STATE OF NEW YORK
SUPREME COURT ALBANY COUNTY

In the Matter of the Application of

PROTECT THE ADIRONDACKS! INC.,

Plaintiff-Petitioner,

for a Judgment Pursuant to
Section 5 of Article 14 of
the New York State Constitution,
and CPLR Article 78,

-against-

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION and
ADIRONDACK PARK AGENCY,

Defendants-Respondents.

AFFIDAVIT OF STEVE SIGNELL

INDEX NO. 2137-13

RJI NO.01-13-ST-4541

STATE OF NEW YORK)
)SS.:
COUNTY OF SCHENECTADY)

Steve Signell, being duly sworn, deposes and says that:

1. I am a forest ecologist who has been retained by Plaintiff-Petitioner Protect the Adirondacks! Inc. ("Plaintiff") to provide expert advice and opinions about the degree of tree cutting and destruction of timber that has and will take place during the construction of Class II Community Connector snowmobile trails in the Adirondack Forest Preserve, and about the ecological impacts to the Forest Preserve from the construction and maintenance of such trails.

2. I earned a Bachelor's of Science degree in Resource Ecology & Ecosystem Management from the University of Michigan

and a Master's of Science degree in Forest Science from The Pennsylvania State University. I have expertise in forest ecology, landscape ecology, dendrochronology, geographic information systems, and related fields. I currently own and operate Frontier Spatial, LLC, a geographic information systems company. I have published academic papers in the journals *Landscape Ecology* and *Journal of Vegetation Science*. I have also published articles on forests in *Advances in Environmental Research* and *The ABCs of Ecology: An Educators Guide to Learning Outside*. A copy of my C.V. is annexed hereto as Exhibit A.

3. I make this affidavit in support of Plaintiff's motion for summary judgment in this action.

4. This action "seeks to enjoin the Defendants from constructing certain new snowmobile trails in the Adirondack Forest Preserve and to obtain a declaratory ruling that the creation of certain new snowmobile trails in the Forest Preserve, sometimes known as 'Class II' and 'Community Connector' trails, is a violation of Section 1 of Article 14" of the New York State Constitution. Complaint, ¶ 1.[1]

[1]A copy of the Plaintiff's Complaint is being submitted simultaneously herewith for the convenience of the Court.

5. Defendant-Respondent New York State Department of Environmental Conservation ("Defendant" or "DEC") proposes to construct a "community connector snowmobile trail network for the entire [Adirondack] Park". Community Connector Trail Plan dated July 2015, p. 11. A copy of the entire Community Connector Trail Plan is annexed hereto as Exhibit B.

Counting Trees in the Forest Preserve

6. When counting trees to be cut for the construction of snowmobile trails, DEC counts only trees larger than 3 inches in diameter at breast height ("DBH"), but there is little support in the scientific literature or in forestry/silvicultural guidelines for using this number. Furthermore, using a cutoff based on forestry and silvicultural principles is inappropriate on the Forest Preserve, as the Forest Preserve is explicitly NOT managed for commercial value, but for ecological preservation. Therefore, ecological principles should be used to define a tree. The ecological perspective supports either: a) using 1" DBH as a lower limit; or b) counting all individuals, regardless of size.

7. The word 'tree' has several meanings, but in the context of botany, forestry and ecology there is general agreement (Table 1) that the term refers to a class of plants having the following attributes: a) Is a woody plant; b) Has a growth form

consisting of a main trunk and distinct crown; and c) Is capable of reaching a considerable height at maturity. None of the definitions for "tree" include mention of a lower size limit, or that an individual must be of a certain age, rather it must only be *capable* of growing to a large size at maturity. In scientific terms therefore, even small seedlings are considered to be trees since they meet the criteria just as adequately as mature individuals. Some common plant species in the Adirondacks that meet these criteria and thus are considered to be trees include White Pine, Sugar Maple, Eastern Hemlock, American Beech, Yellow Birch, Balsam Fir, Red Spruce, Quaking Aspen, Red Maple and Paper Birch.

Table 1: Common and forestry-related definitions for the term 'Tree'.

Source	Tree
FreeDictionary[2]	A perennial woody plant having a main trunk and usually a distinct crown.
Merriam-Webster[3]	A woody perennial plant having a single usually elongate main stem generally with few or no branches on its lower part.
Glossary of Terms Used in Timber Harvesting and Forest Engineering[4]	Woody plant that usually grows to at least 20 feet in height at maturity, typically having a single trunk with no branches within 3 feet of the ground

[2] The Free Dictionary: http://www.thefreedictionary.com.
[3] Merriam-Webster Dictionary: http://www.merriam-webster.com/dictionary.
[4] Stokes, Bryce J.; Ashmore, Colin; Rawlins, Cynthia L.; Sirois, Donald L. 1989.Glossary of Terms Used in Timber Harvesting and Forest Engineering. Gen. Tech. Rep. SO-73. New Orleans, LA: U.S. Dept of Agriculture, Forest Service, Southern Forest Experiment Station. 33 p. http://www.srs.fs.usda.gov/pubs/gtr/gtr_so073.pdf.

Northeastern Forest Inventory & Analysis: Common Definitions[5]	Woody plants that have well-developed stems and that usually are more than 12 feet tall at maturity.

8. Despite this seemingly straightforward meaning, there is still considerable confusion surrounding the term "tree" because of its common (lay) meaning and its usage in forestry and silviculture to refer only to individuals that have *already* grown to be a specified size. In commercial forestry and silviculture, where the goal is managing trees for monetary return, the terms seedling, sapling, pole-timber and saw-timber are used to differentiate larger, more valuable (i.e. "merchantable") trees from smaller, less valuable ones (Table 2). Note that there is no general agreement about which size cutoffs to use, and explicit acknowledgement that the cutoffs can vary regionally. What is considered merchantable varies from place to place and is beholden to many factors including market forces of supply and demand, availability and capacity of saw/pulp mills, fuel prices and developments in technology. For example, the recent expansion of the woodchip industry in New York State alters the equation of what is merchantable since wood chippers can process trees of any size and condition.

[5] United States Forest Service Northeastern Forest Inventory & Analysis Methodology: http://www.fs.fed.us/ne/fia/methodology.

Table 2: Forestry definitions for the terms 'Sapling', 'Seedling','Poletimber' and 'Sawtimber'.

	Seedling	Sapling	Poletimber	Sawtimber
Glossary of Terms Used in Timber Harvesting and Forest Engineering	Young tree grown from seed, from the time of germination until it reaches sapling size	Young tree less than 4 inches in d,b.h. The minimum diameter of saplings is usually, although not always, placed at 2 inches	Arbitrary term for small sawtimber trees; generally, trees 12 to 18 inches in d.b.h. Also known as small sawtimber.	Trees suitable for production of saw logs
Northeastern Forest Inventory and Analysis: Common Definitions	A live tree less than 1.0 inch d.b.h. and at least 1 foot tall.	All live trees 1.0 inches through 4.9 inches d.b.h.	A live tree of commercial species meeting regional specifications of soundness and form and at least 5.0 inches in d.b.h., but smaller than a sawtimber tree.	A live tree of commercial species at least 9.0 inches d.b.h. for softwoods or 11.0 inches for hardwoods, containing at least one 12-foot sawlog or two noncontiguous 8-foot sawlogs, and meeting regional specifications for freedom from defect.

9. DEC's contention that individuals smaller than 3" DBH should not be counted as trees is a relic of an institutional silvicultural mindset that stretches back many decades. This cutoff *may* be appropriate for state-owned forests where logging operations are permitted, but not within the Forest Preserve where the explicit goal of management is to maintain ecological integrity and commercial cutting is expressly prohibited. It makes no sense, therefore, to decide which trees to count based

on an arbitrary size limit that is dependent on so many outside factors and that can change over time.

10. Furthermore, DEC has provided no rationale to explain their use of 3" DBH rather than a more broadly accepted standard such as the 1-inch cutoff (Table 3) used in the USFS Forest Inventory and Analysis (FIA), the most widely-accepted and used standard forest inventory in the United States. The only reference I have found anywhere to using 3" DBH as a cutoff comes from the state-level FIA data products (Table 3), some of which apparently use an arbitrary 3" DBH rule. However, there is no evidence to show that this number is actually used in any of the FIA analysis or reporting. The 136-page 'New York Forests 2012' report from the USDA touted on DEC's web page[6] contains not one single reference to 3" DBH trees. What is referenced, over and over, are "saplings" (1"-4.9") and "trees 5 inches and over." These are often lumped together in charts, statistics and in discussions of ecological function such as biomass and carbon sequestration, precisely because both size classes are considered to be trees. In fact, the FIA Field Manual defines a "tree" as having a diameter of 1.0 inch or more, which includes "saplings", while seedlings (having a diameter less than 1.0 inch) are not included (Table 3). The

[6] DEC's New York Forests 2012 report is available at http://www.dec.ny.gov/lands/92874.html.

Court should use the more widely accepted cutoff of 1" DBH (such as the FIA's), rather than DEC's wholly arbitrary number of 3" DBH, when taking into account the number of trees cut by DEC. See representative pages and DEC website annexed as Exhibit C.

Table 3: Definitions from various sources from the FIA for the terms 'Tree', 'Sapling' and 'Seedling'. (emphasis added)

	Tree	Sapling	Seedling
Forest Inventory and Analysis National Core Field Guide[5]	Data describing saplings with a diameter 1.0 inch through 4.9 inches, and trees with diameter greater than or equal to 5.0 inches	Trees with a diameter at least 1.0 inch but less than 5.0 inches	Data describing trees with a diameter less than 1.0 inch and greater than or equal to 0.5 foot in length (conifers) or greater than or equal to 1.0 foot in length (hardwoods).
Forest Inventory and Analysis Glossary (State Reports) [6]	A woody perennial plant, typically large, with a single well-defined stem carrying a more or less definite crown; **sometimes defined** as attaining a minimum diameter of 3 inches and a minimum height of 15 ft at maturity. For FIA, **any plant on the tree list in the current field manual is measured as a tree.**	Live trees 1.0 to 4.9 inches in diameter (DBH/DRC)	Live trees smaller than 1.0 inch DBH that are at least 6 inches) in height for softwoods and 12-inches in height for hardwoods.

11. Rather than focus on diameter limits and commercial value, an ecologist's goal is to understand the interactions between organisms and their environment. Hence, terms like poletimber and sawtimber are meaningless, and the terms seedling and sapling have a different meaning relating more to biological function and life history rather than strict size limits. The biological functionality of a sapling is essentially the same as the largest overstory tree -- they just happen to be smaller.

These small trees have survived long enough in the forest understory to have established a robust root system and have secured enough light and nutrient resources to persist for years, decades or even centuries alongside their larger neighbors (Barnes, Burton V., et al. Forest Ecology. N. Ed. 4. John Wiley and Sons, 1997). Indeed, many trees between 1 and 3 inches that I observed along cut sections of Class II Community Connector snowmobile trails are decades old, proving they are well established members of the forest ecosystem. (Table 4).

Table 4. Estimated age of discarded tree cross-sections left over from the cutting along the Hyslop-Roosevelt and Roosevelt-Boreas trail sections. I estimated the age of the tree by counting the annual growth rings on these trees. Red Spruce are over-represented in this sample due to their abundance and easily-discernable growth rings. This is a small sample of the total number of small trees cut by the DEC.

Species	Diameter (inches)	Estimated Age
Red Spruce	2.3	85
Red Spruce	1.1	59
Red Spruce	2.6	54
Red Spruce	2.75	54
Red Spruce	2.3	49
Red Spruce	2.1	39
Red Spruce	2.75	39
Red Spruce	1.1	38
Red Spruce	1.75	38
Red Spruce	1.3	37
Red Spruce	1	36

Red Spruce	1.2	34
Red Spruce	1.25	34
Red Spruce	1.75	34
Red Maple	2.8	34
Red Spruce	0.8	32
Red Spruce	1.25	32
Red Spruce	1.6	31
Red Spruce	1.1	30
Red Spruce	1.5	30
Red Spruce	1.75	30
Red Spruce	1	29
Red Spruce	1.1	28
Red Spruce	0.75	27
Red Spruce	1.4	26
Red Spruce	1.75	26
Red Spruce	1.8	25

12. On the other hand, most of the small trees that a forester would call "seedlings" are ephemeral in nature; surviving only a few days, months, or years and leaving virtually no trace behind when they die (Barnes, et. al. 1997). Seedlings lack well-developed root systems and have not yet acquired the light resources they need to become long-lasting members of the forest community. The number of seedlings can vary widely from year to year and they are highly susceptible to

mortality due to all sorts of factors such as drought, flood, temperature, pollination, germination conditions, etc.[7] The biological functionality and ecological role of very small trees is fundamentally different than that of saplings and larger trees. There is therefore a strong ecological case to be made for counting all individuals larger than 1" DBH as trees, similar to the FIA protocols.

Sampling Protocols

13. In my preparation for testifying in this case, I visited the trails in question in order to count or estimate the number of trees that were cut, or were planned to be cut. Depending on the circumstances, I used one of three protocols to do this.

14. Protocol 1: Counting and measuring trees in cut sections: In stands where cutting had occurred prior to sampling, tree diameter was measured at stump height ("DSH") rather than the standard breast height ("DBH") used for standing trees. Data was collected on a mobile device equipped with Fulcrum, a mobile application for field data collection ("Fulcrum App"). For each stump greater than 3 inches DSH, GPS location was recorded (accuracy ~5m) and a photograph taken of

[7] Gilliam, Frank S., ed. *The herbaceous layer in forests of eastern North America*. Oxford University Press, 2014.

the stump and measuring tape. In order to best approximate the diameter of the tree at breast height, all diameters were rounded down to the nearest inch, and stump measurements were always taken across the smallest possible diameter (Figure 1). In the analysis for cut segments, only trees with DSH >4 inches were counted as having a DBH >3 inches. Smaller stumps were simply tallied along 0.1-mile subsections of trail.

Figure 1: Photograph of stump illustrating how measurements were taken across the smallest diameter possible.

15. Protocol 2: counting and measuring trees in uncut sections: In stands where cutting had not occurred prior to sampling, diameter at breast-height (4.5 feet) was used to measure trees. In all uncut sections, two tallies were kept: one for trees larger than 3" DBH, and one for those smaller than 3" DBH. Additionally, in the Polaris Bridge Trail (described below), Boreas River to Hewitt and Stony Pond to Minerva

sections of the Minerva-Newcomb-North Hudson Class II Community Connector snowmobile trail (described below), smaller trees were further subdivided into 1-3" DBH and <1" DBH classes and tallied separately. I only counted trees that were painted or were unpainted but clearly within the cutting corridor, e.g. many of the smaller trees. Trees marked with flagging tape that were outside the clearly delineated, painted corridor were not counted.

16. Protocol 3: assessing ecosystem/habitat characteristics and trail impacts: Observation control points were established every 0.10 mile along each trail section in order to collect information on ecosystem/forest characteristics and trail impacts. The points were established in a Geographic Information System ("GIS") and then loaded into the Fulcrum App, a smartphone based scientific field inventorying program, on a mobile device. These points were then located in the field and the following data were collected:

- A description of the general overstory, understory and groundcover characteristics of the site, along with notable information about disturbance history, stand age, soil conditions, landform, etc.
- Four photographs: one northward along the cut or marked trail, one southward along the cut or marked trail, and a

photo to either side looking into the uncut areas of forest to the East and West.

- o A video showing a 360 degree view of the forest at that location.

17. In addition to the 0.1 mile observation control points, I also collected locations and photographs of notable features such as old growth trees, water crossings, heavily graded areas, and erosion on an ad hoc basis.

Evaluation of Class II Community Connector Snowmobile Trails in the Forest Preserve

18. To date, the Class II Community Connector snowmobile trail network consists of numerous trails, including, but not limited to, the following trails:

A. Newcomb to Minerva to North Hudson Trail;

B. Seventh Lake Mountain Trail;

C. Polaris Bridge Trail;

D. Cooper Kiln Trail; and

E. Gilmantown Trail.

19. As shown below, these five trails, which account for 36,5 miles, will result in significant destruction of the Forest Preserve. Over 31,000 trees have been, or will be, cut for the construction of these trails. A table summarizing all of the tree cutting data discussed below is annexed hereto as Exhibit D. Note that the number of cut trees in actually much higher

but many stumps were removed during grading with heavy machinery of various sections of the trails above. Two additional tables showing trees cut or to be cut by DEC are annexed hereto as Exhibit E.

A. Newcomb to Minerva to North Hudson Trail

20. As the Court is aware, DEC is in the process of constructing an approximately 40-mile long Class II Community Connector ("Class II CC") snowmobile trail that would begin in Minerva, New York and head north, where it will split into two branches, with one branch going west towards Newcomb, New York and the other branch going east towards North Hudson, New York. Hereinafter the trail will be referred to as the "Minerva-Newcomb-North Hudson Class II CC Trail". A map of the Minerva-Newcomb-North Hudson Class II CC Trail is annexed hereto as Exhibit F. As shown on the map, the Minerva-Newcomb-North Hudson Class II CC Trail is divided into four Sections, which are further divided into smaller segments. See Exhibit F. Approximately 15 miles of this trail will be located on State Forest Preserve lands, including lands in the Vanderwhacker Mountain Wild Forest.

21. DEC has already started cutting trees, grading with heavy machinery, and constructing several segments of the trail located in Section 1 of the Minerva-Newcomb-North Hudson Class

II CC Trail. A more detailed analysis of the cutting of trees undertaken for the construction of two of the segments in Section 1 is set forth at paragraphs 25-37, below.

22. DEC is now preparing to construct three segments of Section 2 of the Minerva-Newcomb-North Hudson Class II CC Trail. A more detailed analysis of the anticipated cutting of trees that will be undertaken for the construction of the Roosevelt Truck Trail Segment in Section 2 is set forth below at paragraphs 38-45. A more detailed analysis of the anticipated cutting of trees that will be undertaken for the construction of Segments 9 and 11 in Section 2 is set forth at paragraphs 46-64, below.

23. DEC is also constructing a bridge in Section 4 of the Minerva-Newcomb-North Hudson Class II CC Trail. According to DEC's notices in the Environmental Notice Bulletins on May 4, 2016 and June 15, 2016 (copies of which are annexed hereto as Exhibit G), 279 trees have been cut for the construction of an administrative motor vehicle bridge over the outlet of Palmer Pond in the Town of North Hudson. According to a DEC Press Release dated August 4, 2015, the "construction of a bridge over the outlet of the Palmer Pond near the hamlet of North Hudson" is the beginning of the work "on the trail connecting Newcomb and North Hudson." A copy of the DEC Press Release dated August 4, 2015 is annexed hereto as Exhibit H.

24. Attached hereto as Exhibit D is a table summarizing the trees that have been, or will be, cut for the construction of the Minerva-Newcomb-North Hudson Class II CC Trail. The table shows that 6,601 trees have already been cut, and at least another 8,544 trees will be cut in the immediate future for the construction that is about to take place on three segments located in Section 2 of the Minerva-Newcomb-North Hudson Class II CC Trail.

DEC's Construction of the Harris Lake Segment in Section 1
(Santanoni to Harris Lake)

25. On July 9, 2014 and October 28, 2015, DEC listed an action in the Environmental Notice Bulletin ("ENB") for removal of 366 trees for the Santanoni to Harris Lake segment ("Harris Lake Segment") of the Minerva-Newcomb-North Hudson Class II CC Trail. Copies of these ENB notices are attached hereto as Exhibit I.

26. I have reviewed photographs of 559 tree stumps on the Santanoni to Harris Lake segment of the Minerva-Newcomb-North Hudson Class II CC Trail. This segment of trail is 2.9 miles in total, but 1.5 miles of this trail segment traverses paved roads in the Harris Lake Campground, so tree cutting was focused on

the 1.4 miles from the Camp Santanoni parking lot to Harris Lake.

27. In addition to the 559 stumps of trees of varying sizes, more than half of the 1.4 miles of newly-created trail was heavily graded with heavy machinery. This grading created bench cuts, widened and flattened the trail, and removed and compressed a great deal of top soil. Many rocks and boulders were removed from the trail corridor and many tree stumps were obliterated.

28. In many places, where there was healthy forest on both sides of the trail, with lots of big and small trees, the heavily-graded trail corridor had no stumps at all, so there was no evidence of tree stumps to count in those places. Therefore, the count of 559 trees cut is probably a gross underestimate of the true number of trees that were cut. See Exhibit J for pictures of the heavily graded Harris Lake Trail.

DEC's Construction of the Hyslop Segment in Section 1
(Upper Hudson Woodlands Hyslop Conservation Easement to the Roosevelt Truck Trail)

29. On August 19, 2015, DEC listed an action in the Environmental Notice Bulletin for removal of 1,148 trees on a 3-mile segment of the Minerva-Newcomb-North Hudson Class II CC Trail between the Hyslop Conservation Easement and the Roosevelt

Truck Trail. See Exhibit K. The 1,148 trees to be removed were trees measuring over 3" DBH, an action DEC claims is authorized by Lands and Forests Policy # 91-2 on Cutting, Removal or Destruction of Trees and Other Vegetation on Forest Preserve Lands.

30. In October-November 2015, I hiked the length of this 2.96-mile trail section and documented all stumps according to Protocol 1. I found 4,272 stumps of cut down trees: 3,058 stumps <3" DSH ("diameter at stump height"), 193 stumps between 3 and 4" DSH, and 1,021 stumps >4" DSH. Most of the 3-4" DSH stumps that I counted were most likely not 3" DBH, and should probably be counted as small trees (1-3" DBH), bringing the small tree total to 3,251 trees, and the large tree (>3" DBH) total to 1,021 trees. My field survey found that a total of 4,272 trees were cut down, which is far beyond the DEC estimate of 1,148. See Table 1 attached hereto as Exhibit D.

31. This section of trail traverses a diverse collection of relatively young (20th Century origin) forest types including spruce-fir, northern hardwoods, aspen, pine and 2 large spruce plantations (See map attached as Exhibit L). While much of this section of trail has been part of the Forest Preserve since the 1890s (red dotted area), none of the existing trees date from this time period. Presence of aspen in the forest overstory indicates that many forests initiated following the forest fires

of the early 1900s, while tree ring counts of stumps in the spruce plantations show these trees initiated in the early 1930s, probably planted by workers at the Newcomb CCC camp that was active during this time. Other areas, such as the pine and spruce upland forests may have established on former pasture or denuded lands. This interpretation is corroborated by the 1916 fire map that shows fire and denuded lands in the area. (Note: the areas depicted on the 1916 fire map are inexact and should be interpreted as very generalized indications of how the area looked at the time). The spruce plantations and other spruce-fir dominated areas had dense pockets of tree regeneration which account for the relatively high numbers of small trees relative to many of the other trail sections.

32. The removal of 4,272 trees, both big and small, violates the Article 14, Section 1 of the New York State Constitution.

33. The 3-mile segment of the Minerva-Newcomb-North Hudson Class II CC Trail where 4,272 trees were removed covers 3.27 acres, if the trail width is 9 feet (per DEC guidelines for straight trails), or 4.35 acres, if the trail width is 12 feet (per DEC guidelines for areas with curves or slopes).[8] I did not measure the width of the trail at all locations along the length

[8] A copy of DEC's guidelines for snowmobile construction, "Management Guidance, Snowmobile Trail Siting, Construction and Maintenance on Forest Preserve Lands in the Adirondack Park", is annexed hereto as Exhibit M.

of the trail, but I observed that it was generally between 9 and 12 feet wide, though in some places it was wider.

34. At a total area of 3.27 acres, the average trees per acre removed on the segment from the Hyslop Easement to the Roosevelt Truck Trail would be 1,306 trees per acre removed.

35. At a total area of 4.35 acres, the average trees per acre removed on that segment would be 980 trees per acre removed.

36. Both of these averages (1,306 trees or 980 trees per acre) far exceed the 555 trees per acre, both large and small, that, I am advised, was found to be unconstitutional in a seminal court case applicable to the prohibition against the cutting of trees in the Forest Preserve (Association for Protection of Adirondacks v. MacDonald, 253 N.Y. 234 [1930]).

37. Even using DEC's figure for the allegedly constitutionally-permissible level of cutting of one tree for every 33.4 linear feet of trail[9], the amount of cutting of trees on the segment from the Hyslop Easement to the Roosevelt Truck Trail was greater than the unconstitutional level. The trail is 15,840 feet (3 miles x 5,280 feet/mile) long, so according to DEC's standards, DEC would likely allege that 474 trees may be cut without violating the Constitution. Both DEC's count of

[9] DEC's 2006 Snowmobile Plan, p. 17, a copy of pertinent pages of that document are annexed hereto as Exhibit N.

1,148 trees over 3" DBH, and my tree count of 4,272 total trees, cut for the construction of one segment of the Minerva-Newcomb-North Hudson Class II CC Trail far exceed the 474 trees allegedly permitted to be cut by standards that DEC asserts are constitutionally based.

Anticipated Construction of the Roosevelt Truck Trail Segment in Section 2
(Roosevelt Truck Trail to the Boreas River)

38. In Section 2 of the Minerva-Newcomb-North Hudson Class II CC Trail, DEC staff have flagged and painted the route that will be taken by the Minerva-Newcomb-North Hudson Class II CC Trail for the segment that runs from the Roosevelt Truck Trail south to the Boreas River ("Roosevelt Truck Trail Segment"). See Exhibit O. This segment is 1.95 miles long. To my knowledge, DEC has not yet published its estimate for the number of trees that will be cut to construct this segment of the trail. Nevertheless, the route is marked in many places (see pictures attached hereto as Exhibit P) and it appears ready to be finalized for tree cutting. Given that a clear route is marked in the forest I was able to perform a count of trees, both large and small, to be removed.

39. In November 2015, I hiked the length of this 1.95-mile trail section and documented all trees according to Protocol 2. I counted 839 trees above 3" DBH and 3,101 smaller trees.

40. This section of trail traverses a diverse collection of mostly young (20th Century origin) forests. (See Exhibit P hereto), but also a stand of hardwoods that exhibits all the characteristics of old growth including large trees with highly furrowed bark, pit-and-mound topography, abundant coarse woody debris (large logs decomposing on the forest floor) and no signs of human activity like stumps or multi-stemmed trees. In other areas, presence of aspen in the forest overstory indicates that some forests initiated following the forest fires of the early 1900s. Tree ring counts of cut stumps in the spruce plantation dates the stand to the early 1930s, probably planted by CCC workers stationed in Newcomb during this time. These interpretations are corroborated by the 1916 fire map, which shows fire and denuded lands in the area. The spruce plantation and other spruce-fir dominated areas had dense pockets of tree regeneration, which account for the relatively high numbers of small trees relative to many of the other trail sections.

41. The 1.95-mile segment of the Minerva-Newcomb-North Hudson Class II CC Trail where 3,940 trees will be removed covers 2.13 acres, if the trail width is 9 feet (per DEC guidelines for straight trails). See Exhibit M. Since this route was flagged and not cut my tree cutting estimate is based solely on a 9-foot trail width. Nevertheless, if the trail was

12 feet in width (per DEC guidelines for areas with curves or slopes) it would cover 2.83 acres. See Exhibit M.

42. At a total area of 2.13 acres, the segment from the Roosevelt Truck Trail to the Boreas River will see an average of 1,850 trees per acre removed.

43. At a total area of 2.83 acres, the segment will see an average of 1,387 trees per acre removed.

44. The cutting of 3,940 trees over either 2.13 or 2.84 acres is a substantial amount of tree cutting, and far exceeds the 555 trees per acre, both large and small trees, that I am advised, was found to be unconstitutional in the MacDonald case.

45. Even using DEC's figure for the allegedly constitutionally-permissible level of cutting of one tree for every 33.4 linear feet of trail (See Exhibit N, p. 17), the amount of cutting of trees on the segment from the Roosevelt Truck Trail to the Boreas River would be unconstitutional. The trail is 10,296 feet (1.95 miles x 5,280 feet/mile) long, so according to DEC's standards, DEC would likely allege that 308 trees may be cut without violating the constitution. There is no official count at this time from DEC, yet my tree count of 3,940 total trees (including 838 trees over 3" DBH), to be cut for the construction of one segment of the Minerva-Newcomb-North Hudson Class II CC Trail, far exceeds the 308 trees allegedly

permitted to be cut by standards that DEC asserts are constitutionally based.

Anticipated and Actual Construction of Segment 9 in Section 2
(Boreas River to Stony Pond)

46. On June 8, 2016, DEC listed an action in the Environmental Notice Bulletin for removal of 1,253 trees on a 4.8-mile segment in Section 2 of the Minerva-Newcomb-North Hudson Class II CC Trail that runs between the Boreas River and Stony Pond (so-called "Segment 9" according to DEC). A copy of DEC's notice and a copy of a map of Segment 9 are annexed hereto as Exhibit Q.

47. The 1,253 trees to be removed are trees measuring over 3" DBH, an action DEC claims is authorized by Lands and Forests Policy # 91-2 on Cutting, Removal or Destruction of Trees and Other Vegetation on Forest Preserve Lands.

48. In July 2016, I hiked the length of the 1.56-mile trail section from Route 28N to the Boreas River and documented all trees according to Protocol 2. I counted 814 trees above 3" DBH, 653 trees between 1 and 3" DBH and 494 trees between 0 and 1" DBH. This section has not yet been cut.

49. This section of trail traverses a relatively uniform stretch of young (20th Century origin) forest composed primarily of spruce, fir, red maple, aspen and pine (See first map in

Exhibit R). Presence of aspen in the forest overstory indicates that portions of this forest probably initiated following forest fires of the early 1900s. This interpretation is corroborated by the 1916 fire map that shows fire had burned in this general area.

50. In July 2016, I hiked the length of the 2.85-mile trail section from Hewitt Pond Road to the Stony Pond Trail and, since DEC has already cut in this section, I documented all stumps according to Protocol 1. I counted 588 stumps above 4" DSH, 793 trees between 1 and 3" DSH and 389 trees between 0 and 1" DSH.

51. This section of trail traverses a relatively uniform stretch of old-growth northern hardwood forest containing numerous large (>25" DBH) Sugar Maple, Yellow Birch, spruce and hemlock trees. (See second map in Exhibit R). These stands exhibit all the characteristics of old growth including large trees with highly furrowed bark, pit-and-mound topography, abundant coarse woody debris (large logs decomposing on the forest floor) and no signs of human activity like stumps or multi-stemmed trees (See photographs as Exhibit S). Even though not all of these lands have been part of the Forest Preserve since 1893, large trees are scattered throughout the area. The area showing denuded lands in the 1916 fire map is not correct, as these forests bear no resemblance to forests initiating on

denuded or pasture land. The lower tree counts in this and other old-growth areas in comparison to other sections (e.g. Hyslop-Roosevelt, Boreas-Hewitt) are due to the fact that the trees are less numerous and spread apart. Tree regeneration is generally patchy in old growth forests as well, resulting in fewer small trees counted as compared to younger forests.

52. The 4.41-mile segment of the Minerva-Newcomb-North Hudson Class II CC Trail where I estimate that a total of 1,402 large trees and 2,329 small trees will be removed covers 4.8 acres, if the trail width is 9 feet (per DEC guidelines for straight trails), or 6.39 acres, if the trail width is 12 feet (per DEC guidelines for areas with curves or slopes). See Exhibit M.

53. At a total area of 4.8 acres the segment from the Boreas River to Stony Pond Trail will see an average of 777 trees per acre removed.

54. At a total area of 6.39 acres, the segment will see an average of 583 trees per acre removed.

55. The cutting of 3,731 trees over either 4.8 or 6.39 acres exceeds the 555 trees per acre, both large and small, which I am advised was found to be unconstitutional in the MacDonald decision.

56. Even using DEC's figure for the allegedly constitutionally-permissible level of cutting of one tree for

every 33.4 linear feet of trail (Exhibit N, p. 17), the amount of cutting of trees on the segment from the Boreas River to the Hewitt Pond Road is unconstitutional. The trail is 23,285 feet (4.41 miles x 5,280 feet/mile) long, so according to DEC's standards, DEC would likely allege that 696 trees may be cut without violating the constitution. My tree count of marked or cut trees totals 3,731 total trees (including 1,402 large trees), to be cut for the construction of one segment of the Minerva-Newcomb-North Hudson Class II CC Trail, far exceeds the 696 trees allegedly permitted to be cut by standards that DEC asserts are constitutionally based.

Anticipated Construction of Segment 11 in Section 2
(Stony Pond to Minerva)

57. On June 8, 2016, DEC listed an action in the Environmental Notice Bulletin for the removal of 423 trees on a 2.9-mile segment in Section 2 of the Minerva-Newcomb-North Hudson Class II CC Trail between Stony Pond and private land in the Town of Minerva (so-called "Segment 11" according to DEC). See Exhibit F. A copy of DEC's notice is annexed hereto as Exhibit Q and a copy of DEC's map of Segment 11 is annexed hereto as Exhibit T. The 423 trees to be removed are trees measuring over 3" DBH ("diameter at breast height"), an action DEC claims is authorized by Lands and Forests Policy # 91-2 on

Cutting, Removal or Destruction of Trees and Other Vegetation on Forest Preserve Lands.

58. In August 2016, I hiked the length of this 2.64-mile trail section and documented all trees according to Protocol 2. I counted 465 trees >3" DBH, 851 trees between 1 and 3" DBH and 1,327 trees between 0 and 1" DBH.

59. Most of this section of trail traverses a stretch of old-growth northern hardwood forest containing numerous large (>25" DBH) Sugar Maple, Yellow Birch, spruce and hemlock trees dating back to the 18th Century (See map attached as Exhibit U). There are also two small patches toward the southern end of the marked trail that are dominated by very large aspen trees (30+ inches DBH); the presence of aspen dates these areas to the late 19th Century. The older northern hardwood stands exhibit all the characteristics of old growth including large trees with highly furrowed bark, pit-and-mound topography, abundant coarse woody debris (large logs decomposing on the forest floor) and no signs of human activity like stumps or multi-stemmed trees (See photographs attached as Exhibit V). The 1916 Fire map shows no record of fire, cutting or open lands anywhere near in this section of trail, and even though not all of these lands have been part of the forest preserve since 1893, large trees are scattered throughout the area. Lower tree counts for trees >3" in this and other old-growth areas is due to the fact that the

trees in old growth forests, trees are less numerous and spread further apart.

60. The 2.64-mile segment of the Minerva-Newcomb-North Hudson Class II CC Trail where 2,643 trees will be removed covers 2.89 acres, if the trail width is 9 feet (per DEC guidelines for straight trails), or 3.84 acres, if the trail width is 12 feet (per DEC guidelines for areas with curves or slopes). See Exhibit M.

61. At a total area of 2.89 acres, the segment from the Stony Pond to Minerva will see an average of 914 trees per acre removed.

62. At a total area of 3.84 acres, that segment will see an average of 688 trees per acre removed.

63. The cutting of 2,643 trees (including 1,316 trees greater than 1" DBH) over either 2.89 or 3.84 acres far exceeds the 555 trees per acre, both large and small, which I am advised was found to be unconstitutional in the MacDonald decision.

64. Even using DEC's figure for the allegedly constitutionally-permissible level of cutting of one tree for every 33.4 linear feet of trail (Exhibit N, p. 17), the amount of cutting of trees on the segment from the Stony Pond Trail to private lands would exceed this allegedly constitutional level. The trail is 13,939 feet (2.64 miles x 5,280 feet/mile) long, so according to DEC's standards, DEC would likely allege that 419

trees may be cut without violating the constitution. My tree count of marked trees totals 2,643 total trees (including 465 large trees greater than 3" DBH), to be cut for the construction of one segment of the Minerva-Newcomb-North Hudson Class II CC Trail, far exceeds the 417 trees allegedly permitted to be cut by standards that DEC asserts are constitutionally based.

B. Seventh Lake Mountain Trail

65. Another Class II Community Connector snowmobile trail constructed by DEC is the Seventh Lake Mountain trail. The Seventh Lake Mountain trail was sampled differently than the other trails for two reasons: 1) the trail was cut and graded in 2012, leaving an incomplete record of trees removed, and 2) I did not count the individual stumps, but reviewed photographs of nearly 6,500 stumps in the Fulcrum App, and performed an ecological assessment of the trail. I installed the same Fulcrum App that I used to count stumps on the Hyslop-Roosevelt, Polaris and Hewitt-Stony Ponds sections onto Peter Bauer's mobile device, and in July/August 2016, he walked the entire trail, measuring and photographing every stump he could find according to Protocol 1. This produced a record of each stump along with latitude/longitude coordinates and a photograph proving it existed at that location. We now have a photographic

record of 893 trees >3" DBH and 5,587 trees between 1 and 3" DBH.

66. In August 2016, I hiked the entire length of this 11.69-mile trail section and performed an ecological assessment according to Protocol 3. Prior to going out in the field, I loaded a subsample of 30 of Mr. Bauer's stump photographs onto my phone in order to verify their existence. I successfully located all 30 stumps during my hike, and am confident that his record of trees is accurate. These are easily field checked.

67. Altogether there were 6,480 stumps recorded along this stretch of trail, but this number vastly underestimates the actual number of trees cut, as many stumps were destroyed by grading, terrain alteration, decay or have been covered up by the dense ferns and grassy areas that have grown over the trail since it opened (see map attached as Exhibit W). See Table in Exhibit D.

68. The significant undercount is evident by the fact that only 893 stumps of 3" DBH or greater could be located in 2016 when DEC reported cutting 2,847 trees in 2012.[10] Extensive grading destroyed a great many stumps and signs of grading is evident for long stretches on this trail.

[10] DEC issued numerous ENB notices, at least 7 different notices, in 2012 relating to the cutting of trees on the various segments of the Seventh Lake Mountain trail.

69. Most of this section of trail traverses northern hardwood forests; the southern third of the trail is much younger than the northern two-thirds, which is a nearly uninterrupted stretch of old growth forest containing trees dating back to the 1600s. Much of the southern stretch was logged prior to 1916 and several cut stumps along the trail were 65 years old, indicating that the area was likely heavily impacted by the major hurricane that destroyed many Adirondack forests in 1950. This stretch is dominated by Red Maple, Yellow Birch, Beech, Paper Birch and young Red Spruce. Notably absent in this subsection is Sugar Maple -- only a few individuals were observed on this entire stretch.

70. The northern two thirds of the Seventh Lake Mountain trail is a nearly uninterrupted old growth forest with many very old individuals including one downed **Red Spruce with 338 rings** where it was cut about 15 inches from the base in order to clear the trail. Several other cut trees and stumps along the trail had more than **250 rings**, and large trees >30"DBH are widely distributed throughout this entire section. These forests exhibit all the characteristics of old growth including large trees with highly furrowed bark, pit-and-mound topography, abundant coarse woody debris (large logs decomposing on the forest floor) and no signs of human activity like stumps or

multi-stemmed trees (See photographs attached hereto as Exhibit X).

71. There are also two small patches of a very unique forest type along two hilltops just north of the Eighth Lake Campground. These hilltops are open and almost savannah-like, with a widely-spaced canopy of almost pure Sugar Maple, with an understory of dense raspberries and many rare alkaline site indicators such as solomon's seal, maiden hair fern and gallium. These sites are probably located on calcium-rich Feldspar Apatite soils which can be found in the area. The trees in these stands are not large, and may have initiated following the 1950 hurricane.

72. The 11.69-mile segment of the Seventh Lake Mountain trail where 6,480 trees are known to have been removed, and an even greater number were removed, but extensive grading and terrain alteration have made a total count impossible, covers 12.75 acres, if the trail width is 9 feet (per DEC guidelines for straight trails), or 17.00 acres, if the trail width is 12 feet (per DEC guidelines for areas with curves or slopes). See Exhibit M.

73. At a total area of 12.75 acres, the Seventh Lake Mountain trail saw an average of 508 trees per acre removed, though this count is low due to the fact that the remains of

many cut trees were obliterated by grading and terrain alteration. The actual number of trees cut was much higher.

74. At a total area of 17.00 acres, the Seventh Lake Mountain trail saw an average of 381 trees per acre removed, though this count is low due to the fact that the remains of many cut trees were obliterated by grading and terrain alteration. The actual number of trees cut was much higher.

75. The cutting of 6,480 trees over either 12.75 or 17.00 acres is close to the 555 trees per acre, both large and small, which I am advised was found to be unconstitutional in the MacDonald decision.

76. Even using DEC's figure for the allegedly constitutionally-permissible level of cutting of one tree for every 33.4 linear feet of trail (Exhibit N, p. 17), the amount of cutting of trees on Seventh Lake Mountain Trail is unconstitutional. The trail is 61,723 feet (11.69 miles x 5,280 feet/mile) long, so according to DEC's standards, DEC would likely allege that 1,848 trees may be cut without violating the constitution. The tree count of 6,480 trees (including at least 2,847 large trees) cut for the construction of one major Class II CC Trail, exceeds the 1,848 trees allegedly permitted to be cut by standards that DEC asserts are constitutionally based.

C. Polaris Bridge Trail

77. The Polaris Bridge trail was approved as part of the Essex Chain Lakes Complex Unit Management Plan in early 2016 as a formal Class II Community Connector snowmobile trail. This trail is planned to connect with the Newcomb-Minerva-North Hudson trail system. This trail has not yet been noticed in the Environmental Notice Bulletin.

78. In June 2016, I hiked the length of a 5.24-mile section of the Polaris Bridge trail and documented all trees according to Protocol 2, with one important exception--this trail section had not yet been painted or flagged. Protect the Adirondacks! Inc. supplied a "shapefile" of the GIS coordinates of the proposed trail that it had obtained from DEC via a Freedom of Information Law ("FOIL") request. In order to approximate the location of the proposed trail, this shapefile was imported into a GIS, and then exported into the Fulcrum App on my mobile device. Using the mobile device, I first located the trail route and flagged trees along the way. After hiking the entire trail route, I turned around and used the flagged trees as nodes forming a virtual centerline for the proposed cutting corridor. All trees within 5 feet of either side of this centerline were considered part of the cutting corridor, and counted according to Protocol 2. I counted 2,078 trees >3" DBH, 2,551 trees between 1 and 3" DBH, and 2493 trees between 0"

and 1" DBH. All flagging was removed from the forest upon my return journey.

79. It should be noted that I did not count trees along the northernmost section of trail as the proposed trail in the shapefile trail followed an old road for quite some distance but then veered off and appeared to parallel this old road until reaching the Chaisson Road. I made the assumption that the proposed trail actually follows this road rather than the line provided in the FOIL request for this subsection of trail.

80. This 5.24-mile section of trail traverses a diverse array of forest types, and is of particular ecological interest because of the way modern forests have been so heavily shaped by both by past disturbance history and differences between lands that the State acquired before 1893 and those acquired subsequently. Much of the southern two-thirds of the proposed trail had been burned or cleared prior to 1916 (see map attached as Exhibit Y). In this area, forests that are part of the State's 1893 holdings are currently dominated by hundreds of very large and impressive White Pine trees ranging in diameter from 25" to nearly 50" DBH. These ecosystems are regionally unique. In areas not part of the State's 1893 holdings, the forests are the typical aspen/fir/hardwood forests seen in other parts of the Adirondacks where land was burned and denuded around the turn of the 20th Century. The northern end of the

trail, shows no evidence of fire or clearing in the 1916 fire map, and was also part of the 1893 holdings; this forest exhibits all the characteristics of old growth including large trees with highly furrowed bark, pit-and-mound topography, abundant coarse woody debris (large logs decomposing on the forest floor) and no signs of human activity like stumps or multi-stemmed trees (See photographs attached as Exhibit Z). This section of old growth forest contains numerous large (>25" DBH) Sugar Maple and Yellow Birch trees, likely dating back at least to the early 1800s or 1700s based on analogous forests observed elsewhere.

81. The 5.24-mile segment of the Polaris Class II CC Trail where 7,122 trees will be removed covers 5.71 acres, if the trail width is 9 feet (per DEC guidelines for straight trails), or 7.62 acres, if the trail width is 12 feet (per DEC guidelines for areas with curves or slopes). See Exhibit M.

82. At a total area of 5.71 acres, the segment from the Polaris Bridge Trail to Minerva will see an average of 1,247 trees per acre removed.

83. At a total area of 7.62 acres, that segment will see an average of 934 trees per acre removed.

84. The cutting of 7,122 trees over either 5.71 or 7.62 acres far exceeds the 555 trees per acre, both large and small,

which I am advised was found to be unconstitutional in the MacDonald decision.

85. Even using DEC's figure for the allegedly constitutionally-permissible level of cutting of one tree for every 33.4 linear feet of trail (Exhibit N, p. 17), the amount of cutting of trees on the Polaris Bridge Trail would be unconstitutional. The trail is 27,667 feet (5.24 miles x 5,280 feet/mile) long, so according to DEC's standards, DEC would likely allege that 828 trees may be cut without violating the constitution. The tree count of 7,122 trees (including 2,078 large trees) cut for the construction of one major Class II Community Connector snowmobile trail, far exceeds the 828 trees allegedly permitted to be cut by standards that DEC asserts are constitutionally based.

D. Cooper Kiln Trail

86. Using the Fulcrum App, I have reviewed pictures of stumps photographed by Mr. Bauer in August 2016 cut along 3.3 miles of the Cooper Kiln class II community connector snowmobile trail in the Wilmington Wild Forest area. This trail was constructed in 2012-2013 and DEC estimated it would remove 722 trees over 3" DBH. The count of stumps in the Fulcrum App totaled 565 trees over 3" DBH and 1,634 trees less than 3" DBH.

Approximately 0.5 miles of this trail followed a DEC road that received little cutting and was excluded from this inventory.

87. The 3.3-mile segment of the Cooper Kiln Trail where 2,199 trees were removed covers 3.6 acres, if the trail width is 9 feet (per DEC guidelines for straight trails), or 4.79 acres, if the trail width is 12 feet (per DEC guidelines for areas with curves or slopes). See Exhibit M.

88. At a total area of 3.6 acres, 610 trees per acre were removed from the Cooper Kiln Trail.

89. At a total area of 4.79 acres, 459 trees per acre were removed from the trail.

90. The cutting of 2,199 trees over either 3.6 or 4.79 acres far exceeds the 555 trees per acre, both large and small, which I am advised was found to be unconstitutional in the MacDonald decision.

91. Even using DEC's figure for the allegedly constitutionally-permissible level of cutting of one tree for every 33.4 linear feet of trail (Exhibit N, p. 17), the amount of cutting of trees on the Cooper Kiln Trail is unconstitutional. The trail is 17,424 feet (3.3 miles x 5,280 feet/mile) long, so according to DEC's standards, DEC would likely allege that 521 trees may be cut without violating the constitution. The tree count of 2,199 trees (including 565 large trees) cut for the construction of one major Class II CC

Trail, far exceeds the 521 trees allegedly permitted to be cut by standards that DEC asserts are constitutionally based.

E. The Gilmantown Trail

92. Using the Fulcrum App, I have reviewed pictures of stumps photographed by Mr. Bauer in August 2016 cut along 3.0 miles of the Gilmantown Class II Community Connector snowmobile trail in the Jessup River Forest area. This trail was constructed in 2013 and DEC estimated it would remove 123 trees over 3" DBH. The count of stumps in the Fulcrum App totaled 104 trees over 3" DBH and 283 trees less than 3" DBH. The majority of this trail was built from a former road, which necessitated the removal of few trees.

DEC's Unconstitutional Cutting of Trees in the Forest Preserve Should be Enjoined

In conclusion, so far the DEC has cut down at least 15,637 trees where we have counted stumps, and many more where stumps have been destroyed by grading with heavy machinery, for the construction other Class II Community Connector snowmobile trails, at least 8,844 trees will be cut to facilitate the construction of approved trails, and at least 7,122 more trees are at risk of destruction from trails that are planned.

Steve Signell

Sworn to before me this 25th
day of August, 2016.

NOTARY PUBLIC

Linda A. Jeffer
Notary Public, State of New York
Qualified in Schoharie County
Reg. No. 01JE4930035
My Commission Expires May 2 2018