - Scat (old)
 - Moose Path
 - Survey Tracks
 - Site Boundary
 - Delineated Wetlands



**AMEC Environment & Infrastructure
A Division of AMEC Americas Ltd.**

50 Troop Avenue, Unit 300
Dartmouth, N.S., B3B 1Z1
(P) 902-468-2848 (F) 902-468-1314

Path: \\h11-1s1\projects\0300 PROJECTS\2014\TV144003 - Black Point Quarry EA Support\CAD\Moose Survey\Figure 3.1 - September 2014 Moose Survey.mxd User: derrick.schulz Date: 10/8/2014

Base Image: Nova Scotia Geomatics Centre; Orthoimagery from GeoNOVA, Dated 2007

Barrens

Moose tracks were observed in a few locations in muddy parts of the trail that runs in a north-south direction through the barrens in the centre of the Project site. This open area of barrens could serve as a corridor for moose to move between the areas of potential habitat to the west (Fogherty Lake and associated wetlands) and east (WL1 and WL14) of the Project site. However, the tracks that were seen on the trail were all made by animals travelling along the trail, not across it in an east-west direction (Figure 3.1), suggesting that moose may not be using the barrens as a direct route between these two wetland areas. At least two distinct sets of tracks were observed, one made by an adult bull (Appendix A, Photo 4) and one by a 3 or 4 year old male, but none of the tracks appeared to be recent.

Power Transmission Line

Moose tracks were observed in many locations along the transmission line corridor, all from young (3 to 4 year old) bulls heading in a westerly direction. There were at least two distinct tracks, one set relatively recent (from within a week prior to the survey; Appendix A, Photo 5) and the other set much older. No other evidence of moose presence was observed in this part of the Project site. Notably, no moose trails were observed leading from the transmission line corridor northwards to the wetland areas on the western edge of the Project site (west of Fogherty Lake), suggesting that these wetlands are not frequented by moose.

3.2 INCIDENTAL OBSERVATIONS

White-tailed deer (*Odocoileus virginianus*) tracks and scat were observed at several locations along the transmission line, and a deer was observed in an area of low shrubs near the southwest corner of the Project site. Coyote (*Canis latrans*) scat (old and recent) was observed in several locations. Black bear (*Ursus americanus*) and bobcat (*Lynx rufus*) tracks were also observed along the transmission line, and bear scat was observed in forested habitat near WL14. Snowshoe hare (*Lepus americanus*) scat was seen along the transmission line, and a partial carcass was seen near the southwest corner of the Project site. Raccoon (*Procyon lotor*) tracks were seen along the transmission line, and possible scat was seen on the barrens. Red squirrel (*Tamiasciurus hudsonicus*) was frequently heard throughout the Project site.

The following bird species were seen and/or heard in several locations and are considered to be widespread on the Project site: American Crow (*Corvus brachyrhynchos*), American Goldfinch (*Spinus tristis*), American Robin (*Turdus migratorius*), Black-capped Chickadee (*Poecile atricapillus*), Boreal Chickadee (*Poecile hudsonicus*), Dark-eyed Junco (*Junco hyemalis*), Golden-crowned Kinglet (*Regulus satrapa*), Red-eyed Vireo (*Vireo olivaceus*) and White-throated Sparrow (*Zonotrichia albicollis*). In forested habitat, Blue Jay (*Cyanocitta cristata*), Gray Jay (*Perisoreus canadensis*), Hermit Thrush (*Catharus guttatus*) and Red-breasted Nuthatch (*Sitta canadensis*) were frequently heard, and a flock of 22 Cedar Waxwings (*Bombycilla cedrorum*) was observed near WL1. Near wetlands, Common Yellowthroat (*Geothlypis trichas*) was fairly abundant and Palm Warbler (*Dendroica palmarum*) was observed on a couple of occasions.

Downy Woodpecker (*Picoides pubescens*), Song Sparrow (*Melospiza melodia*) and Swainson's Thrush (*Catharus ustulatus*) were each heard on a single occasion. Common Raven (*Corvus corax*) was occasionally seen flying over the site. An Osprey (*Pandion haliaetus*) was seen flying to the south of the Project area, and two Bald Eagles (*Haliaeetus leucocephalus*; likely a pair) were observed to the northwest of the Project area. An American Kestrel (*Falco sparverius*) was seen hunting over the barrens near the centre of the Project site.

Six Great Cormorants (*Phalacrocorax carbo*) and a single Herring Gull (*Larus argentatus*) flew over the site on September 24th. Fogherty Lake was scanned on several occasions over the two days of the survey, and no waterfowl or shorebirds were observed on or near the waters. The lake does not appear to provide suitable habitat for breeding shorebirds, as the bank vegetation consists of dense low shrubs that overhang the water, and there is no shallow water for wading along the edges. No shorebirds were observed feeding in the barrens and bog habitat, despite the presence of some suitable berries. Fogherty Lake has a very low pH and, based on the results of AMEC surveys conducted in 2010, it does not appear to support fish; therefore it is unlikely to provide nesting habitat for piscivorous species such as loons or kingfishers. Suitable vegetation for dabbling duck species is also absent in the lake.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the observations made during these preliminary surveys, as well as previous observations from NSDNR reports and previous AMEC field surveys, it is evident that moose are occasionally present in the Project area. Efforts to attract moose using auditory and scent attractants were unsuccessful, suggesting that moose may not be presently using the Project location. However, although the rutting season for moose in Nova Scotia is September to October, it is possible that due to the relatively warm temperatures in the days prior to the survey, the moose rutting season was not yet at its peak.

The preliminary survey work suggests that the Project site provides marginal moose habitat. There was very little young hardwood growth, which is a preferred food item for moose (NSDNR 2007), and no sign of browse was observed during the surveys. As well, the moderate ATV use that was evident along the power transmission line would likely discourage moose from the area. Mr. Prosper noted that there are areas of much more suitable habitat nearby (for example, from the higher portions of the site, large bogs could be seen to the south), therefore it is unlikely that moose would reside in the Project area. Most of the tracks seen on the Project site were from young (3 to 4 year old) male moose. Young bulls of this age tend to be driven away from prime habitats by territorial adult bulls.

Based on these preliminary results, it is recommended that winter track and pellet surveys be conducted in order to supplement the understanding of moose presence and abundance on the Project site in different times of year.

Additionally, Mr. Prosper noted that moose would be capable of crossing Chedabucto Bay; therefore, it may be possible that moose in the Project area are from the introduced Cape Breton population rather than the endangered native mainland population. There is evidence that the Cape Breton and mainland moose populations can be distinguished using genetic markers (Ball 2003; cited in NSDNR 2007). If feasible, it may be worthwhile to collect pellets from the Project site that may be used for genetic testing to better understand the knowledge and movement patterns of moose in this area.

5.0 REFERENCES

AMEC. 2014. Black Point Baseline Ecological Surveys Summary Report (2010 Surveys with Updates from 2014). Dated September 2014.

Ball, M. 2003. Genetic Analysis of the endangered Nova Scotia Moose Populations: Project Progress Report. Unpublished Report.

NSDNR: Nova Scotia Department of Natural Resources. 2007. Recovery Plan for Moose (*Alces alces Americana*) in Mainland Nova Scotia. Available online at: <http://novascotia.ca/natr/wildlife/biodiversity/pdf/recoveryplans/MainlandMooseRecoveryPlan.pdf>

**APPENDIX A
PHOTOS**



Photo 1: Possible old scrape



Photo 2: Moose trail between WL1 and WL14



Photo 3: Old moose droppings



Photo 4: Adult bull track



Photo 5: Young (3 to 4 year old) bull track