

An Assessment of the Autumn Bird Migration

At the Point Tupper Wind Farm

2010



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For:

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Executive Summary

This paper documents the 2010 autumn bird migration at and in the immediate vicinity of the Port Tupper Wind Farm in Richmond County, Cape Breton Island, Nova Scotia. The research in this report supplements the avian baseline study of the wind farm conducted in 2008 and 2009.

The methods for assessing the autumn migration in 2010 followed closely those employed during the baseline study. Migration stop-over was observed using a modified point count technique in which all the birds seen or heard at one location were recorded during a ten-minute period. There were eight point count locations. Observations of diurnal migration passage and the flight behaviour of local birds were also made on eight survey days extending from August 28 to October 22.

Throughout the autumn period, there was no clear trend in the abundance of birds but a noticeable declining trend in species diversity. The study demonstrates that the numbers of stop-over birds are particularly concentrated at two locations along the shore of the Strait of Canso. The data also suggest that the project area and the surrounding locality might be a significant stop-over area for the American Robin. Typically robins would be moving from the east and northeast to land in the coastal concentration areas. They would then fly off from those areas across the Strait of Canso in a general westerly direction.

The “watch counts” for diurnal passage of birds yielded few observations.

While this study provides some insights on the extent of the autumn bird migration at Point Tupper, it is not possible to make definitive statements about the magnitude of this migration based on the eight days of observation. Continuation of the mortality study is recommended at Point Tupper and further consideration should be given to developing a greater understanding of the impact of wind farms on the migration of American Robins at this and other wind energy facilities in Nova Scotia.

Introduction

This paper documents the 2010 autumn bird migration at and in the immediate vicinity of the Port Tupper Wind Farm in Richmond County, Cape Breton Island, Nova Scotia (see Figure 1). The research in this report supplements the avian baseline study of the wind farm conducted in 2008 and 2009. The wind farm became fully operational in 2010.

A study of the spring migration and breeding birds on site was conducted in 2008 by Andrew Horn (CBCL 2008) while a late autumn migration and winter bird survey was carried out David Johnson in 2009 (CBCL 2009). Thus there was a gap in coverage of the site for the peak autumn migration which extends from late August to late October. This study aims at filling this gap.

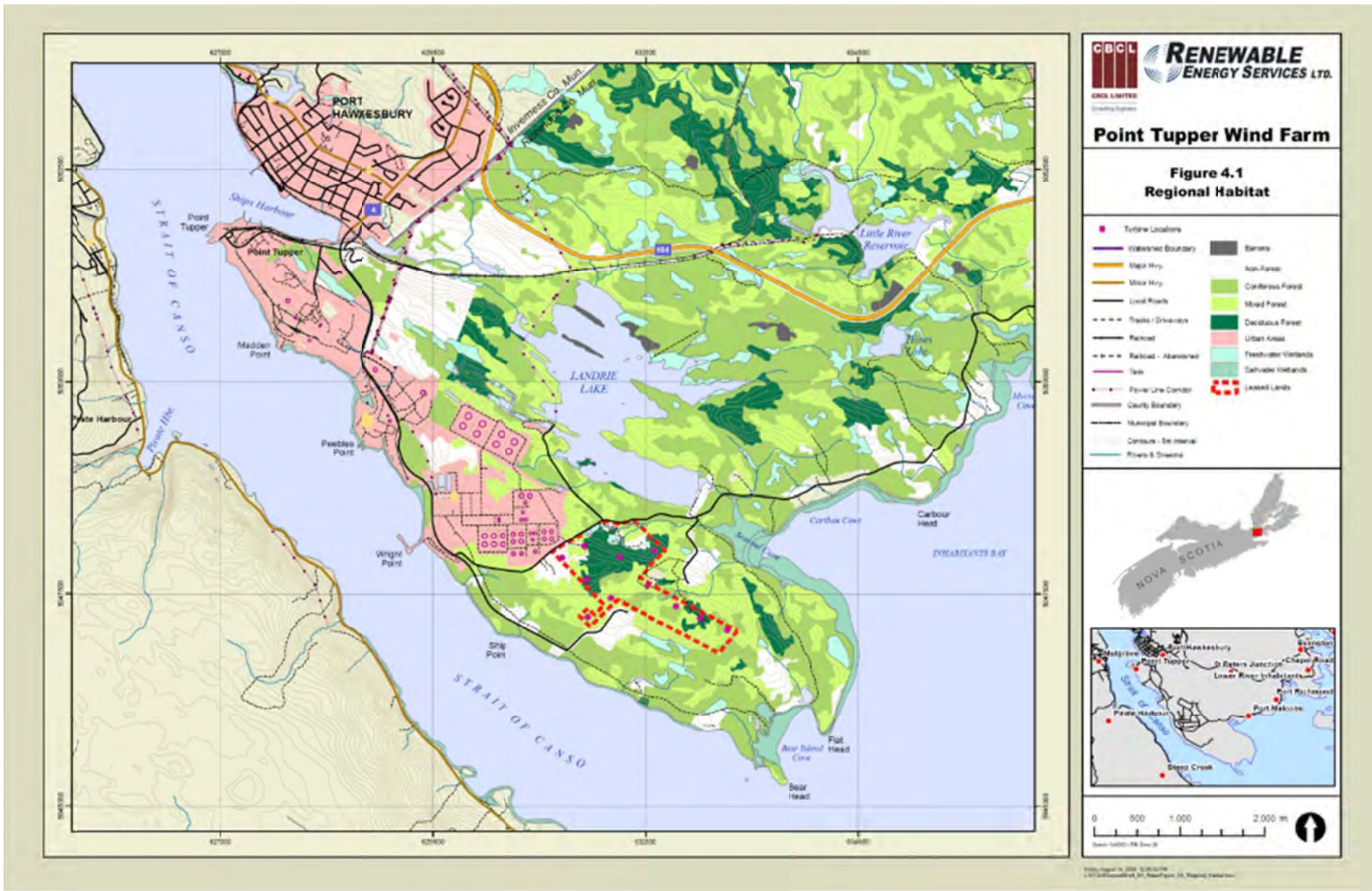
Summary of Baseline Study

The breeding bird survey in May and June of 2008 did not find any species of conservation concern other than the Olive-sided Flycatcher which is listed as threatened by the Committee on the Status of Endangered Wildlife in Canada. However this species was detected outside of the project area. Similarly, the winter survey found no concentrations of birds.

The study of the spring (April and May of 2008) and late autumn (October 30-November 12, 2009) migration also found no evidence for the concentration of migrating birds in the project area. Area searches were conducted for migration stop-over and watch counts for diurnal migration passage. The only evidence of migration in the spring was a small group of songbirds (warblers and a kinglet) and on another occasion, a small flock of migrating American Robins, both seen on the road just outside the north side of the site near the petroleum product tanks. Again, in the late fall migration, small to moderate numbers (1-33) of American Robins were seen on this same road and on the road just outside the southwest corner of the site.

None of the baseline surveys detected significant numbers of raptors or other kinds of soaring birds at any season. In the late fall and winter surveys, soaring birds observed included a few Bald Eagles, Common Ravens, and Herring Gulls.

Figure 1: Location of Point Tupper Wind Farm (Figure 4.1 in Registration Document)



Survey Methods

The methods for assessing the autumn migration in 2010 followed closely those employed during the baseline study. Although termed area searches in the baseline study, it would be more proper to say that migration stop-over was observed using a modified point count technique in which all the birds seen or heard at one location were recorded during a ten-minute period. The observer more actively searched the point count location compared to point counts made during the breeding season in which one relies more on hearing the songs of birds. Six point counts were outside the project area. Their location was changed slightly from the position in the baseline study in order to conform with recent changes in the security surveillance and enforcement measures on the adjacent properties of the Nustar petroleum terminal. Two more point counts were inside the project area. The location of these point counts are shown in Figure 2.

Figure 2: Location of Point Counts



Table 1 describes the habitat types for each of the point count sites. All the point counts were surveyed on eight occasions or on average, every 7 days between August 28 and October 22, 2010.

Table 1: Habitat of Point Count Locations

<i>No.</i>	<i>UTM Coordinates</i>	<i>Habitat</i>
1	20 T 0631566 5048385	Mixed Mature Forest
2	20 T 0630849 5047972	Disturbed-Fields, Alders, and Early Forest
3	20 T 0630382 5047779	Young Mixed Forest
4	20 T 0629963 5047868	Disturbed-Fields, Driveway, Alders, and Young Forest
5	20 T 0630553 5047113	Young Mixed Forest with Bog and Small Softwood Stand
6	20 T 0631034 5046847	Old Orchards, Young Hardwoods, Mature Softwoods
7	20 T 0632898 5047071	Mid-Succession Mixed Forest, 100 Metres from Turbine 6
8	20 T 0632045 5047566	Disturbed Area and Mid-Succession Mixed Forest, 10 Metres from Turbine 3

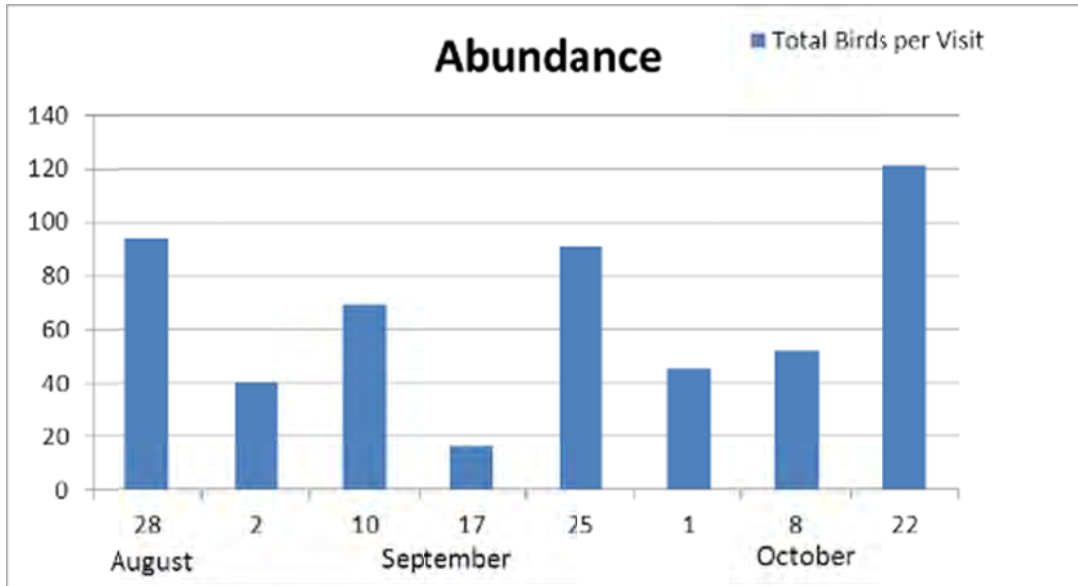
In addition, observations of diurnal migration passage and the flight behaviour of local birds were made at point count location #3 on the eight survey days. From this vantage point, the blade sweep of all eleven turbines could be seen. In total, 4.5 hours of these “watch” counts were made.

Results

Migration Stop-over

Migration stop-over was apparent on most of the eight visits to the Point Tupper Wind Farm site during the autumn of 2010. As shown in Figure 3, there is no clear trend in the abundance of birds during the migratory season from the end of August until late October. Some of the lower counts can be attributed to poor weather conditions such as rain or high winds as well as normal variation within the migratory season.

Figure 3: Abundance of Migrants



In contrast, there is an apparent declining trend in species diversity during the autumn period. Figure 4 demonstrates the decline in the number of species noted from August to October as the migration season progresses and increasing numbers of species head south for the winter. Again, some of the lower counts are due to both normal variation and weather conditions.

Figure 4: Species Diversity of Migrants

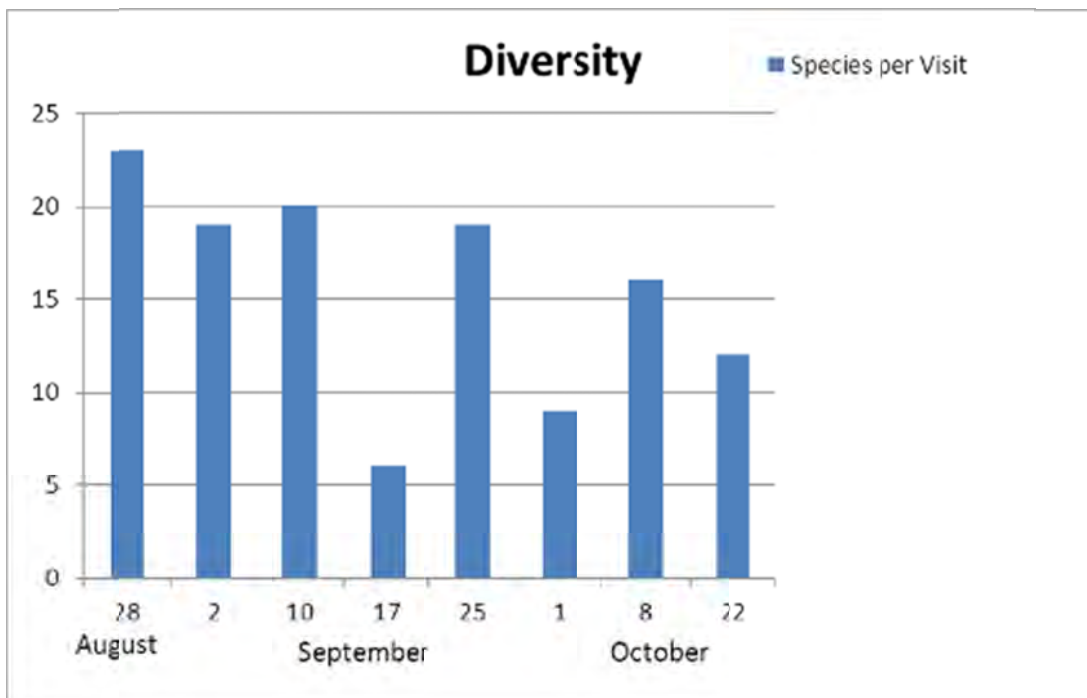
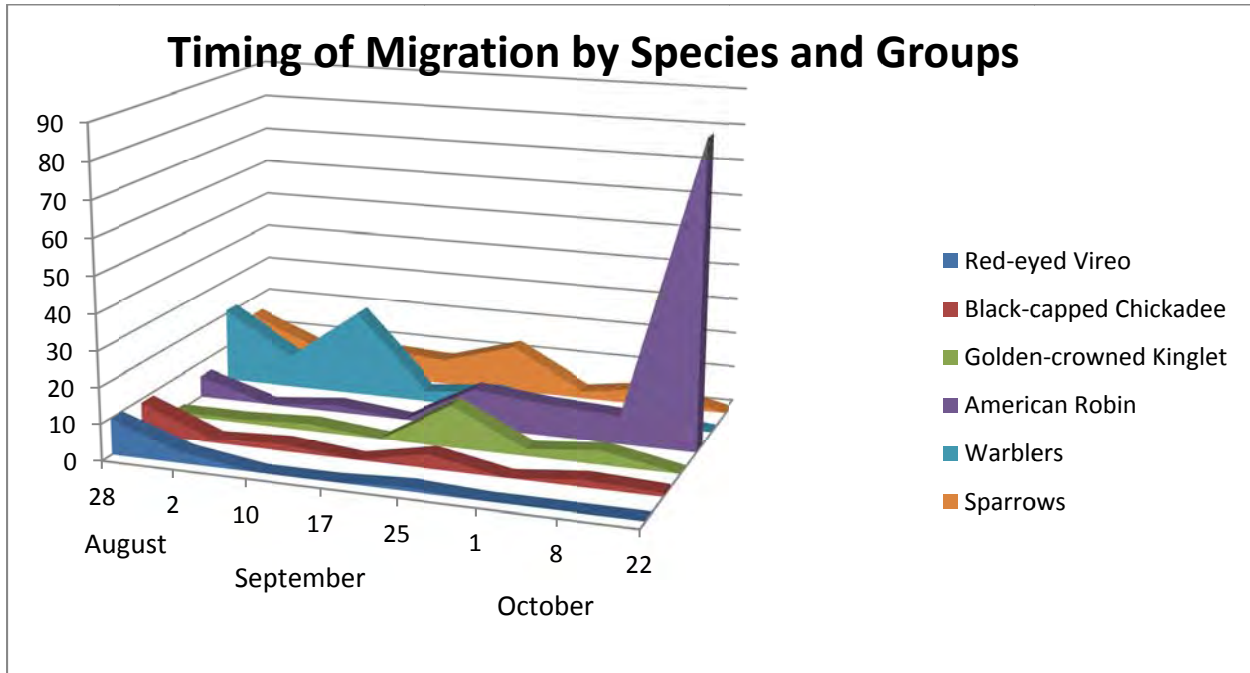


Figure 5 shows the different timings in the migration through the project area for some of the most abundant species or species groups, such as warblers or sparrows.

Figure 5: Timing of Migration



Thus it can be seen that the Red-eyed Vireo migrates early in the autumn season (late August to mid-September) as do many of the species of warblers. Sparrows and the Golden-crowned Kinglets peak in mid-September to early October, and the Black-capped Chickadees appear in consistent numbers throughout the autumn. The American Robin is the most abundant fall migrant with its numbers starting to build in mid-September and peaking in late October. This species was also found in moderate numbers in November during the baseline study. This data suggest that the project area and the surrounding locality might be a significant stop-over area for the American Robin.

When one analyzes the distribution of birds by point count location, another dimension of the autumn migration is revealed. Table 2 and Figure 6 show the mean number of birds seen at each point location during the autumn season. These graphics demonstrate that the numbers of stop-over birds are particularly concentrated at two locations along the shore of the Strait of Canso (Point Count Numbers 4 and 6). There is another, but less significant, concentration point near the

petroleum products storage tanks (Point Count 2). These locations are the same ones where some stop-over birds were noted in the spring and late autumn surveys in the baseline study.

Table 2. Mean Number of Birds at Point Count Stations

Point Count Station	Mean Number of Birds Detected
1	5.63
2	9.63
3	4.50
4	19.33
5	6.63
6	15.63
7	1.50
8	1.50

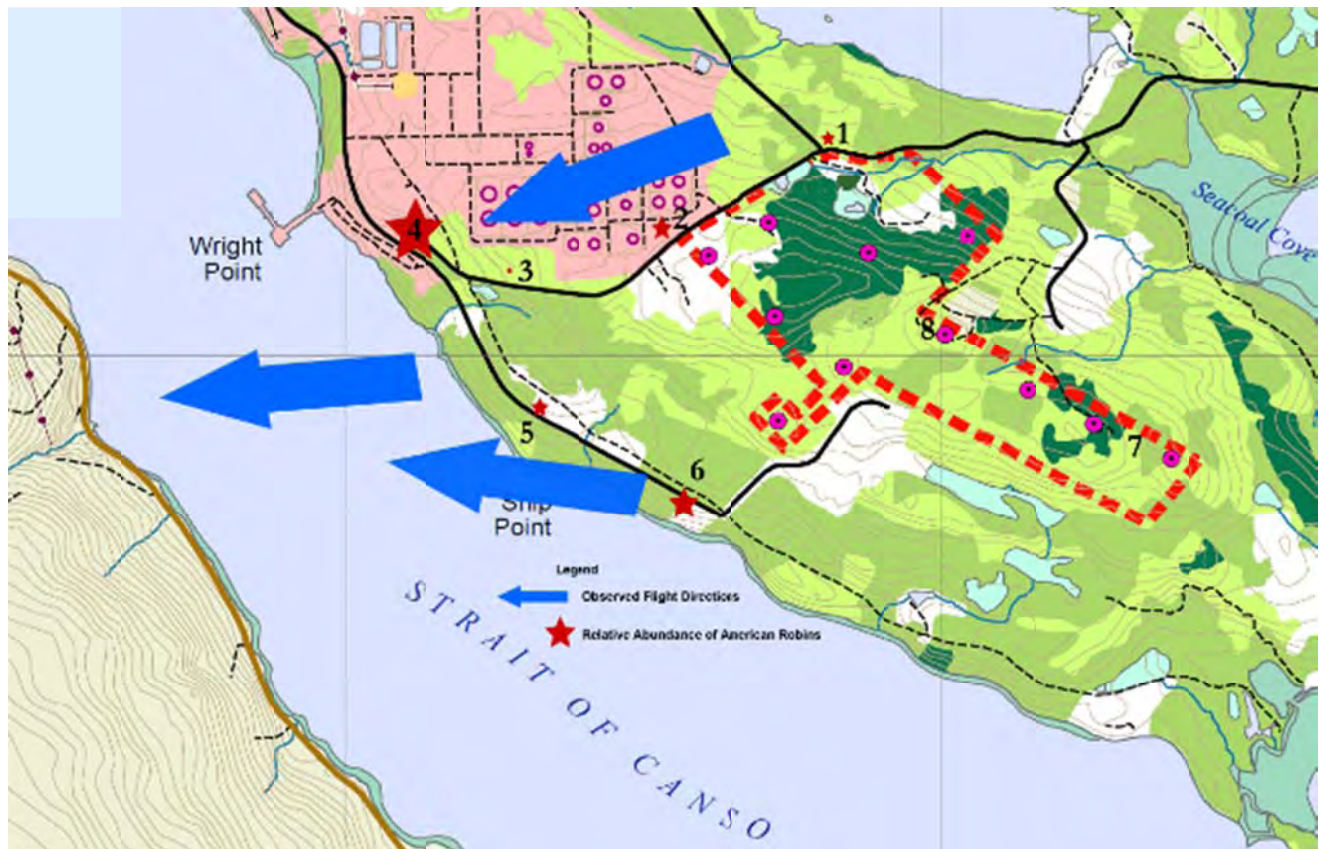
The pattern noted here is consistent with a phenomenon noted elsewhere where migrants collect at coastal “traps”, waiting to make a water crossing. Based on the eight visits that comprised this study, the traps under discussion represent small concentrations compared to other known coastal traps.

Figure 6: Distribution of Birds by Point Count (Based on Mean Number Detected)



This phenomenon can be further understood by mapping the distribution of the American Robin and its observed flight direction. Since it is a medium-sized bird that can be readily identified in flight and often migrates during the day, it is possible to observe their movements. Figure 7 shows the relative abundance of American Robins at each of the point count locations along with the observed directions of their diurnal flight movements during the autumn of 2010.

Figure 7: Distribution and Flight Direction of American Robins



The robins followed the same pattern of coastal concentration as other birds but one can see the direction of their movements between west northwest and west southwest. Typically robins were moving from the east and northeast to land in the coastal concentration areas. They then flew off from those areas across the Strait of Canso in a general westerly direction. Flock sizes varied between 2 and 35 birds.

Diurnal Passage

The “watch counts” for diurnal passage of birds yielded few observations. A total of only seven soaring birds were seen on six separate occasions. These were Osprey, Sharp-shinned Hawk, Red-tailed Hawk, Bald Eagle, and Common Raven. Only one of these, the Osprey, flew at the height of the turbine blade sweep. The others were above or below the blade sweep.

Sixteen songbirds and one Hairy Woodpecker were seen in diurnal passage on five separate occasions. The songbirds included American Goldfinch and American Robin. On one occasion a

flock of 12 American Goldfinches were seen flying at the height of the blade sweep. The remaining birds were lower than the blade sweep.

Discussion

The autumn migration of passerine birds (songbirds) is apparent in the areas immediately adjacent to the Point Tupper Wind Farm site where there are coastal concentration points of birds in stop-over. No such concentration areas were seen on the wind farm site nor were there any significant numbers of birds observed flying over the wind farm. However, the passage observations were oriented toward detecting soaring birds and hence were conducted in the mid-to-late morning. Passerine birds are more likely to be seen in diurnal passage in the early morning. Just as importantly, most passerine migration takes place at night. Thus it is possible that birds that are concentrating on the coast have flown over the wind farm to arrive at those points.

The American Robin was the most abundant migrant observed in the study. It was moving through the area in at least moderate numbers. While it was suspected that other passerine birds were concentrating in the coastal traps before crossing the Strait of Canso, it was clear that this is what the robins were doing. This movement of American Robins in a westerly direction has been noted in other coastal areas of northern Nova Scotia. (Kearney 2008, 2010);

While this study provides some insights on the nature and extent of the autumn bird migration at Point Tupper, it is not possible to make definitive statements about the true magnitude and significance of this migration based on eight days of observation. Autumn mortality rates at the wind farm site over one or two years is not necessarily an accurate gauge of the potential risk of collisions from migrants due to unfavourable weather conditions in future years. Continuation of the mortality study is recommended at Point Tupper and further consideration should be given to developing a greater understanding of the risk of wind farms to the migration of American Robins at this and other wind energy facilities in Nova Scotia.

References

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Acknowledgements

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Map bases produced by CBCL Limited for the registration document of the Point Tupper Wind Farm