Searsburg Wind Tower Expansion Project

Bat Habitat Assessment and Mapping

Final Report

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Prepared for:

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Introduction

In January, 2005 a team of biologists, regulators, and project proponents met to discus possible bat habitat near the proposed Searsburg Wind Power Expansion projects. As a result of this meeting the initial habitat identification phase regarding bats near the project has been developed. Arrowwood Environmental was retained by Deerfield Wind LLC to conduct the bat habitat assessment for the proposed project. The focus of this study was on two species of bats: the federally endangered Indiana bat (*Myotis sodalis*) and the Vermont state threatened small-footed bat (*Myotis leibii*). This report outlines the methodology and results of that study.

Methodology

The work discussed in this report involves the remote mapping of potential Indiana bat and Small-footed bat habitats at the proposed Searsburg expansion area. The scope of work and the habitat criteria considered in this study was developed in cooperation with Vermont Agency of Natural Resources biologists and US Fish and Wildlife biologists. The primary tools for mapping habitat elements were aerial photographs. These were examined under stereoscope to obtain information on topography. The state-wide 1:40,000 Color Infra-red photographs were employed to this end. In addition, National Agricultural Imagery Program true color orthophotos (2003) and black and white Orthophotos (1995-1998), and USGS topographic maps supplemented the aerial photo information. The study area for this inventory consists of a 3 mile radius centered along the proposed development ridge. This study area is shown on the attached map. Methodologies used for the habitat assessments are detailed for each species below.

Indiana Bat (Myotis sodalis)

Habitat identification for the Indiana bat focused on summer-time use of maternity roost areas. The habitat suitability index (HSI) for this species (U.S. Fish and Wildlife Service) outlines a methodology for assessing the potential for necessary habitat within a certain area. The methodology presented in the HSI was used during this study. That methodology calls for assessing habitat within 2km diameter areas. The entire study area was divided into 39 overlapping 2km diameter areas (see attached map) and individual assessments were made for each of these areas. Each area consisted of approximately 872 acres. Under this HSI model, three variables are assessed: 1) food suitability as a function of cover type diversity; 2) roost suitability as a function of the density of roost trees and; 3) landscape suitability as a function of forest cover. A complete HSI determination could not be conducted because of the lack of field work associated with the inventory at this stage. The current study consisted of only assessing the food suitability and landscape suitability of each of the 2km diameter areas.

The food suitability assessment consisted of determining the amount of cover type diversity for each area. The following cover type classes were used:

1. Row crop
2. Pasture and Hay meadow
3. Wetland
4. Open water
6. Early successional habitat
7. Deciduous forest (including upland and floodplain)
8. Coniferous forest

In order for one of the above cover types to be considered present in a suitable amount, it must comprise at least 10% of the landscape being assessed (approximately 87 acres in each 2km diameter area). For each area, the presence of these cover types was recorded.

The landscape suitability portion of the model measures the amount of forest cover within each area. Indiana bats are typically found in areas with a "moderate" amount of forest cover. While less than 5% forest is unsuitable, the ideal range is a landscape with 20-60% forest. The amount of forest as a percentage of the total area was recorded for each 2km diameter area.

Small-footed Bat (Myotis leibii)

Habitat identification for the small-footed bat focused on the presence of cliffs and talus areas as maternity roosting areas. Digital USGS topographic maps were used to initially identify areas that are steep enough to support cliffs and talus areas. The entire study area was then examined with 1990s Color Infrared Aerial Photos (CIR) with special attention paid to the areas identified with the topographic maps. Dot locations of potential areas were mapped. Information such as elevation, aspect, size and quality of the potential habitat is included with the location map.

Results

Indiana Bat (Myotis sodalis)

As mentioned above, the habitat assessment procedure for the Indiana bat consisted of the food suitability and the landscape suitability evaluations. The food suitability is based on the presence of a diversity of cover types. Most areas assessed had only two cover types (hardwood forest and conifer forest) that comprised at least 10% of the landscape (Table 1). Many other cover types were present, but usually only in quantities less than 10%. One area (#14) also had a cover of wetlands that exceeded 10%.

Landscape suitability is based on the percentage of forested cover present within each of the 2km diameter areas. This data is also shown in Table 1. In most cases, forest cover ranged from 90-100%. Only in areas #14 and #18 did forest cover comprise as little as 80-90% cover.

Landscape suitability in all cases is therefore very low for the areas assessed. In general, the landscape is dominated by forest cover and lacks cover type diversity which is essential habitat for the Indiana Bat.

Small-footed Bat (Myotis leibii)

The inventory for the small-footed bat maternity roosting sites yielded four potential ledge or talus locations (see attached map). Descriptions of each location are presented below.

1. This site contains the most likely roosting habitat discovered during this inventory. It consists of a ledge near the summit of a hill overlooking the Deerfield River. It is a south facing ledge and sits at approximately 600 meters above sea level.

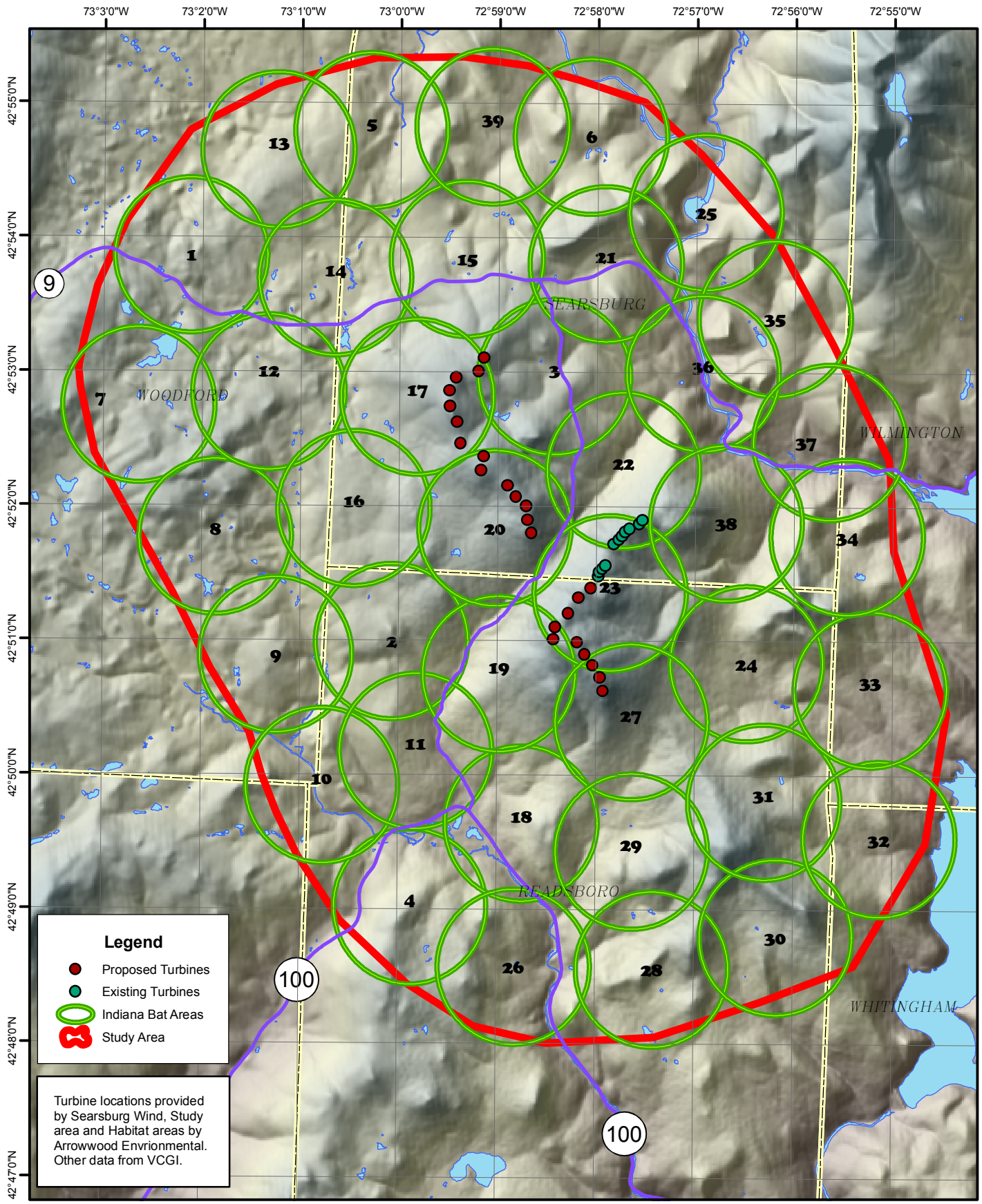
2. This site consists of a rock outcrop on a steep slope in a powerline clearing at 600 meters in elevation. There is only a small possibility for the presence of suitable habitat at this location, but the site should be field checked to verify.

3. Like #2, this site is also a rock outcrop on a steep slope. This outcrop sits on the nose of the summit of Dutch Hill in a ski trail clearing at 720m in elevation. The likelihood for suitable habitat at this sit is also low, but should be field verified.

4. This sit sits on the steep slope above Readsboro Falls at 564 meters in elevation. From remote sources, it is only possible to determine that there is a possibility that ledge or talus exists at this location. Field work is needed to verify the potential habitat at this site.

Because of the uncertainty of remote mapping, each of these sites is referred to as a "Potential" ledge site. Only field work can determine if suitable roosting habitat is actually present. The four potential maternity roost sites that were identified should be further investigated in the field to determine there actual habitat suitability.

	Landscape Suitability	Food Suitability							
ID	% Forest	Row Crop	Pasture	Wetlands	Open Water	Early Successional	Deciduous Upland	Deciduous Riparian	Coniferous
1	90-100	N	N	N	N	N	Y	N	Y
2	90-100	N	N	N	N	N	Y	N	Y
3	90-100	N	N	N	N	N	Y	N	Y
4	90-100	N	N	N	N	N	Y	N	Y
5	90-100	N	N	N	N	N	Y	N	Y
6	90-100	N	N	N	N	N	Y	N	Y
7	90-100	N	N	N	N	N	Y	N	Y
8	90-100	N	N	N	N	N	Y	N	Y
9	90-100	N	N	N	N	N	Y	N	Y
10	90-100	N	N	N	N	N	Y	N	Y
11	90-100	N	N	N	N	N	Y	N	Y
12	90-100	N	N	N	N	N	Y	N	Y
13	90-100	N	N	N	N	N	Y	N	Y
14	80-90	N	N	Y	N	N	Y	N	Y
15	90-100	N	N	N	N	N	Y	N	Y
16	90-100	N	N	N	N	N	Y	N	Y
17	90-100	N	N	N	N	N	Y	N	N
18	80-90	N	N	N	N	N	Y	N	Y
19	90-100	N	N	N	N	N	Y	N	N
20	90-100	N	N	N	N	N	Y	N	Y
21	90-100	N	N	N	N	N	Y	N	Y
22	90-100	N	N	N	N	N	Y	N	Y
23	90-100	N	N	N	N	N	Y	N	Y
24	90-100	N	N	N	N	N	Y	N	Y
25	90-100	N	N	N	N	N	Y	N	Y
26	90-100	N	N	N	N	N	Y	N	Y
27	90-100	N	N	N	N	N	Y	N	Y
28	90-100	N	N	N	N	N	Y	N	Y
29	90-100	N	N	N	N	N	Y	N	Y
30	90-100	N	N	N	N	N	Y	N	Y
31	90-100	N	N	N	N	N	Y	N	N
32	90-100	N	N	N	N	N	Y	N	Y
33	90-100	N	N	N	N	N	Y	N	Y
34	90-100	N	N	N	N	N	Y	N	Y
35	90-100	N	N	N	N	N	Y	N	Y
36	90-100	N	N	N	N	N	Y	N	Y
37	90-100	N	N	N	N	N	Y	N	Y
38	90-100	N	N	N	N	N	Y	N	Y
39	90-100	N	N	N	N	N	Y	N	Y



Indiana Bat Habitat Assessment

Proposed Searsburg Wind Turbine Expansion Project

Prepared for Vermont Environmental Research Associates

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Feet
0 1,500 3,000 6,000

1 inch equals 6,000 feet

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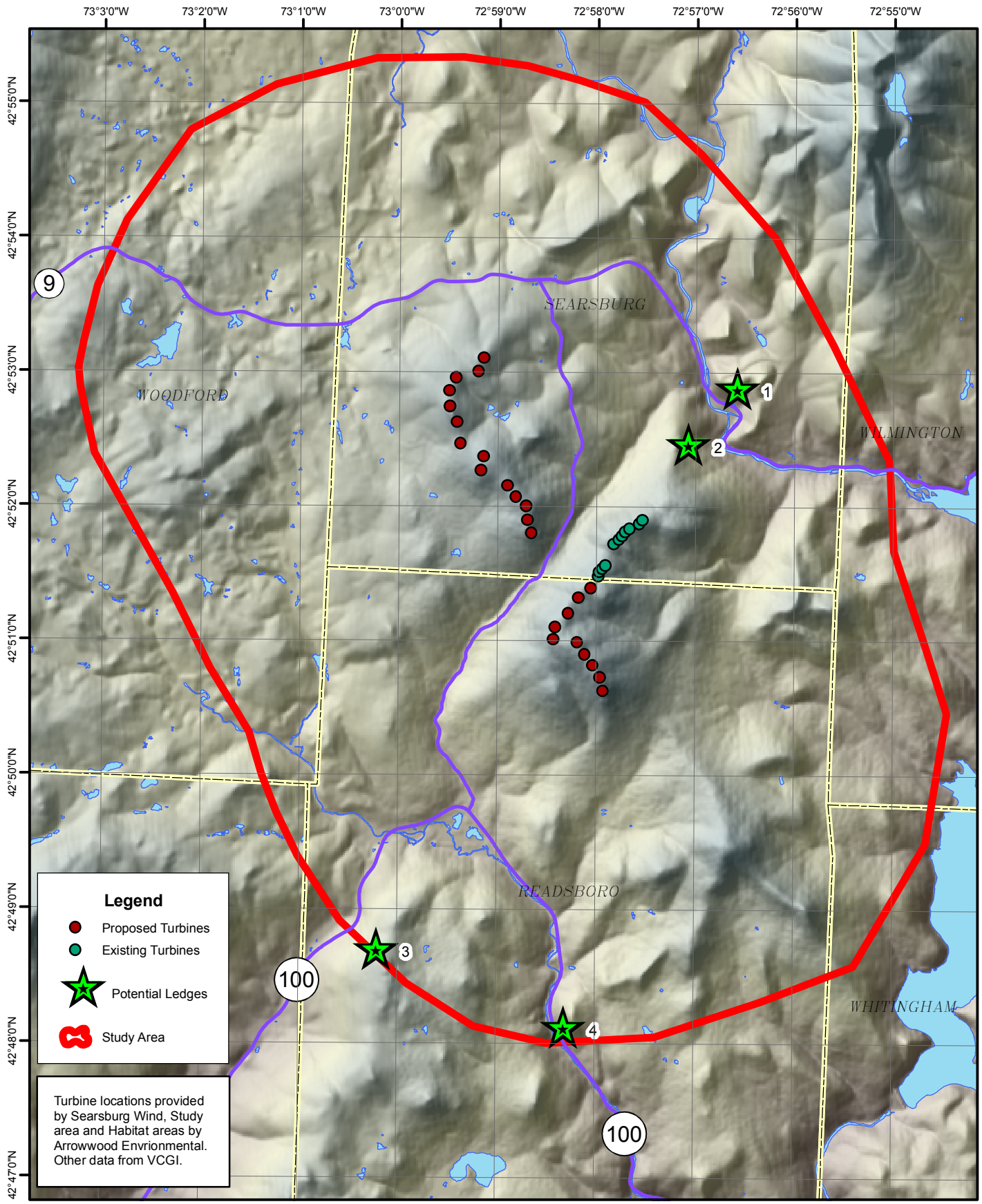

Small Footed Bat Habitat Assessment

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Feet
0 1,500 3,000 6,000

1 inch equals 6,000 feet

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