Faunal Analysis of the Proposed White's Point Quarry Site

Digby Neck, Digby County, Nova Scotia

prepared for

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by

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INTRODUCTION

This report assesses the use of the 155 ha "White's Point" property by terrestrial species of amphibians and reptiles, breeding birds, and mammals currently considered at risk in Nova Scotia.

SITE DESCRIPTION

This property is located on Digby Neck, Digby County, just north of the community of Little River on the west facing slope of the North Mountain. The western boundary of the property extends for 2.8 km along the Bay of Fundy shoreline (Figure 1). Until 2002, the property was almost entirely forested. Forests are heavily dominated by coniferous species: Balsam Fir, White, Red and Black Spruce. Deciduous species present include Red Maple, White Birch, Mountain Ash and Moose Maple. (For a botanical study of this site, see report by R. Newell.) Trees, particularly those along the coast, are stunted and wind sculpted. A significant proportion of the coniferous species (particularly White Spruce) are diseased, dead or dying. Many of the dead trees have fallen making the forest a dense tangle. In early 2002, a large section of forest along the property's east line was clear cut. On the 4 ha site at White's Cove, for which a quarrying permit has already been granted, trees were felled in 2002 but had not been removed at the time of this study.

The entire coastline of the property is basaltic rock. To the south of White's Point are areas with small (< 10 m) coastal cliffs, rock outcrops and large boulders. In this area there are small coastal barrens dominated by prostrate junipers. North of White's Point the shoreline is more gentle. Immediately east of the cove north of White's Point is a small (1.5 ha) freshwater wetland.

Four very small, and presumably seasonal, streams flow from or across the property into the Bay of Fundy. In the southeast corner of the property, there are a very small cattail marsh and several seasonal "sky ponds".

The forests on this property, and the habitats they provide, appear to be typical of the area and of the coastal forests of the North Mountain Basalt Ridge Natural Landscape. The same can be said of the coastal barrens. However, the small wetland north of White's Cove constitutes an uncommon habitat within this Natural Landscape.

Figure 1. The White's Point Quarry property (2001 aerial photo).

METHODS

The White's Point property was visited by the author on four occasions between 4 June 2002 and 23 June 2002. While information was gathered on all taxa of interest during each visit, the primary focus varied among visits.

4 June 2002 - (9:15 a.m. to 5:00 p.m.; sunny, very light breeze, temperature ~18°C) - The author, accompanied in the morning by David Kern, conducted a reconnaissance of the entire coastline of the property and selected woodland areas. All coastal cliffs and rock outcrops were inspected, habitats were noted and information was gathered on herptile, bird and mammal species present. Mammals were identified mainly by sign (tracks, scat, browse).

15 June 2002 - (10:30 a.m. to 12:30 p.m.; overcast, light winds, temperature ~20°C) - A second brief reconnaissance of parts of the property was conducted by the author and Mr. Bernard Forsythe, a very experienced amateur ornithologist and naturalist.

22 June 2002 - (7:30 p.m. to 10:30 p.m.; clear, calm, temperature ~18°C) - The main focus of this visit was to conduct a census of nocturnal birds as well as mammals and amphibians. The author was again accompanied by Mr. Bernard Forsythe. The surveyors walked to the north side of the cove north of White's Cove and returned via the coastal ATV trail and the road to White's Cove. During the return trip, in an attempt to identify any owl species using the area, calls of Great Horned Owls, Barred Owls, Long-eared Owls and Northern Saw-whet Owls were made periodically in the hope of getting a response should any of these species be present.

23 June 2002 - (5:15 a.m. to 11:08 a.m.; clear, winds calm to light, temperature ~15°C.) - The main focus of this visit was to conduct a census of breeding birds using the property. Again the author was accompanied by Mr. Bernard Forsythe. The surveyors traversed various habitats on the property identifying and recording bird species and numbers. Birds were identified primarily by their songs and calls. The survey was conducted in the early morning hours when the frequency of bird song is the greatest.

In this report "species at risk" refers to any amphibian, reptile, breeding bird and mammal species that is designated as colour rank red (at risk) or yellow (sensitive to human activities) by the Province of Nova Scotia or those that are ranked as being "extremely rare" (S1), "rare" (S2) or "uncommon" (S3) in the Province of Nova Scotia by the Atlantic Canada Conservation Data Centre (ACCDC) and those species that occur in Nova Scotia that have been designated as "endangered", "threatened", or of "special concern" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The definitions of the various rankings of these three systems

are presented in another section of this report (see **Amphibian, Reptile, Breeding Bird and Mammal Species At Risk in Nova Scotia**).

An assessment of the possible use of this area by species at risk was based on the census work conducted on the property, the availability of suitable habitat for these species, and their known ranges as determined from personal knowledge, the literature, the Atlantic Canada Conservation Data Centre database, and communications with knowledgeable individuals. Lists of the amphibians and reptiles, breeding birds, and mammals currently considered at risk in Nova Scotia and assessments of their actual or potential occurrence at this site are presented.

The common names of plants and animals are used in this report. The common and scientific names are listed alphabetically in Appendix 1.

SPECIES OF FAUNA RECORDED DURING SITE VISITS (June 2002)

Amphibians and Reptiles

No amphibian or reptile species at risk was recorded during our site visits.

The four amphibian species and two reptilian species recorded during the site visits are listed in Table 1.

A few Northern Spring Peepers were heard at several locations on the property. Several Green Frogs were heard in the small pond containing Common Cattails in the southeast corner of the property. Polliwogs and tadpoles, believed to be Eastern American Toads and Northern Spring Peepers, were observed in several of the small transient ponds in this area. An adult Eastern American Toad was also seen in this area.

A large Eastern Smooth Green Snake was observed sunning itself on the roadway at White's Cove. A large Maritime Garter Snake was observed in the wetland area adjacent to the cove north of White's Point. Pickerel Frogs were also seen in this wetland area.

Table 1. Amphibians and Reptiles

	How Recorded	
Species	Seen	Heard
Eastern American Toad	1	
Northern Spring Peeper		several
Green Frog		several
Pickerel Frog	2	
Maritime Garter Snake	1	
Eastern Smooth Green Snake	1	

Breeding Birds

One bird species at risk, the Boreal Chickadee, was found using the property. An immature Common Loon, another species at risk, was observed feeding in the coastal marine waters adjacent to the property.

The route taken during the 23 June 2002 bird survey is mapped in Figure 2. The route was divided into five sections: one (A) through an area that had been clear cut this year; one (C) along the coastline from White's Cove to near the northern extremity of the property; and three (B, D and E) through woodland areas. The three woodland sections are not markedly different although much of section D is closer to the coast than the other two and the trees are smaller and more stunted. Except for section D and part of section E, existing roadways and ATV trails were followed while conducting this survey. (For the coordinates associated with these sections, see Appendix 2.)

The nocturnal survey conducted on the evening of 22 June 2002 followed a course starting at a point on section C defined by the southern extremity of section D (see Figure 2) and proceeded in a southerly direction along sections C, B and A.

Table 2 presents the information collected on bird species and their distribution on the property (also see Figure 2). The data in Table 2 was primarily obtained from the 23 June 2002 breeding bird survey. When a species was observed only, or in greater numbers, on another visit, these data are also included in Table 2 and the inclusions noted.

A total of 47 bird species was recorded during our four visits to the property. Several are marine species and do not nest on the property. These species are colonial and nest mainly on islands and/or cliffs. They include Great Black-backed Gull, Herring Gull, Double Crested Cormorant, Northern Gannet and Common Eider. No nesting birds were found during our 4 June 2002 search of the small cliffs and rock outcrops on the property, presumably because the habitat available is inadequate. The one Common Loon and all the Northern Gannets seen in the coastal waters were immature plumaged (non-breeding) birds. (The closest active Northern Gannet colonies are in the Gulf of St. Lawrence.) Two small flocks of Common Eiders consisted mainly of males (probably post breeding) with a few females (probably either non-breeding or whose nesting attempts had failed). The single male Black Scoter observed in White's Cove is a rare summer visitor to this area, far from its breeding grounds in subarctic and arctic regions.

Two additional species were observed flying over the property but showed no particular affinity to it. An Osprey was seen flying over the property on our 4 June 2002 visit but was not observed on any subsequent visits. No Osprey nest was

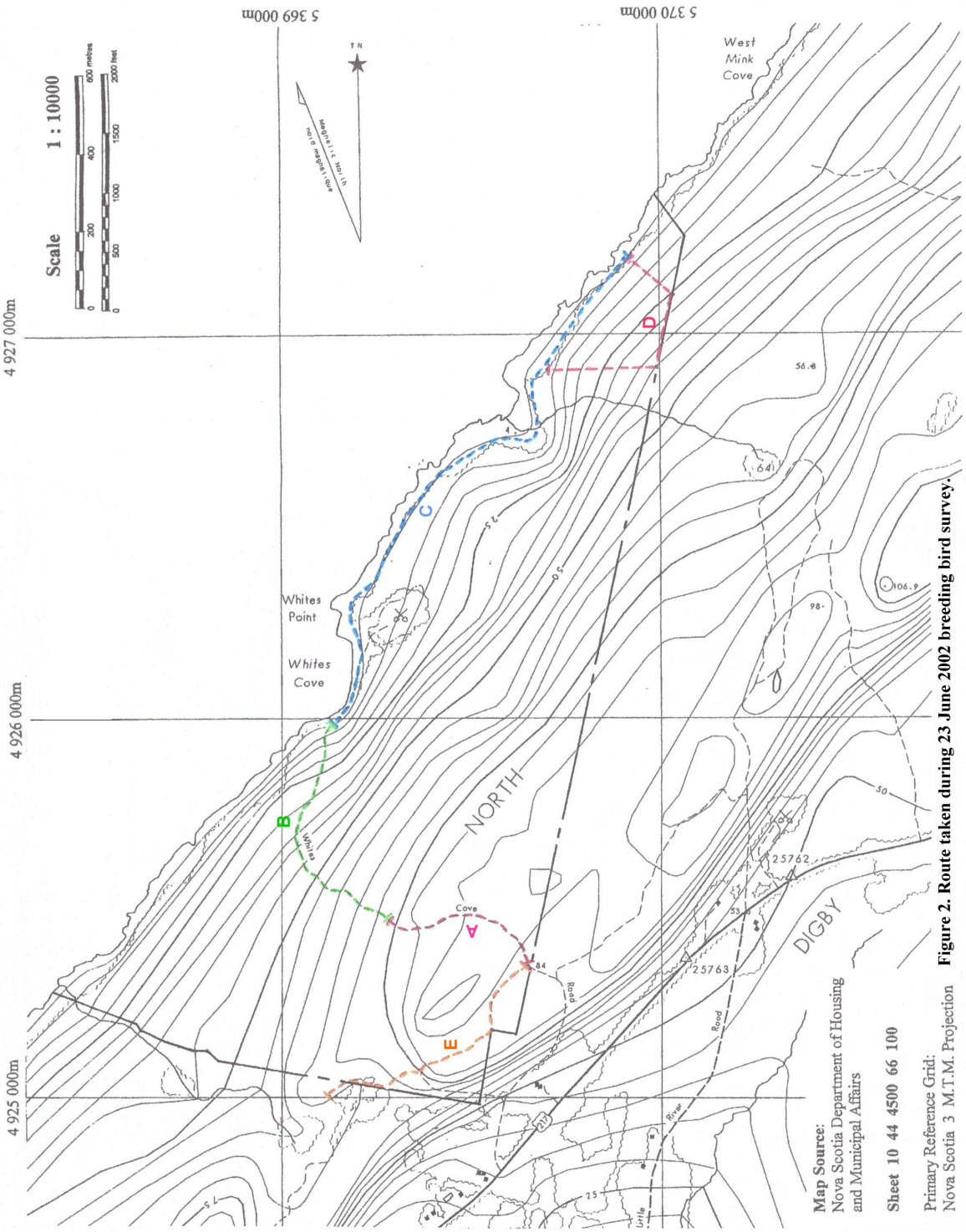

Figure 2. Route taken during 23 June 2002 breeding bird survey.

Table 2. White's Point Breeding Bird Survey – 23 June 2002

	Section					
Species	**A**	**B**	**C**	**D**	**E**	**Total**
Common Loon			1 Φ			1
Northern Gannet			15 Φ			15
Double-crested Cormorant			3			3
Common Eider			28			28
Black Scoter			1 **			1
Osprey		1 *				1
Broad-winged Hawk					3	3
Red-tailed Hawk			2 *			2
American Kestrel					1 **	1
Spotted Sandpiper			2			2
American Woodcock		2 ***				2
Herring Gull			15			15
Great Black-backed Gull			18	9		27
Barred Owl			2 ***			2
Ruby-throated Hummingbird					1	1
Northern Flicker		1		1	4	6
Yellow-bellied Flycatcher			1	1		2
Alder Flycatcher			3			3
Blue-headed Vireo		2				2
Red-eyed Vireo		1	1		1	3
American Crow	1		7	1	4	13
Common Raven		1	1	2		4
Black-capped Chickadee		1		1	1	3
Boreal Chickadee		2				2
Brown Creeper		1				1
Winter Wren	2	2			2	6
Golden-crowned Kinglet		2	1	2	2	7
Swainson's Thrush	7	8	12	8	3	38
Hermit Thrush		1				1
American Robin	4	4	1		1	10
Cedar Waxwing					4	4
Nashville Warbler				1		1
Northern Parula					1	1
Magnolia Warbler	2	3	7	7	4	23
Yellow-rumped Warbler	1	2	6	6	4	19
Black-and-white Warbler	1	2	2	3	1	9
Black-throated Green Warbler	2	9	7	2	4	24
Ovenbird		1	2	2		5
Common Yellowthroat			2	1		3
American Redstart		1	3		2	6
Savannah Sparrow			3			3
Song Sparrow			10	3		13
Swamp Sparrow			3			3
White-throated Sparrow	8	4	8	6	11	37
Dark-eyed Junco	10	7	12	1	3	33
Purple Finch			2		1	3
American Goldfinch					1	1
TOTAL	**38**	**58**	**181**	**57**	**59**	**393**

Φ immature
** recorded on 15 June 2002
* recorded on 4 June 2002
*** recorded on 22 June 2002 nocturnal survey

documented on the property. Three Broad-winged Hawks (two adult and one immature) were observed during the breeding bird survey; however, these birds were soaring together using the air currents along the ridge on the east boundary of the property and soon passed over the property following a northerly course.

Therefore, of the 47 bird species observed, it appears that 38 were using terrestrial habitats on the property and may have nested there in 2002.

The most frequently recorded species of breeding birds were Swainson's Thrush; Magnolia, Yellow-rumped and Black-throated Green Warbler; White-throated Sparrow and Dark-eyed Junco. These species include those whose habitat preferences include closed coniferous (or mixed) forests (Swainson's Thrush, Yellow-rumped Warbler, Black-throated Green Warbler); those that prefer younger more open forests (Magnolia Warbler) and those that prefer edges or forest openings (White-throated Sparrow, Dark-eyed Junco).

White-throated Sparrows, Dark-eyed Juncos and Winter Wrens had established territories within the clear cut area (Section A). Although other species were recorded in this section, their songs were heard coming from woodlands beyond the clear cut.

The three Swamp Sparrows recorded on the coastal section (C) were all found in the wetland adjacent to the cove north of White's Point. The only pair of Spotted Sandpipers seen on the property (and they were seen at the same location on three visits) were on the coastal "barrens" adjacent to the wetland. The three Savannah Sparrows were all recorded in the coastal "barrens" adjacent to this cove. Dark-eyed Juncos, Song Sparrows and White-throated Sparrows were common in this section and associated with the forest edge. Most other songbird species recorded in this section were heard singing in the woodlands adjacent to the coast.

Of the three species of raptorial birds that used the site it was the pair of Barred Owls that demonstrated the greatest territoriality. These birds, which were in the woodland immediately east of White's Cove, responded to our Barred Owl calls and continued their calling for at least twenty minutes. A "pair" of Red-tailed Hawks, consisting of one adult and one immature plumaged bird, was observed twice on 4 June at White's Cove: once in the early morning and again in the late afternoon. These birds were not seen on the property during the 23 June survey; however, after completing the survey a similar adult-immature "pair" was observed adjacent to the property along Highway 217. The third raptor species seen using the property, the American Kestrel, was observed only once (15 June).

Mammals

No mammal species at risk was observed during our site visits.

Table 3 lists the ten mammal species whose presence on the site was confirmed either by observation or by sign (tracks, scats, browse).

Two marine mammal species, the Harbour Seal and the Harbour Porpoise, were observed in the coastal waters adjacent to the property. An abundance of sign suggested reasonable populations of Varying Hare, Coyote, Raccoon, Striped Skunk and White-tailed Deer on the property. American Red Squirrel and American Porcupine were also present. A single Mink was observed on the shoreline of the cove north of White's Point.

Table 3. Mammals and Mammal Sign Observed

Species	How Detected: Seen	How Detected: Sign
Varying Hare		√
American Red Squirrel	2	√
American Porcupine	2	√
Coyote		√
Raccoon		√
Mink	1	
Striped Skunk		√
Harbour Seal	3	
White-tailed Deer		√
Harbour Porpoise	2+	

ASSESSMENT OF OCCURRENCE AND USE OF THE WHITE'S POINT PROPERTY BY FAUNAL SPECIES AT RISK IN NOVA SCOTIA

Derivation of Species at Risk Lists

As indicated above, I have derived species at risk lists for amphibians, reptiles, breeding birds and mammals from three sources: the General Status of Wild Species in Nova Scotia as defined by the Province of Nova Scotia, the Nova Scotia (sub-national) rankings defined by the Atlantic Canada Conservation Data Centre (ACCDC), and the Canadian rankings as defined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

I have considered all species designated by the Province of Nova Scotia as colour ranks Red and Yellow as "species at risk". The definitions of the Province of Nova Scotia colour rankings are as follows:

"**BLUE** (Extirpated/Extinct) – Species that are no longer thought to be present in the province or in Canada, or that are believed to be extinct. Extirpated species have been eliminated from a given geographic area but may occur in other areas. Extinct species are extirpated worldwide (i.e. they no longer exist anywhere). Species listed by COSEWIC as extinct or nationally extirpated automatically receive an Extirpated/Extinct general status rank. This rank applies at the national level and in whichever province or territory the species formerly existed. Nationally Extirpated/Extinct species are not considered part of Nova Scotia's species richness.

RED (At Risk or Maybe at Risk) – Species for which a formal detailed risk assessment has been completed (COSEWIC assessment or a provincial equivalent) and that have been determined to be at risk of extirpation or extinction and are therefore candidates for interim conservation action and detailed risk assessment by COSEWIC or the Province.

YELLOW (Sensitive) – Species that are not believed to be at risk of immediate extirpation or extinction, but which may require special attention or protection to prevent them from becoming at risk.

GREEN (Secure) – Species that are not believed to be at risk, or sensitive. This category includes some species that have declined in numbers but remain relatively widespread or abundant.

UNDETERMINED – Species for which insufficient data, information, or knowledge is available to reliably evaluate their status."
(http://www.gov.ns.ca/natr/wildlife/genstatus/background.htm)

For further information on the Province of Nova Scotia status assessment process, see the above Government of Nova Scotia web site.

I have also considered all species designated by the Atlantic Canada Conservation Data Centre as sub-national (S) ranks S1, S2, S3 for the Province of Nova Scotia as "species at risk". The sub-national rank definitions used by ACCDC are as follows:

"**S1** – Extremely rare throughout its range in the province (typically 5 or fewer occurrences or very few remaining individuals). May be especially vulnerable to extirpation.

S2 – Rare throughout its range in the province (6 to 20 occurrences or few remaining individuals). May be vulnerable to extirpation due to rarity or other factors.

S3 – Uncommon throughout its range in the province, or found only in a restricted range, even if abundant in some locations. (21 to 100 occurrences).

S4 – Usually widespread, fairly common throughout its range in the province, and apparently secure with many occurrences, but the Element is of long-term concern (e.g. watch list). (100+ occurrences).

S5 – Demonstrably widespread, abundant, and secure throughout its range in the province, and essentially ineradicable under present conditions.

S#S# - Numeric range rank: A range between two consecutive numeric ranks. Denotes uncertainty about the exact rarity of the Element (e.g., S1S2).
SH - Historical: Element occurred historically throughout its range in the province (with expectation that it may be rediscovered), perhaps having not been verified in the past 20 - 70 years (depending on the species), and suspected to be still extant.

SU – Unrankable: Possibly in peril throughout its range in the province, but status uncertain; need more information."

Qualifiers for these ranks include:

"**B** – Breeding: Basic rank refers to the breeding population of the element in the province.

? – Inexact or uncertain: for numeric ranks, denotes inexactness, e.g. SE? denotes uncertainty of exotic status. (The ? qualifies the character immediately preceding it in the S rank)." (http://www.accdc.com/products/lists/ranks).

In addition, the ACCDC provides both national (N ranks) and global (G ranks) for those species. The N and G rank definitions are similar to the S ranks but applied at a national or global level. For more information on the ACCDC ranking system, see the above web site.

I have also considered those species which occur in Nova Scotia that have been designated by COSEWIC as being endangered (E), threatened (T) or of special concern (SC). The definitions for the designations used by COSEWIC are as follows:

Extinct (X)	A species that no longer exists.
Extirpated (XT)	A species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A species facing imminent extirpation or extinction.
Threatened (T)	A species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)	A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
Not at Risk (NAR)	A species that has been evaluated and found to be not at risk.
Data Deficient (DD)	A species for which there is insufficient scientific information to support status designation.

(http://www.cosewic.gc.ca/eng/sct0/index_e.cfm)

COSEWIC's mandate is at the national level so its rankings may vary from the other two sources that take a provincial viewpoint. Further information can be obtained regarding COSEWIC at the above web site.

The following lists include the common name of each species at risk, their status rankings by the Province of Nova Scotia, the ACCDC and COSEWIC, and an assessment of their possible occurrence at or immediately adjacent to the quarry property. Assessments of the occurrence of each species is based on our survey work, the known distribution of the species and its habitat preferences.

Amphibians and Reptiles

	Status			
	Prov. of N.S.	ACCDC	COSEWIC	
Amphibian Species	Colour Ranking	N.S. S Ranking	Canadian Ranking	Possible Occurrence At or Adjacent to Sites
Four-toed Salamander	yellow	S3	NAR	unlikely

The only amphibian species at risk in Nova Scotia is the Four-toed Salamander (yellow, S3). The very small streams and ponds on the property do not have the sphagnum borders required by this species for breeding. The Nova Scotia Herpetofaunal Atlas database indicates that no observations of this species have been reported in Digby, Annapolis or Yarmouth Counties. I therefore think it highly unlikely that this species occurs on this property.

	Status			
	Prov. of N.S.	ACCDC	COSEWIC	
Reptile Species	Colour Ranking	N.S. S Ranking	Canadian Ranking	Possible Occurrence At or Adjacent to Sites
Blanding's Turtle	red	S1	T	highly unlikely
Wood Turtle	yellow	S3	SC	unlikely
Northern Ribbon Snake	yellow	S2S3	T	highly unlikely

Two of the reptile species at risk, Blanding's Turtle (red, S1T) and the Northern Ribbon Snake (yellow, S2S3, T), are relic disjunct populations confined to southwestern Nova Scotia. The third species, the Wood Turtle (yellow, S3, SC), is widely dispersed with most records coming from the central and northeast mainland and southwestern Cape Breton. Wood Turtles have not been recorded in Digby County. Furthermore the very small and rapidly flowing small streams on the property would not provide adequate habitat for this species.

I therefore believe that it is highly unlikely that any amphibian or reptile species at risk in Nova Scotia would occur on this property.

Breeding Birds

	Status			
	Prov. of N.S.	ACCDC	COSEWIC	
Breeding Bird Species	**Colour Ranking**	**N.S. S Ranking**	**Canadian Ranking**	**Possible Occurrence At or Adjacent to Site**
Peregrine Falcon	red	S1B	T	highly unlikely
Piping Plover	red	S1B	E	n/a
Roseate Tern	red	S1B	E	n/a
Common Loon	yellow	S4B	NAR	highly unlikely
Black-crowned Night Heron	yellow	S1B	-	highly unlikely
Northern Goshawk	yellow	S3B	NAR	unlikely
Common Tern	yellow	S3B	NAR	n/a
Arctic Tern	yellow	S3B	-	n/a
Razorbill	yellow	S1B	-	n/a
Atlantic Puffin	yellow	S1B	-	n/a
Long-eared Owl	yellow	S1S2B	-	unlikely
Short-eared Owl	yellow	S1S2B	SC	highly unlikely
Purple Martin	yellow	S1S2B	-	highly unlikely
Eastern Bluebird	yellow	S2S3B	NAR	highly unlikely
Bicknell's Thrush	yellow	S1S2B	SC	highly unlikely
Vesper Sparrow	yellow	S2S3B	-	highly unlikely
"Ipswich" Savannah Sparrow	yellow	S1S2B	SC	highly unlikely
Nelson's Sharp-tailed Sparrow	yellow	S2S3B	NAR	possible
Bobolink	yellow	S3B	-	highly unlikely
Eastern Meadowlark	yellow	S1S2B	-	highly unlikely
Least Bittern	green	S1B	T	highly unlikely
Northern Pintail	green	S2B	-	highly unlikely
Northern Shoveler	green	S2B	-	highly unlikely
Gadwall	green	S2B	-	highly unlikely
Common Goldeneye	green	S2B	-	highly unlikely
Red-breasted Merganser	green	S2S3B	-	highly unlikely
Cooper's Hawk	green	S1?B	NAR	highly unlikely
Merlin	green	S3S4B	-	unlikely

continued on next page

	Status			
	Prov. of N.S.	ACCDC	COSEWIC	
Breeding Bird Species (*cont.*)	**Colour Ranking**	**N.S. S Ranking**	**Canadian Ranking**	**Possible Occurrence At or Adjacent to Site**
Virginia Rail	green	S2B	-	highly unlikely
Common Moorhen	green	S1B	-	highly unlikely
American Coot	green	S2B	-	highly unlikely
Semipalmated Plover	green	S2B	-	highly unlikely
Greater Yellowlegs	green	S2B	-	highly unlikely
Solitary Sandpiper	green	S1B	-	highly unlikely
Upland Sandpiper	green	S1B	-	highly unlikely
Least Sandpiper	green	S1B	-	highly unlikely
Wilson's Phalarope	green	S1B	-	highly unlikely
Black-legged Kittiwake	green	S2B	-	n/a
Black Tern	green	S1B	NAR	highly unlikely
Black-billed Cuckoo	green	S3B	-	highly unlikely
Boreal Owl	green	S1?B	-	highly unlikely
Whip-poor-will	green	S2B	-	highly unlikely
Willow Flycatcher	green	S1B	-	highly unlikely
Eastern Phoebe	green	S2S3B	-	highly unlikely
Great Crested Flycatcher	green	S2S3B	-	highly unlikely
Horned Lark	green	S2B	-	highly unlikely
Boreal Chickadee	green	S3S4B	-	observed
Marsh Wren	green	S2B	-	highly unlikely
Wood Thrush	green	S2B	-	unlikely
Northern Mockingbird	green	S3B	-	highly unlikely
Brown Thrasher	green	S1S2B	-	highly unlikely
Loggerhead Shrike	accidental	SHB	E	highly unlikely
Warbling Vireo	green	S2B	-	highly unlikely
Philadelphia Vireo	green	S2B	-	highly unlikely
Scarlet Tanager	green	S3B	-	highly unlikely
Northern Cardinal	green	S3B	-	highly unlikely
Indigo Bunting	green	S2S3B	-	highly unlikely
Rusty Blackbird	green	S3S4B	-	possible
Baltimore Oriole	green	S3B	-	highly unlikely

The only bird species at risk observed using terrestrial habitats on the proposed quarry property was the Boreal Chickadee. This species is not designated as being at risk by the Province of Novas Scotia (colour ranking green); however, the ACCDC ranking for this species is S3S4. The global ranking for this species is "secure" (G5) as is the Canadian national ranking (N5). Nova Scotia is the only province where this species is considered potentially at risk.

As the name implies, the Boreal Chickadee is a bird of the coniferous, particularly spruce, forests across Canada (Erskine, 1992). The Newfoundland and Nova Scotia populations exhibit some genetic differentiation from the continental populations (Gill *et al.,* 1993). Erskine (1992) estimated the Nova Scotia breeding population at 34,000 ± 12,000 pairs. He also suggests that, in recent years, Boreal Chickadee populations seem to be in decline throughout the Maritimes. Erskine (1992) also suggests that one of the reasons for the recent decline is, "Extensive clear-cutting of pure softwood stands including "salvage" after major budworm kills….".

In recent years the Spruce Beetle has killed large numbers of conifers in the Digby Neck area. The wide-spread "salvage" clear-cutting of the forests in this area is undoubtedly reducing the available habitat for Boreal Chickadees.

Two Boreal Chickadees were recorded during our 2002 site visits. I consider it most likely that Boreal Chickadees do nest on the property, but probably in relatively low numbers.

Another bird species at risk observed during our site visits was the Common Loon (yellow, S4B). The single bird observed was a subadult that was feeding in the coastal marine waters adjacent to the site. Non-breeding Common Loons regularly use coastal marine waters to summer and moult. Breeding Common Loons, however, require large freshwater lakes on which to nest. On Digby Neck, Harris Lake and Lake Midway are the only lakes of sufficient size to support breeding Common Loons and these lakes are 7 and 9 km, respectively, from the White's Point property.

Although none was found during our 2002 census, there is a small possibility that Nelson's Sharp-tailed Sparrows (yellow, S2S3B) might nest in the small coastal wetland on this property.

Nelson's Sharp-tailed Sparrow is generally a coastal species most often associated with salt marshes and other coastal and estuarine wetland habitats. It has been estimated that the breeding population of the entire Maritime provinces is less than 2,500 pairs (Erskine, 1992). A volunteer-based study of coastal wetlands of the Maritime provinces, initiated in 2000, suggests that even relatively small coastal wetlands can be important nesting habitat for this species.

On our three visits to the small (~ 1.5 ha) coastal (freshwater) wetland in the cove north of White's Point, no Nelson's Sharp-tailed Sparrows were observed. Swamp Sparrows were found in this marsh and Savannah Sparrows, with which Nelson's Sharp-tailed Sparrows are often associated, were found in the adjacent coastal barrens. While I believe that this habitat would be at best marginal, further information from the ongoing study of coastal wetlands might help clarify this situation.

Although our site visits and nocturnal survey did not reveal its presence, there is a remote possibility that Long-eared Owls (yellow, S1S2B) could nest on the site. This secretive and generally quiet species, which confines its hunting until after dark and roosts in dense conifers during the day, is very difficult to detect. Long-eared Owls tend to nest in "thick evergreen woods" generally in nests constructed by another bird species (American Crow or hawk) or on thick growths of "witches broom" that afflict spruces and Balsam Fir (Tufts, 1986). In Mr. Forsythe's experience (he has been working with owls for almost 30 years) and as suggested by Tufts (1986), Long-eared Owls prefer nest sites immediately adjacent to a "cleared space" (fields, pastures, meadows) that can support high densities of their primary food, mice. Since there are such habitats available along the Digby Neck, it seems likely that such habitats would be favoured over the strictly woodland habitat of this property. An additional factor that might affect use of the property by Long-eared Owls is competition with the pair of Barred Owls that use this property as part their home range.

Another species at risk, the Northern Goshawk (yellow, S3B), might include habitat such as this property within its home range, which can exceed 2,000 ha and can contain a variety of habitats. Northern Goshawk nest sites, however, are generally confined to more specific habitat. Their preferred nesting habitat is in large tracts of mature forests containing tall trees and having a somewhat open understory in which they can hunt. The dense stands of stunted trees that dominate this property would not provide preferred nesting habitat for the Northern Goshawk. I therefore consider it unlikely that Northern Goshawks would nest on this property.

A review of information from the ACCDC database indicates that two bird species at risk had been previously recorded nesting in the vicinity of the proposed quarry site: the Wood Thrush (green, S2B) and the Rusty Blackbird (green, S3S4B).

The Wood Thrush appears to be extending its range north and east and in recent years there have been several breeding records, mainly in central southwestern Nova Scotia (Erskine, 1992). Since this species breeds in the eastern deciduous forest, its presence as a breeding bird on Digby Neck is surprising. It seems quite unlikely that breeding Wood Thrushes would use the predominantly coniferous woodlands that dominate this property.

The Rusty Blackbird, on the other hand, approaches the southern limits of its range in Nova Scotia. It is a boreal species and breeds in spruce bogs, swamps and alder swales. The small coastal wetland on this property could provide potential nesting habitat for Rusty Blackbirds although none was observed during our 2002 site visits.

Mammals

	Status			
	Prov. of N.S.	ACCDC	COSEWIC	
Mammal Species	Colour Ranking	N.S. S Ranking	Canadian Ranking	Possible Occurrence At or Adjacent to Site
Eastern Cougar	undetermined	SU	DD	highly unlikely
American Marten	red	S1	-	highly unlikely
Lynx	red	S1	NAR	highly unlikely
Moose	red	S1	-	highly unlikely
Eastern Pipistrelle	yellow	S1?	-	unlikely
Fisher	yellow	S2	-	unlikely
Gaspé Shrew	yellow	S2	SC	highly unlikely
Hoary Bat	yellow	S2?	-	unlikely
Little Brown Bat	yellow	S4	-	possible
Long-tailed Shrew	yellow	S1	-	highly unlikely
Northern Long-eared Bat	yellow	S2	-	possible
Red Bat	yellow	S2?	-	unlikely
Silver-haired Bat	yellow	S1?	-	unlikely
Southern Flying Squirrel	yellow	S1	SC	unlikely
Southern Bog Lemming	green	S3S4	-	unlikely
Rock Vole	green	S2	-	highly unlikely

There is relatively little information available concerning the distribution, numbers and habitat use by bats in Nova Scotia. While no bats were observed during our nocturnal survey, it is conceivable that bat species at risk could frequent the property during their nocturnal foraging.

Recent work by Hugh Broders *et al.* (2003) confirms that, in southwestern Nova Scotia, the two *Myotis* species, Little Brown Bat (yellow, S4) and Northern Long-eared Bat (yellow, S2), are the most common species and the Eastern Pipistrelle (yellow, S1?) may be locally common. Broders *et al.* suggest that the small numbers of observations recorded for the other three species (Hoary (yellow, S2?), Red (yellow, S2?) and Silver-haired (yellow, S1?)) might represent extralimital occurrences.

Three of these bat species (Silver-haired, Red and Hoary) are migratory. Broders *et al.* (2003), reasoning that if these species were to occur in Nova Scotia, like avian migrants, they might become concentrated in staging areas such as Brier Island, before and after their migratory flights over the Gulf of Maine. During 2001 they conducted echolocation and trapping studies of bats in southwestern Nova Scotia during the spring and fall migration period as well as in the late spring and early summer when the young are born and reared. Only 0.02 % of the echolocation sequences recorded could be attributed to these three bat species. On Brier Island (presumably migratory bats summering on Digby Neck and the adjacent mainland would migrate via Brier Island) of these three migratory species, only the Hoary Bat was detected and only two echolocation sequences of this species were recorded. It would therefore appear most unlikely that any of these species would be found at the proposed quarry site or indeed anywhere in the Digby Neck area. These species are all solitary during June and July when the young are born and reared and roost singly in trees during daylight hours.

The females of the two *Myotis* species often form maternity colonies where the young are reared. Although maternity colonies of both species can be in tree cavities, female Little Brown Bats show a decided preference for buildings (Peterson, 1974; Schowalter *et al.*, 1979). In southern New Brunswick, Broders and Forbes (*in press*) found that female Northern Long-eared Bats that had maternity colonies in tree cavities showed a very marked preference for shade-tolerant hardwood trees in mature hardwood-dominated stands. Conversely, the males of both the Long-eared Bat and the Little Brown Bat showed a marked preference for roosting sites in softwood trees in softwood-dominated mixed stands. Since there are no mature, shade-tolerant hardwood stands on or adjacent to this site, it would appear that the quarry site and adjacent woodlands would provide much better roosting habitat for male *Myotis* bats than for maternity colonies of females.

Female Eastern Pipistrelles are known to form maternity colonies; in other parts of North America, maternity colonies have been found in buildings, tree foliage and rock crevices. Current thinking is that maternity colonies are "often (hidden) inside a clump of dead leaves in an otherwise healthy (deciduous) tree" (Kurta, 2001). While there are rock crevices and some deciduous trees on the property, it is unlikely that maternity colonies of Eastern Pipistrelles would be found here. While censusing bats

by capture and echolocation in 2001, Broders *et al.* (2003) were unsuccessful in detecting this species on nearby Brier Island. Furthermore, Eastern Pipistrelles that were detected on the mainland were always found in association with fresh water: 90 % rivers, 10 % still waters.

There are no known caves on the property that could provide roosts or hibernacula for any of the resident bat species.

Although three other mammal species at risk (American Marten (red, SU), Moose (red, S1), Fisher(yellow, S2)) are known to occur in Digby County, and the property could provide marginal habitat for all three, there is no evidence that these species occur here. It is possible to be quite unequivocal concerning the presence of Moose on the property, and indeed in the general area, but it is more difficult in the cases of these two small and mobile mustelid species.

By the 1930's the Fisher was considered extirpated from Nova Scotia. In the late 1940's a first attempt was made at reintroducing this species into the province by releasing 12 ranch raised animals in the general area of the Tobeatic Wildlife Management Area. This release is believed to have resulted in the establishment of sparse Fisher populations in Annapolis, Digby, Queens, Shelburne and Yarmouth Counties. Mike Boudreau (*pers. comm.*) examined over 1,000 harvest records for the province going back to 1981 and found 63 records for Digby County, none from Digby Neck. The closest reported trapping of this species was a single animal taken in 1996 around Henderson's Brook at the head of St. Mary's Bay.

The Fisher reintroduction program resumed in the late 1990's and reintroductions in Hants, Halifax and Kings Counties are in progress in an attempt to link the sparse Fisher populations of southwestern Nova Scotia with the more recent (mid-1960's), and more successful, reintroductions in the northeastern mainland. No releases are planned for the Digby Neck area.

The American Marten has a history quite similar to the Fisher having been virtually extirpated from mainland Nova Scotia by the early 1900's. A reintroduction program was begun in 1986 with the release of animals, trapped in northern New Brunswick, in Kejimkujik National Park. This program continued until 1994. This reintroduction program appears to have been successful and American Marten are believed to have become established and spread from their initial release sites. However, the status of the mainland population is not well known. Given that the reintroduction program is relatively recent, that the American Marten is slow to reproduce (sexual maturity at 3 years), and its preferred habitat is old forest, it seems unlikely that this species would have now expanded its range to the far end of the Digby Neck.

Mark Elderkin (*pers. comm.*) suggest that climatic factors, such as lack of winter snow pack in the Digby Neck and other coastal areas, could also contribute to making these areas a less favourable habitat for American Marten.

SUMMARY

1) Four visits were made to the 155 ha White's Point property in June 2002 to census reptile and amphibian, breeding bird and mammal populations and to assess habitat potential for these species at risk in Nova Scotia.
2) One species at risk, the Boreal Chickadee, was documented using this property.
3) An analysis of habitat use and known distributions of species at risk concluded:
- **a) It is highly unlikely that any reptile or amphibian species at risk occur on this site.**
- **b) Although the woodlands of this property could provide marginal nesting habitat for one bird species at risk, the Long-eared Owl, given that better potential nesting habitat exists in adjacent areas, it is unlikely that these owls would be found here.**
- **c) A small coastal wetland on the property might provide marginal nesting habitat for Nelson's Sharp-tailed Sparrow and/or Rusty Blackbird although none was recorded at the site.**
- **d) Although two bat species at risk, the Little Brown Bat and the Northern Long-eared Bat, might use this property for foraging, it is unlikely that these species would have maternity colonies on this property and certainly are no more likely to occur here than on similar adjacent properties.**

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Web Sites

Atlantic Canada Conservation Data Centre – http://www.accdc.com

Committee of the Status of Endangered Wildlife in Canada – http://www.cosewic.ca

Environment Canada - http://www.speciesatrisk.gc.ca/

Environment Canada - http://www.on.ec.gc.ca/wildlife/wildspace/

Environment Canada - http://www.ns.ec.gc.ca/wildlife/salt_marsh/volunteer_e.html

Kentucky Bat Working Group - http://www.biology.eku.edu/bats.htm/

Nova Scotia Department of Natural Resources - http://www.gov.ns.ca/natr/wildlife/

Nova Scotia Department of Natural Resources –
http://gis1.www.gov.ns.ca/website/nssighabpub/viewer.htm

Nature Serve – http://www.natureserve.org

Nova Scotia Museum of Natural History - http://museum.gov.ns.ca/mnh/

University of Michigan, Museum of Zoology - http://www.ummz.lsa.umich.edu/

U.S. Forestry Service - http://www.fs.fed.us/database/feis/

Herptofaunal Atlas - database - http://landscape.acadiau.ca/herpatlas/

APPENDIX 1
COMMON AND SCIENTIFIC NAMES OF PLANTS AND ANIMALS CITED IN THIS ANALYSIS

Plants

Common Name	Scientific Name
Balsam Fir	*Abies balsamea*
Black Spruce	*Picea mariana*
Common Cattail	*Typha latifolia*
Junipers	*Juniperus spp.*
Moose Maple	*Acer pensylvanicum*
Mountain Ash	*Sorbus americana*
Red Maple	*Acer rubrum*
Red Spruce	*Picea rubens*
White Birch	*Betula papyifera*
White Spruce	*Picea glauca*

Insects

Common Name	Scientific Name
Spruce Beetle	*Dendroctonus rufipennis*

Amphibians

Common Name	Scientific Name
Eastern American Toad	*Bufo americanus americanus*
Four-toed Salamander	*Hemidactylium scutatum*
Green Frog	*Rana clamitans melanota*
Northern Spring Peeper	*Hyla crucifer crucifer*
Pickerel Frog	*Rana palustris*

Reptiles

Common Name	Scientific Name
Blanding's Turtle	*Emydoidea blandingi*
Northern Ribbon Snake	*Thamnophis sauritus septentrionalis*
Wood Turtle	*Clemmys insculpta*
Maritime Garter Snake	*Thamnophis sirtalis pallidula*
Eastern Smooth Green Snake	*Opheodrys vernalis vernalis*

Birds

Common Name	Scientific Name
Alder Flycatcher	*Empidonax alnorum*
American Coot	*Fulica americana*
American Crow	*Corvus brachyrhynchos*
American Goldfinch	*Carduelis tristis*
American Kestrel	*Falco sparverius*
American Redstart	*Setophaga ruticilla*
American Robin	*Turdus migratorius*
American Woodcock	*Scolopax minor*
Arctic Tern	*Sterna paradisaea*
Atlantic Puffin	*Fratercula arctica*
Baltimore Oriole	*Icterus galbula*
Barred Owl	*Strix varia*
Bicknell's Thrush	*Catharus bicknelli*
Black Scoter	*Melanitta nigra*
Black Tern	*Chlidonias niger*
Black-and-white Warbler	*Mniotilta varia*
Black-billed Cuckoo	*Coccyzuz erythropthalmus*
Black-capped Chickadee	*Poecile atricapilla*
Black-crowned Night-Heron	*Nycticorax nycticorax*
Black-legged Kittiwake	*Rissa tridactyla*
Black-throated Green Warbler	*Dendroica virens*
Blue-headed Vireo	*Vireo solitarius*
Bobolink	*Dolichonyx oryzivorus*
Boreal Chickadee	*Poecile hudsonica*
Boreal Owl	*Aegolius funereus*
Broad-winged Hawk	*Buteo platypterus*
Brown Creeper	*Certhia americana*
Brown Thrasher	*Toxostoma rufum*

Birds (continued)

Common Name	Scientific Name
Cedar Waxwing	*Bombycilla cedrorum*
Common Eider	*Somateria mollissima*
Common Goldeneye	*Bucephala islandica*
Common Loon	*Gavia immer*
Common Moorhen	*Gallinula chloropus*
Common Raven	*Corvus corax*
Common Tern	*Sterna hirundo*
Common Yellowthroat	*Geothlypis trichas*
Cooper's Hawk	*Accipiter cooperii*
Dark-eyed Junco	*Junco hyemalis*
Double-crested Cormorant	*Phalacrocorax auritus*
Eastern Bluebird	*Sialia sialis*
Eastern Meadowlark	*Sturnella magna*
Eastern Phoebe	*Sayornis phoebe*
Gadwall	*Anas strepera*
Golden-crowned Kinglet	*Regulus satrapa*
Great Black-backed Gull	*Larus marinus*
Great Crested Flycatcher	*Myiarchus crinitus*
Greater Yellowlegs	*Tringa melanoleuca*
Hermit Thrush	*Catharus guttatus*
Herring Gull	*Larus argentatus*
Horned Lark	*Eremophila alpestris*
Indigo Bunting	*Passerina cyanea*
"Ipswich" Savannah Sparrow	*Passerculus sandwichensis princeps*
Least Bittern	*Ixobrychus exilis*
Least Sandpiper	*Calidris minutilla*
Loggerhead Shrike	*Lanius ludovicianus*
Long-eared Owl	*Asio otus*
Magnolia Warbler	*Dendroica magnolia*
Marsh Wren	*Cistothorus palustris*
Merlin	*Falco columbarius*
Nashville Warbler	*Vermivora ruficapilla*
Nelson's Sharp-tailed Sparrow	*Ammodramus nelsoni*
Northern Cardinal	*Cardinalis cardinalis*
Northern Flicker	*Colaptes auratus*
Northern Gannet	*Morus bassanus*
Northern Goshawk	*Accipiter gentilis*
Northern Mockingbird	*Mimus polyglottos*
Northern Parula	*Parula americana*

Birds (continued)

Common Name	**Scientific Name**
Northern Pintail	*Anas acuta*
Northern Shoveler	*Anas clypeata*
Osprey	*Pandion haliaetus*
Ovenbird	*Seiurus aurocapillus*
Peregrine Falcon	*Falco peregrinus*
Philadelphia Vireo	*Vireo philadelphicus*
Piping Plover	*Charadrius melodus*
Purple Finch	*Carpodacus purpureus*
Purple Martin	*Progne subis*
Razorbill	*Alca torda*
Red-breasted Merganser	*Mergus serrator*
Red-eyed Vireo	*Vireo olivaceus*
Red-tailed Hawk	*Buteo jamaicensis*
Roseate Tern	*Sterna dougallii*
Ruby-throated Hummingbird	*Archilochus colubris*
Rusty Blackbird	*Euphagus carolinus*
Savannah Sparrow	*Passerculuc sandwichensis*
Scarlet Tanager	*Piranga olivacea*
Semipalmated Plover	*Charadrius semipalmatus*
Short-eared Owl	*Asio flammeus*
Solitary Sandpiper	*Tringa solitaria*
Song Sparrow	*Melospiza melodia*
Spotted Sandpiper	*Actitis macularia*
Swainson's Thrush	*Catharus ustulatus*
Swamp Sparrow	*Melospiza georgiana*
Upland Sandpiper	*Bartramia longicauda*
Vesper Sparrow	*Pooecetes gramineus*
Virginia Rail	*Rallus limicola*
Warbling Vireo	*Vireo gilvus*
Whip-poor-will	*Caprimulgus vociferus*
White-throated Sparrow	*Zonotrichia albicollis*
Willow Flycatcher	*Empidonax trailii*
Wilson's Phalarope	*Phalaropus tricolor*
Winter Wren	*Troglodytes troglodytes*
Wood Thrush	*hylocichla mustelina*
Yellow-bellied Flycatcher	*Empidonax flaviventris*
Yellow-rumped Warbler	*Dendroica coronata*

Mammals

Common Name	**Scientific Name**
American Marten	*Martes americana*
American Porcupine	*Erethizon dorsatum*
American Red Squirrel	*Tamiasciurus hudsonicus*
Coyote	*Canis latrans*
Eastern Cougar	*Felis concolor*
Eastern Pipistrelle	*Pipistrellus subflavus*
Fisher	*Martes pennanti*
Gaspe Shrew	*Sorex gaspensis*
Hoary Bat	*Lasiurus cinereus*
Little Brown Bat	*Myotis lucifugus*
Long-tailed Shrew	*Sorex dispar*
Lynx	*Lynx canadensis*
Mink	*Mustela vison*
Moose	*Alces alces*
Northern Long-eared Bat	*Myotis septentrionalis*
Raccoon	*Procyon lotor*
Red Bat	*Lasiurus borealis*
Rock Vole	*Microtus chrotorrhinus*
Silver-haired Bat	*Lasionycteris noctivagans*
Striped Skunk	*Mephitis mephitis*
Southern bog Lemming	*synaptomys cooperi*
Southern Flying Squirrel	*Glaucomys volans*
White-tailed Deer	*Odocoileus virgianus*

APPENDIX 2
CO-ORDINATES OF SECTIONS OF BREEDING BIRD SURVEY (23 JUNE 2002)

A	Start (E extremity)	N44°27.390' W66°08.285'
	End (W extremity)	N44°27.452' W66°08.556'
B	Start (S extremity)	N44°27.452' W66°08.556'
	End (N extremity)	N44°27.723' W66°08.682'
C	Start (S extremity)	N44°27.723' W66°08.682'
	End (N extremity)	N44°28.395' W66°08.091'
D	Start (S extremity)	N44°28.237' W66°08.257'
	Intersection with E boundary	N44°28.243' W66°08.034'
	Intersection of E boundary and stream	N44°28.347' W66°08.006'
	End (mouth of stream)	N44°28.395' W66°08.091'
E	Start (E extremity)	N44°27.390' W66°08.285'
	Intersection with E boundary	N44°27.209' W66°08.571'
	Survey marker on E boundary	N44°27.218' W66°08.649'
	End (W extremity)	N44°27.194' W66°08.688'