

**STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

IN THE MATTER OF:)	
)	
CENTRAL MAINE POWER COMPANY)	SITE LOCATION OF DEVELOPMENT ACT
NEW ENGLAND CLEAN ENERGY CONNECT)	NATURAL RESOURCES PROTECTION
)	ACT
L-27625-26-A-N)	FRESHWATER WETLAND ALTERATION
L-27625-TB-B-N)	SIGNIFICANT WILDLIFE HABITAT WATER
L-27625-2C-C-N)	QUALITY CERTIFICATION
L-27625-VP-D-N)	
L-27625-IW-E-N)	
)	
CENTRAL MAINE POWER COMPANY)	
NEW ENGLAND CLEAN ENERGY CONNECT)	
SITE LAW CERTIFICATION SLC-9)	
)	

**MOTION FOR STAY OF AGENCY DECISION and APPEAL OF COMMISSIONER’S
DENIAL OF APPLICATION FOR STAY**

The Petitioners, West Forks Plantation, Town of Caratunk, Kennebec River Anglers, Maine Guide Service, LLC, Hawks Nest Lodge, Ed Buzzell, Kathy Barkley, Kim Lyman, Noah Hale, Eric Sherman, Matt Wagner, Mike Pilsbury, Mandy Farrar and Carrie Carpenter, all Intervenors in the joint proceedings before the Maine Department of Environmental Protection (“DEP” or the “Department”) and the Land Use Planning Commission (“LUPC” or “Commission”) and combined into Group 2 and Group 10 (“Petitioners”), by and through their attorneys, BCM Environmental & Land Law, PLLC, file this Motion For Stay and Appeal of the Commissioner of the DEP’s (the “Commissioner”) August 26, 2020 denial of Petitioners’ June 5, 2020 Application for Stay of the Commissioner’s May 11, 2020 Finding of Facts and Order

(“Order”) conditionally approving Central Maine Power’s (“CMP”) applications for State land use permits for the New England Clean Energy Connect project (“NECEC”).

INTRODUCTION

After many months of filings, hearings, amendments to CMP’s application, motions, evidence, testimony, public hearings, public comments, and review of a draft order with further public comments, on May 11, 2020, the Commissioner issued the Order conditionally approving CMP’s NECEC applications for State land use permits. Throughout the review process, many intervenors including Petitioners presented evidence and witness testimony about the negative impact the NECEC would have on the natural environment especially with respect to the new section of the proposed corridor, identified as Segment 1. Petitioners argue in their appeal first to the Somerset County Superior Court pursuant to M.R.C.P. 80C and now on remand and consolidation by the Court to the Board, in light of all evidence and testimony in the record, the DEP Commissioner’s Order was unreasonable, unlawful, and unjust.

Contemporaneous with Petitioners’ 80C appeal, on June 5, 2020, Petitioners filed an Application of Stay of the Commissioner’s Order to the Commissioner. The Commissioner’s August 26, 2020 denial of the Petitioners’ Motion to Stay hinged largely on the Petitioners’ likelihood of success on the merits. While this is part of the standard for a motion to stay, the nature of the Commissioner’s review was that he was deciding if the Petitioners were likely to succeed on their claims that the Commissioner’s own decision was unreasonable, unlawful, and unjust. The Petitioners argue now that this makes it nearly impossible to prevail on such a Motion to Stay. For that reason, Petitioners are asking the Board to consider their Motion to Stay and appeal the Commissioner’s denial of their request.

Accordingly, both because of the impending, irreparable damage NECEC would cause to Maine's environment and because of the procedural issue causing Petitioners to seek relief from the same person who issued the Order, it is unjust for the Commissioner's Order to remain in effect while any appeal is pending on such a significant and impactful project to Maine's environment. Rather, it would be far more prudent to allow the legal appeal process to first be resolved.

LEGAL STANDARD

Pursuant to 5 M.R.S.A § 11004, the Department "may issue a stay upon a showing of irreparable injury to the petitioner, a strong likelihood of success on the merits, and no substantial harm to adverse parties or the general public." Further, "A motion for such relief may be made to the Superior Court, but the motion shall show that application to the agency for the relief sought is not practicable, or that application has been made to the agency and denied, with the reasons given by it for denial, or that the action of the agency did not afford the relief which the petitioner had requested." 5 M.R.S.A. § 11004.

Petitioners requested the Stay of the Commissioner's Order on June 5, 2020. The Commissioner denied Petitioners' Application on August 26, 2020. This denial shows that "application has been made to the agency and denied" and "that the action of the agency did not afford the relief which petitioner had requested." 5 M.R.S.A. § 11004.

Since the Superior Court remanded the M.R.C.P. 80C appeals to the Board, and after first seeking relief from the Commissioner which was denied, Petitioners now seek review of their Motion from the Board and renew their request for a Stay.

ANALYSIS

The Petitioners must satisfy three elements: (1) irreparable injury to the petitioner, (2) a strong likelihood of success on the merits, and (3) no substantial harm to adverse parties or the general public. See 5 M.R.S.A § 11004.

First, failure to grant a stay will cause irreparable destruction of the natural environment in Segment 1 and irreparable harm to the Petitioners' livelihoods. Not only will CMP fail to suffer substantial harm from the addition of mere months to the project start time, but the public will also suffer no harm *and* will *benefit* from the delay by allowing the appeal to proceed.

Environmental damage is an irreparable harm that will be suffered if the Order on NECEC is not stayed. "Environmental injury, by its nature, can seldom be adequately remedied by money damages and is often permanent or at least of long duration, i.e., irreparable. If such injury is sufficiently likely, therefore, the balance of harms will usually favor the issuance of an injunction to protect the environment." Amoco Prod. Co. v. Vill. of Gambell, 480 U.S. 531, 545 (1987). Further, the United States District Court for the District of Maine has held that environmental damage is irreparable harm in United States Pub. Interest Research Group v. Atl. Salmon of Me., LLC, 257 F. Supp. 2d 407 (D. Me., May 28, 2003) (holding that the threat posed to the wild salmon population by non-North American species in a farmed salmon operation was sufficient irreparable harm and "necessary in the public interest" to warrant an injunction).

Here, the harms to the environment are given full voice by a series of witnesses in the proceedings before the Department, all of whom unequivocally emphasized the importance of this ecologically significant area and why it is important for the protection of so many species.

The following is a sampling of those significant environmental impacts:

- "In Maine, [habitat] patch size appears to be particularly critical for species associated with mature forest conditions, larger patch sizes and forest interiors.

Many Maine birds, such as red-shouldered hawk, black-throated blue warbler, Canada warbler, ovenbird and wood thrush, require hundreds of acres of continuous, relatively closed-canopy forest to reproduce successfully, as do mammals with large home ranges, such as moose, bobcat, black bear and American marten. For example, Chapin et al. (1998) found that resident American martens established home ranges in areas where median intact forest patch size ranged from 375 to 518 acres, for males and females respectively. These area-sensitive and habitat specialist species will start disappearing when the size of habitat blocks falls below a certain threshold. The proposed transmission corridor will fragment some of the largest remaining habitat blocks in the region, with unknown impacts on area-sensitive species.” See WF-Ex. 1 McMahon Testimony.

- “Loss and alteration of ecosystems are the leading causes of biodiversity declines in Maine and worldwide, and climate change is exacerbating these impacts. While the proposed NECEC corridor will retain shrub and herbaceous vegetation cover, Segment 1 is nonetheless a direct loss of nearly 1,000 acres of habitat for forest dwelling species. According to Maine State Wildlife Action Plan, Maine is home to more than 800 species of vertebrate wildlife, including more than 200 that are listed as Species of Greatest Conservation Need. For species that have home ranges, such as the red-backed salamander whose populations can reach one per square yard in northern New England forests, the loss of 1,000 acres of forested habitat could impact millions of individuals.” See WF-Ex 2 Hunter Testimony.
- “[P]ine marten in Maine prefer mature forests.... Forest practices on much of Maine’s commercial forestland are creating young habitat that no longer serves the need of marten.... Indeed, given that marten is an “umbrella species” (i.e. a species whose habitat overlaps the habitat of many other species) we should be concerned that the cumulative impact of logging roads, harvest practices, and powerlines may be creating challenging future for many other species that use similar habitat.” Id.
- “In addition to the cumulative impacts [on species habitat], forest fragmentation likely increases the vulnerability of Maine’s native flora and fauna.” Id.
- “Although habitat fragmentation affects different species in different ways, it is clear that many other species would be affected in addition to deer. These include birds such as the scarlet tanager and black-throated blue warbler, mammals including pine marten and Canada Lynx, amphibians such as the spotted salamander and wood frog, and reptiles such as the wood turtle.” Id.

The environmental cost of NECEC will be enormous, is well-documented in the record, and will be permanent. The Commissioner’s Order effectively allows CMP to begin construction of its NECEC project; construction with substantial environmental impacts including, but not

limited to: permanent bisection causing ecological destruction of the largest contiguous forest east of the Mississippi and hugely significant on a global scale, disruption of wildlife corridors, destruction of forest habitat for species including umbrella species such as the pine marten, species mortality, degrading impacts on cold-water streams and wetlands, and direct and immediate disruption of Petitioners' livelihoods in the area of construction. All of this is in Segment 1 alone, but in other Segments, the widening of corridors to accommodate the additional and taller structures will also have an undeniably negative impact on the environment, ecological continuity, and the human livelihoods that depend on the natural world. Any cutting or large-scale disturbance will irreparably damage the existing ecosystem. It is impossible to uncut trees, and un-disturb wetlands. The type of large-scale disturbance caused by allowing CMP to proceed before any appeals are finally resolved is needless and would irreparably harm Petitioners.

Allowing CMP to begin cutting trees, removing vegetation, and establishing construction landing areas will cause irreparable injury to the Petitioners in particular by destroying the environment which they rely upon for their livelihoods – a livelihood that already is in jeopardy due to the coronavirus closure of so many businesses reliant on the tourism industry. The Petitioners rely on the natural beauty of Maine's Western Mountains, the varied and ecologically-intact landscape, and the relative disconnect from the intrusions of eye-sore infrastructure to attract visitors to their region and their businesses. Once the environment, which is the life blood of their businesses, is altered, it will be changed forever. A stay is critical to protect Maine's Western Mountains from irreversible environmental damage and the resulting economic injury to the Petitioners. Requiring CMP to wait until these impacts have been

reviewed in light of the myriad issues with the Order that Petitioners raise in their appeal, will keep the harm at bay.

Second, Petitioners are likely to succeed on the merits of their appeal. See Me. Op. Att’y Gen. No. 80-116 (July 15, 1980) (this “requirement need not amount to a probability that the appeal will succeed but rather merely a substantial possibility of success”) (citations and quotations omitted). The Commissioner reached incorrect conclusions of fact and law in the Order and the evidence in the record does not support the approval of this project. The Petitioners raised several meritorious arguments related to errors that occurred at the DEP-level, including in the Order itself. However, the Commissioner issued the very Order the Petitioners criticized and are challenging as unsupported by the evidence. It is therefore perhaps not all that surprising that the Commissioner failed to find Petitioners’ arguments of likely success on the merits persuasive. At its core, the Commissioner’s denial of Petitioners’ Motion to Stay indicates that the Commissioner believes his original decision was correct. Trying to persuade the decisionmaker that he got it wrong makes the standard of likely success on the merits virtually insurmountable. It is illogical for the Commissioner to be the person in the position to analyze the merits of the issues the Petitioners raised about the Commissioner’s own Order. But as required by law, Petitioners nevertheless sought relief there first.

Further, the Petitioners’ arguments about the merits of the case should have been sufficient basis for a stay. Evidence and witness testimony made it clear that the NECEC would cut through and permanently bisect the largest remaining unfragmented forest east of the Mississippi. Forest fragmentation has a dramatic effect on wildlife and ecological communities. While reducing the corridor width and requiring tapering of vegetation will reduce some negative impacts on wildlife habitat, the forest will nevertheless become fragmented. The

Commissioner's decision ignores this fact and relies on the project as amended being *less* impactful and *less* harmful than the project as originally proposed. A less impactful effect does not justify the harm. By this logic, a demonstrably poorly-designed project, such as the NECEC, can be submitted, reviewed, tweaked by the Department, and then approved because the unreasonable adverse impacts aren't quite the same as the original horror show. This is not the standard for approving a project of this impact and scale. Simply because it is not as bad as before does not mean that it now meets the standards for approval. Nor does a condition of setting aside 40,000 acres for conservation somewhere else – and there is no standard established in the current Order as to where that 40,000 acres will be – mitigate the fragmentation in *this* location.

Further, the Commissioner's decision does not properly take into account testimony and evidence on the visual impact of the amended proposed project on scenic roads, ponds, trails, and other recreational resources. The economy of the Segment 1 area is heavily dependent on tourism based on the natural sites in this area. Allowing a transmission line to cut through the area will have a negative impact on this economic sector. The Commissioner's decision that "low" and "moderate" impacts are acceptable from many highly-valued scenic sites is unreasonable and unjust. No impact is acceptable here, and simply because CMP attempted to improve visual impact over its initial proposal does not mean that the amended proposal is approvable.

It should also be noted that the Commissioner's denial of Petitioners' Motion to Stay focuses on Petitioners' use of the word "pristine" to describe the forests that would be fragmented by the NECEC. Petitioners never argued that the forest in question had never been logged, was untouched by human impact, or was otherwise completely without damage. Rather,

the Petitioners argue that the long, wide, and continuous fragmentation with permanent installation of man-made structures caused by the NECEC corridor will irreparably damage the forest. Smaller-scale damage, overlapping trails, logging roads, and logging cuts of varying ages and locations have created a heterogeneous forest, not a permanently-fragmented forest with a continuous and perpetually-open corridor cutting through it. Witness testimony stated “it is still a remote wilderness area, pristine in the fact that it is not industrialized and scarred by unnatural materials inconsistent with existing use.” See WF-Ex 3 Greg Caruso Rebuttal Testimony. The unfragmented nature of the forest remains despite the commercial logging activity. The impact of the NECEC project is qualitatively different in both scale and duration from the varied uses that have occurred in the forest before now. “The working forest has been cut over but is not industrialized with steel and concrete. By saying something is pristine, untouched or natural, that is referring to the lack of any manmade industrial structures. Trees, stumps, brush, gravel, and water are all natural. One-hundred-foot towers of steel and concrete are not.” Id. The Petitioners are likely to succeed on the merits once the Board critically reviews the existing and any supplemental evidence Petitioners and NRCM present.

Third, staying this decision will not cause substantial harm to CMP or the public. CMP’s investment of dollars and time into the NECEC project, including altering the project along the way as it met with clear evidence of the environmental impacts, would be better protected by the this stay. Not only would waiting a few additional months not cause substantial harm to CMP, it would seem foolhardy and even more expensive for CMP to begin construction until there is certainty of the outcome of the appeals. Moreover, there are conditions of the Order that CMP has yet to prove it can satisfy and which Petitioners raise substantive questions about in their appeal. For example, CMP has not proven whether it has the financial capacity for a

decommissioning plan because the plan has not been (and has not been required to be) submitted to the Department. The costs of producing the decommissioning plan and for carrying out the almost-certainly, expensive decommissioning of NECEC was not considered by the Department when it decided CMP had financial capacity to carry out this project. CMP should not be allowed to dig a single shovel of dirt until it can prove it can meet those conditions and it could hardly be harmful for CMP to have to delay starting a project before it can show it would be able to eventually dismantle the project. CMP has also not proven that decommissioning, to a standard suitable and sufficient to meet the standards of Maine law, can be completed for this project as proposed. Without requiring a decommissioning plan, there is no evidence in the record that supports a conclusion that decommissioning is even possible, let alone financially feasible. For further discussion of the issues related to delaying a decommissioning plan, see Petitioners' Appeal of the Department's Order Approving NECEC, filed September 25, 2020. Finally, there is another citizen's referendum that may moot the entire application and CMP has not yet obtained multiple local municipal approvals and two other necessary federal approvals: a Presidential Permit and the Army Corps of Engineers approval to conduct work in waters of the United States. CMP should not begin work absent those outcomes and approvals which further illustrates why a stay of the Order will not cause substantial harm to CMP.

There is no harm to the general public in delay. To the contrary, the public will only be better served by the stay if the implementation of the decision is delayed until the appeals are resolved. There is no public interest in allowing CMP to begin construction on this project before the full review process is conducted. The State of Maine and its voters have established, over time, the process for permitting and review of projects of this scale. To allow the project to begin construction before the full process is completed robs the people of Maine of the full review

available under Maine law. It is also worth noting, yet again, that the only “public” which should be considered is the citizenry of Maine. Not the residents of Massachusetts as the intended recipients of the power, not the shareholders in Avangrid and Iberdrola, CMP’s Spanish parent corporation and not the citizenry of Quebec, Canada, owners of Hydro-Quebec as the recipients of the revenue from the project.

CONCLUSION

For all of the foregoing reasons, Petitioners respectfully request that the Board of Environmental Protection overturn the decision of the Commissioner and grant Petitioners’ Motion for Stay of Agency Decision and Appeal of Commissioner’s Denial of Application for Stay until all appeals on the Order are resolved.

Respectfully Submitted,

West Forks Plantation, Town of Caratunk, Kennebec River Anglers, Maine Guide Service LLC, Hawks Nest Lodge, Ed Buzzell, Kathy Barkley, Kim Lyman, Noah Hale, Eric Sherman, Matt Wagner, Mike Pilsbury, Mandy Farrar and Carrie Carpenter

By their attorneys,

BCM Environmental & Land Law, PLLC

Dated: September 25, 2020



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STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE
LAND USE PLANNING COMMISSION
IN THE MATTER OF
CENTRAL MAINE POWER COMPANY

Application for Site Location of Development Act permit and Natural Resources Protection Act permit for the New England Clean Energy Connect (“NECEC”)

L-27625-26- A-N

L-27625-TB-B-N

L-27625-2C-C-N

L-27625-VP-D-N

L-27625-IW-E-N

SITE LAW CERTIFICATION SLC-9

Testimony of Janet S. McMahon

Testimony of Janet S. McMahon

Intro/Qualification Questions

Q. Please state your name and business address.

Janet McMahon, PO Box 302, Waldoboro, Maine 04572

Q. Please describe your current employment.

I am a consulting ecologist. I conduct natural resource inventories and prepare management plans and regional conservation plans for conservation groups, government agencies, and private landowners. I am also on the faculty of Watershed School, an independent high school in Camden, Maine, where I teach a course on Global Climate Change.

Q. Please describe your education and professional background and experience.

I have a B.S. in biology and geology from Colby College and an M.S. in plant ecology from the University of Maine. My masters thesis, The Biophysical Regions of Maine, and my professional career have focused on conservation at the landscape scale. I helped develop Maine's Ecological Reserves system, worked at The Nature Conservancy as a conservation planner, and more recently have worked with land trusts to identify conservation focus areas and wildlife corridors that are most likely to be resilient to the impacts of climate change and to prepare management plans that take these and other considerations into account. My resume is attached (Group 1 Exhibit 2)

Q. Please describe any publications you have authored or co-authored (papers, chapters of books, etc.).

A list of publications is attached (Group 1 Exhibit 3). Two that are particularly relevant to this topic include:

McMahon, J. 2016. Diversity, Continuity and Resilience: The Ecological Values of the Western Maine Mountains. Occasional Paper No. 1. Maine Mountains Collaborative, Phillips, Maine.

McMahon, J. 2018. The Environmental Consequences of Forest Fragmentation in the Western Maine Mountains. Occasional Paper No. 2. Maine Mountains Collaborative, Phillips, Maine.

Summary of Testimony

Q. What is the purpose of your direct testimony in this proceeding?

To describe the adverse impacts of habitat fragmentation that would be caused by the New England Clean Energy Connect Project.

Q. On whose behalf are you offering testimony in this proceeding?

Friends of the Boundary Mountains

Q. Please summarize your testimony.

The proposed NECEC Project transmission corridor would be the largest fragmenting feature in the Western Maine Mountains region. This region is significant at a continental scale for a variety of reasons. It includes more than half of the United States'

largest globally important bird area, which provides crucial habitat for 34 northern woodland songbird species. It provides core habitat for marten, lynx, loon, moose and a host of other iconic Maine animals. Its cold headwater streams and lakes comprise the last stronghold for wild brook trout in the eastern United States. Its unfragmented forests and complex topography make it a highly resilient landscape in the face of climate change. It lies at the heart of the Northern Appalachian/ Acadian Forest, which is the largest and most intact area of temperate forest in North America, and perhaps the world (Haselton et al. 2014; Riitters et al. 2000). Most importantly, the Western Maine Mountains region is the critical ecological link between the forests of the Adirondacks, Vermont and New Hampshire and northern Maine, New Brunswick and the Gaspé.

My comments focus on the negative impacts of the 53.5 mile stretch of the transmission corridor that would cross the Western Maine Mountains region. The impacts associated with a project of this scale are huge. The 150-foot wide 53.5 mile long NECEC proposed transmission corridor would directly impact approximately 973 acres of the region through forest and wetland species mortality and habitat alteration and destruction associated with the corridor footprint. It would negatively impact between 20,000+ and 40,000+ of additional acres due to edge effects and hydrologic changes that would extend from 0.5 to 1 km (1640 to 3280 feet) from the high contrast edges of the corridor into adjacent forest land. In addition, the corridor would have significant negative regional and long term impacts because it would reduce connectivity in a critical ecological linkage, fragment large habitat blocks into smaller ones, and compromise headwater stream water

quality and function. The applicant does not address any of these negative regional and long term impacts in their application.

It is also worth noting that fragmentation almost always leads to more fragmentation. As access roads are built and corridors are widened over time (as is happening in other parts of the NECEC corridor), these typically create new nodes of development.

Q. Are you including exhibits as part of this filing?

Yes, the following four exhibits are attached:

Group 1 Exhibit 2 Resume of Janet S. McMahon (JSM)

Group 1 Exhibit 3 List of Publications, JSM testimony

Group 1 Exhibit 4 for JSM testimony

McMahon, J. 2016. Diversity, Continuity and Resilience: The Ecological Values of the Western Maine Mountains. Occasional Paper No. 1. Maine Mountains Collaborative, Phillips, Maine.

Group 1 Exhibit 5 for JSM testimony

McMahon, J. 2018. The Environmental Consequences of Forest Fragmentation in the Western Maine Mountains. Occasional Paper No. 2. Maine Mountains Collaborative, Phillips, Maine.

Q. Upon what materials did you rely in reaching the opinions set forth in your direct testimony?

See literature cited and analyses summarized in the two exhibits listed above and

the citation below:

Smith, M.P., R. Schiff, A. Olivero, and J. MacBroom. 2008. *The Active River Area: A Conservation Framework for Protecting Rivers and Streams*. The Nature Conservancy, Boston, Massachusetts.

Also, I've drawn from first-hand on the ground experience as an ecologist working in all corners of the state for the past 40 years, and I reviewed the relevant parts of CMP's application.

Detailed Information

Q. Please describe the significance of the region through which the proposed transmission line would pass.

The Western Maine Mountains region, which would be bisected by Segment 1 of the NECEC transmission corridor, is exceptional because it remains a largely unfragmented, lightly settled and connected landscape. The region is significant at a continental scale for many reasons. It lies at the heart of the Northern Appalachian-Acadian Forest Ecoregion, which is the largest and most continuous area of temperate forest in North America, and perhaps the world (Haselton et al. 2014; Riitters et al. 2000). This high degree of connectivity, combined with large elevation gradients and a diversity of physical landscapes, makes the Western Maine Mountains a highly resilient landscape in the face of climate change and a critical ecological link between undeveloped lands to the north, south, east and west.

Resilient sites are those that are projected to continue to support biological diversity, productivity and ecological function even as they change in response to climate

change. In The Nature Conservancy's Conservation Gateway climate resilience map of the eastern United States, the Western Maine Mountains stand out in terms of biodiversity, climate flow and climate resilient sites. Eighty percent of the region is of above-average resilience, based on geophysical setting and local connectedness. This compares to 60% for the state as a whole and an average of 39% in southern Maine. A review of The Nature Conservancy's Conservation Gateway maps for the rest of New England and the eastern United States indicates that resiliency is even lower outside of Maine, making the Western Maine Mountains one of the most resilient and connected landscapes east of the Mississippi. Most importantly, the Western Maine Mountains region is the critical ecological link between the forests of the Adirondacks, Vermont and New Hampshire and northern Maine, New Brunswick and the Gaspé.

The Western Maine Mountain region includes more than half of the United States' largest globally important bird area, which provides crucial habitat for 34 northern woodland songbird species. The region provides core habitat for umbrella species such as American marten and Canada lynx, loon, moose and a host of other iconic Maine animals. Its cold headwater streams and lakes comprise the last stronghold for wild brook trout in the eastern United States (Whitman et al. 2013; DeGraaf 2014).

Q. Please explain the concept of forest fragmentation.

Habitat fragmentation occurs when habitats are broken apart into smaller and more isolated fragments by permanent roads, utility corridors, buildings, clearings or changes in habitat conditions that create discontinuities in the landscape. These features not only reduce the total amount of forest in a landscape, but they alter the environment

in adjacent habitat because of edge effects. Fragmenting a forest landscape by a transmission corridor creates an abrupt edge between the corridor and adjacent forest edge which greatly increases the total amount of land impacted. Different species are affected by fragmentation in different ways, depending on biological attributes such as habitat specialization, niche specialization, home range size, dispersal ability, mobility and a host of other factors (Lindenmayer and Fischer 2006). Some effects are temporary and local in extent, such as clearings created by timber harvests, while others such as permanent roads and utility corridors occur at a landscape scale and are cumulative, playing out over decades or more. Research in Maine, the Northeast and around the world demonstrates unequivocally that fragmentation degrades native terrestrial and aquatic ecosystems and reduces biodiversity and regional connectivity over time.

Q. Would the proposed NECEC transmission line cause forest fragmentation?

Yes. The 53.5 miles of new transmission corridor between Beattie Twp and Wyman station (Segment 1) would be the largest fragmenting feature in the Western Maine Mountains region. To put this in context, a 150-foot wide cleared corridor is about two times as wide as Route 201 or Route 1, and about as wide as the I-95 Turnpike (including pavement and cleared verges). The transmission corridor would permanently remove ~973 acres of forest habitat, it would divide large forest habitat blocks into smaller ones, and it would create 107 miles of high contrast edge between the cleared corridor and adjacent forest. Associated edge effects would impact thousands of additional acres of forest land. The impacts of forest fragmentation at this scale are regional in scope. The corridor would have a profound negative impact on forest connectivity of the region.

Q. What would be the negative impacts of forest fragmentation caused by the NECEC transmission line?

The proposed corridor would negatively impact both terrestrial and aquatic ecosystems processes, habitats and species on a regional scale. Regional and long term impacts of the proposed corridor such as forest fragmentation are not addressed in the application. The most severe effects are summarized below:

1) Direct forest habitat loss and species mortality from corridor construction.

Approximately 973 acres of upland and wetland forest will be cleared and then maintained in an early-successional (scrub shrub or meadow) condition, through regular cutting of capable trees and herbicide application. Forest plant and animals in the corridor will be destroyed during construction. Forest and undisturbed wetland ecosystems support a completely different suite of species than artificially maintained meadow and scrub shrub habitat.

2) Direct impacts on headwater stream and catchment areas associated with infrastructure during and after construction.

Segment 1 crosses or includes portions of approximately 89 perennial streams, 215 intermittent streams and 480 wetlands (from application). Almost all of these are located in the uppermost reaches of their watersheds. It is within these small watersheds that 1st order streams are formed from overland flows, intermittent and zero order streams and gullies, and from springs (Smith et al. 2008). The catchments and riparian areas along these streams contribute inorganic and organic material and large woody debris which

serve as the basic building blocks for the food web of the entire stream system. Large woody debris originating from trees within 50 meters of the channel influences local channel structure and habitat (Smith et al.). In addition, in headwater wetlands, the accumulation, processing, and eventual downstream transport of organic material is an important energy transfer process that influences the entire watershed. A transmission line that converts forest to scrub or meadow vegetation in material contribution areas of this many headwater streams will negatively impact downstream water quality and habitat conditions for brook trout and other cold water species, as well as downstream aquatic biodiversity and processes in general. The overall impact of clearing and maintaining shrubby vegetation in narrow stream buffer areas, as opposed to closed canopy forest in the catchment area, is not addressed in the application. Also not addressed are the impacts of herbicide application on overall water quality. In addition, many wetlands, streams, and vernal pool boundaries extend beyond the corridor boundary. Because habitat alteration within the corridor would impact portions of these features that extend outside of the corridor, the total acreage of wetlands and stream catchment areas impacted by the project would be significantly greater than indicated in the application.

3) *Increased mortality and other direct impacts to wildlife associated with infrastructure after construction is complete.*

Negative impacts such as avian and bat collisions with transmission poles and wires over a new corridor of this length are likely to be substantial. There is a growing body of research suggesting that electromagnetic radiation from transmission lines can affect behavior, reproduction and development of bird and other species groups. This is not

addressed in the application.

4) *Changes in species composition and reduced habitat quality from edge effects.*

The transmission corridor will create ~ 107 miles of high contrast edge where the maintained corridor meets adjacent forest. Forest abutting the corridor will be windier, warmer and drier than the forest interior. Increased sunlight, changes in air temperature and humidity, altered plant, animal and microbial species composition, and species invasions are typical edge effects. Penetration distances range from 20-50 meters to more than a kilometer, depending on the edge effect. For example, the decline of many ground-nesting, forest-interior species in the Northeast, such as the oven bird and wood thrush, have been attributed to increased predation pressure from raccoons and other generalist species that thrive along forest edges (Ortega and Capen 1999; De Camargo et al. 2018). Increased nest predation and reduced reproductive success can extend more than 2,000 feet into adjacent forest. The habitat lost or altered by edge effects will be many times greater than the footprint of the transmission corridor itself. This is not addressed in the application. The application states that generalist species diversity can increase in the early-successional habitat that will be maintained in the corridor. This is at the expense of forest plant species which typically have low dispersal capacities compared to disturbance-adapted “weedy” plants (Harper et al. 2005). There is no shortage of early successional habitat in the Western Maine Mountains. In fact, 2017 U.S. Forest Inventory and Analysis data indicates that 98.6% of the forest is in an early to mid-successional condition and that total forest acreage in the region declined by approximately 12,000 acres.

5) *Changes in species composition and behavior as habitat patch size decreases.*

A habitat patch is a relatively homogeneous habitat area that differs from its surroundings. Large habitat patches have more species than small ones for several reasons. First, a large patch will almost always have a greater variety of environments than a small fragment, and each will provide niches for different species. Second, a large patch is likely to have both common and uncommon species, but small fragments are likely to have only common species. For instance, species with larger home ranges, such as black bear or bobcat, are unlikely to survive in smaller fragments. Finally, small fragments will, on average, have smaller populations that are more susceptible to being extirpated than a large population. In Maine, patch size appears to be particularly critical for species associated with mature forest conditions, larger patch sizes and forest interiors. Many Maine birds, such as red-shouldered hawk, black-throated blue warbler, Canada warbler, ovenbird and wood thrush, require hundreds of acres of continuous, relatively closed-canopy forest to reproduce successfully, as do mammals with large home ranges, such as moose, bobcat, black bear and American marten (Charry 1996; Askins 2002). For example, Chapin et al. (1998) found that resident American martens established home ranges in areas where median intact forest patch size ranged from 375 to 518 acres, for males and females respectively. These area-sensitive and habitat specialist species will start disappearing when the size of habitat blocks falls below a certain threshold (Askins 2002; Blake and Karr 1984; Whitcomb et al. 1981). The proposed transmission corridor will fragment some of the largest remaining habitat blocks in the region, with unknown impacts on area-sensitive species. The application does not provide a habitat block map with the corridor overlay,

which makes it impossible to determine the exact number and extent of intact habitat blocks affected. Animals from Maine's populations are currently replenishing "sink" populations in New Hampshire. The corridor could compromise the Western Maine Mountain region function as a source area for marten and lynx.

6) Introduction and spread of exotic species.

Invasion by exotic plant species is a common and widespread negative impact of fragmentation that can result in displacement of native species. In general, non-native invasive plant species thrive in disturbed and early successional habitats and frequently become established in utility corridors. Common traits of invasives include rapid growth, light and drought tolerance, bird-disseminated seeds, and the ability to outcompete native plants (Webster et al. 2006). In addition, invasive woody and herbaceous plants rapidly colonize forest edges and may penetrate more than 330 feet into the forest interior, altering or eliminating habitat for native plants (Cherry 1996). Wetland and aquatic invasives pose a similar threat in wetland and aquatic ecosystems. Other impacts include changes in soil chemistry and biota—which may suppress native tree regeneration—and reduced or eliminated foods used by pollinators, fruit and seed eaters and herbivores (Silander and Klepeis 1999; Cherry 1996; Webster et al. 2006; Burnham and Lee 2010; Ehrenfield et al. 2001; Heneghan et al. 2006; Hunter and Mattice 2002). Large forest blocks appear to resist woody plant invasions better than small blocks due to the deep shade created by mature trees and the buffering effect of large block size, which serves to isolate interior portions of the forest from invasive seeds.

Many terrestrial invasive plant species and wetland invasives, such as glossy buckthorn, oriental bittersweet, purple loosestrife and phragmites, are already well established in southern Maine and have expanded to the edges of the Western Maine Mountains. These disturbance-adapted species thrive in utility corridors and roadside ditches, where they out-compete native species. With roughly one third of Maine's flora comprised of non-native plant species (and most of these already established in the southern part of the state), the cause-and-effect relationship between fragmentation and the establishment of non-native plant species poses a significant threat to native species and habitats in northern Maine (Mosher et al. 2009; Charry 1996).

The applicant proposes controlling invasives that become established in the transmission corridor through manual removal and herbicide application. The negative impacts of herbicides on other species are not addressed, nor is the fact that the corridor would increase suitable habitat for invasives outside of the corridor ROW in areas impacted by edge effects.

Q. What would be the long-term consequences of forest fragmentation caused by the NECEC transmission line?

The magnitude and permanence of the land-use changes associated with this project would have negative long-term consequences on connectivity in the Western Maine Mountain region. Fragmentation, by definition, is a continuous and cumulative process that leads to degraded habitats and loss of species over time. There is a growing body of research that suggests that the ecological dynamics in fragmented landscapes are a stark contrast to the dynamics in intact landscapes (Haddad et al. 2015). Research shows strong

and consistent responses of organisms and ecosystem processes to fragmentation arising from decreased habitat patch size, decreased connectivity and the creation of habitat edges (Haddad et al. 2015; Lindenmayer and Fischer 2006). In general, the greater the difference between forested patches and their surrounding environment and the smaller and more isolated patches become, the greater the adverse impact on biodiversity and ecosystem function.

In the Western Maine Mountains, changing land use patterns resulting from fragmentation have already caused changes in species composition and will likely cause changes in plant and animal abundance over time. Two of these changes include the increased proportion of early successional species and the large-scale reduction in the structural complexity of forest stands on which other forest organisms and ecological processes may depend (Rowland et al. 2005; Hagan and Whitman 2004). The transmission corridor would significantly exacerbate both of these trends.

Large tracts of forest are important because they are relatively free from the variety of plant and animal population dynamics that might take place near new edges, including the encroachment of individuals displaced by habitat loss. This immigration lag may also mask the risk of invasion by exotic species since there may be a long lag between introduction, colonization, and rapid range expansion of some invasive species (Webster et al. 2006).

Ecosystem functions, such as nutrient cycling and decomposition rates, can also be reduced or lost over time—a process called ecosystem function debt. Evidence suggests that during forest succession, this delayed loss of function is greater in smaller, more isolated

fragments (Cook et al. 2005; Billings and Gaydess 2008). The mechanisms for this are complex. Functional debt can result when fragmentation causes food webs to be simplified as species are lost, or when altered forest succession patterns resulting from permanent fragmentation cause changes in tree density, light and moisture, which impair ecosystem function (Haddad et al. 2015).

Increased fragmentation is expected to exacerbate the negative impacts of climate change on biodiversity and connectivity in the region. Forest fragmentation increases the vulnerability of Maine's native flora and fauna to climate change (Fernandez et al. 2015; Rustad et al. 2012). For example, declines in the diversity of native flora in New England's mixed northern hardwood forests are attributed to a high degree of habitat specialization, a highly fragmented range, depauperate understories and barriers to dispersal (New England Wildflower Society 2015). Three of the top four stressors are caused or aggravated by forest fragmentation, including habitat conversion, invasives and succession. All of these stressors are expected to become more pronounced as the climate changes. The resiliency of the Western Maine Mountains in the face of climate change is largely due to the extent and connectivity of its forests. These would be adversely affected by the proposed NECEC transmission corridor.

The application focuses on direct and immediate impacts and fails to address long-term and regional impacts of the corridor on connectivity and biodiversity.

Conclusion

Q. Please summarize your testimony.

The proposed NECEC Project transmission corridor would be the largest fragmenting feature in the Western Maine Mountains region. This region is significant at a continental scale for a variety of reasons. It includes more than half of the United States' largest globally important bird area, which provides crucial habitat for 34 northern woodland songbird species. It provides core habitat for marten, lynx, loon, moose and a host of other iconic Maine animals. Its cold headwater streams and lakes comprise the last stronghold for wild brook trout in the eastern United States. Its unfragmented forests and complex topography make it a highly resilient landscape in the face of climate change. It lies at the heart of the Northern Appalachian/ Acadian Forest, which is the largest and most intact area of temperate forest in North America, and perhaps the world (Haselton et al. 2014; Riitters et al. 2000). Most importantly, the Western Maine Mountains region is the critical ecological link between the forests of the Adirondacks, Vermont and New Hampshire and northern Maine, New Brunswick and the Gaspé.

The negative impacts of a 53.5 mile stretch of the transmission corridor crossing the Western Maine Mountains (Segment 1) would be regional in scale and would have long term negative ecological implications. The 150-foot wide transmission corridor would directly impact approximately 973 acres through forest and wetland species mortality and habitat alteration and destruction associated with the corridor footprint. It would negatively impact between 20,000+ and 40,000+ of additional acres due to edge effects and hydrologic changes that would extend from 0.5 to 1 km (1640 to 3280 feet) from the high contrast edges of the corridor into adjacent forest land. In addition, the corridor would

have significant negative regional and long term impacts because it would reduce connectivity in a critical ecological linkage, fragment large habitat blocks into smaller ones, and compromise headwater stream water quality and function. The applicant does not address any of these negative regional and long term impacts in their application.

It is also worth noting that fragmentation almost always leads to more fragmentation. As access roads are built and corridors are widened over time (as is happening in other parts of the NECEC corridor), they typically create new nodes of development.

Q. In your opinion:

1. Would this project have an unreasonable adverse effect on the existing natural resources of the Western Mountain region of Maine? If so, how?

Yes. The NECEC transmission corridor would be the largest infrastructure project in the history of the WMM. It would have direct negative impacts on upland forest, wetlands, vernal pools, streams and stream catchment areas. Forest conversion and maintenance of land within the corridor in an early-successional condition would permanently fragment this forested region. This would contribute to the simplification of forest structure and negatively impact native biodiversity (particularly cold water aquatic species) in the region. Forest simplification would, in turn, reduce the current high climate resiliency of the region. The proposed transmission corridor would compromise the region's value as the key ecological linkage between forests in New Hampshire and the Adirondacks and those of Northern Maine and the Gaspé. The application does not address these regional and long-term impacts.

2. Would this project fit harmoniously into the existing natural environment?

If not, why not?

No, this transmission corridor would require habitat conversion, and then vegetation maintenance in an early successional condition through herbicides and regular removal of “capable” trees¹. It would create a permanent high contrast edge on either side of the 53.5 mile corridor, an artificial feature that would impact thousands of additional acres of adjacent forest land due to edge effects. It would fragment large forest blocks into smaller more isolated ones. It would cross large wetland complexes such as those along Gold Stream and Moxie Stream, and would impede movement of some wildlife species. There is no way new energy infrastructure at this scale can fit harmoniously into one of the more remote and environmentally intact areas of the state.

3. Would this project have an unreasonable adverse effect on water quality in the townships where it is located or in neighboring townships? If so, please explain.

Yes. See page 5, bullet 2.

4. Would this project have an unreasonable adverse effect on any undeveloped land or water area which is undeveloped and which contains natural features of unusual geological, botanical, zoological, ecological, hydrological, or other

¹ Applicant describes capable trees as “those plant species and individual specimens that are capable of growing tall enough to violate the required clearance between the conductors and vegetation established by NERC” (North American Electric Reliability Transmission Vegetation Management, Standard FAC 003-3). Follow-up maintenance when the line is operating will require the removal of capable species, dead trees as well as hazard trees along the edge of the corridor.

scientific, educational, scenic or recreational significance? If so, please explain.

Yes. Many species and discrete ecological features, such as jack pine stands, vernal pools, and deer yards would be negatively impacted. My testimony focuses primarily on the adverse regional and long term impacts of fragmentation that would be caused by the transmission corridor.

5. Will this project provide buffer strips with adequate space for movement of wildlife between important habitats? If not, why not?

No. Proposed buffer strips along streams and around wetlands are insufficient to maintain functioning catchments around these important headwater systems.

6. Will this project maintain suitable and sufficient habitat to provide wildlife with travel lanes between areas of available habitat? If not, why not?

No. By definition, transmission corridors are major fragmenting features on any landscape. The large extent of this corridor means it will reduce connectivity on a regional scale, especially because of its east-west orientation. As the climate warms, species are expected to move from south to north and upslope.

7. Will this project unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life?

Yes. A project of this scale will have a direct negative impact on hundreds of individual vernal pools, headwater streams, wetlands and other habitats, including the portions of these that lie outside of the corridor footprint. Reducing canopy height and closure, altering vegetation structure and composition, and application of herbicides will harm terrestrial and aquatic habitat within and adjacent to the corridor. In addition, because the corridor will impact the catchment areas of headwater streams and wetlands, it will impact the watersheds that these feed. Looking at discrete impacts on only state significant features masks the regional and cumulative impacts of the corridor as a whole.

Notarization

I, Janet McMahon being first duly sworn, affirm that the above testimony is true and accurate to the best of my knowledge.

Date: February 28, 2019 Name: Janet S McMahon

Personally appeared the above-named Janet S McMahon and made affirmation that the above testimony is true and accurate to the best of her knowledge.

Date: February 28, 2019 Name: Colleen G Jones
Notary Public

My Commission Expires: Dec 16, 2019

COLLEEN G. JONES
Notary Public • State Of Maine
My Commission Expires Dec. 16, 2019

Testimony before the Maine Department of Environmental Protection

**By
Malcolm L. Hunter Jr., PhD.
Serving as an Expert Witness for
The Nature Conservancy in Maine**

February 25, 2019

RE: Central Maine Power’s New England Clean Energy Connect Transmission Proposal

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1. Background and Credentials

My name is Malcom L. Hunter, Jr., and I am the Libra Professor of Conservation Biology at the University of Maine, where I have taught for the last 40 years. I was born and raised in Damariscotta, Maine, and I received my Bachelor of Science degree in Wildlife Science from the University of Maine. I received my PhD. in Zoology from Oxford University, where I was a Rhodes Scholar. I am the past president of the Society for Conservation Biology, a global professional organization, and have served on the Editorial Board of the Ecological Society of America.

I have been the lead author or co-author in over 200 professional publications on wildlife and conservation biology, including 47 peer-reviewed journal papers and three books that specifically address the issue of fragmentation. My research has covered a variety of ecosystems and organisms – birds, amphibians, mammals, reptiles, insects, vascular plants, rivers, lakes, wetlands, grasslands, and more – but my major focus is on forest ecosystems and the maintenance of their biological diversity. I am a member of a research team that has studied one forest and the evolving interactions among its vascular plants, amphibians, birds, and small mammals through nearly 40 years. Perhaps most relevant to this project, I also work with ecosystems at large spatial and temporal scales, studying the effects of landscape structure and climate change on global ecosystems. My interests are geographically broad, and I have worked in 30 countries and on every continent except Antarctica. As a researcher and advisor, I interact with a broad spectrum of organizations including the Society for Conservation Biology, The Nature Conservancy, the U.S. Fish and Wildlife Service and U.S. Forest Service, and I have had three gubernatorial appointments to various natural resource advisory groups.

2. Role in this Project

I have followed the progression of this project over the past year. As a former Trustee of The Nature Conservancy of Maine, I have been in discussion with Conservancy staff over the past few months about their concerns regarding potential impacts to wildlife habitat. As an intervenor in the DEP proceedings, The Nature Conservancy has taken a neither ‘for’ nor ‘against’ position on this project. However, the Conservancy strongly asserts that the project will have significant cumulative and long-term impacts on the region’s wildlife, and that the compensation and mitigation currently proposed are inadequate and not commensurate with those impacts. I understand that DEP provides significant latitude for the Department to consider cumulative, landscape-level impacts that extend beyond isolated impacts to specific resources, and I am providing testimony in support of The Nature Conservancy’s concerns about these issues.

My testimony represents my own research and perspective and does not reflect the University of Maine. I have received no compensation for this testimony.

3. Habitat Fragmentation and NECEC

Stated simply, ecosystem fragmentation is the gradual breaking apart of a natural landscape into smaller blocks of native vegetation.¹ The impacts of fragmentation have been widely evaluated in the scientific literature, and there are at least hundreds, probably thousands, of peer reviewed publications on this topic. In short, it is widely recognized that fragmentation is one of the leading causes of biodiversity decline across the globe, but its role is context-dependent.

Thus, it's important to carefully consider the landscape in which NECEC is planned. Unlike some characterizations of the region, it is not pristine "wilderness." On the other hand, it is not an intensively managed industrial forest landscape with monoculture crops grown on short rotations, such as characterizes much of New Brunswick's forest. It is an extensively managed, working forest, traversed by logging roads and marked by a patchwork of forests in various age classes and harvest conditions. In multiple parts of its application, CMP argues that in a working landscape such as this, the additional impacts from a powerline corridor are inconsequential. However, it is important to recognize that with the exception of major haul roads, clearing from forest management is *temporary*, and even industrial forest management requires forests to grow back to maturity before they are harvested again. The results of forest management across the western Maine landscape create a patchwork of age classes that shift over time. Although these shifts are more frequent, and the patches larger, than would occur in a totally natural forest setting (i.e., under a regime of natural disturbance such as windstorm and insect damage), because of the largely intact and connected landscape, over time Maine's wildlife are able to move among these patches. In contrast to these temporary and shifting impacts of forest management, *the proposed NECEC corridor would be a permanent fragmenting feature, much like the few major forest roads in the region.*

It is also important to note that the *type, orientation, and spatial scale* of a fragmenting feature are instrumental in determining the level of impact. A 150-foot wide powerline will create a wider barrier to movement than a typical woods logging road (which may be one-fifth the width of the powerline), and both linear features will create far more edge and have a different impact than a similar area of widely spaced clear cuts.

In addition, we often ask, is a road, pasture, or utility line fragmenting to *what species*? A highly mobile, generalist species such as a black bear will react to a utility corridor very differently than a smaller species that strongly prefers a shaded forest floor, like a spotted salamander or wood frog.

There are no known examples of comparable development projects in Maine that traverse lands mapped as "Resilient and Connected" by The Nature Conservancy. ("Resilient and Connected" lands are those that have been identified, based on land form and land cover, as being most capable of supporting biodiversity as the climate changes.) As a result, because of the scale and location of this project, there are no studies I'm aware of that have assessed impacts in a landscape such as this. Thus, it can be challenging to apply academic studies to specific cases of

¹ Hunter, M.L., Jr., and J. Gibbs. 2007. *Fundamentals of conservation biology* (3rd ed.). Blackwell Publishing. 482 pp.

fragmentation, but I have attempted to draw primarily from those factors and studies that are likely to have implications for the NECEC corridor project.

3.1 Types of Impacts

Fragmentation results in at least three related impacts: immediate loss of forest vegetation, increase in “edge” (i.e., the border between a forest and an opening), and a decrease in the overall amount of “interior” forest. These impacts can have both short-term and long-term impacts.

3.1.1. Habitat Loss and Alteration:

Loss and alteration of ecosystems are the leading causes of biodiversity declines in Maine and worldwide, and climate change is exacerbating these impacts. While the proposed NECEC corridor will retain shrub and herbaceous vegetation cover, Segment 1 is nonetheless a direct loss of nearly 1,000 acres of habitat for forest-dwelling species. According to the 2015 Maine State Wildlife Action plan, Maine is home to more than 800 species of vertebrate wildlife, including more than 200 that are listed as Species of Greatest Conservation Need.² For species that have small home ranges, such as the red-backed salamander whose populations can reach one per square yard in northern New England forests³, the loss of 1,000 acres of forested habitat could impact millions of individuals. Even for larger species, the altered habitat in a utility corridor may serve as a barrier to movement. Biasotto and Kindel⁴ report that, “Many studies suggested that the distribution and density of ungulates are affected by powerline RoW, especially when combined with roads. This response may be caused by a higher risk of predation, poor foraging conditions, hindered movement and decreased habitat quality.”

3.1.2 Increased Edge and Reduced Interior:

Forest loss associated with a transmission line and associated construction roads is amplified by the edge effects that extend the corridor’s impact far into the adjacent forest. At the global scale, forest edges influence more than half of the world’s forests and contribute to worldwide declines in biodiversity and ecosystem functions.⁵ These changes occur as a result of differences in light and wind exposure at forest edges, associated changes in plant community composition and structure (e.g., forest vs. shrub), introductions of invasive species, and changes in predator/prey relationships. ***Segment 1 of the NECEC will create more than 100 linear miles of permanent new edge habitat in Segment 1 alone.***

Forest edge microclimates are typically windier, warmer, and drier than forest interiors.⁶ Because of simple rules of geometry (i.e., a circle has the lowest perimeter to area ratio) the

² <https://www.maine.gov/ifw/fish-wildlife/wildlife/wildlife-action-plan.html#greatestneed>

³ Burton, T.M., and G.E. Likens. 1975. Salamander populations and biomass in the Hubbard Brook Experimental Forest, New Hampshire Copeia. 1975:541-546.

⁴ Biasotto, L., and A. Kindel, 2018. Power lines and impacts on biodiversity: A systematic review. Environmental Impact Review Assessment 71:110-119.

⁵ Pfiefer, M., V. Lefebvre, C.A. Peres, et al. 2017. Creation of forest edges has a global impact on forest vertebrates. *Nature* 551: 187–191.

⁶ Hunter, M., and F. Schmiegelow. 2011. Wildlife, Forests, and Forestry: Principles of Managing Forests for Biological Diversity. Prentice Hall, Upper Saddle River, New Jersey, USA. 259 pp

amount of edge is also far greater for long narrow clearings, such as roads and utility corridors, than for more compact clearings of the same size, such as harvested areas. Forest edges are often more favorable to “generalist” species that can adapt to a wide variety of conditions, including raccoons, brown-headed cowbirds, blue jays, and others. As a result, some studies have found greater species richness and abundance in habitat fragments and edges compared to forest interiors.⁷ These studies have been used to suggest that the impacts of habitat fragmentation on biodiversity may not be as significant as once considered.

However, generalist species are typically more common, and thus of lower conservation concern, than many species that are restricted to the specific habitat of interior forest. Depending on the species in question the edge impact may extend hundreds of feet into the forest.^{8,9} At the global scale, species that live in interior forest and are more likely to be listed as threatened by the International Union for Conservation of Nature (IUCN), reached peak abundances only at sites farther than 200–400 m from forest edges.¹⁰ In particular, smaller-bodied amphibians, larger reptiles, and some medium-sized mammals experience greater reduction from edge effects than other forest-core species.¹¹ Moreover, “distance from power lines has also been demonstrated as the most important factor determining the choice of nest and rest sites, influencing the movement of migratory birds and acting as a barrier to populations.”¹²

In the Northeast U.S., the decline of many ground-nesting forest interior birds has been attributed to increased predation or competition from generalist species.¹³ In Maine there are more than two dozen bird species e.g., black-throated blue warbler, Canada warbler, black-throated green warbler, and wood thrush-- that are associated with forest interiors and are listed as Species of Greatest Conservation Need.¹⁴ Typically these species tend to avoid forest edges and require hundreds of acres of continuous, relatively interior forest to reproduce, as do some mammals with large home ranges, such as American marten.¹⁵ Northeastern forests have been shown to support important breeding grounds for many of these species, and these area-sensitive habitat specialists will decline if the size of habitat blocks falls.^{16,17,18}

⁷ Fahrig, L., Arroyo-Rodríguez, V., Bennett, J., et al. 2019. Is habitat fragmentation bad for biodiversity? *Biological Conservation* 230.

⁸ Laurance, W.F., T.E. Lovejoy, H.L. Vasconcelow, et al. 2002. Ecosystem decay of Amazonian forest fragments: A 22 year investigation. *Conservation Biology* 16: 605–618.

⁹ Laurance, W.F., J.L.C. Camargo, P.M. Fearnside, et al. 2017. An Amazonian rainforest and its fragments as a laboratory of global change. *Biological Reviews*, 93(1). 25 pp.

¹⁰ Pfeifer et al 2017.

¹¹ Pfeifer et al 2017.

¹² Biasotto and Kindel 2018.

¹³ Ortega, Y.K., and D.E. Capen. 1999. Effects of forest roads on habitat quality for ovenbirds in a forested landscape. *The Auk*, 116(4): 937–94.

¹⁴ <https://www.maine.gov/ifw/fish-wildlife/wildlife/wildlife-action-plan.html#greatestneed>

¹⁵ Chapin, T.G., D.J. Harrison, and D.D. Katnik, 1998. Influence of landscape pattern on habitat use by American marten in an industrial forest. *Conservation Biology*, 12: 1327–1337.

¹⁶ Askins, R.A. 2002. Restoring North America’s birds: lessons from landscape ecology. Yale University Press, New Haven, Connecticut.

¹⁷ Blake, J.G., and J.R. Karr. 1984. Species composition of bird communities and the conservation benefit of large versus small forests. *Biological Conservation*, 30: 173–187.

As previously noted, most of the land surrounding Segment 1 is privately-owned working forest, traversed by logging roads and marked by a patchwork of forests in various age classes and harvest conditions. Nonetheless, approximately 48% of the forest in the Western Mountains is more than 3,300 feet from a public road or major logging road, which is beyond the distance of most edge effects (McMahon 2018). By contrast, only 5% of forestland in southern Maine is beyond this threshold¹⁹, and globally this figure is about 30%²⁰. ***Assuming an edge effect of just 330 feet, the acreage affected by Segment 1 of NECEC jumps roughly five-fold to 5,000 acres, and assuming an edge effect of 1,000 feet, the acreage affected increases nearly fifteen-fold.***

3.1.3 Introduction of Invasive Species

Utility corridors may serve as conduits for the movement and spread of invasive exotic species.²¹ Most invasive plant species in Maine thrive on disturbed and early successional sites, such as old fields, roadsides, and utility corridors. Invasive plants such as Japanese honeysuckle, glossy buckthorn, Japanese barberry, and Japanese knotweed have the potential to profoundly alter forest ecosystems by colonizing forest edges, and they may penetrate far into the forest interior, degrading or eliminating habitat for native plants.²² There are a number of locations in southern Maine such as the Rachel Carson National Wildlife Refuge where this alteration is already occurring.

Overall the region surrounding the proposed NECEC corridor has few invasive species documented, probably because large forest blocks resist woody plant invasions better than land that has a history of agricultural or residential use.²³ The current rarity of invasive plants in the region increases the importance of keeping them out, because after new populations establish in remote locations, they may go undetected or controlled for many years, and control becomes virtually impossible once populations have gained a strong foothold.

3.1.4. Other Impacts

In addition to impacts associated with forest loss and creation of edge, other impacts from utility corridors may include bird and bat collisions with transmission lines, and electromagnetic radiation on wildlife. This is not my area of expertise but I would note that Fernie and Reynolds²⁴ have reported that exposure of birds to electromagnetic radiation “altered the behavior, physiology, endocrine system, and the immune function of birds, which generally

¹⁸ Whitcomb, R.F., C.S. Robbins, J.F. Lynch, et al. 1981. Effects of forest fragmentation on avifauna of the eastern deciduous forest. Page 125-205 in R.L. Burgess and D.M. Sharpe (eds.), Springer-Verlag, New York.

¹⁹ McMahon, J. 2018. The Environmental Consequences of Forest Fragmentation in the Western Maine Mountains. Occasional Paper #2 for the Maine Mountain Collaborative.

²⁰ Haddad, N.M., L.A. Brudvig, J. Clobert, et al. 2015. Habitat fragmentation and its lasting impacts on Earth's ecosystems. American Association for the Advancement of Science. *Science Advances*, 1, 9 pp

²¹ Forman, R.T.T., and L.E. Alexander. 1998. Roads and their major ecological effects. *Annual Review of Ecological Systematics* 29: 207–231.

²² Charry, B. 1996. *Conserving wildlife in Maine's developing landscape*. Maine Audubon Society, Falmouth, Maine.

²³ Mosher, E.S., J.A. Silander, Jr., and A.M. Latimer. 2009. The role of land-use history in major invasions by woody plant species in the northeastern North American landscape. *Biological Invasions* 11: 2317.

²⁴ Fernie, K.J., and J. Reynolds. 2005. The effects of electromagnetic fields from power lines on avian reproductive biology and physiology: A review. *Journal of Toxicology and Environmental Health, Part B*, 8: 127–140.

resulted in negative repercussions on their reproduction or development. Such effects were observed in multiple species, including passerines, birds of prey, and chickens in laboratory and field situations, and in North America and Europe.”

3.2 Cumulative, Long Term Consequences

Many forest fragmentation impacts are not immediate and may in fact take years, or even decades, to fully play out on the landscape. Tere and Parasharya²⁵ note that, “the cumulative effects of power lines and other sources of mortality might be noticed only after a few decades, making it difficult to reverse population declines.” If, for example, the edge effect of a powerline causes just a 10% decline in reproduction rate of a population deterred from crossing a powerline each year, over many years the cumulative impact of this may have a significant lag time, whereby impacts created today set in motion a population decline that is not fully manifested for years to come. The regulatory framework often falls short in acknowledging cumulative impacts. Bisotto and Kindel²⁶ note that most impact assessments neglect the long-term effects of transmission lines on biodiversity.

Immediate impacts from fragmentation may be deceiving. In one relevant study in Maine’s working forestlands, Hagan et al.²⁷ found that densities of some forest-dwelling bird species actually increased within a forest patch soon after the onset of fragmentation, reflecting displaced individuals packing into remaining habitat. However, because many forest songbirds are highly territorial during the breeding season, nesting productivity was actually lower in these densely populated habitats.

As noted previously, pine marten in Maine prefer mature forests, and much prior work has focused on quantifying their habitat requirements. Studying marten populations in northern Maine, Legaard et al.²⁸ and Simons-Legaard et al.²⁹ suggest that forest harvest practices on much of Maine’s commercial forestland are creating young habitat that no longer serves the needs of marten. As a result, the forest management practices of today are likely to have a detrimental impact on pine marten in the future.^{30,31} Indeed, given that marten is an “umbrella species” (i.e., a species whose habitat overlaps the habitat of many other species), we should be concerned that the cumulative impact of logging roads, harvest practices, and powerlines may be creating a challenging future for many other species that use similar habitat.

²⁵ Tere, A., & Parasharya, B. M., 2011. Flamingo mortality due to collision with high tension electric wires in Gujarat, India. *Journal of Threatened Taxa* 3: 2192–2201

²⁶ Biasotto and Kindel 2018.

²⁷ Hagan, J.M., W.M. Vander Haegen, and P.S. McKinley. 1996. The early development of forest fragmentation effects on birds. *Conservation Biology*, 10: 188–202.

²⁸ Legaard, K.R., S.A. Sader, and E.M. Simons-Legaard. 2015. Evaluating the impact of abrupt changes in forest policy and management practices on landscape dynamics: Analysis of a Landsat image time series in the Atlantic Northern Forest. *PLoS ONE*, 10(6): e0130428.

²⁹ Simons-Legaard, E.M., D.J. Harrison, and K.R. Legaard. 2018. Ineffectiveness of local zoning to reduce regional loss and fragmentation of deer wintering habitat for white-tailed deer. *Forest Ecology and Management*, 427: 78–85.

³⁰ Simons-Legaard, E.M., D.J. Harrison, W.B. Krohn, and J.H. Vashon. 2013. Canada Lynx occurrence and forest management in the Acadian Forest. *The Journal of Wildlife Management*, 77: 567–578.

³¹ Simons-Legaard 2018.

In addition to the cumulative impacts cited above, forest fragmentation likely increases the vulnerability of Maine's native flora and fauna to climate change.^{32,33} This is true because movements of individuals and ultimately entire populations is the main ways that species respond to climate change. According to McMahon, "The resiliency of the Western Maine Mountains in the face of climate change is largely due to the extent and connectivity of the region's forests."³⁴ In short, when we consider the long-term, cumulative nature of fragmentation impacts, the forest of western Maine may already be stressed by forestry roads and the addition of the NECEC could, while not the "straw that breaks the camel's back", still be a log that significantly weakens the camel.

4. Shortcomings of the Proposed Mitigation Plan

The NECEC corridor would be one of the largest fragmenting features in the region, and as previously noted, there really is no comparable precedent for assessing the impacts to wildlife connectivity. CMP has made adjustments to its original compensation plan to accommodate for corridor impacts to white-tailed deer (particularly wintering habitat) and a few selected rare species (roaring brook mayfly and northern spring salamander). While deer have been identified in this process because of their regulatory standing, there are approximately 800 species of vertebrate wildlife in Maine and thousands of species of invertebrates, and many hundreds of species are present in the region affected by this corridor. Although habitat fragmentation affects different species in different ways, it is clear that many other species would be affected in addition to deer. These include birds such as scarlet tanager and black-throated blue warbler, mammals including pine marten and Canada lynx, amphibians such as spotted salamander and wood frog, and reptiles such as the wood turtle. ***The proposed mitigation and compensation plan does not adequately address the cumulative impacts to the full array of Maine's wildlife.***

5. Conclusion

Because of the global ecological importance of this region and the substantial length of new corridor, it is challenging to find comparable examples of regulatory review and commensurate mitigation and compensation. It is my contention that, based on the evidence presented above, CMP has not made adequate provisions for the protection of wildlife and fisheries. If in fact the project is permitted, I believe that the DEP should recommend that either: A) the proposed mitigation package needs to be substantially increased (by significantly expanding some of the existing strategies proposed for Segment 1), and/or B) the compensation package needs to be considerably increased to conserve land commensurate with the impacts, as outlined by TNC.

³² Fernandez, I.J., C.V. Schmitt, S.D. Birkel, et al. 2015. *Maine's climate future: 2015 update*. University of Maine, Orono, Maine. 24 pp.

³³ Rustad, L., J. Campbell, J.S. Dukes, et al. 2012. *Changing climate, changing forests: The impacts of climate change on forests of the northeastern United States and eastern Canada*. Gen. Tech. Rep. NRS-99. USDA Forest Service, Northern Research Station. Newtown Square, Pennsylvania. 48 pp.

³⁴ McMahon 2018

By: MLH
Malcolm L. Hunter, Jr., PhD.

Date: 25 Feb 2019

The above-named Malcolm L. Hunter Jr. did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Althea Tibbetts
Notary Public/Attorney at Law

Date: 02/25/2019.

Althea Tibbetts
Notary Public, State of Maine
My Commission Expires: My Commission Expires August 12, 2025

**STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

and

**STATE OF MAINE
LAND USE PLANNING COMMISSION**

IN THE MATTER OF:

CENTRAL MAINE POWER COMPANY)
25 Municipalities, 13 Townships/Plantations,)
7 Counties)

L-27625-26-A-N)
L-27625-TB-B-N)
L-27625-2C-C-N)
L-27625-VP-D-N)
L-27625-IW-E-N)

CENTRAL MAINE POWER COMPANY)
NEW ENGLAND CLEAN ENERGY CONNECT)
SITE LAW CERTIFICATION SLC-9)

) APPLICATION FOR SITE LOCATION OF
) DEVELOPMENT ACT PERMIT AND
) NATURAL RESOURCES PROTECTION
) ACT PERMIT FOR THE NEW ENGLAND
) CLEAN ENERGY CONNECT

**REBUTTAL TESTIMONY OF GREG CARUSO OF PRE-FILE TESTIMONY
OF ROBERT MEYERS (GROUP 3)
AND LARRY WARREN AND JOSEPH CHRISTOPHER (GROUP 7)**

1 ***Rebuttal of Pre-filed Direct Testimony of Robert Meyers, Maine Snowmobile Association***

2 On page 2, paragraph 4, Bob Meyers writes “I have never heard a single complaint about seeing
3 or snowmobiling in the vicinity of a power line.” There is no doubt that he IS hearing complaints
4 from MSA members about the potential scenic impacts of the powerline in the Coburn/Johnson
5 Mountain trail system but is choosing to ignore them. Mr. Meyers has a seemingly uncaring
6 attitude toward his membership and the Coburn/Johnson Mountain trails systems including ITS
7 87, 89, the Coburn Mountain Connector, the North Shoulder Bypass and the Coburn Summit
8 Trail. In fact his membership, myself included, understand the riding public would be inundated
9 with obtrusive views in an upper alpine environment with the line crossing the trails at least eight
10 times and incurring large, in-your-face elevation changes from the time the trail crosses Route
11 201 until it reaches the Spencer Road.

12 One can appreciate having access on private land, but by industrializing it from a working forest,
13 the very nature of the use is changed - and with it, the remote character of the tourist destination
14 such as the Coburn/Johnson Mountain area. Such a change of designation demands that at the
15 very least, the line should be placed underground in critical areas where scenic impacts are high
16 and have a large draw of tourism. None of this have been proposed by CMP or asked as a
17 concession by Mr. Meyers. In addition to that, there have been no use studies by CMP with the
18 thousands upon thousands of snowmobilers that visit this area each year.

19 As a groomer, snowmobiler and MSA member for well over 20 years, I can attest that
20 powerlines, when used on snowmobile trails, are only used as means of egress to a destination
21 when absolutely no other option exists. They are bypassed regularly whenever possible because
22 they are an unimproved surface that doesn't hold snow well, is boulder-strewn, full of spring
23 holes and swamp mud.

1 Coburn/Johnson Mountain area is the destination. The proposed line will not be part of the trail
2 but crisscross and fragment that very destination.

3 ***Rebuttal to Pre-filed Direct Testimony of Larry Warren, WM&RC***

4 Page 4, paragraph 1 states that “as noted by CMP, snowmobilers are accustomed to seeing
5 transmission corridors and traveling in cleared corridors. So it is unlikely that the project would
6 have an impact on their continued enjoyment of the snowmobile trails.” This statement begs the
7 question, was there any user study completed in critical destination areas that this line would
8 affect? The answer is NO. In my professional experience, snowmobilers are not accustomed to
9 seeing powerlines in remote alpine, non-industrialized areas. It would most certainly diminish
10 their experience if the transmission line dramatically affects the very destination they are
11 planning on traveling to. He also states on page 4, paragraph 1, “that hikers experiences should
12 also not be adversely impacted by the project.” To which again, begs the question, were any user
13 studies done? Who did they ask? Would a transmission line above the Maine Huts and Trails
14 system affect the hikers there as it would on Coburn Mountain or Number 5 Mountain?
15 He goes on to say on page 4, paragraph 2, “In areas where hikers may see or pass under the
16 Project, the Project does not adversely impact existing scenic aesthetic and recreational uses and
17 employs buffers where necessary to minimize impact.” Again, there are no buffers from the top
18 of Coburn, Number 5, Pleasant Pond, Moxie Bald or other mountains where hikers frequent.
19 And again there was no attempt to bury the lines from view in these destination areas.
20 Mr. Warren also states in page 6, paragraph 2 that “the existing forest are hardly in pristine or
21 wilderness condition.” While Mr. Warren points out that the working forest of the area has been
22 overworked, it is still a remote wilderness area, pristine in the fact that it is not industrialized and
23 scarred by unnatural materials inconsistent with existing uses. Mr. Warren, of all people,

1 understands that but chooses to ignore it to benefit his huts and trails system. Why has he not
2 arranged to place new huts or trails in or on the NECEC corridor? After all, according to Mr.
3 Warren and CMP, “hikers should not be adversely affected by the Project.”

4 The hypocrisy of this testimony is overwhelming.

5 ***Rebuttal to Pre-filed Direct Testimony of Joe Christopher, WM&RC***

6 On page 4, paragraph 2, Joe states: “The characterization by intervenors that these areas are
7 ‘pristine,’ ‘untouched,’ and ‘natural’ are misleading and simply not true.”and that “CMP has
8 proposed the NECEC in a manner that seeks to minimize adverse impacts of the project upon the
9 experience of hikers, hunter, rafters, anglers or other users of the wilderness whose activities
10 may take them into the vicinity of the NECEC.” I ask, “How?” The working forest has been cut
11 over but is not industrialized with steel and concrete. So by saying something is pristine,
12 untouched or natural, that is referring to the LACK of any manmade industrial structures.
13 Trees, stumps, brush, gravel, and water are all natural...steel and concrete, 100’ towers are NOT.
14 This is a dramatic change of usage that should require at the very least an underground
15 alternative.

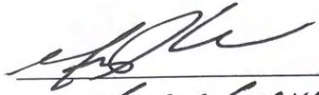
16 Page 4, paragraph 3 also says “CMP has proposed to site the line in a manner that seeks to avoid
17 the impact on these areas and have proposed buffers to help ensure that water bodies are
18 protected.” When looking at the maps of the line over Coburn/Johnson Mountain, the line would
19 make dramatic elevation changes along high alpine areas, full of springs and swamps and
20 headwaters to important streams and brooks with abundant brook trout habitat. Herbicide spray
21 to keep miles of powerline clear will most certainly end up in these water bodies. So how are
22 they being protected by an overhead line? Burying the lines under the current logging roads
23 would remedy this, but it is obvious that CMP has not considered this option.

1 Paragraph 3, Joe states “the project also proposes other buffers that will allow for the movement
2 of animals between important habitats and help shield adjacent uses from unsightly
3 developments...” This statement is overwhelmingly false. By CMP not considering an
4 underground option under current logging roads, further fragmentation of forest areas in the
5 Coburn/Johnson Mountain area will be abhorrently evident with the dramatic elevation changes
6 and crisscrossing of logging roads. In addition, the line will be carved through existing buffers
7 between current cutting areas, assuring that animal movements between important habitats are
8 further degraded. Furthermore, the suggestion that the project buffer “will help shield adjacent
9 uses from unsightly development” is an oxymoron. Considering the high visibility, high
10 elevation, 100’ towers with red, blinking lights, crisscrossing of snowmobile trails and
11 dramatically wide linear shape, they are assuring existing uses such as snowmobiling, hiking,
12 hunting, fishing, leaf-peeping or anything else will be ANYTHING but shielded!

13 As is clear in regards to scenic impact and existing uses, these testimonies along with CMP have
14 taken a shallow and narrow minded view of a dramatic change in use and skyline. They have not
15 given gravity to significant changes to mountain and forest, to 53 miles of wilderness area at risk
16 of industrial development. There has been no ample consideration or studies done with regards to
17 burying the line or at the very least in areas of high recreation value with maximum scenic and
18 environmental impact. The DEP and LUPC must consider the value of these remote places to our
19 fragile economy and thriving ecosystems in much more detail than these testimonies suggest
20 when charged with protecting Maine’s environment.

Date: 3/15/19

Respectfully submitted,


nt Name: Greg Canuso

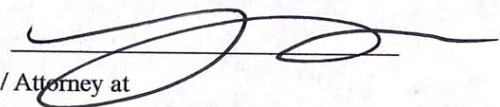
By:

Pri

STATE OF Somerset
COUNTY OF Maine

Personally appeared before me on the above- named Greg Canuso, who being duly sworn, did testify that the foregoing testimony was true and correct to the best of his/her knowledge and belief.

Before me,



Notary Public/ Attorney at

Law

My Commission expires _____

