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Good Morning, I am grateful for the opportunity to be here. I am a wildlife ecologist and professional forester and I am the founder and director of Keeping Track®. I am here today to share my thoughts as a private citizen and not on behalf of Keeping Track.

Vermont's Green Mountains, Worcester and Taconic Mountains, and numerous other ridgelines and summits are both physiographic and spiritual highlands that define our State; they rise with enduring beauty above our rural lowlands, villages and cities alike. This highest terrain is what all Vermonters look upon with awe and appreciation each day. Unlike mountain tops in other states, Vermont's ridgelines are minimally impacted by us and we like it that way. Make no mistake about it, our mountains and their clear waters, and the wildlife that thrive there are the qualities we are all proud of the minute we cross the border and come "home".

I am here today because I believe that these qualities that Vermonters love are in grave danger. I am convinced that industrial wind power turbine construction and energy production cannot be done on ridgelines within our limited wild, unfragmented forests in a manner that protects natural resources and wildlife, safeguards water quality and forest health, and assures the best interest of Vermonters. Even if there was some way to make the turbines perfectly safe for wildlife, the roads, power line corridors and other disturbances that accompany proposed wind energy facilities will not be. These facilities will introduce roadways and power line cuts into sensitive mountain terrain and such fragmenting alterations of core habitats lead to numerous damaging influences that an impressive and growing body of scientific research has elucidated. I would like to share with you the following brief summary of just a few of the impacts that we should be worried about:

IMPACTS TO CORE WILDLIFE HABITAT AND NECESSARY REFUGIA

Roads, and even trails that follow along power line corridors, introduce significant stress factors within the foraging, resting and denning habitats that sustain numerous species of invertebrates, birds, amphibians, reptiles and mammals. For example, nesting birds and denning mammals are often displaced, if not killed as a result of increased numbers of people, their pets and vehicles regularly using habitats that were formally undisturbed. Vermont's Fish and Wildlife Department bear biologist, Forrest Hammond, has acknowledged that utility-scale wind facilities may disturb or displace black bears from accessing and utilizing critical concentrated food resources, as well as important forested wetlands and ridgeline travel corridors.

IMPACTS RESULTING FROM INCREASED HUMAN ACCESS

The following negative impacts to ecosystems include habitat fragmentation, soil erosion, nutrient loading, water quality degradation, pollution, poaching and the introduction of non-native plant and animal species.

DISRUPTION OF MOVEMENT CORRIDORS

Vermont's wild ridgelines function as preferred travel routes and corridors that many wildlife species use as they access local habitat amenities as well as move about the larger landscape in order to find mates and/or disperse. Migrating birds, bats, moose, bobcats, bears and others regularly use these important pathways, and as such, ridgeline travel routes facilitate species and genetic exchange throughout an impressive assemblage of connected habitats both locally and throughout the northeast and neighboring Canada. Such corridors offer vital opportunities for demographic rescue—the ability for new individuals to reach and replenish a habitat should some stochastic event or disease cause an entire population to perish. Such intact habitats along Vermont's ridgelines will play an increasing and integral role as global climate change forces countless species of plant and animals to seek new habitats in which to adapt and survive.

ALTERED WILDLIFE BEHAVIOR AND CONSEQUENT ENERGY LOSSES

When wild animals are frightened and flushed needlessly and repeatedly their alarm and flight behaviors affect them in many ways. The cumulative effects of increased energetic demands resulting from such activities may prove too costly for some animals, especially during winter or other periods of food shortage. Vermonters have long recognized this hazard with respect to the vital need for whitetail deer on "critical winter range" to conserve their limited energy budget and *not* be harassed or disturbed by us or our dogs. Numerous studies have also demonstrated that increased mortality is a harsh reality for species that are flushed and displaced over extended periods of time. For example, birds have exhibited decreased nest fidelity and other species completely forsake what would otherwise be preferred foraging and nesting habitats. Such altered behaviors and missed opportunities for optimal food and cover insidiously compromises the fitness, sustainability and diversity of species over time.

IMPACTS BEYOND THE ROAD OR POWERLINE CUT

A road or trail alters the surrounding area far beyond its actual footprint, and has been shown to impact wildlife thousands of feet into the adjacent forest. These "distance effects", as they are called, within an area of influence surrounding a road or trail may cause displacement of wildlife from otherwise suitable habitats. For example, when a songbird's primary song is interrupted by human disturbance some bird species are reluctant to establish nesting territory. Even a single pedestrian traveling through a bird's breeding territory causes a decline in that bird's inclination to engage in courtship and breeding behavior.

IMPACTS TO BATS

At a time when northeastern bat species are severely threatened by a new disease in North America, White-nosed syndrome (WNS), any measures Vermonters can take to eliminate other causes of mortality are now more important than ever. A recent study led by Boston University researchers predicts that even Vermont's most common bat species, the Little Brown Myotis, is threatened with extinction within the next 20 years, even if current losses due to WNS lessens over time. At least 7 species of bats are known to be affected by this rapidly spreading disease, and scientists are now alarmed that significant damages to ecosystem health, structure and functions may occur as a result of this serious epidemic. Bats are obligate insectivores and contribute immeasurably to human society by their daily consumption of millions of insects that would otherwise destructively affect

forest and wildlife health, agricultural crops, and pose health hazards to people, livestock and pets. According to a new study published in *Science Magazine* bats save U.S. farmers an estimated 53 billion dollars each year as a result of their consumption of insects. Closer to home, the million bats that have already been killed in Vermont and the surrounding region due to WNS would have consumed approximately 1,320 metric tons of insects. Just one Little Brown Myotis foraging around the State House lawn during one night may consume as many as 4,000 mosquitoes and other insects. Wind power turbines kill bats and birds by the thousands. Wind turbines kill migratory bats as well; by 2020 an estimated 33,000 to 111,000 bats are predicted to be killed by turbines in the mid-Atlantic Highlands alone. Given the severity of the White-nosed syndrome epidemic any losses of bats cannot be justified or found to be acceptable in my view—not when other energy-saving and producing alternatives exist!

Air pressure drops caused by spinning turbine blades results in bat and songbird deaths. These animals die of lung damage as a consequence of being sucked into a low pressure area behind the turbine blades. At a Pennsylvania wind project average yearly fatalities for each of 23 turbines is 32 bats and 4 songbirds. In Montana, a 90 turbine wind farm near Judith Gap killed more than 1,200 bats in one year during the animals' fall and spring migrations.

Vermont's ridgelines and mountain summits--from our loftiest Green Mountains to the foothills which grace our lives--are vital for the wildlife that lives there. In the context of sobering habitat losses here in Vermont and throughout America, our choice today should be to permanently conserve these wildlands. Nation-wide, we lose an estimated 22 million acres of habitat each year—that is an area roughly 3 times the size of Vermont! To be sure, global climate change requires that each and every one of us make necessary sacrifices, change our fossil fuel-burning ways, and boldly define how we will live and share this planet with all other life in the future. Industrial wind power on Vermont's ridgelines is not the answer, however, simply because of the habitat fragmentation and destruction of biodiversity which we *know* will result.

Internationally renowned biologist, E. O. Wilson offers us this marvelously succinct definition of biodiversity. He said, "The diversity of life forms so numerous that we have yet to identify most of them is the greatest wonder of the planet. The biosphere is an intricate tapestry of interwoven life forms." Today, the consequences of our continuous human impacts (including the largest mass extinction in 65 million years) must be addressed and corrected. Here in Vermont and worldwide E.O. Wilson's "intricate tapestry of life" is at risk. Frayed in places, in unraveled disarray in others, these damaged ecosystems remind us that remaining natural habitats like our still intact mountain and foothill ridgelines must be studied and conserved permanently by the one and only species that can do these things. Indeed, if we can make the right choices in our State House, as well as at home, the enduring beauty of our mountains and the life they support will be our positive legacy—something that future Vermonters will look up to with pride.

Respectfully read in committee and
submitted by



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