

**BREEDING BIRD SURVEY FOR THE  
SEARSBURG/READSBORO EXPANSION WIND PROJECT,  
BENNINGTON COUNTY, VERMONT**

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Prepared for:

John Zimmerman, VERA

and

enXco

Prepared by:

Paul Kerlinger, Ph.D. and James Dowdell  
Curry & Kerlinger, LLC  
P.O. Box 453  
Cape May Point, NJ 08212  
609-884-2842, fax 609-884-4569  
[pkerlinger@aol.com](mailto:pkerlinger@aol.com)

## **Breeding Bird Study for the Searsburg/Readsboro Expansion Wind Project Bennington County, Vermont**

### **Executive Summary**

A breeding bird study was conducted in the two areas proposed for the Searsburg/Readsboro Expansion Wind Power Project in Bennington County, Vermont. The project is a proposed expansion of the existing wind power project and is on hills immediately adjacent to the existing project site. The study was conducted after a project-specific avian risk assessment recommended that a nesting study be conducted. The focus of the breeding bird study was to determine whether listed species were nesting locally and whether there were likely to be significant impacts resulting to listed or common species from construction of the project and associated infrastructure. The object of the study was to identify the species, numbers of individuals, and distribution of those birds along the eastern and western transect areas where turbines are proposed. A total of thirty-two (32) point count locations were established along transects on the eastern (12 point counts – immediately south of existing turbines) and western (20 point counts) mountaintops (west of Route 8). In addition, point count observations were conducted at the 11 existing Searsburg wind turbines. Each point was surveyed on the survey day for 5 minutes during which all birds seen or heard were recorded. Playbacks of the Bicknell's Thrush song were made in an effort to locate that species. Also recorded were the distance and direction from the observer of each bird. Surveys were conducted on June 11, 12, 13, 17 and July 2, 3, and 4, 2003, on seven separate mornings. A total of 6 surveys of all the point count locations were made and 1 survey was made of existing turbines.

A total of 37 species were detected at point count locations along the eastern and western transects. Bicknell's Thrush was not detected despite a concerted effort in the most suitable habitats on site. Additionally, no federal or Vermont endangered or threatened species were detected, nor were Vermont species of concern found. Risk to those species is, therefore, improbable. The species found on site were a combination of interior forest, forest edge, and, to a lesser extent, brushland species. Almost all of the species detected are likely to nest on site. The birds recorded at the point count locations were a mixture of northern temperate forest and brushland birds, along with a few species that also occur in boreal forests. An additional 16 species were observed while walking to and from the two transects, many of which were edge and brushland species that are not generally found in large, unbroken forest tracts. The presence of edge and brushland species along the two transects and at lower elevations suggest that portions of the Searsburg/Readsboro Expansion areas are influenced by forest clearings and that the forests show signs of fragmentation from prior logging operations. The presence of edge species along the western transect, as opposed to the eastern transect, suggest that the previous clearings have fragmented that forest. No such clearings exist on the eastern transect. The species on the eastern transect were found to be more similar to those at the existing wind site and the species present had greater affinity to boreal and more northern forests than to deciduous forests. The western transect was dominated by northern deciduous nesting species and had few to none of the more boreal species such as Blackpoll Warbler, Magnolia Warbler, Yellow-

rumped Warbler, and White-throated Sparrow. Species that were more numerous on the western transect included Red-eyed Vireo, Ovenbird, and a few others that are most often found in deciduous forests. The presence of stands of balsam fir on the eastern site (none found on the western site) explains the presence of these more boreal species and other differences between the two transects.

The data collected in this breeding bird study suggest that the potential for significant numbers of collision fatalities involving nesting birds at the project site is minimal and not biologically significant (to species' regional or global populations). The species recorded nest on site or near the site and seldom fly above the forest canopy at heights that would bring them into the range of the proposed turbine rotor-heights. Some species that nest in more open areas and edge situations were also present, however they are not likely to be impacted significantly. The proposed clearing of trees for turbines and roads suggests that forest fragmentation may occur and therefore, impacts to the breeding bird community are likely, at least in the short term. Minor, and likely temporary changes in the species composition at the two sites (especially the western site) can be expected. The presence of edge species, especially on the western transect suggest some fragmentation already exists. A forest management plan should be adopted to promote the growth of trees and brush along roadsides and up to turbine bases. This plan could reduce or eliminate the potential for displacement of nesting birds and further fragmentation of the forest. However, the succession process takes years so it is likely that recovery of the avifauna would take several years. A post-construction study at the Searsburg/Readsboro Expansion project would aid in determining the extent and duration of resultant impacts to nesting birds.

## Introduction

Wind power is the fastest growing source of electric generation in the United States and in the world ([www.awea.org](http://www.awea.org)). New wind power projects are being proposed and built at a rapid and increasing rate across the United States. With that growth, has come a greater awareness that impacts to birds have been documented at several wind power plants. However, those impacts have not been demonstrated to be ecologically significant in terms of causing population declines of individual species. Most avian studies from the United States have focused on collision fatalities, whereas European studies have also focused on disturbance and displacement, as well as habitat impacts. Of the studies conducted in the U.S., only the previous Searsburg Project study (Kerlinger 2000, 2002) assessed (pre-construction) and monitored (post-construction) impacts of wind power development on birds that nest in forested areas. Because few wind power projects have been constructed in forested areas in the United States, it is important for the industry and the environment that potential and realized impacts to birds be examined.

A Phase I Avian Risk Assessment was conducted for the Searsburg/Readsboro Expansion Project in mid-2003 (Kerlinger 2003). That report suggested that collision impacts to birds were not likely to be ecologically significant and that disturbance/displacement impacts were likely to be minimal. However, that study identified the potential for forest fragmentation impacts that might have an effect on the avian community that now nests within areas of the proposed expansion.. That conclusion was based on interviews with environmentalists and Vermont Agency of Natural Resources staff who suggested such impacts, as well as the potential presence of rare species of birds. Although the latter species are not endangered or threatened, some are in decline in the northeastern United States, presumably because of habitat change and destruction. This nesting bird study was proposed and designed to determine which species were present within the Searsburg/Readsboro Expansion project area and to provide a broader database on the types of birds nesting within the project area.

Specific objectives of this Nesting Bird Study are:

- Determine whether federal or Vermont endangered or threatened species, or Vermont species of concern (with a particular emphasis on Bicknell's Thrush) are present on site;
- Provide baseline data on the species of birds that nest on the site in an effort to determine the degree and magnitude of impacts, if any, that may result from the expansion;
- Provide baseline data from which potential post-construction monitoring could determine the degree and magnitude of disturbance/fragmentation impacts, if any, that result from clearing of forest and construction.

## Study Area and Methods

To provide quantitative information on the species of birds that nest within the eastern and western portions of the Searsburg/Readsboro Expansion Wind Power Project site, two transects were established along the hilltops where turbines are proposed. Point counts (sampling points) were then located along those transects (Figure 1). The transects traversed the highest portions of two mountains and included the proposed wind turbine. The length of the eastern and western transects was about 2.0 kilometers (1.24 miles) and 2.8 kilometers (1.74 miles), respectively. The elevation of the western transect was between about 2,670 and 2,920 feet ASL. The elevation of the eastern transect was between about 2,890 and 3,109 feet ASL. No roads or well-marked trails were found along the two mountaintops. Both transects were flagged for ease of transit. In addition to the above transects, birds were surveyed one time at the existing turbines. Point counts were sampled at each of the turbines to provide some comparative information on the birds. Transects and point counts were established utilizing a preliminary site plan identifying possible turbine locations provided by enXco.. Field investigators understand that the final site plans may be altered from this preliminary site plan, however it is likely turbine locations would be generally located along the same transects that were chosen for this study. A description of the habitat along each transect is provided in the avian risk assessment.

A total of 12 point counts were established on the eastern transect and 20 point counts were established on the western transect. The field technician\* spaced point count locations by 200 paces, flagged and located using a Garmin Global Positioning System (GPS) device (Table 1, Figure 1). The distance between point count locations was about 165 meters (543ft). Most species could easily be heard at distances out to 150 m (492 ft). It is probable that the entire proposed turbine/road site area was included within the area surveyed. The survey order of the two transects was reversed each day to allow each transect to be surveyed first roughly one half of the days.. In addition, the order in which the point counts within a transect were surveyed was reversed on a similar pattern.

Transects and point count locations were established on May 30 and 31, 2003. Observers became familiar with the habitat and birds within the area at this same time. Each transect, covering all point counts were then sampled 6 times. Surveys were conducted on 7 mornings during the peak of the nesting season within the period of June 11 to July 4, 2003 (Table 2). Six surveys of all points along the two transects were completed on seven days in the field. Rain on June 13<sup>th</sup>, after completion of the eastern transect survey, did not allow for the western transect survey to be completed that day. The western transect was sampled 4 days later (June 17<sup>th</sup>). The surveys started at dawn, as soon as there was enough light for the observer to safely walk in the forest. The earliest observations were made at 04:45 hours Eastern Daylight Time (EDT) and the latest observations were made at approximately about 10:05 hours EDT. Five minutes was spent at each point count location looking and listening for birds. Data collected for all birds observed or heard included the species, approximate distance from the observer (to the nearest 10 m) and approximate direction in one of 8 cardinal directions.

The playback technique was used to determine the presence of Bicknell's Thrush. A tape of Bicknell's Thrush song was played in the best potential habitat (thick fir just south of the

existing turbines). This method, used at the right time of day and during the right season almost always elicits responses by that species (Dr. Chris Rimmer, VINS, personal communication). To verify this technique, a secondary location in Vermont was assessed for nesting Bicknell's Thrush during the same survey period. Bicknell's Thrushes responded almost immediately to the tape and were heard singing after dawn at the secondary location, indicating a valid methodology for detecting the species. This strongly indicates that if the species was present at the Searsburg/Readsboro study area it would have been found.

Birds observed or heard while traversing the site to point count locations were also recorded. These occurred in two primary locations: 1) the transmission line right of way located at the north end of the western transect and 2) near the cemetery-substation area near Route 8. This was done to determine whether species of concern, and threatened or endangered species were present at sites immediately adjacent to the proposed project site and to determine whether nest parasites and predators were present in nearby cleared areas where those species are most common. If present, they could invade cleared areas of the forest and indicate forest fragmentation by the project.

[\*The field technician, James Dowdell, is a highly experienced field biologist who has spent more than 2 decades observing and listening to forest nesting birds in the northeastern United States. He is very knowledgeable regarding the songs of all species that are likely to be encountered in northeastern forests and has experience identifying vocalizations of all forest nesting species in Vermont. Dowdell conducts surveys for endangered and threatened species (as well as more common species) for the New Jersey Department of Environmental Protection (Division of Fish, Game, and Wildlife – Endangered and Nongame Species Program), the Nature Conservancy, Izaak Walton League, New Jersey Conservation Foundation, New Jersey Audubon Society, and other nonprofit environmental organizations.]

## Results and Discussion

Thirty-seven (37) different species were observed during the seven-day survey period at the 32 point count sites of the Searsburg/Readsboro Expansion area (Table 3). Thirty-one (31) species were observed at the western transect point counts and twenty-four (24) species were observed at the eastern transect point counts. All of these species are likely to nest on or immediately adjacent to the transects and can be considered local nesters. An average of 7.4 birds were seen per point count sampled, whereas an average of 7.7 individual birds were observed at the eastern transect point counts and 7.2 individual birds were observed at the western transect point counts.

Overall, the species found on the eastern and western transects are representative of northern temperate forests, northern mixed forests (deciduous and coniferous), and to a lesser degree, boreal forest. Also, the species are a mix of those found in pristine, unbroken forests and as well as forests that have been fragmented. The presence of large or moderate numbers of species such as Red-eyed Vireo, Ovenbird, Black-throated Blue Warbler, Blackburnian Warbler, Swainson's Thrush, Veery, and others suggest high-quality nesting habitat in these forests.

Five species, Red-eyed Vireo, Dark-eyed Junco, Ovenbird, Yellow-rumped Warbler, and Black-throated Blue Warbler (Table 3), accounted for a majority (59.7%) of the individuals observed on the east and west transect point counts together. The most numerous five species on the western transect (Red-eyed Vireo, Ovenbird, Black-throated Blue Warbler, and Blue Jay) accounted for two-thirds of all individuals recorded (66.9%) and on the eastern transect the most numerous species (Yellow-rumped Warbler, Dark-eyed Junco, White-throated Sparrow, Blackpoll Warbler, and Red-eyed Vireo) accounted for 72.3% of all individuals observed. The species composition varied dramatically for the most numerous species at the two transects.

The eastern transect species composition strongly reflected the more boreal and coniferous vegetation on that site, whereas the western transect reflected the typical northern deciduous forest avifauna. Species such as Blackpoll Warbler, Magnolia Warbler, White-throated Sparrow, Dark-eyed Junco, Yellow-rumped Warbler were far more numerous on the eastern transect than on the western transect. Blackpolls and White-throated Sparrows did not occur on the western transect and only a single Magnolia Warbler was present on the western transect. The differences were not quite as pronounced for Dark-eyed Junco, Yellow-rumped Warbler. These species are more typically found farther north and in boreal forests rather than in more southerly northern temperate forests. Similarly, species such as Red-eyed Vireos, Ovenbirds, and Black-throated Blue Warblers have either more southerly distributions than the above listed species or are dependent on deciduous forests. Vireos and Ovenbirds are usually found in deciduous forests. Rose-breasted Grosbeak, Veery and some other species were also more common on the western transect. These species are either found lower on mountains or at more southerly latitudes. They are also found mostly in deciduous forests, which explains why they were found more often on the western transect.

Edge loving species were far more numerous along portions of the western transect than on the eastern transect. American Robins, Common Yellowthroats, and Chestnut-sided Warblers, all edge and brush loving species, were present on the western transect but absent on

the eastern transect. Similarly Blue Jays, also considered edge species, were far more common on the western transect and were the fifth most often counted species. The presence of these species on the western transect suggests strongly that the forest has been fragmented by earlier logging operations.

A total of 12 species were noted on the single survey of the existing turbine point counts. Blackpoll Warblers were most numerous followed by Dark-eyed Juncos, White-throated Sparrows, Magnolia Warblers, and Yellow-rumped Warblers, respectively. These species accounted for 87.5% of all individuals observed during that survey. These findings suggest that these, and other species, may not be averse to nesting and/or singing near existing turbines and the small clearings around those turbines. In fact, on average a larger number of birds per point count were found at the existing turbine site than at the eastern and western transects. A total of 9.5 birds per point count were heard beneath the turbines. The species composition at the existing turbine point counts was more similar to that of the species observed at the eastern transect than at the western transect. Four of the five most common species at the turbines were also four of the five most numerous at the eastern transect. The similarity between these areas is logical considering that both the turbine transect and the eastern transect have significant amounts of balsam fir, whereas the western transect is almost entirely deciduous forest, with larger forested patches that contain dense stands of short trees.

An additional 16 species were detected incidental to walking into and out of the eastern and western transect areas (Table 4). The species observed were often species of forest edges and lower elevations, as well as residential areas. For example, American Crow, American Goldfinch, American Robin, Barn Swallow, Chestnut-sided Warbler, Chipping Sparrow, Common Yellowthroat, Indigo Bunting, Red-tailed Hawk, Song Sparrow, and Turkey Vulture are found along forest edges or in early successional forests, as well as open fields and to some extent, residential neighborhoods. Thus, many of the birds observed during walks into and out of the proposed turbine areas on the mountaintops are typical of different avian communities than the species found along the tops of the mountains. The cemetery located along Route 8 hosts many edge species and promotes fragmentation in that general area. As well, the transmission line right-of-way at the northern terminus of the western transect is an important factor promoting the potential for forest fragmentation in the general area. The degree of fragmentation seems to be minimal along the eastern and western transects, however, probably because the forests at Searsburg are remote from farmland where nest parasites and nest predators are far more common. The absence of American Crow and Brown-headed Cowbirds along the transects suggests that severe fragmentation effects have not occurred. Their presence nearby suggests that these impacts could occur.

No federal or Vermont endangered or threatened species were found at the point count locations at either the eastern or western transects, nor while walking between point count locations or into/out of the study area or at the existing turbine point counts. Bicknell's Thrush was not heard or seen, despite using playbacks to elicit this species' song. It is not likely to nest locally, although the presence of dense balsam fir suggests it could nest in some areas nearby. A 2005 report on Bicknell's Thrush prepared by Joe Torres for the Deerfield Wind Project also concluded that while it is possible Bicknell's Thrush are transient to the area, it is "highly

unlikely” that the species is using the eastern ridge project area as nesting habitat. (Exhibit DFLD-PK-5).

### **Assessment of Impacts to Nesting Birds**

Based on the surveys and casual observations by the field biologist conducting the point counts at the Searsburg/Readsboro Expansion area during the nesting season, no federal or Vermont endangered or threatened avian species, or Vermont avian species of concern were observed at the project site. Furthermore, the habitat did not appear to be suitable for any of those species, and, therefore, it is highly unlikely that there will be any impact to these species.

Risk of collision to species nesting in the two areas where turbines would be located is likely to be minimal and not biologically significant. Collision fatalities at wind power facilities rarely involve forest nesting species during the nesting season (Erickson et al. 2001). Most of the species observed at the Searsburg transects rarely fly above the treetops and would, therefore, not likely be flying within the rotor swept height of the turbines (about 100-375 feet above ground level). The activity of most of these species is below the forest canopy or a few feet above the forest canopy during the nesting season. The only time these birds are likely to venture above the treetops, at rotor swept height, is potentially during dispersal in later summer and during migration. A few species that nest in the general area around the project site (seen on point counts or during incidental to conducting point counts) will fly within the rotor swept height zone. These include Common Raven, Broad-winged Hawk, Cedar Waxwing, Red-tailed Hawk, Turkey Vulture, and, possibly some other species. Few of these species are likely to experience biologically significant risk because they are present infrequently or in small numbers. Their behavior is generally, to avoid flying into turbine rotors and other obstructions in the airspace above the forest. As with other sites, low patterns of use (in this case flight in the rotor swept height zone) and collision fatalities involving nesting birds are likely to be minimal and not biologically significant.

Risk attributable to habitat disturbance and forest fragmentation, is less understood than is collision risk. Some grassland and open country birds have been found to avoid the area near wind turbines. For example, in Minnesota species that nest on Conservation Reserve Program grasslands avoided the area within about 100 or more meters (328 ft) of turbines (Leddy et al. 1999) and species responses varied. In Wyoming, Mountain Plovers would not nest within about 200 m (656 ft) of turbines (Johnson et al. 2000). Conversely, in Colorado, at the Ponnequin Wind Energy Facility, grassland songbirds like Horned Larks foraged directly beneath turbines, and along with Western Meadowlarks, foraged directly beneath turbines in the Altamont of California, where they also perch on lattice turbines (Curry & Kerlinger, LLC studies in progress). A similar pattern to that found by Leddy et al. was demonstrated for Golden Plover and some geese in Europe (Larsen and Madsen 2000). Golden Plovers, when stopping over during migration, would not forage within several hundred meters of wind turbines in farm fields, although geese would forage much closer to turbines. Pink-footed Geese were reluctant to forage within about 100 m of turbines, whereas Barnacle Geese would forage within 25-50 m (82-164 ft) of turbines, demonstrating slightly different patterns among closely related species. For open country birds, the pattern varies among species and there seems to be some evidence

for habituation by these birds. It will be several years before these patterns can be determined with certainty.

Forest nesting birds have been studied only rarely at wind plants. Studies from the existing turbines at Searsburg are the only available from North America.. At that mixed conifer-hardwood forest site, disturbance from habitat modification and turbine presence was found to be low, although a few species seemed to avoid the clearings where the turbines were located (Kerlinger 2002). Although species such as Blackpolls, White-throated Sparrows, Dark-eyed Juncos and some others were observed singing in close proximity to the forest edge and the turbines, other species, most notably Swainson's Thrush, seemed to move farther into the forest. Whether the clearing or turbine presence was responsible – or whether some other factor was involved — is not known. The Kerlinger (2002) study also suggested that some forest edge species became more numerous after as opposed to before construction at the Searsburg turbines. American Robins and Blue Jays become more numerous following construction, although American Crows and Brown-headed Cowbirds, two of the most important indicators of forest fragmentation were not present following construction at Searsburg.

The point count survey conducted at the 11 Searsburg turbines in June 2003, suggested that many of the same species were present, 6 years after construction of the Searsburg site. Blackpoll Warbler, White-throated Sparrow, Dark-eyed Junco, Magnolia Warbler, and others were detected singing and/or foraging within 20-30 m of the existing turbines. In addition, Swainson's Thrush was heard singing about 40 m south of the southernmost turbine. Interestingly, few American Robins were found, although a few Chestnut-sided Warbler were present, suggesting fragmentation. These findings suggest that some or many forest nesting birds do habituate to the presence of wind turbines. Without a broader scaled, long-term study, these patterns cannot be confirmed, nor can generalizations be made about other species of forest nesting birds.

The eastern transect of the Searsburg/Readsboro Expansion site is very similar to the existing project site and it is likely that the degree of disturbance resulting from the presence of small clearings and wind turbines is also likely to be small and similar to those found at the existing plant. The forest clearings are likely to increase fragmentation only slightly. The forests at the western transect of the Searsburg Expansion project is less similar, so it is difficult to generalize regarding potential impacts at that site. However, that portion of the project area is, in some places, already slightly fragmented as evidenced by the presence of several edge species (American Robins, Blue Jays, Common Yellowthroat, Chestnut-sided Warbler, etc.). The forest openings are located mostly in the middle of the turbine string, a result of a USFS forest cut during the mid-early 1990s. Most importantly, the Searsburg/Readsboro Expansion project offers the possibility of determining whether forest nesting birds do habituate to the presence of turbines and the degree to which such projects fragment the forest and its avian community. Post construction studies would be needed to evaluate whether disturbance or habituation occur. Such a study should be conducted at least 4-10 (or more) years after construction, and would require one or two years of study.

Recommendations. A forest management plan should be developed and adopted. The plan should have similar goals to the one currently in use at the existing Searsburg site. Such a plan

would permit the natural reforestation of the areas surrounding the turbines, meteorology towers, roads, and other infrastructure, that was cleared prior to construction. The goal of this reforestation is to revegetate the cleared areas as quickly as possible in an effort to ameliorate the effects of forest fragmentation that may result from clearing. This kind of reforestation has occurred at Searsburg, a result of an agreement between the developer and the permitting authority to allow the forest to regrow up to the road and turbines naturally. At the Searsburg site, native cherry and some other trees have grown up rapidly much of the road edges and around turbines. Grading practices after construction should leave sufficient soil such that trees will naturally reseed and rapidly provide a brushy cover that will reduce the potential for fragmentation. Without such management, fragmentation and disturbance impacts are likely to be greater than if a management plan is implemented.

A second recommendation is a post-construction study of nesting birds in the expansion areas, as well as at the existing Searsburg site. Ideally, the study would be conducted over several years. Impacts, if they occur, would most likely be greatest immediately after construction of the facility. As forest succession occurs in the managed areas around turbines and other infrastructure, fragmentation impacts are likely to be reduced. A study that examined the impacts 10 years after construction would be more instructive than one that examined impacts one year after construction because of the length of time needed for forest succession to occur. State and federal monies may be available for this work because stakeholders are currently interested in the impacts and benefits of wind power.

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**Table 1.** GPS locations for the nesting bird study point counts along two transects at the Searsburg/Readsboro Expansion Project site, Bennington Vermont, E1 through E12 are the locations along the eastern mountain transect (east of Route 8 and south of existing turbines). W1 through W20 are the locations along the western mountain transect (west of Route 8).

Point Count	Latitude	–	Longitude
E-1	42.85763 N		72.96642 W
E-2	42.85667 N		72.96768 W
E-3	42.85570 N		72.96867 W
E-4	42.85497 N		72.97038 W
E-5	42.85375 N		72.97137 W
E-6	42.85183 N		72.97125 W
E-7	42.85070 N		72.97188 W
E-8	42.84925 N		72.97172 W
E-9	42.84887 N		72.96987 W
E-10	42.84770 N		72.96753 W
E-11	42.84627 N		72.96662 W
E-12	42.84477 N		72.96547 W
W1	42.88305 N		72.98887 W
W2	42.88232 N		72.99064 W
W3	42.88099 N		72.99100 W
W4	42.87973 N		72.99159 W
W5	42.87864 N		72.99090 W
W6	42.87739 N		72.99041 W
W7	42.87613 N		72.98972 W
W8	42.87445 N		72.98946 W
W9	42.87316 N		72.98873 W
W10	42.87244 N		72.98703 W
W11	42.87146 N		72.98566 W
W12	42.87043 N		72.98431 W
W13	42.87088 N		72.98254 W
W14	42.86958 N		72.98139 W
W15	42.86820 N		72.98032 W
W16	42.86700 N		72.97905 W
W17	42.86565 N		72.97857 W
W18	42.86443 N		72.97822 W
W19	42.86307 N		72.97775 W
W20	42.86200 N		72.97648 W

**Table 2.** Summary of dates and times of avian nesting surveys at the eastern and western transects of the Searsburg/Readsboro Expansion Project, Bennington County, Vermont, along with a synopsis of the weather conditions. Temperatures are in degrees Fahrenheit; wind is direction from which wind was blowing in miles per hour; %CC = percentage of the sky covered by clouds, and notes on precipitation if present have been included. Order in which transects were conducted is the order given in Transect(s) Sampled column.

Date	Transect(s) Sampled	Start-End Time	Weather
June 11	East and West	04:50-10:00	60-65+F, West/SW 10-25, 70-80% CC, (lite rain at end)
June 12	West and East	04:50-10:05	60-65+ F, W/E 0-5, 100%-70%-40% CC, (some fog lifting)
June 13	East	05:10-06:50	57 F, W/SE 10-20, 100% CC (lite drizzle then moderate rain)
June 17	West	04:50-08:00	48-57 F, Calm-W-SW 5-10, 0% CC
June 17	Turbine String	08:40-09:50	57-63 F, W-SW 5-10, 0% CC
July 2	East and West	04:50-09:45	55-72 F, W-SW-0-10, 10-20% CC
July 3	West and East	04:50-09:55	60-74 F, W-SW 10-15, 0-50% CC
July 4	East and West	04:45-09:30	60-76 F, SW-WSW 0-15, 0% CC

**Table 3.** List of species and numbers of sightings (from visual observations and vocalizations heard) detected at the point count locations on the eastern and western portions of the Searsburg/Readsboro Expansion Project site, and at the existing turbines, in June and July 2003, Bennington County, Vermont.

	West	East	Total	Turbines
American Redstart	21	0	21	0
American Robin	9	0	9	1
Barred Owl	2	0	2	0
Black-and-White Warbler	11	0	11	0
Black-capped Chickadee	19	9	28	3
Blackburnian Warbler	13	4	17	0
Blue Jay	36 ( 4.1%)	8	44	0
Blackpoll Warbler	0	45 ( 8.2%)	45	31
Black-throated Blue Warbler	98 (11.3%)	6	104 ( 7.3%)	1
Black-throated Green Warbler	27	4	31	0
Canada Warbler	6	0	6	0
Cedar Waxwing	5	3	8	0
Common Yellowthroat	9	0	9	0
Chestnut-sided Warbler	31	0	31	3
Dark-eyed Junco	64 ( 7.4%)	124 (22.5%)	188 (13.2%)	20
Downy Woodpecker	3	0	3	0
Golden-crowned Kinglet	0	6	6	0
Hairy Woodpecker	19	4	23	1
Hermit Thrush	23	24	47	0
Magnolia Warbler	1	23	24	11
Mourning Dove	1	3	4	0
Ovenbird	157 (18.1%)	4	161 (11.3%)	0
Pileated Woodpecker	3	1	4	0
Purple Finch	0	12	12	2
Red-breasted Grosbeak	10	0	10	0
Red-breasted Nuthatch	2	0	2	0
Red-eyed Vireo	226 (26.0%)	35 ( 6.3%)	261 (18.3%)	0
Ruffed Grouse	3	0	3	0
Scarlet Tanager	0	3	3	0
Swainson's Thrush	24	27	51	2
Veery	15	0	15	0
White-breasted Nuthatch	4	0	4	0
Winter Wren	1	10	11	0
White-throated Sparrow	0	70 (12.7%)	70	19
Yellow-bellied Flycatcher	0	1	1	0
Yellow-bellied Sapsucker	16	1	17	0
Yellow-rumped Warbler	9	125 (22.6%)	134 ( 9.4%)	10
Total	868	552	1,420	104
Species	31	24	37	12

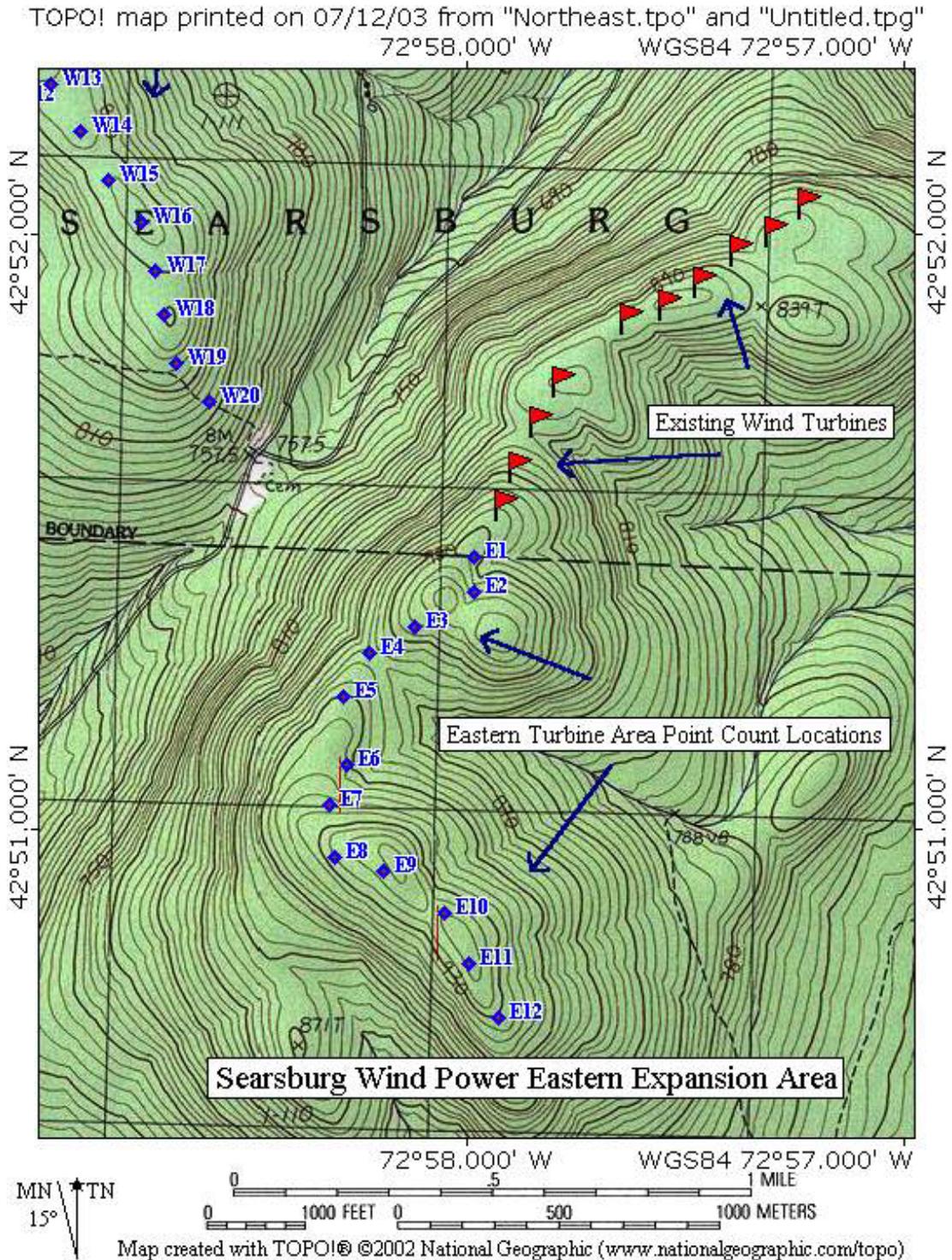
**Table 4.** Incidental sightings of birds during walks to and from the transects at the Searsburg/Readsboro Expansion Project, Bennington County, Vermont (including transmission line right-of-way and Fairington Cemetery on Route 8). Only species not seen on the transects and at point count locations are listed below.

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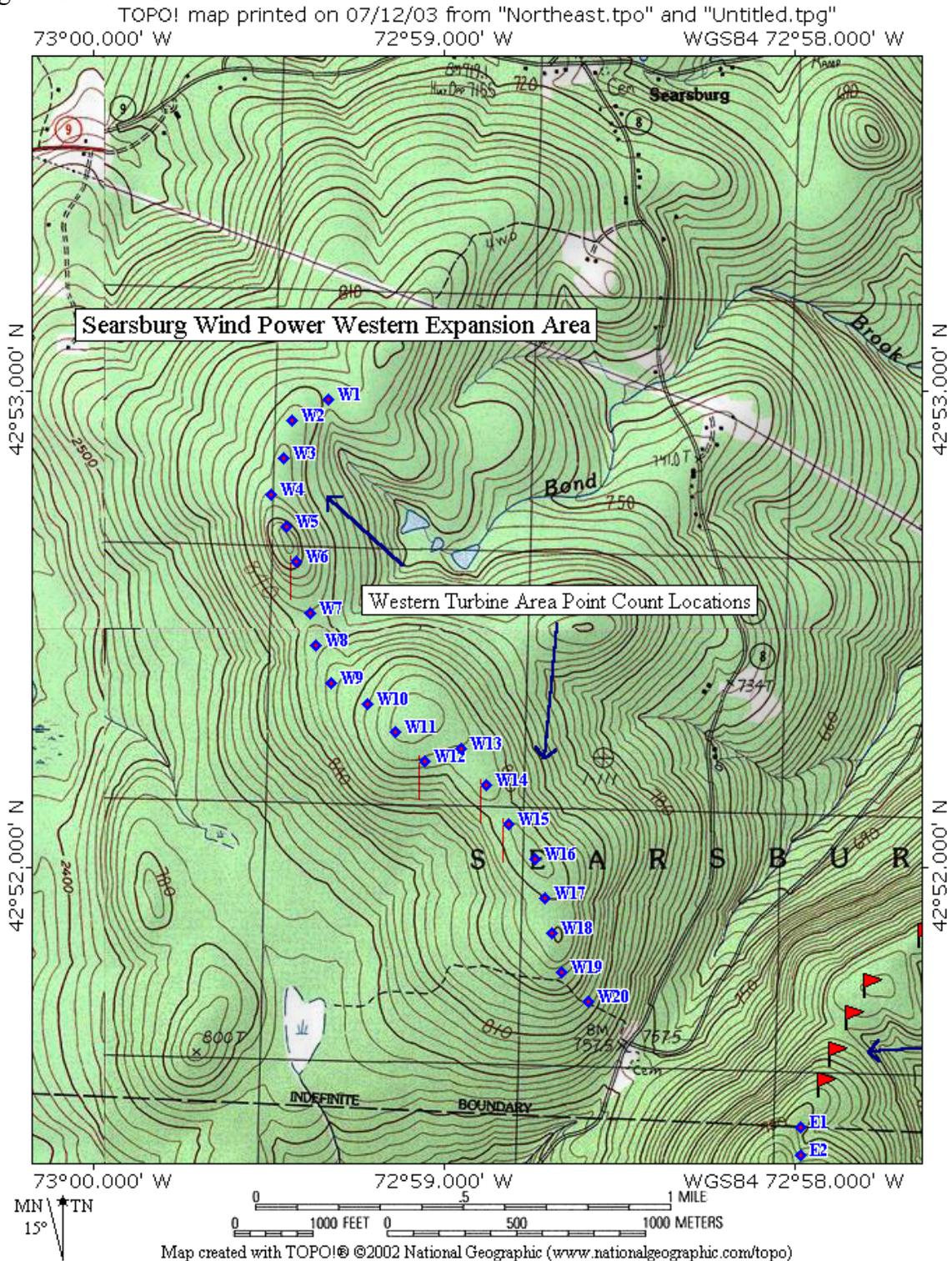
Alder Flycatcher  
American Crow  
American Goldfinch  
Barn Swallow  
Blue-headed Vireo  
Broad-winged Hawk  
Chipping Sparrow  
Common Raven  
Indigo Bunting  
Least Flycatcher  
Northern Parula  
Red-tailed Hawk  
Red-winged Blackbird  
Song Sparrow  
Tree Swallow  
Turkey Vulture

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**Figure 1.** Location of point counts (GPS locations) used to sample nesting bird species on the eastern portion of the Searsbur/Readsboro Expansion Project site, Bennington County, Vermont. GPS locations for point counts are provided in Table 1. Flags indicate location of existing wind turbines.



**Figure 2.** Location of point counts (GPS locations) used to sample nesting bird species on the western portion of the Searsburg/Readsboro Expansion Project site, Bennington County, Vermont. GPS locations for point counts are provided in Table 1. Flags indicate location of existing wind turbines.



Appendix I. Birds with special status in Vermont: US Fish & Wildlife Service listed and candidate species (US-T = threatened); Vermont Nongame and Natural Heritage Program listed species (E = endangered, T = threatened, SC = species of concern). Also noted is habitat suitability for nesting at or immediately adjacent to the Searsburg Expansion project sites for nesting (S = Suitable, MS = Marginally Suitable, NS = Not Suitable, ? indicates uncertainty).

Species - Status	Suitability of Project Site Habitat
Common Loon – E -	NS
Pied-billed Grebe – SC	NS
Least Bittern - SC	NS
Osprey – E	NS
Bald Eagle – E, US-T*	NS
Northern Harrier – SC	NS
Cooper’s Hawk – SC	NS
Peregrine Falcon – E	NS
Spruce Grouse – E	NS
Sora – SC	NS
Upland Sandpiper – T	NS
Common Tern - E	NS
Black Tern – T	NS
Barn Owl – SC	NS
Long-eared Owl – SC	NS
Short-eared Owl – SC	NS
Common Nighthawk – SC	NS
Whip-poor-will – SC	NS-MS?
Red-headed Woodpecker – SC	NS
Three-toed Woodpecker – SC	NS
Black-backed Woodpecker – SC	NS
Gray Jay – SC	MS
Sedge Wren - E	NS
Bicknell’s Thrush – SC	NS-MS?
Loggerhead Shrike – migrant – E	NS
Cerulean Warbler – SC	NS
Wilson’s Warbler – SC	NS
Vesper Sparrow – SC	NS
Grasshopper Sparrow – T	NS
Henslow’s Sparrow – E	NS
Rusty Blackbird – SC	NS

\*Bald Eagle was proposed for delisting by U. S. Fish & Wildlife Service in 2000.

\*\*Indicates species was not found within about 15 km of project site.