STATE OF MAINE
LAND USE REGULATION COMMISSION

IN THE MATTER OF DEVELOPMENT APPLICATION DP 4886 BLUE SKY EAST, LLC BULL HILL WIND PROJECT	))))	Pre-Filed Direct Testimony of Adam Gravel, Dale Knapp, and Brooke Barnes on behalf of Blue Sky East, LLC

On behalf of Blue Sky East, LLC ("Blue Sky"), Adam Gravel, Dale Knapp, and Brooke Barnes are submitting this pre-filed direct testimony in support of DP 4886 for the Bull Hill Wind Project ("Project" or "Bull Hill Wind Project").

I. QUALIFICATIONS AND BACKGROUND

A. Adam Gravel

I am employed by Stantec Consulting ("Stantec") as a Project Manager. I am responsible for coordinating and conducting wildlife use and impact assessment surveys, with a specific focus on large-scale avian and bat studies associated with wind power projects. In 2003, I earned my Bachelor of Science in Wildlife Management from the University of New Hampshire. I was hired by Woodlot Alternatives, Inc. (now Stantec) in 2004 as a Project Technician and radar ornithologist and was promoted to Project Manager in 2006. I have been a certified wildlife biologist since 2008, a nationally recognized certification process through The Wildlife Society for wildlife professionals.

I have conducted and coordinated environmental studies as part of State and Federal permitting requirements at over 60 wind development projects from Maine to Virginia. These studies include daytime raptor migration, nocturnal radar migration, acoustic bat detector, and breeding bird surveys designed to assess potential direct impacts from proposed wind energy projects. I have also assessed the potential indirect (non-collision related) impacts of projects on

wildlife, including habitat impacts and fragmentation effects, impacts to rare species, and impacts to local wildlife communities.

My experience in Maine includes managing and conducting several nocturnal radar and acoustic bat surveys, diurnal raptor migration surveys, breeding bird surveys, and winter tracking surveys for federally listed species. I routinely consult with State and Federal agencies to identify and discuss potential resources of concern at proposed projects and also have developed field surveys to address agency concerns for wildlife. I have coordinated or conducted these studies at nearly every proposed or permitted wind project in the State of Maine. A copy of my resume is attached as Exhibit A.

B. Dale Knapp

I am a licensed site evaluator, wetland scientist, and ecologist with over a decade of experience. Currently, I am the Director of the Water Resources Division at Stantec's Topsham office. My primary responsibilities include directing large-scale ecological field surveys. I first began conducting wetland surveys associated with wind farms in the Fall of 2006. Since that time, I have worked on a total of 13 grid-scale wind projects in Maine where I have been responsible for overseeing the completion of associated wetland and natural resource inventories. I hold a B.A. from the University of Maine with concentrations in soil science and geology and will complete degree studies toward an M.S. from Southern New Hampshire University this fall. I am a professional member of the Soil Science Society of Southern New England and the Maine Association of Professional Soil Scientists. I am a past President of the Maine Association of Wetland Scientists and am the current President of the Maine Association of Site Evaluators. I have extensive experience in wetlands, vernal pools, soil mapping, morphology, and subsurface wastewater design. A copy of my resume is attached as Exhibit B.

C. Brooke Barnes

I am employed by Stantec in Topsham as a Senior Project Manager. Since 2007, my work has been primarily focused on managing state, federal and local permitting for wind power projects. I design and evaluate environmental and other necessary studies, determine regulatory requirements in consultation with regulatory agencies, assemble permit applications, and assist in guiding projects through the regulatory process. Maine projects I have managed include the Stetson, Stetson II, Rollins, Oakfield and Bull Hill Wind Projects.

I have a BS in Sociology, and earned a JD from the University of Maine in 1986. I was employed by the Maine Department of Environmental Protection ("DEP") in enforcement, policy and administrative positions from 1988 until 2002. A copy of my resume is attached as Exhibit C.

D. Company Qualifications and Background

Stantec is an environmental consulting company that provides services to a variety of sectors, including the wind industry. Between 2002 and 2008, Stantec[1] has conducted over 180 distinct seasons of pre-construction avian and bat studies on behalf of proposed wind projects in twelve states, from Texas to Maine. Stantec has provided screening analyses or full scale pre-construction avian and bat studies for fifteen utility-scale projects in Maine.

Pre-construction avian and bat surveys typically include nocturnal radar surveys, acoustic bat monitoring, diurnal raptor surveys, breeding bird surveys, and targeted rare species surveys, depending on specific requests from State and Federal resource agencies. Stantec maintains regular contact with State and Federal resource agencies and seeks involvement with regional and national organizations whose sole purpose is to better understand and minimize potential

[1] On October 1, 2007, Woodlot Alternatives was acquired by Stantec. Unless otherwise noted, references to Stantec include work conducted under either the Woodlot or Stantec company name.

wind energy-associated wildlife impacts. Stantec has directly participated in the development and review of proposed guidelines and monitoring protocols sponsored by several State and Federal agencies.

Based on the results of on-site field surveys, Stantec has also prepared screening-level avian and bat risk assessments for a variety of wind projects and has designed and conducted agency-approved post-construction surveys. Finally, Stantec has completed post-construction bird and bat mortality surveys at existing wind projects in Maine, New York, Utah and Pennsylvania. The post-construction efforts have allowed Stantec to further refine its survey methodology to provide more comprehensive data sets to the regulatory agencies and the regulated community. Post-construction mortality surveys are particularly helpful to determine if any relationships occur between pre-construction and post-construction survey results and overall impacts to bird and bat species.

II. INVOLVEMENT WITH THE BULL HILL WIND PROJECT

Stantec has provided environmental impact analysis and permitting support for the Bull Hill Wind Project. We are responsible for the technical environmental consulting provided at the Project and have been involved in agency consultations, the design of field studies, implementation of field studies, and analysis and reporting associated with the Project. This testimony summarizes the information collected and evaluated to characterize existing environmental conditions of the Project area, and analyses conducted to assess Project-related impacts.

Design and implementation of field studies and environmental impact analyses have involved qualified specialists from Stantec, as well as extensive input from State and Federal agencies, including the Land Use Regulation Commission ("LURC") staff, Maine Department of

Inland Fisheries and Wildlife ("MDIFW"), the Maine State Soil Scientist, the DEP, the United States Fish and Wildlife Service ("USFWS"), and the United States Army Corps of Engineers ("USACE"). The following is a description of each witnesses' activities related to the Bull Hill Wind Project.

Adam Gravel

The purpose of my testimony is to briefly explain the process of designing and implementing wildlife field studies, specifically bird and bat studies, and summarize the results of the surveys conducted by Stantec in 2009 and 2010 on behalf of the Bull Hill Wind Project. Avian and Bat surveys conducted at the Project include:

- Fall 2009 and Spring 2010 Nocturnal Radar Migration Survey;
- Summer/Fall 2009 and Spring 2010 Acoustic Bat Survey;
- Fall 2009 and Spring 2010 Raptor Migration and Eagle Survey;
- Summer 2009 Bald Eagle activity Survey; and
- Spring 2010 Aerial Bald Eagle Nest Survey and White Sucker Spawning Assessment.

Complete presentations of the methods, analysis, and results of each survey are contained in Exhibit 13A and 13C of the permit application (the "Application").

Dale Knapp

Under my direction, the Water Resources Division at Stantec has performed wetland delineations, vernal pool surveys, threatened and endangered species surveys, ecological community characterizations, biological assessments, environmental planning, fish and wildlife surveys, and wetland mitigation and compensation for the Project.

Brooke Barnes

I assisted in the development of the project design and was responsible for development

and implementation of the studies, information, and facilitation of the regulatory discussions necessary to complete the Bull Hill permit application.

III. ENVIRONMENTAL ASSESSMENT

The Bull Hill Wind Project consists of 19 turbines located along Bull Hill and Heifer Hill, in T16 MD, Hancock County, Maine. Power from the turbines will be collected by an underground collector line and delivered to the existing Bangor Hydro Electric ("BHE") transmission line via a new substation. By locating the substation immediately adjacent to the existing BHE system, no new transmission line need be constructed for the Project. In addition, access for the Project has been designed to utilize existing logging roads to the extent feasible. A full description of the Project elements can be found in Section 1 of the Application.

The testimony below addresses two issues: (1) the consultation process that we followed in identifying environmental, habitat, and species impacts, as well as the data we collected regarding the Project area as a result of that process; and (2) our assessment of the impacts of the Project on those resources and species.

As discussed below, Blue Sky sought input from all appropriate consulting agencies in developing its survey protocols and has collected information regarding all potential environmental impacts within the Project area. In addition, and with regard to impacts, although construction and operation of the Project will result in some impacts to environmental resources, there are no special, endangered, or rare habitat areas or species located in the immediate Project area and the Project layout and footprint has been designed to optimize engineering and wind resource conditions while minimizing environmental impacts to the maximum possible extent. As a result, the Project will not result in an undue adverse effect on environmental resources or wildlife, including habitat.

A summary of the Project impacts is shown below in Table 1.

Table 1

Resource	Impact
Wetlands	No impacts
Vernal Pools	No impacts to pools or buffers
Vegetation/Clearing	Common forest community
Rare, Threatened, Endangered Species	None in Project area
Significant or Essential Wildlife Habitat	None in Project area
Rare or Exemplary Natural Community	None in Project area; closest community 1.25 miles away
Avian	No undue adverse effect; majority of nocturnal flights above rotor swept zone
Raptors	Passage rates low; no bald eagle nests in Project area
Wildlife	No protected habitat areas or species of concern

A. Agency Consultation and Data Collection

1. Consultation.

Stantec sought information regarding potential environmental impacts in several ways. First, initial agency consultation letters were sent to request information on any known occurrences of rare, threatened, or endangered species or their habitats located in the Project vicinity. A response letter from MDIFW indicated that no Significant or Essential Wildlife Habitats or significant fisheries resources were known to occur in the Project area. See July 8, 2009 Letter from Rick Jordan and June 23, 2009 Letter from James Hall, at Exhibit 13B to the Application. The USFWS initially commented that the Project area was located within the range of the federally endangered DPS for Atlantic salmon and identified the possible occurrence of bald eagle and golden eagle passing through the Project area during migration. Subsequently,

USFWS concluded that as no federal permit was required for the Project, it did not intend to comment on specific impacts associated with the Project. After reviewing the Blue Sky East Project, the Maine Department of Marine Resources determined that the Project would not have an impact on Atlantic Salmon population or habitat. See e-mail from Mr. Dube, Maine DMR to LURC dated March 1, 2011.

In addition, through an iterative consultation process with MDIFW and USFWS representatives, Stantec developed and implemented an approved work plan for comprehensive natural resource surveys of the Project area. MDIFW and USFWS recommended that raptor-use and migration surveys be conducted at the project during the summer and fall of 2009 to evaluate potential impacts to seasonally local and migrant raptors (particularly conservation concern species). The plan included avian and bat studies, as well as nocturnal radar surveys, raptor migration surveys, aerial bald eagle nest surveys, and bat acoustic surveys.

Other site-specific surveys included a review of aerial photography to characterize the predominant cover types and habitats of the Project area and surrounding vicinity and wetland mapping and vernal pool surveys. Studies were designed to address general concerns of state and federal agencies, in addition to critical habitat for rare, threatened or endangered species. Stantec also conducted a site visit with regional and State MDIFW biologists to allow agency staff to observe existing ecological conditions within the Project area, be informed of remaining field survey efforts and field survey results to date, and to assess future project planning considerations.

Both MDIFW and USFWS confirmed the appropriate timing and geographic scope for aerial bald eagle nest surveys and provided Geographic Information System data for both known

bald eagle nests and rookeries of great blue heron, a state species of special concern, in the vicinity of the Project area.

2. Data Collection

The Project is located in the Eastern Interior biophysical region of Maine, characterized by gently rolling topography with elevations between 85 to 190 meters (280 to 624 feet). The region is largely undeveloped and the dominant land use is commercial forestry. Recreational boating, fishing, hunting, and snowmobiling also occur in the area.

The area immediately surrounding the Project area consists of a series of coastal low elevation hills around Bull Hill and Heifer Hill. At 190 meters (624') above sea level, Bull Hill has the highest elevation in the Project area and like the other peaks, consists of gently sloping to moderately steep topography. An existing network of well-maintained logging roads is present throughout the area and the effects of past and current timber harvesting are evident across the entire Project area, from large clear-cuts to small selective harvesting areas. Aside from the roads and skidder trails and an existing transmission line, the Project area is almost entirely undeveloped.

B. Vegetation and Habitat

The dominant land cover types dictate the wildlife communities in the Project area. Climate conditions, geology, and past and recent land uses (i.e., forest harvesting) are probably the most significant factors affecting the type and structure of the available habitats. A complete discussion of vegetation and habitat can be found in Exhibit 13A of the Application. The Project site is heavily harvested, characterized primarily by regenerating upland hardwood forest with pockets of emergent, scrub-shrub, and some forested wetlands. Small streams and drainages are

scattered throughout the Project area. Small areas of mixed conifer-deciduous forest or conifer-dominated forest occur sporadically and these occur mainly in wetlands.

Upland forested habitats on Bull and Heifer Hills largely fall within the Spruce-Fir-Northern Hardwoods Forest Ecosystem. This is a very common, widespread ecosystem throughout most of northern Maine (Gawler and Cutko 2005). A variety of forested natural communities can occur within this ecosystem but only one, Beech-Birch-Maple Forest, predominates in the Project area.

Beech-Birch-Maple Forest is the dominant hardwood forest in the State and is ranked by MNAP as S4[2]. It is predominant along the length of the Project's turbine area, as well as along the side slopes of the hills. The majority of the Project area has been heavily logged in the last five years, and the canopy in those areas is primarily open. Areas not recently affected by harvesting have a canopy that is closed with some patchy open areas, resulting in a shaded forest floor with limited herbaceous and shrub development.

Early successional habitat occurs in the Project area in locations that have been previously disturbed, including along road and trail edges, meteorological measurement ("met") tower clearings, and areas that have previously been heavily logged. These areas are fairly limited in the Project area. Some areas still have an intact, though sometimes quite open, canopy of mature trees.

Stantec contacted the Maine Natural Areas Program ("MNAP") and requested information regarding any biological features or rare and exemplary natural communities in the Project area. At Frenches Meadow a domed bog ecosystem (S3[3]) was identified as a potentially

[2] MNAP's State Rarity Ranks describe S4 as apparently secure in Maine.
[3] MNAP's State Rarity Ranks describe S3 as Rare in Maine (20-100 occurrences).

sensitive area. See Application, Exhibit 14. The final layout of the Project, however, is 1.25 miles from French's Meadow and, therefore, will have no impact on this resource.

Project Impacts and Conclusion

As noted in Table 1 of the Application, total Project clearing will be approximately 89.9 acres (55.4 acres temporary/34.5 acres permanent). The clearing will be minimized by utilizing the existing logging road network to the greatest extent possible and, as no new transmission line is required to connect to the BHE grid, such clearing impacts will be avoided altogether. Moreover, no clearing will take place near any rare or exemplary natural communities, and the forest type in the Project area is common in Maine. As a result, the Bull Hill Wind Project will not result in an undue adverse effect on existing vegetation or habitat.

C. Wetlands and Streams

1. Methodology

The majority of wetland and stream delineation work was completed in 2009 and involved several weeks of field work by teams traversing the Project area. The ridgeline was evaluated by 2- to 6-person teams following mapped courses and working abreast of each other in a coordinated manner across the defined Project area. The terrestrial resource assessments concluded in 2010. A complete discussion of the wetland and stream delineation methodology can be found in Exhibit 12A of the Application.

Delineations were completed using the methodology established by the Corps 1987 Manual, and supplements. Stream determinations were made using criteria set forth in the LURC Land Use Districts and Standards Chapter 10. A Global Positioning System (GPS) receiver was used to ascertain the location of the project boundary to ensure a complete delineation of the Project area. Wetlands, potential vernal pools, and streams encountered within

the Project area were marked with pink, numbered flagging and located using a GPS Trimble® Pro—XR receiver.

The wetlands were evaluated on three separate parameters. The first parameter is the presence of hydric soil. A soil auger is used to extract a sample that is then examined for indicators of hydric conditions. The second parameter is a predominance of wetland vegetation. Making this determination requires knowledge of plants and their indicator status (i.e., wetland plants versus upland plants). The tree, pole, shrub, and herbaceous layers are observed and a determination is made as to whether or not wetland vegetation is dominant. The last parameter investigated is evidence of hydrology, or water. This can be visible water on the surface or evidence that water has been on the ground surface recently.

Wetland boundaries were assessed and determined using the three parameters of soils, vegetation, and hydrology. Given the sensitive nature and concerns expressed in dealing with hydrologically sensitive areas (e.g., seeps and intermittent drainages), these areas were also flagged to ensure that the design and construction of the project minimized impacts to the overall hydrology of the area. Maine State Soil Scientist David Rocque also reviewed the site with Dale Knapp on November 11, 2010.

2. Field Survey Results

The Project area contains a total of 111 wetland resources. Of the 111 wetland resources, 21 would be considered Wetlands of Special Significance (part of the resource protection subdistrict P-WL1) for containing Significant Wildlife Habitat or due to their proximity to a stream resource. There are 14 streams, 3 of which are perennial. The wetlands present within the Project area have been disturbed by timber harvesting activities and are predominantly forested. Many of the wetlands observed have been either directly created or influenced by

timber harvesting activities. The entire Project area has been cut over in the past, and many of the wetlands and stream channels are located in old skid ruts.

Common wetland vegetation encountered within these wetlands included green ash, red maple, American elm, black spruce, balsam fir, northern white cedar, gray birch, and yellow birch in the overstory. The shrub layer often contained species present in the tree layer and occasionally speckled alder, red osier dogwood, high bush cranberry, willow, and high bush blueberry. The herbaceous layer contained soft rush, cinnamon fern, dark green bulrush, common woolsedge, northeastern mannagrass, fowl mannagrass, fringed willow herb, sensitive fern, golden-saxifrage, necklace sedge, fox sedge, rough sedge, and fringed sedge.

Project Impacts and Conclusion

Wetlands, streams, and hydrologically sensitive areas within the Project area were identified. Due to the significant network of existing roadways and cleared areas, as well as design efforts to avoid wetlands, none of the wetlands identified within the Project area will be impacted by construction of the access road system. In addition, there will be no wetland fill associated with any other component of the proposed Project. There is only one stream crossing, which will be accomplished by use of an open culvert bridge, thereby avoiding any stream impacts. Through an effective alternatives analysis and avoidance and minimization utilized during the Project design, the Bull Hill Wind Project will have no undue adverse impact to wetland or stream resources.

D. Vernal Pools

Vernal pools were surveyed in the spring of 2009 and spring of 2010 to determine if they

qualify as vernal pools and meet the MDIFW definition of a Significant Vernal Pool.[4] The pools were visited twice to ensure accuracy in the documentation of species presence and abundance. The results of these surveys can be found in Exhibit 12A of the application.

Stantec identified 53 vernal pools within the Project area. Eighteen of those pools were determined to be naturally occurring. Of the 18 natural vernal pools, 7 were determined to be Significant Vernal Pools under the Natural Resources Protection Act (NRPA) definition.[5] A table detailing observed amphibian breeding activity in each vernal pool is presented in Table C-3 of Exhibit 12A of the LURC application.

One potential vernal pool ("PVP") identified outside of vernal pool season was inadvertently left off the electronic data used to create the natural resource maps. PVP's are treated by MDIFW as Significant Vernal Pools with a 250 foot habitat buffer for regulatory purposes, unless verified as not significant during vernal pool season. The initial civil design as proposed impacted 14.4 percent of the buffer around this PVP, less than the 25 percent acceptable regulatory impact. Through redesign, this impact has been eliminated and there are no SVP buffer impacts associated with the proposed project. See April 21, 2011 Letter from Brooke Barnes to Don Murphy.

Project Impacts and Conclusion

There are 8 Significant Vernal Pools within the project area (including the PVP). Through avoidance and minimization measures, there are no impacts to any Significant Vernal

[4] See IFW regulations Chapter 10, Section 10.02(G).

[5] The difference between a Significant Vernal Pool and a vernal pool is defined by Chapter 10, Section 10.02(G) of MDIFW) regulations and is based on species abundance criteria. The abundance requirements are determined by entering the pool and counting the egg masses laid by the indicator species present. Some pools may contain one or all of the indicator species. Some contained water, but had no evidence of breeding amphibians. Finally, other areas identified as vernal pools contained egg masses but did not meet the abundance requirements to be considered Significant Vernal Pools.

Pools or their associated 250-foot habitat areas. Based on these findings, the Bull Hill Wind Project will not result in undue adverse impact to vernal pool habitat.

E. Wildlife

Stantec initiated consultation with MDIFW and USFWS on the Bull Hill Wind Project in spring 2009 with the presentation of a draft work plan for comprehensive natural resource surveys. A summary of the consultation that occurred with regard to species issues is included in Exhibit13B of the Application. Potential impacts to wildlife and related habitat are addressed in Exhibit 13A of the Application. No Deer Wintering Areas, Inland Waterfowl and Wading Bird Habitat occur within the Project area. No federally listed threatened, or endangered species were documented or observed within the Project area. One state listed threatened species, peregrine falcon (*Falco peregrinus*), was observed in the Project area during fall 2009 raptor migration surveys (Exhibit 13C).

1. Avian and Bats

Stantec conducted a robust avian and bat sampling effort at the Bull Hill Wind Project in 2009 and 2010. Avian and bat study designs were developed to be consistent with other pre-construction surveys conducted at other proposed and operational wind energy projects in the State and in consultation with MDIFW and USFWS. Draft work plans were submitted to MDIFW and USFWS for comment and revised according to their recommendations.

2. Raptors and Eagles

Raptor migration surveys were conducted in summer 2009, fall 2009 and late winter/ spring 2010 for a total of 33 days. The purpose of the raptor surveys was to sample use and migration activity at central and prominent locations within the Project area. The specific goal of summer surveys was to characterize bald eagle activity in the vicinity of the project during the

late-fledging period. The objective of the spring and fall surveys was to document the species that occur in the vicinity of the project and the specific flights heights, flight path locations, and other flight behaviors of raptors within or in the vicinity of the project during the migratory period. A total of 12 species of raptor were documented in the vicinity of the Project area in 2009 and 2010. During fall 2009 raptor migration surveys, one state-listed endangered species, peregrine falcon, was observed in the Project area. The falcon was flying over the tree canopy, approximately 15 meters above ground, moving northwest over Bull Hill. Two state species of special concern were observed during the fall surveys: bald eagle and northern harrier. Two state species of special concern were observed in late winter and spring 2010: six bald eagle observations were recorded and one eagle was seen as the observer was leaving the Project after a survey. All bald eagle observations were outside the Project area. Five northern harrier observations were made during the spring surveys. One observation of northern harrier occurred within the Project area. For full results of raptor migration surveys conducted at Bull Hill, see Exhibit 13C.

No active bald eagle nests were identified in the Project area during spring 2010 aerial nest surveys (Exhibit 13C). A known bald eagle nest (MDIFW Nest #360), was located on an island in Molasses Pond approximately two miles from the southwestern-most turbine, but the nest was not active in 2010. Attempts were made to find mapped bald eagle nest locations on Spectacle Pond (MDIFW #221A/B/C), approximately two miles northwest of the turbine string on Bull Hill, Webb Pond (MDIFW Nest #511), approximately six miles from the southwestern-most turbine, Scammon Pond (MDIFW Nest #170A/B), approximately four miles from the southwestern-most turbine, and Abrams Pond (MDIFW Nest #170C), approximately four miles from the southwestern-most turbine. No nests on these ponds were identified. During aerial

surveys, one adult bald eagle was observed on Rocky Pond flying along the western shore of the pond and then leaving the pond to the south. One adult bald eagle was also observed on Spectacle Pond flying along the eastern shore. No other bald eagles or nests were observed. Two active osprey nests were identified along the transmission line that bisects the Project area. Attempts were made to locate a reported great blue heron rookery at the south end of Scammon Pond; however, no rookery was observed.

Raptor migration through the Bull Hill Wind Project area is similar to other sites proposed for wind energy in Maine where similar surveys were conducted, including species composition and passage rates. The overall season mean passage rate during the spring (0.53 birds/hour) and fall (1.43 birds/hour) is near the low end of the range of other pre- and post-construction raptor migration studies in Maine. Pre-construction passage rates at the now operational Mars Hill Wind Project were higher than Bull Hill with 1.06 birds/hour in the spring and 1.5 birds/hour in the fall. Pre-construction raptor passage rates at Stetson were also higher than Bull Hill during the spring (0.6 birds/hour) but slightly lower in the fall (0.9 birds/hour). Perhaps most importantly, post-construction raptor migration surveys during the first year of operation at the Stetson Wind Project documented a combined spring and fall passage rate of 1.7 birds/hour but did not document a single turbine related raptor fatality during post-construction mortality surveys[6]. No raptor fatalities were documented during the second year of mortality surveys at Stetson. One Barred owl was found during two years of mortality surveys at Mars Hill. Based on pre-construction survey results at Bull Hill, a comparison of those results to pre- and post- construction results at proposed, permitted, and operational projects in Maine, and overall low raptor mortality at operational wind energy projects in the U.S. we do not expect any

[6] One red tailed hawk was found by operations personnel that had been electrocuted by a riser pole at the electrical collection system

undue impacts to raptors as a result of the construction and operation of the Bull Hill Wind Project.

3. Bats

Acoustic surveys were conducted at Bull Hill in fall 2009 and were redeployed in spring 2010. The objectives of acoustic surveys were (1) to document bat activity patterns in airspace near the rotor zone of the proposed turbines, at an intermediate height, and near the ground; and (2) to document bat activity patterns in relation to weather factors, including wind speed and temperature. Six Anabat® acoustic bat detectors were deployed in the Project area; two detectors were deployed on the Little Bull Hill met tower, and four were deployed in trees throughout the Project area. Detectors were deployed at relatively low heights where increased bat activity levels are generally documented, particularly during the non-migratory periods. Data were summarized by guild and species and tallied per detector on an hourly and nightly basis.

Of those calls that were identified to species guild, bats of the Genus Myotis were the most abundant bats documented during both the fall 2009 acoustic survey and the spring 2010 acoustic surveys. Other bat guilds that were documented include big brown/silver haired bat, hoary bat, and eastern red bat/tri-colored bat guilds. Tree detectors in both seasons recorded more Myotis calls than the met tower detectors. For full results of acoustic surveys conducted at Bull Hill, refer to Exhibit 13C.

Overall, bat detection rates during acoustic surveys at Bull Hill were at the low end of the range of other similar studies conducted at wind energy projects in Maine. Like other studies in Maine and throughout the northeast, bat activity peaked in late July and early August with greater activity recorded from bat detectors deployed in trees than those located at greater heights in met towers. The results of post-construction acoustic bat surveys conducted concurrently with

mortality searches during the first year of operation at the Stetson Wind Project demonstrated greater bat activity rates than were observed at Bull Hill and only 5 bats were found during mortality searches. Based on pre-construction survey results at Bull Hill (including species composition and timing of activity), a comparison of those results to pre- and post- construction results at proposed, permitted, and operational projects in Maine, and overall low bat mortality at operational wind energy projects in Maine we do not expect any undue impacts to bats as a result of the construction and operation of the Bull Hill Wind Project. For additional information regarding results of other publicly available pre-construction acoustic bat surveys see Appendix B Table 7 of Exhibit 13C of the Application.

4. Nocturnal Migrants

Stantec conducted nocturnal radar studies to characterize nocturnal migration activity in the Project area in fall 2009 and spring 2010. Marine surveillance radar was used during field data collection. Radar surveys were conducted on 20 nights in fall 2009 and on 20 nights in spring 2010. The radar was located on the summit of Bull Hill and provided adequate visibility of the surrounding airspace to characterize migration.

The overall mean passage rate for the entire fall survey period was 614 ± 32 targets per kilometer per hour (t/km/hr) and was 387 ± 21 for the entire spring survey period. Nightly passage rates varied from 188 ± 30 to 1500 ± 209 t/km/hr in fall 2009 and between 43 ± 16 t/km/hr to 879 ± 76 t/km/hr in spring 2010. Mean flight direction through the Project area for the fall season was 260 ± 66° and 48 ± 49° for the spring season. The seasonal mean flight height of targets in fall 2009 was 356 ± 9 meters above the radar site and 217 ± 8 meters above the radar site in spring 2010. Nightly flight heights ranged from 208 ± 9 meters to 558 ± 22 meters in fall 2009 and from 100 ± 10 meters to 358 ± 53 meters in spring 2010. The percent of targets

observed flying below 145 meters was 14 percent for the entire fall 2009 season and was 38 percent for the entire spring 2010 season.

In terms of passage rates, the mean passage rate of 614 t/km/hr at the project in fall 2009 is on the higher end of the range of results from these other studies (91 to 620 t/km/hr). It is typical for fall passage rates to be higher than spring passage rates as fall migrants include juveniles born that year and older birds who may die during migration or over the winter and therefore would not migrate in spring. Possible concentrations of birds along the coast in the northeast may also explain relatively high passage rates at the project.

Although the seasonal average flight height for spring (217 ± 8 meters) is on the low end of the range of flight heights recorded at other wind projects in the east (210 meters to 552 meters in spring), the results found at over 22 radar studies conducted in Maine suggest that the vast majority of nocturnal migrants fly at altitudes well above the rotor swept zone of the proposed turbines (see Appendix A Table 5 of the *2010 Report* in Exhibit 13C for a review of seasonal radar migration surveys from other publicly available wind projects). The results of completed and ongoing nocturnal avian migration studies within the region has been shown to be relatively consistent. In general, nightly and seasonal passage rates, average flight heights, average seasonal flight directions, and percentage targets observed below turbine height have nearly all been within general ranges of other ongoing seasonal migration studies.

5. Potential Collision Risk at Bull Hill

Since there has not yet been any direct correlation made between pre-construction survey results and post-construction mortality, fatality rates from other projects can be used to determine a possible level of impact at the proposed project. This is particularly true where those projects have both pre- and post-construction data. Projects such as Mars Hill and Stetson have

conducted both pre- and post- construction surveys which provide useful information that may be used to predict collision risk at the Bull Hill Wind Project.

The pre-construction results observed at other facilities can be considered comparable to a proposed wind farm if those projects are representative of the site being assessed (i.e., in the same region with similar landscape and project design characteristics). Both Mars Hill and Stetson share similar landscape and project design characteristics with the Bull Hill Wind Project. Relative mortality estimates from post-construction monitoring conducted at the Mars Hill Wind Project in Maine, Stetson Wind Project in Maine, Stetson II Wind Project in Maine and the Lempster Wind Project in New Hampshire were low. For raptors, only one owl fatality was found at Mars Hill in two years of post-construction monitoring. One red-tailed hawk was found at Stetson in 2009, the result of electrocution of the bird, which perched on a riser pole of the electrical collection system.

In 2007, the numbers of bats and birds found at Mars Hill (before correction for observer and removal biases) were 24 and 22, respectively. Estimates of mortality (factoring observer and removal biases and the number of turbines included in searches) for the study period that year ranged from 0.43-4.4 bats/turbine/year [bats/t/yr] and 0.44-2.5 birds/turbine/year [birds/t/yr]. In 2008 at Mars Hill, the numbers of bats and birds found were 5 and 22, respectively; estimates of mortality for the study period ranged from 0.17 to 0.68 bats/t/yr and 2.4 to 2.65 birds/t/yr. At Stetson I in 2009, there were 5 bats and 39 birds found; estimates of mortality for the study period were 2.11 bats/t/yr and 4.03 birds/t/yr. At Stetson II in 2010, there were 14 bats and 11 birds found; estimates of mortality during the study period were 2.48 bats/t/yr and 2.14 birds/t/yr. At the Lempster Wind Farm in NH in 2009, there were 12 bats and 13 birds found in the spring and fall study periods combined; estimates of mortality for the study period were 0.58

bats/t in the spring and 5.51 bats/t in the fall, and 0.80 birds/t in the spring and 5.95 birds/t in the fall.

As mortality rates are typically described as fatalities per turbine per year, the overall mortality expected at a given project is proportional to the size (i.e., number of turbines) of the proposed wind farm. The Bull Hill Wind Project would include 19 turbines, a small project compared to most wind projects already operating in the eastern United States. Accordingly, collision risk at the Project is likely to be lower than Mars Hill and Stetson. For a complete discussion on potential collision risk, please refer to Exhibit 13A of the Project's Application.

6. Other Wildlife

Large mammals observed in the Project area during on-site 2009 and 2010 environmental surveys include white-tailed deer, moose, and black bear. Predator species observed includes American marten. Other predators expected to occur in the Project area based on their habitat requirements include coyote, red fox, bobcat, fisher, long-tailed weasel, and raccoon. Common medium-sized mammals expected to occur in the area include porcupine, snowshoe hare, and striped skunk. Listed species in the state such as Canada lynx, northern bog lemming, spring salamander, and roaring brook mayfly are not known to occur in this region of the state or the habitats within the Project area and are not expected to be impacted by the Project. The small mammal community is likely made up of masked shrew, pygmy shrew, northern short-tailed shrew, eastern chipmunk, red squirrel, deer mouse, and southern red-backed vole. Other less common species that could occur include smoky shrew, northern flying squirrel, and woodland jumping mouse. Some of the more open areas along the ridge could be used by meadow voles, although their overall abundance in this predominantly forested area is likely low relative to other small mammals.

Project Impacts and Conclusion

With regard to avian impacts, the vast majority of nocturnal migrants fly at altitudes well above the rotor swept zone of the proposed turbines. Given the flight heights identified in the surveys, operation of the Bull Hill Wind Project is not likely to have an undue adverse effect on bird species. Although the estimated number of migrants below turbine height in one season was higher than some other projects , this calculation alone is not an appropriate measure of post-construction risk. As with other projects, the applicant has committed to perform post-construction mortality surveys designed in consultation with MDIFW to identify the level of project impact on migratory species. An adaptive management plan that involves close coordination with state agencies will be implemented if significant impacts to migratory species occur as a result of the project.

For non-avian wildlife, the direct loss of habitat could occur from the conversion of vegetated habitats to permanent roads and turbine clearings. Potential indirect effects could also include disturbance effects during and following construction of the project, which could result in short-term avoidance of the area by some species and targeted use of the Project area by others, possible longer-term avoidance of the Project area by certain species, and the conversion of forested habitats to early successional habitats. Impacts to wildlife communities due to loss of habitat on Bull Hill, Heifer Hill and Beech Knoll are not expected to be adverse to those populations, particularly in light of the fact that the local wildlife populations already adapt to the occasional rapid changes in the distribution of habitats along the ridge from harvesting activities, and the existence of many substantial forest roads.

IV. CONCLUSION

In summary, Blue Sky has carefully considered the full range of environmental issues in determining that the Project, as proposed, is appropriately sited. Project layout and identified best management practices, which have been successfully utilized in connection with the construction of other First Wind Projects, continue to focus on minimizing environmental impact to the maximum possible extent. As designed, the Project will impact a very small area relative to the overall property where it is situated and the amount of existing impact.

Date: 4/21/2011

Adam Gravel

STATE OF MAINE
County of Cumberland

Date: 4/21/2011

Personally appeared before me the above named Adam Gravel, who, being duly sworn, did testify that the foregoing testimony was true and correct to the best of his knowledge and belief.

Before me,

Notary Public
My commission expires: 10/21/2017

DEHAHN NOTARY PUBLIC MAINE

Date: 4/22/11

Dale Knapp

STATE OF MAINE
County of Cumberland

Date: 4/22/2011

Personally appeared before me the above named Dale Knapp, who, being duly sworn, did testify that the foregoing testimony was true and correct to the best of his knowledge and belief.

Before me,

Notary Public
My commission expires: 10/21/2017

Date: April 21, 2011

Brooke Barnes

Brooke Barnes

STATE OF MAINE
County of Cumberland

Date: 4/21/2011

Personally appeared before me the above named Brooke Barnes, who, being duly sworn, did testify that the foregoing testimony was true and correct to the best of his knowledge and belief.

Before me,

Notary Public
My commission expires: 10/21/2017

Gravel, Knapp and Barnes Pre-Filed Direct Testimony Exhibits

Exhibit A: Gravel Resume

Exhibit B: Knapp Resume

Exhibit C: Barnes Resume

Adam J. Gravel

Project Manager, Certified Wildlife Biologist

Stantec

Mr. Gravel is a Project Manager at Stantec responsible for coordinating ecological inventories and environmental resource evaluations, including wildlife surveys, avian and bat impact evaluations, and habitat studies. Mr. Gravel has most recently been involved in organizing and conducting large-scale natural resource investigations associated with wind power and transmission projects. He has provided permitting and expert testimonial support to several New England wind projects and managed Stantec's New England based wildlife biologists. His field biology experience has allowed him to conduct avian radar surveys, breeding-bird surveys, winter track surveys, bat surveys, raptor surveys, and natural community surveys in Maine, New Hampshire, Vermont, Pennsylvania, Ohio, West Virginia, Virginia, and New York. Mr. Gravel takes an innovative, solution oriented approach to survey design and implementation which has enabled Stantec to conduct ecological surveys in some of the Northeast's most remote and challenging locations.

PROFESSIONAL EXPERIENCE

- Stantec Consulting. 2007-present. Project Manager.
- Woodlot Alternatives, Inc. 2004-2007. Project Manager.
- New Hampshire Division of Forests and Lands. 2003. Field Research Technician.
- University of New Hampshire. 2002-2003. Research Lab Technician.
- University of New Hampshire. 2002. Field Research Assistant.

EDUCATION

BS, Wildlife Management, University of New Hampshire, Durham, New Hampshire, 2003

40-hour HAZWOPER Certified, OSHA, Topsham, Maine, 2009

REGISTRATIONS

Certified Wildlife Biologist, The Wildlife Society

PROJECT EXPERIENCE

Natural Resource Services

Georgia Mountain Community Wind Project, Milton, Vermont

As Project Manager for this proposed 4.5 megawatt wind project, Mr. Gravel coordinated a nocturnal migration study using X-band radar. He also provided support for the Section 248 process, including participation in meetings with Vermont Agency of Natural Resources biologists and development of a work scope for nocturnal radar surveys. Mr. Gravel prepared and submitted pre-filed testimony and responses to discovery requests, and he provided expert witness testimony during subsequent evidentiary hearings before the Vermont Public Service Board.

Adam J. Gravel

Project Manager, Certified Wildlife Biologist

Groton Wind Project, Grafton County, New Hampshire

Mr. Gravel is Project Manager for the proposed Groton Wind Project, which will consist of up to 25 2.0 MW turbines on the forested ridges of Tenney and Fletcher Mountains in the Sunapee Uplands of New Hampshire. He has coordinated numerous studies to address wildlife-related issues present in the vicinity of the project, including avian radar studies, acoustic bat surveys, and Breeding Bird Surveys (BBS) using the United States Fish and Wildlife Service BBS methods. Mr. Gravel worked with the New Hampshire Fish and Game Department to develop protocol and perform spring and fall raptor surveys, and collaborated with New Hampshire Audubon to conduct monitoring of peregrine falcons near the project area. He was involved in the drafting of an avian risk assessment that evaluated the potential impacts to birds and bats as a result of the project and provided expert witness testimony and support during the New Hampshire Site Evaluation Committee process.

Highland Wind Project, Somerset County, Maine

Highland is a proposed wind energy facility consisting of 48 turbines. Mr. Gravel acted as Technical Lead during the planning process and was responsible for wildlife studies including nocturnal radar migration surveys, acoustic bat surveys, raptor migration surveys, and rare threatened or endangered species surveys. He acted a liaison between the client and state and federal resource agencies to develop work plans and avoidance and minimization measures during the planning phase of the project. Mr. Gravel also assisted in generating permit application materials for the project.

Mars Hill Wind Farm, Aroostook County, Maine

Mars Hill is a 28 turbine wind energy facility situated on a low-elevation ridge in Aroostook County, Maine. Mr. Gravel acted as Technical Lead during the planning process and was responsible for avian and bat studies including nocturnal radar migration surveys, acoustic bat surveys, raptor migration surveys, and morning bird stopover surveys. He also assisted in the design of a post-construction avian and bat monitoring program.

Wind Farm Development Bird and Bat Surveys and Impact Studies, Mid-Atlantic, New England, Pennsylvania, Ohio, and New York

Mr. Gravel has managed and conducted pre-construction wildlife impact assessments at proposed wind energy projects at multiple sites in the Mid-Atlantic, New England, Pennsylvania, Ohio, West Virginia and New York. These assessments include habitat analyses, critical issues analyses, nocturnal migration surveys using marine radar, acoustic bat surveys, breeding bird surveys, raptor migration surveys, and ecological community characterizations. Mr. Gravel has effectively served as liaison between clients and regulatory agencies to ensure that studies and monitoring plans are in accordance with federal and state guidelines. Study results and determinations of risk have been provided to clients to assist with their project planning and permit applications in compliance with applicable local, state, and federal natural resource regulations. Mr. Gravel has also provided expert witness testimony for projects in Vermont and New Hampshire.

Hounsfield Wind Farm, Galloo Island, New York

As Project Manager for the nocturnal migration surveys conducted to determine site suitability for this proposed wind energy project located on Galloo Island in Lake Ontario. Mr. Gravel negotiated and designed a marine radar survey reflective of the unique location of this island site. Solutions to transport, maintenance, and site coverage were carefully determined in order to produce one of the most extensive migration surveys to date, successfully documenting avian abundance, flight patterns, and flight altitudes surrounding the site. Mr. Gravel and his project team were praised for their thoroughness and insights provided to state agencies.

Adam J. Gravel

Project Manager, Certified Wildlife Biologist

Granite Reliable Wind Park, Coos County, New Hampshire

Mr. Gravel has acted as the Project Manager on this long-term project, supervising and conducting a variety of natural resource surveys to assess potential concerns raised by the proposed project. Surveys included several seasons of nocturnal radar surveys, wetland and vernal pool reconnaissance surveys, multiple seasons of acoustic bat surveys, rare plant surveys, a raptor migration survey, and a Natural Community Characterization. A winter track survey was also conducted within the project site to document occurrence of American marten (State Threatened) and Canada Lynx (Federally Threatened). Mr. Gravel gave several agency presentations to summarize the multiple seasons of environmental surveys and their implications for the project and he has provided expert witness testimony regarding the work conducted at the site.

Stetson Mountain Wind Farm, Washington County, Maine

Stetson is a 57 MW generation facility consisting of 38 turbines on a 6.5-mile, low-elevation ridge in Washington County, Maine. Mr. Gravel acted as Technical Lead responsible for avian and bat studies during the planning process and assisted in the design of a post-construction avian and bat monitoring program.

Lempster Wind Project, New Hampshire

As the Project Manager, Mr. Gravel was responsible for coordinating and conducting environmental surveys and providing permitting support for this 24 MW wind project, the first in New Hampshire. Tasks included developing and negotiating work plans with agencies, performing avian and bat studies, rare species investigations, vernal pool surveys, and providing testimonial support. Mr. Gravel was also involved in the initial development of post-construction bird and bat monitoring protocols for the project.

Record Hill Wind Farm, Maine

Mr. Gravel acted as Project Manager for the Record Hill wind project, which is a 22-turbine, 55 MW wind project on a forested ridge environment in the western mountains of Maine. For this project, he coordinated planning and feasibility studies, wetland delineations, wildlife impact studies, noise and visual impact assessments, and helped to coordinate all state and Federal environmental permitting.

Adam J. Gravel

Project Manager, Certified Wildlife Biologist

PUBLICATIONS

Pelletier, S.K., G.C. Kendrick, T.S. Peterson, and A.J. Gravel. Atlantic Offshore Bird & Bat Pilot Study: 2009 Results. *Poster Presentation at AWEA Offshore Energy Conference, Atlantic City, New Jersey*, 2010.

Giumarro, G. and A. Gravel. Assessing The Risk Of Avian And Bat Mortality At Commercial Wind Farms. *Presentation at the Windpower 2009 Conference and Exhibition, Chicago, Illinois*, 2009.

Pelletier, S., G. Kendrick, G. Giumarro, T. Peterson, and A. Gravel. Gulf of Maine Offshore Bat and Bird Project. *Poster Presentation at AWEA Offshore Energy Conference; Boston, Massachusetts*, 2009.

Pelletier, S.K., A.J. Gravel, and T.S. Peterson. Nocturnal avian flight heights relative to risk of collision with wind turbines. *Poster presentation at the NWCC Wind Wildlife Research Meeting VII in Milwaukee, Wisconsin*, 2008.

Pelletier, S.K., C.W. Meinke, T.S. Peterson, and A.J. Gravel. 2008. Radar and acoustic bat surveys in pre and post-construction bird and bat mortality monitoring. *Poster presentation at the 2008 American Wind Energy Association conference in Los Angeles, California*, 2008.

Gravel, A. Windpower and Wildlife an Overview of Pre-construction Survey Methods and Results. *Presentation to State and Federal Natural Resource Agencies*, 2008.

Dale F. Knapp

Senior Project Manager, Wetland Scientist, Soil Scientist

Stantec

Mr. Knapp is a Senior Project Manager and the Director of the Water Resources Division at Stantec. His primary responsibilities include staff management, project administration and management, ecological field surveys, strategic planning for permitting, and report preparation. In addition to managing and implementing large scale permitting and restoration projects, Mr. Knapp has conducted a variety of field biological sampling efforts to determine risk to ecological receptors and water quality determinations. He has also provided expert witness testimony regarding the findings of various ecological field surveys. Mr. Knapp also has extensive experience in soil mapping, morphology, and subsurface wastewater design.

Under Mr. Knapp's direction, the Water Resources Division performs wetland delineations, vernal pool surveys, threatened and endangered species surveys, ecological community characterizations, permitting, biological assessments, environmental planning, fish and wildlife surveys, wetland mitigation and compensation, project management and document preparation in accordance with the state and federal regulatory agencies.

PROFESSIONAL EXPERIENCE

- Stantec Consulting. 2007-present. Senior Project Manager, Director of Water Resources.
- Woodlot Alternatives, Inc. 2005-2007. Project Manager.
- Corinne Leary. 2002-2005. Field Scientist.
- Leary Soil Works. 2001-2002. Construction.

EDUCATION

BA, University of Maine, Orono, Maine, 2003

Preserving the Wetland Landscape - Tools for Successful Mitigation, Grappone Center, Concord, New Hampshire, 2006

Subsurface System Inspector, Joint Environmental Training Coordination Committee, Portland, Maine, 2006

Hydric Sandy Soils Workshop, Maine Association of Professional Soil Scientists, Scarborough, Maine, 2006

Basic and Advanced Erosion Control Practices, Maine Non-point Source Training and Resource Center, Portland, Maine, 2007

40-Hour HAZWOPER Certification, OSHA, Topsham, Maine, 2010

REGISTRATIONS

Onsite Sewage Disposal System Inspector #523, State of Maine, An Office of the Department of Health and Human Services - Subsurface Wastewater Program

Apprentice Wetland Scientist #WSA-18, New Hampshire Joint Board

Licensed Site Evaluator #386, State of Maine, An Office of the Department of Health and Human Services - Subsurface Wastewater Program

Enviro-Septic Certified #5058MEES, Presby Environmental Inc.

PROFESSIONAL ASSOCIATIONS

Vice President, Maine Association of Site Evaluators

Dale F. Knapp

Senior Project Manager, Wetland Scientist, Soil Scientist

Member, New Brunswick Environment Industry Association

Member, Society of Wetland Scientists

Professional Member, Society of Soil Scientists of Southern New England

President, Maine Association of Wetland Scientists

Recognized Wetland Delineator, New Brunswick Department of Environment

Member, Association of State Wetland Managers

Member, Maine Association of Professional Soil Scientists

PROJECT EXPERIENCE

Natural Resource Services

Pine Tree Landfill Restoration Project, Hampden, Maine
Senior Project Manager responsible for conducting natural resource surveys and developing and implementing a restoration plan to repair and rehabilitate habitat affected by an incidental release of liquid material of unknown composition from a gas-to-energy recovery system at the Pine Tree Landfill.

Rollins Wind Project, Penobscot County, Maine
Senior Project Manager responsible for organizing and managing all natural resource surveys for an extensive 60-megawatt wind project consisting of 40 turbines, 2 transmission lines, an electrical substation, and an operations and maintenance building. He also helped address agency questions and concerns, including those of the U.S. Fish and Wildlife Service regarding impacts to eagles and oversaw the QA/QC of natural community mapping and permitting efforts, which included Maine Department of Environmental Protection, U.S. Army Corps of Engineers, and local permit applications. The project is expected to be fully operational in 2010.

Oakfield Wind Project, Oakfield, Maine
Senior Project Manager responsible for organizing and managing all natural resource surveys for a 34-turbine wind project encompassing 600 acres, including 12 miles of collector line, capable of generating 51 megawatts of renewable energy. Survey efforts included wetland delineations, vernal pool surveys, and rare, threatened and endangered species plant and wildlife surveys. He also oversaw the QA/QC of natural community mapping and permitting efforts, which included Maine Department of Environmental Protection, U.S. Army Corps of Engineers, and local permit applications. The project is expected to be fully operational in 2010.

Old Port Village Peer Review, Kennebunkport, Maine
Senior Project Manager. Reviewed documents filed by the applicant as they pertained to natural resource impacts associated with a proposed subdivision and the presence or absence of rare, threatened, and endangered (RTE) species that may occur within the proposed project area. Work done on behalf of an abutting property owner to the proposed development.

Penobscot River Restoration Natural Resource, Penobscot County, Maine
Technical Lead. Coordinated and participated in natural resource assessment of three dam impoundments along a 10-mile stretch of the Penobscot and Piscataquis Rivers. Characterized existing ecological resources and collected existing infrastructure information. Tasks included wetland reconnaissance, site specific delineation and Function Value Assessments along the backwater of all three impoundments. In addition, coordination of invasive/exotic plant management and supporting development of ecological changes post removal.

Wind Farm Development Surveys and Risk Assessments, Maine
As Senior Project Manager, Mr. Knapp has managed preconstruction wind farm development surveys and assessments at multiple sites throughout Maine. These assessments include site prospecting for wind farm sites, landscape analyses, fatal flaws, and ecological community characterization.

Dale F. Knapp

Senior Project Manager, Wetland Scientist, Soil Scientist

Hoosac Wind Project, Massachusetts

Field Manager/Senior Project Manager. Conducted a series of wetland delineations in concert with other environmental team members. Field surveys included confirming mapped wetlands and other natural communities and delineating the boundaries of wetlands, streams, and other natural resource features. He also conducted extensive botanical field surveys within the project area to determine if any state- or federal-listed rare plant species were present.

Cabelas Retail Development, Scarborough, Maine

Wetland Scientist. Conducted wetland delineations and vernal pool surveys. Completed a systematic mitigation site search through several counties in suppport of permitting efforts.

Highland Wind, Maine

Senior Project Manager responsible for the organization and management and oversaw the QA/QC of the wetland delineations, vernal pool surveys, natural community mapping, and RTE plant and wildlife surveys conducted on an approximately 1,500-acre project area.

Line 56, Maine

Senior Project Manager responsible for organization and management of all natural resource work along more than 50 miles of transmission line corridor.

Maine Power Connection Transmission Corridor, Maine

Senior Project Manager responsible for the organization and management and oversaw the QA/QC of the wetland delineations, vernal pool surveys, natural community mapping, and RTE plant and wildlife surveys conducted along over 140 miles of existing and proposed power line corridor between Haynesville and Chester, Maine.

Grand Manan Wind Farm Phase I, New Brunswick

Senior Project Manager responsible for organization and management of all wetland delineations and impact assessments for a 20 MW wind project covering 250 acres on the island of Grand Manan.

Stetson Wind Farm, Maine

Field Manager and Permitting Support. Responsible for completing natural resource surveys on a 1,300-acre project area for this 24 MW wind project. Mr. Knapp functioned as field leader responsible for leading teams of 4-6 person crews. Studies included wetland delineations, vernal pool surveys, natural community mapping, and RTE plant and wildlife surveys. Assisted in the completion of required state and federal permit applications filed in support of the project.

Record Hill Wind Farm, Roxbury, Maine

Senior Project Manager supporting the Record Hill wind project, which is a 22-turbine, 55 MW wind project on a forested ridge environment in the western Maine mountains. This project has included planning and feasibility studies, wetland delineations, wildlife impact studies, noise and visual impact assessments, and coordination of all state and Federal environmental permitting.

Redington Wind Farm, Maine

Field Manager and Permitting Support. Responsible for completing natural resource surveys on a 1,700-acre project area. Functioned as field leader responsible for leading teams of 4-6 person crews. Studies included wetland delineations, vernal pool surveys, natural community mapping, and RTE plant and wildlife surveys. Assisted in the completion of required state and federal permit applications filed in support of the project.

Dale F. Knapp

Senior Project Manager, Wetland Scientist, Soil Scientist

PUBLICATIONS

Emerson, B., D. Knapp, and G. Carpentier. Potential Alteration of Wetland Functions and Values from Dam Removal. *Poster presented at New England Water Environment Association 2010 Annual Conference, Boston, Massachusetts*, 2010.

Emerson, B., D. Knapp, J.D. DeGraaf, and G. Carpentier. Potential Impacts to Wetland Functions and Values from Dam Removal. *Poster presented at The Diadromous Species Restoration Research Network Science Meeting, University of Maine, Orono, Maine*, 2009.

Presentation: The Dirty Side of Wetland Science. *Distinguished Speaker Series: University of Maine Fort Kent, Fort Kent, Maine*, 2009.

Guest Lecturer: College Level Course PSE 413/PSE 533 Wetland Delineation and Mapping. *University of Maine, Orono, Maine*, 2009.

Guest Lecturer: College Level Course PSE 413/PSE 533 Wetland Delineation and Mapping. *University of Maine, Orono, Maine*, 2008.

Workshop: Hydric Soil Determination. *Stantec Consulting*, 2007.

Guest Lecturer: College Level Course PSE 413/PSE 533 Wetland Delineation and Mapping. *University of Maine, Orono, Maine*, 2007.

Workshop: Intro to Soil Science. *Stantec Consulting*, 2006.

Brooke E. Barnes

Senior Project Manager, Regulatory Specialist

Stantec

Mr. Barnes is a recognized expert in environmental regulations and permitting, with more than 20 years experience in the regulatory field. As a former Deputy Commissioner of the Maine Department of Environmental Protection (Maine DEP), Mr. Barnes offers Stantec clients unparalleled practical expertise in evaluating critical permitting issues for projects, developing permit applications, conducting negotiations with state and federal agencies, and assisting in expert witness testimony preparation.

Mr. Barnes' 15 years of experience at the Maine DEP included extensive work in enforcement, policy analysis, compliance monitoring, policy development and implementation, licensing, rulemaking, leadership development, and organizational change. In addition to his regulatory experience, he served on the Governor's Alternative Dispute Resolution Task Force, as Acting Chief Counsel to Governor King and was a Leadership Instructor for the Maine Management Institute, building professional leaders and managers in state government.

PROFESSIONAL EXPERIENCE

- Stantec Consulting. 2007-present. Senior Project Manager.
- Woodlot Alternatives, Inc. 2006-2007. Project Manager.
- Maine DEP. 1998-2003. Deputy Commissioner.
- Office of Governor Angus S. King, Jr., Maine. 2002. Acting Chief Legal Counsel.
- Maine DEP. 1995-1998. Director, Policy Development & Implementation.
- Maine DEP. 1990-1995. Director, Enforcement and Procedures.
- Maine DEP. 1988-1990. Chief Policy Analyst.
- Sherman, Sandy and Lee. 1987-1988. Associate Attorney.

EDUCATION

JD, University of Maine School of Law, Portland, Maine, 1986

BA, Sociology, University of Southern Maine, Portland, Maine, 1983

REGISTRATIONS

Attorney #3347, Maine State Bar Association

PROFESSIONAL ASSOCIATIONS

Member, Maine Management Service

Board of Directors, Environmental & Energy Technology Council of Maine

PROJECT EXPERIENCE

Facility Siting and Permitting

Bangor Landing Coal Tar Cap, Bangor, Maine

Senior Project Manager responsible for overseeing preparation of environmental surveys and a Section 7 biological assessment for salmon and shortnosed sturgeon. These work products were prepared for applications to the Maine Department of Environmental Protection and the U.S. Army Corps of Engineers for dredging and capping coal tar deposits in the Penobscot River. He provided regulatory contact and strategic management of the permitting and natural resources agency review. This project was completed in late-2009.

Brooke E. Barnes

Senior Project Manager, Regulatory Specialist

Line 56 Project, Maine

Senior Project Manager responsible for completing all siting and natural resource permitting simultaneously with the Stetson Wind Project for a 38-mile long, 115-kilovolt transmission line running through 6 townships. The purpose of the Line 56 Project was to connect the (then) proposed Stetson Wind Project with an existing substation in Chester, Maine. Permitting efforts included drafting and submitting Maine Department of Environmental Protection, U.S. Army Corps of Engineers, Land Use Regulation Commission, and local permit applications and answering all regulatory agency questions regarding these applications. He participated in all public meetings to address comments and questions from local citizens; provided strategic regulatory advice to the client; and oversaw the extensive natural resource surveys necessary to acquire information for inclusion in the permit applications. Following acquisition of the necessary permits, he oversaw resource demarcation (i.e., marking previously identified wetlands, vernal pools, and other significant natural resources) and provided environmental compliance support during the construction process. Line 56 is fully operational.

Lowes Home Improvement Centers, Ellsworth, Thomaston, and Brewer, Maine

Senior Project Manager responsible for coordinating all wetland permitting, wetland mitigation design, and wetland mitigation monitoring for three commercial developments resulting in nearly 10 acres of wetland impacts. Annual monitoring is conducted in order to determine the success of three mitigation sites. Monitoring efforts include providing reports to state and federal regulatory agencies as a condition of the three permits issued. Permits from the Maine Department of Environmental Protection and the U.S. Army Corps of Engineers were obtained in 2006, the stores were constructed in 2007, and the second of five monitoring years was successfully completed.

Penobscot River Module Facility, Brewer, Maine

Senior Project Manager responsible for developing an Endangered Species Act-compliant biological assessment and mitigation plan and completing natural resource permitting in association with a 10-acre area of sediment containing visible tar at a paper mill demolition site in Bangor, Maine. The purpose of the assessment and mitigation plan was to remediate the site in order to obtain permits for the construction of a module facility at this site. Permitting efforts including submitting Maine Department of Environmental Protection and U.S. Army Corps of Engineers permit applications. He was instrumental in reducing the typical turn-around time for application review, as permits were obtained in mid-2009 within 30 days of application submittal.

Cabela's Commercial Development, Scarborough, Maine

Senior Project Manager responsible for natural resource permitting associated with a mixed-use retail and commercial development on 73 acres, anchored by a 130,000-square foot Cabela's retail store, the first in the State of Maine. Permitting efforts included drafting and submitting Maine Department of Environmental Protection, U.S. Army Corps of Engineers, and local permit applications and answering all regulatory agency questions regarding these applications. Cabela's, as well as the restaurants, banks, and hotel on-site, have been operational since 2007.

Wind Farm Development

Oakfield Wind Project, Oakfield, Maine

Senior Project Manager responsible for all siting and natural resource permitting for a 34-turbine wind project encompassing 600 acres, including 12 miles of collector line, capable of generating 51 megawatts of renewable energy. Permitting efforts included drafting and submitting Maine Department of Environmental Protection, U.S. Army Corps of Engineers, and local permit applications and answering all regulatory agency questions regarding these applications. He also participates in all public meetings to address comments and questions from local citizens; provides strategic regulatory advice to the client; oversees the extensive natural resource surveys necessary to acquire information for inclusion in the permit applications; and manages a budget in excess of 1.1 million. The project is expected to be fully operational in 2011.

Brooke E. Barnes

Senior Project Manager, Regulatory Specialist

Stetson II Wind Project, Washington County, Maine

Senior Project Manager responsible for obtaining all federal, state, and local permits for a 60-million dollar wind project consisting of 17 turbines along mountain ridgelines and a 32,183-linear foot collector line connecting this project to the Stetson Wind Project. Permitting efforts included drafting and submitting Land Use Regulation Commission, Maine Department of Environmental Protection, and Maine Department of Transportation permit applications. He participated in all public meetings to address comments and questions from local citizens; managed subcontractors, provided strategic regulatory advice to the client, oversaw the natural resource surveys for the siting and permitting of the project, and handled a nearly half-million dollar budget. This project is currently under construction and is expected to be fully operational in early 2010.

Rollins Wind Project, Penobscot County, Maine

Senior Project Manager and Prime Subcontractor Manager responsible for permitting and design of an extensive 60-megawatt wind project consisting of 40 turbines, 2 transmission lines, an electrical substation, and an operations and maintenance building. Permitting efforts included drafting and submitting Maine Department of Environmental Protection, Maine Department of Transportation, U.S. Army Corps of Engineers, and local permit applications; and addressing agency questions and concerns, including those of the U.S. Fish and Wildlife Service regarding impacts to eagles. The results of these discussions in turn influenced the siting and permitting efforts of future wind projects. He participated in all public meetings to address comments and questions from local citizens; provided strategic regulatory advice to the client, oversaw the natural resource surveys for the siting and permitting of the project, and managed a 1.4-million dollar budget. Permits for the Rollins Wind Project were obtained in 2009, and the project expects to be operational in 2011.

Stetson Wind Project, Washington County, Maine

Senior Project Manager responsible for all siting and natural resource permitting for a 38-turbine, 57-megawatt wind project located along the Stetson Ridgeline. Permitting efforts included drafting and submitting Maine Department of Environmental Protection, U.S. Army Corps of Engineers, Land Use Regulation Commission, and local permit applications and answering all regulatory agency questions regarding these applications. He participated in all public meetings to address comments and questions from local citizens; provided strategic regulatory advice to the client; oversaw the extensive natural resource surveys necessary to acquire information for inclusion in the permit applications; and managed a budget in excess of 1.5 million. Following acquisition of the necessary permits, he oversaw resource demarcation (i.e., marking previously identified wetlands, vernal pools, and other significant natural resources) and provided environmental compliance support during the construction process. The Stetson Wind Project is fully operational.