April 10, 2022

To Whom It May Concern,

I wrote an article in 2004 when we formed a committee to oppose the first wind farm project being proposed in the surrounding Wentworth area. We retired to Wentworth Valley 12 years ago because of the lifestyle - 4 seasons of recreation, the beauty,wildlife, nature,peace and tranquility found here.

Three turbines were erected in the area which have not operated in the past 3 years, yet they are still standing.The size and scale of the new project is massive in comparison - 623 feet in height on top of our 900 ft. hills.

My biggest fear is our water - this is a watershed area. The Wallace River runs through our backyard. We and all our neighbors depend on crocks and springs for our drinking water.The proponet says there are only a few streams , yet drive through the valley after a 50 mm. rainstorm and you couldn't possibly count the number of run-offs coming down the mountain.

When the Trans-Canada Highway was going to pass through Wentworth, a major decision for by-passing the valley was the fear of blasting and the impact on the water.Uranium was present in the rocks.

Please read my article - I am so afraid that erecting a major industrial wind turbine site in the area is a major mistake, and once it is done, it will be too late. Thanks for your time,

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Debbie Atkinson – Notes submitted to Protect Wentworth Valley

It is frustrating that little consideration is given to wildlife and the health and functioning of intact ecosystems when building wind turbine projects.

The Cobequid Mountains are characterized by deep incised valleys and fast flowing streams. To the west of the existing turbines the roaring river flows northward to the Wallace River. To the east a number of smaller, even more deeply incised valleys fall towards the Wentworth Valley. The area is full of steep water courses, headwater ponds and bogs. According to the Nova Scotia Department of Natural Resources significant habitat database, there are significant "other habitat" within approximately 800 metres of turbines 2 & 3. This habitat known as "Talus Slopes", provide important habitat for several mammal and plant species of concern. The Cobequid Hills provide habitat for a wide range of fauna, flora, and avian species.

Fauna – deer, black bear, fox, bobcats, coyotes, snowshoe hare, fishers, beaver, muskrat and lynx. Recently there have been sightings of cougar and of course, the mainland moose.

Eight Amphibians, five freshwater mussels, three fish and one reptile of concern – the wood turtle were identified as being either known to the area or found in habitat similar to the project area.

In the watercourses of the area, brook trout are the predominant fish species. Brown trout and Atlantic salmon are also found in some of the small headwater streams and the Wallace River is a predominant spawning river for the Atlantic salmon. HAAD, a project under the federal fisheries act for "harmful alteration, disruption or destruction of fish habitat that reduces its capacity to support one or more life processes of fish – and should be considered in the construction of wind turbines.

Plant species – The Northern Bedstraw is listed on the ACCDC list as being known to the area.

The Great Horned Owl is known to nest in the forest on the slopes below Higgins Mountain Road. Goshawks (?), red-tailed hawks, barred owl, sharp-shinnied hawk, the American Kestrel, broad winged hawk were among the raptors that frequent the area. The bald eagle and turkey vulture are frequently seen along the Wallace River. There are a number of breeding bird species in the area, but the vespar sparrow and bicknell's thrush are of the most concern.

Bats – We had one of the largest bat hibernacula in the province at Lear Shaft. It is an abandoned but open vertical mineshaft located near Londonderry, Nova Scotia. According to Bridgette R. Tutty who wrote her thesis on bat hibernacula "The destruction and degradation of bat hibernacula is one of the most serious threats to global bat population". During hibernation bats are vulnerable to disturbance. Surviving depends on the amount of energy stored as fat prior to hibernation. Bats arouse naturally throughout hibernation for reasons that are unclear. The energetic cost of arousal represent 80-90%of the animals' fat store. Unnatural arousals due to any type of disturbance (which could include noise, both high and low frequency, which travel for miles) can have a significant effect on fat stores and can cause premature depletion of fat reserves and possible starvation. From the "Interim Guidelines to Avoid and Minimize Wildlife Impacts from wind turbines in the US Fish and Wildlife Service: #3: Avoid placing turbines near known bat hibernation, breeding, and maternity/nursing colonies, in migration corridors, or in flight pats between colonies and feeding areas. They go on to say wind turbines should not be installed on mountain ridges…

Bird and bat fatalities at the existing 3 turbines on Higgins Mountain is hard to determine. I spoke with Andrew Horn, who did the count for the Maritime Breeding Bird Atlas and he said carcasses at the turbines only lasted a maximum of 2 days. He said he left chicken wings at the site several times and the longest they remained was 2 days. Therefore, unless someone checked the sites several times per day for an extended period of time over several seasons an accurate count could not be made.

Birds - We have a large number of birds and raptors that live in the proposed turbine area. (see copy of Maritimes Breeding Bird Atlas sheet for Wentworth area). As with bats, studies on actual fatalities have been few and often inconclusive. Songbirds mostly migrate at night and low enough to collide with the blades of large turbines. Wind power is a unique threat to raptors (hawks, eagles, owls, etc.). As with bats raptors have very low reproductive rates and long life spans so any fatalities with turbines augment existing threats to their population. Bill Weber, Hawk Migration Association of North America, says "some hawk watchers across North America fear wind turbines may be the biggest man-made threat to these raptors, other birds and bats, since DDT caused massive population declines in the 1960s…adequate study of collision risk requires observation through whole seasons and several years, not the limited hours of non-expert observation typically cited in most feasibility studies.

Studies have been done on the effects of noise upon some bird species and quite clearly show that low frequency noise played a significant role in creating bird disturbance / displacement and was sufficient to cause serious reduction in breeding numbers in the study area. Location is the most important migrating displacement and collision risk. Current guidelines recommend avoiding areas with listed species, migration pathways or other areas where birds congregate. Cliff edges, mountain passes and areas of high prey abundance. Turbines placed on ridges appear to have a higher probability of causing bat and raptor fatalities than those at other sites.

The original EA concluded that the site is near a landform and that several provincial listed species might breed in the area. Uncommon species that might occur in proximity to the turbine location, Purple Martin, Bicknell's Thrush, Wood Thrush, Philadelphia Vireo, Eastern Meadowlark, and the Vesper Sparrow. The Bicknell's Thrush is of concern because of habitat change, low numbers, patchy distribution and low reproductive potential. This is a very secretive species so documented cases are hard to find.

Moose - Mainland moose of Nova Scotia are an endangered species. The higher elevations of the Cobequid Mountains are know to be an important moose range, especially in winter. (Tony Nette, N.S. Dept of Natural Resources). In 1996, provincial and territorial governments endorsed the "Accord for the Protection of Species at Risk (SARA). SARA protects plants and animals from the list of wildlife species at risk and makes it an offence to kill, harm, harass, capture or take an individual of a listed endangered, threatened or extirpated species, or its parts or derivatives; damage or destroy the Residence of one or more individuals of a listed endangered or threatened species, or a listed extirpated species if a recovery strategy has recommended its reintroduction into the wild in Canada.

The construction and maintenance of wind energy facilities alter ecosystem structure through vegetation clearing, soil disruption, and potential for erosion, and noise. Alteration of vegetation, including forest clearing, represents the most significant potential change through fragmentation and loss of habitat. Low frequency noise, if wild animals were exposed to, would also describe disturbance and displacement, which would be contrary to the appropriate legislation in the case of endangered species. Building of new and larger roads, access is increased. Snow removal as well as servicing the turbines, power lines plus the indirect which would be increased motor vehicle use

in the area (including off road vehicles) for recreation pursuits, would result in increased disturbance, fragmentation and habitat abandonment. Unfortunately better access – easier for poachers!

Moose have been shown to change behaviour and are displaced from preferred habitat…up to 1.6 km from cross country ski trails and snow mobile trails. Hearing and their ability to detect predators by detecting movement is basic to survival and a sense of security. Imagine the effects of the construction, maintenance and running of wind turbines…and increased traffic would have on moose. According to Tony Nette at Government of NS, "At this time we simply don't have evidence to prove the nature and extent of these concerns. Research to better describe/understand is very costly and takes years. It remains to be seen if adequate time and resources are provided to properly understand these matters before going ahead with development. ****Update: Nov 2021 NS Mainland Moose Recovery Plan***

In the Endangered Species Act, the purpose of the act is to provide for the protection, designation, recovery, and other relevant aspects of conservation of species at risk in the province, including habitat protection, while recognizing the following:

a. The goal of preventing any species in the province from becoming extirpated or extinct as a consequence of human activities.

d. All Nova Scotians share responsibility for the conservation of species at risk and governments have a leadership role to play in this regard,

h. the precautionary principle that a lack of full scientific certainty must not be used as a reason for postponing measures to avoid or minimize the threat of a species at risk in the province.

13 (1) No person shall (C) destroy, disturb or interfere with or attempt to destroy, disturb or interfere with the specific dwelling place or area occupied or habitually occupied by one or more individuals or population of an endangered or threatened species, including the nest, nest shelter, hibernaculum or den of an endangered or threatened species.

Wind power developments fragment the landscape and increasingly isolate herds and groups of moose from one another. In main pockets where mainland moose are found, the large viable herds are generally associated with the most remote wilderness areas, suggesting the cumulative threats of development, long term habitat loss and cumulative threats of development, long term habitat loss and cumulative loss of habitat…is perhaps the most serious challenges to maintaining long term viability of the mainland population. Geographic isolation increases the risk to moose of reduced health and productivity, and possibly progressive genetic deterioration and may eventually lead to local extirpations. Potential impacts of proposed wind farm developments in high elevation area, or their cumulative impacts on mainland moose using these areas are unknown and poorly addressed by existing studies in eastern North America (Recovery Plan for moose in Mainland Nova Scotia)

Wood Turtles - Another vulnerable species listed in Nova Scotia is the wood turtle. There may be as few as 2500 widely dispersed across river habitats but info suggests that the species is declining. It is of concern because even low mortality rates of adults can have serious population impacts. Threats to wood turtles include alteration and disturbance of river and stream habitats, as well as possible harm during the construction of the turbines and site development. In the original EA report it stated "directly individuals could be killed during land

clearing operations; indirectly they could be affected by a reduction in the quality and quantity of suitable habitat.

Fishers – Seldom seen by humans these solitary animals are protected. At best there are 150 fishers left in the province, mainly centred in Cumberland and Colchester Counties. Habitat loss is of major concern because a female normally occupies 4 square miles and a male 8 square miles; although between sexes, territory may overlap, apparently only one animal occupies each territory so any possible habitat loss is extremely detrimental to the existence of this species. According to the original EA study, it was stated in the report "directly individuals could be killed during land clearing operations; indirectly they could be affected by a reduction in the quality and quantity of their habitat." It goes on to say …since the footprint was limited in extent, the loss is considered minimal. Where each fisher is so territorial and this project will cover such a wide area, it could have a significant effect on the population.

(This year 2021 – We spotted a fisher in Westchester, one on the slopes of Wentworth Ski Hill and another off Old Station Road.)

Invertebrates - In the original EA report, likely to be found inhabiting the lands in the general vicinity of the 3 turbines are 4 of the listed invertebrates, ie the Early Hairstreak, the Hoary Comma, the greenstriped Darner and the Satyr Anglewing. Again the EA states "directly individuals could be killed during land clearing operations; indirectly by a reduction in the quality and quantity of suitable habitat." Also expected to be present in the area is the Monarch Butterfly which is also on the list of endangered species.

The cumulative assessment in the original EA Report: There are no proposed new works known that will take place in, or in the vicinity of, the WTG sites that might add cumulatively with the construction, operation or decommissioning of the proposed turbines to cause a significant adverse effect on the identified species of concern.

Low frequency noise and infrasound: Concludes there is a case to answer to when land based animals and freshwater creatures are exposed to noise at low Hz levels. Creatures have low acceptance levels, as their survival is more reliant upon instinct and interpretation of unusual sounds as a source of danger. Low Hz, if wild animals are exposed to, would describe disturbance and displacement, which in the case of protected species would be contrary to appropriate legislation. High levels could be lethal to animals and even low levels can be debilitating and create disturbance. Studies have been done on the effects of noise upon some bird species and quite clearly show low frequency noise played a significant role in creating bird disturbance / displacement and was sufficient to cause serious reduction in breeding numbers in the study area. Vocal communication plays an important part in the social interaction of many creatures and the imposition of noise from man-made sources could potentially disrupt the ability of species to communicate. It could introduce new and possibly disturbing behavioural factors into social groups. In captivity, it has been shown to cause increased heart rates, respiratory changes and reduction in feeding. Vibrations from wind farms have been picked up as far as 10 kilometres away. Many species use ultrasonic for a variety of tasks, communication, foraging, and navigation. Infrasound can travel long distances and has been identified as an important sound element that can be responsible for problems in reproduction in captive breeding programs. Literature suggests large animals use the infrasmic range for communication during courtship. It could have an impact in wilderness habitats for large

animals such as moose. The area of acoustic environment related to wind turbines is one that should be more clearly defined. The generation of such signals be they sonic, infrasonic or ultrasonic ranges should be documented for any technologies being deployed in wildlife habitats. There are few published studies on the scope of the acoustic element for non-human activities. Most of the literature associated with wind turbines tend to dismiss noise as a significant issue. It is known that some humans have hearing acuity beyond the normal range, and there are documented cases of humans being able to detect sounds in the instrasonic range at distances of 10s of kilometres from point of generation. Noise perceived by those living some kilometres from wind turbines, and particularly downwind or in valleys below, is caused by the pressure wave that is generated each time a turbine blade passes the tower. For a single turbine these broad band pressure fluctuations are not excessively intrusive to humans, but when several turbines operate in proximity, the pulses move in and out of phase to create a doubling and tripling or more in the sound level, depending on how many are together. The noise heard directly underneath is no indication of the noise heard by those living some distance away. It will be worse at night. The Wentworth Valley should be considered as a quiet zone, and for those who live in a rural environment where background noises are exceptionally low, the noise is even more intrusive. In the animal kingdom this is even more magnified!

Water: Many people who live in the Wentworth Valley rely on springs, have dug wells or point-wells. The quality of surface water is extremely important. Many have tried to dig wells and have gone to depths of 400 feet or more and have not hit bed rock. Any construction, from putting in roads, improving existing roads, the building of turbine sites, excavation, blasting, etc. will have an affect on our drinking water! Added to this issue , the area is known to have uranium, which is very water soluble and is linked to MS. This should be a major concern for those of us who do not have drilled wells. Acidic soils are also typical in the area. Exposing sulphide minerals to the air triggers the oxidation of pyrrhotite which leads to the production of acidic drainage. The sulphide-bearing veins do occur in the granite rock in the area. The Wallace River flows right through the valley – one of the cleanest salmon spawning rivers in the province.

In conclusion, the industrial wind projects proposed for the Wentworth Valley are going to affect many endangered and listed species of plants and animals. The best area to put in wind farms of this magnitude is already cultivated land where the impact is less felt. We are still in a learning phase…we have the opportunity to learn before plowing ahead and wishing later that we had done better research. Doing proper studies will be very costly and take time. That will be difficult for industry and much of the public to accept because there is an urgent need to develop alternate energy sources. Wentworth Valley is not the place to put an industrial wind projects.

"Any society which does not insist upon respect for all life must necessarily decay!"
- Albert Einstein.