Adirondack Mountain Club

American Hiking Society

Appalachian Mountain Club

Appalachian Trail Conference

NY-NJ Trail Conference

Potomac Appalachian Trail Conference

Great Falls Trail Blazers (VA)

Green Mountain Club

ADK- Black River Chapter

Coastwalk

Florida Trail Association

Ozark Greenways

# HIKERS FOR CLEAN AIR

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BY EMAIL/EDOCKET SUBMISSION;

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OAR Docket
United States Environmental Protection Agency
Mailcode: B102
1200 Pennsylvania Avenue, N.W.
Washington , D.C. 20460

Attention: EPA Public Docket No. OAR-2002-0076;
69 Fed. Reg. 25184 (May 5, 2004)

July 15, 2004

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**Comments submitted by Hikers for Clean Air on EPA's "Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations"**

Hikers for Clean Air, a coalition comprised of the undersigned organizations, represents national and regional outdoor recreation and conservation organizations concerned about poor air quality impacting our health and the outdoor experience. Collectively our membership numbers more than 500,000 hikers who recreate in and cherish the national parks and Wilderness areas across the United States.

We value our nation's wonderful outdoor spaces that provide renewal, healthy lifestyles and retreats for many Americans. Hence we are dismayed by the continued problems caused by regional haze, ozone pollution, nitrogen saturation and acid deposition in Class I areas which include many of our nation's parks and Wilderness areas. We are pleased that EPA has published a draft Regional Haze Best Available Retrofit Technology (BART) rule. However, we are concerned that EPA's proposal would undermine the intent that Congress laid out 27 years ago to prevent future, and remedy existing, visibility impairment in each individual Class I area. We strongly urge EPA to strengthen the current proposed BART rule to ensure that our national parks and other special places are meeting the timelines and interim goals for visibility improvements as laid out in the Regional Haze Rule.

**A Strong BART program is essential**

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A strong BART program is necessary to reach the goal Congress established more than 25 years ago to protect visibility in our national parks and wilderness areas. As laid out in the Clean Air Act, BART-eligible sources are facilities that have the potential to emit 250 tons per year or more of any visibility-impairing pollutant and became operational between August 7, 1962 and August 7, 1977. There are a large number of eligible sources still operating today that are indeed emitting pollution that contributes to regional haze and other air pollution in Class I areas across the nation.

**Specific Comments**

We strongly advocate that EPA not allow the proposed Clean Air Interstate Rule (CAIR) to be offered to state's as a *substitute* for the BART requirements for power plants. CAIR is aimed at meeting the national health standards and provides no guarantee that each Class I area's air quality will adequately improve. This type of substitution is inappropriate and illegal under the Clean Air Act. We direct you to comments being submitted to the docket by the Clean Air Task Force, Environmental Defense and others (CATF/ED) for further discussion of the legal issues and other concerns. One key point is that under the current law all of the largest affected power plants, > 750 MW, are required to implemented BART by 2013. CAIR would not ensure that this legal obligation is met. The HCA coalition believes that states will need both the Interstate Rule and the BART program to protect Class I areas and the surrounding communities from detrimental air pollution.

The BART rule must ensure that the required reductions result in improved visibility in all affected national parks and Wilderness areas, as Congress intended. Improvements in visibility are required in current law at *each* Class I area and should not be averaged across large geographical areas. Our members go to different parks or public lands that they consider to be the most beautiful and important to protect. For some it is the White Mountains of NH and others it is Shenandoah National Park. These individual Class I areas are recognized because of their unique qualities. EPA should reject the concept of averaging visibility improvements geographically and honor the mandate Congress laid out in 1977 that *each* area be protected.

HCA believes that EPA should aggregate all haze-causing pollutants together when determining if a source exceeds the 250-ton per year threshold as part of the BART eligibility analysis. In addition we are concerned about the proposal to not consider rural volatile organic compounds emissions as a haze-forming pollutant.

We support EPA's threshold of a 0.5 dv, over background visibility, for determining what level of contribution constitutes visibility impairment, however this threshold should not be used to determine what individual BART-eligible sources are subject to BART. The Clean Air Act requires that a BART-eligible source be subject to BART if that source may reasonably be anticipated to cause or contribute to any impairment of visibility in a Class I area. The issue is explained in the following example. A cluster of 3 individual sources just outside a park may only cause a 0.2 dv contribution each to the visibility impairment in the park but together they contribute 0.6 dv. EPA's proposal to use a 0.5 dv threshold when determining individual contribution will make it difficult to meet the goals of the Regional Haze program. We agree with

a proposed 0.1 dv threshold presented in CATF/ED comments for determining individual source contribution. We are also concerned about the modeling alternatives for determining whether an individual source is exceeding the visibility impairment threshold. An individual pollution source that meets the initial BART criteria should not be given an exemption from BART unless a rigorous modeling analysis demonstrates that it does NOT cause or contribute to haze in any Class I area. Adequate air quality models must be used in this analysis. HCA is very concerned about the alternatives to CALPUFF that EPA requests comments on. The methods are very unsatisfactory as they oversimplify and underestimate the potential contributions from sources. The CALPUFF screening mode assumes flat terrain yet it is difficult to think of a Class I area in the East that is predominantly flat. Complex terrain alters wind and precipitation patterns, and relative humidity varies across mountainous landscapes. EPA's own analyses[1] of CALPUFF in screening mode, using ISC meteorology (instead of the CALMET refined estimates), documents that sulfate concentrations are greatly underestimated. For hypothetical distances of 75-300 km the maximum 24-hour and 1-hour sulfate concentration averages were 66 and 49 percent lower in screening mode than the refined mode (for a source with a 200 m stack height), respectively. This comparison analysis for sulfate, the surrogate for visibility in this model, has only been conducted in 1 year, 1990, and in an area of the country with flat terrain. In this same analysis EPA reports that year-to-year variability for sulfur dioxide concentrations in screening mode is more variable for 24 and 1 hour averaging times, the same averaging times proposed to assess visibility impairment in this rule. This inter-annual variability test was not done for sulfate concentrations. EPA has not provided enough information about the sensitivities and accuracy of the screening mode of CALPUFF to the public. Therefore, until further analysis has been done and the approach validated, CALPUFF screening mode should not be used to determine if BART-eligible can be exempt from being subject to BART. Nor should other alternatives based on the screening mode or other general assumptions be used.

Cost-effective pollution control technology is available for power plants, which are the largest contributors to hazy skies in parks and wilderness areas. As EPA has recognized, coal-fired power plants can reduce their sulfur dioxide emissions by 90 to 95 percent at reasonable cost. Similarly, these facilities can cost-effectively reduce their nitrogen oxide emissions by installing and operating currently available control technology throughout the year. We support the presumptive control levels EPA presents for sulfur dioxide for units >250 MW. However we are concerned that the current language implies that at plants > 750 MW units < 250 MW do not fall under the presumptive requirement as do units >250 MW. EPA should require presumptive controls for all units at 750 MW plants. In addition, we are concerned that the nitrogen oxide presumptive control level EPA proposed is higher than the level current technology can provide. EPA should review currently proposed nitrogen oxide retrofits and consider lowering it presumptive level of 0.2 lbs/MMBtu. We agree with previous comments submitted to the docket by NPS that EPA should specify an averaging time for the emission limits similar to the averaging time of visibility impact assessments.

While EPA has stated that federal land managers (FLM's) have a role during the state implementation planning process we believe they should be directly involved in the BART

[1] EPA-454/R-98-019 Interagency Workgroup on Air Quality Modeling Phase 2 and EPA-454/R-98-010 Analysis of the CALMET/CALPUFF Modeling System in a Screening Mode.

process from the beginning. The FLM's are required by law under the CAA to protect visibility in Class I areas and this current proposed rule does not allow these experts to do this effectively. Additionally, EPA should work with FLM's on the methods to identify and quantify the non-air quality environmental impacts considered in BART determinations. We agree with EPA that when conducting a BART determination non-air quality benefits should be considered and FLM's, through their evaluation of air quality related values, are best positioned to assess the benefits of applying BART. HCA is very concerned about other negative impacts from the sulfur dioxide and nitrogen oxide pollution beyond visibility impairment in mountainous regions and discuss this in detail below.

**Polluted Parks**

Regional haze pollution, mainly in the form of sulfate and nitrate aerosols, is a major problem in mountainous regions. The largest source of this haze in the Eastern US is from older coal-fired power plants emitting sulfur dioxide and nitrogen oxide that then reacts in the atmosphere to form acidic aerosols. Haze is not the only consequence of acid aerosols formation. Recent scientific studies are further illuminating the associated human health impacts of exposure to fine particulates, such as respiratory and cardiac disease and premature death. The warnings in EPA health messaging material include restricting prolonged or heavy exertion, which includes hiking, during elevated levels of fine particle pollution, similar to the health warnings during high ozone events. Our organizations promote outdoor activities as a healthy lifestyle, yet this type of pollution impedes our ability to do so.

Hikers explore the high peaks of the Adirondacks, Smoky Mountains, and Presidential Range in the White Mountains for the spectacular views but often find haze blocking expected vistas. In fact, in Shenandoah National Park average summertime visibility is about 1/8th of natural – only 12-15 miles. From the top of Mount Washington, NH, on a clear day, the Adirondack mountains can be seen as far as 130 miles away, while on a hazy day visibility can be reduced to less than 10 miles. Acadia National Park, often called the tail pipe of the nation, experiences high ozone levels in addition to reduced visibility.

While some of our National Parks are seeing improvements in air pollution the rate of the progress is slow and there are many examples of parks where things are getting worse. Examples of trends in visibility, ozone, and of nitrate and sulfate in precipitation at parks where members of Hikers for Clean Air organizations often recreate are given in the table below.

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Table 1. Air Pollution Trends

| National Park | Visibility Trend (dv/year) | Ozone Trend[2] (ppb/year) | Nitrate Trend (ueq/L[3]/year) | Sulfate Trend (ueq/L[2]/year) |
|---|---|---|---|---|
| Acadia | *-0.26* ⬇ | 0.56 ⬆ | 0.12 ⬆ | -0.34 ⬇ |
| Shenandoah | *-0.38* ⬇ | 0.22 ⬆ | 0.10 ⬆ | -0.21 ⬇ |
| Great Smoky Mountain | *-0.17* ⬇ | 0.46-*1.49*[4] ⬆ | -0.07 ⬇ | -0.07 ⬇ |
| Everglades | nd | 0.10 ⬆ | 0.05 ⬆ | -010 ⬇ |
| Rocky Mountain | *0.10* ⬆ | 0.26 ⬆ | *0.63* ⬆ | -0.12 ⬇ |
| Mesa Verde | *0.13* ⬆ | *0.91* ⬆ | *0.81* ⬆ | -0.18 ⬇ |
| Redwood | 0.02 ⬆ | nd | nd | nd |
| Yellowstone | 0.06 ⬆ | *0.79* ⬆ | *0.31* ⬆ | -0.10 ⬇ |
| Yosemite | *0.15* ⬆ | -0.29 ⬇ | 0.13 ⬆ | 0.19 ⬆ |

*Source: NPS, see:* Presentation on current GPRA Trends from 1993-2002 (powerpoint)
Negative trends indicate pollution is decreasing, ⬇, (improvement) while positive trends indicate pollution is increasing, ⬆, (degradation of air quality). Numbers that are italized indicated that the statistical significance of the trend is greatest with a p less than or equal to 0.15.

Looking at the slopes of long-term trends only tells part of the story. For example the rate of visibility change shown in Table 1 above are based on the ten-year average from 1993-2002[5]. While visibility has improved in Eastern US parks the slope value is driven by earlier reductions in sulfate and progress has been minimal in recent years. The graphs show the annual deciview values from Eastern Class I areas on the 20% worst visibility days. Note that from 1996 onward little progress has been made especially in the Northeast. The annual average deciview value included for Shenandoah National Park for 1998, 29.2 dv, is based on the reconstructed extinction with nitrate concentrations assumed to be zero for missing values (Source: NPS). The annual average dv value for 1998 from Shenandoah was not included in the IMPROVE data set due to invalid nitrate values and hence the year not meeting completeness criteria according to EPA guidance.

Mountain tops often experience higher ozone levels than adjacent valleys and air masses reaching higher elevations are considered characteristic of the regional air quality. A recent analysis of air masses with enhanced ozone levels (>80 ppbv) reaching the summit of Mount Washington (6,288') indicates that this polluted air is rapidly transported from the Mid-west and southwest while a nearby low elevation site does not experience the

[2] Ozone trend is calculated from annual may-september average of the daily maximum 1-hr value.
[3] Precipitation concentrations are based on volume weighted annual averages.
[4] Great Smoky Mountains has several ozone monitors at different elevations. Higher elevation sites show stronger trends of increasing ozone through time.
[5] This method differs from the trend analysis done by Malm and others in 2000 in which trends are calculated from a 5-year rolling average. When these comments were submitted the trend analysis using a rolling average had not yet been updated using the most recent data.

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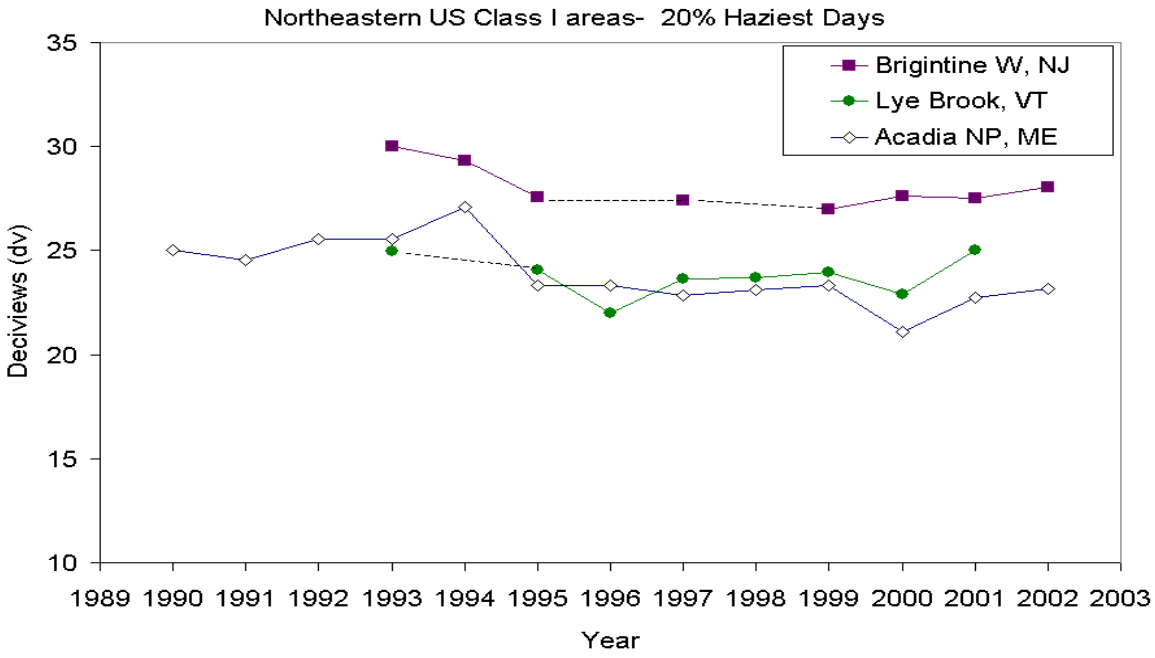


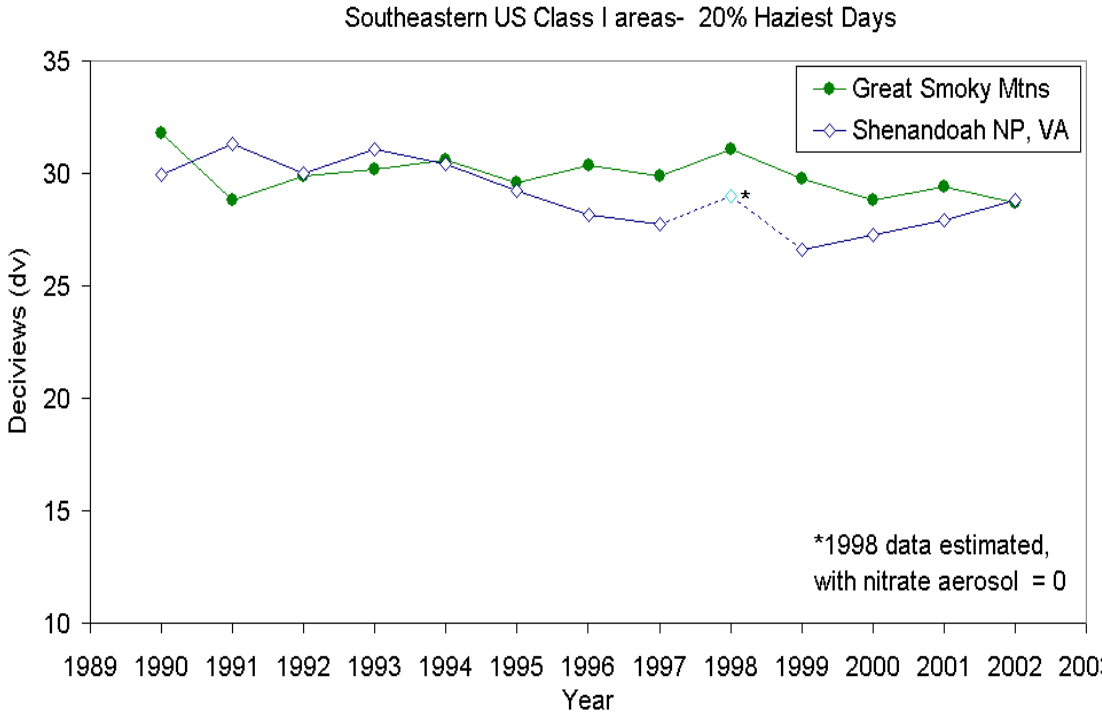


*Source: IMPROVE/VIEWS web site*. Note that dashed lines indicate missing data. These values were calculated according to EPA guidance. IMPROVE cautions using nitrate concentrations in annual average dv calculations before June of 1996 due to some inconsistency in nitrate levels at some IMPROVE stations when compared to other methodologies. These data should be viewed with this caution in mind.

same patterns in regional air pollution events[6]. This phenomenon is also discussed in a recent report by the New Hampshire Department of Environmental Services, see Appendix A of the report[7]. There is not always a direct correlation between increasing ozone levels with increasing altitude as concentration are also largely related to the region's meteorology and location of the source pollution. However, there are many parks that experience higher concentrations on summits and above tree line – often the destination of hikers. Ten out of sixteen national park monitors reporting significant increasing ozone trends (p<=0.15) are at elevations greater than 3000 feet (914 meters). The table below shows ozone trends and number of exceedance days in recent years from a number of high elevation sites across the nation. Parks with ozone monitors at different elevations exemplify the problem.

Table 2. Ozone trends and exceedance days, nd = not data available.

| National Park or Wilderness Area | Elevation (m) | Ozone Trend[8] (ppb/year) | No. of $O_3$ Exceedances days[9] 2002 | 2003 |
|---|---|---|---|---|
| **Sites with >1 monitor** | | | | |
| Great Gulf Wilderness/ Camp Dodge[10] | 452 | nd | 0 | 0 |
| Great Gulf Wilderness/ Mt. Washington Summit | 1910 | nd | 4 | 0 |
| Great Smoky Mtns/ Look Rock | 793 | 0.46 | 32 | 9 |
| Great Smoky Mtns/ Cades Cove | 564 | 0.78 | 2 | 1 |
| Great Smoky Mtns/ Cove Mountain | 1243 | 0.75 | 35 | 3 |
| Great Smoky Mtns/ Clingman's Dome | 2021 | 1.49 | 29 | 3 |
| Sequoia/ Ash Mtn. | 457 | -0.29 | 80 | 72 |
| Sequoia/ Lookout Point | 1225 | 1.36 | 81 | 53 |
| **Sites with 1 monitor** | | | | |
| Chamizal | 1128 | 1.81 | nd | nd |
| Mesa Verde | 2165 | 0.91 | nd | nd |
| Rocky Mountain | 2743 | 0.26 | 6 | 7 |
| Yellowstone | 2400 | 0.79 | 24 | 10 |

[6] Fischer et al. 2004 http://ams.confex.com/ams/pdfpapers/77199.pdf
[7] http://www.des.state.nh.us/ard/PollutionTransport/
[8] Ozone is annual May-September average of the daily maximum 1-hr value.
[9] Exceedance day being a daily 8-hour average concentration >84 ppb
[10] Data for Great Gulf Wilderness from the Appalachian Mountain Club.

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Human pulmonary function is negatively affected by ozone pollution. Exposure is often greater for people hiking due to time spent outside, enhanced respiration, and if their destination is a high elevation peak. Brigham and Women's Hospital, Harvard School of Public Health, and the Appalachian Mountain Club (AMC) conducted a three-year study to examine health effects of rural air pollution on hikers on Mount Washington. The study, *Effects of Ozone and Other Pollutants on the Pulmonary Function of Adult Hikers,* published in Environmental Health Perspectives 1998, demonstrated that ozone, and to a lesser extent fine particulate matter, result in acute respiratory impacts to healthy, active adults hiking in Eastern parklands[11].

It has also been demonstrated that sulfur dioxide and nitrogen oxide emissions are still significantly degrading aquatic and forested ecosystems[12]. Of specific concern are the high elevation ecosystems like those found along the Appalachian mountain chain that contain fragile and unique vegetation communities. Unfortunately these higher elevation areas receive greater doses of pollution compared to low elevation sites. Atmospheric deposition rates increase with elevation, and cloud deposition becomes significant above 1000 meters[13]. AMC has collected cloud and rain water deposited near the summit of Mount Washington in the White Mountains of New Hampshire and found it is very acidic with a pH equal to that of vinegar, and the main cause of acidity is sulfate and nitrate compounds. Heavy loading of these pollutants will often result in acidification of soils and adversely affects vegetation and aquatic systems across the landscape. Class I areas such as the Great Gulf and Presidential/Dry River wilderness areas in NH contain unique alpine vegetation as well as high elevation streams and lakes. From 1995-1997 AMC collected stream water in the Great Gulf Wilderness at high elevation and found some of the highest nitrate levels in the region, along with elevated calcium and magnesium concentrations, signs of nitrogen saturation and leaching of base cations. Similar trends are found elsewhere at high elevations. A study of stream chemistry in the Catskill Mountains of New York over an elevation range of 817-1234 meters have shown a strong positive correlation between elevation and concentrations of nitrates and sulfates while concurrently showing a strong negative correlation between elevation and concentrations of exchangeable base cations[14]. Low concentrations of base cations at this study area indicate that the system has already been depleted due to the higher acid loading at high elevations. An initial report on assessing forest sensitivity to nitrogen and sulfur loading in Vermont estimates that 73% of the state's higher elevation forests (red spruce and balsam fir) have exceeded the threshold for harmful ecological effects[15]. While this forest type is only a small percent of

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[11] Korrick, Neas, Dockery, Gold, Allen, Hill, Kimball, Rosner, Speizer, Effects of Ozone and Other Pollutants on the Pulmonary Function of Adult Hikers. *Environmental Health Perspectives* 106(2)

[12] Driscoll CT, Lawrence GB, Bulger AJ, Butler TJ, Cronan CS, Eagar C, Lambert KF, Likens GE, Stoddard JL, Weathers KC. 2001. Acidic deposition in the northeastern United States: sources and inputs, ecosystem effects, and management strategies. *BioScience* 51(3): 180-198.

[13] Weathers KC, Lovett GM, Likens GE, Lathrop R. 2000. The effect of landscape features on deposition to Hunter Mountain, Catskill Mountains, New York. *Ecological Applications* 10(2): 528-540.

[14] Lawrence GB, David MB, Lovett GM, Murdoch PS, Burns DA, Stoddard JL, Baldigo BP, Porter JH, Thompson AW. 1999. Soil calcium status and the response of stream chemistry to changing acidic deposition rates. *Ecological Applications* 9(3): 1059-1072.

[15] 2003 http://www.ecosystems-research.com/fmi/VT-NF-Forest-Sensitivity-Report.pdf

the landscape in Vermont it forms the spine of the Green Mountains, where many hiking trails traverse. The study discusses how the mountain top forests in Vermont receive higher amounts of acid deposition but have lower mineral weather rates and hence low acid buffering capacity in the soils.

Low elevation ecosystems in wilderness areas and national parks also experience deleterious effects from acid deposition. Driscoll et al. (2001) recently summarized the body of scientific evidence that acid deposition is damaging forested ecosystems across the Northeast on many levels, including declines in the health of sugar maple and red spruce stands, the death of aquatic organisms, and poor water quality in streams and lakes.

**Economic Impacts**

The Appalachian Mountain Club, a founding member organization of Hikers for Clean Air, has conducted research in the White Mountains of NH that indicates that the state's economy is likely affected by deterioration of vistas[16]. Clear vistas of up to 130 miles are an important draw for tourists to the White Mountain region, with more than 1.8 million visitor days to the White Mountain National Forest annually[17]. As part of the investigation, a survey was conducted in 1996 and 1997 to determine if there was a threshold at which visitors find visibility of a view of Great Gulf Wilderness "unacceptable." Results showed that the median visitor found a 33-mile visibility or worse "unacceptable" for the Great Gulf vista. On a clear day the visibility in New England is 90-130 miles, while on the haziest day visibility is near 10 miles. Of those planning to revisit the White Mountains 64-68% surveyed would be less likely to visit if conditions worsened. Clearly, visibility affects decisions of tourists. NH's economic base relies heavily on tourism. The total impact of visitor spending on the state's economy (direct and indirect spending and induced impacts) was over $9.3 billion in that FY 2000[18]. Direct spending equaled 7.9 percent of the gross state product (GSP). The cited economic report states: "Travel and tourism spending is a tremendously important part of the state's economy. It remains the second leading export activity (after manufacturing). As a total employer, the travel and tourism industry (10.6% of total jobs) ranks second behind retail trade, and ahead of health services and business services." Over 40% of the spending in NH in FY2000 was during the summer months when haze is most prevalent. To balance the decline in the forest products industry nationally, it is critical that local economies recover the important economic value of the recreational use of public lands lost due to regional haze. There is no doubt that degraded vistas from man-induced haze represent a lost value to recreation clubs, the public, and a region's tourist-based economies. An additional study, commissioned by Clean Air Task Force, reported on the cost of decreased visitation to National Parks due to haze, an example is Acadia National Park where it was estimated that $328 million (in 1999 dollars) is lost annually[19].

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[16] Hill, LB, W Harper, JM Halstead, TH Stevens, I Porras, KD Kimball. 1999. Visitor Perceptions and Valuation of Visibility in the Great Gulf Wilderness, New Hampshire. 1999 US Forest Service Wilderness Science in a Time of Change Conference in Missoula Montana.

[17] http://www.fs.fed.us/r9/white/3_WM_fpr_Web/forest_plan/revision/survey/chapter_3.pdf

[18] http://oz.plymouth.edu/inhs/EconomicReports/

[19] Abt Associates Inc. 2000. Out of Sight: The Science and Economics of Visibility Impairment. A report prepared for the Clean Air Task Force.

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In conclusion, the undersigned organizations are encouraged that EPA has moved ahead with the publication of the BART rule, however, we are dismayed by the potential changes EPA has proposed that would rob states and citizens of the opportunity to experience significant improvements in visibility and other air quality related problems in line with the Regional Haze programs, timelines, and goals. We respectfully request that EPA reconsider many aspects, as discussed above, of the proposed Regional Haze BART program and that the organization provide a final rule that honors the intent of Congress and goal of the Clean Air Act- to eradicate haze pollution from our cherished public lands.

Respectfully submitted,

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