TABLE D-1 Breeding Status and Population Status of Birds Recorded in the Project Area and the MBBA Square within which the Project Area is Located.

Scientific Name	Common Name	Breeding Status (BBA Data)	Breeding Status (Field Survey)	ACCDC Rank	NSDNR Rank	SARA Rank (COSEWIC Status)
Accipiter striatus	Sharp-shinned Hawk	Possible	Yes	S4B	Green	-
Actitis macularia	Spotted Sandpiper	Confirmed	No	S5B	Green	-
Agelaius phoeniceus	Red-winged Blackbird	Confirmed	Yes	S5B	Green	-
Aix sponsa	Wood Duck	Confirmed	No	S4B	Green	-
Ammodramus nelsoni	Nelson's Sharp-tailed Sparrow	Confirmed	Yes	S3B	Green	-
Anas acuta	Northern Pintail	Confirmed	Yes	S2B	Green	-
Anas americana	American Wigeon	Confirmed	Yes	S4B	Green	-
Anas clypeata	Northern Shoveler	Confirmed	Yes	S2B	Green	-
Anas crecca	Green-winged Teal	Confirmed	Yes	S5B	Green	-
Anas discors	Blue-winged Teal	Confirmed	Yes	S4B	Green	-
Anas platyrhynchos	Mallard	Probable	Yes	S5B	Green	-
Anas rubripes	American Black Duck	Confirmed	Yes	S5B	Green	-
Anas strepera	Gadwall	Probable	Yes	S2B	Green	-
Archilochus colubris	Ruby-throated Hummingbird	Confirmed	No	S5B	Green	-
Ardea herodias	Great Blue Heron	Possible	Yes	S5B	Green	-
Asio flammeus	Short-eared Owl	Possible	Yes	S1S2B	Yellow	Special Concern (COSEWIC Special Concern)
Aythya collaris	Ring-necked Duck	Confirmed	No	S5B	Green	-
Bartramia longicauda	Upland Sandpiper	Probable	No	SAB	Accidental	-
Bombycilla cedrorum	Cedar Waxwing	Confirmed	No	S5B	Green	-
Bonasa umbellus	Ruffed Grouse	Confirmed	No	S5	Green	-
Botaurus lentiginosus	American Bittern	Confirmed	Yes	S4B	Green	-
Branta canadensis	Canada Goose	Confirmed	Yes	S4B	Green	-
Bubo virginianus	Great Horned Owl	Confirmed	No	S5	Green	-
Buteo jamaicensis	Red-tailed Hawk	Possible	No	S5B	Green	-
Carduelis pinus	Pine Siskin	Probable	No	S5	Green	-
Carduelis tristis	American Goldfinch	Confirmed	Yes	S5	Green	-
Carpodacus purpureus	Purple Finch	Confirmed	No	S5B	Green	-
Catharus guttatus	Hermit Thrush	Possible	No	S5B	Green	-
Catharus ustulatus	Swainson's Thrush	Probable	No	S5B	Green	-
Catoptrophorus semipalmatus	Willet	Possible	No	S4B	Green	-
Certhia Americana	Brown Creeper	Possible	No	S5	Green	-
Ceryle alcyon	Belted Kingfisher	Probable	No	S5B	Green	-
Chaetura pelagica	Chimney Swift	Probable	No	S4B	Yellow	No Status (COSEWIC Threatened)
Charadrius vociferus	Killdeer	Probable	Yes	S5B	Green	-
Chlidonias niger	Black Tern	Confirmed	No	S1B	Green	-
Chordeiles minor	Common Nighthawk	Possible	No	S4B	Yellow	No Status (COSEWIC Threatened)
Circus cyaneus	Northern Harrier	Confirmed	Yes	S5B	Green	-
Cistothorus palustris	Marsh Wren	Confirmed	No	S2B	Green	-
Coccothraustes vespertinus	Evening Grosbeak	Probable	No	S5	Green	-
Coccyzus erythropthalmus	Black-billed Cuckoo	Possible	No	S3B	Green	-
Colaptes auratus	Northern Flicker	Confirmed	No	S5B	Green	-
Columba livia	Rock Dove	Confirmed	Yes	SEB	Exotic	-
Contopus cooperi	Olive-sided Flycatcher	Possible	No	S4B	Yellow	No Status (COSEWIC Threatened)
Contopus virens	Eastern Wood-Pewee	Possible	No	S4B	Green	-
Corvus brachyrhynchos	American Crow	Confirmed	Yes	S5	Green	-

TABLE D-1 Breeding Status and Population Status of Birds Recorded in the Project Area and the MBBA Square within which the Project Area is Located.

Scientific Name	Common Name	Breeding Status (BBA Data)	Breeding Status (Field Survey)	ACCDC Rank	NSDNR Rank	SARA Rank (COSEWIC Status)
Corvus corax	Common Raven	Confirmed	Yes	S5	Green	-
Coturnicops noveboracensis	Yellow Rail	Possible	No	SAB	Accidental	Special Concern (COSEWIC Special Concern)
Cyanocitta cristata	Blue Jay	Confirmed	Yes	S5	Green	-
Dendroica castanea	Bay-breasted Warbler	Possible	No	S5B	Green	-
Dendroica coronata	Yellow-rumped Warbler	Probable	No	S5B	Green	-
Dendroica fusca	Blackburnian Warbler	Possible	No	S4S5B	Green	-
Dendroica magnolia	Magnolia Warbler	Probable	No	S5B	Green	-
Dendroica palmarum	Palm Warbler	Possible	No	S5B	Green	-
Dendroica pensylvanica	Chestnut-sided Warbler	Possible	No	S5B	Green	-
Dendroica petechia	Yellow Warbler	Confirmed	No	S5B	Green	-
Dendroica striata	Blackpoll Warbler	Possible	No	S4B	Green	-
Dendroica tigrina	Cape May Warbler	Probable	No	S4B	Green	-
Dendroica virens	Black-throated Green Warbler	Possible	No	S5B	Green	-
Dendroica caerulescens	Black-throated Blue Warbler	Possible	No	S4B	Green	-
Dolichonyx oryzivorus	Bobolink	Probable	Yes	S3B	Yellow	-
Dryocopus pileatus	Pileated Woodpecker	Possible	No	S5	Green	-
Dumetella carolinesis	Gray Catbird	Probable	No	S5B	Green	-
Empidonax alnorum	Alder Flycatcher	Probable	No	S5B	Green	-
Empidonax flaviventris	Yellow-bellied Flycatcher	Possible	No	S5B	Green	-
Empidonax minimus	Least Flycatcher	Possible	No	S5B	Green	-
Euphagus carolinus	Rusty Blackbird	Possible	No	S3B	Yellow	No Status (COSEWIC Special Concern)
Falco columbarius	Merlin	Possible	Yes	S4B	Green	-
Falco sparverius	American Kestrel	Possible	Yes	S5B	Green	-
Fulica americana	American Coot	Confirmed	No	S2B	Green	-
Gallinago gallinago	Common Snipe	Probable	No	S5B	Green	-
Gallinula chloropus	Common Moorhen	Confirmed	No	S1B	Green	-
Gavia immer	Common Loon	Confirmed	No	S4B,S4N	Yellow	-
Geothlypis trichas	Common Yellowthroat	Probable	No	S5B	Green	-
Haliaeetus leucocephalus	Bald Eagle	Possible	Yes	S5B,S4N	Green	-
Hirundo pyrrhonota	Cliff Swallow	Confirmed	No	-	Green	-
Hirundo rustica	Barn Swallow	Confirmed	Yes	S4B	Yellow	-
Junco hyemalis	Dark-eyed Junco	Probable	No	S5	Green	-
Loxia leucoptera	White-winged Crossbill	Possible	No	S5	Undetermined	-
Melospiza georgiana	Swamp Sparrow	Confirmed	No	S5B	Green	-
Melospiza melodia	Song Sparrow	Confirmed	Yes	S5B	Green	-
Mimus polyglottos	Northern Mockingbird	Probable	No	S3B	Green	-
Mniotilta varia	Black-and-white Warbler	Probable	No	S5B	Green	-
Molothrus ater	Brown-headed Cowbird	Confirmed	No	S4B	Green	-
Nycticorax nycticorax	Black-crowned Night-Heron	Possible	No	S1B	Yellow	-
Oporornis philadelphia	Mourning Warbler	Possible	No	S5B	Green	-
Pandion haliaetus	Osprey	Confirmed	No	S5B	Green	-
Parula americana	Northern Parula Warbler	Probable	No	S5B	Green	-
Parus atricapillus	Black-capped Chickadee	Probable	Yes	S5	Green	-
Parus hudsonicus	Boreal Chickadee	Confirmed	No	S3S4	Yellow	-
Passer domesticus	House Sparrow	Confirmed	No	SE	Exotic	-
Passerculus sandwichensis	Savannah Sparrow	Probable	Yes	S5B	Green	-
Phalaropus tricolor	Wilson's Phalarope	Probable	No	SAB	Accidental	-
Phasianus colchius	Ring-necked Pheasant	Confirmed	Yes	SEB	Exotic	-
Pheucticus ludovicianus	Rose-breasted Grosbeak	Confirmed	No	S4B	Green	-

TABLE D-1 Breeding Status and Population Status of Birds Recorded in the Project Area and the MBBA Square within which the Project Area is Located.

Scientific Name	Common Name	Breeding Status (BBA Data)	Breeding Status (Field Survey)	ACCDC Rank	NSDNR Rank	SARA Rank (COSEWIC Status)
Picoides arcticus	Black-backed Woodpecker	Possible	No	S4	Green	-
Picoides pubescens	Downy Woodpecker	Probable	No	S5	Green	-
Picoides villosus	Hairy Woodpecker	Possible	No	S5	Green	-
Podilymbus podiceps	Pied-billed Grebe	Confirmed	Yes	S4B	Green	-
Porzana carolina	Sora	Confirmed	No	S4B	Green	-
Progne subis	Purple Martin	Confirmed	No	S1B	Red	-
Quiscalus quiscula	Common Grackle	Confirmed	Yes	S5B	Green	-
Rallus limicola	Virginia Rail	Confirmed	No	S2B	Green	-
Regulus calendula	Ruby-crowned Kinglet	Probable	No	S5B	Green	-
Regulus satrapa	Golden-crowned Kinglet	Confirmed	No	S5B	Green	-
Riparia riparia	Bank Swallow	Confirmed	No	S4B	Green	-
Scolopax minor	American Woodcock	Confirmed	No	S4S5B	Green	-
Seiurus aurocapillus	Ovenbird	Probable	No	S5B	Green	-
Seiurus noveboracensis	Northern Waterthrush	Possible	No	S5B	Green	-
Setophaga ruticilla	American Redstart	Confirmed	No	S5B	Green	-
Sitta canadensis	Red-breasted Nuthatch	Confirmed	No	S5	Green	-
Sitta carolinensis	White-breasted Nuthatch	Probable	No	S4	Green	-
Sphyrapicus varius	Yellow-bellied Sapsucker	Probable	No	S5B	Green	-
Spizella passerina	Chipping Sparrow	Confirmed	No	S5B	Green	-
Sterna hirundo	Common Tern	Probable	No	S3B	Yellow	-
Sturnus vulgaris	European Starling	Confirmed	Yes	SE	Exotic	-
Tachycineta bicolor	Tree Swallow	Confirmed	Yes	S5B	Green	-
Troglodytes troglodytes	Winter Wren	Possible	No	S5B	Green	-
Turdus migratorius	American Robin	Confirmed	Yes	S5B	Green	-
Tyrannus tyrannus	Eastern Kingbird	Probable	No	S4B	Green	-
Vermivora peregrina	Tennessee Warbler	Probable	No	S5B	Green	-
Vermivora ruficapilla	Nashville Warbler	Possible	No	S5B	Green	-
Vireo olivaceus	Red-eyed Vireo	Probable	No	S5B	Green	-
Vireo solitarius	Solitary Vireo	Possible	No	S5B	Green	-
Wilsonia canadensis	Canada Warbler	Probable	No	S4B	Yellow	-
Wilsonia pusilla	Wilson's Warbler	Possible	No	S4B	Green	-
Zenaida macroura	Mourning Dove	Probable	Yes	S5B	Green	-
Zonotrichia albicollis	White-throated Sparrow	Probable	No	S5B,SZN	Green	-

Key:

ACCDC Ranking

S1: Extremely rare. S2: Rare. S3: Uncommon. S4: fairly common. S5: Secure. S#S#: A range between two consecutive numeric ranks. Denotes range of uncertainty about the exact rarity of the element (e.g., S1S2). B: Breeding. SH: Historical and suspected to be still extant. SU: Unrankable: Possibly in peril throughout its range in the province, but status uncertain; need more information. SX: Extinct/Extirpated: Element is believed to be extirpated within the province. S?:Unranked: Element is not yet ranked. SZ: Zero occurrences: Not of practical conservation concern in the province, because there are no definable occurrences, although the species is native and appears regularly. NZ: Long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations) or transitory.

NSDNR Ranking

Red: Known to be or thought to be at risk. Yellow: Sensitive to human activities or natural events. Green: Not believed too be sensitive, or at risk. Not Assessed: Known or believed to be present in Nova Scotia but yet unassessed. Undetermined: Insufficient data exists to determine status. Exotic: Introduced as a result of human activity.

COSEWIC Ranking

Endangered: Species facing imminent extirpation or extinction. Threatened: Species likely to become endangered if limiting factors are not reversed. Special Concern: Species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats. Data Deficient: A category that applies when the available information is insufficient to resolve a wildlife species' eligibility for assessment or to permit an assessment of the wildlife species' risk of extinction. Not at Risk: Species that has been evaluated and found to be not at risk of extinction given the current circumstances.

Avian Surveys Relating to a Proposed Wind Farm in West Amherst, Cumberland County Nova Scotia

Final Report - April 2006

John Wile

Contents

Summary

Wind Dynamics Inc, (WDI) and Acciona Wind Energy Canada Inc. (Acciona) are proposing to develop a wind farm near Amherst, Nova Scotia. This project is subject to the *Canadian Environmental Assessment Act* and the Nova Scotia *Environment Act*. To help provide information necessary for the project's environmental assessment, Wind Dynamics Inc. retained the author to undertake surveys for the purpose of collecting data on the birds and their movements prior to the construction of the wind farm.

Most of the survey area is a diked and drained salt marsh, dominated by intensively managed sod fields, along with small patches of hay, grain or unused tall grass or shrub cover. The area also contains a multitude of infrastructure, including a twinned section of the Trans Canada Highway, a secondary highway, main CN rail line and power transmission lines. The open grasslands, with their juxtaposition in the Upper Bay of Fundy on the Isthmus of Chignecto, provide habitat to a variety of bird species. Birds also migrate across the Isthmus, from the Northumberland Strait to the Bay of Fundy and vice versa in spring and fall, but little existing information is available about the extent of migration as it pertains to this most southerly part of the Isthmus.

These surveys were conducted to determine what species of birds are present and how they use the ground and air space within and adjacent to the study area, throughout the seasons. Some attempt was made to relate the findings here to long term data that exist on seasonal use by birds of the Isthmus of Chignecto.

A total of 203 hours of observation during 68 individual surveys resulted in 59 bird species being identified during 827 sightings involving over 20,000 birds. Nearly 80% of the birds were observed either on the ground or at a height of less than 30m, with only 5% over 100m. The La Planche River (tidal and non-tidal sections) and the adjacent salt marsh and estuary accounted for 36% of the total bird sightings and 53% of the total individual bird numbers, making this an important habitat within the study area. The large central grassland (non-wetland) section, which makes up most of the study area, accounted for about 30% of the bird activity. Only 2.5% of the sightings and 0.5% of the total bird numbers were seen using the 100m wide (hypothetical) travel corridor that connects the non-tidal section of the La Planche River to the John Lusby salt marsh.

Adjacent pasture and hayland to the north of the sod farm is also being considered as a location for wind turbines. Although not formally surveyed until November 2005, it would appear that the habitat is similar and the data collected on the sod farm would be applicable to this area also. However, supplemental surveys of the area during spring or late summer to monitor for Peregrine Falcon and Short-eared Owl use might be a wise precaution.

1. Introduction

Avian surveys were conducted by wildlife biologist / consultant John Wile, from January 21, 2005 until January 18, 2006, at the request of Wind Dynamics Inc. The surveys generally followed a protocol (Appendix 1) set out by an ad hoc advisory committee made up of Canadian Wildlife Service biologists, with input from Ducks Unlimited Canada. The purpose of the surveys was to obtain pre-construction data on bird activity within the area of a proposed wind farm.

2. Brief Description of Study Area

Figure 1 shows the approximately 630 hectare study area which is located just to the west of the town of Amherst at the head of the Bay of Fundy. The entire area is below sea level, but protected from the Bay of Fundy tides by extensive dikes and tide gates (aboiteau). The alluvial soils consist of heavy marine silts and an elaborate system of internal ditching and contour land forming has been used to convert this former salt marsh into farm land. Most of the area (800 ac or 323.7 ha) is used for growing sod and is owned by Maritime Sod Ltd. This intensively managed horticultural crop has been harvested since the early 1970's and appears to be sustainable as each harvested sod layer and subsequent cultivation allows for a decompression of the soil so that the land level does not seem to be getting lower over time.

A limited amount of grain and hay (< 100 acres; 40 ha) is grown either in rotation to supply much needed organic matter to the sod-farmed land or on land not owned by Maritime Sod. As well, the study area has patches of rough cover that are not suitable for sod production or are not owned by Maritime Sod Limited. Wetland habitat exists in the form of ditches, irrigation ponds and the main La Planche River that has two distinct ecological components – freshwater and tidal, created and separated by a tide gate.

From a landscape perspective, the study area is situated at the head of the Bay of Fundy east of and adjacent to the John Lusby National Wildlife Area, a large complex of salt marsh and tidal creeks and estuaries. Additional diked farmland stretches to the east and at the upper end of this so-called Amherst Marsh is a 3200 acre (1295 ha) managed freshwater wetland. Other Ducks Unlimited managed wetlands exist to the north and east of the study area. Urban and rural homes, properties and businesses surround the study area to the south. Across the La Planche River to the north is more diked farmland in the form of pasture and hay. The Trans Canada Highway running north and south bisects the area into east and west sectors. The main CN railroad line runs parallel to a secondary road and a major power line runs diagonally across the study area, adding to the already busy assortment of infrastructure found in the area. Few if any trees exist on the study area, except for a few wire birch or shrubs.

Those species of birds adapted to this flat, treeless, windswept, grass-dominated environment were expected to use the area on a seasonal basis for feeding, resting or breeding purposes. Little quantitative or qualitative data existed on how birds used the air space over the study area either during migration or during daily flights to adjacent habitats.

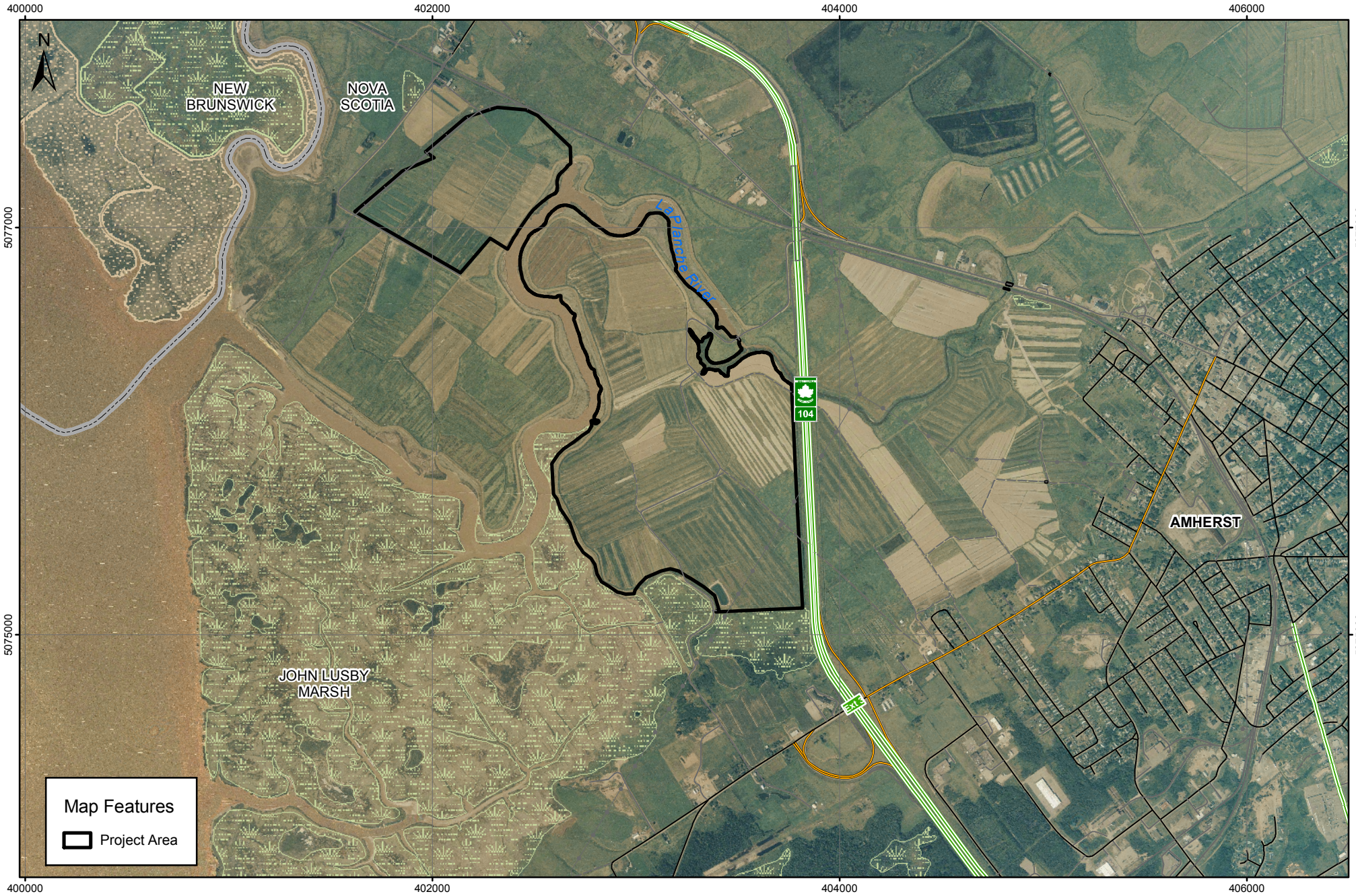


Figure 1

West Amherst, Nova Scotia - Main Study Area

Map Parameters
Projection: UTM-NAD83-Z20
Scale 1:25,000
Date: March 28, 2008
Project No.: 1005774

0 250 500 1,000 1,500 2,000 Metres

acciona Energy

Jacques Whitford

3. Methodology

The original protocol called for 3 hour ground surveys each week during winter and more intense 6 hour per week surveys during migration peaks. Originally, the plan was to conduct the three hour surveys in short blocks of time during the morning, mid and late day period. However, for practical reasons, the surveys were done, for the most part, in a continuous 3 hour time frame. Although some surveys were conducted both during the early morning and late evening, late morning or early afternoon surveys were just as productive. The tide cycle seemed to be an important factor driving bird use, with an incoming tide or a high tide resulting in more bird activity. Visibility was good and vocalization was largely not required to identify birds, except for the Sharp-tailed Sparrow. However, bird vocalization often alerted the observer to birds that were flying overhead, especially on day with light wind conditions.

Due to the seasonal difficulty in traveling through the area, transects or fixed observation stations were not used. While the survey route and observation points varied throughout the seasons, each survey did cover the approximately 630 hectare study area to the extent possible and the general effort could be duplicated if necessary in the future. The three hour survey time is sufficient to cover the entire study area and because of the flat open nature of the study area, flying birds could be seen and identified from great distances. It was felt that the 6 hour per week survey was not necessary once spring migration was over and breeding birds occupied the study area. This period was roughly from mid June until late July.

Efforts were made to understand peak migration periods on the Isthmus of Chignecto to ensure that surveys were conducted during this period. In addition to field guides and the Maritime Breeding Bird Atlas, reference was made to a recent publication by Erskine and McMannus (2005) to help understand the timing and historical use of the area by birds, in an effort to help identify some bird species and to help understand how these surveys may relate to longer term data set.

It was felt that an overland aerial travel route may be used by birds to short circut a large meander in the river. Therefore, particular attention was given to a 100 m wide corridor, running west from the La Planche River Bridge on the Trans Canada Highway, located above the tidal barrier, to reconnect with the tidal river within the John Lusby National Wildlife Area. Observations were noted at other major points within the study area, because they were either obvious habitat changes or they were separate sections divided by highways or other linear features. These included: the southern upland edge, central sod farm area, over or close to the tidal river, east of the Trans Canada highway and bird “hot spots’ such as the sewer outfall or tidal gate area or large areas of unused cover containing tall grasses or shrubs.

The original study area was restricted to land on both the east and west sides of the Trans Canada Highway owned by Maritime Sod Ltd. However, occasional visits were made to surrounding or adjacent habitats outside of the original study area to help determine what species of birds may be there or to look for early migrating arrivals. As mentioned above,

the flat open, treeless landscape enabled birds to be seen at great distances and most of these observations were recorded. In particular, bird use of the salt marsh and estuary habitat was recorded. Habitats to the north and west of the original study area were visited on occasion and general bird use of air space over these pasture and hay fields was noted. From November 2005 until January 18, 2006, survey time was devoted to these areas, in anticipation that they too may become sites for wind turbines.

4. Results and Discussion

4.1 Survey Effort

Surveys generally followed the suggested protocol, but were adjusted somewhat as a reflection of bird activity and seasonal conditions. A total of 68 individual surveys generated 203 hours of observation (Table1).

Table 1: Survey Effort

Season	Time Frame	# Surveys	Hours
Winter	January 21 – April 7, 2005 and December 1, 2005 – January 18, 2006	20	60
Spring	April 13 – May 25, 2005	8	24
Summer	June 2 – August 28, 2005	18	53
Fall	September 2 – November 25, 2005	22	66
Total		68	203

4.2 General results and presentation of data

A total of 59 bird species were observed during the survey period and are listed in Table 2. The 68 surveys resulted in 827 individual sightings (single birds and flocks) involving 20,677 birds (Table 3). While effort was made to avoid counting the same birds twice during each daily survey, it was impossible to know how many times the same birds may have been counted during the entire seasonal or yearly survey period.

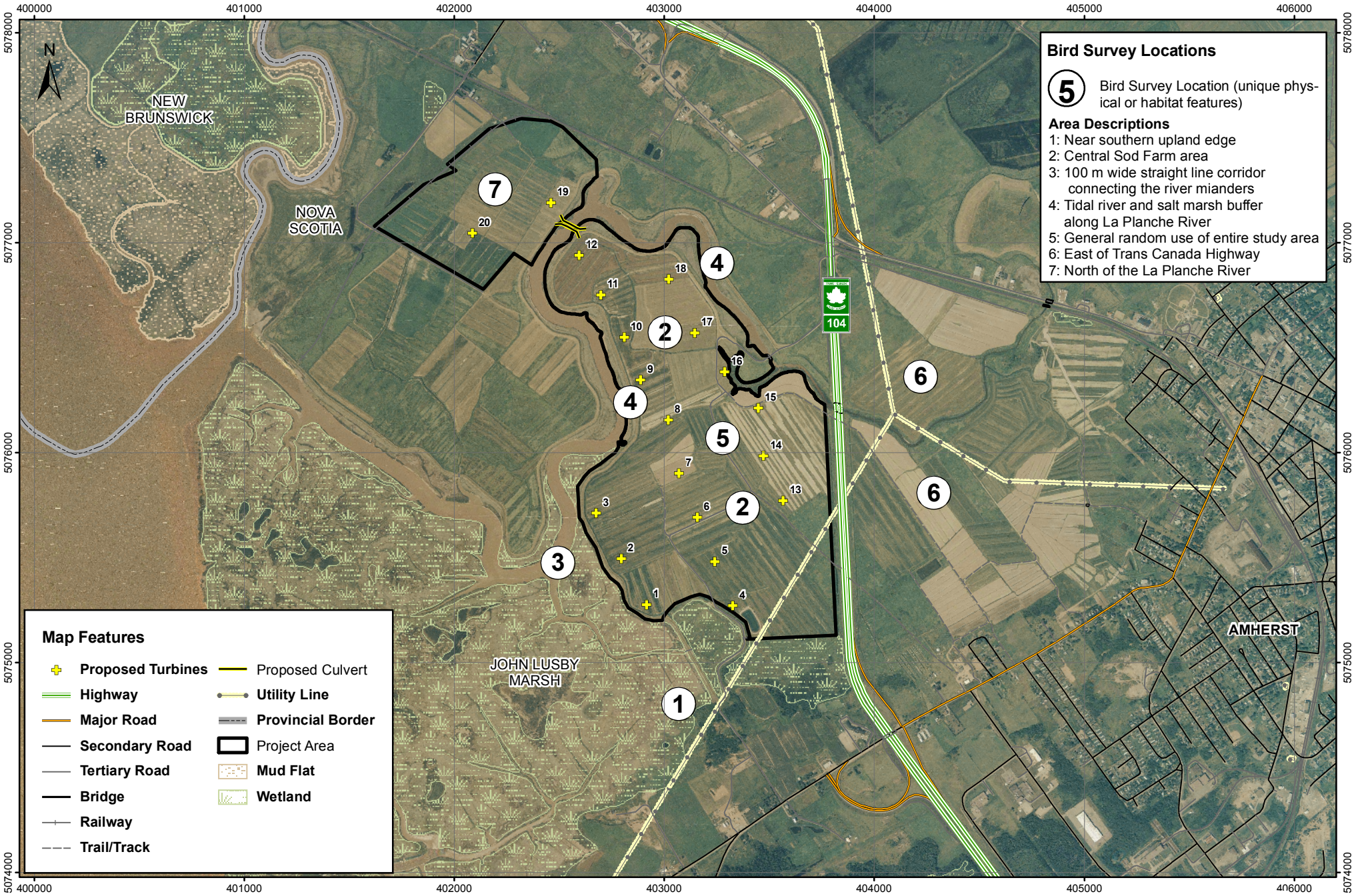
The data were sorted into five major bird groups for further discussion: Waterfowl, Waterbirds, Raptors, Shorebirds and Landbirds. In some tables, the data are presented as percentages of observations and percentages of individual birds, to help reduce the bias that large flocks can create.

Tables 3 and 4 indicate the seasonal use of the study area by birds. The largest number of total sightings (292) and bird numbers (11,096) as well as the largest percent of the total sightings (35.3%) and percent of total birds (53.6%) were seen during the fall survey period. This is heavily influenced by the presence of shorebirds and waterfowl that use the region as a staging or migration stop during the long fall period. Spring had the fewest number of sightings and birds of all the seasons, although this is partly explained by the fewer surveys undertaken for this time period.

Tables 5 - 8 deal with flight height and 4 categories were used: not flying; < 30 m; 30m to 100m; and > 100m. Data for each of the 5 major bird groups are presented for each of the flight heights for all seasons combined (Tables 5 & 6) and for each of four seasons (Tables 7 & 8). A more detailed discussion for each bird group with regards to flight height is incorporated in the discussion below. However, it can be noted that generally speaking, the area does not seem to be a major flight path for migrating birds or for birds traveling over the study area to get to some other location. Nearly 80% percent of the observations and individual birds were seen on the ground or at a height of less than 30 metres, with only 5% observed at over 100 m. Most of the waterfowl were seen resting or foraging in the tidal river. The shorebirds used the tidal river for foraging and the central area for roosting during high tide, both of which place the birds on the ground. Obviously, the birds seen on the ground had to have occupied air space to get there. Most of the birds seen on the ground flew when disturbed, but stayed close to the ground (< 30m) and usually flew to another similar habitat close by to land and resume feeding or resting.

Tables 9 and 10 are designed to help answer the questions of where, within the study area, were the birds seen. The study area was divided into 7 locations to help determine what parts of the area may be more important (Figure 2). These 7 areas are: (1) near the southern upland edge: (2) the central sod farm area; (3) within a 100 metre wide east / west corridor through the study area, thought to be a flight path; (4) over the tidal river or salt marsh: (5) random use of the area; (6) east of the Trans Canada Highway; and, (7) on the diked farmland and pasture on the north side of the La Planche River (Atkinson and other properties). It should be noted that during the course of the year long survey period, the random category (5) was disregarded and the observations plugged into other locations. The Atkinson and other properties (Area 7) received only brief survey until November of 2005, when it was then included regularly as a part of the remaining fall and winter surveys.

It is important to note that the tidal section of the La Planche River and the salt marsh adjacent to it (including the John Lusby salt marsh) received 36% of the total bird sightings and 53% of the total bird numbers. Nearly 30% of the bird sightings and total number were seen in the large central area (Area 2), but this is mainly due to the fact that the central area represents a very large percentage of the total surface area being studied. Only 2.5% of the sightings and 0.5% of the total bird numbers were seen using the 100 m wide travel corridor connecting the non tidal section of the La Planche River to the John Lusby salt marsh. Therefore, this area is not as important to birds as anticipated.



Map Parameters
Projection: UTM, NAD83, Zone 20
Scale 1:24,000
Date: January 2008
Project No.: 1005774.

Figure 2

West Amherst Bird Suvey Location Map

0 250 500 1,000 1,500 2,000
Meters

acciona Energy

Jacques Whitford

5. Discussion by Bird Groups

The following is a discussion of 5 major bird groups, including peak numbers, how they used the study and surrounding areas, both on the ground and in the air and how the observations relate to the long term (1930 – 2000) data presented by Erskine and McMannus (2005).

5.1 Waterfowl

5.1.1 Species, numbers

A total of 282 observations resulted in 6718 individual birds, representing 11 waterfowl species. Individual numbers of Green-winged Teal were the most abundant followed by Canada Goose, American Black Duck, Mallard, Blue-winged Teal, Gadwall, American Wigeon, Northern Pintail, Northern Shoveler, Brant and Common Merganser. Peak numbers of Green-winged Teal were recorded in April (125 – many appeared to be breeding pairs) and in late September (200-250). The other large dabbler ducks were present in lesser numbers, often in mixed groups. A late spring / early summer migrating flock of Brant was seen on June 6th, flying east, several hundred metres above the study area near the upland edge. The only waterfowl species seen during the winter survey period were Common Merganser, American Black Duck and Green-winged Teal. American Black Duck and Green-winged Teal were first observed in late March, with the other species showing up in April.

5.1.2 Use of ground and air space within the study area

Seasonal use
Summer and fall accounted for over 60% of the observations of birds in the waterfowl group, but fall itself accounted for nearly 60% of the individual birds, due mainly to the long fall period and staging use by Green-winged Teal.

Location
Preferring wetland areas, 70% -80% of waterfowl observations and individual birds were in the river (tidal and non tidal) and the salt marsh. During spring, breeding pairs were seen scattered in small numbers in small ditches or ponds. Geese used the fields in spring and fall for foraging, but ducks were seldom seen on land. A group (up to 120) of goslings and adult geese were seen either in the study area or in the tidal section of the river during June and July. Broods of Mallard, Green-winged Teal, Blue-winged Teal and Canada Goose were observed, indicating that the area was used as breeding or brood rearing habitat for these species. The section of river immediately below the tide gate was a concentration area for waterfowl due, in part, to the sewer outfall as a food source. While waterfowl occasionally used the monitored flight corridor, this was not a common flight path.

Flight heights and patterns
Between 80% and 90% of the waterfowl observed were not flying, but rather resting or foraging in the river. Those that were seen in flight preferred to follow the twists and turns of the river near the western and northern edges of the study area. Most waterfowl that were seen flying near, over or in the study area were below an estimated 100 metres, more often in the 30 to 100m range. Flocks of Canada Geese were observed gaining altitude to well above 100 metres when traveling east from the salt marshes, presumably in response to the power line and Trans Canada Highway.

5.1.3 Use of surrounding habitats

The salt marsh and estuary habitat adjacent to the study area to the west was used by waterfowl, especially during the late summer and early fall. Flocks were often seen circling and landing in the salt marsh ponds and creeks. Waterfowl were not seen routinely traveling from the salt marsh over the study area to the large freshwater wetlands to the east, as predicted, but more often seemed to leave the salt marsh in a southerly direction, perhaps going to a freshwater pond nearby or the freshwater marshes of the Amherst Point Migratory Bird Sanctuary. Migrating sea ducks were seen crossing the Isthmus of Chignecto, but not over the study site. Adjacent diked pasture and hay land to the north west of the study area did not seem to be a routine flight path either; however, waterfowl were often seen using salt marsh habitat close to or crossing over the western tip of the pasture, adjacent to the open tidal waters of the upper Bay of Fundy.

5.1.4 Listed or uncommon species

No listed species were observed and only the migrating flock of Brant would be considered unusual, since there have been no recent records of Brant in the area and none in June.

5.1.5 Comparison to long term observations

There have been some long term changes in waterfowl numbers in the region. In particular, there has been a decline in the spring staging numbers of Canada Geese, which historically had much larger spring staging populations (10,000 peak numbers in 1968) in the area and was one reason behind the establishment of the John Lusby National Wildlife Area. Increased numbers of spring staging geese in Prince Edward Island may account for the decline in spring staging numbers in the West Amherst area. There has been increased breeding activity of Canada Geese, probably as a result of introductions.

Over the past few decades there has been an increase in the species diversity of large dabbling ducks in the area, such as Mallard, Northern Pintail, American Wigeon and Gadwall. This has come about possibly due to Mallard releases, a natural eastward expansion of these species from the west and/or in response to the large managed freshwater wetlands built in the area that simulate western marshes.

5.2. Waterbirds

5.2.1 Species, numbers

The surveys resulted in 211 observations of waterbirds or 3217 individuals, representing 9 species: Pied-billed Grebe, Double-crested Cormorant, American Bittern, Great Blue Heron and 5 gull species (Ring-billed, Herring, Iceland, Glaucous and Great Black-backed). The 5 gull species accounted for most of the waterbird observations, but two large flocks (800 to 1000 birds in total) of cormorants (presumably Double-crested) were seen flying high (several hundred metres) over the study area in a westerly direction on October 22. These two cormorant sightings alone accounted for 30% of the total individual waterbirds.

5.2.2 Use of ground and air space within the study area

Seasonal use
Approximately 70%- 80% of all waterbird observations and individuals were seen during the summer and fall survey period. The gull species composition changed with the seasons, and was the only waterbird seen during winter. The Pied-billed Grebe was a single summer sighting; Double-crested Cormorants were seen only occasionally except for the large fall migrating flock mentioned above; American Bitterns were not common and seen only in summer; Great Blue Herons were seen on a regular basis from June until the end of November (peak count in August of 15 birds); Herring and Great Black-backed Gulls were seen in all seasons, while Ring-billed Gulls were present from the end of July to the time of writing (peak September to October 125+); Iceland Gulls were present during fall and winter and Glaucous Gulls were seen in winter.

Location
As with waterfowl, the La Planche River was an attraction for waterbirds. During spring, summer and fall, the tidal and non-tidal sections of the river are where 50% of the waterbird sightings took place, while the large central area of sod land accounted for approximately 25%, as it provided a resting area for gulls. In the winter, gulls were the only waterbird seen, spending much of their time flying low (<30m) as they foraged over the tidal section of the river.

The Town of Amherst's sewer outfall was a hot spot as was the area immediately down stream of the tidal gate. Gulls, especially Ring-billed Gulls, used the study area both for feeding and resting. Large groups were seen resting together in mixed flocks during high tides or windy conditions. The adaptable Ring-billed Gulls were seen feeding both on flying insects at or above 100m and on invertebrates on the ground. They also followed sod harvesters, similar to what is often seen on upland fields that are being ploughed.

Flight heights and patterns
Overall, about 50% of the waterbird observations were of non-flying birds, either resting or foraging. Approximately 20 % were seen flying at less than 30m, 20% between 30 and 100 m and about 10% were above 100m. Gulls were the most commonly seen waterbird

in the air space above the study area, although they, like waterfowl, usually followed the river at a height below 100 metres. When in the air over the sod farm fields, gulls were usually above 100 metres and were traveling to other destinations. Morning and evening flights of gulls during winter indicated that the birds moved inland towards town for the day and back to the tidal marsh area in the evening. Great Blue Heron were seen flying below 100m coming or leaving the study area, but gaining altitude if heading east over the highway.

5.2.3 Use of surrounding habitats

Gulls and Great Blue Heron used the salt marsh and tidal habitats regularly and were seen traveling over or into the study area, either coming from or going to the salt marsh or river estuary. As mentioned, gulls were seen traveling towards the Town's urban areas, likely in a search for food.

5.2.4 Listed or uncommon species

No listed or uncommon species of waterbirds were seen. Black-crowned Night-Heron Yellow-crowned Night-Heron, Cattle Egret and Snowy Egret have been seen in the past in the general surrounding area, but not during this survey.

5.2.5 Comparison to long term observations

The large migrating flocks of Double-crested Cormorants seem a bit unusual, as these numbers were higher than previously recorded. As for the other species of waterbirds identified in this study, the numbers and timing seem to be consistent with previous records.

5.3. Raptors

5.3.1 Species, numbers

A total of 74 raptor individuals were seen during 67 observations, indicating that they were mostly single bird sightings. The 7 raptor species seen were the Bald Eagle, Northern Harrier, Rough-legged Hawk, Sharp-shinned Hawk, American Kestrel, Merlin and Peregrine Falcon.

5.3.2 Use of ground and air space within the study area

Seasonal use
Approximately 45% of the raptor observations and individuals were seen during the summer survey period. The Bald Eagle was seen during all four seasons. Northern Harriers were quite common except in winter, while Rough-legged Hawk was seen mainly in winter (never more than one at a time), but were also seen both during spring and fall surveys. Sharp-shinned Hawk was present only during fall migration and American Kestrel used the area in spring and summer. Merlin and Peregrine Falcons first

appeared with the arrival of the shorebirds in late July and were seen occasionally into the fall.

Location
Rough-legged Hawk, American Kestrel and Northern Harrier were most commonly seen in the central grassland area, while Peregrine Falcon and Merlin used the tidal river area, mainly as they hunted shorebirds. The Bald Eagles were seen in all areas, but in winter focused over the tidal river.

Flight height and patterns
The study area contains few natural perching areas for raptors, with only the power line towers, the wind test tower and a couple of gate posts serving the purpose. In spite of this, 30% of the sightings and individual raptors were seen not flying – either on the ground or perched. Rough-legged Hawks used the area for hunting during the winter and early spring and could often be seen sitting on the artificial perches (including the wind test tower) or circling overhead at various heights. They sometimes settled on the ground as well. Overall, 86% of the raptors were seen below 100m either perched or hunting over the open grass land or along the river. Bald Eagles were sometimes seen overhead, soaring at great heights or sometimes low over the tidal river, but seldom seen low over the sod farm area. In winter, eagles were seen hunting over the Trans Canada Highway, perhaps searching for road killed birds or mammals. American Kestrels were seen in late spring and summer, often chasing Savannah Sparrows or insects, at heights between 30m and 100m. Northern Harriers were abundant, usually seen hunting just above ground level or sitting on any slight elevations such as the dikes. Occasionally, Harriers would be seen circling above 100m, usually near the Trans Canada Highway. Peregrine Falcons were seen chasing shorebirds and these encounters are described in detail in Section 5.3.4 below. Merlin were seen chasing Semipalmated Sandpipers, the pursuit flights usually taking place low (<30m) over the tidal river, but sometimes taking them over the sod farmed area, after smaller flocks of sandpipers. A Merlin was also seen chasing a Tree Swallow in a pursuit that lasted (unsuccessfully for the Merlin) several minutes at about a height at or above 100m. A Merlin was also seen in the late fall on the pasture land on the north side of the La Planche River, where it chased Snow Buntings.

5.3.3 Use of surrounding habitats

Raptors used the air space over the study area and surrounding habitats interchangeably. Northern Harriers seemed to focus on a hay field to the north west of the study area, during late June and early July. The tidal river seemed to be the main attraction for the falcons, as they hunted shorebirds.

5.3.4 Listed or uncommon species

Consideration must be given to the **Peregrine Falcon.** It is known to be present in the Upper Bay of Fundy during shorebird migration and its presence on this study area cannot be deemed accidental. Peregrine Falcons were seen on the study area on three occasions (July 25, Sept. 20, and Oct. 19). The July sighting was most interesting in that

the falcon was seen flying into the study area from the west carrying prey and was attacked by a Short-eared Owl during a brief aerial battle. The Peregrine landed in a cultivated field, ate its prey and then flew back towards the salt marsh. On Sept. 20th, a Peregrine was seen chasing and attacking a Sharp-shinned Hawk within the study area and below 100m. The final Peregrine sighting was on October 19th, when a single bird was seen perched on a driftwood log, near the tidal river.

5.3.5 Comparison to long term observations

The species and individual numbers of raptors may be below normal. Species conspicuous by their absence are Red-tailed Hawk and Osprey. While it is difficult to quantify Northern Harrier numbers, they seemed abundant, both on the study area and in surrounding habitats. Harriers have been studied extensively in the area and are known to nest on the diked marsh land.

5.4. Shorebirds

5.4.1 Species, numbers

A total of 64 observations of shorebirds resulted in 8 species and 6494 individual birds being sighted. Semipalmated Sandpiper and Semipalmated Plover accounted for most of the shorebirds during the survey period. Other species seen in very low numbers were: Greater Yellowlegs, Least Sandpiper, Killdeer, Black-bellied Plover, Lesser Yellowlegs and Short-billed Dowitcher.

5.4.2 Use of ground and air space within the study area

Seasonal use
Greater Yellowlegs, Least Sandpiper and Killdeer were observed during the spring survey period. Starting in July, populations of Semipalmated Sandpiper (peak of 2000 on August 19th) and Semipalmated Plover (peak of 1200-1500 Sept. 9th) began to build in the area. Most Sandpipers left in early September, while Plovers were seen as late as October 19th. Black-bellied Plover, Lesser Yellowlegs and Short-billed Dowitcher were present in small numbers (< 5) during late summer and fall.

Location
Killdeer pairs were seen near the Trans Canada Overpass and likely nested on or near that area. Black-bellied Plovers used the sod flats close to the river (north and west sections of study area) or salt marsh as resting areas and flew low to the ground when in the air. Greater Yellowlegs (3 birds) were seen only once and that was in the freshwater section of the river near the old town dump site, during a spring survey. Lesser Yellowlegs (3 birds) and Short-billed Dowitchers (2 birds) were seen feeding at low tide in the mud flats immediately below the tidal gate. Least Sandpipers used the same area for feeding during the spring and also were observed with the larger flocks of Semipalmated Sandpipers and Semipalmated Plovers. The Semipalmated Sandpipers stayed almost exclusively along the exposed mud flats on the banks of the tidal river.

The Semipalmated Plovers, on the other hand, were often seen resting on the newly cultivated sod fields, especially during high tide. They preferred the brown earth, possibly for camouflage or because of the warmth generated from the dark earth. On September 9th 1200 to 1500 plovers were seen in one large roosting flock that assembled as smaller groups flew in from the tidal marsh to the west. They were also seen on newly cultivated fields on the east side of the Trans Canada Highway, a kilometre or two from the tidal area, so it appears they will travel to find these newly cultivated fields and not roost only on those found close to the tidal marshes or mud flats. Interestingly enough, the falcons did not seem to find these large roosting flocks of Semipalmated Plovers.

Flight heights and patterns
Semipalmated Sandpipers and Semipalmated Plovers accounted for most of the shorebird sightings and individuals. Their behaviour of foraging in the mud flats at low tide or roosting in the fields at high tide greatly influenced the statistic that 87% of the individual shorebirds seen on the study area were non-flying birds. When in flight, the Semipalmated Sandpipers traveled low over the water and followed the river. Occasionally, they were seen flying overland when being pursued by falcons, at which time they stayed < 30m from the ground. When in flight, the Plovers usually stayed below 30m, but some were seen above that height, while heading towards the eastern side of the Trans Canada Highway.

5.4.3 Use of surrounding habitats

The shorebirds obviously used the tidal river and salt marsh to a great extent as a feeding area and some species moved to the sod flats for a roosting area. It was speculated that Black-bellied Plovers may be present on surrounding upland pastures, but none were seen during occasional visits. The pasture to the northwest of the study area is a very likely habitat for these birds, but the area was not surveyed extensively.

5.4.4 Listed or uncommon species

During one survey of the surrounding area, an unconfirmed sighting of Whimbrel in flight took place. These birds were seen only briefly and at a great distance and therefore were not recorded. However, Whimbrels were reported in the Cape Jourimain area at about the same time. Other than this, no uncommon or listed shorebird species were present during the survey times.

5.4.5 Comparison to long term observations

Seasonal arrival and departure times, as well as numbers, seem to be in line with other records for the species observed.

5. 5 Owls

5.5.1 Species, numbers

Only one species of owl was observed during surveys: Short-eared Owl. A total of five observations were noted within the study area during surveys.

5.5.2 Use of ground and air space within the study area

Seasonal use
All observations of Short-eared Owl were made during July and August.

Location
On three occasions Short-eared owls were seen roosting on the ground within the sod farm land. All other observations were of birds flying low over the river or over the John Lusby Salt marsh..

Flight heights and patterns
All owl observations were either of birds seen on the ground or seen flying within 30 m above the ground.

5.5.3 Use of surrounding habitats

Short-eared Owls were seen both in the study area and on the salt marsh or flying from one to the other and have been seen in abundance during the Christmas Bird Count on the Minudie Marsh located a few kilometres to the west of this study area.

5.5.4 Listed or uncommon species

Short-eared Owl is a species of Special Concern**.** Single birds were sighted on July 15, July 20, July 25, July 30 and August 19. On July 25th a Short-eared Owl was seen attacking a Peregrine Falcon, as mentioned above, but on the same day and just previous to this, three Short-eared Owls were seen flying low over the salt marsh, possibly pushed off of a roosting site by a very high tide. Except for the attack on the Peregrine Falcon, all sightings of the Short-eared Owl were of birds sitting on or flying just barely above the ground.

5.5.5 Comparison to long term observations

If late evening surveys were conducted, they may have resulted in sightings of other owl species or birds such as the Common Nighthawk.

5. 6 Landbirds

5.6.1 Species, numbers

All other bird species observed during the survey period were grouped as landbirds. A total of 178 observations of 4169 birds, represents 23 species, that are listed in Table 2.

5.6.2 Use of ground and air space within the study area

Seasonal use
While species in the landbird group were present during all four seasons, the number of observations and numbers of individual birds were more abundant in fall and winter. This is due mainly to the abundance of Snow Buntings and Horned Larks in the area during late fall and winter. Roosting flights of over 100 American Crow were observed in winter, although these species used the study area on a regular basis in smaller groups during all seasons. Most of the other landbird species did not occur in large numbers, except for the occasional migrating flock. One-time peak counts of staging or migrating flocks of Tree Swallows (200+ on July 25th) and Red-winged Blackbirds (500+ on Oct. 14) occurred in the air space adjacent to the study area, specifically, the salt marsh (Swallows) and pasture land to the northwest (Red-winged Blackbirds). Sparrows (Song, Savannah, and Sharp-tailed) were seen during spring summer, and fall and were believed to be nesting in the area. Other species such as the American Goldfinch were seen only once, as a large flock was feeding on a patch of thistle on August 3rd.

Location
The landbird group, expectedly, used the non-wetland areas to a great extent. 87% of the sightings and 70% of the individuals were seen on the terrestrial habitats. However, the river and salt marsh still attracted some of the landbird species (Common Raven, American Crow and Snow Bunting) as they were often seen searching for food here. Ground nesting birds that quite possibly use the study area for nesting purposes are: Savannah Sparrow (nest with young found (intact) in mowed sod field + many newly fledged birds), Song Sparrow, Sharp-tailed Sparrow (more likely in adjacent salt marsh than on sod flats), Bobolink (hayfield), Ring-necked Pheasant and Red-winged Blackbird (ditches and wetlands). Landbird species seen using the area as a feeding or resting area were Snow Bunting, Horned Lark, American Crow, Common Raven, Barn and Tree Swallow. All other landbird species were seen only occasionally, either flying over the site at various heights or on the ground or perched in the few trees found in the area.

Flight heights and patterns
Approximately 95% of the landbirds were observed to be <100m. Of these, 45% were seen on the ground, 32 % were <30m from the ground and the remaining 18% or so were flying between 30 and 100m. Most of the flights were short and low, as the birds searched for food, often flying only a few metres or so before landing again. Except for the two large migrating flocks mentioned above (Swallows - 200 and Red-winged Blackbirds – 500), the area does not seem to be a migration path for species in the landbird group.

5.6.3 Use of surrounding habitats

Sharp-tailed Sparrows were heard and seen in the salt marsh adjacent to the dikes and Bobolinks were observed in the hayfields across the La Planche River to the northwest of the study area. Crows and Ravens were often seen flying along the Trans Canada Highway corridor in winter, searching for food. The same species used the study area and

adjacent habitats interchangeably during the other seasons, often flying over one only to land in another.

5.6.4 Listed or uncommon species

The Sharp-tailed Sparrow and Bobolink are considered to be species in decline and both were seen here.

5.6.5 Comparison to long term observations

The numbers and timing for most landbirds sightings during the survey period appear to be consistent with historic sightings. Many woodland species of landbirds known to be in the Isthmus of Chignecto were not seen here, because of a lack of forest or tree cover. If late evening surveys were conducted, they may have resulted in sightings of other owl species or birds such as the Common Nighthawk.

6. Conclusions / Recommendations

As the final locations for the turbines are being determined, bird use of the area needs to be considered. No consideration has been given here to night time bird travel over the area or to what impact the frequent occurrence of fog may have on flight height or patterns.

While it appears that the area is not an obvious day time low level migration funnel for large numbers of birds, birds do use the river, salt marsh and open grasslands as a resting or feeding area. Most waterfowl, waterbirds and shorebirds seem to prefer traveling over the river, while in flight, rather than taking an overland route across the study area. Based on the results of this study, the large central sod farm area does not seem to have any particular areas of concern in terms of turbine placement. The tidal and freshwater habitats associated with the La Planche River are important to the waterfowl, waterbird, shorebird and some raptor species using the area. This ribbon of river that meanders its way through the study area is where many birds feed, rest and fly over. This area should be avoided as much as possible, when selecting wind turbine locations.

To answer the question of the need for further pre- wind farm development surveys, the following questions could be asked:

Do the results in this survey represent a typical year for birds in the area?
The data collected and presented here, when compared to long term information that is available, is felt to be fairly typical for the habitat types and their juxtaposition in the landscape. There will no doubt be some abnormal years in the future, just as there has been in the past, when the species mix and abundance will vary to some degree, perhaps because of large-scale climatic conditions. However, most or all of the species that were expected to be seen were encountered during the year-long survey period.

Can the results in this survey be applied to similar adjacent areas?
As the locations for the wind turbines are being selected, there is interest in placing at least one unit on the pasture or hay land located on the north side of the La Planche River. This area was not a part of the original survey area and therefore did not receive regular surveys until November. The question is: How applicable are the data collected during the year long surveys on the adjacent sod farm land to this area to the north? Based on the casual observation of birds as they flew over this area and on the more intense fall surveys conducted on the areas to the north, it is unlikely that the species mix, flight heights or behaviour of birds would be all that different there, than on the adjacent land located on the south side of the river. There does not seem to be any natural landscape feature there that would attract birds or funnel their flight any more than does the area to the south. Generally, the data collected on the Maritime sod land and adjacent habitats would seem to be applicable to the land to the north, because of its similar habitat features. However, it would be worthwhile to survey both the original and expanded study areas on a few selected days during the spring and summer of 2006, perhaps during peak migration or staging times for birds, based on this survey. It might also be useful to survey for the presence of specific species of concern, such as the Short-eared Owl and Peregrine Falcon, when they are likely to be in the area.

Tables

Table 2: list of bird species observed from January 21 to January 18, 2006

Common Name by Group	Scientific Name	Season observed*
Waterfowl		
American Black Duck	*Anas rubripes*	S,Su,F
American Wigeon	*Anas americana*	S,Su,F
Blue-winged Teal	*Anas discors*	S,Su,F
Brant	*Branta bernicla*	S
Canada Goose	*Branta canadensis*	S,S,F
Common Merganser	*Mergus merganser*	W,S
Gadwall	*Anas strepera*	S,Su
Green-winged Teal	*Anas crecca*	S,S,F
Mallard	*Anas platyrhynchos*	S,Su
Northern Pintail	*Anas acuta*	S, Su
Northern Shoveler	*Anas clypeata*	S,Su
Waterbirds		
American Bittern	*Botaurus lentiginosus*	Su
Double-crested Cormorant	*Phalacrocorax auritus*	Su, f
Glaucous Gull	*Larus hyperboreus*	W
Great Black-backed Gull	*Larus marinus*	W,S,Su,F
Great Blue Heron	*Ardea herodias*	Su, F
Herring Gull	*Larus argentatus*	W,S,Su,F

Table 2: list of bird species observed from January 21 to January 18, 2006

Common Name by Group	Scientific Name	Season observed*
Iceland Gull	*Larus glaucoides*	W,F
Pied-billed Grebe	*Podilymbus podiceps*	su
Ring-billed Gull	*Larus delawarensis*	Su,F
Raptors		
American Kestrel	*Falco sparverius*	S, Su
Bald Eagle	*Haliaeetus leucocephalus*	S,Su,F,W
Merlin	*Falco columbarius*	S,F
Northern Harrier	*Circus cyaneus*	S, Su,F
Peregrine Falcon	*Falco peregrinus*	S, F
Rough-legged Hawk	*Buteo lagopus*	W,S,F
Sharp-shinned Hawk	*Accipiter striatus*	F
Shorebirds		
Black-bellied Plover	*Pluvialis squatarola*	S,F
Greater Yellowlegs	*Tringa melanoleuca*	S
Killdeer	*Charadrius vociferus*	S, Su
Least sandpiper	*Calidris minutilla*	S,Su,F
Lesser Yellowlegs	*Tringa flavipes*	F
Semipalmated Plover	*Charadrius semipalmatus*	S,F
Semipalmated Sandpiper	*Calidris pusilla*	S,F
Short-billed Dowitcher	*Limnodromus griseus*	F
Owls		
Short-eared Owl	*Asio flammeus*	S,Su
Landbirds		
American Crow	*Corvus brachyrhynchus*	W,S,Su,F
American Goldfinch	*Carduelis tristis*	Su
American Robin	*Turdus migratorius*	W, S,Su,F
American Tree Sparrow	*Spizella arborea*	W
Barn Swallow	*Hirundo rustica*	S,Su,F
Black-capped Chickadee	*Poecile atricapilla*	F
Blue Jay	*Cyanocitta cristata*	F
Bobolink	*Dolichonyx oryzivoris*	S,Su
Common Grackle	*Quiscalus quiscula*	S, Su
Common Raven	*Corvus corax*	W,S,Su,F
Common Redpoll	*Carduelis flammea*	W
European Starling	*Sturnus vulgaris*	W, S,Su,F

Table 2: list of bird species observed from January 21 to January 18, 2006

Common Name by Group	Scientific Name	Season observed*
Horned Lark	*Eremophila alpestris*	W,S, F
Lapland Longspur	*Calcarius lapponicus*	W
Mourning Dove	*Zenaida macroura*	S,
Red-winged Blackbird	*Agelaius phoeniceus*	S,Su,F
Ring-necked Pheasant	*Phasianus colchicus*	W,S,Su,F
Rock Pigeon	*Columba livia*	W,S,Su,F
Savannah Sparrow	*Passerculus sandwichensis*	S,Su,F
Sharp-tailed Sparrow	*Ammodramus nelsoni*	S,Su
Snow Bunting	*Plectrophenax nivalis*	W,F
Song Sparrow	*Melospiza melodia*	S,Su,F
Tree Swallow	*Tachycineta bicolor*	S,Su,F

*W – winter, S –spring, Su-summer, F-fall

Table 3: Total bird numbers by group by season

	Winter		Spring		Summer		Fall		Total	
	Sightings	Individuals	Sightings	Individuals	Sightings	Individuals	Sightings	Individuals	Sightings	Individuals
Waterfowl	37	259	58	630	92	1814	95	4015	282	6718
Waterbirds	54	383	4	65	44	398	109	2371	211	3217
Raptors	13	13	8	8	29	34	17	19	67	74
Shorebirds	0	0	2	12	37	3498	25	2984	64	6494
Landbirds	84	1713	16	110	57	644	46	1707	203	4174
Total	188	2368	88	825	259	6388	292	11096	827	20677

Table 4: Bird numbers by group by season – percent of total

	Winter		Spring		Summer		Fall		Total	
	Sightings % of total	Individuals % of total	Sightings % of total	Individuals % of total	Sightings % of total	Individuals % of total	Sightings % of total	Individuals % of total	Total Sightings	Total Individuals
Waterfowl	13	3.8	20.5	9.4	32.6	27	33.6	59.7	282	6718
Waterbirds	25.6	12	1.9	2	20.8	12.4	51.6	73.7	211	3217
Raptors	19.4	17.5	11.9	10.8	43..3	45..9	25..3	25..6	67	74
Shorebirds	0	0	3	0	57.8	53.8	39	45..9	64	6494
Landbirds	41.4	41	7.8	2.6	28	15.4	22.6	40..9	203	4174
Total	22.7	11.4	10.6	4	31.3	31	35..3	53.6	827	20677

Table 5: All seasons – bird groups by height – number of sightings and (individuals)

Bird group	Not flying	< 30 m	30 m to 100m	> 100 m	total
waterfowl	226 (6165)	20 (100)	26 (338)	10 (115)	282 (6718)
waterbirds	122 (1716)	34(222)	35 (228)	20 (1051)	211 (3217)
raptors	21 (23)	23 (26)	14 (14)	9 (11)	67 (74)
shorebirds	35 (5681)	21 (660)	6 (115)	2 (38)	64 (6494)
landbirds	92 (1527)	66 (1542)	34 (783)	11 (322)	203 (4174)

Table 6: All seasons – bird groups by height - % of total

Bird group	Not flying	< 30 m	30 m to 100m	> 100 m	total
waterfowl	80.1 (92)	7.1 (1.5)	9.2 (5)	3.5 (1.7)	282 (6718)
waterbirds	57.8 (53.3)	16(6.9)	16.6(7)	9.4(32.7)	211 (3217)
raptors	31.3 (31)	34.3(35.1)	21 (18.9)	13.4 (14.8)	67 (74)
shorebirds	54.6 (87.5)	32.8 (10.1)	9.3 (1.7)	3.1(0.5)	64 (6494)
landbirds	45.3(36.6)	32.5 (36.9)	16.7(18.7)	5.4 (7.7)	203 (4174)

Table 7: Height by Season: numbers

Spring:

Bird group	Not flying		< 30 m		>30 < 100m		>100m		total	
	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals
Waterfowl	50	601	2	4	3	6	3	19	58	630
Waterbirds	2	62	0	0	2	3	0	0	4	65
Raptors	4	4	1	1	1	1	2	2	8	8
Shorebirds	1	6	1	6	0	0	0	0	2	12
Landbirds	11	77	2	26	2	4	1	3	16	110
Total	68	750	6	37	8	14	6	24	88	825

Summer:

Bird group	Not flying		< 30 m		>30 < 100m		>100m		total	
	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals
Waterfowl	74	1629	4	10	13	144	1	31	92	1814
Waterbirds	21	306	11	57	8	29	4	6	44	398
Raptors	9	11	12	15	4	4	4	4	29	34
Shorebirds	19	3049	12	300	5	112	1	37	37	3498
Landbirds	32	257	17	109	7	78	1	200	57	644
Total	155	5252	56	491	37	367	11	278	259	6388

Table 7 (continued) Bird Group by Height: numbers

Fall:

Bird group	Not flying		< 30 m		>30 < 100m		>100m		total	
	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals
Waterfowl	82	3813	2	4	7	141	4	57	95	4015
Waterbirds	80	1241	9	79	11	31	9	1020	109	2371
Raptors	2	2	7	7	6	6	2	4	17	19
Shorebirds	15	2626	8	354	1	3	1	1	25	2984
Landbirds	19	619	15	547	9	536	3	5	46	1707
Total	198	8301	41	991	34	717	19	1087	292	11096

Winter:

Bird group	Not flying		< 30 m		>30 < 100m		>100m		total	
	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals	# sightings	# individuals
Waterfowl	20	122	12	82	3	47	2	8	37	259
Waterbirds	19	107	14	86	14	165	7	25	54	383
Raptors	6	6	3	3	3	3	1	1	13	13
Shorebirds	0	0	0	0	0	0	0	0	0	0
Landbirds	30	574	32	860	16	165	6	114	84	1713
Total	75	809	61	1031	36	380	16	148	188	2368

Table 8: Height by Bird Group: % of total

Spring:

Bird group	Not flying		< 30 m		>30 < 100m		>100m		total	
	% sightings	% individuals	% sightings	% individuals	% sightings	% individuals	% sightings	% individuals	Number sightings	Number individuals
Waterfowl	86.2	95.4	3.4	.6	5	.9	5	3	58	630
Waterbirds	50	95.4	0	0	50	4.6	0	0	4	65
Raptors	50	50	12.5	12.5	12.5	12.5	25	25	8	8
Shorebirds	50	50	50	50	0	0	0	0	2	12
Landbirds	68.7	70	12.5	23.6	12.5	3.6	6.2	2.7	16	110

Summer:

Bird group	Not flying		< 30 m		>30 < 100m		>100m		total	
	% sightings	% individuals	% sightings	% individuals	% sightings	% individuals	% sightings	% individuals	Number sightings	Number individuals
Waterfowl	80.4	89.8	4.3	.5	14.1	8	1	1.7	92	1814
Waterbirds	47.7	76.8	25	14.3	18.2	7.3	9	1.5	44	398
Raptors	31	32.3	41.3	44.1	13.7	11.7	13.7	11.7	29	34
Shorebirds	51.3	87.2	32.4	8.5	13.5	3.2	2	1	37	3498
Landbirds	56.1	39.9	29.8	16.9	12.2	12.1	1.7	31	57	644

Table 8 (continued): Bird Group by Height: % of totals

Fall:

Bird group	Not flying		< 30 m		>30 < 100m		>100m		total	
	% sightings	% individuals	% sightings	% individuals	% sightings	% individuals	% sightings	% individuals	Number sightings	Number individuals
Waterfowl	86.3	95	2	0	7.3	3.5	4.2	1.4	95	4015
Waterbirds	73.4	52.3	8.2	3.3	10	1.3	8.2	43	109	2371
Raptors	11.7	10.5	41.2	36.8	35.3	31.6	11.7	21	17	19
Shorebirds	60	88	32	11.8	4	0	4	0	25	2984
Landbirds	41.3	36.2	32.6	32	19.5	31.4	6.5	.2	46	1707

Winter:

Bird group	Not flying		< 30 m		>30 < 100m		>100m		total	
	% sightings	% individuals	% sightings	% individuals	% sightings	% individuals	% sightings	% individuals	Number sightings	Number individuals
Waterfowl	54	47.1	32.4	31.6	8	18.1	5.4	3	37	259
Waterbirds	35.2	27.9	25.9	22.4	25.9	43	13	6.5	54	383
Raptors	46.1	46.1	23	23	23	23	7.7	7.7	13	13
Shorebirds	0	0	0	0	0	0	0	0	0	0
Landbirds	35.7	33.5	38.1	50.2	19	9.6	7.1	6.6	84	1713

Table 9: Bird group by location: total numbers

Location	Waterfowl		Waterbirds		Raptors		Shorebirds		Landbirds		Total	
	sightings	Indiv.	sightings	Indiv.	sightings	Indiv.	sightings	Indiv.	sightings	Indiv.	sightings	Indiv.
1 – near upland	9	53	3	18	6	6	1	8	12	174	31	259
2 - central	31	496	56	798	26	28	28	2489	110	2231	251	6042
3 – in corridor	9	22	4	7	0	0	0	0	8	89	21	118
4 – over tidal river or salt marsh	128	4859	104	1742	17	19	24	3181	27	1227	300	11028
5 - random	0	0	1	6	0	0	0	0	3	14	4	20
6 – East of TCH	104	1038	38	494	15	18	10	808	33	257	200	2615
7 - Atkinson's	1	250	5	152	3	3	1	8	10	182	20	595
total	282	6718	211	3217	67	74	64	6494	203	4174	827	20677

Table 10: Bird group by location: % of total

Location	Waterfowl		Waterbirds		Raptors		Shorebirds		Landbirds		Total	
	sightings	Indv.	sightings	indv	sightings	indv	sightings	indv	sightings	indiv	sightings	indiv
1 – near upland	3.2	0.7	1.4	0.5	8.9	8	1.5	0.1	5.9	4.1	3.7	1.2
2 - central	11	7.4	26.5	24.8	38.8	37.8	43.7	38.3	54.2	53.4	30.3	29.2
3 – in corridor	3.2	0.3	1.8	0.2	0	0	0	0	3.9	2.1	2.5	0.5
4 – over tidal river or salt marsh	45.4	72.3	49.3	54.1	25.3	25.6	37.5	49	13.3	29.4	36.3	53.3
5 - random	0	0	0	0	0	0	0	0	1.4	0.3	0.4	0
6 – East of TCH	37	15.4	18	15.3	22.3	24.3	15.6	12.4	16.2	6.1	24.2	12.6
7 - Atkinson's	0.2	3.7	2	4.7	4.4	4	1.5	0.1	4.9	4.3	2.4	2.9
total	282	6718	211	3217	67	74	64	6496	203	4174	827	20677

Appendix 1

Amherst Wind Farm Bird Monitoring Protocol -January 6, 2005

Dan Busby (CWS), Keith McAloney (CWS), John Wile (consultant)

A. Elements:

Pre-construction phase

The following is a description of the species of concern and guidelines for monitoring:

1. Wintering raptors
Concern: Red-tailed Hawks, Rough-legged Hawks hunting on open marshlands, primarily for rodents.
Monitoring: Observations of bird use of area, especially the height at which they soar in the area to be populated with turbines.
Frequency: Once a week, January to end of April, 3 times a day (morning mid-day, late afternoon) for 1 hour each.

2. Migrating and breeding raptors
Concern: Spring and fall migrant raptors using the area for hunting or just passing through; breeding raptors – especially Short-eared Owls (COSEWIC-listed as Special Concern) and Northern Harriers. Perhaps some other species.
Monitoring: Observations during spring, summer, fall, especially the height at which they soar in the area to be populated with turbines.
Frequency: Twice a week during migration periods (Mid-April to late May; early September to late October), 3 times a day (morning, mid-day, late afternoon) for 1 hour each.

3. Winter finches
Concern: Flocks of winter finches (Snow Buntings, Common Redpolls, Horned Larks, longspurs, etc.) feeding on grass and weed seeds in area.
Monitoring: Observations during winter (early November to mid-April), especially noting height of flights and specific areas of feeding, relative to proposed location of turbines.
Frequency: Randomly chosen 1 hour daylight observation periods, 3 times a week. Or concentrated several-hour observation periods less frequently.

4. Migrant shorebirds
Concern: Little known about shorebird use of area. Need to keep open several possibilities. Some concern areas include Golden Plover spring movements, Black-bellied Plover fall movements, yellowlegs in spring and fall, possible dowitchers and peeps.

Frequency: Need some discussions. Contact Peter Hicklin (Peter.Hicklin@ec.gc.ca, phone 506-364-5042). Spring movements mainly in mid-April to mid-May. Fall movements mainly July and August. Should observe several times a week. Could survey bird use of nearby upland fields and lowland mudflats as well as movements through the turbine area.

5. Waterfowl

Sea duck migration – Particularly Common eider migrating across site, perhaps some scoters. Record number and height of migrating flocks in relation to proposed blade height. April-May one morning and one afternoon per week. Fall migration of sea ducks from mid October to mid November – survey can be conducted concurrently with fall raptor and finch surveys.

Canada Geese grazing – March 15 to May 1 – Spring staging Canada geese use sod farm extensively. One am and one pm per week to determine numbers and feeding location relative to proposed tower sites.

Spring staging by dabbling ducks – Black ducks, Pintail and Green –winged teal use the river upon their spring arrival as most ponds are frozen. Foot survey of river through the sod farm once per week as well as recording distribution across the sod farm when doing goose observations. Also record whether flight paths from salt marsh to upstream fresh marshes follow the river or are random across the sod farm.

Fall dabbling duck and goose staging surveys during the month of September only (4 weeks); can be combined with concurrent fall raptor survey.

B. Methods and Scheduling:

A total of 262 hours will be spent surveying in 48 of the 52 weeks of the year, during the pre construction phase in 2005. No surveys will be conducted in December, as any these birds will be seen during either the fall or winter surveys.

Table 1 outlines the schedule, target species and the expected time budget for the surveys during each of the major seasons. For efficiency, overlap of species surveys will take place, however numbers and behavior activities for each species will be kept separate. If it is impossible to keep track of multi species use of the area, it may be necessary to add additional surveys. This may occur during the spring or summer, especially with shorebird migrations. Timing of the surveys will coincide with expected peak bird use, where this is known or the surveys will be spread throughout the day in one hour intervals.

Where possible, the numerical field data will be transferred to a spreadsheet format. Behavioral activities of birds may have to be recorded in text format. All of the recorded information will be made available as baseline information for the post construction monitoring phase.

Table 1: Schedule and Time Budget for Surveys

Season, time frame and total hours	Wintering Raptors and Finches	Migrating and Breeding Raptors	Migrating Shorebirds	Spring and fall Waterfowl: Dabbling ducks, geese and sea ducks
Winter: January 10 to March 30 12 weeks Total 46 hours	3 hours one day per week: one hour early am, mid day and late pm			spring geese March 15 to 31 6 hrs per week (1am and 1pm) overlap 2 hrs with raptor survey
Spring: April1 to May 31 9 weeks Total 54 hours		2 surveys per week, 3 hrs each →		→
Summer: June 1 to August 31 14 weeks Total 84 hours		2 surveys per week, 3 hours each →		
Fall: Sept. 1 to November 30 13 weeks Total 78 hours	2 surveys per week, 3 hours each →	→		→

Arrows indicate that the survey will be conducted concurrently for more than one species or group of birds.

References

Erskine, Anthony J. McManus Reid Jr. 2005, Bird status changes – and changes in environment – in the Chignecto Isthmus region of Atlantic Canada, Technical Report Series Number 430, Atlantic Region Canadian Wildlife Service Environment Conservation Branch

Erskine, A.J. 1992 Atlas of breeding birds of the Maritime Provinces. Nimbus Publ. and N.S. Museum, 270pp.

Supplemental Bird Surveys Relating to a Proposed Wind Farm in West Amherst, Cumberland County, Nova Scotia - July 18, 2006 to November 7, 2006

John Wile December 7, 2006

1. Introduction

Additional bird surveys were completed on the site of a proposed wind farm in West Amherst during the period July 18 to November 7, 2006 for 2 specific reasons:

1) To survey the part of the study area located on the north side of the La Planche River under consideration to receive wind turbines, which was not formally surveyed until November of 2005.

2) To gain a better understanding on the use by Peregrine Falcons and Short Eared Owls over the entire area proposed to receive wind turbines.

2. Survey Methods and Effort

18 separate surveys were conducted involving 28.5 hours of observation (Table 1). The survey times ranged from 1 hour to 2 hours in length (average 1.58 hrs) and took place during a variety of times and tide cycles. Surveys were conducted twice per week during the peak of shorebird staging period and reduced to once per week thereafter. Good visibility was available by traveling along the dike walls that run parallel to the river or from the elevated hay fields. From these positions it was possible to observe birds that used the air space on the entire study area both on sides of the La Planche River.

The large area of sod farm land east of the Trans Canada Highway surveyed from January 2005 to January 2006 was not included in these surveys, since this area is now not being considered as a location for wind turbines.

The April 2006 report presents detailed accounts of bird use and activity during the January 2005 to January 2006 survey period. It is felt that, because this report is a good characterization of general bird use on these habitats, it was not necessary to document all bird sightings, their flight patterns and behaviour again. Instead the July 18, 2006 to November 7, 2006 surveys focused on trying to determine if the area on the north side of the La Planche River differed in any way as habitat or as a travel corridor for birds and on expanding the observations of the two listed bird species identified as using the study area during the first survey period (Jan. 2005 to Jan 2006).

Table 1: Survey dates: July 18 – November 7, 2006

Date	Number of Hours	Time of Day / Tide cycle
2006 07 18	2	Mid morning low tide
2006 07 25	2	Mid day – high tide
2006 08 01	2	Mid day – low tide
2006 08 07	1	Mid day – high tide
2006 08 13	2	Late afternoon – high tide
2006 08 17	2	Evening – high tide
2006 08 22	2	Mid day – high tide
2006 08 28	1.5	Late afternoon – high tide
2006 09 03	1.5	Mid afternoon – low tide
2006 09 09	1.5	Mid day – extreme high tide
2006 09 17	2	Early morning – low tide
2006 09 22	1.5	Evening – low tide
2006 09 26	1.5	Early afternoon – high tide
2006 10 11	1	Early afternoon – high tide
2006 10 18	1.5	Early morning – high tide
2006 10 23	1	Morning – tide low
2006 10 31	1	Mid afternoon – tide low
2006 11 07	1.5	Early afternoon – tide high
	Total hours surveyed: 28.5	

3. Results

3.1 Habitat description and general bird use of the hay land and pastures located on the north side of the La Planche River

This survey area differed from the main study area of 2005 to 2006 in that it is not used for sod farming. Instead it contains a mix of pasture and hay. Most of the area surveyed is below sea level and protected by agricultural dikes. One upland hayfield was included as well. Generally, the area north of the La Planche River in Fort Lawrence was divided into eastern dike land and upland hayfields and western pastures. Hay production and pasture create two distinct habitat types for birds.

The hay fields provided dense cover until harvest time, which did not take place until the second week of August and continued into September. The very late harvest time of hay provided good opportunity for birds such as Northern Harrier, Savannah Sparrow and Bobolink to nest here successfully. The western pastures were occupied by cattle and horses and so were open, closely cropped grassland habitat during the entire survey period. Bird use here seemed similar to that of the closely cropped sod farm area in that it served as a resting area for gulls and a resting and feeding area for Canada Geese.

3.2 Discussion by major bird groups

Waterfowl

Waterfowl were observed using the tidal river in a very similar way as during the previous survey, in that they used it as both a travel route and as a feeding and resting area. Canada Geese (20 -60 birds) were seen on the ground in the pasture land on several occasions, each time very close to the ocean on the extreme western end of the pastures. Small flocks (< 20) of Green Winged Teal, American Black Ducks and Mallards were seen on the small freshwater cattle ponds. Flocks of large dabblers and teal were occasionally observed flying over the area, but at a height greater than 100 metres.

On July 18, 2006 a female American Widgeon was pushed off a nest located on the dike wall. Because the north side of the La Planche River contains much more hay land and because it is not harvested until August, there could be more waterfowl nesting activity here than to the south.

Water birds

Great Black Backed Gulls, Herring Gulls and Ring Billed Gulls were observed in and over the tidal river, sitting in the pastures and were attracted in larger (>50) numbers to the cut hay fields. Only a few Great Blue Heron were seen and these were flying at heights greater than 100 metres. 2 American Bitterns were seen in the tidal river. One Cormorant was seen flying over the area at an elevation greater than 100m.

Generally, waterbird activity was confined to the tidal river or to newly cut hayfields where gulls were seen feeding. Gulls were seen resting on pasture land during high tides or on windy days, similar to what was seen on the sod land during the previous survey period.

Raptors

The abundance of hay land relative to that found on the south side of the La Planche River seems to account for the abundance of Northern Harrier observations. These birds were seen during every survey hunting over the hay fields and were likely nesting there as well, although this was not confirmed.

Peregrine Falcons were seen on 3 occasions and described in more detail in another part of the report. On Sept. 26, 2006 a Turkey Vulture was observed flying low and then landing on the ground in a cut hay field. Other than the occasional Bald Eagle seen circling high overhead, no other raptor species were observed during this survey period.

Shore birds

Semipalmated Sandpipers and Plovers were again concentrated in the tidal river. During the previous survey, large numbers of Semipalmated Plovers were seen roosting on cultivated sod fields, especially during high tide cycles. The north side of the La Planche River does not contain this type of habitat and no similar sightings occurred.

Worthy of note, during this survey period, was the observance of fairly large numbers (up to 250) of Black Bellied Plovers. Large groups of these birds were seen feeding in the

same newly cut upland hay field from August 13th to August 18th. Only one observation of 10 birds was seen afterwards and these were located on the western pastures on October 18th. Far fewer numbers of Black Bellied Plovers was observed during the previous year's survey.

The only other shorebird species seen was the Greater Yellowlegs, as a couple of birds were seen following the tidal river.

Land birds

Land bird species use of this area was similar to the previous survey, during the same time frame. Savannah Sparrows and Bobolink were seen using hayfields and rough cover along drainage ditches, Common Ravens and Crows used the ground and air space in a random search for food. Tree and Barn Swallows were seen on occasion, but because the survey period ended in early November, few winter finches were observed.

Owls

No owls of any species were seen during this survey period.

3.3 Discussion on listed species observations July 18 – Nov. 7, 2006

Since both Peregrine Falcons and Short Eared Owls were observed during the previous survey (Jan 2005 to Jan 2006), it was decided to continue with additional surveys for these species this year during the time when they would most likely be present. In addition to surveys on the north side of the La Planche River as described above, the surveys conducted from July 18 to Nov. 7, 2006 also were intended to gather further information on Peregrine Falcons and Short Eared Owls over the entire area to receive wind turbines.

Peregrine Falcon

The surveys coincided with the peak time for Peregrines to be in the area - July to October and in many cases during high tide cycles when shorebirds are more likely to be present. Peregrines are also known to migrate through the area in the fall.

Single bird sightings took place on August 22, August 28 and September 6, 2006. Each time it was an immature bird in the same general area and therefore quite possibly was the same individual bird. The location was near the tidal river on the north side. The August 28th sighting saw the young falcon chasing 2 Northern Harriers, possibly trying to steal prey from them.

Short Eared Owl

Surveys for Short Eared Owls were conducted this year so that they coincided with the time frame when they were observed during the previous year's survey (mid July to mid August). In addition, specific surveys were targeted for Short Eared Owls by choosing early morning or late evening times, some of which coincided with high tide cycles (August 18, Sept. 17, and Sept. 22, 2006). In spite of this effort, no owls were seen.

Some attempt was made to consult with others to determine if Short Eared Owls were present in the area and to determine a relative abundance. In conversation with Canadian Wildlife Service personnel (Dianne Ameriault), it was learned that the CWS is developing survey protocol for Short Eared Owls. Although surveys were conducted, the purpose was to develop the most efficient methods for surveys rather than providing good numbers. The Owls were present in the Sackville N.B. area, on agricultural dike lands in the summer of 206, but no information on how numbers compare to other years was available.

4.0 Summary

Reason for survey

During the January 2005 to January 2006 survey period, the hay and pasture land on the north side of the La Planche River was not formally surveyed until November. However, due to the wide open, flat nature of the landscape, it was possible to clearly see any birds that were flying over this area and these observations were recorded and included in the April 2006 report. In order to fill the information gap for this part of the proposed wind farm and to gain further understanding of bird use, including listed species over the entire proposed wind farm area; additional surveys were conducted from July 18 to November 7, 2006.

New Species sightings

The only new species to be added to the list of birds on the previous survey is the single sighting of a Turkey Vulture.

New information on general bird use of the proposed wind farm site:

a)North of the La Planche River

This area contained more hay land and therefore is likely more attractive to nesting birds such as the Northern Harrier, Bobolink, Savannah Sparrow and waterfowl. The fact that the hay is cut very late (August into September) adds its attractiveness as nesting habitat for these species. The large number (250) of Black Bellied Plovers on a newly cut hayfield is a much larger number than seen on the previous year's survey on the south side of the river. However, it may not be unusual for this many birds to use the area during this time frame, as they are considered to be a common transient speices (Erskine and McManus.

b)South of La Planche River

The surveys conducted during July 18 – November 7, 2006 add nothing new to the information gathered on the same area during the January 2005 to January 2006 survey period. Birds seemed to use the area in the same way as they did before, although due to the rotational nature of the sod farm operations, the cultivated fields were in different locations. The large roosting flocks of Semi Palmated Plovers used the cultivated fields in a similar manner to the fields that were cultivated in 2005.

5.0 Conclusions

The survey period July 18 to November 7, 2006 provides a more detailed look at bird use of the habitat and air space found on the north side of the La Planche River, as well as another look at bird use over the entire proposed wind farm area, prior to construction. Special effort was made to survey for the two listed species found during the previous years survey – Peregrine Falcon and Short Eared Owl.

There does not appear to be any dramatic difference in bird use of the air space above the proposed wind farm area between the two survey periods. The north side of the La Planche River differs in that it does not contain sod farmed land, but the pasture was used by birds as resting areas in a similar way as the sod flats. There seemed to be more Northern Harriers using the area north of the La Planche River, likely relating directly to there being more hay land. No Short Eared Owls were seen, even during early morning and evening surveys during high tide cycles. 3 Peregrine Falcon sightings occurred, all of a single and possibly the same immature bird.

Spring use of the air space north of the La Planche River was picked up during the previous year's survey and this area was intensively surveyed for winter birds. The July 18, 2006 start date for this survey is believed to be early enough to capture the species of birds that might be using this area as breeding habitat. Those species are mentioned in the discussion above and include: Savannah Sparrow, Bobolink, Northern Harrier and waterfowl such as the American Widgeon.