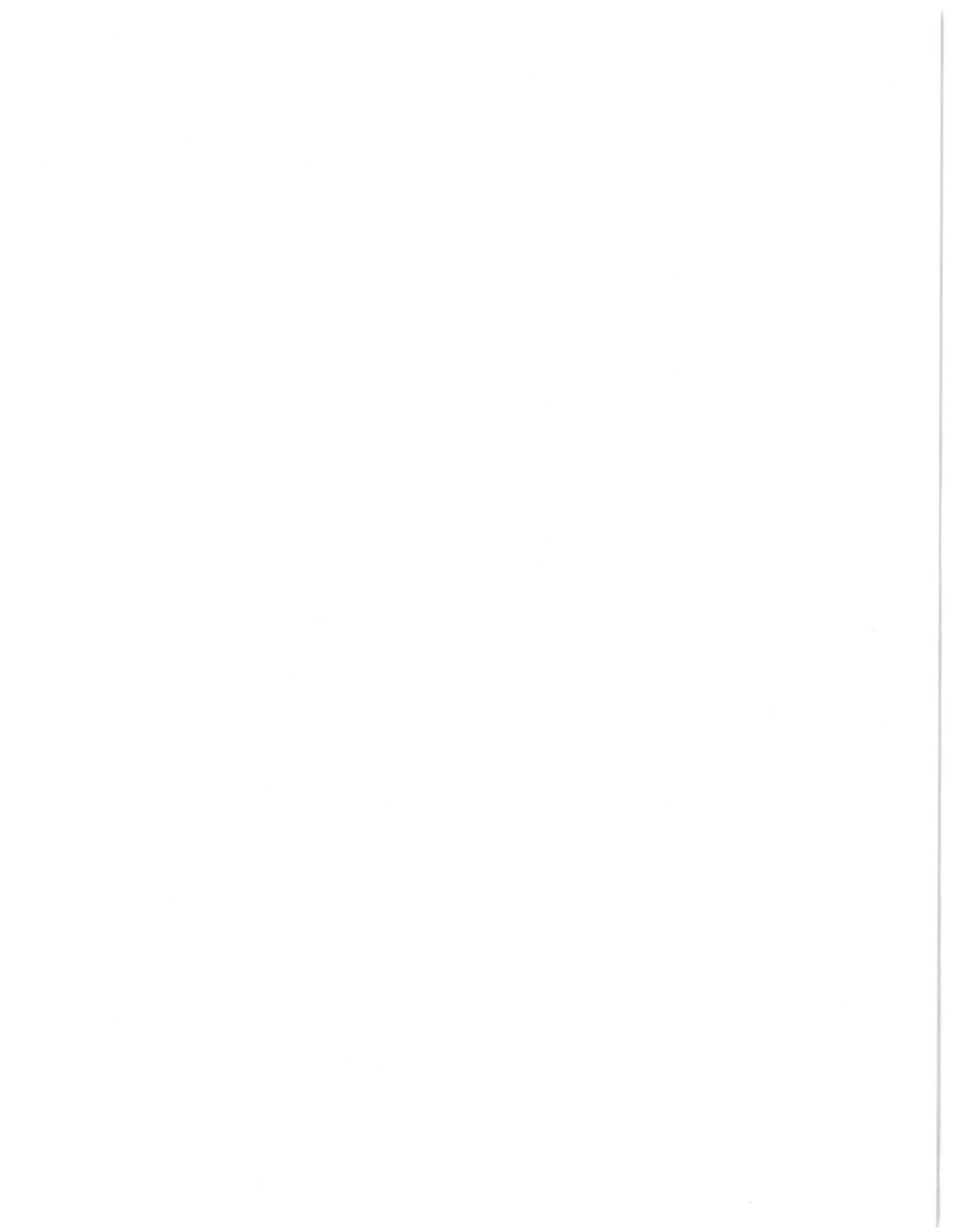


## **Maine Department of Inland Fisheries & Wildlife Comments**

- MDIFW Review Comments dated October 9, 2013
- Response by First Wind and Stantec dated October 18, 2013
- Additional Comment by MDIFW dated December 9, 2013





STATE OF MAINE  
DEPARTMENT OF  
INLAND FISHERIES & WILDLIFE  
284 STATE STREET  
41 STATE HOUSE STATION  
AUGUSTA ME 04333-0041

CHANDLER E. WOODCOCK  
COMMISSIONER

**Forward to:** Daniel Courtemanch, Maine Department of Environmental Protection

<b>Comments - Environmental Project Review</b>	
<b>Maine Department of Inland Fisheries and Wildlife</b>	
<b>Bureau of Resource Management Comments - Regions D &amp; E</b>	
Applicant's Name: Blue Sky West & Blue Sky West II (subsidiaries of First Wind Energy)	
Project #: # L-25973-24-A-N / L-25973-TG-B-N	Regulatory Agency: MDEP
Project Type: utility-scale wind energy facility	Project Manager: Daniel Courtemanch
"Final Agency Comments" Sent: October 9, 2013	MDIFW Contact: Charles Todd
<b>Project Location</b>	
Towns: Bingham, Mayfield Township, Moscow	County: Somerset
Towns: Abbott, Kingsbury Plantation, Parkman	County: Piscataquis
Biologists (review coordinators): Bethany Atkins, John Perry, Bob Stratton, Charlie Todd	
Biologists (Fisheries Division): Dave Boucher, Tim Obrey, Robert VanRiper	
Biologists (Wildlife Division): Bob Cordes, Danielle D'Auria, John Depue, Shawn Haskell, Tom Hodgman, Doug Kane, Amy Meehan, Beth Swartz	

**Consultation summary:** MDIFW Wildlife Division biologists have met with project applicants periodically since 2010. Fisheries Division personnel had more limited input during project scoping and pre-application consults. At least 15 MDIFW biologists have now examined portions of the Bingham Wind Project application since circulated for review on May 28, 2013.

MDIFW preliminary concerns were compiled June 26, 2013 and focused on potential impacts to sensitive aquatic resources, especially coldwater fisheries, that received less focus attention at earlier stages. Key staff attended review sessions with MDEP and the applicant on July 11 and again on August 7. The stormwater analysis for the project initially amplified MDIFW concerns for aquatic resources. Those were summarized by letter on August 30. Subsequent site visits with the applicant and MDEP were conducted on September 10 and September 18.

We commend all parties for thoughtful discussion and attentiveness to our review comments. At least 6 different topics have been the subject of follow-up submissions received as recently as September 27. These recent materials clarify some questions and propose some modifications of specifics outlined in the combined Natural Resources Protection Act / Site Location of Development Law (NRPA/SITE LAW) application now under review.

The following comments and findings review the proposal's potential impacts to resources under management authority of this agency. We also include data updates when more current information was available than that presented in the permit applications for Bingham Wind.

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- A. **Vulnerable bat species:** Bat mortality is a traditional concern at wind energy installations. Pre-project acoustical studies to detect bats and bat mortality studies during operational phases have become standard expectations of the industry in Maine and elsewhere. Several tree bats in Maine have been designated as “Species of Special Concern” since 1987: silver-haired bat (*Lasionycteris noctivagans*), eastern red bat *Lasiurus boreali*), and hoary bat (*Lasiurus cinereus*). In addition, two cave bats have long been recognized as “Species of Special Concern” due to their relative rarity or limited distribution near range limits: eastern small-footed Myotis (*Myotis leibii*) and eastern pipistrelle (*Pipistrellus subflavus*).

However, the plight of little brown bats (*Myotis lucifugus*) and northern long-eared bats (*Myotis septentrionalis*) are now a grave concern. Both are currently listed as “Species of Special Concern” in Maine. Their status is under review for listing under auspices of the Maine Endangered Species Act and more broadly under the U.S. Endangered Species Act. Rapid declines of the species have occurred following the sudden onset of widespread deaths among cave bats attributed to White Nose Syndrome (WNS). Bats in all known cave hibernacula in Maine are now exposed to WNS.

1. The U.S. Fish and Wildlife Service (USFWS) recently announced a 12-month finding that Endangered Species status was warranted federally for northern long-eared bats. The notice was published on October 2, 2013 in the *Federal Register* 78(191): 61046–61080.
2. In 2010, scientists with Boston University’s Center for Ecology and Conservation Biology published a status review of the little brown Myotis. They determined that immediate listing under the federal Endangered Species Act was both scientifically and legally warranted. MDIFW has begun its listing review process.
3. The Bingham Wind Project application notes that most bat activity documented in pre-project studies was from the *Myotis* group of bats. Seasonal curtailment of turbines at low wind speeds during night periods has been a condition of the last two draft orders from MDEP for wind energy installations.
4. Northern long-eared bats are often described as foraging primarily on forested ridges and hillsides: the typical setting for most wind energy installations in Maine.
5. Wind turbines have been found to kill *Myotis* species across the northeastern and midwestern U.S. Researchers have found especially high bat fatalities at some project sites in forested areas of the eastern U.S. More intensive monitoring or mitigating measures are evolving, as described in a 2013 report of a study at Sheffield, Vermont.
6. Data from a midwestern study in 2010 demonstrated that fewer bats were killed if the seasonal night-time cut-in speed for turbines was raised from 5.0 meters /second (m/s) to 6.5 m/s. A 2013 synthesis of such studies by the National Renewable Energy Laboratory offered comparable conclusions: increasing cut-in speeds (usually set at 3.5 - 4 m/s for modern turbines) by an additional by another 3 m/s “offers an

ecologically sound and economically feasible strategy for reducing bat fatalities at wind energy facilities and should be implemented broadly.”

7. Bat conservation has become a very high priority throughout the Northeast. State fish and wildlife agencies work with each other and federal agencies to achieve more effective regional conservation. We have determined that the curtailment standard in Vermont, a cut-in speed of 6.0 m/s, is more appropriate than the “*minimum 5.0 m/s*” threshold previously advised by MDIFW. This reflects a growing need to advance regional consistency of permitting / mitigation standards and to address science-based risk assessments of declining status among several bat species.
8. In order to avoid a judgment of significant adverse impact for bats, MDIFW requests that curtailment language be stipulated as a clear condition of operational permits for wind energy projects. Safeguards should meet or exceed standards in recent MDEP permits at similar facilities in Maine. Ongoing research may refine permit guidance.
9. The Bingham Wind NRPA/SITE LAW application (Exhibit 7: page 408) offers to adopt a 5 m/s cut-in speed based on older MDIFW recommendations. Actual permit conditions adopted by MDEP for 2 recent wind projects read as below, *except* the minimum cut-in speed had previously been stipulated as “*exceeding 5 m/s.*”

In summary, based on the factors outlined above (some of which are only recently coming to light), MDIFW is revising its “Maine Turbine Curtailment Requirements to Decrease Bat Mortality” from a minimum cut-in speed of 5 m/s to a minimum 6 m/s. This permit language reflects our best, current insights to minimize bat mortality:

**Wind turbines will operate only at cut-in wind speeds exceeding 6.0 meters per second each night (from at least ½ hour before sunset to at least ½ hour after sunrise) during the period April 20 – October 15 over the life of the project. Cut-in speeds are determined based on mean wind speeds measured at hub heights of a turbine over a 10-minute interval. Turbines will be feathered during these low wind periods to minimize risks of bat mortality.**

- B. **Deer wintering areas:** Impacts to four mapped deer wintering areas (DWAs) were noted in the NRPA/SITE LAW application (Exhibit 7: pages 8-11 and 193-204). Initial consultations urged avoidance of impacts via alternative routes of the generator lead line. In response, the applicant itemized constraints that limit alternative routes and avoidance measures (Dale Knapp letter to Doug Kane: July 10, 2013).

Subsequent negotiations have emphasized minimization strategies. In particular, closer spacing of taller poles can somewhat reduce canopy disruption in impacted DWAs in Abbot and Parkman along the generator lead corridor of the Bingham Wind proposal.

1. DWA #084033 in Parkman: V-style clearing will feather removal of taller trees only as necessary underneath and laterally to achieve transmission line clearance standards. Access roads for construction will be 16-foot wide or less. Construction and

maintenance will occur in winter, supervised by a third-party inspector, and subject to MDIFW monitoring. Specifications are outlined in e-mail correspondence from Josh Bagnato to Dan Courtemanch *et al.*: September 27, 2013. Appropriate permit conditions are requested.

2. DWA #084031 in Parkman: The generator lead line route here is a compromise between two Significant Wildlife Habitats mapped under NRPA: an "Inland Waterfowl / Wading bird Habitat" and this DWA. During a September 18 site visit, MDIFW advised that a single pole installation in the wetland would vastly reduce impacts to the forest canopy integral to wintering deer. This adjustment has not been formally submitted, but appropriate permit conditions are requested.
  3. DWA #084029 in Parkman and DWA #080604 in Kingsbury Plantation: The generator lead line corridor intersects the periphery of each DWA. Mitigation is proposed for these fringe impacts.
  4. Regardless of avoidance and minimization efforts, impacts to each DWA merit mitigation. Overall DWA impacts are estimated as 8,800 linear feet of disruption by the generator lead line corridor. The greatest influence (5,250 linear feet) is in DWA #084033 near the terminus of the generator lead line in Parkman. The impact is more than its linear extent since it intersects a constricted travel corridor that connects two separate lobes that provide the bulk of suitable DWA habitat locally.
  5. A Piscataquis River parcel in Abbot visited on September 18 by MDIFW staff was determined to be unsuitable as mitigation for DWAs impacted by the project. No alternatives have been offered since that time.
- C. **Vernal pools:** Impacts to four significant vernal pool habitats were identified in the NRPA/SITE LAW application (Exhibit 7: pages 3, 9, 11, 58). Subsequent data provided by the applicant and an August 7 meeting clarified that three seem eligible for permit-by-rule: pools #07AL\_N, #50KN\_N, and #108SK\_N along the turbine corridor / collector line in Mayfield Township. This opinion hinges on a MDEP determination that the extent of impacts proportionate to the size of the parcel held by title, right, or interest is below the regulatory threshold (NRPA/SITE LAW application Exhibit 2).
1. Pool #53KN\_N along the generator lead line in Abbot does not qualify for a NRPA permit by rule. However, an interim review by MDIFW finds this setting to be a "Potentially Significant" vernal pool based on the likelihood that a road may be altering hydrology to create it. A site visit can confirm this determination. Project representatives are requested to provide descriptive and photo documentation.
  2. Proposed turbine # 51 is in a sensitive location at the end of a ridgeline turbine string in Kingsbury Plantation. Four vernal pools and two wetlands lie within a 500-foot arc on the western periphery of the site. The headwaters of Bear Brook (a northern spring salamander occurrence) lie immediately southeast.

- D. **Roaring Brook mayfly:** The Roaring Brook mayfly is designated an “Endangered Species” in Maine. Several other mayflies are recognized as “Species of Special Concern.”

MDIFW does not agree with the assertion in the application that this species is *not present* in 3 suitable, unsurveyed streams along the generator lead line: #S014 and #S023 in Mayfield Township as well as #S049 in Kingsbury Plantation. The statement is based on absence during surveys of a single stream: #S041 in Kingsbury Plantation (NRPA/SITE LAW application Exhibit 7: page 93). The array of streams in the project area precludes such generalizations. Absence of a species at one site cannot predict occurrences in other suitable habitats.

In an analogous discussion, the NRPA/SITE LAW application notes a single occurrence of northern spring salamanders in project streams, but 7 findings resulted from subsequent surveys of a subset of potential stream habitats.

1. Regardless, MDIFW stipulates that precautions for northern spring salamanders are a reasonable surrogate for potential Roaring Brook mayfly occurrences.

- E. **Northern spring salamanders:** Northern spring salamanders are recognized as a “Species of Special Concern” in Maine, Massachusetts, and Connecticut. Its distribution in Maine is confined to western / central regions that are the range limits for the species in the Northeast.

A single documented occurrence (at stream S021) was reported among 5 streams formally surveyed for northern spring salamanders in the NRPA/SITE LAW application (Exhibit 7: page 88). Twenty-five streams were judged to have potential habitat (Exhibit 10: pages 4, 14 & 31). MDIFW concerns for coldwater streams led to additional project surveys in 17 of these waters along the generator lead line sector of the project during September, 2013. As a result, 7 occurrences in the Bingham Wind Project area are now documented and include:

<b>Documented Occurrences of Northern Spring Salamanders, Bingham Wind</b>	
<u>Stream name / Bingham Wind stream ID#</u>	<u>Township of occurrence</u>
Bear Brook / S049	Kingsbury Plantation
Bigelow Brook / S023	Mayfield Township
Bottle Brook / S045	Kingsbury Plantation
Kingsbury Stream – unnamed tributary / S046	Kingsbury Plantation
Gales Brook – unnamed tributary / S070	Abbot
Gales Brook – unnamed tributary / S071	Parkman
Rift Brook – unnamed tributary / S021	Mayfield Township

Several compilations (NRPA/SITE LAW application Exhibit 7: page 4; Exhibit 7A: pages 60-63; Exhibit 10A: page 31) collectively identify 20 other streams potentially hosting northern spring salamanders where the applicant concedes their potential presence. Minor inconsistencies in the compilation were found. The combined lists include:

<b>Streams Potentially Suitable for Northern Spring Salamanders, Bingham Wind</b>	
<u>Stream name / Bingham Wind stream ID#</u>	<u>Township of occurrence</u>
Bear Brook / unnamed tributary / S047	Kingsbury Plantation
Bear Brook / unnamed tributary / S050	Kingsbury Plantation
Bear Brook / unnamed tributary / S051	Kingsbury Plantation
Bog Brook / unnamed tributary S041 [noted only in Exhibit 7: page 4]	Kingsbury Plantation
Carlton Stream / S062	Parkman
Carlton Stream / unnamed tributary / S057	Kingsbury Plantation
Carlton Stream / unnamed tributary / S058	Kingsbury Plantation
Carlton Stream / unnamed tributary / S063	Parkman
Carlton Stream / unnamed tributary / S065	Parkman
Kingsbury Pond / unnamed tributary / S025	Mayfield Township
Kingsbury Pond / unnamed tributary / S027	Mayfield Township
Kingsbury Stream / S052	Kingsbury Plantation
Kingsbury Stream – unnamed tributary / S043	Kingsbury Plantation
Kingsbury Stream – unnamed tributary / S048	Kingsbury Plantation
Rift Brook – unnamed tributary / S007 [noted only in Exhibits 7: page 4 & 10A: page 11 ]	Mayfield Township
Unnamed perennial stream / S009	Mayfield Township
Unnamed perennial stream / S014	Mayfield Township
Unnamed perennial stream / S022	Mayfield Township
Unnamed perennial stream / S024	Mayfield Township
Unnamed perennial stream / S066	Parkman

The above 27 streams with northern spring salamanders (documented and presumed) will have 250-foot vegetation management zone buffers, prohibited herbicides use within 250 feet, and no utility pole installations within 25 feet. Poles will be installed within 100 feet of 10 streams in order to maximize residual shade by achieving higher conductor spans and retention of higher canopy shade underneath. There will be no in-stream work or crossings other than temporary timber mats. Disturbed stream buffers will be protected by standard erosion and sedimentation control measures. The prescriptions also benefit mayflies.

Several uncertainties remain on potential impacts to streams with documented /presumed northern spring salamanders. Unavoidable impacts likely merit mitigation.

1. Crane paths appear to cross the large wetland complex (KING\_W260) at the headwaters of stream # S041 in Kingsbury Plantation between turbine pads #54 and #55 (NRPA/SITE LAW application Exhibit 7A: page 31). Distinctions between the wetland and stream portions of such waters are best determined on site. Both the re-routed stream crossing and revegetation of an existing gravel road merit attention to safeguards for northern spring salamanders.

2. Additional clearing is presumed along the above-ground collector line route at the crossing and riparian buffer of stream # 027 in Mayfield Township, although not specifically addressed in the application. The line transitions from an overland route to an existing roadway near the headwaters of stream # S027.
3. Timber mat crossings (e.g., #S045, #S046, and #S049 in Kingsbury Plantation; #S070 in Abbot; and #S071 in Parkman) should explicitly meet or exceed standards in MDIFW's *Recommended Performance Standards for Riparian Buffers in Overhead Utility ROW Projects* (2012) and *Recommended Management Guidelines for Land Use in or Adjacent to Roaring Brook Mayfly and Spring Salamander Habitat* (2012). Assurances were not clearly found in the NRPA/SITE LAW application.
4. The above-ground collector line crosses 7 northern spring salamander streams: S009, S014, S022, S023, S024, S025, and S027 in Mayfield Township. The generator lead line corridor crosses 5 other northern spring salamander waters: S045, S046, and S049 in Kingsbury Plantation; S070 in Abbot; and S071 in Parkman. Canopy disruption via removal of capable vegetation in the corridor is inevitable. MDIFW recommends the use of taller poles and closer spacing to further reduce impacts at each crossing.
5. As several existing stream crossings within the project area could benefit from improvements during the course of nearby construction activity, MDIFW recommends the following crossings be upgraded with corrugated culverts sized to at least bankfull width and embedded 25% in order to enhance northern spring salamander habitat and stream connectivity:
  - a) A recreational vehicle trail crossing of stream #S025 in Mayfield Township.
  - b) An existing logging road crossing of stream #S027 via a 24-inch culvert in Mayfield Township.
  - c) An all-terrain vehicle trail crossing of stream #S070 in Abbot.
6. Specifics on the seed mixes used for revegetation and a timeline for documented achievement of revegetation standards are requested.
7. Waters downslope from project ridgelines along the turbine corridor may be impacted from altered hydrology or changes in water quality inputs to relatively cold, headwater streams. Existing stormwater discharge standards may not be applicable to slopes and impervious ridgeline roadways of wind projects. Risks are compounded by reduced buffering due to recent forestry practices in the project area. This concern compliments that discussed more fully in the section on coldwater fisheries below.
8. Water quality monitoring proposed by the applicant is an appropriate pre-project baseline and monitoring requirement once operational. Regardless of the status of state permits, the 2014 season may provide opportunities for a baseline study if all issues are not resolved. Specific objectives and methods are beyond the scope of this

analysis and must involve MDEP staff. The draft plan submitted on September 27 is still under MDIFW review; our response will be separate from this document.

- F. **Post-project mortality studies for birds and bats:** The size and extent of the Bingham Wind proposal certainly warrant judicious monitoring for dead birds and bats in operational phases of the project. A high-passage rate of nocturnal migrants during fall, 2010 seemed somewhat unique. The applicant agreed to a second year of radar studies at the Bingham Wind Project during fall migration in 2011. Passage rates were higher that year. A substantial proportion (16% - 21%) of targets passed over the project area at heights within the rotor swept zone. In combination, these indices infer higher risks than some projects in Maine.
1. The frequency of searching at turbines sampled for mortalities has been a greater concern than other variables at existing wind energy installations in Maine. Weekly intervals are deemed inadequate. Daily searches at a subset of turbines are preferred.
  2. The applicant met with MDIFW staff on September 24, 2013 to discuss post-project monitoring for bird and bat mortalities. Correspondence from Robert Roy (dated September 27, 2013) offered a modified approach than that depicted in the NRPA/SITE LAW application Exhibit 7: pages 402-406. Key changes include:
    - a) Daily searches will occur during peak migration periods (tentatively April 15 - June 1 and September 1 – October 15 / subject to slight adjustment via new data) during years 1 and 2 of project operation.
    - b) Radar will be used concurrently in years 1 and 2 of project operations to attempt correlating observed mortality with nightly passage rates.
    - c) Analyses will include weather and turbine operation variables.
    - d) Carcass persistence trials will provide corrections for searcher efficiency and scavenger rates.
    - e) Twenty turbines will be searched in the overall project. Sampling locations will be made in consultation with MDIFW and include installations in each string of turbines, special niches (terminus of ridgelines, saddles, summits).
    - f) A third year of mortality monitoring during years 3 - 5 of operations will be based upon initial findings and developed with MDIFW review and approval.
- G. **Golden eagles:** At present, there is no definitive evidence of golden eagle nesting activity in the project area or elsewhere in Maine. A small number of transients may visit in any season. Golden eagle activity likely peaks during fall and spring migrations to and from breeding ranges further north in eastern Canada. A few, golden eagles overwinter in Maine. Reports of sightings during the spring / summer breeding season occur, but are rarely validated. The difficulties include the immense home range (~ 2,000 square miles) of breeding eagles, the highly mobile nature of subadult eagles, widespread misidentification of juvenile bald eagles, and the certainty that golden eagles are a very rare bird (at best) in Maine.

Some researchers have deployed satellite telemetry units to track golden eagles in the region. Most bypass Maine in route between breeding grounds in northeastern Canada and winter range in mid-Atlantic regions. However, a subadult eagle frequented the northwestern one-

third of Maine during 2009 – 2012 before it died in northern New Brunswick last April. It often visited historic nest locations in Maine and similar potential habitats: perhaps pioneering suitable nests. Among > 9,500 telemetry fixes in Maine, this golden eagle infrequently visited the Bingham Wind project area and only early after its arrival during its annual spring return trips to the state:

<b>Recent Golden Eagle Activity in the Bingham Wind Project Area</b>	
<u>Date: time (EST)</u>	<u>Township of telemetry encounter</u>
2011 April 6: 7 AM	Moscow
2012 March 20: 10 AM	Bingham
2013 March 16: noon, 1 PM, 2 PM, 3 PM & 4 PM	Kingsbury Plantation
2013 March 20: 2 PM	Bingham

1. Golden eagles (residents and visitors) have been designated as an “Endangered Species” in Maine since 1986. The currently transient nature of golden eagles in the Bingham Wind Project area (and Maine generally) precludes a meaningful judgment of potential impacts of this project. In the event that increased activity of golden eagles is evident, MDIFW has the discretion to advocate parties develop an incidental take permit under provisions of Maine’s Endangered Species Act.
  2. This MDIFW review provides no assurances to the applicant from liabilities related to the Bald Eagle – Golden Eagle Protection Act and associated “Eagle Conservation Plan – Wind Energy Guidance.” The U.S. Fish and Wildlife Service, Division of Migratory Bird Management has sole authority for oversight and implementation of this law; see <http://www.fws.gov/northeast/EcologicalServices/eagleact.html> and <http://www.fws.gov/migratorybirds/PDFs/Eagle%20Conservation%20Plan%20Guidance-Module%201.pdf>
- H. **Bald eagles:** Both resident and transient bald eagles utilize the project area. Although there is some risk to injury or death to individual bald eagles from impact with wind turbines, there are < 10 incidents documented in North America. None are reported in Maine. Wind energy projects consult with the U.S. Fish and Wildlife Service (USFWS) regarding policies and liabilities for incidental harm under the nexus of a federal law, the Bald Eagle – Golden Eagle Protection Act.

This species was reclassified as “Recovered” in September, 2009 after 31 years of recognition as “Endangered” or “Threatened” in Maine. MDIFW now recognizes bald eagles as a “Species of Special Concern.” The schedule for a statewide nesting inventory to index eagle population and abundance shifted from an annual effort prior to 2008 to a periodic survey once every five years. MDIFW / USFWS collaborated to update the census in 2013: the first statewide effort in 5 years. Continued population expansion is indicated by 2013 data compiled in July. This information was not yet available at the time of the application submitted in May. Accordingly, findings in the vicinity of the Bingham Wind Project are

reported here on behalf of all interested parties:

<b>Bald eagle nests in the vicinity of the Bingham Wind Project, 2013</b>			
<u>MDIFW nest #</u>	<u>Township</u>	<u>Status (survey date)</u>	<u>Location relative to project</u>
509C	Bingham	Breeding pair (4/22) 0 eaglets (6/21)	4.9 miles ESE to turbines
[alternate nests 509A (Bingham) & 509B (Concord Twp.) = unoccupied / nests down]			
112A	Concord Twp.	Single adult nearby (former nest)	5.6 miles ENE to turbines
380B	Concord Twp.	Breeding pair (4/22) 2 eaglets	7.1 miles NNE to turbines
[alternate nest 380A (Bingham) = unoccupied / nest down]			
415A	Solon	Unoccupied (former nest)	8.4 miles NNE to turbines
659A	Bingham	Resident pair (4/22) 0 eaglets (6/21)	8.3 miles SW to turbines
698A	Guilford	Breeding pair (4/22) 0 eaglets (6/21)	11.7 miles WSW to turbines
301C	Carrying Place Township	Resident pair (4/22) 1 eaglets (6/21)	12.1 miles SE to turbines
[alternate nests 301A & 301B (Carrying Place Twp.) = unoccupied / nest down]			
543A	Parkman	Resident pair (4/22) 1 eaglets (6/21)	12.7 miles WNW to turbines 1 mile N to gen line feed
704A	East Moxie Township	Breeding pair (4/22) 2 eaglets	17.8 miles SE to turbines

1. This MDIFW review provides no assurances to the applicant from liabilities related to the Bald Eagle – Golden Eagle Protection Act and associated “Eagle Conservation Plan – Wind Energy Guidance.” The U.S. Fish and Wildlife Service, Division of Migratory Bird Management has sole authority for oversight and implementation of this law; see <http://www.fws.gov/northeast/EcologicalServices/eagleact.html> and <http://www.fws.gov/migratorybirds/PDFs/Eagle%20Conservation%20Plan%20Guidance-Module%201.pdf>
2. The current abundance and distribution of Maine’s population suggest no significant adverse impacts are likely at present as a result of construction / operation of the

Bingham Wind Project. New research is underway in Maine to improve quantitative risk assessments of incidental deaths / injuries of individual bald eagles.

I. **Northern bog lemming:** This species is designated a Threatened Species under the Maine Endangered Species Act. Seven wetlands were searched for bog lemmings in the project area; see NRPA/SITE LAW application (section 7.0 - pages 90-91; RTE Species Report – pages 7-8). Evidence of bog lemming activity was found in one (MAY\_W137). No specimens were obtained to definitively distinguish this occurrence from the more widespread occurrences of southern bog lemmings.

1. MDIFW concurs with the applicant’s assertion that no significant adverse impacts on northern bog lemmings are likely. In general, direct wetland impacts are avoided over the entire project area. The single wetland with lemming activity is 600 feet upslope of the nearest project development: clearing for a portion of the above-ground collector line along Route 16 in Mayfield Township. Any project modifications that impair local hydrology or reduce this separation are a potential concern given the application’s concession that the setting is presumed to support northern bog lemmings.

J. **Canada lynx:** The Canada lynx is federally-listed as a Threatened Species under the U.S. Endangered Species Act. Applicants conducted snow track surveys and remote camera surveys with guidance from the U.S. Fish and Wildlife Service.

<b>Recent Canada Lynx Activity in the Bingham Wind Project Area</b>	
<u>Date: encounter type &amp; data source</u>	<u>Township of encounter</u>
1986 fall: carcass verified	Bingham / Moscow
2006 December 21: track encounter by MDIFW	Bald Mountain Township
2007 January 8: track encounter by MDIFW	Bald Mountain Township
2010 February 3: track encounter by MDIFW	Blanchard Township
2010 May 9: telemetry encounter by MDIFW	Abbot
2010 May 10: telemetry encounter by MDIFW	Parkman
2010 February 4: track encounter by MDIFW	Bald Mountain Township
2011 March 23: track & scat encounter by project (Stantec)	Mayfield Township
2011 November 25: track encounter by MDIFW	Bald Mountain Township

1. MDIFW recognizes Canada lynx as a Species of Special Concern. No significant adverse impacts are likely as a result of construction / operation of the Bingham Wind Project.
2. The project area lies approximately 20 miles south of the portions of northern Maine currently designated as Critical Habitat for Canada lynx. Consultations with U.S. Fish and Wildlife Service will occur during Army Corps of Engineers permit review of the project.

- K. **Great blue herons:** MDIFW currently recognizes great blue herons as a “Species of Special Concern” based on regional trends of decline. A significant adverse impact on the statewide population is unlikely. It is increasingly evident that neither great blue herons nor ospreys can be adequately monitored incidentally to bald eagle nesting surveys as suggested in the NRPA/SITE LAW application (section 7.0 - pages 52, 188). Optimal timing and primary habitat emphasis do not overlap well in these otherwise similar, aerial inventories.
1. MDIFW guidance for great blue heron surveys stipulate monitoring during May in this region of Maine. Searches conducted prior to leaf out are much more effective. The habitat focus for heron nests is focused at flowages, wetland complexes, and upland forests within 4 miles of a wind project proposal.
- L. **Migrant raptors:** No significant impacts or agency findings are provided for studies of migrant raptor in the Bingham Wind project application.
- M. **Coldwater, inland fisheries:** Numerous consultations between Bingham Wind and review agencies focused on potential concerns for fisheries and other aquatic resources since MDIFW preliminary concerns were outlined by letter on June 28. We appreciate the ongoing communication and cooperation with both MDEP and the applicant while we assessed potential impacts to aquatic resources of concern in the Project area. The extent and scale of the Project are substantial, and the applicant has been very cooperative in addressing site-specific aquatic resources concerns raised by our Department. Because of this and the opportunity to review stormwater related issues with Art Mcglaulin, MDEP’s stormwater engineer, many of MDIFW’s earlier aquatic concerns have been addressed.

Outstanding MDIFW concerns for aquatic resource impacts in the NRPA/SITELAW application are itemized here:

1. We still question if Maine’s Stormwater Law and Best Management Practices are applicable and effective in wilderness settings. Modeling storms of the same intensity would have benefitted Pre-Development and Post-Development peak run-off values determined for both Gulf Stream and Rift Brook. We urge continuing attention by MDEP’s stormwater division on this topic and defer to their expertise.
2. The water quality monitoring study provided for First Wind’s Sheffield Wind Project in Vermont is a helpful model, but not clearly applicable to evaluating potential impacts at Bingham Wind. Differing geology, watersheds, number of stream crossings, habitat type, land uses, etc. minimize comparability. The results of the Vermont study appear favorable *through the short term*. The water quality monitoring plan recently drafted for Bingham Wind is still under review but an appropriate permitting consideration at wind energy facilities in Maine.
3. MDIFW acknowledges the applicant’s willingness to conduct water quality monitoring both as a pre-project baseline (as practicable) and subsequently during

project operations. A draft plan submitted September 27 is still under MDIFW review. Details of sampling locations and specific methods may evolve, but we find the overall strategy appears reasonable.

4. Since the initial NRPA/SITE LAW application, Bingham Wind has agreed to provide 100-foot buffers during project operations on all perennial streams that potentially support eastern brook trout (Josh Bagnato letter to Charlie Todd: September 18, 2013). This modification should be stipulated in any final permit language.
5. Culvert improvements on existing roadways have not been considered simply to avoid in-stream work. MDIFW contends that opportunities to improve stream connectivity are worthwhile and not unreasonable expectations for a project of this magnitude. Whereas the Bingham Wind Project will likely go through informal consultation (at least) under Section 7 of the U.S. Endangered Species Act, improvements via stream culvert replacement(s) will not hinder this process and may, in fact, provide mitigation opportunities. Specific locations are recommended below.
6. MDIFW is concerned about the spread of non-native, invasive and noxious weeds (e.g. purple loosestrife, phragmites, etc.) into riparian zones and wetlands within the Project area. Therefore, MDIFW recommends that all construction vehicles must be cleaned prior to entering the construction site to remove all soil, seeds, vegetation, or other debris that could contain seeds or reproductive portions of plants. All equipment shall be inspected prior to off-loading to ensure that they are clean. MDIFW also recommends that the applicant submit for review and approval, a restoration plan for the eradication of these species should they be observed during and/or post-construction, and comply with said restoration plan.

MDIFW offers the following comments on Bingham Wind's response to preliminary concerns on fisheries (Josh Bagnato letter to Charlie Todd dated September 18, 2013):

7. Page 4: *"All streams mapped by MDIFW as "Wild Brook Trout Habitat" are more than 500 feet from the nearest edge of project impacts, with two exceptions noted below. The generator lead for the project does not cross any streams identified as "Wild Brook Trout Habitat."*

MDIFW appreciates that First Wind has utilized our resource maps in site selection. However, these are guidance tools only. All wild brook trout habitat has not been mapped statewide, similar to that of Significant Vernal Pools. Additionally, while not specifically mapped as such, many other important habitats exist and are of concern to the Department. Project developments are in close proximity to several water bodies known to contain wild brook trout including Bigelow Brook, Bear Brook, Bottle Brook, Kingsbury Stream, and the tributaries of each. In fact, the application contains copies of emails from MDIFW staff referring to native brook trout in most of the streams (NRPA/SITELAW application Exhibit 7: pages 14-18).

Vegetative clearing at these stream crossings may result in thermal impacts to these reaches. While vegetative buffers will be allowed to regrow, these buffers will be ineffective at the wider stream crossings, particularly with the maintenance (removal) of capable species. How does the applicant propose to address this issue?

8. Page 5: *“As described in the application, there are no direct impacts to any perennial or intermittent streams proposed.”*

As discovered during the September 10 site visit, the waterbody at Station 208+00 was identified as an intermittent stream by MDIFW staff, with concurrence from staff from MDEP and USFWS. The channel at the site of the proposed crossing was likely disturbed sometime in the past by previous timber harvesting activities. First Wind has agreed to modify this crossing, replacing the rock sandwich with an appropriately-sized culvert<sup>1</sup> to facilitate passage of aquatic fauna.

9. Page 6: *“In addition, as discussed during the field visit, First Wind is willing to allow the turbine pads and portions of the crane roads to revert to forbs and shrubs (i.e., not mowed), if requested by MDEP, after initial loam and seed are established.”*

MDIFW recommends that all turbine pads, side slopes, and portions of the crane roads be allowed to revert to forbs and shrubs.

10. Page 15: *“No new stream crossings are required to construct the project, but it is expected that replacement of existing drainage culverts and the installation of outlet treatments will improve water quality compared to the existing conditions. Further, because these are all cross-drainage culverts they will not provide habitat for fish. However, as part of the final design process First Wind is willing to consider corrugated pipe and greater openness ratios at specific locations where they would be appropriate to address habitat considerations for wildlife.”*

During site visits and subsequent consultations, project staff expressed a willingness to replace rock sandwiches and culverts at other locations along the project with appropriately-sized culverts *if* MDIFW deems them necessary for aquatic organism passage and habitat connectivity. MDIFW appreciates the cooperation on the part of the applicant and, in addition to Station 208+00, recommends the following stations<sup>2</sup> where appropriately-sized culverts appear warranted over rock sandwiches:

- a) Station 79+00 (Sheet C-S1.08) (BING\_010)--linear wetland drainage feature
- b) Station 359+00 (Sheet C-S1.18) (MAY\_W098/MAY\_W099)--linear wetland drainage feature

<sup>1</sup> Because these drainages or intermittent streams are likely devoid of fish, culverts should be sized to pass other aquatic and semi-terrestrial organisms, ideally with an openness ratio >0.5. Due to the shallow fill of the roads, MDIFW recommends the use of squat or elliptical pipes to achieve this goal.

<sup>2</sup> MDIFW is basing its recommendations on wetland mapping, terrain features, site visits, and photographs and descriptions provided by the applicant in a letter dated September 30, 2013.

- c) Station 832+00 (Sheet C-N1.10) (S036; MAY\_W208)--linear wetland drainage feature
- d) Station 2002+50 (Sheet C-N1.18) (S038; KING\_W245/KING\_W246)--linear wetland drainage feature
- e) Station 1267+50 (Sheet C-N1.23)--wetland drainage between vernal pools VP\_61TT\_M and VP\_58MJ\_N, VP\_59MJ\_M, and others
- f) Station 1407+00 (Sheet C-N1.27)--wetland drainage crossing between vernal pools and downstream Northern Spring Salamander stream

In addition to requesting an appropriately-sized culvert at Station 1407+00, MDIFW also requests that the ATV trail culvert at the road/trail crossing immediately downstream, which conveys Stream #S041, be replaced with an appropriately-sized culvert. As an alternative design consideration, First Wind could utilize the existing ATV road / trail and replace the culvert with an appropriately-sized culvert, which would also minimize impacts to Wetland #KING\_W252. This location was previously referenced in the northern spring salamander section above.

11. Pages 15- 16: *“Temporary bridges will cross streams at right angles to the channel at a location with firm banks and level approaches whenever possible and as site conditions dictate. At each crossing location, the ends of the stringers will extend at least two feet onto firm banks or several feet into the upland edge of a wetland to ensure a dry, firm approach onto the bridge. Mats or a stone pad installed on top of geotextile fabric will provide a smooth transition for equipment travel from the adjacent ground or temporary road onto the bridge. In addition, rough stone areas will be installed at both ends of the bridge to promote cleaning of vehicle tires. Temporary bridges will be monitored during construction by professional Environmental Inspectors to ensure their correct functioning. Construction details and specifications dictate that any bridges must be kept clean and any accumulated soil material removed must be spread out and stabilized in an upland location. Under no circumstances would the material be deposited into the water resource. The Contractor will replace timbers or decking in poor condition as soon as deterioration is observed. At a minimum, the Environmental Inspector will be responsible for inspecting all bridges regularly and will keep a log of all changes, improvements and other maintenance performed. The temporary bridges will be removed as soon as they are no longer required.”*

MDIFW appreciates the addition of the rough stone areas at each end of the timber mat temporary bridges, and that these temporary crossings will be monitored for sediment build-up. After a cursory review of the Preliminary Plans (General Notes, Erosion Control Details, and Erosion Control Notes) and the Access Road Details (Exhibit 2, Drawing DET-03) no details could be found indicating maintenance of temporary bridges and stone pads at temporary stream crossings, although reference to maintenance of “construction entrances” was noted. MDIFW requests that the applicant confirm that maintenance of temporary bridges and associated stone pads are included in the final plans and construction notes.

During the September 10 site visit, the applicant agreed to geotextile fabric covering over the temporary bridges to contain soil. MDIFW requests that the Typical "Swamp Mat" Temporary Bridge plans be revised to reflect this detail and that maintenance of this fabric be included in the final notes.

12. Page 16: *"This location (Stream S027) was visited during the 9/10/13 site visit, and based on field discussions, MDIFW indicated there are no concerns with the existing crossing or the use proposed associated with this project."*

As discussed during the September 18 site visit, MDIFW had serious concerns with the existing crossing structure: three perched culverts where improvements were not considered in order to avoid in-stream work. During the September 18 site visit, we discussed the possibility of replacing, or entirely removing, this crossing as an enhancement to habitat connectivity for both fish and other aquatic organisms. MDIFW *strongly* encourages this opportunity to restore connectivity in this stream. In addition, we recommend restoration, either through complete structure removal or through an appropriately-sized, properly installed culvert<sup>3</sup>, at the following locations:

- a) Stream #S025: a recreational vehicle trail crosses this stream next to an old stone bridge that has washed out; this trail causes some disturbance within the stream channel. This location was previously referenced in the northern spring salamander section above.
- b) Stream #S070: a narrow ATV trail crosses over this stream; there is no bridge or culvert present and the stream has washed out a portion of the trail. This location was previously referenced in the northern spring salamander section above.

If removal is the option selected, physical barriers will need to be incorporated to prevent ATV traffic through stream beds.

13. Page 16: *Responses to Streams S045, S050, S060, and Intermittent Streams*

MDIFW appreciates the changes in scopes at these important locations that will protect water quality and aquatic resources.

- N. **Atlantic salmon**: The Gulf of Maine represents a Distinct Population Segment of Atlantic salmon listed as an Endangered Species under the U.S. Endangered Species Act. The Maine Department of Marine Resources has lead responsibility amongst state agencies for salmon.

1. The project area within the Piscataquis River watershed is designated as Critical Habitat for Atlantic salmon. Consultations with U.S. Fish and Wildlife Service will occur during Army Corps of Engineers permit review of the project.

<sup>3</sup> MDIFW recommends that culverts in fish-bearing streams be sized to at least bankfull width and embedded 25% of the diameter of the culvert. Smoothbore culverts should not be used in fish-bearing streams due to the velocity barriers they can create.



October 18, 2013

Dan Courtemanch  
 Maine Department of Environmental Protection  
 17 State House Station  
 Augusta, ME 04333

Subject: Bingham Wind Project, Response to Environmental Project Review Comments from Maine  
 Department of Inland Fisheries and Wildlife  
 Project # L-25973-24-A-N / L-25973-TG-B-N

Dear Dan,

Below is our response to the new Maine Department of Inland Fisheries and Wildlife (MDIFW) curtailment guidance. In addition to these comments, we appreciate the challenges associated with the Maine Department of Environmental Protection (MDEP) setting policy on curtailment and think it would be helpful if MDEP were provided with a comprehensive overview of our experience with curtailment, including in Maine, Hawaii, and Vermont. First Wind would be happy to meet with MDEP to provide an overview of the literature and results from our operating projects and to discuss the issues and intricacies associated with curtailment.

We were surprised and disappointed by MDIFW's recommendation to increase the cut-in speed from 5.0 m/s to 6.0 m/s at this late stage of their review. First Wind and its wildlife experts have been in regular consultation with MDIFW about this project since 2010 and as recently as late September, 2013, and bat curtailment has been discussed at length, but the concept of raising the restrictions even further was never discussed. The duration of the 5.0 m/s cut-in scenario proposed in our application is very conservative, reflected the latest guidance from MDIFW, and follows what has been required on other recent projects. As we have stated previously in our application and follow-up materials, we do not believe that the best available science supports this level of curtailment; nonetheless First Wind believes it is appropriate to work cooperatively with the review agencies to develop a curtailment scenario that is appropriately conservative but also reflects the level of risk presented by the project.

Had we been aware of MDIFW's intention to recommend a 6.0 m/s cut-in speed in their latest comments, we would have requested further discussion on the subject. In our view it reopens the question of what constitutes the best strategy for addressing bat impacts at wind farms, in terms of ensuring no undue adverse impact to the affected species and minimizing losses of clean, renewable power generation.

Simply raising the cut-in speed from 5.0 m/s to 6.0 m/s may seem like a small change, but in fact, as proposed by MDIFW, it would approximately *double* the amount of clean, renewable power generation that would be *lost* by the project to curtailment. We believe there are equally effective ways to ensure no undue adverse impact to bats that will result in far less lost power generation.

The sole purpose of the Bingham Wind Project is to generate clean, renewable power right here in Maine, using a naturally available resource that is both abundant and pollution-free. Generating power locally from wind reduces our dependence on fossil-fuel (including imported sources of fuel), is in the interest of national security, and helps to reduce carbon emissions that contribute to climate change. It follows that any efforts to mitigate bat impacts should be implemented in a manner that provides the greatest benefit to bats, while minimizing losses of

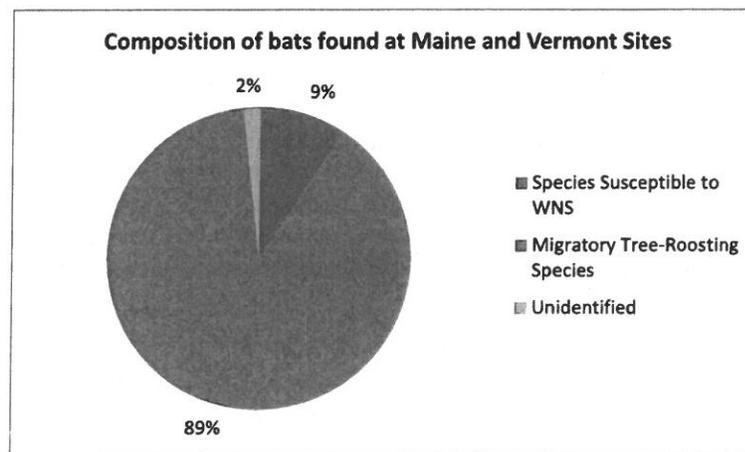
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wind power generation. This is consistent with the requirements of LD 385 to provide “best practical mitigation,” taking into account both the effectiveness of the methods and the economic feasibility of the proposed mitigation.

We share MDIFW’s concerns about the devastating effects of White-Nose Syndrome (WNS) on populations of cave-hibernating bats in Maine. Bat mortality from wind projects, particularly in Maine, however, is associated primarily with species that are not affected by WNS. A strategy of curtailment that is overly broad will result in unnecessary levels of curtailment that will not result in any meaningful reduction of risks to bat species affected by WNS.

Of the eight species of bats that are known to occur in Maine, three are considered migratory “tree-roosting” species, and include the Hoary bat, Silver-haired bat, and Eastern red bat. These species account for over 75% of bat fatalities at wind farms in the eastern United States (Johnson 2005, Arnett et al. 2008, Cryan and Barclay 2009, Arnett and Baerwald 2013). Importantly, these species are not affected by WNS.

The species affected by WNS are primarily resident species of the genus *Myotis* that do not migrate, but overwinter by hibernating locally. These species account for a relatively small percentage of bat fatalities at wind farms in the U.S. and, as noted by MDIFW and others, their populations are threatened by WNS, not by wind turbines. As the chart below depicts, data from over six years of mortality studies at operating wind farms in Maine and Vermont indicate that less than 10% of the bats found are of species that are susceptible to WNS. Notably, none of the documented fatalities have been northern long-eared bats, the species proposed for listing by USFWS.



Studies have shown that bat fatalities can be significantly reduced by raising the threshold at which turbine blades start to rotate, i.e., by raising the cut-in wind speed. The Vestas and Siemens turbines proposed for Bingham have a manufacturer’s cut-in wind speed of 3.0 m/s. Under previous guidance from MDIFW, the cut-in speed would have been raised from 3.0 m/s to 5.0 m/s from one half hour before sunset to one half hour after sunrise between April 20 and October 15. This represents a loss of approximately 8,400 megawatt hours (MWh/yr) of generation annually, enough to power approximately 1,350 average Maine homes, and thus represents a significant loss of renewable power for the State of Maine. Raising the cut-in speed from 5.0 m/s to

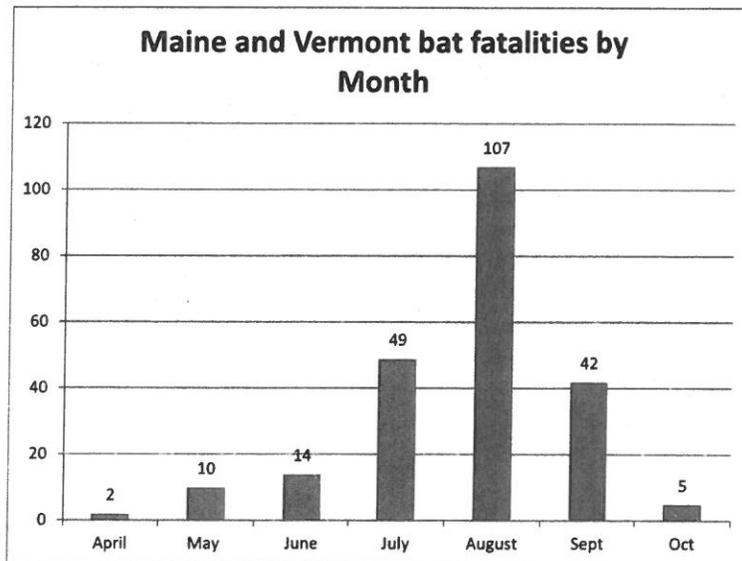
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6.0 m/s would nearly double this loss to approximately 15,500 MWh/yr or roughly enough energy to power 2,500 homes annually.

Cut-in speed is only one component of a curtailment plan - it needs to be considered in the context of other factors that correlate with bat activity, including *seasonality* (i.e., months of curtailment) and factors such as *temperature*. We know that migratory species comprise the majority of bat fatalities and that bat mortality rates are consequently very seasonal (August – September being the peak). We also know that bat activity is related not only to wind speed but also temperature and precipitation. Imposing an overly broad curtailment requirement for mid-April through mid-October ignores what we know about seasonality of bat mortality, and does not take advantage of the ability to design a curtailment system incorporating multiple weather variables. In other words, if the objective is to minimize the risk of collisions, then curtailment should be implemented during periods when bat fatalities are known to occur.

#### Seasonality and Temperature

Approximately 86% of bat fatalities documented at facilities in Maine and Vermont have occurred between July 1 and September 30, which corresponds with the post-breeding dispersal and fall migration periods for tree-roosting species. Based on the species composition of fatalities found to-date, of the few fatalities that occur outside this period, only a small percentage are species susceptible to WNS. Thus, requiring curtailment outside this period holds little potential for benefitting bats in general, or WNS species in particular. The reports documenting these fatalities have been submitted to the respective state wildlife agencies over the past seven years.



Our Sheffield Wind Project in northeast Vermont has been the subject of intensive research into the effects of wind energy on bats over the past two years. This research has been a cooperative effort between First Wind, the Vermont Agency of Natural Resources (ANR), U. S. Fish and Wildlife Service (USFWS), Bat Conservation International (BCI), and Texas Tech University. Monitoring includes daily, intensive searches of wind turbines to document bat fatalities. During two years of fatality surveys at the Sheffield Wind Project 100%

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of all bat fatalities have been tree-roosting species. Approximately 87% of these fatalities occurred between the dates of July 1 and September 30.

In addition to wind speed, parameters such as rain and air temperature have been shown to affect bat activity and can be used to further “tailor” mitigation to achieve the greatest benefit with less unnecessary loss of energy production. For example, as noted by MDIFW, the Sheffield project in Vermont is currently operating with a 6.0 m/s cut-in speed to limit bat fatalities. However, the 6.0 m/s cut-in speed has only been stipulated on nights between June 1 and September 30, and only when air temperatures are above 49 deg F. Previously agreed-upon curtailment strategies at other First Wind projects in Maine (e.g., Bull Hill and Oakfield) also include temperature thresholds for curtailment.

Further, the 6.0 m/s cut-in speed is stipulated as a *maximum* at Sheffield. It is intended to set an upper limit, and it can be adjusted downward based on the best available science. Similarly, the curtailment season may also be shortened based on the results of the curtailment study at Sheffield. The use of 6.0 m/s is also *not* a standard in Vermont. Two operating wind facilities in Vermont are currently conducting studies to assess the relative benefits of curtailment at 5.0 m/s and 6.0 m/s. Results from those studies will be used to set recommendations for wind sites in the state.

In our view, an appropriate curtailment strategy needs to optimize curtailment to include periods when the greatest percentages of fatalities have occurred, and exclude periods when fatalities are relatively infrequent. Based on surveys of Maine and Vermont projects over the last seven years, a curtailment period of July 1 – September 30 would encompass the period when approximately 86% of bat fatalities have been documented, including fatalities of species affected by WNS. Limiting curtailment to this period would ensure no undue adverse impacts to bats and avoid unnecessary loss of renewable generation. Further, including a temperature threshold of 49 deg F would allow turbines to operate during periods when bat activity is minimal during summer months.

#### Cut-In Speed

The physics of wind energy dictate that power generation increases exponentially with wind speed. Accordingly, the generation of clean, renewable power is exponentially *lost* when the cut-in speed is raised. For example, raising the cut-in speed from the 5.0 m/s threshold previously recommended by MDIFW to 6.0 m/s for the entire April 20 – October 15 period would result in an additional incremental loss of approximately 7,100 MWh of energy per year generated by the Bingham project. This single, 1.0 m/s change nearly doubles the energy loss over the original increase from 3.0 to 5.0 m/s. This not only represents a substantial loss of clean, renewable power, but this power will need to be replaced by the combustion of fossil fuels with their attendant air emissions. It is our view that a large portion of this power does not need to be sacrificed, but can be retained by tailoring curtailment, without materially increasing risk to bats.

MDIFW’s recommendations are somewhat arbitrary, as there is no conclusive evidence that the increase from 5.0 to 6.0 m/s will materially reduce bat mortality. Curtailment at 4.5 and 5.0 m/s has been shown to reduce bat mortality by substantial margins in ongoing studies, so it is by no means a given that incrementally increasing the cut-in speed from 5.0 to 6.0 m/s will yield additional significant reductions in fatalities. What is assured is that it will yield significant reductions in power production. Bat Conservation International (BCI) recently published a summary of studies that tested the effectiveness of different curtailment strategies at reducing bat fatalities at 10 wind facilities in North America (Arnett et al. 2013). Five studies looked at bat fatalities at turbines with cut-in speeds of 5.0 m/s and higher, however none evaluated the incremental benefit of raising the cut-in speed from 5.0 m/s to 6.0 m/s. In most cases the greatest percentage reductions in bat fatalities were achieved by raising the cut-in speed from “normal” (3.0, 3.5, or 4.0 m/s) to 4.5 or 5.0 m/s. In at least one case the

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greatest percentage of reductions occurred simply by feathering blades below the normal cut-in speed, without any curtailment whatsoever (Baerwald et al., 2009).

Where incremental reductions in bat fatalities have been observed above 5.0 m/s they are significantly smaller than the reductions achieved at 5.0 m/s. In other words, there is a diminishing benefit with each incremental increase in the cut-in speed, while at the same time there is an exponential increase in power lost. As noted above, these reductions were almost entirely related to tree-roosting migrants, not the species whose populations are being decimated by WNS.

#### An Appropriate Balance

As stated in BCI's recently published synthesis, one of their objectives was to identify ways to, "...optimize operational mitigation so as to reduce economic costs while maintaining effectiveness of mitigation..." (Arnett et al. 2013). According to BCI, "...a substantial portion of bat fatalities occur during relatively low-wind conditions during the late summer-fall bat migration period...", and "...Bats significantly reduce their flight activity during periods of rain, low temperatures, and strong winds ... and are less at risk to collision with wind turbines under these conditions...". In other words, a balance can be struck between reducing risk for bats and allowing renewable power to be generated.

In Maine, winds are lower in the late summer/early fall, which coincides with the well-documented timing of bat migration and higher bat fatality rates. Focusing curtailment during this period is not only protective of bats, but minimizes the loss of renewable power generation.

Simply put, the curtailment parameters of 6.0 m/s from April 20 – October 15 proposed by MDIFW are overly broad and do not balance the protection of bats with minimizing losses of renewable energy generation. Studies have shown that risk to bats is extremely low and curtailment is unnecessary during much of the period that IFW proposes. As an alternative to MDIFW's proposed criteria, we suggest the following curtailment parameters as optimal for reducing the risk of bat collisions with wind turbines, while minimizing the loss of renewable power:

- i. 5.0 m/s from July 1 to September 30
- ii. A temperature threshold of 49 deg F
- iii. Curtailment from sunset to sunrise

Given the small numbers of bat fatalities that occur before July 1 and after September 30, curtailment during these periods does not represent the best practical approach to reducing bat fatalities (including species affected by WNS) during these periods. Efforts to address WNS should be focused where they can have the greatest benefit. These may include such measures as protection of hibernacula, as is being done under a Vermont ANR program that is partially funded by wind energy companies. First Wind would be very willing to work cooperatively with MDIFW and others to identify and support similar efforts to combat the devastating effects of WNS on Maine bat populations.

Sincerely,



Robert Roy



Dave Cowan

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Vice President, Environmental Affairs  
First Wind Energy, LLC

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October 18, 2013

Dan Courtemanch  
 Maine Department of Environmental Protection  
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 Augusta, ME 04333

**Subject: Bingham Wind Project, Response to Environmental Project Review Comments from  
 Maine Department of Inland Fisheries and Wildlife  
 Project # L-25973-24-A-N / L-25973-TG-B-N**

Dear Dan:

Thank you for providing the final agency comments submitted to the Maine Department of Environmental Protection (MDEP) from the Maine Department of Inland Fisheries and Wildlife (MDIFW) regarding the Bingham Wind Project (project), dated October 9, 2013. We are pleased that the majority of initial concerns expressed by MDIFW regarding this project have been addressed. For your reference, we have provided a response to certain MDIFW comments in this letter that we felt required additional clarification. The original text of the MDIFW letter is below in *italics* (with corresponding page numbers from the letter in parentheses) and our response follows in black.

A. **Vulnerable bat species** (page 3):

*In summary, based on the factors outlined above (some of which are only recently coming to light), MDIFW is revising its "Maine Turbine Curtailment Requirements to Decrease Bat Mortality" from a minimum cut-in speed of 5 m/s to a minimum 6 m/s. This permit language reflects our best, current insights to minimize bat mortality:*

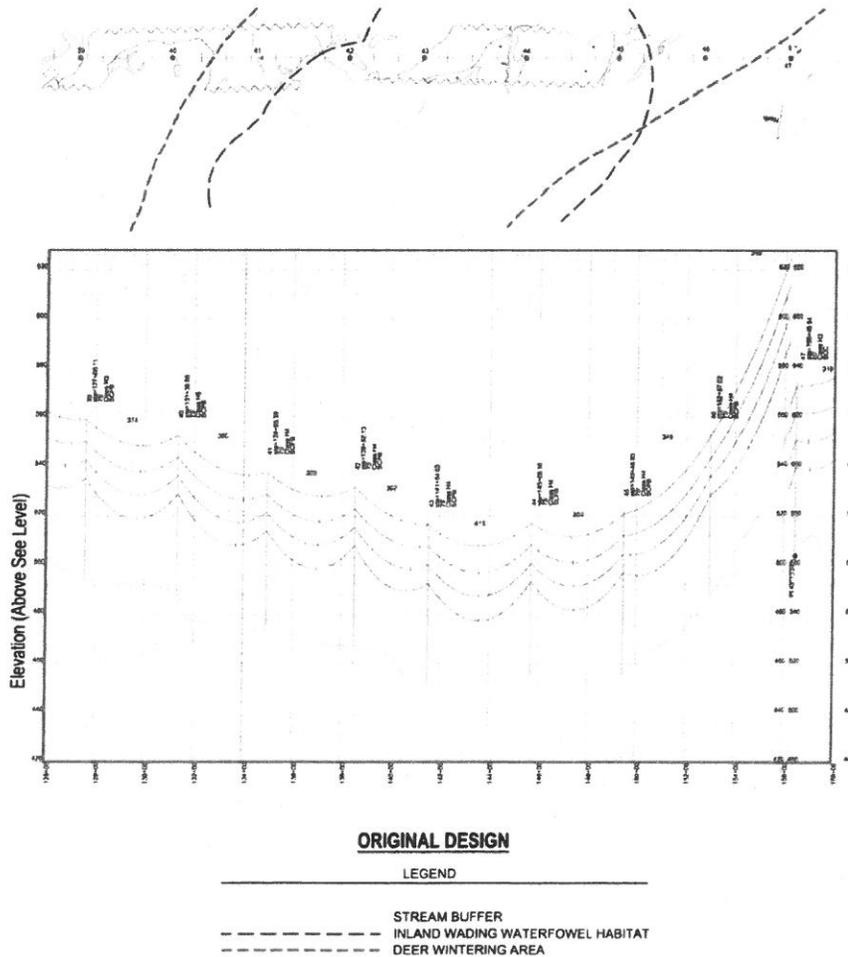
**Wind turbines will operate only at cut-in wind speeds exceeding 6.0 meters per second each night (from at least ½ hour before sunset to at least ½ hour after sunrise) during the period April 20 – October 15 over the life of the project. Cut-in speeds are determined based on mean wind speeds measured at hub heights of a turbine over a 10-minute interval. Turbines will be feathered during these low wind periods to minimize risks of bat mortality.**

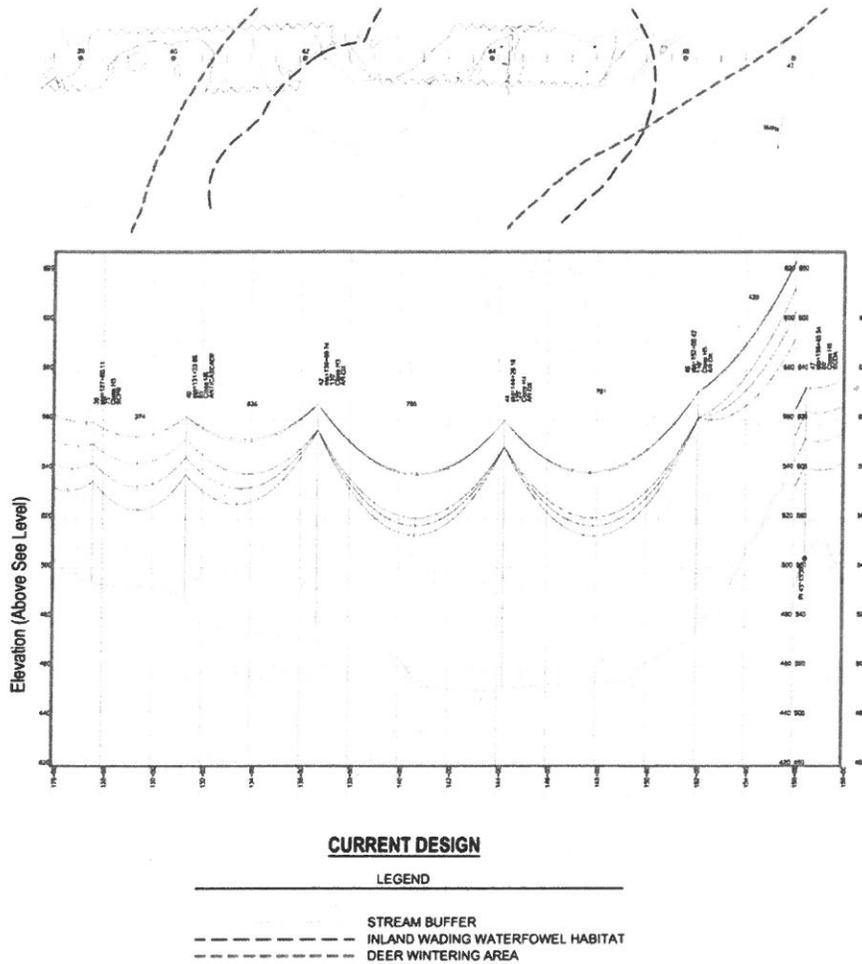
**Applicant Response:** The Applicants have provided a response to this comment in the enclosed letter.

B. **Deer wintering areas** (page 4):

2. *DWA #084031 in Parkman: The generator lead line route here is a compromise between two Significant Wildlife Habitats mapped under NRPA: an "Inland Waterfowl / Wading Bird Habitat" and this DWA. During a September 18 site visit, MDIFW advised that a single pole installation in the wetland would vastly reduce impacts to the forest canopy integral to wintering deer. This adjustment has not been formally submitted, but appropriate permit conditions are requested.*

**Applicant Response:** The revised generator lead design discussed with MDIFW and proposed in DWA #084031 in Parkman incorporates taller H-frame structures that will result in less clearing and allow a taller tree canopy within this deer wintering area (DWA) and Inland Waterfowl and Wading Bird Habitat (IWWH) as a result of increased conductor height. During deer yard surveys performed in March of 2013 (see Section 7 of MDEP Application), the canopy cover in the area, where present, is 35-50 feet. H-frame poles will be taller and allow conductors to be an average height of 61.5 feet, much taller than those associated with single pole structures with an average conductor height of 32.3 feet. These original and revised designs can be seen in profile below. This information was provided to MDIFW via email on September 27, 2013. V-style clearing will still be implemented around pole structures to reduce impacts to the forest canopy,





**B. Deer wintering areas (page 4):**

4. *Regardless of avoidance and minimization efforts, impacts to each DWA merit mitigation. Overall DWA impacts are estimated as 8,800 linear feet of disruption by the generator lead line corridor. The greatest influence (5,250 linear feet) is in DWA #084033 near the terminus of the generator lead line in Parkman. The impact is more than its linear extent since it intersects a constricted travel corridor that connects two separate lobes that provide the bulk of suitable DWA habitat locally.*

**Applicant Response:** The Applicant has been coordinating with both MDIFW and MDEP on addressing compensation for these impacts. Significant design and construction efforts have been undertaken to reduce clearing of the canopy at the two sensitive crossing locations including taller poles, reduced cleared right of way, V-notch clearing, buffers, and maintenance restrictions. In addition, the Applicant is willing to provide compensation. Based on guidance from MDEP on October 17, 2013, compensation for impacts to DWAs should be calculated using the resource compensation rate for the average assessed land value per square feet in Piscataquis County. These rates are provided in the MDEP Fact Sheet – In Lieu Fee Compensation Program dated July 16, 2013. The table below displays the compensation calculations for each DWA and provides the total amount of calculated compensation. Clearing impacts were based on the square footage of generator lead that will cross DWAs. The Applicant has assumed a 100-foot-wide corridor in all locations to calculate square feet of clearing impact. The actual amount of

clearing impact will be much less, due to restrictive cutting procedures and a narrower corridor in certain sections of the generator lead. Therefore, the calculated compensation amount should exceed the amount of compensation needed for actual clearing impacts of these DWAs.

Deer Wintering Area	Square Feet of Clearing Impact (based on 100-foot clearing width)	Average Assessed Land Value per Square Foot	Compensation Amount
#080604	40,510.8	\$0.04	\$1,620.43
#084029	54,885.6	\$0.04	\$2,195.42
#084031	283,140	\$0.04	\$11,325.60
#084033	559,310.4	\$0.04	\$22,372.42
<b>Total</b>	<b>937,846.8</b>	<b>\$0.04</b>	<b>\$37,513.87</b>

C. Vernal pools (page 4):

1. Pool #53KN\_N along the generator lead line in Abbot does not qualify for a NRPA permit by rule. However, an interim review by MDIFW finds this setting to be a "Potentially Significant" vernal pool based on the likelihood that a road may be altering hydrology to create it. A site visit can confirm this determination. Project representatives are requested to provide descriptive and photo documentation.

Applicant Response: Pool #53KN\_N is located adjacent to the west side of a private ATV trail. The trail leads south from a cabin on Gales Road. The trail bisects a forested wetland (ABB\_W385 and ABB\_W386) dominated by Northern white-cedar (*Thuja occidentalis*). Stream S069 crosses under the ATV trail through an 18-inch diameter corrugated metal pipe approximately 145 feet north of Pool #53KN\_N. The surface of the ATV trail is approximately 6-12 inches higher than the ground level within the forested wetland. Elevation drops roughly 3-5 feet from the northern edge of the wetland near Gales Road to Pool #53KN\_N. On May 18, 2011 and May 23, 2011, egg masses were concentrated in areas of pooled water within the wetland. Saplings, trees, rotting stumps and logs, and mossy hummocks are scattered throughout the pool. The eastern edge of the pool abuts the ATV trail and extends west into the forested wetland. During site visits with MDIFW, the Applicant recommended visiting Pool #53KN\_N. MDIFW noted at that time that there were no issues with Pool #53KN\_N, and there was no interest in visiting the pool.



May 2011. Looking west into Pool #53KN\_N from edge of ATV trail.



May 2011. Looking south down ATV trail adjacent to Pool #53KN\_N.



December 2012. Looking south from Stream S069 down ATV trail. Pool #53KN\_N is located in the background near the bend in the ATV trail.

E. **Northern spring salamanders** (page 7):

2. *Additional clearing is presumed along the above-ground collector line route at the crossing and riparian buffer of stream # 027 in Mayfield Township, although not specifically addressed in the application. The line transitions from an overland route to an existing roadway near the headwaters of stream # S027.*

**Applicant Response:** Clearing proposed along the collector line route is shown on sheet CL-1.05 in Exhibit 1 of the MDEP Application.

**E. Northern spring salamanders (page 7):**

3. *Timber mat crossings (e.g., #S045, #S046, and #S049 in Kingsbury Plantation; #S070 in Abbot; and #S071 in Parkman) should explicitly meet or exceed standards in MDIFW's Recommended Performance Standards for Riparian Buffers in Overhead Utility ROW Projects (2012) and Recommended Management Guidelines for Land Use in or Adjacent to Roaring Brook Mayfly and Spring Salamander Habitat (2012). Assurances were not clearly found in the NRPA/SITE LAW application.*

**Applicant Response:** The Applicant agrees to meet guidelines regarding timber mat crossings within MDIFW's *Recommended Performance Standards for Riparian Buffers in Overhead Utility ROW Projects (2012)* and MDIFW's *Recommended Management Guidelines for Land Use in or Adjacent to Roaring Brook Mayfly and Spring Salamander Habitat (2012)*. A professional environmental inspector and/or third party inspector will be present during the construction of the project to observe compliance with these guidelines. Any deviations from these guidelines will be discussed in advance with MDEP and/or the third party inspector. See Table 10-1 of the MDEP Application, which identifies buffers and clearing restrictions at these locations and for the entire project (Section 10).

**E. Northern spring salamanders (page 7):**

4. *The above-ground collector line crosses 7 northern spring salamander streams: S009, S014, S022, S023, S024, S025, and S027 in Mayfield Township. The generator lead line corridor crosses 5 other northern spring salamander waters: S045, S046, and S049 in Kingsbury Plantation; S070 in Abbot; and S071 in Parkman. Canopy disruption via removal of capable vegetation in the corridor is inevitable. MDIFW recommends the use of taller poles and closer spacing to further reduce impacts at each crossing.*

**Applicant Response:** Each of the northern spring salamander stream crossings will have a 250-foot vegetative management zone. Poles are proposed to be installed between 25 and 100 feet of the stream in order to achieve higher conductor spans and retention of higher canopy shade underneath. As detailed in the memo from Stantec to MDIFW dated August 21, 2013, these crossings were designed per the MDIFW 2012 Guidelines.

**E. Northern spring salamanders (page 7):**

5. *As several existing stream crossings within the project area could benefit from improvements during the course of nearby construction activity, MDIFW recommends the following crossings be upgraded with corrugated culverts sized to at least bankfull width and embedded 25% in order to enhance northern spring salamander habitat and stream connectivity:*
  - a) *A recreational vehicle trail crossing of stream #S025 in Mayfield Township.*
  - b) *An existing logging road crossing of stream #S027 via a 24-inch culvert in Mayfield Township.*
  - c) *An all-terrain vehicle trail crossing of stream #S070 in Abbot.*

**Applicant Response:** The crossing improvements identified by MDIFW are not proposed or required to construct or operate the Project and the Applicant has worked diligently to design the project such that no in-stream work is needed. Consequently, incorporating new or improved culverts at these locations within the Application would result in increased impacts to regulated resources. The Applicant understands MDIFW's desire for net improvement of aquatic organism passage and habitat connectivity in these areas. The Applicant is open to providing technical and/or financial support and generally coordinating with the landowner or local recreational groups to upgrade these three existing stream crossings once the project becomes operational.

E. **Northern spring salamanders** (page 7):

6. *Specifics on the seed mixes used for revegetation and a timeline for documented achievement of revegetation standards are requested.*

**Applicant Response:** The specific seed mixes used for revegetation are provided below in Table 14-3. This information was provided to MDEP during their review of the Basic Standards section subsequent to the Application being filed. The Basic Standard Section of the Application (Section 14) provides additional details on requirements related to revegetation. The timeline to achieve the revegetation standard will be a product of what season construction activities are completed. If construction is completed prior to mid-summer in a given year, it is conceivable that the revegetation standard could be met by mid-October, but if construction ends in late fall or winter it may take until the following summer to meet the standard. However, similar to other First Wind projects in Maine, the Bingham site will be revegetated as quickly as conditions allow and a Notice of Termination will be filed once the standard has been met.

Table 14-3: Permanent Seeding Schedule

	Seed	Percent By Weight
Upland Areas with Loam Cover	Tall Fescue	35%
	Creeping Red Fescue	30%
	Perennial Ryegrass	20%
	Annual Ryegrass	15%
Upland Areas with Erosion Control Mix Cover	Crown Vetch	50%
	Perennial Lupine	25%
	Crimson Clover	15%
	Annual Rye	10%
Slopes and Ditches Below Water Table or Line of Seepage	Creeping Red Fescue	47%
	Red Top	6%
	Tall Fescue	47%

K. **Great blue herons** (page 12):

*MDIFW currently recognizes great blue herons as a "Species of Special Concern" based on regional trends of decline. A significant adverse impact on the statewide population is unlikely. It is increasingly evident that neither great blue herons nor ospreys can be adequately monitored incidentally to bald eagle nesting surveys as suggested in the NRPA/SITE LAW application (section 7.0 - pages 52, 188). Optimal timing and primary habitat emphasis do not overlap well in these otherwise similar, aerial inventories.*

1. *MDIFW guidance for great blue heron surveys stipulate monitoring during May in this region of Maine. Searches conducted prior to leaf out are much more effective. The habitat focus for heron nests is focused at flowages, wetland complexes, and upland forests within 4 miles of a wind project proposal.*

**Applicant Response:** The Applicant met with MDIFW and US Fish and Wildlife Service (USFWS) on March 5, 2010, to discuss the scope of pre-construction surveys at the site. During that meeting and a subsequent email correspondence, it was determined that conducting the heron rookery survey concomitant with the aerial eagle survey was acceptable. Specifically, in an email dated March 11, 2010, from MDIFW to Stantec, the following guidance was provided: "Timing of aerial surveys could coincide with eagle nest surveys if done between 20 Apr and 30 Jun; although dates within this time period prior to leaf-out are preferred."

The heron surveys were conducted in accordance of this guidance (on May 12, 2010 and May 2, 2011) and the results were provided in the annual eagle aerial survey memos submitted to MDIFW. The Applicant understands that MDIFW currently prefers that any surveys specific to great blue herons (and osprey) to be conducted outside of the time period that aerial flights for bald eagles are made and will take that into account should surveys for those species be necessary again in the future.

**M. Coldwater, inland fisheries (page 13):**

6. *MDIFW is concerned about the spread of non-native, invasive and noxious weeds (e.g. purple loosestrife, phragmites, etc.) into riparian zones and wetlands within the Project area. Therefore, MDIFW recommends that all construction vehicles must be cleaned prior to entering the construction site to remove all soil, seeds, vegetation, or other debris that could contain seeds or reproductive portions of plants. All equipment shall be inspected prior to off-loading to ensure that they are clean. MDIFW also recommends that the applicant submit for review and approval, a restoration plan for the eradication of these species should they be observed during and/or post-construction, and comply with said restoration plan.*

**Applicant Response:** The Applicant will develop an invasive species construction management plan prior to the initiation of construction that includes inspection of construction vehicles, equipment, and materials. The Applicant has also developed an appropriate plan for the eradication and management of non-native, invasive species that are observed during and/or after construction. The Invasive Species Management Plan is found in Section 10 – Buffers of the MDEP Application as Exhibit 10B.

**M. Coldwater, inland fisheries (pages 13-14):**

*MDIFW offers the following comments on Bingham Wind's response to preliminary concerns on fisheries (Josh Bagnato letter to Charlie Todd dated September 18, 2013):*

7. *Page 4: "All streams mapped by MDIFW as "Wild Brook Trout Habitat" are more than 500 feet from the nearest edge of project impacts, with two exceptions noted below. The generator lead for the project does not cross any streams identified as "Wild Brook Trout Habitat."*

*MDIFW appreciates that First Wind has utilized our resource maps in site selection. However, these are guidance tools only. All wild brook trout habitat has not been mapped statewide, similar to that of Significant Vernal Pools. Additionally, while not specifically mapped as such, many other important habitats exist and are of concern to the Department. Project developments are in close proximity to several water bodies known to contain wild brook trout including Bigelow Brook, Bear Brook, Bottle Brook, Kingsbury Stream, and the tributaries of each. In fact, the application contains copies of emails from MDIFW staff referring to native brook trout in most of the streams (NRPA/SITELAW application Exhibit 7: pages 14-18).*

*Vegetative clearing at these stream crossings may result in thermal impacts to these reaches. While vegetative buffers will be allowed to regrow, these buffers will be ineffective at the wider stream crossings, particularly with the maintenance (removal) of capable species. How does the applicant propose to address this issue?*

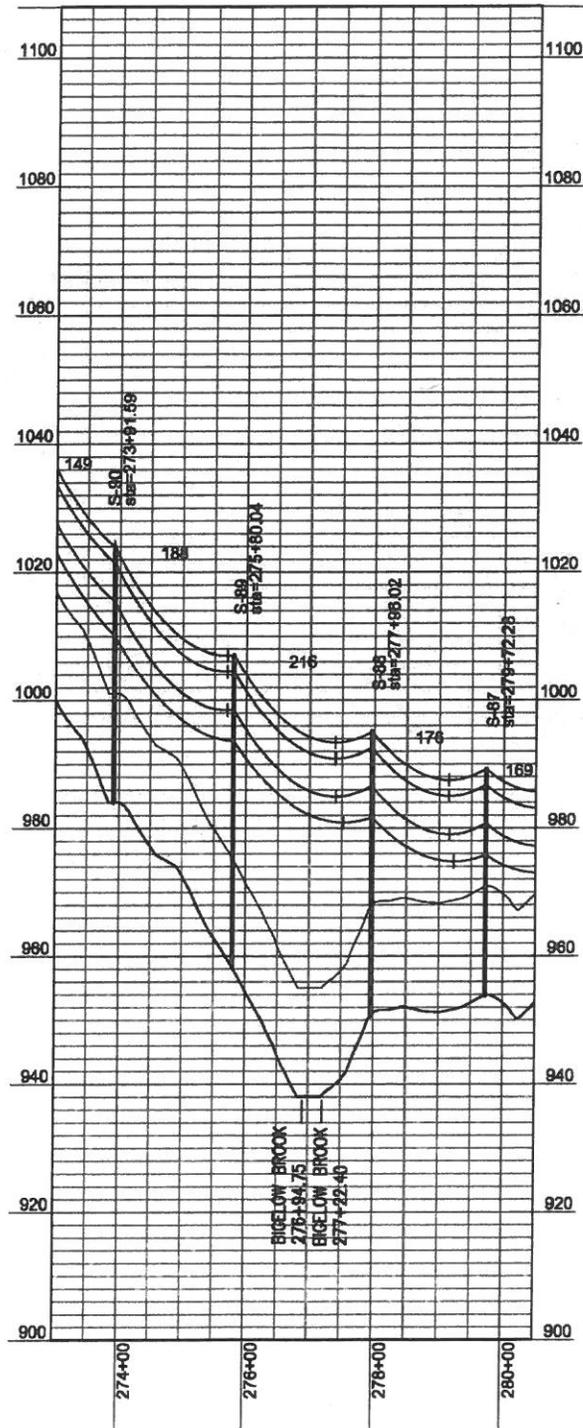
**Applicant Response:** Clearing activity around these streams will follow all guidance in the ISO-NE Vegetative Maintenance Standards and meet or exceed the guidelines in MDIFW's *Recommended Performance Standards for Riparian Buffers in Overhead Utility ROW Projects* (2012). Only trees capable of growing to a height of 15 feet from a conductor within the next 3-4 years will be topped or removed. Topping of trees is the preferred method of vegetative maintenance because it will allow the tree to continue to provide shade for the stream. Trees will only be removed if topping the tree will leave insufficient vegetation to sustain the tree. No other vegetation, other than dead or danger trees, will be removed. Each of these four streams also have documented or presumed occurrences of northern spring salamanders. A 250-foot vegetation management zone buffer will be established at each location. Poles will be located within 100 feet but outside of 25 feet from the stream in order to achieve higher conductor spans and retention of higher canopy shade underneath. The Applicant will take extra measures to limit

clearing as much as possible in these locations. Oversight by a professional environmental inspector will be required at all stream crossings.

Bigelow Brook — The collector line will cross Bigelow Brook approximately 185 feet northwest of the Route 16 crossing. A steep bank on the west side of the stream should help increase conductor height over the stream and reduce the number of trees that will need to be topped.



September 2013. Bigelow Brook. From approximate collector line crossing looking south towards Route 16.



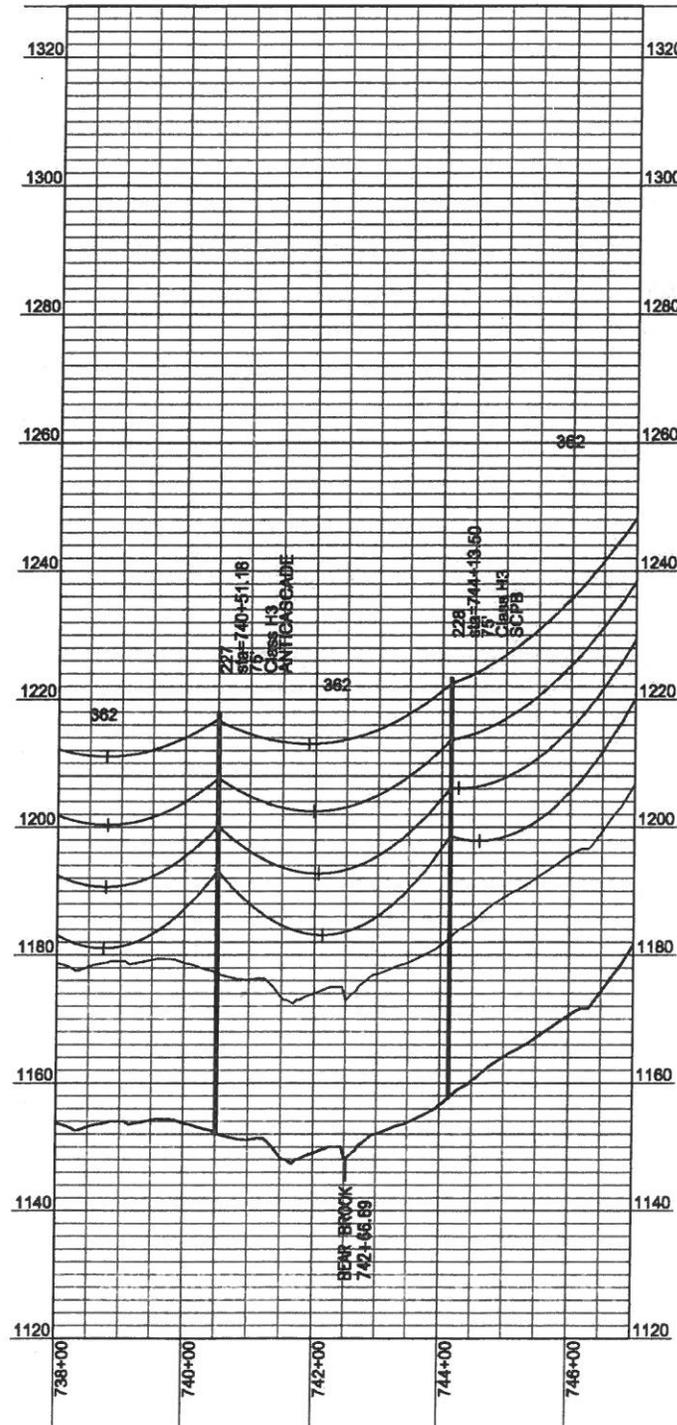
**BIGELOW BROOK**

An approximately 42-foot-tall canopy will be retained within 25-feet on either side of the stream.

**Bear Brook** — Bear Brook is situated in a small valley and bordered by upland forest. The surrounding forest is several feet higher than the stream and should help increase conductor height over the stream and reduce the number of trees that will need to be topped. Further, the narrow width of Bear Brook in this area will allow for the development of a dense streamside shrub community. These shrubs will provide the stream channel itself with canopy cover, limiting or mitigating any potential warming concerns.



December 2012. Bear Brook. Looking south, downstream. Note steep bank leading to upland forest on the east side of the stream.



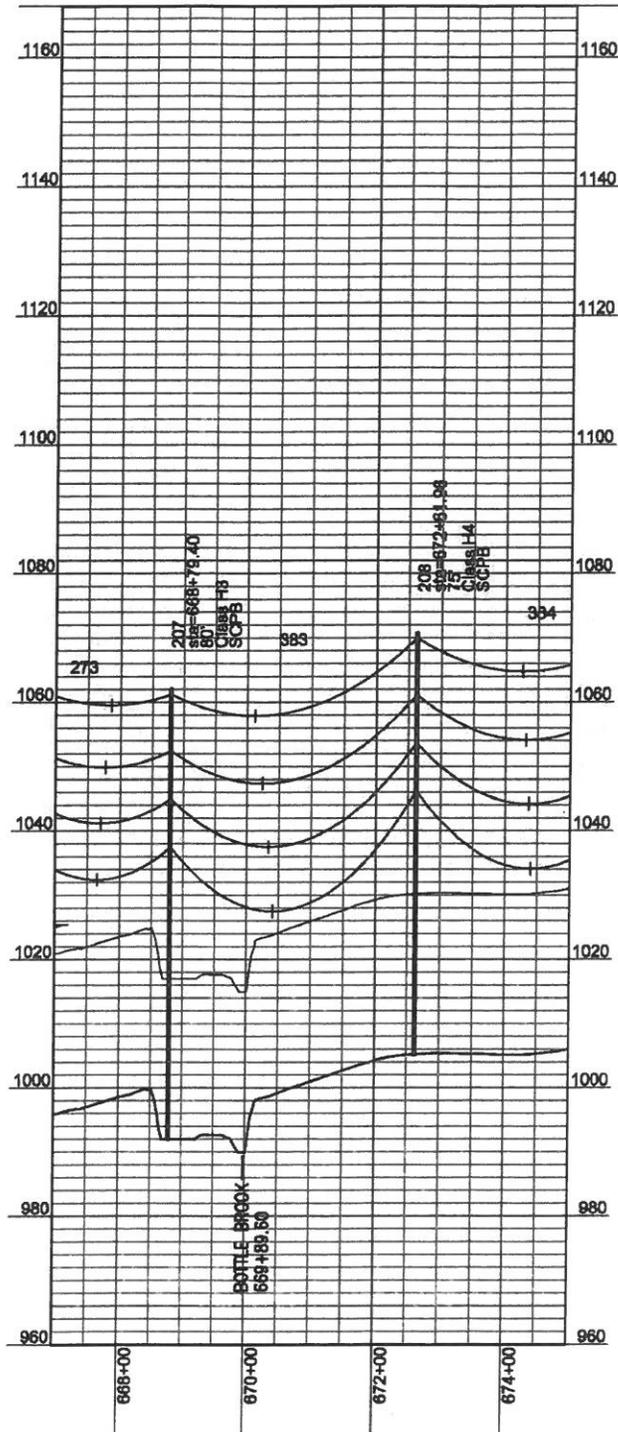
**BEAR BROOK**

An approximately 34-foot-tall canopy will be retained within 25-feet on either side of the stream.

**Bottle Brook** — Bottle Brook is situated in a small valley. A steep slope leads down to the stream from the west. This slope should help increase conductor height over the stream and reduce the number of trees that will need to be topped. Timber harvesting operations occurred within the last 3-4 years on the east side of the stream. Disturbance and tree removal extends to within approximately 25-35 feet of the stream bank. A limited number of trees remain on the east bank that will need to be topped. Vegetation maintenance at this crossing will allow for the reestablishment of dense shrubs and saplings along the banks of this narrow brook, particularly along the previously impacted eastern bank. This shrub and sapling development will provide shading to the already exposed stream channel.



November 2010. Bottle Brook. Looking south, downstream. Note thinned canopy from timber harvesting on the east side of the stream.



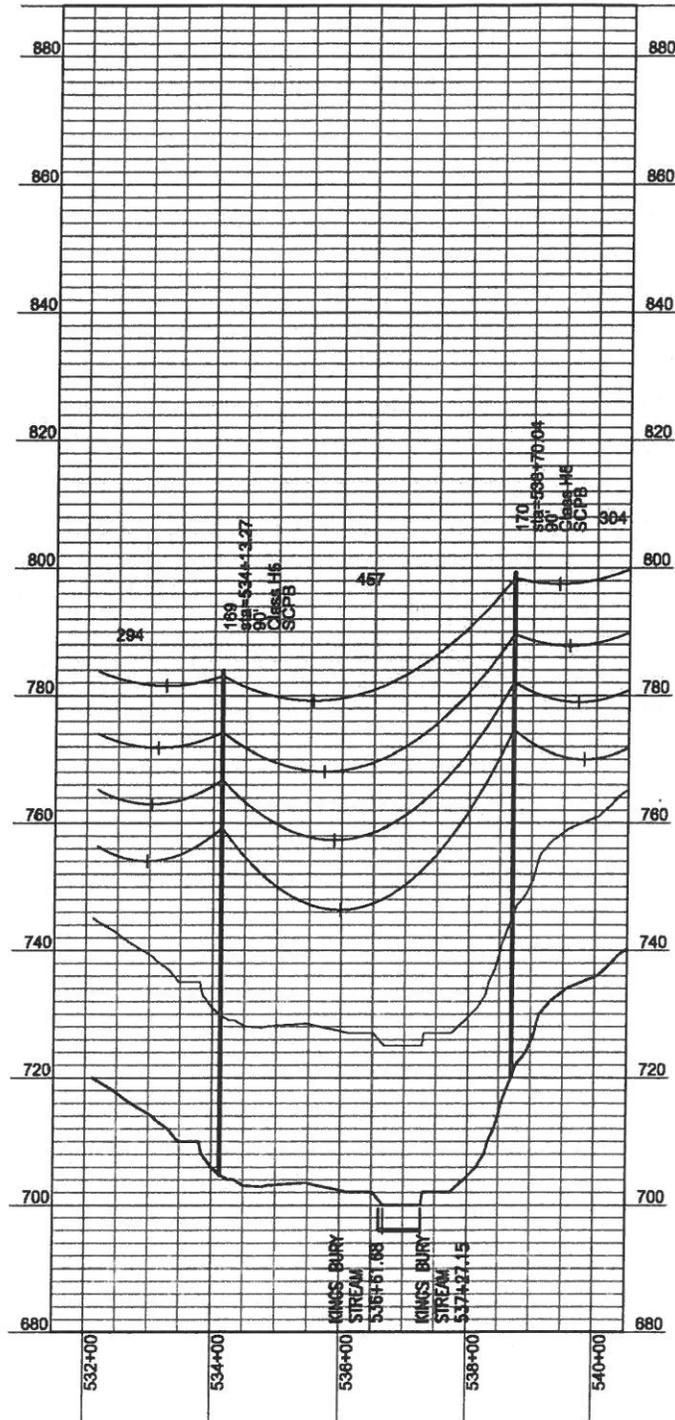
**BOTTLE BROOK**

An approximately 34-foot-tall canopy will be retained within 25-feet on either side of the stream.

Kingsbury Stream — The generator lead will cross Kingsbury Stream adjacent to an existing bridge. Current conditions in this area provide little shading of the stream. It is likely that topping trees within 100 feet of the Kingsbury Stream will not result in adverse impacts to the stream. While some trees currently providing some shade to the channel will be removed, the width of the stream already creates a high degree of sun exposure.



May 2010. Kingsbury Stream. Looking southwest back towards bridge where generator lead will be co-located.



**KINGSBURY STREAM**

An approximately 49-foot-tall canopy will be retained within 25-feet on either side of the stream.

**M. Coldwater, inland fisheries (pages 14-15):**

10. Page 15: "No new stream crossings are required to construct the project, but it is expected that replacement of existing drainage culverts and the installation of outlet treatments will improve water quality compared to the existing conditions. Further, because these are all cross-drainage culverts they will not provide habitat for fish. However, as part of the final design process First Wind is willing to consider corrugated pipe and greater openness ratios at specific locations where they would be appropriate to address habitat considerations for wildlife."

*During site visits and subsequent consultations, project staff expressed a willingness to replace rock sandwiches and culverts at other locations along the project with appropriately-sized culverts if MDIFW deems them necessary for aquatic organism passage and habitat connectivity. MDIFW appreciates the cooperation on the part of the applicant and, in addition to Station 208+00, recommends the following stations<sup>1</sup> where appropriately-sized culverts appear warranted over rock sandwiches:*

- a) Station 79+00 (Sheet C-S1.08) (BING\_010)--linear wetland drainage feature
- b) Station 359+00 (Sheet C-S1.18) (MAY\_W098/MAY\_W099)--linear wetland drainage feature
- c) Station 832+00 (Sheet C-N1.10) (S036; MAY\_W208)--linear wetland drainage feature
- d) Station 2002+50 (Sheet C-N1.18) (S038; KING\_W245/KING\_W246)--linear wetland drainage feature
- e) Station 1267+50 (Sheet C-N1.23)--wetland drainage between vernal pools VP\_61TT\_M and VP\_58MJ\_N, VP\_59MJ\_M, and others
- f) Station 1407+00 (Sheet C-N1.27)--wetland drainage crossing between vernal pools and downstream Northern Spring Salamander stream

*In addition to requesting an appropriately-sized culvert at Station 1407+00, MDIFW also requests that the ATV trail culvert at the road/trail crossing immediately downstream, which conveys Stream #S041, be replaced with an appropriately-sized culvert. As an alternative design consideration, First Wind could utilize the existing ATV road / trail and replace the culvert with an appropriately-sized culvert, which would also minimize impacts to Wetland #KING\_W252. This location was previously referenced in the northern spring salamander section above.*

**Applicant Response:** The Applicant agrees to replace rock sandwiches at locations a through f with appropriately sized culverts to allow for increased aquatic organism passage and habitat connectivity. Rock sandwiches were proposed in these locations based on past input from state regulators concerned with preserving existing hydrology. The Applicant will not utilize the existing ATV road/trail because it would result in impacts to Stream S041. There is no current evidence of an existing, functioning culvert at this location. The Applicant proposes to continue with its current design of installing a rock sandwich uphill of the ATV trail. However, the Applicant will block future recreational use of this ATV road and replant the road with native vegetation, allowing it to revert back to a natural state.

**M. Coldwater, inland fisheries (pages 15-16):**

11. Pages 15-16: "Temporary bridges will cross streams at right angles to the channel at a location with firm banks and level approaches whenever possible and as site conditions dictate. At each crossing location, the ends of the stringers will extend at least two feet onto firm banks or several feet into the upland edge of a wetland to ensure a dry, firm approach onto the bridge. Mats or a stone pad installed on top of geotextile fabric will provide a smooth transition for equipment travel from the adjacent ground or temporary road onto the bridge. In addition, rough stone areas will be installed at both ends of the bridge to promote cleaning of vehicle tires. Temporary bridges will be monitored during construction by professional Environmental Inspectors to ensure their correct functioning. Construction details and specifications dictate that any bridges must be kept clean

<sup>1</sup>MDIFW is basing its recommendations on wetland mapping, terrain features, site visits, and photographs and descriptions provided by the applicant in a letter dated September 30, 2013.

*and any accumulated soil material removed must be spread out and stabilized in an upland location. Under no circumstances would the material be deposited into the water resource. The Contractor will replace timbers or decking in poor condition as soon as deterioration is observed. At a minimum, the Environmental Inspector will be responsible for inspecting all bridges regularly and will keep a log of all changes, improvements and other maintenance performed. The temporary bridges will be removed as soon as they are no longer required."*

*MDIFW appreciates the addition of the rough stone areas at each end of the timber mat temporary bridges, and that these temporary crossings will be monitored for sediment build-up. After a cursory review of the Preliminary Plans (General Notes, Erosion Control Details, and Erosion Control Notes) and the Access Road Details (Exhibit 2, Drawing DET-03) no details could be found indicating maintenance of temporary bridges and stone pads at temporary stream crossings, although reference to maintenance of "construction entrances" was noted. MDIFW requests that the applicant confirm that maintenance of temporary bridges and associated stone pads are included in the final plans and construction notes.*

*During the September 10 site visit, the applicant agreed to geotextile fabric covering over the temporary bridges to contain soil. MDIFW requests that the Typical "Swamp Mat" Temporary Bridge plans be revised to reflect this detail and that maintenance of this fabric be included in the final notes.*

**Applicant Response:** Construction and maintenance of temporary bridges and addition of stone pads on final plans and construction notes will be included with a pending permit amendment. Applicant agrees to Geotextile fabric covering over the temporary bridges to control soil – to be added to Typical 'Swamp Mat' Temporary Bridge plans.

**M. Coldwater, inland fisheries (page 16):**

12. Page 16: "This location (Stream S027) was visited during the 9/10/13 site visit, and based on field discussions, MDIFW indicated there are no concerns with the existing crossing or the use proposed associated with this project."

*As discussed during the September 18 site visit, MDIFW had serious concerns with the existing crossing structure: three perched culverts where improvements were not considered in order to avoid in-stream work. During the September 18 site visit, we discussed the possibility of replacing, or entirely removing, this crossing as an enhancement to habitat connectivity for both fish and other aquatic organisms. MDIFW strongly encourages this opportunity to restore connectivity in this stream. In addition, we recommend restoration, either through complete structure removal or through an appropriately-sized, properly installed culvert, at the following locations:*

- a) *Stream #S025: a recreational vehicle trail crosses this stream next to an old stone bridge that has washed out; this trail causes some disturbance within the stream channel. This location was previously referenced in the northern spring salamander section above.*
- b) *Stream #S070: a narrow ATV trail crosses over this stream; there is no bridge or culvert present and the stream has washed out a portion of the trail. This location was previously referenced in the northern spring salamander section above.*

*If removal is the option selected, physical barriers will need to be incorporated to prevent ATV traffic through stream beds.*

**Applicant Response:** See above response to E 5.

Response to Final Agency Comments from  
Maine Department of Inland Fisheries and Wildlife, Bingham Wind Project

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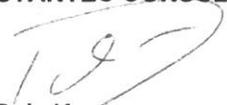
If you have any further questions, please do not hesitate to contact us.

Sincerely,

**FIRST WIND**

  
Josh Bagnato  
Environmental Permitting and Compliance Manager  
129 Middle Street, 3rd Floor  
Portland, Maine 04101  
Tel. 802.477.3830

**STANTEC CONSULTING SERVICES INC.**

  
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CC: Charles Todd, Maine Department of Inland Fisheries and Wildlife  
John Perry, Maine Department of Inland Fisheries and Wildlife  
Bob Stratton, Maine Department of Inland Fisheries and Wildlife  
Dave Cowan, First Wind  
Robert Roy, First Wind





PAUL R. LEPAGE  
GOVERNOR

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DEPARTMENT OF  
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284 STATE STREET  
41 STATE HOUSE STATION  
AUGUSTA ME 04333-0041

CHANDLER E. WOODCOCK  
COMMISSIONER

December 9, 2013

Dan Courtemanch  
Project Manager - Division of Land Resource Regulation  
Maine Department of Environmental Protection  
17 State House Station  
28 Tyson Drive  
Augusta, Maine 04333-0017

**RE: Bat Curtailment at the Bingham Wind Power Project**  
**Project #: L-25973-24-A-N / L-25973-TG-B-N**

Dear Dan:

As you well know, the advent of wind power in Maine is creating new challenges for both the Maine Department of Environmental Protection and the Department of Inland Fisheries and Wildlife. Regarding the challenges facing our Agency, wind power development has been steadily increasing across our landscape and MDIFW staff have been involved with assessing impacts not only through numerous, large-scale field survey efforts to determine site-specific concerns for a wide variety of species and habitats, but also through consulting with our peers across the region, as well as the nation, and by reviewing the existing research on the subject.

In the case of bats, this research is still in its infancy but is growing as well as evolving. Consensus among our peers with other state wildlife agencies, as it pertains to wind curtailment and protection of bats, has been toward increasing minimum wind speeds at which turbines are allowed to turn freely. Unfortunately, determination of the threshold needed to provide the greatest protection possible to this animal while still allowing the wind industry to maximize its generating capacity is also evolving. Understandably, higher curtailment is a major concern to the wind industry, as generating opportunities are lost.

As it pertains to the Bingham Wind Project, MDIFW called both First Wind and MDEP prior to the formal submittal of the recommendation to increase the minimum curtailment wind speed. While we recognize that this was a change from earlier discussions it must be re-emphasized that the timing of the recommendation had everything to do with the timing of the U.S. Fish and Wildlife Service October 2 announcement that Federal Endangered Species status was warranted for northern long-eared bats. This necessitated that we reexamine the most recent research and modify our curtailment policy to provide further protection to all of our species that are in jeopardy including reviewing Maine Endangered Species Act listing for two bats currently listed as Special Concern--the little brown bat (*Myotis lucifugus*) and northern long-eared bats (*Myotis septentrionalis*).

Letter to Dan Courtemanch, Maine Department of Environmental Protection  
RE: Bat Curtailment at the Bingham Wind Power Project  
Project #: L-25973-24-A-N / L-25973-TG-B-N  
December 9, 2013

MDIFW continues to appreciate the open communication and exchange of information on the Bingham Wind Project between MDEP, First Wind, and our Agency. While concessions had to be made by all parties involved, and MDIFW still has concerns as to what the curtailment threshold needs to be to protect bats, we accept the mutually-agreed upon curtailment for the Bingham Wind Project, as stated below, as it is more protective than previously permitted wind projects in Maine:

**Wind turbines will operate only at cut-in wind speeds exceeding 5.0 meters per second each night (from at least ½ hour before sunset to at least ½ hour after sunrise) during the period April 20 – June 30; 6.0 meters per second each night (from at least ½ hour before sunset to at least ½ hour after sunrise) during the period July 1 – September 30; 5.0 meters per second each night (from at least ½ hour before sunset to at least ½ hour after sunrise) during the period October 1 – October 15. Cut-in speeds are determined based on mean wind speeds measured at hub heights of a turbine over a 10-minute interval. Turbines will be feathered during these low wind periods to minimize risks of bat mortality. These cut-in speeds are independent of ambient air temperature.**

Please note that MDIFW will be recommending a minimum cut-in speed of at least 6 meters per second for all future wind power projects, consistent with its “Maine Turbine Curtailment Requirements to Decrease Bat Mortality” policy:

**Wind turbines will operate only at cut-in wind speeds exceeding 6.0 meters per second each night (from at least ½ hour before sunset to at least ½ hour after sunrise) during the period April 20 – October 15. Cut-in speeds are determined based on mean wind speeds measured at hub heights of a turbine over a 10-minute interval. Turbines will be feathered during these low wind periods to minimize risks of bat mortality. These cut-in speeds are independent of ambient air temperature.**

Additionally, all other points emphasized in MDIFW’s October 9, 2013, formal review recommendations and comments remain. Specific to aquatic resources, recent conversations between MDIFW’s Deputy Commissioner and First Wind have resulted in acceptance of MDIFW’s recommended scope changes over earlier designs at several wetland drainages that will facilitate habitat connectivity for smaller organisms, as identified during site visits and through subsequent discussions. MDIFW also appreciates First Wind’s willingness to improve riparian buffers and to correct barriers at stream crossings that were identified by MDIFW. Of particular note, recommendations #4, #10, #12 (Stream S027), and #13 are important enhancements that will protect water quality and benefit aquatic resources within the Project area.

Finally, note that final comments on Deer Wintering Areas will be addressed shortly in a separate letter.

That MDEP, MDIFW, and First Wind have worked so long and so collaboratively on this project, with each entity addressing the concerns of the others while still maintaining their respective professionalism and integrity, is a testament to all those involved. We look forward to working with MDEP and First

Letter to Dan Courtemanch, Maine Department of Environmental Protection  
RE: Bat Curtailment at the Bingham Wind Power Project  
Project #: L-25973-24-A-N / L-25973-TG-B-N  
December 9, 2013

Wind to resolve outstanding issues. Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

Handwritten signature of Charles S. Judd in cursive.

MDIFW Endangered & Threatened Species Coordinator

