

STATE OF MAINE  
DEPARTMENT OF CONSERVATION  
LAND USE REGULATION COMMISSION

IN THE MATTER OF

MAINE MOUNTAIN POWER, LLC	)	
REDINGTON WIND FARM	)	
	)	PRE-FILED TESTIMONY
REDINGTON TOWNSHIP, FRANKLIN	)	APPALACHIAN MOUNTAIN CLUB
COUNTY, MAINE	)	DR. DAVID A. PUBLICOVER
	)	
ZONING PETITION ZP 702	)	

I. Introduction

My name is David Publicover. I hold a doctorate in forest ecology from the Yale University School of Forestry and Environmental Studies, and have been employed as a Senior Staff Scientist in the AMC's Research Department since 1992. I developed and oversee the club conservation GIS program, which provides information and analyses on the landscape of northern New England to other conservation agencies, land trusts, state agencies, and local groups for the purposes of conservation planning. In addition, for over a decade I have been involved in research and policy development related to windpower siting. I represented AMC during our intervention in the Kenetech project, currently am serving on windpower/wildlife policy development groups in Massachusetts and Maine, and have spoken at many conferences and public meetings on windpower siting, including LURC's windpower forum in December 2005. My curriculum vitae is attached as Appendix A.

I have visited the site on two occasions, once in the mid-1990s in the company of the applicant, and most recently on June 20, 2006 in the company of the applicant's representative

and other witnesses for the intervenors. I have reviewed in detail Sections 1, 6, 7 and 9 of the application.

## II. AMC General Statement on Ridgeline Windpower Development

As the region's primary organization devoted to the conservation and wise use of the region's mountain areas, the AMC has a strong interest in the development of renewable energy. We have a long history of research into mountain air quality and the conservation of alpine areas, and we fully recognize the damage that our society's continued reliance on fossil fuels can have on the areas our members care about. We believe that windpower is an important part of a regional renewable energy strategy. However, terrestrial ridgelines, one of the primary sites of interest for windpower development, are often the least developed and most natural parts of our heavily utilized landscape, and are areas of potentially high ecological, recreational and scenic value. In permitting this technology, we believe it is important that regulators strike a proper balance between development and conservation of open space areas with high resource value. Our research has been aimed at providing information that would allow stakeholders to assess this tradeoff, and to identify potential development sites with both high and low levels of conflict with natural resource values of recognized state, regional or national significance.

Our opposition to this project is based on our understanding of the particular resource values that the project would impact. It should not be taken as blanket opposition to ridgeline windpower development. To date we have evaluated about a dozen windpower projects proposed for ridgelines across New England, and this is the only one that we oppose. We do not believe that all P-MA zones should be off-limits to windpower, and our testimony is not intended to convey any interpretation or set any precedent to that effect.

### III. Issues of Concern but Not Discussed in Detail

There are a number of issues that are of major concern to AMC, but we defer to other witnesses within our consolidated group on these issues which include: (1) Bicknell's thrush; (2) Northern bog lemming; (3) road construction erosion and sedimentation; and (4) scenic impacts to the Appalachian Trail and Mount Abraham. On the subject of decommissioning, we note that the applicant has failed to offer adequate financial security to ensure that all materials are removed and the project area is restored to as natural a condition as possible in the event that the facility ceases operation.

### IV. The Application is Inconsistent with LURC's Comprehensive Land Use Plan

Because the resource values on Redington are so high and relate so directly to LURC's core values, Redington Mountain clearly falls into the category of mountains unsuitable for rezoning and associated development. LURC's Comprehensive Land Use Plan (CLUP) makes clear that not all mountain areas are suitable for rezoning: "In light of the limited supply of mountain resources and their value, it is unlikely that all such areas will be considered suitable for rezoning and associated development by the Commission."<sup>1</sup>

#### A. The Project is Inconsistent with the CLUP's Broad Goals

The proposal should be denied in light of its inconsistency with the CLUP's three broad goals. The first addresses the need for sound planning: "Support and promote the management of all the resources, based on the principles of sound planning and multiple use, ...to ensure the separation of incompatible uses, and to ensure the continued availability of outstanding quality water, air, forest, wildlife and other natural resource values of the jurisdiction."<sup>2</sup> The applicant has failed to comply with several basic principles for sound planning including ensuring that the

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<sup>1</sup> Comprehensive Land Use Plan ("CLUP") P. 59.

<sup>2</sup> CLUP P. 134.

decision-maker has sufficient information so as to make sound decisions.<sup>3</sup> For example, the bird and bat migration studies that have been conducted are inadequate and fail to meet the current industry standards thereby not providing LURC with all of the necessary data relating to bird and bat migration.<sup>4</sup> The applicant has also not met another test of sound planning, to ensure that the project will function as planned. For example, the road construction plans provided in the application will not function so as to prevent significant erosion and sedimentation.<sup>5</sup>

Furthermore, the proposal fails to adequately address the CLUP's second broad goal, "Conserve, protect and enhance the natural resources of the jurisdiction primarily for fiber and food production, nonintensive outdoor recreation and fisheries and *wildlife habitat*."<sup>6</sup> The proposed wind development on Redington significantly threatens rather than conserves the outstanding wildlife community that both resides in and passes through the site. Locating a commercial windpower facility on Redington will cause unreasonable adverse impacts to a suite of bird species, many of which have specific habitat requirements that are in decline, and some of which are area sensitive and are most successful utilizing large blocks of interior forest habitat, such as Bicknell's thrush.<sup>7</sup> Fragmentation, due to roads and development, has been shown to degrade forest interior habitat and will cause similar habitat degradation on Redington.<sup>8</sup> In addition, the wetlands and wildlife that use them will face significant degradation if the project is approved.<sup>9</sup> The relatively high passage rates at Redington put the migratory birds and bats that pass through the site at serious risk.<sup>10</sup> Also, the proposed application would likely cause

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<sup>3</sup> See the testimony below and that of Jody Jones, John Albright, Dr. Aram Calhoun, Bud Brown, and Bert Lambert.

<sup>4</sup> See testimony of Jody Jones.

<sup>5</sup> See Bert Lambert's testimony.

<sup>6</sup> CLUP P. 134 (emphasis added).

<sup>7</sup> See the testimony of Jody Jones.

<sup>8</sup> See my testimony below and that of Jody Jones.

<sup>9</sup> See the testimony of Bud Brown.

<sup>10</sup> See the testimony of Jody Jones.

a catastrophic loss of or damage to the habitat of the Northern bog lemming, a state-listed threatened species.<sup>11</sup>

The rare ecological community found at the summit of Redington Mountain that is located in the heart of an unfragmented roadless area will be significantly degraded if the project is approved, contrary to both the CLUP's third broad goal which is to, "Maintain the natural character of certain areas within the jurisdiction having significant natural values and primitive recreational opportunities,"<sup>12</sup> and to the specific CLUP Mountain Resources Policy #2: to "identify and *protect* high mountain resources with particularly high natural resource values or sensitivity which are not appropriate for most development."<sup>13</sup> (Emphasis added.)

Redington Mountain lies within a contiguous unfragmented roadless corridor extending for over 17 miles from Route 4, across Saddleback, The Horn, Saddleback Jr., Redington, and Crocker Mountains to Route 27, encompassing over 35,000 acres. In addition, Redington is also an integral part of one of the state's most significant mountainous areas. The upper elevations of Redington and Crocker Mountains also encompass two of only five exemplary examples in the state of the rare (S3) Fir-Heartleaved Birch Sub Alpine Forest natural community. Furthermore, the seeps that are found on the summit are very fragile, hold potentially unique values, contribute to the special ecological community and are particularly sensitive to disturbance and permanent alteration.<sup>14</sup> The value of the area is also demonstrated by the high level of interest in land conservation in this region that has emerged in recent years. Redington is one the most valuable of our mountain resources and therefore clearly falls into the category to be protected from development.

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<sup>11</sup> See the testimony of John Albright.

<sup>12</sup> CLUPP. 58.

<sup>13</sup> CLUP P. 138.

<sup>14</sup> See the testimony of Dr. Aram Calhoun.

Natural character value is identified in the CLUP to include “the uniqueness of a vast forested area that is largely undeveloped and removed from population centers.”<sup>15</sup> In fact, the CLUP states that “Remoteness and the relative absence of development are perhaps *the most distinctive* of the jurisdiction’s principal values, due mainly to their increasing rarity in the Eastern United States.”<sup>16</sup> It goes on to say, “These traits also enhance other values, particularly recreational opportunities and natural resources.... The value of natural resources is generally enhanced when they are part of a large, undisturbed area, especially one that encompasses entire watersheds or ecosystems.”<sup>17</sup> Redington is in the middle of a largely unfragmented high conservation value area. It is the combination of the lack of fragmentation and relatively pristine condition together with the rare suite of wildlife species and natural community that combine to make the summit of Redington a truly spectacular place that warrants protection from development.<sup>18</sup>

**B. The High Values on Redington Significantly Outweigh the Need for Windpower Development at This Site**

The values put at risk by this project are significantly higher when balanced against the need for a windpower development project on this particular site. According to the CLUP, there is a need for balance when evaluating energy projects and that when balancing these competing values, protection of LURC’s core values weighs heavier. While “meeting the state’s energy needs with reliable energy supplies at the lowest possible cost” is important, the need for energy, even renewable energy, does not trump the need to protect the other values within the

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<sup>15</sup> CLUP P. 114.

<sup>16</sup> CLUP P. 114 (emphasis added).

<sup>17</sup> CLUP P. 114.

<sup>18</sup> The nature of unfragmented areas makes them highly susceptible to being devalued by development. “Remote, undeveloped qualities are also particularly sensitive to permanent changes in the landscape resulting from development.” CLUP P. 115. Although the definition of what constitutes an unfragmented area has subjective elements, this doesn’t decrease the importance of protecting this value. “These values may be difficult to quantify but they are integral to the jurisdiction’s identity and to its overall character.” CLUP P. 115.

jurisdiction.<sup>19</sup> The CLUP's Energy Policy guides LURC to "Prohibit energy developments and related land uses in areas identified as environmentally sensitive where there are overriding, conflicting environmental and other public values requiring protection."<sup>20</sup> In fact, the CLUP goes even further to prohibit energy development where the competing values put at risk are simply too high.<sup>21</sup> Clearly, the applicant has failed to meet this test.

### C. Windpower Development Should be Sited in Low Value Areas

The application should be rejected because it recommends the siting of development contrary to LURC's policy of directing development towards sites of low, not high value. LURC's goal for the location of development is to "protect and conserve" important natural resources, to ensure compatibility of land uses, and to permit a reasonable range of development opportunities.<sup>22</sup> In its implementing policies, it makes explicit that it will "Guide proposals for major new [energy facilities]<sup>23</sup> to locations on the fringe of the jurisdiction that have ... *low natural resource values*, and are separate from incompatible land uses."<sup>24</sup> Redington Mountain is not an area of low resource value,<sup>25</sup> nor will the development be separate from other uses, and is thus inappropriate for development.

### D. Conclusion

LURC's CLUP calls for balance when evaluating energy projects, but clearly indicates that when an area has high values core to LURC's jurisdiction, the competing values prevail.

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<sup>19</sup> CLUP P. 41. The CLUP recognizes the tension between competing values, "Large windpower installations, however, have the potential to conflict with other values of the jurisdiction, particularly those associated with mountain areas. . . ." CLUP P. 40.

<sup>20</sup> CLUP P. 136.

<sup>21</sup> Energy Resources Policy Two: "Prohibit energy developments and related land uses in areas identified as environmentally sensitive where there are overriding, conflicting environmental and other public values requiring protection." CLUP P. 136.

<sup>22</sup> CLUP P. 140.

<sup>23</sup> CLUP P. 130.

<sup>24</sup> CLUP P. 140 (emphasis added).

<sup>25</sup> See testimony below.

The CLUP policy regarding windpower development is very clear. Windpower development must be directed towards low value areas. Redington Mountain possesses some of the highest values of all the privately owned mountains in LURC jurisdiction. Its inherent value and its location in the heart of the largest contiguous area above 2700 feet elevation in the state that is the subject of state and federal conservation efforts and interest disqualifies it from windpower development.

#### V. The Application is Unable to Satisfy Criteria for Rezoning Protection

The application should be denied because it has failed to meet its burden for approval of a D-PD subdistrict that the proposal “Incorporates, where the land proposed for inclusion in the D-PD subdistrict is in a protection subdistrict, a substantially equivalent level of environmental and resource protection as was afforded under such protection subdistrict.”<sup>26</sup> Protection districts are areas “where development would jeopardize significant natural, recreational and historic resources, including, but not limited to, precipitous slopes, wildlife habitat and other areas critical to the ecology of the region or state.”<sup>27</sup> The P-MA zone, in particular, is specifically designed to “preserve the natural equilibrium of vegetation, geology, slope, soil and climate in order to reduce danger to public health and safety posed by unstable mountain areas, to protect water quality, and to preserve mountain areas for their scenic values and recreational opportunities.”<sup>28</sup>

Accordingly, for the applicant to successfully petition for the rezoning of over 1000 acres of a P-MA subdistrict, the proposal must provide for a substantially equivalent level of protection of 1) wildlife habitat; 2) ecologically critical areas; 3) the natural equilibrium of vegetation, geology, slope, soil and climate in order to reduce danger to public health and safety

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<sup>26</sup>LURC Chapter 10.21,G,8,b,2.

<sup>27</sup> 12 M.R.S.A. § 685-A(1)(A).

posed by unstable mountain areas; 4) water quality; 5) scenic values; and 6) recreational opportunities. The applicant has not shown and cannot show that its proposed rezoning will provide a “substantially equivalent” level of protection.

Currently, LURC protects these six values by limiting the permitted uses in the P-MA zone. Uses with high impacts, such as new road construction, mineral exploration activities which disturb *no more than 2 acres* of soil and vegetation, and utility facilities, are only permitted by “special exception” where the applicant can meet two tests: “show by substantial evidence that (a) there is no alternative site which is both suitable to the proposed use and reasonably available to the applicant; (b) the use can be buffered from those other uses and resources within this subdistrict with which it is incompatible . . . .”<sup>29</sup>

The proposed project fails both of the requisite tests necessary for new road construction and utility facilities in the P-MA: The applicant has not demonstrated that there is no alternative site, and the applicant is not buffering (and cannot buffer) the wind farm from all of the other incompatible existing uses and resources, including existing wildlife habitat that is of significant value.

The proposed project will result in significant negative impacts to the six values the P-MA was designed to protect. This is because the project involves:

- Permanent removal of wildlife habitat in an area which at least 7, but perhaps 17 rare, threatened and endangered species occur; (Application, Section 7, pp. 74-95).
- Clearing of at least 135 acres above 2700 feet where the dominant forest type is the Fir-Heartleaved Birch Subalpine Forest, designated as rare in Maine;
- Construction of a road immediately adjacent to Northern bog lemming habitat;

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<sup>28</sup> LURC Chapter 10.23,G,1.

<sup>29</sup> LURC Chapter 10.23,G,3,d.

- Impact on more than nine acres of wetland;<sup>30</sup>
- Clearing of over 300 acres of vegetation, much of which will not revegetate either intentionally or due to growing conditions on the mountains;
- Construction of both access and mountaintop roads including filling and grading;
- Blasting and drilling 30 foot deep holes in the mountaintops for the installation of each turbine;
- Storm water run off and erosion created by the roads and concrete pads;
- Groundwater contamination from trucks and turbines, and the lubricants and chemical products used in the operation of such equipment;
- Visual impacts on six different types of public resources, all which are used by the public in varying degrees throughout the year, and elimination of the natural character of the ridgeline; and
- Restriction of ATV and snowmobile access to the mountaintop areas.

The proposed rezoning would allow uses of a scope and impact not permitted in the P-MA which will significantly impact the six values the P-MA is designed to protect. There simply will not be a substantially equivalent level of environmental and resource protection as is currently afforded under the P-MA zone.

## VI. The Value of Redington Mountain

### A. The Importance of Large Blocks of Contiguous Unfragmented Forest

The value of large blocks of contiguous forest unfragmented by roads and clearing and the negative impacts of roads on wildlife habitat have been well established.<sup>31, 32, 33, 34</sup> The “loss

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<sup>30</sup> Applicant claims 9.43 acres of wetlands will be impacted (Application P. 102), but I refer you to Bud Brown’s testimony in which he indicates that the applicant has under-reported the extent of the proposed wetland alteration.

<sup>31</sup> Flatebo et al. (1999) discuss the impacts of forest fragmentation and the importance of large blocks of interior forest, and note (page 110) “The amount of mature forest in the landscape is a consideration in determining how important it is to maintain large, contiguous forest tracts. As the proportion of mature forest in a landscape decreases, the importance of the remaining areas increases.”

<sup>32</sup> The need to maintain these blocks was recognized in avian research conducted by the Manomet Center for Conservation Sciences (Hagan et al. 1995). Their report stated (page 21), “A landscape-level habitat feature that is difficult to maintain at relatively high harvest rates are large tracts of continuous mature forest.” It also stated, “At

of large blocks of forested habitat (>10,000 acres) and connectivity between large blocks” as well as “habitat loss and fragmentation associated with development and building of permanent roads” have been identified as threats to both deciduous/mixed and coniferous forest.<sup>35</sup> Maine’s Comprehensive Wildlife Conservation Strategy (CWCS) identifies “habitat loss and degradation from development and building of permanent roads” as the first threat to mountaintop forests. Furthermore, the U.S. Fish and Wildlife Service recommends avoiding fragmentation of large, contiguous tracts of wildlife habitat in its wind turbine guidelines.<sup>36</sup> The negative effect of roads on habitat include elimination of natural habitat, the restriction of small animal movement, the creation of edge effects, increased blowdowns, contribution to erosion and runoff, and corridors for disease, pests, and exotics.<sup>37, 38, 39, 40</sup>

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this [i.e., current] harvest rate, only areas exclusive of harvesting options for one reason or another will reach older age classes (*high elevation areas*, riparian areas, deer wintering areas).” [Italics added.]

<sup>33</sup> Large blocks of interior forest are recognized as an important habitat feature by Maine’s Beginning with Habitat program; see [http://www.beginningwithhabitat.org/the\\_maps/map9-forestblocks.html](http://www.beginningwithhabitat.org/the_maps/map9-forestblocks.html).

<sup>34</sup> An unpublished report prepared by biologists from the New Hampshire Fish and Game Department in the mid-1990s concerning management of high-elevation forests in northern New Hampshire (an area that is ecologically, historically and economically comparable to the western mountains region of Maine) noted, “Presently large contiguous blocks of older aged spruce/fir habitat is at a premium in the North Country. Budworm harvests and intensified silviculture because of the high value of softwood and/or mill demands have placed increased pressures on all available softwood. Most valleys have been entered for harvest and the softwood stands which grew back from the cuts performed in the late 1800s and early 1900s have been harvested once again in recent times. High elevations represent some of the last areas which provide this habitat type.”

<sup>35</sup> Maine Comprehensive Wildlife Conservation Strategy (Chapter 5, Table 36)

<sup>36</sup> The U.S. Fish and Wildlife Service’s *Interim Guidelines to Avoid and Minimize Impacts from Wind Turbines* (see <http://www.fws.gov/habitatconservation/wind.pdf>) recommends “Avoid fragmenting large, contiguous tracts of wildlife habitat. Where practical, place turbines on lands already altered or cultivated, and away from areas of intact and healthy native habitats. If not practical, select fragmented or degraded habitats over relatively intact areas.”

<sup>37</sup> See Flatebo et al. (1999), pages 125-127.

<sup>38</sup> Gawlor et al. (1996), quoting a report prepared for the Maine Environmental Priorities Project, noted the following fragmenting effects of roads (page 67): “Roads eliminate natural habitat, restrict the movement of small animals that hesitate to cross even narrow swaths, create edge effects and exacerbate blowdown, contribute to erosion and runoff in steep terrain, and provide corridors for forest disease/pests and exotics.”

<sup>39</sup> See also Noss, R. 2001.

<sup>40</sup> The New Hampshire Fish and Game Department report noted, 1) “New Hampshire Fish and Game has strong reservations regarding high elevation timber harvest...there are inherent sensitivities to operating at these high elevations.” 2) “The soils at these elevations tend to be shallow. We have seen summer harvests resulting in the total loss of the soil layer in areas where the combination of heavy skidding and erosion have exposed large sections of bedrock precluding any establishment of forest cover well into the future. Very often the soils are saturated as well because of numerous springs and seeps.” 3) “Truck roads should not be built above 2700’. Erosional hazards are intensified with road construction at these elevations because of steep slopes and thin soils. It is also difficult to put these roads to bed. Roads also can present a significant negative human intrusion for animals that are not

## B. Large Roadless Areas in Maine

The AMC has mapped the extent and decline of large roadless areas in northern New England, using satellite imagery and published road atlases as the major sources. These are areas of at least 5,000 acres in size, include no obvious roads or forest clearing since the late 1960s, and thus represent the most significant large blocks of contiguous, unroaded relatively mature habitat in the region. A report on this work, including criteria for the delineation of these areas, is included as Exhibit C.

The major results of this work include:

- Between 1997 and 2000, the number of these areas in the state declined from 88 to 72, and the total area encompassed by them declined by 27%.<sup>41</sup>
- Between 2000 and 2004, an additional eight areas were lost due to new road construction.<sup>42</sup>
- These areas are disproportionately concentrated on public lands, on steeper slopes, and at higher elevations. These trends increased between 1997 and 2000 as roadless areas were eliminated from more accessible land at lower elevations.
- Over half of the remaining roadless areas in Maine remain at high risk of future loss due to their location on accessible private lands.

## C. Redington is an Important Roadless Area

The high elevations of the area bounded by Routes 16, 27, 4 and 142 (sometimes called the “Western High Mountains” region) constitute an expanse of unfragmented and relatively

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adapted to this exposure. Canada lynx in particular are sensitive to disturbances associated with some forms of increased human presence in their habitat.” It should be noted that the areas considered in this report are generally between 2700 and 3500 feet in elevation. In contrast, the development on Redington Mountain will take place between 3500 and 4000 feet, and the disturbance created by its construction will be far more severe than that created by timber harvesting.

<sup>41</sup> There is a high likelihood that this trend is continuing.

<sup>42</sup> Additional areas may have been lost as well but this could not be conclusively determined.

pristine habitat that has few parallels in the state. Redington Mountain lies within a contiguous unfragmented roadless corridor extending for over 17 miles from Route 4, across Saddleback, The Horn, Saddleback Jr., Redington, and Crocker Mountains to Route 27 (Exhibits A-1, A-2 and A-3), encompassing over 35,000 acres.<sup>43</sup> The unfragmented nature of the project area can be seen in the photos included as Exhibits B-1 and B-2.<sup>44</sup> Much of the Sugarloaf and Mount Abraham areas also lie within large roadless areas, as well as Bigelow Mountain just to the north. With the exception of the Baxter/Debsconeags/Nahmakanta area, the Western High Mountains encompass the greatest concentration of large roadless areas in the state.<sup>45</sup> Except for Saddleback and Sugarloaf ski areas, the upper slopes and ridgelines of the high mountain areas are free of roads and most other human disturbance.

Development threatens the lower elevations of this area, but the higher elevations may be kept intact into the future. As mapped by AMC, the size of this large roadless area declined by about 6,000 acres due to new road construction and forest clearing between 1997 and 2000. Continuation of this activity is likely to lead to continued reduction in the area. However, inaccessible topography and public ownership of part of the area is likely to maintain at least the *high-elevation* core of this area intact in the absence of this development.

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<sup>43</sup> Both state and federal agencies have highlighted the unfragmented nature of this area. Comments on the application filed by the Maine Natural Areas Program state that “the site is part of a large unfragmented area of plant and animal habitat.” The U.S. Fish and Wildlife Service’s description of the SEET Facility property (Exhibit E), which directly abuts the project area, also notes the high ecological value of the area.

<sup>44</sup> These photos are a more accurate representation of this habitat than that shown in the application as photo 15 (Application Section 7, page 14). Photo 15 was taken during the winter, and the white areas could be misinterpreted as natural openings. In fact, these are inclusions of hardwood-dominated vegetation (primarily white birch) that are in the leaf-off stage. They are part of the natural compositional and structural diversity of this forest and should not be considered fragmenting features.

<sup>45</sup> Two other concentrations of areas seen on Exhibit C Map 1 - one in the northern Boundary Mountains and one in the Deboullie Lakes region - lie largely on accessible private land and are likely to decline significantly as private timber road construction continues.

#### D. The Value of the Western High Mountains Landscape

Redington is also an integral part of one of the state's most significant mountainous areas since it lays at the heart of the largest contiguous expanse of land above 2700 feet in the state --- an area of over 20,000 acres that includes Redington and Black Nubble as well as Crocker, Abraham, Spaulding and Sugarloaf. The Western High Mountains region encompasses about the same area as Baxter State Park (about 200,000 acres), yet contains over one-third more land above 2700 feet (27,000 acres versus 20,000 acres). It contains seven of the thirteen highest peaks in the state<sup>46</sup> (Sugarloaf, Crocker, Saddleback, Abraham, The Horn, Spaulding and Redington), and half of the peaks over 4000 feet.<sup>47</sup>

The Western High Mountains region is recognized for its significant ecological, recreational and scenic values. The region is traversed by one of the most spectacular and remote stretches of the entire Appalachian Trail and is a prominent visual backdrop to the Rangeley Lakes Scenic Byway.<sup>48</sup> Outside of Baxter State Park, it encompasses the greatest extent of alpine vegetation in the state. The upper elevations of Redington and Crocker Mountains possess two of only five exemplary examples in the state of the rare (S3) Fir - Heartleaved Birch Subalpine Forest natural community (Exhibit D). A letter submitted to LURC as part of a separate application in the same area states, "Care should be taken to ensure that harvesting activities are limited to areas outside of the communities indicated on the enclosed map."<sup>49</sup> Certainly, if skid roads constitute an unacceptable disturbance to this area, then an industrial windpower project is clearly unacceptable.

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<sup>46</sup> As listed in Hanstedt (1975), page 7.

<sup>47</sup> These figures do not include Bigelow Mountain, which lies in close proximity to but outside of this area and which should also be considered part of the Western High Mountains region.

<sup>48</sup> More detail on the scenic value of the area is provided by the testimony of J.T. Horn and Jean Vissering.

The higher elevations of the Western High Mountains region also contain the greatest contiguous expanse of coniferous forest in western Maine (Exhibit A-4).<sup>50</sup> Because of their extent and relatively pristine condition, the remaining mature unfragmented high elevation coniferous forests in the region constitute an area of regionally significant habitat.

The value of the area is demonstrated by the high level of interest in land conservation in this region that has emerged in recent years, including:

- The National Park Service's long-standing effort to conserve the Appalachian Trail corridor and adjacent lands on Saddleback Mountain.
- The work done by the State of Maine and the Trust for Appalachian Trail Lands to conserve lands around Mount Abraham.
- The U.S. Fish and Wildlife Service's strong interest in transferring the U.S. Navy's SEET facility (directly adjacent to the proposed development) to the National Wildlife Refuge System (see Exhibit E).
- The core of the area, encompassing all of the high peaks (including Redington) and most of the roadless area, has been mapped as a priority block for conservation and establishment of a large ecological reserve by The Nature Conservancy as part of their Northern Appalachians bioregional analysis<sup>51, 52</sup>

## VII. Fragmenting Impacts of the Project

### A. Application's Mischaracterization of the Fragmentation Impacts

The application<sup>53</sup> describes fragmentation as "the division of habitat into smaller and smaller patches that become more and more isolated from each other and from larger forested

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<sup>49</sup> Letter dated 7/26/01 from Emily Pinkham (MNAP) to Sara Brusilla (LURC) regarding Plum Creek's application to skid timber through this P-MA zone (FOP 778B).

<sup>50</sup> As designated in updated land cover data recently released by the Maine Office of Geographic Information Systems.

<sup>51</sup> Digital data provided by the Maine Chapter of The Nature Conservancy. The data was developed by TNC's Eastern Region Science Office as part of TNC's analysis of conservation priorities in the Northern Appalachians ecoregion. The identified areas represent a portfolio of sites that, if conserved, would encompass the full range of biophysical diversity within the ecoregion. This work is a component of TNC's "Conservation by Design" program, a global effort to conserve biodiversity (see <http://www.nature.org/aboutus/howwework/cbd/>).

<sup>52</sup> The value of establishing an ecological reserve in this area was also noted by the U.S. Fish and Wildlife Service (see Exhibit E).

<sup>53</sup> Section 7.9.5, page 105.

areas.” However, this refers only to the late stages of the fragmentation process,<sup>54</sup> which is most commonly associated with heavily disturbed landscapes such as agricultural and residential areas (see Exhibit F). By this definition, none of the working forest landscape is fragmented - a conclusion that is clearly at odds with common sense and the generally understood concept of fragmentation. The earlier stages of fragmentation, which are more applicable to the working forest landscape, are *dissection* and *perforation*, whereby contiguous habitat becomes interspersed with roads and openings. By using an extreme definition of fragmentation that is not relevant to the project area landscape, the applicant minimizes the effects that the project will have.

## B. Fragmentation Impacts of the Project on Redington Mountain

### 1. Landscape Level Impacts

At the landscape scale, the construction of the Redington Mountain access and summit roads will essentially bisect this large contiguous unfragmented area and eliminate the central portion of the large roadless corridor,<sup>55</sup> isolating Crocker Mountain from the larger part of this area to the south (Exhibits A-5, A-6). While this may not severely impede the movement of birds and large mammals across the landscape, it will affect the ability of small mammals, amphibians and other non-motile (i.e., relatively immobile) organisms from moving between these two areas of high-elevation habitat.<sup>56</sup>

### 2. Local Level Impacts

#### a) The Artificial Nature of Project Impacts

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<sup>54</sup> More accurately described as *segregation* and *isolation*.

<sup>55</sup> Based on the criteria that AMC has used to identify these areas.

<sup>56</sup> The CWCS notes (Appendix 12, page 26) “some sensitive species will avoid roads, including large mammals, some songbirds, small mammals, amphibians and insects (see deMaynadier and Hunter 2000, Mader 1984, and Swihart and Slade 1984). Avoidance behavior will separate populations and reduce usable habitat size, effectively causing habitat fragmentation.”

At the local scale, the project will cause a severe degree of dissection and perforation of this otherwise unfragmented habitat. The application leaves the impression that the openings created by this development will not be significantly different than those created by natural disturbance patterns, and that “It is also fully anticipated that local wildlife populations will adapt and respond to this conversion of habitat types much as they already do to the natural occurrence of blowdowns and forest management activities in the area.”<sup>57</sup> First, much of the area where turbine strings and summit roads are proposed for construction is unsuitable for timber harvesting. Second, blowdowns are a natural and temporary impact to which native species are adapted. They are “messy,” meaning that they do not create distinct openings or sharp contrasts with surrounding habitat, as can be seen from the photos (Exhibits B-1 and B-2). In addition, blowdowns contain valuable habitat features such as downed wood, and they maintain a heterogeneous forest canopy that varies in height, composition and density but remains relatively continuous, with little disturbance to the soil other than root throw mounds. In contrast, this development would be a permanent feature that creates large areas of unvegetated surface. To describe this as a “conversion of habitat types” is disingenuous and masks the nature of the impacts.

The construction of a 32-foot-wide summit roadway, adjacent shoulders and cut and fill slopes, turbine openings and terrain alterations of up to 20 feet will constitute a significant disturbance that in no way resembles natural disturbance processes. In many areas these openings will have all soil and loose parent material removed or will be blasted into bedrock. The application indicates that much of the disturbed area will be revegetated. However, surficial organic soil horizons are the primary source of nitrogen in these soils. Revegetated areas where soil is removed will suffer from nitrogen deficiency, and addition of wood chips to control

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plication Section 7.9.5, page 106.

erosion will exacerbate this problem.<sup>58</sup> Any revegetation of severely disturbed high-elevation areas is likely to be problematic. It is highly unlikely that these areas will return to anything resembling the natural ecosystem, and thus will remain inhospitable to many of the native species.

b) The linear nature of the disturbance

The application states, “The linear nature of the Redington Wind Farm project features will not contribute to creating forest fragments. Neither will it isolate small fragments of forests on the landscape.”<sup>59</sup> Again, by using an extreme and limited definition of fragmentation, the applicant minimizes the potential effects. Linear corridors can have significant fragmenting effects<sup>60</sup> that are often much greater than those created by an equivalent sized but more compact and isolated opening. These impacts include increased levels of edge effect (see below) and serving as travel corridors for the invasion of exotic or competitive species, generalist predators, and disease or parasites.<sup>61</sup>

c) Edge effects

The applicant also understates the extent of the disturbance by counting only those acres that will be actively disturbed. However, this type of linear opening creates extensive edge effects, the most significant of which are likely to be increased blowdown<sup>62</sup> and microclimate alteration.<sup>63</sup> These effects can extend two to three tree heights or more into the adjacent forest.<sup>64</sup> The corridor’s broad width, its location on an exposed ridgeline and its orientation perpendicular

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<sup>58</sup> One does not put sawdust on a garden for this reason.

<sup>59</sup> Section 7.9.5, page 106.

<sup>60</sup> See Willyard et al. 2004.

<sup>61</sup> This issue is discussed in more detail in the testimony of John Albright.

<sup>62</sup> Increased blowdown of softwood stands on wet or thin soils following exposure of edges is commonly observed in Maine’s forests.

<sup>63</sup> Microclimate alteration includes increased temperature and light levels and reduced humidity.

<sup>64</sup> Noss, R. 2001. Also, the CWCS notes (Appendix 12, page 25) that “The effects of roads can extend over some distance from their centers, such that their ‘effective widths’ can be many times their actual widths.”

to the prevailing winds will all serve to increase these effects, and make them more significant than those associated with narrower timber management roads at lower elevations.

d) Microclimate Effects

The effects of microclimate alteration were evident during our site visit (June 20, 2006). The morning of the visit was hot and sunny. It had rained the previous afternoon. Within the undisturbed forest canopy the air was cool and moist. Groundcover was variable but often lush, with species associated with cool moist boreal forests (e.g., red-stemmed moss, wood fern, goldthread and creeping snowberry). In contrast, the small opening created for the meteorological tower was hot and dry. Groundcover was sparse and desiccated, despite the wetter-than-normal conditions of the spring and the fact that the clearing did not noticeably disturb the soil (see photo, Exhibit B-3).

VIII. Redington is Not the Best Available Site for Windpower Development

The application states that the Redington Wind Farm site is “unique” in its ability to offer the elements necessary for a successful wind farm.<sup>65</sup> At the very least, the construction of the Mars Hill project and the pending application for TransCanada’s Boundary Mountains project indicate that the Redington site is not unique. We believe that the likelihood that there are no other feasible sites for this type of development is very low, and that the Redington project is not located in the best available site.

A. AMC’s Windpower Development Siting Analysis

The AMC has developed an analytical approach to evaluating the relative suitability of potential windpower development sites across broad landscapes. This analysis does not consider all factors relevant to windpower siting, but should be considered an initial screening tool that helps to sort potential development sites relative to their potential level of conflict with

recognized natural resource values. What follows is a summary of our initial analysis of potential sites in Maine; a more detailed description is included as Exhibit G.

#### B. AMC's Analytical Approach

The analytical approach is relatively straightforward: 1) Identify potential windpower development sites from published wind resource data. 2) Identify natural resource factors of recognized state, regional or national significance that may potentially conflict with development. 3) Evaluate each site for each factor. The resulting database can then be queried to identify sites that meet various criteria.

#### C. Identification of Potential Windpower Development Sites

We delineated 268 separate segments of primary ridgeline totaling 674 miles that were at least one mile in length and which were underlain by Class 4 or greater windpower resource. In some cases long continuous ridgelines were divided into multiple sites at prominent saddles to allow for a more spatially-focused analysis.

#### D. Natural Resource Factors

For this analysis, only five factors were considered:<sup>65</sup> 1) whether the site extends above 3500 feet in elevation;<sup>67</sup> 2) whether the site lay at least partially within a large roadless area;<sup>68</sup> 3) whether the site lay at least partially within two miles of the Appalachian Trail;<sup>69</sup> 4) whether the site was at least partially underlain by Bicknell's thrush habitat as mapped by the Vermont Institute of Natural Science; and 5) whether the site lay within a conservation priority matrix

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<sup>65</sup> Application Section 1.A.3(3), page 36.

<sup>66</sup> Another factor that would have been of great value to include was Natural Heritage Inventory elements (documented rare plants and natural communities), but this data is not publicly available for the unorganized territories.

<sup>67</sup> These lands constitute a small fraction of the state's land area and are the portion of P-MA zones that are generally the most sensitive to development.

<sup>68</sup> As described above, these areas are a small and declining part of the state's land base and represent the best examples of large unfragmented habitat areas.

block delineated as part of The Nature Conservancy’s Northern Appalachians ecoregional analysis.

The AMC would not argue that any of these factors alone (with the possible exception of close proximity to the Appalachian Trail) should disqualify a site for development. Dozens of sites extend above 3500 feet, lay within roadless areas, lay within Bicknell’s thrush habitat, or lay within TNC priority areas. However, when considered in combination, they provide a starting point for identifying “high mountain resources with particularly high natural resource values.”

#### E. Evaluation of Sites

##### 1. Sites Identified to be Inappropriate for Windpower Development

Of the 268 sites, only 20 met all five of the above criteria.<sup>70</sup> These 20 sites encompass less than 10% of the total length of ridgeline considered in the analysis. They represent a fairly complete list of Maine’s most well-known and highly valued mountains: six sites in the Mahoosucs (Carlo, Goose Eye [2 sites], Mahoosuc, Old Speck and Baldpate); three sites in Baxter State Park (Mount Katahdin [2 sites] and Barren Mountain [part of The Brothers]); Whitecap Mountain; and ten sites in the Western High Mountains region (Saddleback, The Horn, Saddleback Junior, Redington, Crocker, Abraham, Spaulding, Sugarloaf and Bigelow [2 sites]).<sup>71</sup> The great majority of these sites are protected from development by conservation ownership.

We do not believe that the presence of Redington on this list is an anomaly, but that it deserves a place among Maine’s most significant mountain resources. Inclusion of other factors

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<sup>69</sup> This is a very restrictive criterion. The U.S. Forest Service’s Scenery Management System uses four miles as the boundary of the midground zone (in which visual impacts may be prominent).<sup>69</sup>

<sup>70</sup> This is a fairly broad search, as it allows consideration of sites that have as little as 1% of their length overlapping any particular factor.

<sup>71</sup> The only 4000’ peak not on this list is North Brother in Baxter State Park, which lies more than two miles from the AT but which meets the other four criteria.

not considered (such as the presence of rare species, i.e. Northern bog lemming, and an exemplary rare natural community) would only strengthen its inclusion on the list.

## 2. Sites More Suitable for Windpower Development

At the other end of the scale are sites with few resource conflicts - sites that at a first cut would be more suitable for consideration for development. Sites were screened for the following criteria:<sup>72</sup> 1) lay in their entirety below 3500 feet; 2) have less than 50% of their length within a large roadless area; 3) have at least one mile of their length lying more than four miles from the Appalachian Trail (note that this is a wider buffer than used earlier); 4) have less than 50% of their length lying within a TNC priority area; and 5) have at least one mile of their length lying on unencumbered private land (to eliminate sites on public land or protected from development by conservation easement).

The result was a list of 75 sites encompassing about 175 miles of ridgeline. This screening is very cursory – the list certainly includes some sites that would be unsuitable for development, and excludes others that may be suitable. However, it does provide a first cut at evaluating the range of potential development sites in the state.

We recognize that many of these sites will not be developable for a variety of reasons not considered in this analysis.<sup>73</sup> However, two facts are worth noting. First, about two-thirds of this ridgeline lies within five miles of a highway (the approximate distance of Redington and Black Nubble from Route 16/27), contrary to the general impression that Maine's wind resource

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<sup>72</sup> The presence of Bicknell's thrush habitat was not considered in this screening as it would eliminate most if not all sites above 2700 feet.

<sup>73</sup> For example: availability of land for lease or purchase, access to roads or transmission capacity, topographic suitability, presence of important natural resource values not considered, etc.

lies in remote inaccessible areas. Second, the great majority of this ridgeline lies on large commercial timberland ownerships.<sup>74</sup>

We find it unlikely that within the range of possible sites for windpower development there are not others (perhaps a considerable number) that could have been reasonably available to the applicant and far more suitable for development than Redington Mountain. We thus conclude that Redington Mountain clearly does not constitute the “best available site” for this type of development.

## IX. Conclusions

In light of the testimony presented above and by the witnesses for the other consolidated intervenors, we conclude:

- The Western High Mountains region is the greatest assemblage of high elevation areas and high peaks in the state. It encompasses a concentration of unroaded, unfragmented and relatively pristine habitats that have few parallels in the state. The ecological, recreational and scenic resources of the area make it one of the state’s two most significant mountain landscapes (along with Baxter State Park). It clearly qualifies as an area of “high mountain resources with particularly high natural resource values or sensitivity which are not appropriate for most development.”
- Redington Mountain lies near the center of the area and possesses many resource values that contribute to the significance of the area. Among these are its location within a large unfragmented roadless corridor of over 35,000 acres that stretches for over 17 miles across the region, the presence of one of the state’s few exemplary subalpine forest communities, habitat for two of the state’s rarest animal species, and close proximity to and visual prominence from the Appalachian Trail.
- The proposed development would severely impact many of the important resource values of Redington Mountain. Among other impacts, it would fragment a regionally significant area of contiguous unroaded coniferous forest habitat encompassing an exemplary rare natural community.
- When considered in comparison with other potential windpower development sites, Redington Mountain possesses a combination of resource values that are shared by only a small number the state’s most recognizably significant mountains. There

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<sup>74</sup> Over one-quarter lies on land owned by Plum Creek Timber Company, which has shown a willingness to lease land for windpower development.

appear to be a considerable number of other potential sites that are of lower resource value and which may be reasonably available for development.

- Redington Mountain is clearly not the “best available site” for this type of development.
- The proposed project is in conflict with many existing public policies, including LURC’s Comprehensive Land Use Plan, Maine’s Comprehensive Wildlife Conservation Strategy, other publicly-developed bird conservation plans, and on-going federal, state, and private efforts to permanently conserve significant areas within the Western Mountains region.

If LURC’s Comprehensive Land Use Plan and Land Use Districts and Standards are intended to protect any high mountain areas from development, they are intended to protect an area as significant as Redington Mountain. We believe that if this development is permitted it will set a precedent that will render P-MA designation essentially meaningless. We request that LURC deny the application.

#### X. Literature Cited

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U.S. Fish and Wildlife Service. 2003. Interim Guidelines to Avoid and Minimize Impacts from Wind Turbines. USDI Fish and Wildlife Service, Washington, DC. Available at <http://www.fws.gov/habitatconservation/wind.pdf>.

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## **EXHIBITS**

### **A. MAPS**

- A-1. The Western High Mountains region.
- A-2. Roadless areas in the Western High Mountains region.
- A-3. Roadless areas in the Western High Mountains region (satellite image).
- A-4. Land cover in western Maine.
- A-5. Effect of development on large roadless areas.
- A-6. Effect of development on Redington-Crocker roadless area.

### **B. PHOTOS**

- B-1. Crocker Mountain from meteorological tower opening on north summit of Redington.
- B-2. South summit of Redington from meteorological tower opening on north slope of north summit of Redington.
- B-3. Meteorological tower opening on north summit of Redington.

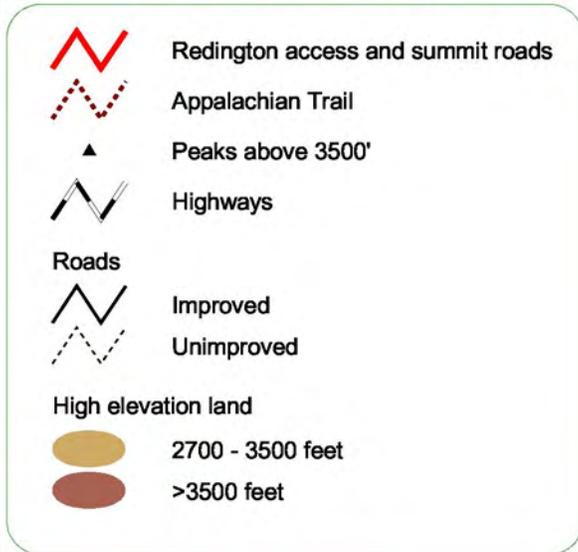
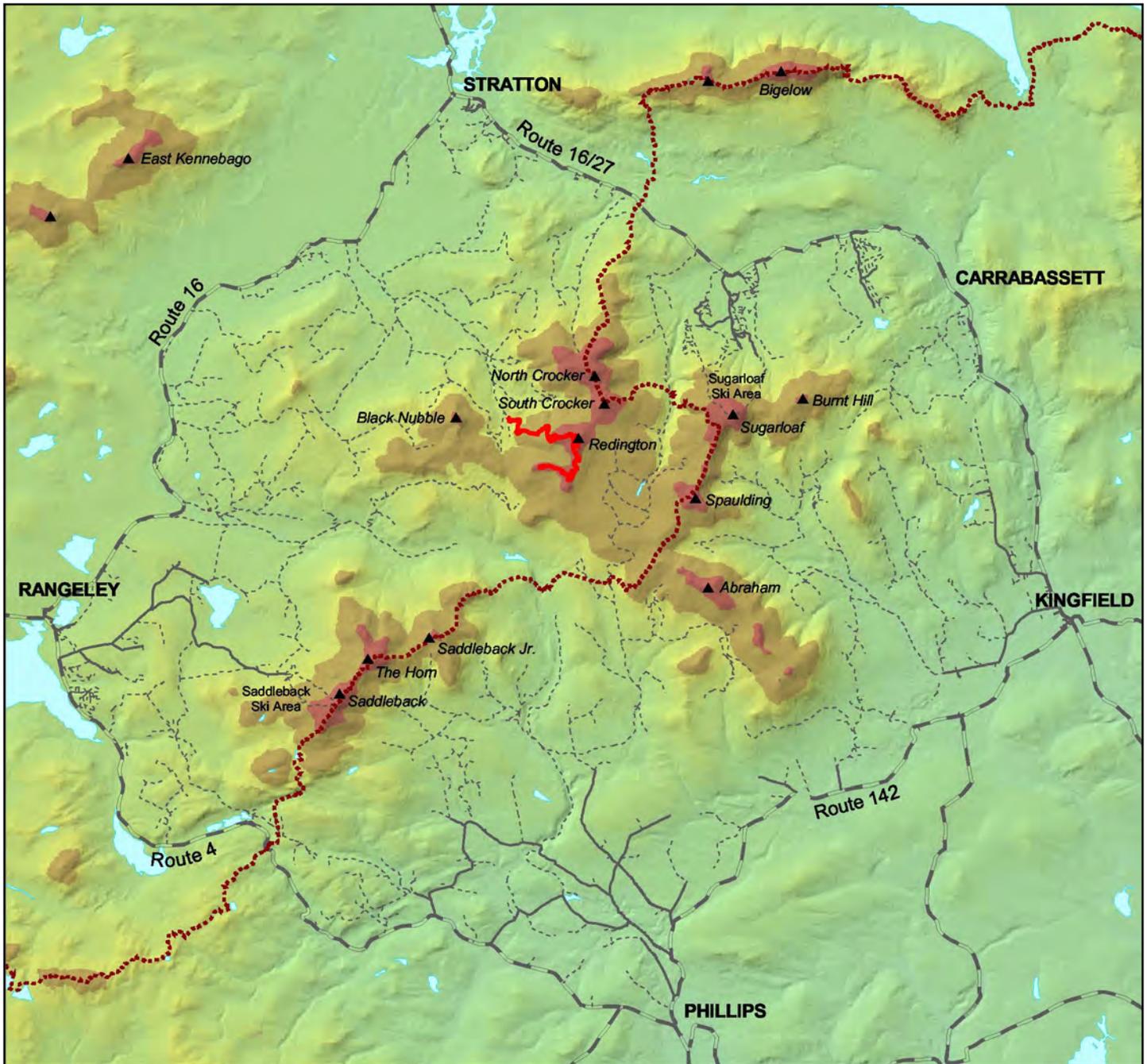
### **C. Roadless Areas in Northern New England: An Updated Inventory. AMC Technical Report 06-1.**

### **D. Letter and spreadsheet from Maine Natural Areas Program describing known occurrences of Fir - Heartleaved Birch Subalpine Forest community in Maine.**

### **E. Internal U.S. Fish and Wildlife Service memorandum supporting the transfer of the U.S. Navy Survival, Escape and Evasion Training Facility to the National Wildlife Refuge System.**

### **F. Description of stages of fragmentation from Flatebo et. al (1999), pages 107-108.**

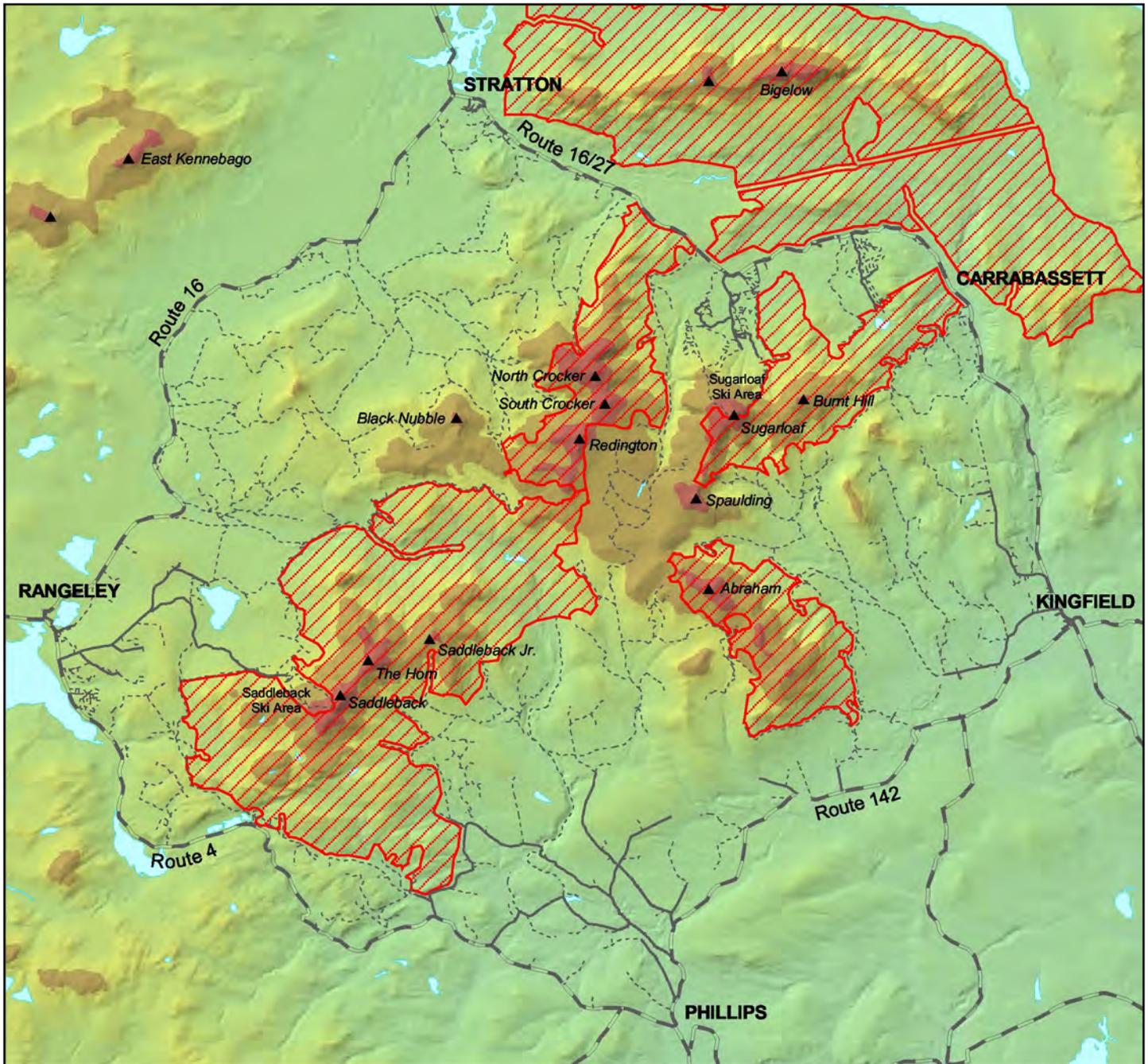
### **G. Comparative analysis of potential windpower development sites in Maine.**



**EXHIBIT A-1**

The Western High Mountains region

Redington Mountain lies in the heart of the greatest concentration of high elevation land and major peaks in the state. With the exception of Saddleback and Sugarloaf Ski Areas the upper slopes and ridgelines are free of major human impacts. Redington lies along a 17-mile roadless corridor stretching from Route 4 in the south to Route 16/27 in the north. (Roads were delineated by AMC from DeLorme SAT10 satellite imagery.)

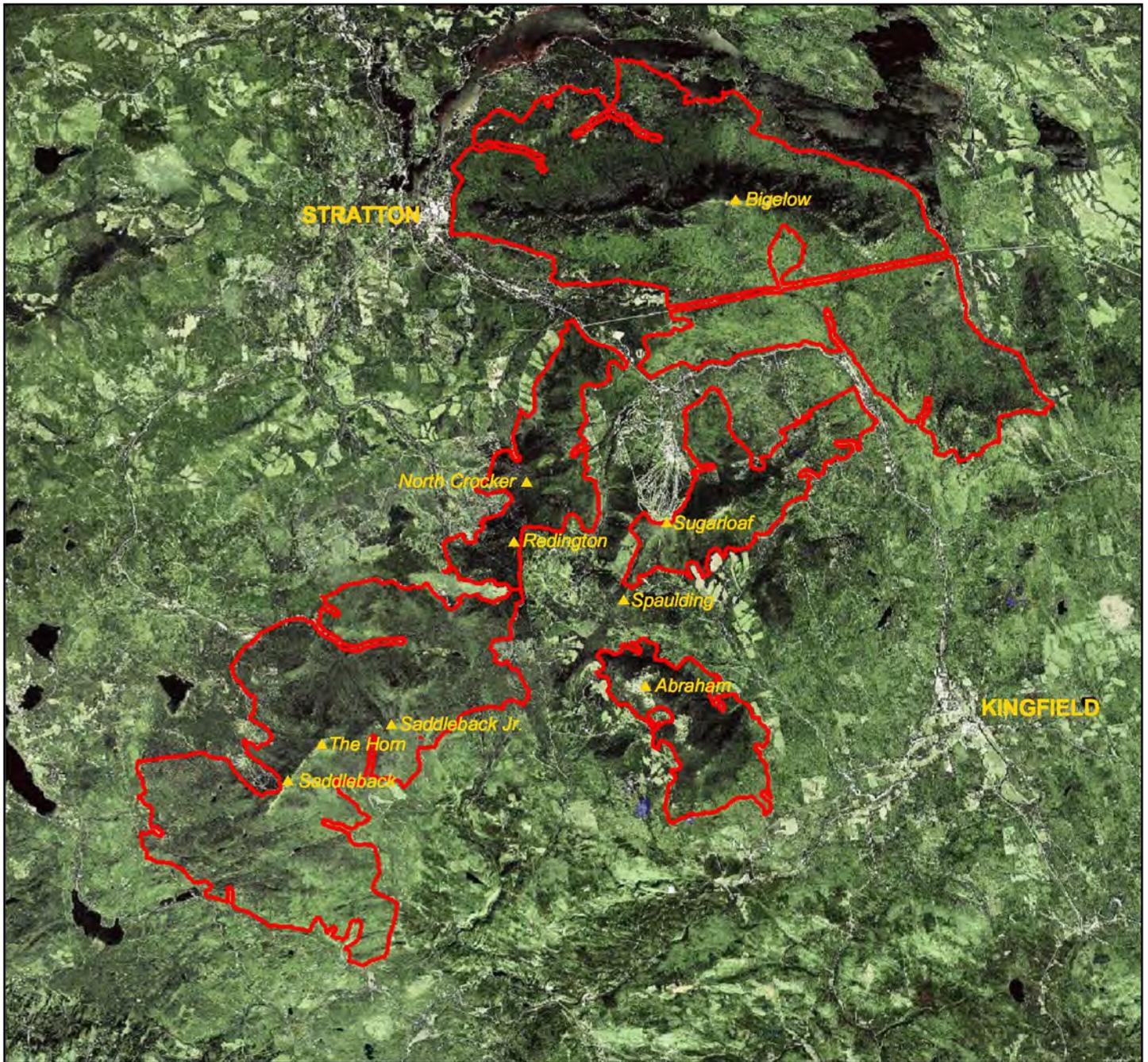


**EXHIBIT A-2**

Roadless areas in the Western High Mountains region

Redington Mountain lies within a contiguous roadless area of over 35,000 acres. With the exception of the Baxter State Park/Debsconeags/Nahmakanta region, the Western High Mountains contains the greatest concentration of large roadless areas in the state. Large roadless areas represent the most significant large unfragmented habitat blocks in the region, though they are rapidly declining due to the continuation of road construction on private commercial timberlands.

As delineated by AMC, these areas exclude not only roads but also where forest cover has been cleared at any time since the late 1960s. For details on the methods and criteria for delineation of these areas see Exhibit C.

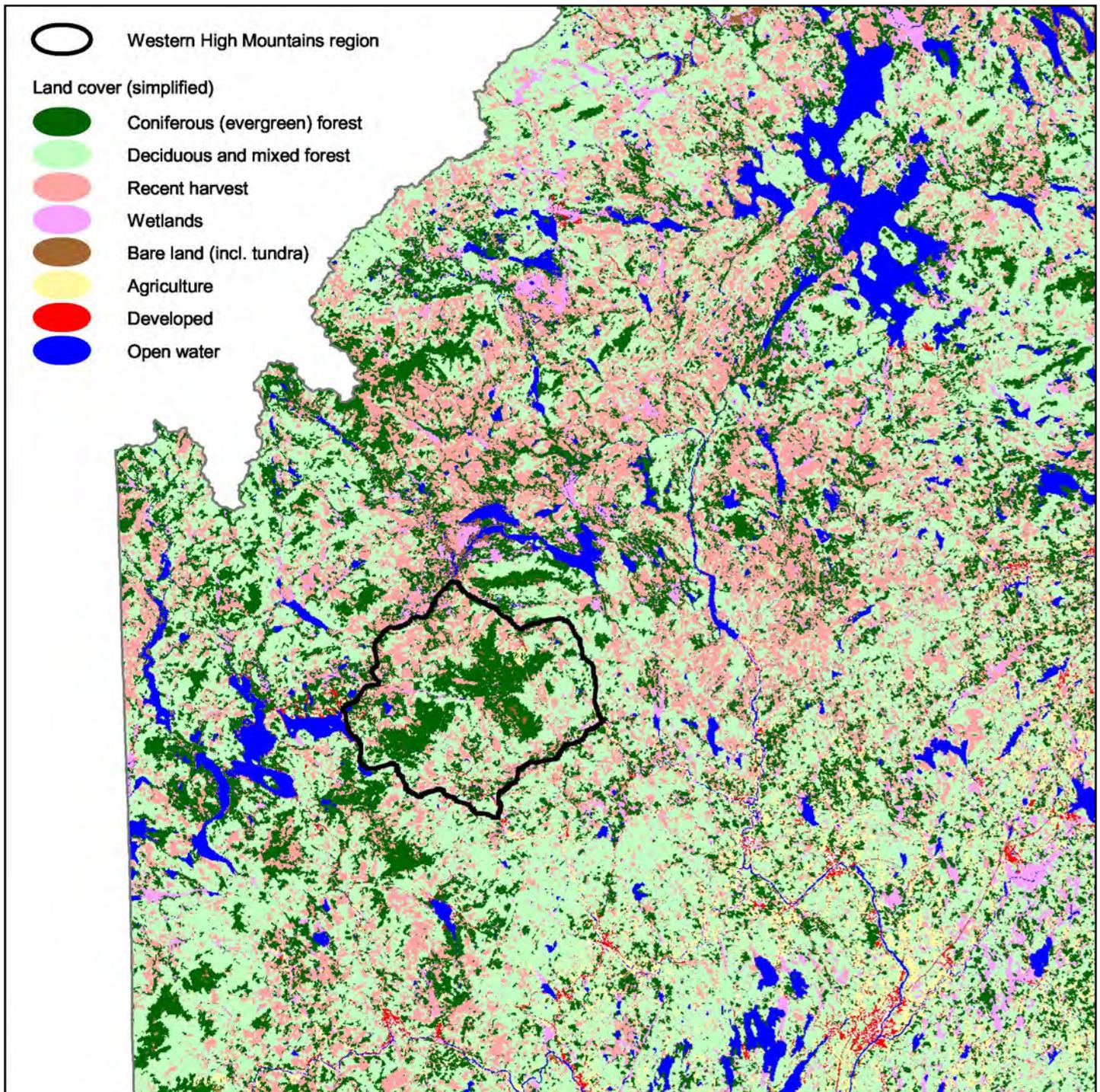


### EXHIBIT A-3

#### Roadless areas in the Western High Mountains region

This map shows roadless areas in the Western High Mountains region over a base of DeLorme SAT10 high-resolution satellite imagery from 2000. While fragmentation at lower elevations due to roads and heavy timber harvesting is evident throughout the region, the higher elevations encompass large areas of unfragmented unroaded forest. Lighter areas along Saddleback, Abraham and Bigelow represent natural openings (ledge and alpine vegetation).

Much of the area mapped as roadless consists of coniferous forest. The higher elevations of the Western High Mountains region encompass the largest extent of contiguous coniferous forest in western Maine (see Exhibit A-4). The mature unfragmented areas of this forest contained within roadless areas are of particularly high habitat value.

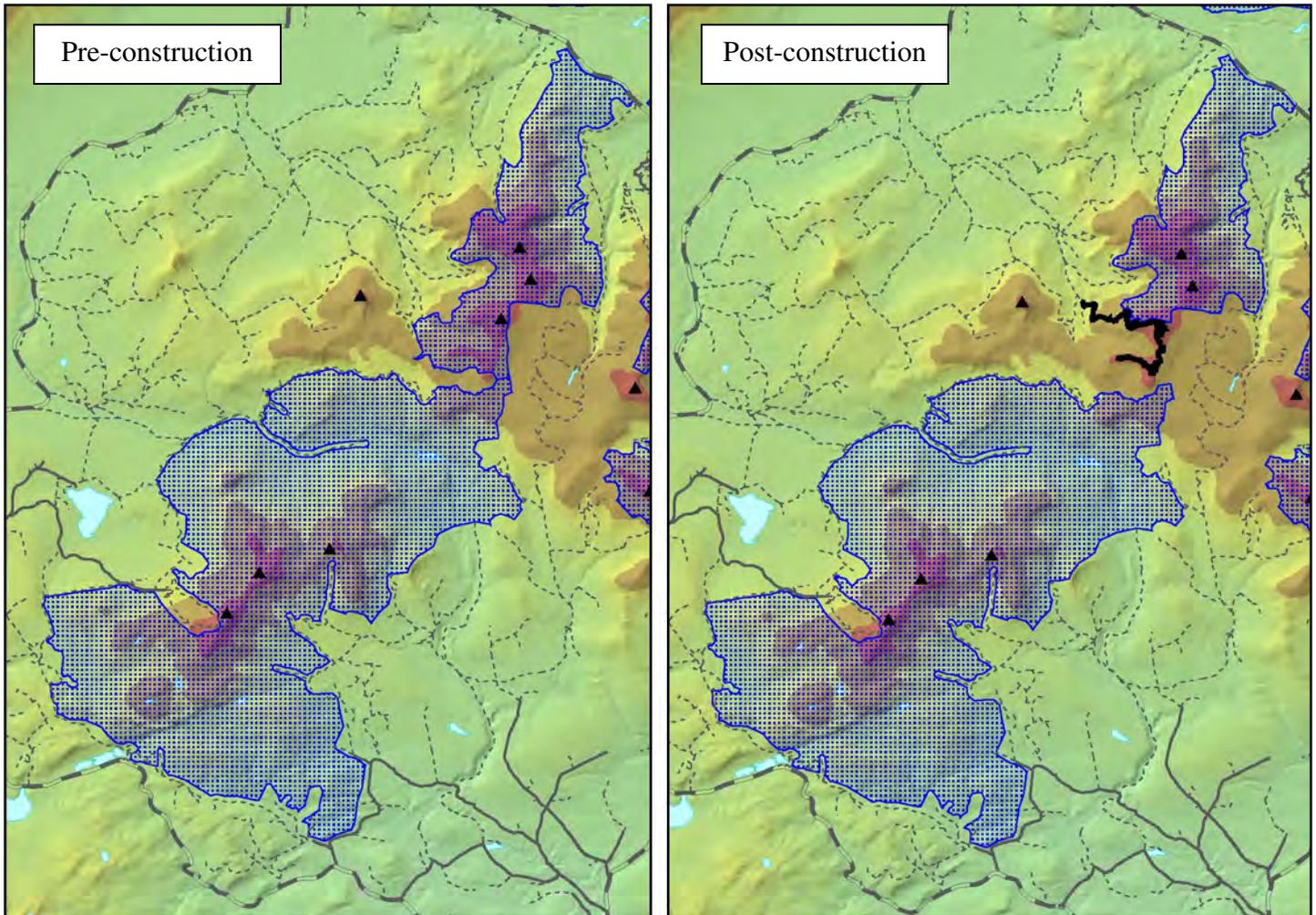


**EXHIBIT A-4**

Land cover in western Maine

This map shows land cover in western Maine based on data recently released by the Maine Office of Geographic Information Services. Detailed classifications have been simplified for display. The Mahoosuc range is in the southwest corner and Moosehead Lake is in the northeast corner.

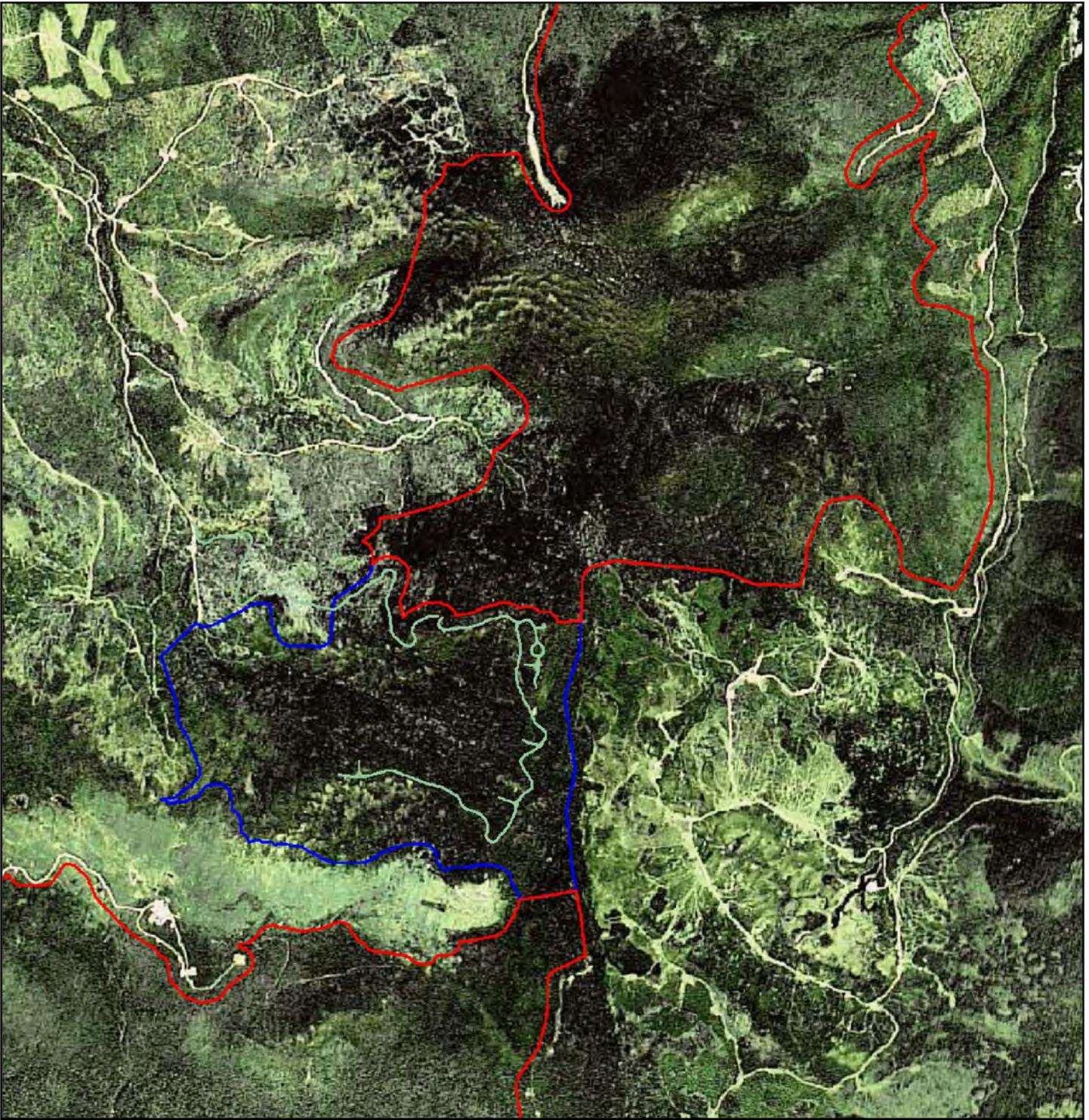
The higher elevations of the Western High Mountains region contain the largest expanse of contiguous coniferous forest in this region. (Note that the data do not distinguish mature forest from the younger regenerating forest in the Caribou Pond valley.)



## EXHIBIT A-5

### Effect of development on large roadless areas

These maps show the extent of the Saddleback-Redington-Crocker roadless complex prior to construction and how it would be delineated after construction of the Redington Mountain access and summit roads, based on criteria used by AMC to delineate these areas. The Redington-Crocker portion of this area would be separated from the larger area to the south, much as the areas on Sugarloaf and Mount Abraham have already been separated by the road construction and harvesting in the Caribou Pond valley.



## **EXHIBIT A-6**

### Effect of development on Redington-Crocker roadless area

This map shows the reduction in the Redington-Crocker roadless area that would occur from the construction of Redington access and summit roads (light green), based on criteria used by AMC to delineate these areas. This roadless area (which extends from the project area north across Crocker Mountain to Route 16/27) would be reduced in size by nearly 20% (approximately 1300 acres). The original roadless area boundary is in blue, the new boundary in red. Note the existing fragmentation at lower elevations. The base image is DeLorme SAT10 high-resolution satellite imagery from 2000.



### **EXHIBIT B-1**

This photo shows the north and south summits of Crocker Mountain from the meteorological tower opening on the north summit of Redington Mountain. Fir waves are visible on the upper slope at the left of the photo. The unfragmented nature of these upper slope forests is apparent.

This photo should be contrasted with photo 15 on page 14 of the application's Section 7. That photo was taken during the winter and shows the same area. The white patches on these slopes seen in that photo represent inclusions of hardwood-dominated vegetation but do not constitute fragmenting elements.

Photo taken by the author during site visit of June 20, 2006.



## **EXHIBIT B-2**

This photo shows the south summits of Redington Mountain from a meteorological tower opening on the slope of the north summit. This unfragmented roadless area would be extensively disturbed by the construction of project roads and turbine openings.

Photo taken by the author during site visit of June 20, 2006.



### **EXHIBIT B-3**

This photo shows the clearing created for a meteorological tower on the north summit of Redington Mountain. The desiccating effects of increased exposure to sunlight and drying winds is apparent, despite the wetter-than-normal conditions of the preceding weeks.

Photo taken by the author during site visit of June 20, 2006.

July 6, 2006

Jody Jones

[jjones@maineaudubon.org](mailto:jjones@maineaudubon.org)

Re: Rare and exemplary botanical features, Subalpine Fir Forests, Maine.

Dear Ms. Jones:

I have searched the Natural Areas Program's digital, manual and map files in response to your request of July 6, 2006 for information on documented Subalpine Fir Forests in Maine. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

According to our information, there are twenty-three Subalpine Fir Forests that have been documented in the state of Maine. Seventeen of the Subalpine Fir Forests have been recently documented while the other six natural communities have not been field verified within the past twenty years. The enclosed spreadsheet lists each Subalpine Fir Forest in accordance with its EO Rank, Survey Site and size (in acres).

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

Thank you for using the Natural Areas Program for your request. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,  
Raquel D. Ross  
Information Manager  
93 State House Station  
Augusta, ME 04333-0093  
207-287-8046  
[raquel.ross@maine.gov](mailto:raquel.ross@maine.gov)

Enclosures





## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

300 Westgate Center Drive

Hadley, MA 01035-9589



In Reply Refer To:  
FWS/Region5/MBSP-MB

SEP 28 2005

#### Memorandum

**To:** Director

**From:** Regional Director, Region 5

**Subject:** Background Information from the Division of Migratory Birds for the Transfer of the U.S. Navy Survival, Escape and Evasion Training Facility to the National Wildlife Refuge System.

A conservation proposal was submitted on August 16, 2005, by the National Wildlife Refuge System in Region 5 for a property known as the U.S. Navy Survival, Escape and Evasion Training facility (SEET property) in Redington, Maine that has been included in the 2005 Base Realignment and Closure list. The attachment provides background information from the Region 5 Division of Migratory Birds on the proposed no-cost transfer of the property to the U.S. Fish and Wildlife Service. The Division of Migratory Birds strongly supports the proposal based on the existing and potential value of the habitat on the property for migratory birds and other wildlife.

If you have questions or would like additional information, please feel free to contact Sherry Morgan, Assistant Regional Director for Migratory Birds and State Programs (MBSP), at 413-253-8610, or Andrew Milliken, Atlantic Coast Joint Venture Coordinator, Migratory Birds Division, MBSP, at 413-253-8269.

A handwritten signature in black ink, appearing to be "Sherry Morgan", written over a horizontal line.

Attachment

cc: Paul Schmidt, Assistant Director, Migratory Birds

### Attachment

#### Background Information from the Division of Migratory Birds for the Transfer of the U.S. Navy Survival, Escape and Evasion Training Facility to the National Wildlife Refuge System

##### **Bird Conservation Priorities in the Atlantic Northern Forest Bird Conservation Region**

The U.S. Navy Survival, Escape and Evasion Training facility (SEET property) is located within the Atlantic Northern Forest Bird Conservation Region. Bird conservation regions are ecologically-based units, as defined by the North American Bird Conservation Initiative (NABCI), for planning, implementing, and evaluating cooperative bird conservation efforts across North America. The Atlantic Northern Forest Bird Conservation Region (known as BCR 14) encompasses a largely forested area stretching southwest to northeast from the Taconic Hills and Adirondack Mountains of Eastern New York through most of Vermont, New Hampshire and Maine, Quebec south of the St. Lawrence River, and all of the Maritime provinces of New Brunswick, Prince Edward Island, and Nova Scotia. An international partnership led by the Atlantic Coast and Eastern Habitat Joint Ventures has been working together for several years to determine the bird conservation priorities and actions for this BCR. This effort culminated in a conservation plan entitled *Blueprint for the Design and Delivery of Bird Conservation in the Atlantic Northern Forest (Blueprint)*, approved by the joint venture management boards in July 2005.

The importance of the property to the conservation of migratory birds is indicated in the *Blueprint* by the number of priority species identified in the plan that use the property and by the inclusion of the property in or near priority geographic areas (known as focus areas) identified in the plan for landbirds, waterbirds and waterfowl. Of the 17 "Highest Priority" bird species identified in the *Blueprint*, at least 6 species would directly benefit from protection of this site. The higher elevation conifer forests on and adjacent to this site are at the center of the global distribution of Bicknell's Thrush, the region's only endemic bird species. This property likely hosts a significant portion—and some of the highest densities—of this species' entire global population. The late successional conifer forests across this site provide superior nesting habitat for the Bay-breasted Warbler. The area's alder swales and open areas (e.g., natural disturbance patches and any cleared areas used by the U.S. Navy) would provide valuable breeding and stopover habitat for American Woodcock. These same habitats also are used for breeding and migration habitat by American Black Duck and Canada Warbler. Both of these species are probably common throughout all the forest types on the property that are associated with wetter soil types, including small wetlands and beaver meadows. Wood Thrush are likely present at low to moderate densities throughout the mature and regenerating hardwood stands on the property. The four nongame species discussed above are also identified by the U.S. Fish and Wildlife Service (FWS) as Birds of Conservation Concern for BCR 14.

Similarly, nearly all of the 16 designated "High Priority" terrestrial bird species for BCR 14 are either common breeders or are likely to be found on this property, including (from most to least common) Yellow-bellied Sapsucker, Black-throated Blue Warbler, Purple Finch, Eastern Wood-Pewee, Rusty Blackbird, Veery, Olive-sided Flycatcher, American Redstart, Cape May Warbler, Boreal Chickadee, Chestnut-sided Warbler, Long-eared Owl, Chimney Swift, and Common

Nighthawk. Other priority species that are likely to be relatively common on part or most of the property include Blackburnian Warbler, Blackpoll Warbler, Black-throated Green Warbler, Northern Parula, Brown Creeper, Ovenbird, Common Loon, Wood Duck, American Bittern, Yellow-bellied Flycatcher, Gray Jay, Pine Grosbeak, Rose-breasted Grosbeak, Bald Eagle, Ruffed Grouse, Black-backed Woodpecker, Common Goldeneye, Northern Flicker, and Northern Goshawk. Some of these priority species likely are found throughout the SEET property in very high densities and some of these species are considered rare across the northern forest region.

The SEET property is within a landbird focus area identified in the *Blueprint* in recognition of the importance of the area to Bicknell's Thrush and the vulnerability of the high elevation forests in this area to habitat loss, fragmentation and degradation. The plan specifically identifies the acquisition of the lands in this focus area through fee or conservation easement and the management of high elevation timberlands for this species as priority conservation actions. The SEET property is also within a waterbird focus area known as the Nulhegan-Rangeley complex in recognition of the importance of the lakes and wetlands in this area to Common Loon, American Bittern, Pied-billed Grebe and other waterbirds. The property is within the Maine Inland Wetlands waterfowl planning area and within 6 miles of the Flagstaff Lake/Dead River/Kennebec River waterfowl focus area. This planning area and focus area are also identified in the *Revised Atlantic Coast Joint Venture Waterfowl Implementation Plan* approved in July 2005. The SEET property includes several hundred acres of wetlands, especially in its central bottomland portions, and this wetland complex includes a wide range of wetland types from open lake to emergent marsh, shrub-scrub wetland, and forested and shrub wetlands.

#### **Northern Forest Early Successional Habitat Initiative**

The transfer of the SEET property to the National Wildlife Refuge System (NWRS) is consistent with an Atlantic Northern Forest initiative for early successional species recently initiated through a cooperative agreement between the Northeast Region of the FWS and the Wildlife Management Institute. The purpose of the initiative and the agreement is to initiate a partnership to further research and implement forest management practices in the Atlantic Northern Forest to the benefit of American Woodcock and other early successional migratory birds. Including the SEET property in the NWRS will allow for management demonstration sites on this property in the immediate vicinity of a large number of privately held and managed forest lands to show how lands can be managed for early successional species while also maintaining late successional forest through reserves and forest management approaches.

#### **Need for Publicly Owned Reserves in Northern Forest**

Most of the SEET property is forested uplands, and the vast majority of the roughly 12,000 acres of habitat on the site is thought to be largely undisturbed and "pristine" with most of the forests in a very late-successional condition (or a late seral stage). Very old and largely undisturbed forests are extremely rare in Maine and other northeastern States because so much of the region was cleared for agriculture starting in the seventeenth century and has been heavily and repeatedly logged since the early 1900s. Based on their work in the industrial forests in Maine,

the Manomet Center for Conservation Sciences estimates that only about 5 percent of the forests in Maine are in a late successional stage; that the level of late successional forest is declining and that at current rates of loss, some species that depend on the late successional forest will be lost from much of the northern forest in the next few years. Even with forest certification and working forest conservation easements on privately held timberlands becoming more common, private forest landowners are not maintaining enough late successional forest. A network of strategically placed reserves owned by conservation agencies and organizations combined with forest management that allows better retention of late-successional habitats in working forests is needed. If transferred to the NWRS, the SEET property could serve as an important forest reserve and management demonstration site. The site not only contains a diversity of wetland and upland habitats, but those habitats have exceptionally high ecological value for birds and other wildlife because of the relatively pristine nature of the landscape and relatively late successional stage of the forests compared to the surrounding working forest lands.

The importance of this area as a possible reserve within the larger working forest landscape has been recognized by the Northern Forest Alliance (NFA), a coalition of conservation, recreation, and forestry organizations committed to protect the 26-million-acre Northern Forest region of Maine, New Hampshire, Vermont, and New York. The NFA's Western Mountains Wildland focus area contains 8 of Maine's 12 highest mountain peaks, most of which are either partly located within the SEET property (e.g., Redington Mountain) or within only 1-2 miles of the property (e.g., Abraham, Saddleback, Sugarloaf, and Crocker Mountains).

The southern half of the SEET property is bisected by the Appalachian Trail (AT), which is owned and administered by the National Park Service (NPS). This trail is one of the oldest, largest, and most important networks of recreation and conservation land in the entire United States. Other than a narrow corridor around the trail owned by the NPS, much of the AT winds through private and/or industrial timber lands in northern New England. Due to the size of the SEET property and the rarity of late-successional forests throughout Maine, the SEET property may be one of the most ecologically valuable tracts along the northern end of the AT. Therefore, its protection as a refuge would greatly increase the ecological value of the AT as a conservation corridor for plants and animals, in addition to its role maintaining the high recreational quality of the AT.

#### **Threats from Commercial Development**

Although the SEET property is in a relatively remote part of the world, the property itself is not far from major roads and developments or free from recreational and commercial development pressure. The property is only 4 miles west of Sugarloaf USA, one of New England's largest ski resorts, and major roads traverse the area. Other major ski resorts (e.g., Sunday River) are also nearby, and contribute to the region's increasing development for seasonal and/or second homes. For example, new condominium complexes are currently planned near both of the major ski resorts nearby. A number of wind farms have been proposed for mountaintops in western Maine. Adjacent landowners are mostly industrial land managers focused on regular and extensive timber harvesting.

**Summary**

The Division of Migratory Birds strongly supports the transfer of the SEET property to the NWRS due to the high value of the habitats on the property for migratory birds and other wildlife and the need to maintain ecological reserves managed for wildlife and to demonstrate sustainable forest management practices within the larger working forest landscape in the Atlantic Northern Forest.

## Forest Management Issues: Habitat Patch Size

By Gro Flatebo

### DEFINITION

Habitat patch size refers to the range and variation in shapes and sizes of forest stands or groups of stands with similar characteristics. Forest-interior habitat is available in areas of forest large enough to support viable populations of species associated with sizable tracts of unbroken forest.

### IMPORTANCE TO BIODIVERSITY

Habitat patch size is important because of the preference of some wildlife species for small patches of habitat of various ages and types, and the preference of other wildlife species for large areas of one age or type.

In some instances, species need large forested stands with relatively closed canopies because the interior of the stand insulates against the effects of the stand's edge, where there may be, for example, a modified microclimate or an abundance of predators. Here, stand shape is important as well, because in linear or irregularly shaped stands a larger portion of the stand is closer to an edge than in relatively circular stands. On the other hand, some species are positively affected by the edges between forest stands (especially between late- and early-successional stands) because they need easy access to two different types of stands or because they need the special conditions associated with a stand edge. These species favor small, irregularly-shaped stands.

From a landscape perspective, large tracts of contiguous forest can provide a population source, at both a local and regional level, to replenish animal populations that may be

present but not successfully reproducing in fragmented or suboptimal habitats. Large tracts of contiguous forest can also provide a source for less-mobile forest organisms to recolonize nearby younger or disturbed forests.



### GOAL

Maintain a variety of stand sizes and shapes, and design forest landscapes that are capable of supporting viable populations of species whose life-history requirements include large areas of contiguous forest.

### BACKGROUND AND RATIONALE

Forests cover almost 90 percent of the landscape in Maine and occur as a mosaic of interconnected forest stands at different successional stages. Many of the effects of forest fragmentation — nest predation, nest parasitism, isolation — are dampened in a forested landscape as compared to isolated forest stands in a predominantly agricultural or developed landscape (Sabine et al. 1996). However, these effects are not well understood.

There are four stages of forest fragmentation (Hunter 1996). Roads and power lines can dissect a forested tract (Figure 14A), filtering and, in some cases, impeding movement across the break; the width of the road or right-of-way determines the species affected. Small harvests or development can perforate a tract (Figure 14B), creating edge and heterogeneity across the landscape. As perforation increases, the forest becomes more segregated by nonforested areas (Figure 14C) until the remaining forest is

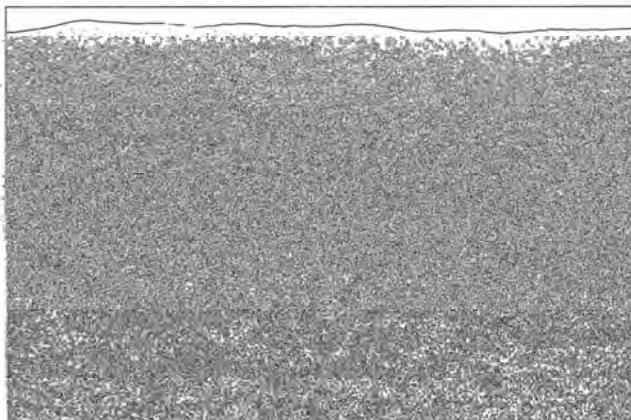
## Habitat Patch Size

in small, isolated patches (Figure 14D). This may be temporary until a harvested forest reaches maturity, or may be permanent through forestland conversion.

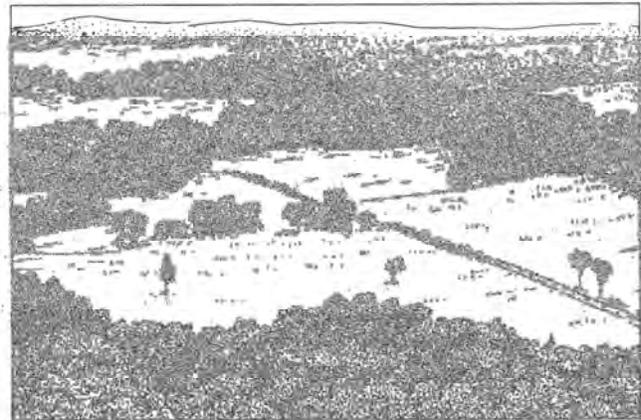
Large forest tracts are more likely than small tracts to support wildlife species with large home ranges or special habitat needs, and those species that require forest interiors. Some wildlife species, particularly small carnivores, are area sensitive and require large territories to forage or range (Hunter 1990). In Maine, Chapin et al. (1998) documented that the presence of large, contiguous stands was a

prerequisite for resident pine marten to occupy an area. Fifteen percent of the 338 forest-dwelling vertebrate species occurring in New England have average home ranges greater than 50 acres, some as large as 12 sq. mi., and a few that exceed 1000 sq. mi. These include most raptors, large-bodied woodpeckers, and medium- and large-size mammals (Degraaf et al. 1992).

Forest-interior species require the inner portions of relatively large tracts because their preferred habitat or food source exists only some distance from the forest edge.



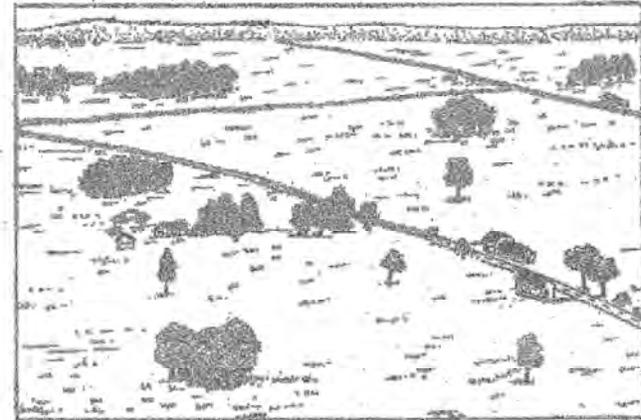
A. Direction



B. Perforation



C. Segregation



D. Isolation

Figure 14.

Four stages of forest fragmentation. (First published in Hunter 1996.)

## COMPARATIVE ANALYSIS OF POTENTIAL WINDPOWER SITES IN MAINE

This analysis was undertaken to better understand the resource values of Redington Mountain as they compare with other potential windpower development sites in Maine. This information is relevant to determining whether Redington Mountain is in fact the “best available site” for this type of development.

Potential windpower development sites were identified with reference to modeled wind resource data developed by TrueWind Solutions, LLC<sup>75</sup>. Data on windpower class at 50 meter height were used. Areas with windpower class 4 and above were isolated. While some consideration is being given to sites with lower windpower classes, class 4 and above is generally considered the most desirable for commercial windpower development. All ridgelines underlain by class 4 and above wind resource were digitized on-screen using contour line data overlaid on the windpower class data.

A total of 1,091 miles of ridgeline was delineated. Some part of this length consists of short ridgelines or side ridges off of longer main ridges. In order to focus on sites with the greatest potential for commercial development, we considered only main ridgelines at least one mile in length. Shorter ridgelines are generally insufficient to support commercial scale projects. Side ridges may expand the potential of a site but are unlikely to be developed in the absence of development of the main ridge. This left 674 miles of ridgeline at 268 separate sites. In some cases longer continuous ridgelines were broken into several separate sites at prominent saddles in order to provide a more precise spatial focus.

These sites were then overlaid on several different variables to get a sense of the nature and extent of potential constraints at each site. For each factor, the percent of the total length of the site that overlapped that particular factor was determined.

- Conservation status: Some sites are unavailable for development because of legal restrictions or because development would clearly conflict with management goals. These include the Appalachian Trail corridor, state and national parks, ecological reserves, and conservation easements. Other sites lay on conservation land and may legally be available for development, but development is unlikely due to the conservation goals of ownership. Some sites lay partially on conservation land; these were considered unavailable for development if less than one mile of ridgeline lay on unencumbered private land.
- Jurisdiction: Whether the site lay at least partially in LURC jurisdiction and particularly in P-MA zones.
- Land above 3500': These lands constitute a small fraction of the state's land area but are the most sensitive parts high-elevation environments due to the presence of rarer subalpine and alpine communities and more fragile soils.

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<sup>75</sup> Data developed under contract to AWS Scientific, Inc. as part of a project jointly funded by the Connecticut Clean Energy Fund, the Massachusetts Technology Collaborative, and Northeast Utilities System

## AMC PRE-FILED TESTIMONY ZP 702 - EXHIBIT G

- Within 2 miles of the Appalachian Trail: This is a fairly restrictive criteria; the midground of the USFS Scenery Management System extends out to 4 miles. A landscape classification conducted by a multi-stakeholder process in Virginia defined a 5-mile buffer along the AT as “unsuitable”.
- Large roadless areas: This was based on data developed by AMC and reflecting conditions as of 2000. These areas represent the largest blocks of unfragmented habitat in the state.
- Bicknell’s thrush habitat: Habitat data developed by the Vermont Institute of Natural Science was used. Each site was buffered by 50 meters and the percentage of the buffered area mapped as suitable Bicknell’s habitat was calculated.
- TNC priority matrix blocks: The Eastern Region Science Office of The Nature Conservancy has developed a bioregional analysis of the Northern Appalachians bioregion (approximately equivalent to the Northern Forest, though extending into Canada). Within this region, a portfolio of large matrix forest blocks was identified that if conserved would encompass the full range of ecosystem diversity across the region. For this analysis, smaller blocks delineated by the TNC Maine Chapter were used; these represent the core of larger priority blocks and are focus areas for the establishment of ecological reserves and buffers (Dan Coker, TNC, personal communication).

### Results of these overlays include:

- Conservation status: 57 sites totaling 132 miles lay on land where development is legally prohibited or clearly incompatible. Another 15 sites totaling 37 miles lay on land covered by conservation easement. Thus a total of 72 sites totaling 169 miles (about one-quarter of the total length) are currently off-limits to development. Another 11 sites totaling 20 miles lay predominantly on public or private conservation land that is potentially available for windpower development but which may realistically not be available given the conservation goals of ownership.
- LURC jurisdiction: 173 sites totaling 445 miles lay entirely in LURC jurisdiction. Another 30 sites totaling 82 miles lay partially in LURC jurisdiction. Thus nearly 80% of the ridgeline is at least partially under LURC jurisdiction. About 45% of the ridgeline outside of LURC jurisdiction lies in Baxter State Park and Acadia National Park.
- LURC P-MA zones: 104 out of the 268 sites lie at least partially in LURC P-MA zones. Overall, about 190 miles of ridgeline (28% of the total) lies in P-MA zones. However, there are 77 sites with at least one mile on unencumbered private land within LURC jurisdiction that do not extend into P-MA zones.
- Land above 3500’: 44 of the 268 sites extend above 3500’, but only 18 have at least a third of their length above 3500’.

AMC PRE-FILED TESTIMONY ZP 702 - EXHIBIT G

- Within 2 miles of the Appalachian Trail: Of the 268 sites, 63 had at least part of their length within 2 miles of the AT, and 48 of these had at least 75% of their length within two miles of the trail.
- Roadless areas: This was based on data developed by AMC and reflecting conditions as of 2000. 110 sites lie at least partially in roadless areas. Of these, 94 lay at least 75% in roadless areas and 70 lay entirely in roadless areas.
- TNC priority areas: 105 sites lay at least partially within TNC's priority blocks. Of these 78 sites lay entirely within these areas.

The database developed from these overlays was queried to identify sites with high and low levels of conflict with these factors. The results are described in the testimony.