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 TIMOTHY G. HOWARD, Ph.D.

Index No. 2137-13 RJI No. 01-13-ST-4541

Hon. Gerald W. Connolly

State of New York : :ss.: County of Albany :

Timothy G. Howard, being duly sworn, deposes and says:

1. I am Director of Science with the New York Natural Heritage Program located at 625 Broadway, Albany, New York. I received a BA in Biology from Middlebury College (1987), an MS in Biology from the University of Michigan (1994), and a PhD Degree in Biology (Plant Ecology) from The University of Michigan in 1998. I have worked for the New York Natural Heritage Program since November, 2000.

2. The Natural Heritage Program (NYNHP) is a program of the Research Foundation for the State University of New York College of Environmental Science and Forestry (SUNY-ESF). NYNHP provides information and scientific expertise on rare species, natural ecosystems, and landscape assessment. NYNHP works in partnership with the New York State Department of

Environmental Conservation (DEC) and other state, federal, and private organizations involved in natural resource management, land protection and stewardship, and biodiversity conservation. I am responsible for helping with oversight of our science staff and science program, helping to obtain funding for the program, managing projects, and leading most of the landscape analysis and modeling portions of our projects. I have extensive experience in ecological field surveys and condition assessment, landscape assessment and species distribution modeling, mapping and aerial photo interpretation using Geographic Information Systems (GIS), and statistical analysis and modeling. A copy of my resume was attached in a previous affidavit (08-24-2016).

3. I previously submitted affidavits in support of the State's motion for summary judgment on 08-24-2016 and 10-26-2016.

4. I have read the affidavits submitted by Steve Signell on 10-26-2016 and Ronald Sutherland on 09-27-2016. The purpose of this affidavit is to respond to details in these two affidavits, primarily about my earlier assessment of forest fragmentation and canopy closure over the Class 2 Connector trails (Howard affidavit 08-24-2016).

5. The affiants raise two primary concerns with the fragmentation assessment. First, Signell pointed out that Focus Area 2 (the forested area through which the Seventh Lake Mountain Trail passes) contains roads not included in my analysis (Signell affidavit 10-26-2016 ¶26, ¶27). Second, trails indicated as closed either had been abandoned earlier or were only closed on paper (Signell affidavit 10-26-2016 ¶28). I will address each of those in turn, below.

6. Signell is correct that I did not include roads that penetrated into this forest block. This is because they were unchanged from the 'before' scenario to the 'after' scenario. My goal was to keep it simple and focus on land use changes to the forested area, not on the parts of the forest

that would remain constant. Including the existing roads that will remain in the forested area effectively lowers the metrics in both scenarios but not change the overall conclusions of the fragmentation assessment.

7. To verify this conclusion, I conducted the assessment again while including all the regular roads, powerlines, and 4WD roads that penetrated into this block. With the exception of the Wilson Pond Trail in the Northeast section of the study area (leaves Route 28 just west of Blue Mountain Lake, more info here: <u>http://www.adirondackexperience.com/recreation/wilson-pond-snowshoe-trail</u>), I used the fragmenting features as described by Signell (Affidavit 10-26-2016 ¶27, ¶28, and Exhibit I). The single-track (hiking and snowshoeing) trails identified by Signell are intentionally not included in this analysis because the goal was to look at the fragmentation effects of snowmobile trails. These trails (single-track) are also unchanging so including them would have similar effects to this extended analysis.

8. I also excluded the Benedict Creek Trail closing from this analysis (i.e. I removed it from both 'before' and 'after'), even though it is clear that it was once a snowmobile trail, it is now closed (Jonathan DeSantis Affidavit 11-15-2016), and including it would have improved the numbers.

9. The results of this new analysis are presented in Exhibit A. There are some unexpected results. The inclusion of Sagamore Road and the connected 4WD trail south towards Bear Pond creates a fragmented forested area west of Sagamore Road in the 'before' scenario. The closing of the majority of the Seventh-Eighth Loop Trail reconnects this section with the larger forest area in the 'after' scenario. This creates a positive benefit in acreage for the largest forest block in this new analysis, which we did not have in the earlier analysis. In other words, inclusion of the roads as suggested in the Signell affidavit results in an even greater net benefit to the Forest

Preserve as an isolated forest parcel becomes part of the larger forest area after interior trails are closed. As expected, the overall level of fragmentation, as based on the shape index, improves with the 'after' scenario (Exhibit A, Table 1).

10. I appreciate the considerable time Signell spent visiting the roads and trails in the area of the Seventh Lake Mountain Trail (Affidavit ¶27, ¶28). The closure status of these roads and trails is adequately addressed by Jonathan DeSantis' Affidavit (11-15-2016). However, in a theme that will return below, it should be noted that forest recovery takes a significant amount of time. Trails once driven by 4WD vehicles or snowmobiles take many years to return to a forested state or single-track trail appearance. The act of actually blocking the road so that motorized traffic is stopped is the first step, no matter the condition of the road. Once blocked, vegetation will no longer be disturbed by motorized vehicles and recovery can begin. Similarly, once blocked, winter-time disturbance to animals becomes significantly lessened due to the absence of snowmobiles.

11. Another issue brought up in the responses to my initial Affidavit (Howard 08-24-2016) concerned the amount of canopy closure along the Class II trails and ground-truth validation.

12. On August 2, 2016, I visited (ground-truthed) both ends of the Dunning Pond Trail, and one end of the Gilmantown Trail (a Class II Snowmobile trail). On August 3, 2016, I visited a section of the Perkins Clearing to Lewey Lake Trail and the Old Telephone Line Trail (both Class II Snowmobile Trails).

13. On September 15, 2016, I visited the Northern end of the Seventh Lake Mountain Trail. With regards to the Seventh Lake Mountain Trail, I concur with Sutherland (Affidavit 09-

27-2016) that "These trails retained a closed canopy for much of their length" (page 3, ¶7). Sutherland then notes that there were canopy openings at regular intervals along the trails. Again, I concur, for the Seventh Lake Mountain trail. This is also the primary point made by Signell (Affidavit 10-26-2016) that openings remain in the trail and grasses and present in patches along the trail (¶17-¶21). My only addition to these observations and analyses is that three to four years is not nearly enough time for trees adjacent the trail to grow into these light gaps. Indeed, one research project (Valverde et al. 1997, Canopy Closure Rate and Forest Structure. Ecology 78:1555-1562) found trees close up gaps from the edges (lateral tree extension of twigs) about 4 -26 cm per year (1.6 - 10.2 inches) while another found rates of 17-18 cm (6.7 - 7.0 inches) per year (Cipollini et al. 1993. Population Growth, Structure, and Seed Dispersal in the Understory herb Cynoglossum virginianum: a Population and Patch Dynamics Model. Plant Species Biology. 8:117-129). If a tree from one side of a 9 foot trail already projects one quarter of the way over the trail and only needs to extend half-way across the trail (assuming other trees take care of the remainder of the gap), it would need to extend 40.5 inches. With a range of 1.6 to 10.2 inches, this may take anywhere from four years to 25 years. These same papers suggest tree gap closure rates of eight to ten years.

14. The concept that given more time the canopy over these trails will close up is evident in the Old Powerline Trail and the Perkins Clearing – Lewey Lake Trail, two trails I visited this summer. Both of these trails were mostly existing trails when converted to Class II trails in 2014 (Maxwell A. Wolckenhauer Affidavit of 08-24-2016, Exhibit A). The section of the Perkins Clearing – Lewey Lake Trail I visited is clearly a trail created for snowmobile travel (e.g. not exceptionally wide) and the section I visited had a closed canopy and understory forbs. A photo of this section is in Exhibit B. The canopy has had adequate time to close up the gap for this trail.

15. The Old Powerline Trail is an even more extreme example. This trail clearly was once a graded dirt road and is now being maintained as a snowmobile trail. The trees along the edge have had plenty of time to grow up into the light gaps over the road and the trail is now shaded similarly to the adjacent forest (Exhibit C).

16. In summary, amending the fragmentation analysis to include the roads pointed out by Signell improves one of the measures of fragmentation (size of largest forest block) and maintains improvements in the other fragmentation metrics from the 'before' state to the 'after' state. Newly created trails will certainly have openings in the forest canopy and it takes more than four years to close those gaps. That they do actually close is most clearly evident in the Old Powerline Trail.

Timothy G/Howard

Sworn to before me this $\frac{17}{100}$ day of November , 2016

Notary Public

Fiona M. McKinney Notary Public, State of New York 01MC6122742 Qualified in Albany County My Commission Expires February 22, 20<u>17</u>

Exhibit A.

Figure and Table for fragmentation assessment



Figure 1. Focus Area 2, containing the Seventh Lake Mountain Trail. The left panel shows the snowmobile trails, two-tracks, and roads present beforehand. The right panel shows the current snowmobile trail and road systems within this focus area. In both cases, the outer ring of the study area (thick black line) consists of roads and snowmobile trails (whichever is inner-most) circumscribing the Focus Area. Compare with Howard Affidavit 2016-08-24.

Table 1. Fragmentation metrics for Focus Area 2. Lower values for shape index represent lower levels of fragmentation. Positive (blue) numbers in the % change column indicate improvements in the fragmentation metric; negative (red) numbers indicate a decline in the fragmentation metric.

Metric	Before	After	% change
Largest Block (acres)	80,956	84,857	4.6%
Shape Index (largest polygon)	2.89	2.70	6.6%
Shape Index (10 largest polygons, area	2.72	2.63	3.2%
weighted mean)			

Exhibit B. Photo of the trail and a bridge along the Perkins Clearing – Lewey Lake Trail





