

## 8.5 Terrestrial Vegetation

### 8.5.1 Desktop Review

Prior to undertaking field assessments, the ACCDC database was reviewed to compile a list of recorded observations of plant species within 100 km of the Project site. ACCDC records indicate that 307 vascular and 5 nonvascular plant species have been identified within 100 km of the Project site (ACCDC 2012). Of the 312 species identified by ACCDC, 206 vascular and 5 nonvascular plant SOCI were identified within 100 km of the Project site.

The preliminary list was then used to develop a short list of plant SOCI that may be present at the Project site (Appendix C). For the purpose of this assessment, SOCI include:

- Species listed by the COSEWIC (COSEWIC 2012) or under SARA (SARA 2012) as endangered, threatened or of special concern;
- Species protected under the NSESA (NSESA 2007); and
- Species listed in the NSDNR General Status Ranks of Wild Species in Nova Scotia as “Red” or “Yellow”.

The results of the desktop review were used by botanists to determine priority habitats for the field assessment.

### 8.5.2 Plant Surveys

A plant survey was completed on July 18 and 19, 2012 within the Project site boundaries by an experienced botanist. A complete list of plant species identified during the survey is provided in Appendix C.

Habitat within the Project site consisted mostly of secondary mixed forest, with both upland and wetland habitats. Additional diversity was supplied by an existing access road and shoulders, where most of the recorded exotic weedy species were identified. Small clusters of conifers or hardwoods were also occasionally observed.

Common tree species within the typical forest include red maple, red spruce, and balsam fir, with occasional yellow birch, white pine, and white ash.

The treed wetlands observed tended to be flat basin features, dominated by trees such as black spruce and red maple. Scattered speckled alder and black holly (*Ilex verticillata*) were also identified within this habitat. Cinnamon ferns were the most dominant herbaceous plants and sphagnum mosses carpeted the ground.

### 8.5.3 Rare Plant Species

No vascular plant SOCI were observed during this survey.

## 8.6 Terrestrial Fauna

Information regarding terrestrial fauna in the vicinity of the Project site, including any SOCI, was obtained through a combination of desktop review and field studies. The desktop component

included a review of the NS Significant Species and Habitat Database (NSDNR 2012c) and ACCDC data (ACCDC 2012) for species recorded within a 100 km radius of the Project site. A comparison of habitat mapping data to known habitat requirements for species expected to occur within the area, and for all species of conservation interest, was also completed.

### 8.6.1 Mammals

The landscape of Nova Scotia features a variety of habitats for mammalian fauna, including forests, fields, mountains, wetlands, and shorelines (Davis and Browne 1996).

The Nova Scotia Significant Species and Habitat Database (NSDNR 2012c) contains 36 unique species and/or habitat records pertaining to mammals within a 100 km radius of the Project site. Most of these records (23) represent wintering grounds for White-tailed deer (*Odocoileus virginianus*), while four pertain to “Species of Concern” including Fisher (*Martes pennant*), and Long-tailed shrew (*Sorex dispar*), as classified in the database. Records relating to “Species at Risk”, as classified in the database, include six records of American marten (*Martes americana*) all of which are at least 80 km from the proposed Project infrastructure, and a single record of Southern flying squirrel (*Glaucomys volans*), occurring approximately 31.5 km northwest of the Project site. There are no records pertaining to terrestrial mammals (excluding bats; refer to Section 8.8) within a 10 km radius of the Project site.

The ACCDC database (2012) indicates that nine species of terrestrial mammals (excluding bats) have been recorded within a 100 km radius of the Project site (Table 8.6).

**Table 8.6: Mammal Species Recorded within a 100 km radius of the Project Site**

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSESA Status <sup>4</sup>
American marten	<i>Martes americana</i>	Red	Not Listed	Not Listed	Endangered
Canada lynx	<i>Lynx canadensis</i>	Red	Not at Risk	Not Listed	Endangered
Cougar – Eastern pop.	<i>Puma concolor</i>	Undetermined	Data Deficient	Not Listed	Not Listed
Fisher	<i>Martes pennanti</i>	Yellow	Not Listed	Not Listed	Not Listed
Long-tailed shrew	<i>Sorex dispar</i>	Yellow	Not Listed	Not Listed	Not Listed
Maritime shrew	<i>Sorex maritimensis</i>	Green	Not Listed	Not Listed	Not Listed
Mainland moose	<i>Alces americanus</i>	Red	Not Listed	Not Listed	Endangered
Southern bog lemming	<i>Synaptomys cooperi</i>	Green	Not Listed	Not Listed	Not Listed
Southern flying squirrel	<i>Glaucomys volans</i>	Yellow	Not at Risk	Not Listed	Not Listed

Source: ACCDC 2012

<sup>1</sup>NSDNR 2010; <sup>2</sup>COSEWIC 2012; <sup>3</sup>SARA 2012; <sup>4</sup>NSESA 2007

Of note, is that sightings of many of the most common species are unreported to ACCDC, and are therefore under-represented or absent from the database. Consequently, a review of the ACCDC

data reveals predominantly rare or noteworthy species despite the fact that these species represent a small fraction of the existing mammal community in any area.

Field studies of mammalian fauna at the Project site consisted of direct observation of individuals, as well as the indirect identification of species by sound and/or sign (i.e., scat, tracks, scent, dens, lodges, etc.). Mammal surveys were conducted between March and November 2012. Table 8.7 lists the mammal species observed/identified at or near the Project site during field studies.

**Table 8.7: Mammal Species Observed/Identified during Field Studies**

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSESA Status <sup>4</sup>
American black bear	<i>Ursus americanus</i>	Green	Not at Risk	Not Listed	Not Listed
Coyote	<i>Canis latrans</i>	Green	Not Listed	Not Listed	Not Listed
Ermine	<i>Mustela erminea</i>	Green	Not Listed	Not Listed	Not Listed
Red squirrel	<i>Tamiasciurus hudsonicus</i>	Green	Not Listed	Not Listed	Not Listed
Smoky shrew	<i>Sorex fumeus</i>	Green	Not Listed	Not Listed	Not Listed
Southern red-backed vole	<i>Myodes gapperi</i>	Green	Not Listed	Not Listed	Not Listed
White-tailed deer	<i>Odocoileus virginianus</i>	Green	Not Listed	Not Listed	Not Listed

<sup>1</sup>NSDNR 2010; <sup>2</sup>COSEWIC 2012; <sup>3</sup>SARA 2012; <sup>4</sup>NSESA 2007

Although evidence of the presence of other mammals was not confirmed during field studies, other mammal species are expected to occur at the Project site, based upon habitat observations. Habitat mapping indicates that multiple forest types are present at the Project site (refer to Section 8.4). Spruce-fir forests are known to provide habitat for such species as American marten and Red squirrel (*Tamiasciurus hudsonicus*), and the high amounts of coarse woody debris associated with red spruce-red maple-white birch forest type provide habitat complexity necessary for a variety of small mammals.

The Project site, however, lacks distinct water bodies that provide habitat for certain semi-aquatic mammals including Muskrat (*Ondatra zibethicus*), American beaver (*Castor canadensis*), and River otter (*Lontra canadensis*).

#### SOCI – Mammals

Mammal species identified during field studies or that have been recorded within a 100 km radius of the Project site were screened against the criteria outlined in the document “[Guide to Addressing Wildlife Species and Habitat in an EA Registration Document](#)” (NSE 2009a) to develop a list of priority species. These priority species include:

- American marten – “Red” (NSDNR 2010), “Endangered” (NSESA 2007)
- Canada lynx – “Red” (NSDNR 2010), “Endangered” (NSESA 2007);
- Fisher – “Yellow” (NSDNR 2010);

- Long-tailed shrew – “Yellow” (NSDNR 2010);
- Mainland moose – “Red” (NSDNR 2010), “Endangered” (NSES 2007); and
- Southern flying squirrel – “Yellow” (NSDNR 2010).

None of the priority species listed above were observed during field surveys.

American marten prefer mature coniferous forests, and have been more recently observed in mixed forests and cutovers (MTRI 2008). Although these types of habitat are present at the Project site, the current known distribution of the American marten in Nova Scotia is limited to Cape Breton and the southwestern part of the province (NSDNR 2012d). Therefore, it is unlikely that the Project will interact with and/or impact American marten populations.

The distribution of Canada lynx is limited to the availability of extensive coniferous forests and distribution of Snowshoe hare (*Lepus americanus*) (main prey item), and in Nova Scotia the Canada lynx is limited to the Cape Breton Highlands (MTRI 2008). Although individuals may travel great distances in times of food scarcity (as cited in Parker 2001), potentially passing through the Project site, the possibility of this occurring during the construction phase of the Project is highly unlikely. The Project, therefore, will not have any impact on Canada lynx.

The Fisher is listed as sensitive to human activities or natural events (NSDNR 2010). The species generally requires dense mixed wood forests with continuous overhead cover (as cited in Allen 1983). Mixed woods are the predominant habitat type at the Project site suggesting that the species may be found in the immediate area. Although only 2% of Fisher trapped in Nova Scotia between 2000 and 2011, a total of 29 individuals, were taken from Hants County (NSDNR 2012e), it is possible that Fisher are present at the Project site and, if so, have the potential to be affected by the Project.

Long-tailed shrew in Nova Scotia was thought to be found only in the Cobequid Mountains, but recent research has identified an additional population 60 km to the southwest, near Wolfville (Shafer and Stewart 2006). The species appears to favour rocky areas and sites adjacent to cool, mountain streams, and the presence of rocks is considered a principal habitat component (Kirkland 1981). The Project site lacks these key habitat features, and combined with the current knowledge of the range of this species in Nova Scotia, it is unlikely that the Project will impact Long-tailed shrew populations.

Habitat requirements for Mainland moose change throughout the year. Early successional growth, such as that provided by recent cutovers, offers quality foraging habitat for moose, and interspersed wetlands provide suitable summer habitat for cows and calves (Parker 2003; Snaith and Beazley 2004). The Project site lacks these features, although the mature coniferous stands may provide suitable winter cover and relief from deep snow. Five significant concentration areas for Mainland moose have been identified in Nova Scotia (NSDNR 2012f). The Project site is located within approximately 5.7 km of the nearest concentration area, which encompasses the Halifax peninsula. According to the ACCDC database, the closest sighting of Mainland moose was  $\pm 17$  km from the Project site. Although no indication of Mainland moose was observed during the field studies completed at the Project site, there is potential for Mainland moose to occur at the Project site.

The Project site occurs in close proximity to the known range of Southern flying squirrels in Nova Scotia, which includes the New Ross area in northeast Lunenburg County (COSEWIC 2006b). The species requires mast bearing trees for forage, and tree cavities for nesting. In the Atlantic Region, southern flying squirrels select older forest stands (COSEWIC 2006b). Areas of the Project site feature large, mature trees which could provide suitable habitat for this species, although mast bearing trees are not dominant in most forest stands. ACCDC records show that the closest sighting was within 28±10 km from the Project site. Although not noted during field studies, this species' nocturnal habits often preclude it from being identified in wildlife surveys. It is possible that Southern flying squirrel occurs at or near the Project site and may therefore be affected by the Project.

### 8.6.2 Herpetofauna

Nova Scotia's reptile and amphibian community consists of 25 species; a relatively low level of diversity when compared to mainland areas of the continent (Davis and Browne 1996). However, the same factors that have limited post-glacial species colonization in the province, namely climatic changes, have caused amphibian and reptile populations to become isolated leading to a higher degree of morphologic variation than seen in continental populations (Davis and Browne 1996).

The Nova Scotia Significant Species and Habitat Database (NSDNR 2012c) contains 51 unique species and/or habitat records pertaining to reptiles and amphibians within a 100 km radius of the Project site. Most of these records (50) represent records of reptile, which include Wood turtle (*Glyptemys insculpta*), Blanding's turtle (*Emydoidea blandingii*), and Eastern ribbonsnake (*Thamnophis sauritus*).

Wood turtle habitat has been identified along the Herbert River, approximately 9.45 km northeast of the Project site. An additional record relates to Painted turtle, which is categorized as a "Species of Concern" in the database, but is not considered a priority species according to the criteria outlined in the document "A Guide to Addressing Wildlife Species and Habitat in an EA Registration Document" (NSE 2009b).

Data from the ACCDC (2012) indicate that five species of terrestrial herpetofauna have been recorded within a 100 km radius of the Project site (Table 8.8).

**Table 8.8: Reptile and Amphibian Species Recorded within a 100 km Radius of the Project Site**

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSESA Status <sup>4</sup>
Blanding's turtle - Nova Scotia pop.	<i>Emydoidea blandingii</i>	Red	Endangered	Endangered	Endangered
Eastern ribbonsnake - Atlantic pop.	<i>Thamnophis sauritus</i>	Red	Threatened	Threatened	Threatened
Four-toed salamander	<i>Hemidactylium scutatum</i>	Green	Not at Risk	Not Listed	Not Listed
Common snapping turtle	<i>Chelydra serpentina</i>	Green	Special Concern	Special Concern	Not Listed
Wood turtle	<i>Glyptemys insculpta</i>	Yellow	Threatened	Threatened	Vulnerable

Source: ACCDC 2012

<sup>1</sup>NSDNR 2010; <sup>2</sup>COSEWIC 2012; <sup>3</sup>SARA 2012; <sup>4</sup>NSESA 2007

The same data limitations and interpretations as noted for the mammalian fauna (Section 8.6.1) are also applicable to the reptile and amphibian data.

Field studies of amphibian and reptile species were conducted in conjunction with other surveys completed between March and November 2012. Species were either identified directly through visual observation, or indirectly using other evidence (i.e., calls, egg masses, tadpoles, etc.). Table 8.9 lists the amphibian and reptile species identified at or near the Project site during field studies.

**Table 8.9: Reptile and Amphibian Species Observed During Field Studies**

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSESA Status <sup>4</sup>
Green frog	<i>Lithobates clamitans</i>	Green	Not Listed	Not Listed	Not Listed
Pickereel frog	<i>Lithobates palustris</i>	Green	Not at Risk	Not Listed	Not Listed
Yellow spotted salamander	<i>Ambystoma maculatum</i>	Green	Not Listed	Not Listed	Not Listed

<sup>1</sup>NSDNR 2010; <sup>2</sup>COSEWIC 2012; <sup>3</sup>SARA 2012; <sup>4</sup>NSESA 2007

#### SOCI - Herpetofauna

Amphibian or reptile species identified during field studies or that have been recorded within a 100 km radius of the Project site were screened against the criteria outlined in the document “Guide to Addressing Wildlife Species and Habitat in an EA Registration Document” (NSE 2009b) to develop a list of priority species. These priority species include:

- Blanding’s turtle – “Red” (NSDNR 2010), “Endangered” (COSEWIC 2012), “Endangered” (SARA 2012), “Endangered” (NSESA 2007);
- Common snapping Turtle – “Special Concern” (COSEWIC 2012), “Special Concern” (SARA 2012).
- Eastern ribbonsnake – “Red” (NSDNR 2010), “Threatened” (COSEWIC 2012), “Threatened” (SARA 2012), “Threatened” (NSESA 2007); and
- Wood turtle – “Yellow” (NSDNR 2010), “Threatened” (COSEWIC 2012), “Threatened” (SARA 2012), “Vulnerable” (NSESA 2007).

None of the priority species listed above were observed during field studies.

Blanding’s turtle make use of a variety of wetland habitats including lakes, ponds, brooks, creeks, and marshes (COSEWIC 2005). Although not indicated by topographic mapping, multiple watercourses were identified at the Project site during field studies. However, the known distribution of this species in Nova Scotia is restricted to the area near Kejimikujik National Park, with sporadic sightings in southwestern parts of the province (MTRI 2008). Due to the geographic separation between the known range of the species and the Project site, it is unlikely that Project activities will affect Blanding’s turtle.

Common snapping turtle (*Chelydra serpentina*), despite its conservation status, is considered relatively common in mainland Nova Scotia (Davis and Browne 1996). Snapping turtle habitat is usually associated with slow moving water of moderate depth, with a muddy bottom and dense

vegetation. Established populations are typically found in ponds, lakes and river edges (COSEWIC 2008). Although there are some small streams at the Project site, it lacks open water bodies and slow moving rivers. However, due to their widespread distribution across mainland Nova Scotia, there is the potential for Snapping turtle to occur at the Project site and to therefore be affected by the Project.

Similarly, Eastern ribbonsnake is found in freshwater habitat types, including streams that are present at the Project site (MTRI 2008). However, this species appears to be restricted to southwestern parts of the province in Queens and Lunenburg Counties (Davis and Browne 1996), such that it is unlikely that Eastern ribbonsnake are present at or near the Project site. For this reason, it is not expected that Project activities will impact this priority species.

Wood turtle requires three key habitat components: a watercourse, sandy substrate, and a forested area (MacGregor and Elderkin 2003). The species is found throughout the province, with a known concentration east of the Project site in Guysborough County (MTRI 2008). Wood turtle prefer clear, moderately flowing watercourses in forests and are often associated with alder riparian zones. Suitable habitat is present at the Project site, particularly in Fall Brook, so it is possible that Wood turtle occur in association with this watercourse and could therefore be affected by the Project.

### 8.6.3 Butterflies and Odonates

There are approximately 13,000 species of insects in Nova Scotia of which 2,000 are moths and butterflies (Davis and Browne 1996). Some species have ranges limited by habitat type and/or the availability of host species (Davis and Browne 1996), and others are present only at certain times of year (The Butterflies of Nova Scotia 2008).

The NS Significant Species and Habitats database identifies four significant habitat features relating to butterflies and Odonates within a 100 km radius of the Project site: two for Jutta arctic (*Oeneis jutta*), classified in the database as a “Species of Concern”; one for Ebony boghaunter (*Williamsonia fletcheri*), classified in the database as a “Species at Risk”; and one for the Hoary elfin (*Callophrys polios*), classified as “Other Habitat” in the database. All records are at least 20 km from the proposed Project site; the closest being a record of Hoary elfin along a secondary road close to Black’s River, approximately 21.9 km to the west.

The ACCDC database contains records of 59 unique taxa of butterfly and Odonates within a 100 km radius of the Project site (Table 8.10).

**Table 8.10: Unique Butterfly and Odonate Species Recorded within a 100 km radius of the Project Site**

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSEA Status <sup>4</sup>
Aphrodite fritillary	<i>Speyeria aphrodite</i>	Green	Not Listed	Not Listed	Not Listed
Arctic fritillary	<i>Boloria chariclea</i>	Yellow	Not Listed	Not Listed	Not Listed
Baltimore checkerspot	<i>Euphydryas phaeton</i>	Green	Not Listed	Not Listed	Not Listed
Banded hairstreak	<i>Satyrium calanus</i>	Undetermined	Not Listed	Not Listed	Not Listed

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSESA Status <sup>4</sup>
Banded hairstreak	<i>Satyrrium calanus</i>	Undetermined	Not Listed	Not Listed	Not Listed
Bog elfin	<i>Callophrys lanoraieensis</i>	Red	Not Listed	Not Listed	Not Listed
Bronze copper	<i>Lycaena hyllus</i>	Green	Not Listed	Not Listed	Not Listed
Brook snaketail	<i>Ophiogomphus aspersus</i>	Red	Not Listed	Not Listed	Not Listed
Clamp-tipped emerald	<i>Somatochlora tenebrosa</i>	Green	Not Listed	Not Listed	Not Listed
Common branded skipper	<i>Hesperia comma</i>	Green	Not Listed	Not Listed	Not Listed
Common roadside-skipper	<i>Amblyscirtes vialis</i>	Green	Not Listed	Not Listed	Not Listed
Compton tortoiseshell	<i>Nymphalis l-album</i>	Green	Not Listed	Not Listed	Not Listed
Compton tortoiseshell	<i>Nymphalis l-album</i>	Green	Not Listed	Not Listed	Not Listed
Delicate emerald	<i>Somatochlora franklini</i>	Yellow	Not Listed	Not Listed	Not Listed
Eastern comma	<i>Polygonia comma</i>	Not Listed	Not Listed	Not Listed	Not Listed
Eastern pine elfin	<i>Callophrys niphon</i>	Green	Not Listed	Not Listed	Not Listed
Eastern red damsel	<i>Amphiagrion saucium</i>	Green	Not Listed	Not Listed	Not Listed
Elfin skimmer	<i>Nannothemis bella</i>	Green	Not Listed	Not Listed	Not Listed
Forcipate emerald	<i>Somatochlora forcipata</i>	Red	Not Listed	Not Listed	Not Listed
Gray comma	<i>Polygonia progne</i>	Green	Not Listed	Not Listed	Not Listed
Gray hairstreak	<i>Strymon melinus</i>	Green	Not Listed	Not Listed	Not Listed
Green comma	<i>Polygonia faunus</i>	Green	Not Listed	Not Listed	Not Listed
Greenish blue	<i>Plebejus saepiolus</i>	Not Listed	Not Listed	Not Listed	Not Listed
Harlequin darner	<i>Gomphaeschna furcillata</i>	Yellow	Not Listed	Not Listed	Not Listed
Harpoon clubtail	<i>Gomphus desertus</i>	Yellow	Not Listed	Not Listed	Not Listed
Harvester	<i>Feniseca tarquinius</i>	Green	Not Listed	Not Listed	Not Listed
Henry's elfin	<i>Callophrys henrici</i>	Green	Not Listed	Not Listed	Not Listed
Hoary comma	<i>Polygonia gracilis</i>	Yellow	Not Listed	Not Listed	Not Listed
Hoary elfin	<i>Callophrys polios</i>	Green	Not Listed	Not Listed	Not Listed
Jutta arctic	<i>Oeneis jutta</i>	Red	Not Listed	Not Listed	Not Listed
Juvenal's duskywing	<i>Erynnis juvenalis</i>	Green	Not Listed	Not Listed	Not Listed
Kennedy's emerald	<i>Somatochlora kennedyi</i>	Red	Not Listed	Not Listed	Not Listed
Lance-tipped darner	<i>Aeshna constricta</i>	Green	Not Listed	Not Listed	Not Listed
Laurentian skipper	<i>Hesperia comma</i>	Green	Not Listed	Not Listed	Not Listed
Maine snaketail	<i>Ophiogomphus mainensis</i>	Red	Not Listed	Not Listed	Not Listed



Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSESA Status <sup>4</sup>
Milbert's tortoiseshell	<i>Aglais milberti</i>	Green	Not Listed	Not Listed	Not Listed
Monarch	<i>Danaus plexippus</i>	Yellow	Special Concern	Special Concern	Not Listed
Mottled darner	<i>Aeshna clepsydra</i>	Green	Not Listed	Not Listed	Not Listed
Mustard white	<i>Pieris oleracea</i>	Yellow	Not Listed	Not Listed	Not Listed
Northern cloudywing	<i>Thorybes pylades</i>	Yellow	Not Listed	Not Listed	Not Listed
Northern pearly-eye	<i>Lethe anhedon</i>	Green	Not Listed	Not Listed	Not Listed
Northern pygmy clubtail	<i>Lanthus parvulus</i>	Green	Not Listed	Not Listed	Not Listed
Ocellated darner	<i>Boyeria grafiana</i>	Yellow	Not Listed	Not Listed	Not Listed
Orange bluet	<i>Enallagma signatum</i>	Red	Not Listed	Not Listed	Not Listed
Prince baskettail	<i>Epithea princeps</i>	Yellow	Not Listed	Not Listed	Not Listed
Quebec emerald	<i>Somatochlora brevicincta</i>	Red	Not Listed	Not Listed	Not Listed
Question mark	<i>Polygonia interrogationis</i>	Green	Not Listed	Not Listed	Not Listed
Riffle snaketail	<i>Ophiogomphus carolus</i>	Green	Not Listed	Not Listed	Not Listed
Rusty snaketail	<i>Ophiogomphus rupinsulensis</i>	Red	Not Listed	Not Listed	Not Listed
Salt andpepper skipper	<i>Amblyscirtes hegon</i>	Green	Not Listed	Not Listed	Not Listed
Satyr comma	<i>Polygonia satyrus</i>	Yellow	Not Listed	Not Listed	Not Listed
Seaside dragonlet	<i>Erythrodiplax berenice</i>	Yellow	Not Listed	Not Listed	Not Listed
Skillet clubtail	<i>Gomphus ventricosus</i>	Red	Not Listed	Not Listed	Not Listed
Spot-winged glider	<i>Pantala hymenaea</i>	Yellow	Not Listed	Not Listed	Not Listed
Striped hairstreak	<i>Satyrium liparops</i>	Undetermined	Not Listed	Not Listed	Not Listed
Striped hairstreak	<i>Satyrium liparops</i>	Undetermined	Not Listed	Not Listed	Not Listed
Taiga bluet	<i>Coenagrion resolutum</i>	Red	Not Listed	Not Listed	Not Listed
Vesper bluet	<i>Enallagma vesperum</i>	Yellow	Not Listed	Not Listed	Not Listed
Zebra clubtail	<i>Stylurus scudderi</i>	Red	Not Listed	Not Listed	Not Listed

Source: ACCDC 2012

<sup>1</sup>NSDNR 2010; <sup>2</sup>COSEWIC 2012; <sup>3</sup>SARA 2012; <sup>4</sup>NSESA 2007

No incidental observations of butterflies were made during other field studies conducted at the Project site between March and November 2012.

#### SOCI – Odonates and Butterflies

Butterfly or Odonate species that have been recorded within a 100 km radius of the Project site were screened against the criteria outlined in the document “Guide to Addressing Wildlife Species and

Habitat in an EA Registration Document” (NSE 2009b) to develop a list of priority species. These priority species include:

- Arctic fritillary – “Yellow” (NSDNR 2010);
- Bog elfin – “Red” (NSDNR 2010);
- Brook snaketail – “Red” (NSDNR 2010);
- Delicate emerald – “Yellow” (NSDNR 2010);
- Forcipate emerald – “Red” (NSDNR 2010);
- Harlequin darner – “Yellow” (NSDNR 2010);
- Harpoon clubtail – “Yellow” (NSDNR 2010);
- Hoary comma – “Yellow” (NSDNR 2010);
- Jutta arctic – “Red” (NSDNR 2010);
- Kennedy's emerald – “Red” (NSDNR 2010);
- Maine snaketail – “Red” (NSDNR 2010);
- Monarch – “Yellow” (NSDNR 2010), “Special Concern” (COSEWIC 2012), “Special Concern” (SARA 2012);
- Mustard white – “Yellow” (NSDNR 2010);
- Northern cloudywing – “Yellow” (NSDNR 2010);
- Ocellated darner – “Yellow” (NSDNR 2010);
- Orange bluet – “Red” (NSDNR 2010);
- Prince baskettail – “Yellow” (NSDNR 2010);
- Quebec emerald – “Red” (NSDNR 2010);
- Rusty snaketail – “Red” (NSDNR 2010);
- Satyr comma – “Yellow” (NSDNR 2010);
- Seaside dragonlet – “Yellow” (NSDNR 2010);
- Skillet clubtail – “Red” (NSDNR 2010);
- Spot-winged glider – “Yellow” (NSDNR 2010);
- Taiga bluet – “Red” (NSDNR 2010);
- Vesper bluet – “Yellow” (NSDNR 2010); and
- Zebra clubtail – “Red” (NSDNR 2010).

Only the Monarch has been granted a designated conservation status at either the provincial or federal level. Nova Scotia falls within the breeding range of this migratory species (COSEWIC 2010), and breeding habitat is restricted to areas where milkweed (*Asclepias* sp.) grows. This species is known to gather in large numbers during migration and congregates in dense clusters at overwintering grounds in Mexico. This concentration of the population is one reason why the Monarch has garnered conservation concern. The Monarch was not identified at the Project site during field studies, but food plants such as goldenrods (*Solidago* sp.) are present along roadways which may attract the species during migration. Thus, there is the potential for the Monarch to occur at the Project site and therefore be affected by the Project.

### 8.7 Avifauna

Information regarding the bird community in the vicinity of the Project site, including any species of conservation interest, was obtained through a combination of desktop review and field studies. According to habitat mapping, the Project site is completely forested by a combination of softwood,

mixed-wood, and hardwood stands. In addition, field studies have identified several areas of wetland habitat throughout the Project site. This diversity of habitat types provides foraging, breeding, and roosting habitat for a variety of resident and migratory bird species.

#### 8.7.1 Desktop Review

A desktop review on avifauna was completed. Available data was obtained from sources including the Maritime Breeding Bird Atlas (MBBA 2012), the NS Significant Species and Habitats database (NSDNR 2012c) and the ACCDC (2012). This information was used to gain insight into protected avifauna habitats, species utilization of the area, and to identify species of conservation interest potentially occurring at or near the Project site.

The closest Important Bird Area (IBA) (IBA Canada 2012) is the Southern Bight of the Minas Basin located approximately 7 km north of the Project site. This IBA is a 22,190 ha staging ground for an estimated 1 to 2 million shorebirds in late July to early August. A high diversity of migrant shorebirds forage on the large intertidal mud and sand flats throughout the Bight. This area is also a designated Ramsar Wetland Site as it supports the largest numbers of mixed species of shoreline birds during fall migration in all of North America.

The majority of the Project site is contained within map square 20MQ17, and in the most recent edition of the atlas (covering the years 2006-2012), 66 species were identified as being possible, probable, or confirmed breeders within this area. The following *SOCI* are considered possible, probable, or confirmed breeders in the survey area:

- Bank Swallow (*Riparia riparia*) – “Red” (NSDNR 2010);
- Barn Swallow (*Hirundo rustica*) – “Yellow” (NSDNR 2010), “Threatened” (COSEWIC 2012);
- Boreal Chickadee (*Poecile hudsonicus*) – “Yellow” (NSDNR 2010);
- Canada Warbler (*Wilsonia canadensis*) – “Red” (NSDNR 2010), “Threatened” (COSEWIC 2012); “Threatened” (SARA 2012);
- Common Loon (*Gavia immer*) – “Red” (NSDNR 2010);
- Common Nighthawk (*Chordeiles minor*) – “Red” (NSDNR 2010), “Threatened” (COSEWIC 2012), “Threatened” (SARA 2012), “Threatened” (NSES 2007);
- Eastern Kingbird (*Tyrannus tyrannus*) – “Yellow” (NSDNR 2010);
- Eastern Wood Peewee (*Contopus virens*) – “Yellow” (NSDNR 2010);
- Golden-crowned Kinglet (*Regulus satrapa*) – “Yellow” (NSDNR 2010);
- Gray Catbird (*Dumetella carolinensis*) – “Red” (NSDNR 2010);
- Rose-breasted Grosbeak (*Pheucticus ludovicianus*) – “Yellow” (NSDNR 2010);
- Ruby-crowned Kinglet (*Regulus calendula*) – “Yellow” (NSDNR 2010);
- Spotted Sandpiper (*Actitis macularius*) – “Yellow” (NSDNR 2010);
- Tennessee Warbler (*Vermivora peregrina*) – “Yellow” (NSDNR 2010); and
- Yellow-bellied Flycatcher (*Empidonax flaviventris*) – “Yellow” (NSDNR 2010).

The NS Significant Species and Habitats database contains 385 unique records pertaining to birds and/or bird habitat within a 100 km radius of the Project site. These records include 147 classified as “Other Habitat”, primarily relating to Bald Eagle (*Haliaeetus leucocephalus*) nests, 99 records classified as “Species of Concern”, primarily relating to Common Loon nesting habitat, 80 records

classified as “Migratory Bird Habitat”, primarily relating to waterfowl and shorebirds, and 59 records classified as “Species at Risk”, which include a variety of species including Harlequin Duck (*Histrionicus histrionicus*) and Piping Plover (*Charadrius melodus*).

Twelve of these significant habitat records fall within 10 km of the proposed Project site. These include Bald Eagle nests at Hemlock Hills, Windsor Forks, Martock Mountain, Mill Lakes, Avon River, Elderkin Creek, and the Head of Panuke Lake; Gray Partridge (*Perdix perdix*) habitat along the Avon River and in the Town of Windsor; and Common Loon nesting habitat at Panuke Lake and Mill Lakes.

The ACCDC database contains records of 96 bird species within a 100 km radius of the Project site. Table 8.11 lists these species as well as their respective provincial and national conservation status ranks.

**Table 8.11: Bird Species Recorded within a 100 km Radius of the Project Site**

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSEA Status <sup>4</sup>
American Bittern	<i>Botaurus lentiginosus</i>	Yellow	Not Listed	Not Listed	Not Listed
American Coot	<i>Fulica americana</i>	Undetermined	Not at Risk	Not Listed	Not Listed
American Golden-Plover	<i>Pluvialis dominica</i>	Yellow	Not Listed	Not Listed	Not Listed
Arctic Tern	<i>Sterna paradisaea</i>	Red	Not Listed	Not Listed	Not Listed
Atlantic Puffin	<i>Fratercula arctica</i>	Yellow	Not Listed	Not Listed	Not Listed
Baltimore Oriole	<i>Icterus galbula</i>	Red	Not Listed	Not Listed	Not Listed
Bank Swallow	<i>Riparia riparia</i>	Red	Not Listed	Not Listed	Not Listed
Barn Swallow	<i>Hirundo rustica</i>	Yellow	Threatened	No Status	Not Listed
Bay-breasted Warbler	<i>Dendroica castanea</i>	Yellow	Not Listed	Not Listed	Not Listed
Bicknell's Thrush	<i>Catharus bicknelli</i>	Red	Threatened	Special Concern	Vulnerable
Black Guillemot	<i>Cephus grylle</i>	Green	Not Listed	Not Listed	Not Listed
Black Tern	<i>Chlidonias niger</i>	Red	Not at Risk	Not Listed	Not Listed
Black-backed Woodpecker	<i>Picoides arcticus</i>	Yellow	Not Listed	Not Listed	Not Listed
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Red	Not Listed	Not Listed	Not Listed
Black-legged Kittiwake	<i>Rissa tridactyla</i>	Yellow	Not Listed	Not Listed	Not Listed
Blackpoll Warbler	<i>Dendroica striata</i>	Yellow	Not Listed	Not Listed	Not Listed
Blue-winged Teal	<i>Anas discors</i>	Red	Not Listed	Not Listed	Not Listed
Bobolink	<i>Dolichonyx oryzivorus</i>	Yellow	Threatened	No Status	Not Listed
Boreal Chickadee	<i>Poecile hudsonicus</i>	Yellow	Not Listed	Not Listed	Not Listed
Boreal Owl	<i>Aegolius funereus</i>	Undetermined	Not at Risk	Not Listed	Not Listed

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSESA Status <sup>4</sup>
Brant	<i>Branta bernicla</i>	Yellow	Not Listed	Not Listed	Not Listed
Brown Thrasher	<i>Toxostoma rufum</i>	Undetermined	Not Listed	Not Listed	Not Listed
Brown-headed Cowbird	<i>Molothrus ater</i>	Green	Not Listed	Not Listed	Not Listed
Canada Warbler	<i>Wilsonia canadensis</i>	Red	Threatened	Threatened	Not Listed
Cape May Warbler	<i>Dendroica tigrina</i>	Yellow	Not Listed	Not Listed	Not Listed
Chimney Swift	<i>Chaetura pelagica</i>	Red	Threatened	Threatened	Endangered
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	Red	Not Listed	Not Listed	Not Listed
Common Goldeneye	<i>Bucephala clangula</i>	Green	Not Listed	Not Listed	Not Listed
Common Loon	<i>Gavia immer</i>	Red	Not at Risk	Not Listed	Not Listed
Common Moorhen	<i>Gallinula chloropus</i>	Undetermined	Not Listed	Not Listed	Not Listed
Common Nighthawk	<i>Chordeiles minor</i>	Red	Threatened	Threatened	Threatened
Common Tern	<i>Sterna hirundo</i>	Yellow	Not at Risk	Not Listed	Not Listed
Eastern Bluebird	<i>Sialia sialis</i>	Yellow	Not at Risk	Not Listed	Not Listed
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Yellow	Not Listed	Not Listed	Not Listed
Eastern Meadowlark	<i>Sturnella magna</i>	Yellow	Threatened	No Status	Not Listed
Eastern Phoebe	<i>Sayornis phoebe</i>	Yellow	Not Listed	Not Listed	Not Listed
Eastern Wood-Pewee	<i>Contopus virens</i>	Yellow	Not Listed	Not Listed	Not Listed
Fox Sparrow	<i>Passerella iliaca</i>	Green	Not Listed	Not Listed	Not Listed
Gadwall	<i>Anas strepera</i>	Red	Not Listed	Not Listed	Not Listed
Gray Catbird	<i>Dumetella carolinensis</i>	Red	Not Listed	Not Listed	Not Listed
Gray Jay	<i>Perisoreus canadensis</i>	Yellow	Not Listed	Not Listed	Not Listed
Great Cormorant	<i>Phalacrocorax carbo</i>	Yellow	Not Listed	Not Listed	Not Listed
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Red	Not Listed	Not Listed	Not Listed
Greater Yellowlegs	<i>Tringa melanoleuca</i>	Yellow	Not Listed	Not Listed	Not Listed
Harlequin Duck - Eastern pop.	<i>Histrionicus histrionicus</i>	Red	Special Concern	Special Concern	Endangered
Horned Lark	<i>Eremophila alpestris</i>	Green	Not Listed	Not Listed	Not Listed
Hudsonian Godwit	<i>Limosa haemastica</i>	Yellow	Not Listed	Not Listed	Not Listed
Indigo Bunting	<i>Passerina cyanea</i>	Undetermined	Not Listed	Not Listed	Not Listed
Killdeer	<i>Charadrius vociferus</i>	Yellow	Not Listed	Not Listed	Not Listed
Laughing Gull	<i>Leucophaeus atricilla</i>	Green	Not Listed	Not Listed	Not Listed

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSESA Status <sup>4</sup>
Least Sandpiper	<i>Calidris minutilla</i>	Green	Not Listed	Not Listed	Not Listed
Long-eared Owl	<i>Asio otus</i>	Red	Not Listed	Not Listed	Not Listed
Northern Bobwhite	<i>Colinus virginianus</i>	No Status	Not Listed	Not Listed	Not Listed
Northern Cardinal	<i>Cardinalis cardinalis</i>	Green	Not Listed	Not Listed	Not Listed
Northern Gannet	<i>Morus bassanus</i>	Green	Not Listed	Not Listed	Not Listed
Northern Goshawk	<i>Accipiter gentilis</i>	Green	Not at Risk	Not Listed	Not Listed
Northern Mockingbird	<i>Mimus polyglottos</i>	Green	Not Listed	Not Listed	Not Listed
Northern Pintail	<i>Anas acuta</i>	Red	Not Listed	Not Listed	Not Listed
Northern Shoveler	<i>Anas clypeata</i>	Red	Not Listed	Not Listed	Not Listed
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Red	Threatened	Threatened	Not Listed
Peregrine Falcon - anatum/tundrius	<i>Falco peregrinus</i>	Yellow	Special Concern	Threatened	Vulnerable
Philadelphia Vireo	<i>Vireo philadelphicus</i>	Undetermined	Not Listed	Not Listed	Not Listed
Pied-billed Grebe	<i>Podilymbus podiceps</i>	Yellow	Not Listed	Not Listed	Not Listed
Pine Grosbeak	<i>Pinicola enucleator</i>	Red	Not Listed	Not Listed	Not Listed
Pine Siskin	<i>Spinus pinus</i>	Yellow	Not Listed	Not Listed	Not Listed
Piping Plover melodus ssp	<i>Charadrius melodus</i>	Red	Endangered	Endangered	Endangered
Purple Martin	<i>Progne subis</i>	Red	Not Listed	Not Listed	Not Listed
Purple Sandpiper	<i>Calidris maritima</i>	Yellow	Not Listed	Not Listed	Not Listed
Razorbill	<i>Alca torda</i>	Yellow	Not Listed	Not Listed	Not Listed
Red Knot rufa ssp	<i>Calidris canutus</i>	Red	Endangered	No Status	Endangered
Red Phalarope	<i>Phalaropus fulicarius</i>	Yellow	Not Listed	Not Listed	Not Listed
Red-breasted Merganser	<i>Mergus serrator</i>	Green	Not Listed	Not Listed	Not Listed
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Accidental	Not Listed	Not Listed	Not Listed
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Yellow	Not Listed	Not Listed	Not Listed
Ring-billed Gull	<i>Larus delawarensis</i>	Green	Not Listed	Not Listed	Not Listed
Roseate Tern	<i>Sterna dougallii</i>	Red	Endangered	Endangered	Endangered
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	Yellow	Not Listed	Not Listed	Not Listed
Rusty Blackbird	<i>Euphagus carolinus</i>	Red	Special Concern	Special Concern	Not Listed
Scarlet Tanager	<i>Piranga olivacea</i>	Undetermined	Not Listed	Not Listed	Not Listed
Semipalmated Plover	<i>Charadrius semipalmatus</i>	Green	Not Listed	Not Listed	Not Listed

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSESA Status <sup>4</sup>
Semipalmated Sandpiper	<i>Calidris pusilla</i>	Yellow	Not Listed	Not Listed	Not Listed
Short-eared Owl	<i>Asio flammeus</i>	Red	Special Concern	Special Concern	Not Listed
Solitary Sandpiper	<i>Tringa solitaria</i>	Green	Not Listed	Not Listed	Not Listed
Spotted Sandpiper	<i>Actitis macularius</i>	Yellow	Not Listed	Not Listed	Not Listed
Tennessee Warbler	<i>Vermivora peregrina</i>	Yellow	Not Listed	Not Listed	Not Listed
Turkey Vulture	<i>Cathartes aura</i>	Yellow	Not Listed	Not Listed	Not Listed
Vesper Sparrow	<i>Poocetes gramineus</i>	Red	Not Listed	Not Listed	Not Listed
Virginia Rail	<i>Rallus limicola</i>	Undetermined	Not Listed	Not Listed	Not Listed
Warbling Vireo	<i>Vireo gilvus</i>	Undetermined	Not Listed	Not Listed	Not Listed
Whip-Poor-Will	<i>Caprimulgus vociferus</i>	Red	Threatened	Threatened	Not Listed
Willet	<i>Tringa semipalmata</i>	Red	Not Listed	Not Listed	Not Listed
Willow Flycatcher	<i>Empidonax traillii</i>	Yellow	Not Listed	Not Listed	Not Listed
Wilson's Snipe	<i>Gallinago delicata</i>	Yellow	Not Listed	Not Listed	Not Listed
Wilson's Warbler	<i>Wilsonia pusilla</i>	Yellow	Not Listed	Not Listed	Not Listed
Wood Thrush	<i>Hylocichla mustelina</i>	Undetermined	Not Listed	Not Listed	Not Listed
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	Yellow	Not Listed	Not Listed	Not Listed

Source: ACCDC 2012

<sup>1</sup>NSDNR 2010; <sup>2</sup>COSEWIC 2012; <sup>3</sup>SARA 2012; <sup>4</sup>NSESA 2007

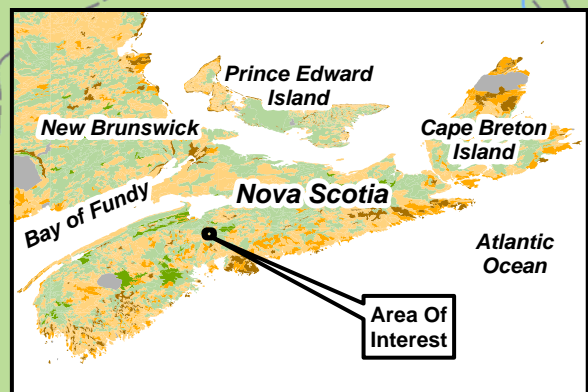
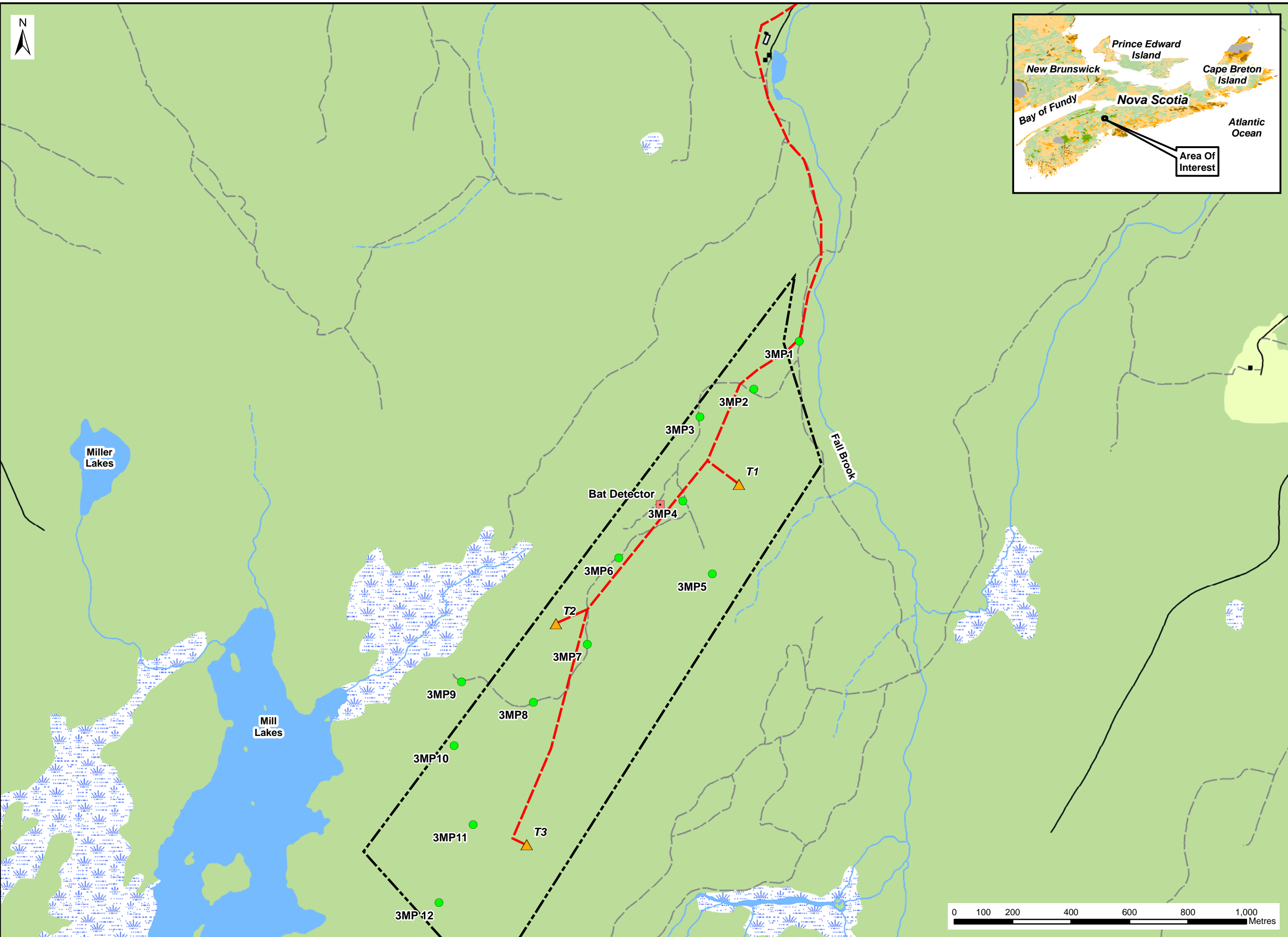
### 8.7.2 Field Surveys

Field surveys were completed to gather data to characterize the year round, pre-construction (baseline) bird community at the Project site. These surveys were carried out by an expert birder and were designed to capture changes in the diversity and abundance of bird species at the Project site coinciding with such important events as breeding and migration. All field surveys were designed in consultation with officials from NSDNR and CWS, and conformed to protocols outlined in the document "Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds" (CWS 2007).

Detailed results for bird surveys are provided in Appendix D.

#### Winter Bird Survey

Eleven area searches were conducted at or near the Project site on March 20, 2012 (Drawing 8.6). Detailed survey results are provided in Table D1, Appendix D. A total of 22 species were identified, including 212 individual birds (Table D2, Appendix D). Pine Siskin (*Carduelis pinus*) and Dark-eyed Junco (*Junco hyemalis*) were the most frequently observed and most abundant species.



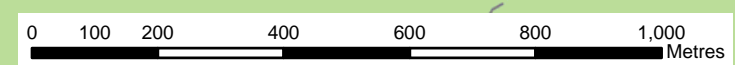
- Notes:**
1. Reference: Digital Topographic Mapping By Nova Scotia Geomatics Centre.
  2. Projection: NAD83(CSRS), UTM Zone 20 North.
  3. GPS Points Taken Are Typically To +/-5m Accuracy.

- Legend:**
- 2012 Bat Detector Location
  - 2012 Bird Survey Locations
  - ▲ Proposed Turbine
  - Proposed Road
  - ▭ Project Site Boundary
  - Building
  - Roads
  - - - Access Roads / Trails
  - ▭ Large Structure
  - Mapped Stream
  - - - Indefinite Stream
  - Water Bodies
  - ▨ Mapped Wet Area
  - Cleared Area

**Bird Survey  
And Bat Detector  
Locations**



Date: January 2013	Project #: 12-4402
Scale: 1:12,000	Drawing #: <b>8.6</b>
Drawn By: H. Serhan	Checked By: A. Walter





### Spring Migration Surveys

Spring migration surveys were conducted on April 19, May 1, and May 31, 2012. A total of 31 stopover count surveys were conducted at 11 locations within the Project site boundaries (Drawing 8.6). Detailed survey results are provided in Table D3, Appendix D.

A total of 42 species, comprising 746 individual birds, were observed during the spring migration surveys (Table D4, Appendix D). Dark-eyed Junco and Yellow-rumped Warbler (*Dendroica coronata*) were the most frequently observed, while American Robin (*Turdus migratorius*) was the most abundant species. Common passerine species were abundant during these surveys, with substantial numbers of Black-capped Chickadee (*Poecile atricapillus*), Black-throated Blue Warbler (*Dendroica caerulescens*), Hermit Thrush (*Catharus guttatus*), and Blue Jay (*Cyanocitta cristata*) observed. The majority of bird species observed were passerines, but waterfowl, woodpecker, and upland gamebird species, as well as birds of prey, were also noted.

### Breeding Bird Surveys

Eleven point count locations were surveyed on June 16 and again on July 16, 2012 (Drawing 8.6). Detailed survey results are provided in Table D5, Appendix D. A total of 457 individual birds, representing 39 species, were observed during these point counts (Table D6, Appendix D). Of these, 16 species were considered probable breeders based upon the observation of breeding pairs and/or the establishment of permanent territories in appropriate habitat and four species were confirmed breeders (MBBA 2012). The most frequently observed species, in terms of the number of point counts at which they were recorded, were American Robin, Ovenbird (*Seiurus aurocapilla*), Magnolia Warbler (*Dendroica magnolia*), and Red-eyed Vireo (*Vireo olivaceus*). American Robin, Hermit Thrush, and Red-eyed Vireo were the most abundant species with 105, 40, and 38 individuals recorded, respectively.

The vast majority of the species identified during the breeding bird surveys were passerines. However, a variety of non-passerine birds were also observed during these surveys including: Hairy Woodpecker (*Picoides villosus*), Pileated Woodpecker (*Dryocopus pileatus*), Yellow-bellied Sapsucker (*Sphyrapicus varius*), Common Nighthawk (*Chordeiles minor*), and Barred Owl (*Strix varia*).

### Fall Migration Surveys

A total of 34 stopover count surveys were conducted at 12 locations within the Project site boundaries (Drawing 8.6). Detailed survey results are provided in Table D7, Appendix D. A total of 36 species, consisting of 513 individual birds, were recorded during the fall migration surveys (Table D8, Appendix D). Black-capped Chickadee, Canada Goose (*Branta canadensis*), and Golden-crowned Kinglet (*Regulus satrapa*) were the most abundant species, while Common Raven (*Corvus corax*), Black-capped Chickadee, and Golden-crowned Kinglet were the most frequently observed species.

### Summary of Bird Surveys

The mature, mixed woods habitat at the Project site provides habitat for a number of migrant, breeding, and resident species throughout the year. The bird community at the Project site strongly reflects the forested nature as forest-dwelling species dominated the bird community at the Project

site in all seasons. The presence of mature forest species such as the Pileated Woodpecker and Barred Owl, combined with the presence of conifer associated species such as Golden-crowned Kinglet (*Regulus satrapa*) and Pine Siskin, suggest that the forests at the Project site offer a suitable mixture of softwoods and hardwoods and feature an old-growth component. Sheltered habitats allow for the Project site to maintain relatively high species diversity during the winter months, although habitat homogeneity limits species diversity during migration and breeding. No obvious migration corridors were indicated by the results of the surveys, nor were any significant features observed (clusters of fruit-bearing trees/shrubs, valleys, etc.) that might attract or concentrate migrating passerines.

The absence of water bodies within the Project site boundaries suggests it is unlikely that waterfowl use the Project site directly, although American Black Duck (*Anas rubripes*) and Canada Goose were observed flying over the Project site during the spring and fall migration, respectively. It is likely that these waterfowl pass over the Project site on the way to nearby Mill Lakes and Panuke Lake, or, in the case of the Canada Geese, to agricultural fields adjacent to Highway 14.

Similarly, the limited wetlands at the Project site likely accounted for the absence and/or low numbers of swamp associated species including Gray Jay (*Perisoreus canadensis*), Swamp Sparrow (*Melospiza georgiana*), and Common Yellowthroat (*Geothlypis trichas*), as well as aerial insectivores like Tree Swallow (*Tachycineta bicolor*).

Overall, there were 58 different species identified at or near the Project site during surveys conducted throughout the year, including ten species of conservation interest (Table 8.12, Drawing 8.7A-D).

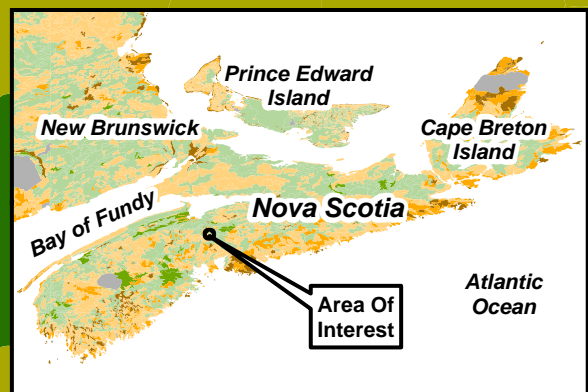
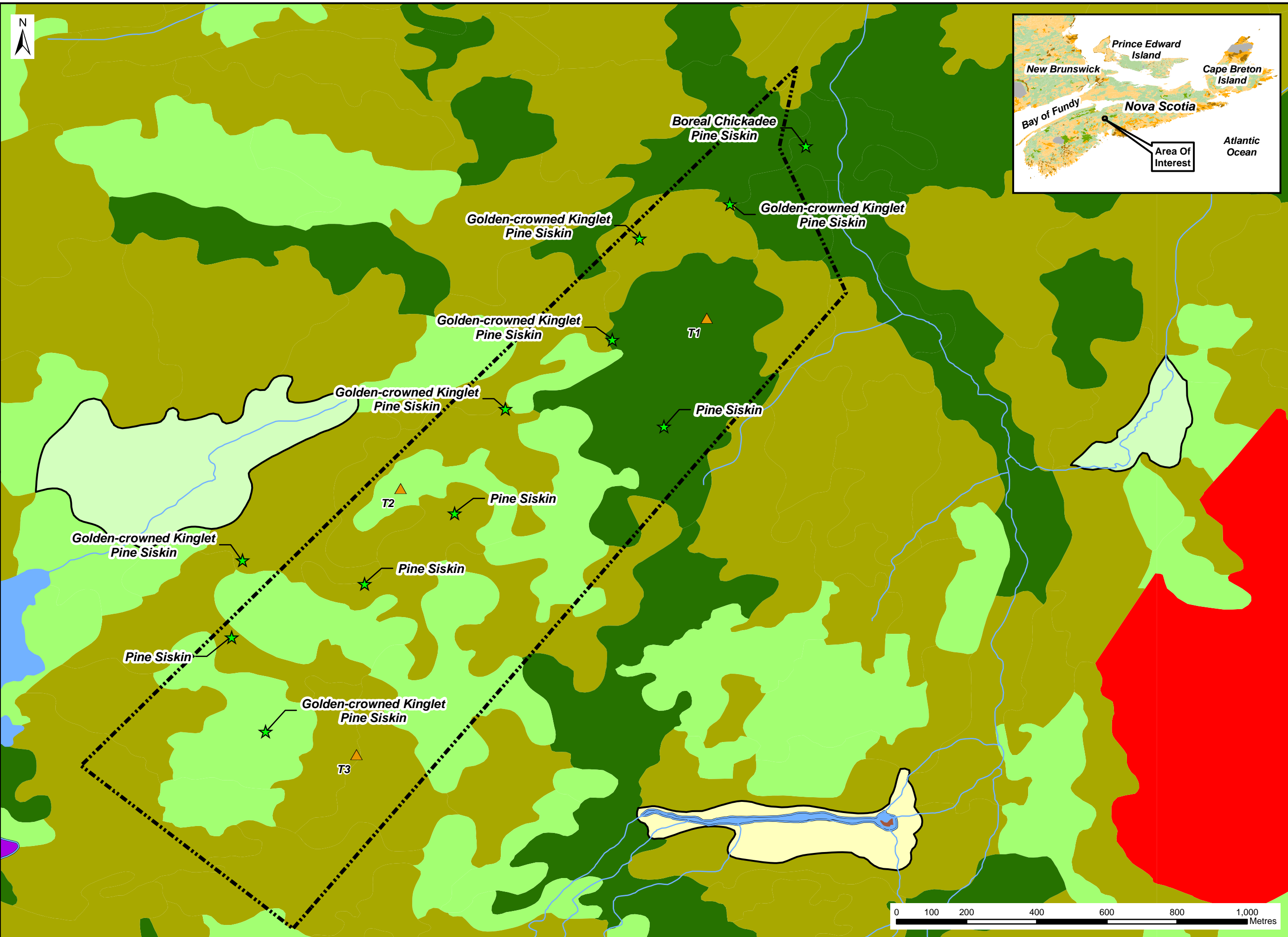
**Table 8.12: Species of Conservation Interest identified at the Project Site**

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSESA Status <sup>4</sup>	Survey Observed <sup>5</sup>
Black-backed Woodpecker	<i>Picoides arcticus</i>	Yellow	Not listed	Not listed	Not listed	SM
Boreal Chickadee	<i>Poecile hudsonicus</i>	Yellow	Not listed	Not listed	Not listed	W
Common Nighthawk	<i>Chordeiles minor</i>	Red	Threatened	Threatened	Threatened	B
Eastern Wood-pewee	<i>Contopus virens</i>	Yellow	Not listed	Not listed	Not listed	SM, B
Golden-crowned Kinglet	<i>Regulus satrapa</i>	Yellow	Not listed	Not listed	Not listed	W, SM, B FM
Gray Jay	<i>Perisoreus canadensis</i>	Yellow	Not listed	Not listed	Not listed	FM
Pine Grosbeak	<i>Pinicola enucleator</i>	Red	Not listed	Not listed	Not listed	FM
Pine Siskin	<i>Spinus pinus</i>	Yellow	Not listed	Not listed	Not listed	W, SM, B FM
Ruby-crowned Kinglet	<i>Regulus calendula</i>	Yellow	Not listed	Not listed	Not listed	SM, B FM

Common Name	Scientific Name	NSDNR Status <sup>1</sup>	COSEWIC Status <sup>2</sup>	SARA Status <sup>3</sup>	NSESA Status <sup>4</sup>	Survey Observed <sup>5</sup>
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	Yellow	Not listed	Not listed	Not listed	B

<sup>1</sup>NSDNR 2010; <sup>2</sup>COSEWIC 2012; <sup>3</sup>SARA 2012; <sup>4</sup>NSESA 2007

<sup>5</sup>W - winter; SM - spring migration; B - breeding; FM – fall migration



**Notes:**  
 1. Reference: Project Layout Provided by Client. Habitat Mapping by NSDNR 2011. Topographic Data by NS Geomatics Centre  
 2. Projection: NAD83 Zone 20N

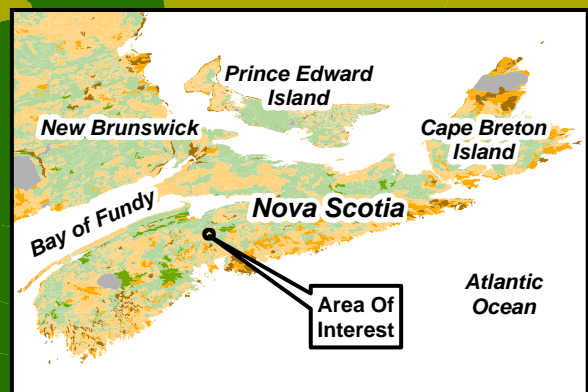
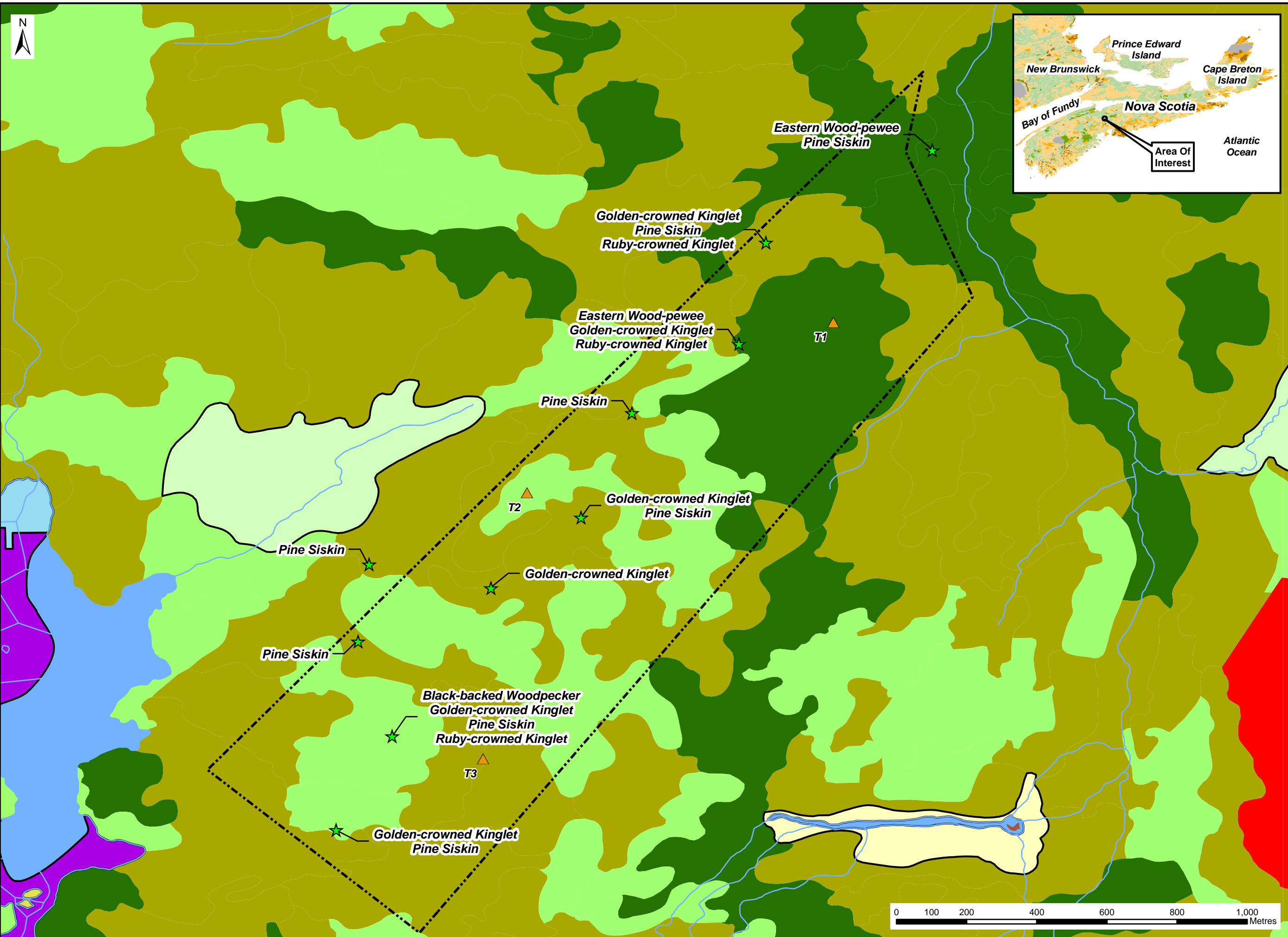
- Legend:**
- ★ Winter Priority Species Locations
  - ▲ Proposed Turbine Location
  - Watercourse
  - Roads
  - Highways
  - - - Project Site Boundary
  - Softwood
  - Mixedwood
  - Hardwood
  - Clear Cut
  - Treed Bog
  - Lake
  - Inland Water
  - Other
- NS DNR Wetland Inventory**
- Wetland Type**
- Bog or Fen
  - Fen
  - Marsh
  - Salt Marsh
  - Swamp
  - Water

**Priority Species Location  
 Winter Bird Surveys**



Date: January 2013	Project #: 12-4402
Scale: 1:10,000	Drawing #: <b>8.7A</b>
Drawn By: G. Gregory	
Checked By: M. Smith	





**Notes:**  
 1. Reference: Project Layout Provided by Client. Habitat Mapping by NSDNR 2011. Topographic Data by NS Geomatics Centre  
 2. Projection: NAD83 Zone 20N

- Legend:**
- ★ Spring Priority Species Locations
  - ▲ Proposed Turbine Location
  - Watercourse
  - Roads
  - Highways
  - - - Project Site Boundary
  - Softwood
  - Mixedwood
  - Hardwood
  - Clear Cut
  - Treed Bog
  - Lake
  - Inland Water
  - Other
- NS DNR Wetland Inventory**
- Wetland Type**
- Bog or Fen
  - Fen
  - Marsh
  - Salt Marsh
  - Swamp
  - Water

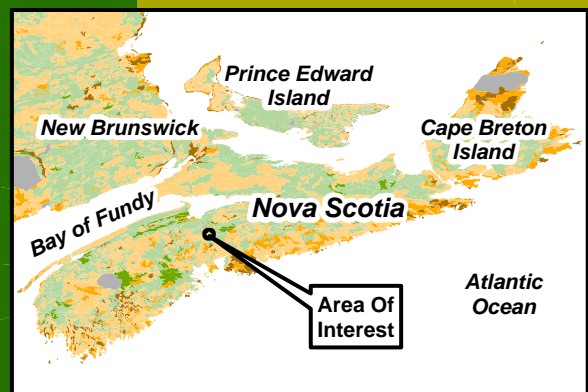
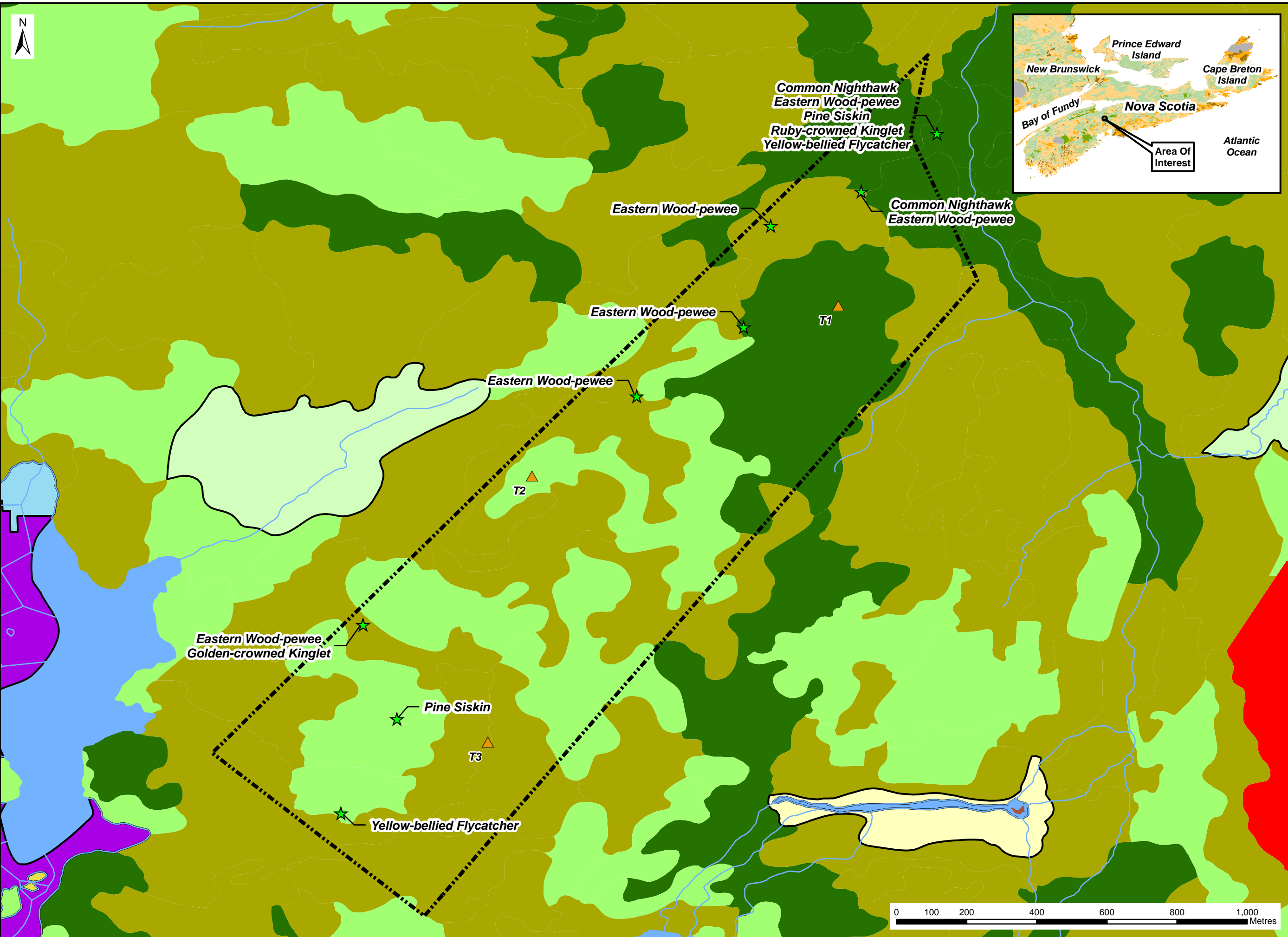
**Priority Species Location  
Spring Bird Surveys**



Date: January 2013	Project #: 12-4402
Scale: 1:10,000	Drawing #: <b>8.7B</b>
Drawn By: G. Gregory	
Checked By: M. Smith	







**Notes:**  
 1. Reference: Project Layout Provided by Client. Habitat Mapping by NSDNR 2011. Topographic Data by NS Geomatics Centre  
 2. Projection: NAD83 Zone 20N

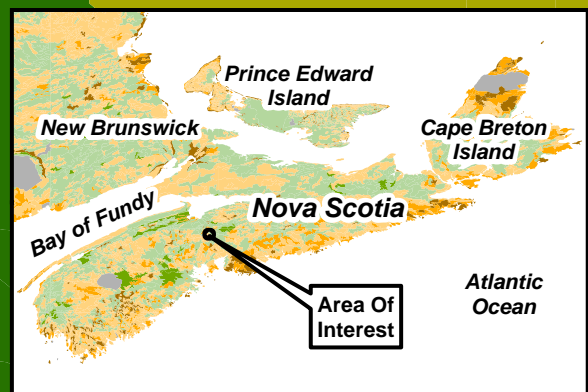
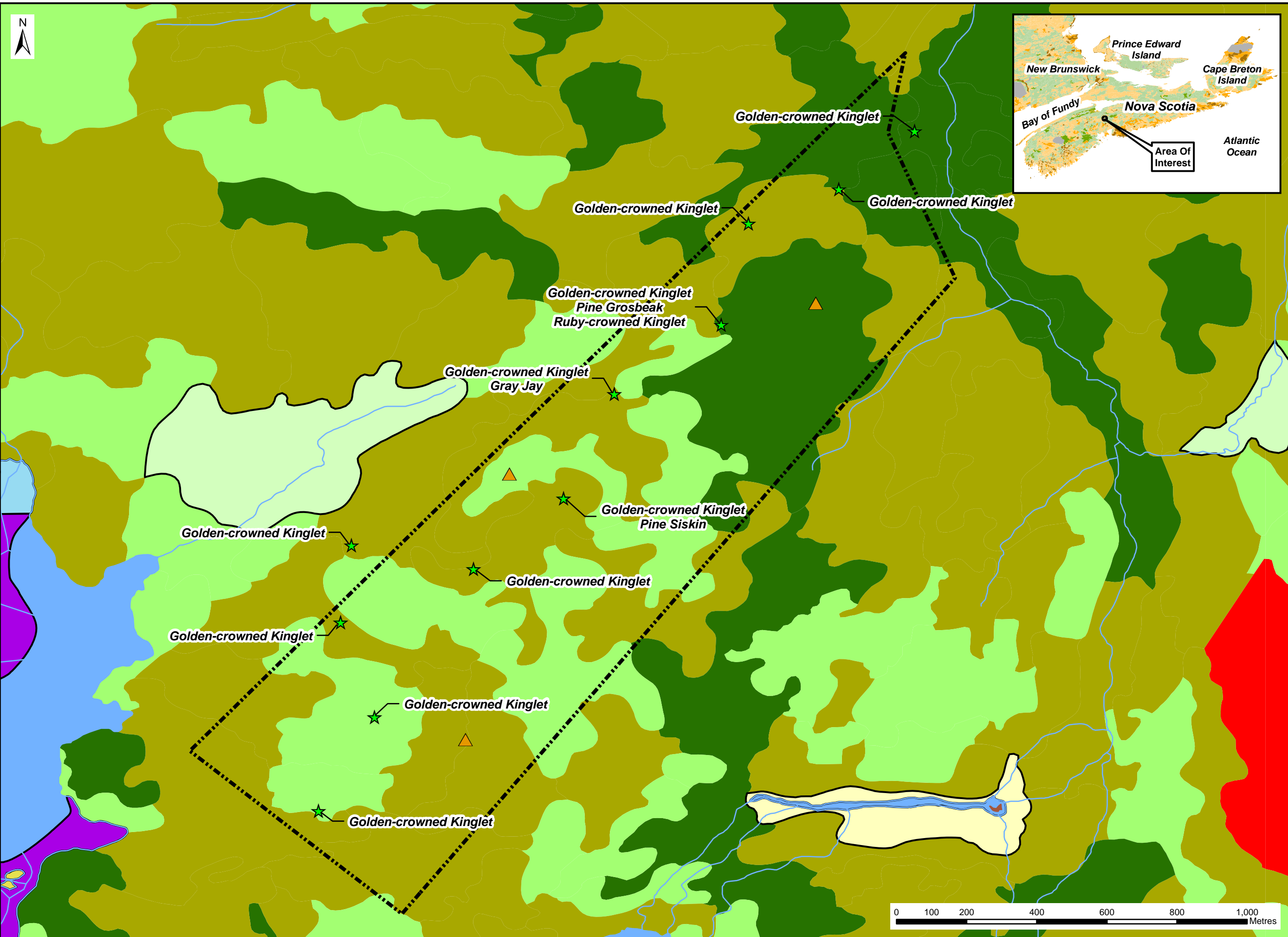
- Legend:**
- ★ Breeding Priority Species Locations
  - ▲ Proposed Turbine Location
  - Watercourse
  - Project Site Boundary
  - Roads
  - == Highways
  - Softwood
  - Mixedwood
  - Hardwood
  - Clear Cut
  - Treed Bog
  - Lake
  - Inland Water
  - Other
- NS DNR Wetland Inventory**
- Wetland Type**
- Bog or Fen
  - Fen
  - Marsh
  - Salt Marsh
  - Swamp
  - Water

**Priority Species Locations  
Breeding Bird Surveys**



Date: January 2013	Project #: 12-4402
Scale: 1:10,000	Drawing #: <b>8.7C</b>
Drawn By: G. Gregory	
Checked By: M. Smith	





**Notes:**  
 1. Reference: Project Layout Provided by Client. Habitat Mapping by NSDNR 2011. Topographic Data by NS Geomatics Centre  
 2. Projection: NAD83 Zone 20N

- Legend:**
- ★ Fall Priority Species Locations
  - ▲ Proposed Turbine Location
  - Watercourse
  - Roads
  - Highways
  - - - Project Site Boundary
- NS DNR Wetland Inventory**
- Wetland Type**
- Bog or Fen
  - Fen
  - Marsh
  - Salt Marsh
  - Swamp
  - Water
  - Softwood
  - Mixedwood
  - Hardwood
  - Clear Cut
  - Treed Bog
  - Lake
  - Inland Water
  - Other

**Priority Species Locations  
Fall Bird Surveys**



Date: January 2013	Project #: 12-4402
Scale: 1:10,000	Drawing #: <b>8.7D</b>
Drawn By: G. Gregory	
Checked By: M. Smith	

