

SOCIOECONOMIC ASSESSMENT

[General: This section needs a thorough editing for streamlining, format consistency, spelling, capitalization, grammar, definition and consistent use of acronyms, etc. These issues are only partially addressed in the comments shown below.]

The objective of the socioeconomic assessment is to examine some of the social and economic implications of the SAMI strategies. This was a two-phase process. Phase I produced a listing of potential topic areas including an assessment of the relative magnitude of impacts for each topic, the potential ability to develop credible estimates of the impacts, and the costs associated with varying levels of analysis. The Phase I report enabled the workgroup to choose 6 topic areas (later reduced to 4) based on relative impact, feasibility, and to strike a balance across the selected topics among the interests of various stakeholder groups. The workgroup was comprised of representatives of the federal land managers, environmental groups, industry, EPA, and the states.

[While the environmental groups were not active during the entire assessment, they were involved early on, when key decisions were made about topic selection, topic methodology, and during the final review of the observations and conclusions, so they should be included in the list of participants.]

The Phase I report also described methods for quantitatively or qualitatively assessing each of the selected topics. Consistent with the rest of the SAMI assessment, the report suggested a “benefits transfer” approach which relies on information from existing studies in which the subjects and the environmental quality improvements are as close as possible to those under consideration, rather than on original research. **[Without further elaboration, the deleted sentences are not particularly useful because jargon such as contingent valuation will not be understood. In addition, the sentences as written are probably not totally accurate.]**

Phase II, was not a comprehensive assessment of the social and economic implications of the SAMI emission reduction strategies. However, for the topics selected it did provide some useful information about the potential impacts in the SAMI region for three emissions management strategies A2, B1 and B3, **[The original wording is misleading, since only two topic areas were assessed quantitatively in dollars. Even the suggested wording is slightly inaccurate, since the workgroup did not specifically address the relative implications of the three emissions management strategies on sense of place/stewardship.]** The socioeconomic assessment is missing key benefit categories including **[This is not a benefit and should not be included in this list]**, health and ecosystem effects, and effects from additional pollutants. **[The entire previous sentence should be deleted. – The socioeconomics analysis does not assess effects, that was the job of the effects contractors.]** Initially six topics were chosen. However, two of the topics, mortality risk and competitiveness, were not finalized. Based on a review of the ,draft contractor reports, SAMI concluded that the uncertainties precluded drawing any conclusions for these topic areas. The four remaining topic areas and their scopes are:

Fishing: The extent to which reductions in air pollution may reduce acidification of fishable waters in the SAMI region leads to a variety of potentially quantifiable chemical or biological changes. The SEWG looked at how these changes might affect an angler’s fishing experience. As the density of the fish population increases so does the probability of catching fish which provides a

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value to those who fish. Based on previous socioeconomics studies, the change in the value brought about by a selected control strategy was assessed.

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Visibility while hiking and enjoying scenery: In an area such as the Southern Appalachian Mountains, improved visibility is one of the most noticeable results of improving air quality. When the view is obscured aesthetic and economic consequences potentially occur. Some visitors to National parks and wilderness (class I) areas may not always be able to see the spectacular views as well as they expect because, at times, a haze obscures them. Because poor visibility reduces a person's enjoyment of the views (recreational visibility), it may reduce the likelihood of a return visit. There also is evidence that people value visibility at National Parks even when they are at home, whether they visit those areas or not. In addition, people value good visibility where they live (residential visibility). Although difficult to estimate, people's desire for improved visibility, be it recreational or residential, seems genuine.

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Sense of Place/Stewardship (SOP/S): Reducing emissions provides both benefits and costs to society. Some of the benefits can be associated with a direct use by individuals of an environmental resource (e.g., consumption of agricultural products) or linked to activities sensitive to environmental quality (e.g., recreation activities). These benefits involve values based on use of the environment. Individuals may also have intrinsic values for environmental resources and environmental quality that do not involve a use value. [Both sense of place and stewardship include an economic component (e.g. the need to maintain a livelihood (jobs). That needs to be addressed here as well. This paragraph currently leaves the impression that there are only benefits from sense of place and stewardship. Therefore, a sentence or two about costs should be added to this paragraph and the next.)]

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In the context of SAMI's mission, stewardship refers to the notion that there is a fundamental ethical responsibility for humans to tend to nature and to pass on to succeeding generations a world that reflects a sustainable pattern of consumption of nature's resources. Stewardship values are reflected in individual preferences but do not overlap with any present or future use value held by an individual. They are distinct values, often associated with unique, irreplaceable environmental assets, for which an individual has a willingness to pay to maintain positive supply now and in the future. Stewardship values can have local, regional and global dimensions.

Community sense of place refers to values that reflect the mixture of quality-of-life attributes associated with living in a specific area. In the context of the environment, sight attributes, including viewscape are especially important to community values. Another aspect of sense of place may be closer to the idea of preservation of a particular complex set of quality of life attributes, which includes the ability to earn a reasonable living in the place you reside. SOP explores community values, beliefs and behaviors as they relate to life and the surrounding natural environment. It explores the relationship in the Appalachian Mountains between air pollution and what makes residents identify with the place they live. [This paragraph also needs to make clear that economic well-being plays a role in sense of place.]

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Lifestyles: This topic examines the changes that flow from the need to change individual household behavior in response to the implementation of the SAMI strategies. The focus is on how restrictions on both consumer and producer activities in industries with large emissions affect individuals' lifestyles. A qualitative assessment was made of "hidden cost" impacts such as the

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time consumers invest due to environmental regulations such as waiting on vehicle inspection lines and constraints on consumer choices that are altered by control strategies due to higher costs or fewer options.

Fishing

Objective

This study assessed the extent to which reductions in acid deposition in streams in the SAMI region result in economic gains. The indicator was the effect on recreational fishing for native brown trout. A stream's acid neutralizing capacity (ANC) is affected by many forcing functions including acid rain resulting from nitrogen and sulfur emissions. SAMI's emissions management strategies are designed to reduce these emissions, which should in turn increase ANC (refer to the section on acid deposition for more detail). The benefits that result from improvements in a stream's ANC, lead to an increase in the populations of various recreational fish species, in this case native brook trout. The main assumption is that anglers are willing to pay to improve fish availability.

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Methods:

The Model of Acidification of Groundwater in Catchments (MAGIC) provided by SAMI's effects contractor estimates changes in ANC for A2, B1 and B3. The estimated changes in water quality chemistry were used to analyze changes in fishing opportunities to recreational anglers due to increased fish populations. These changes include both increases in the number of fishing sites available and improvements in the quality of existing sites. A benefits transfer method was used to estimate an angler's willingness to pay (WTP) for projected changes in the number and quality of trout fishing sites in the SAMI region

This study applies only to native brook trout because they favor higher elevation streams that are more likely to be affected by acid rain. [This is not correct – The effects assessment was limited to brook trout because that was the only species for which studies and data were available.] Changes in fish biomass (the amount of fish) from improved ANC are estimated using a computer model which links ANC and fish biomass. The model looked at changes from one ANC classification to another, not changes within an ANC class. The Five ANC Classes are:

ANC < 0	Unsuitable-Lethal to Brook Trout
ANC 0 – 20	Marginal-Sub-lethal
ANC 20-50	Indeterminate-Extremely sensitive to acidification
ANC 50-150	Suitable- Brook trout will reproduce
ANC >150	Sustainable- Brook trout will reproduce

Exhibit 3.2 shows the estimated brook trout biomass for streams in each of the five ANC classes. Because effects of the emissions management strategies on stream ANC take the form of categories or class specified by ranges of ANC rather than by specific point estimates. Low, mid and high ANC estimates were used to estimate a range of brook trout biomass for each ANC class. The first estimate of brook trout biomass was in kilograms per 0.1 hectare, and then a conversion factor was used to express fish biomass in pounds/acre. The latter metric is used to place a monetary value on the benefit to anglers.

Exhibit 3.2 Conversion of Stream ANC to Brook Trout Biomass

ANC Class	ANC Range (µeq/L)	ANC (µeq/L)			Biomass (kg/.1ha)			Biomass (lbs/acre)		
		Low	Midpoint	High	Low	Midpoint	High	Low	Midpoint	High
1. Chronically acidic	Less than 0	0	0	0	0.7	0.7	0.7	1.3	1.3	1.3
2. Episodically acidic	0 to 20	0	10	20	0.7	1.0	1.3	1.3	1.8	2.3
3. Indeterminate	20 to 50	20	35	50	1.3	1.6	1.9	2.3	3.0	3.6
4. Not acidic-1	50 to 150	50	100	150	1.9	2.7	2.9	3.6	4.9	5.4
5. Not acidic-2	Greater than 150	150	150	150	2.9	2.9	2.9	5.4	5.4	5.4

The resulting estimates for the average that anglers are WTP per trip per amount of fish available to catch (low, medium, high) are given below for the three SAMI scenarios A2, B1, B3 in the years 2010 and 2040:

Average Willingness To Pay per Trip per Angler for Levels of Biomass (~~This is per angler, per trip, and should be dollars(as shown in contractor report), not millions of dollars.~~), 2000\$) *

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Year	Baseline Average WTP under A2 Biomass			Change in Average WTP under B1 Biomass			Change in Average WTP under B3 Biomass		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
2010	\$ 56.47	\$ 56.77	\$ 56.89	\$ 0.08	\$ 0.08	\$ 0.08	\$ 0.18	\$ 0.18	\$ 0.18
2040	\$ 58.82	\$ 59.05	\$ 59.14	\$ 0.15	\$ 0.15	\$ 0.15	\$ 0.54	\$ 0.54	\$ 0.55

The above information combined the estimated angler’s WTP for trout fishery improvements in the SAMI region with the estimated level of angler participation in trout fishing in the SAMI region to estimate the total economic value of trout fishing improvements. Angler participation for years 2010 and 2040 was adjusted to reflect changes in demographics in the SAMI region, but not for changes in income.

Estimated Total Willingness To Pay for Water Quality Improvements in the Eight-County Region of the Northern Plateau (Millions, 2000\$) *

Year	Strategy (B1) (Biomass Level)			Strategy (B3) (Biomass Level)		
	Low	Medium	High	Low	Medium	High
2010	\$ 0.5	\$ 0.5	\$ 0.5	\$ 1.2	\$ 1.2	\$ 1.2
2040	\$ 1.2	\$ 1.2	\$ 1.2	\$ 4.4	\$ 4.4	\$ 4.4

* WTP does not account for income growth in 2010 and 2040.

Results

Using this methodology, it was found that the quantified recreational fishing benefits from changes in acid deposition are substantially lower than other benefits (i.e., benefits from visibility improvements). Under strategy B1, the resulting gain in an angler's welfare is estimated at \$0.08 and \$0.15 (measured in 2000\$) per trip in 2010 and 2040, respectively. The corresponding value of total benefit is \$0.5 and \$1.2 million (2000\$) for 2010 and 2040, respectively. Under scenario B3, the estimated gain in an angler's welfare is \$0.18 and \$0.54 (2000\$) per trip in 2010 and 2040, respectively. The estimated total economic value of fishery improvement in the SAMI region under strategy B3 is \$1.2 and \$4.4 million (2000\$) annually for 2010 and 2040, respectively.

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Limitations and Uncertainties

Limitations of this fishing study include: (1) the lack of data on water chemistry changes within each ANC class; (2) the focus on only one species—brook trout; and (3) the consideration of only one benefit category - recreational trout fishing. (4) the lack of projections of fisheries to 2100. (5) the focus on a small geographic area, the Northern Plateau region, seven counties in West Virginia. (see following map) where streams were estimated to have larger changes in ANC, resulting in shifts into higher ANC classes.¹ **[The entire footnote should be deleted. It is out-of-place here. It is also inconsistent with the assumptions and data available for this study.]** (6) the focus on a short period of time (from 1995 to 2040), which may not be enough to adequately capture the benefits of water chemistry improvements because acidification and recovery operate over much longer time periods. (7) the location of actual benefiting streams and anglers is not known. Benefit estimates are sensitive to stream length (8) This analysis makes no adjustments to the WTP estimates to reflect the growth in real income in 2010 and 2040, (9) the changes within ANC classes are not considered.

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Most of the above factors are likely to result in an underestimation of the total benefits from improvements in ANC. Potential over-estimates of benefits relate to a liberal assumption on the average distances that anglers are willing to travel for the fishing experience and the use of the ANC class change rather than the smaller projected changes within a class to calculate benefits for

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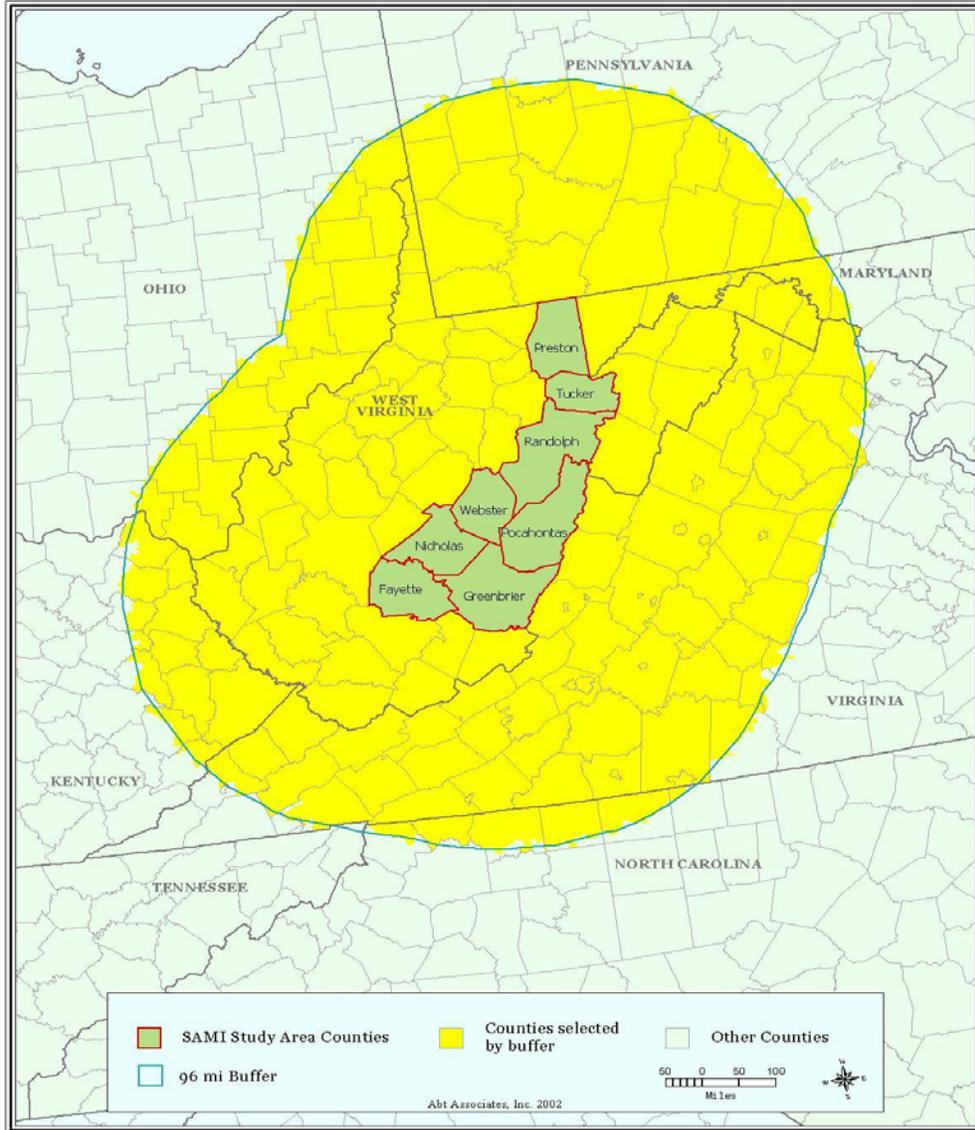
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Area of fishing Study

The majority of the streams that improve their ANC under the SAMI strategies, as determined by the effects work group, are located in the following eight counties in West Virginia: Fayette, Preston, Greenbriar, Nicolas, Pocahontas, Tucker, Randolph and Webster. The analysis of economic benefits resulting from improved brook trout fishing is limited to the geographic area comprised of these eight counties shown in the previous figure.

Observations

Using the results of the study submitted by the contractor, the SAMI Socioeconomic workgroup (SEWG) observed that:

- The benefits analysis focused on the small geographic area where the largest ANC changes occurred.
- The results showed: small increases in total WTP across all strategies
- The estimated economic value of fishery improvement in the SAMI region under strategy B1 is \$1.2 million in 2040. (These would be larger benefits if shifts within ANC classes were measured). B1 increases are less than half the increase in the value per trip under B3.
- The estimated economic value of fishery improvement in the SAMI region under strategy B3 is \$4.4 million in 2040. The trend is toward increased fishing benefits as air quality improves.

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Conclusions

Brook Trout improvements provide a small incremental benefit to the total value of SAMI policies compared to other socioeconomic topic areas. WTP for water quality improvements in the eight-county region of West Virginia ranges from a low of \$500,00 in 2010 to a high of \$4.4 million in 2040.

Visibility

Objectives

The SAMI strategies generally show visibility improvements throughout most of the SAMI region.

The object of the visibility assessment is to evaluate the socioeconomic impacts of visibility improvements from SAMI emissions reduction strategies, in and around the Class I areas. This may be measured in visual range (how far you can see) or by Extinction or Deciview. [A better, more precise explanation is needed.] It puts a monetary value on people’s desire for clear views (WTP) based on emission reductions from the SAMI strategies. Visibility includes recreational visibility (WTP for visibility improvements in Class I areas) which assumes people everywhere in the country want good visibility in the National parks in the southeast whether they plan to visit them or not. A more limited analysis was done for residential visibility (people’s WTP for good visibility where they live.)

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Methods

SAMI’s atmospheric modeling contractor prepared visual air quality profiles for A2, B1 and B3. emissions reduction strategies, in and around the Class I areas. The socioeconomic report estimates a general relationship between the amount of visibility improvement and the average value households are willing to pay for that improvement using benefits transfer methodology.

Benefit Transfer Studies

Though there have been a number of visibility valuation studies, only two gave monetary estimates of the visibility changes in the Southeast. One is a study on residential visibility conducted in 1990 (McClelland et al., 1991) and the other is a 1988 survey on recreational

visibility value (Chestnut and Rowe, 1990). Chestnut and Rowe (C&R) was chosen to serve as the basis for the recreational estimate of visibility benefits in the SAMI analysis. It is the only study to estimate the value of visibility improvements at parks in the Southeast. The McClelland et al. visibility study was chosen as the basis for the estimate of SAMI residential visibility benefits.

Contingent valuation (CV) tries to place a dollar value on people's desire for improved visual air quality by asking them what they are willing to pay for improved views. It must separate this desire from other effects of emission changes. Both studies chosen for this analysis use the CV method. McClelland et al. (1991) conducted a CV study of residential visibility in Atlanta. Chestnut and Rowe (1990) included a CV study of visibility at National Parks in the Southeast with particular emphasis on Shenandoah National Park.

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Benefit Transfer Function

In order to estimate the value of the different visibility improvements projected to occur under each of the SAMI strategies, a general relationship between the amount of improvement in visibility and the average value households place on that improvement, observed in both the C&R and McClelland et al. studies was used. Separate recreational values were estimated for residents of the Southeast, the rest of country and each of 10 Class I Areas (requiring apportionment of benefits among the Class I areas and the wilderness areas in the SAMI region). Residential visibility has a separate estimate. Using the benefit transfer function, the C&R- and McClelland-based WTP parameters, the projected visual air quality for A2 B1, and B3 and the corresponding future year population are used to estimate each household's WTP for visibility improvements. The sum of household WTP for recreational visibility improvements equaled the total estimate of recreational visibility benefits. Similarly, the sum of household WTP for residential visibility improvements equals the estimate of total residential visibility benefits.

Primary Estimate of Total Recreational Visibility Benefits in Class I Areas Only

Year	Control Scenario	Benefits (\$million)
2010	A2 to B1	\$796
	A2 to B3	\$2502
2040	A2 to B1	\$1474

(Last column of table below should read Benefits (in \$millions))

Class I Visibility Results

Year	Scenario	Region	Benefits
2010	A 2 to B 1	National	\$796
		SAMI 8 State Region	\$155
		Non-SAMI Region	\$641
	A 2 to B 3	National	\$2,502
		SAMI 8 State Region	\$482
		Non-SAMI Region	\$2,021
2040	A 2 to B 1	National	\$1,474
		SAMI 8 State Region	\$301
		Non-SAMI Region	\$1,173
	A 2 to B 3	National	\$2,705
		SAMI 8 State Region	\$555
		Non-SAMI Region	\$2,150

Benefits in Millions of year 2000 \$

*Totals do not reflect adjustments for income growth, which would increase benefits in 2010 up to 27% and in 2040 up to 82% using EPA's methods.

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Results

Visibility Benefits by Class I Area

Class I Area	2010		2040	
	A2 to B1	A2 to B3	A2 to B1	A2 to B3
Great Smoky Mountains	\$561	\$1,810	\$952	\$1,724
Shenandoah	\$229	\$673	\$511	\$961
Cohutta	\$3.0	\$9.3	\$5.4	\$9.9
Dolly Sods	\$0.4	\$1.1	\$0.6	\$1.4
James River Face	\$0.1	\$0.4	\$0.3	\$0.5
Joyce Kilmer-Slickrock	\$1.3	\$3.5	\$1.9	\$3.4
Linville Gorge	\$0.5	\$1.3	\$0.7	\$1.3
Otter Creek	\$0.2	\$0.5	\$0.3	\$0.7
Shining Rock	\$0.7	\$2.3	\$1.1	\$2.0
Sipsey	\$0.3	\$1.1	\$0.7	\$1.1

Benefits in Millions of year 2000 \$

*Totals do not reflect adjustments for income growth, which would increase benefits in 2010 up to 27% and in 2040 up to 82% using EPA's methods.

The above tables show the national benefits for each control scenario in 2010 and 2040 as well as the portion of national benefits attributed to residents both within and outside of the SAMI region. Recreational visibility benefits are based on the change in visibility at each of the Class I areas and therefore apply to each park itself.

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Recreational visibility improvements are the primary estimate of SAMI-related visibility benefits. Under scenario B1, the value of recreational visibility improvements is \$796 and \$1,474 million (2000\$) for 2010 and 2040, respectively.² Under scenario B3, the value of recreational visibility improvements is \$2,502 and \$2,705 million (2000\$) for 2010 and 2040, respectively.

Supplemental Estimate of Residential Visibility Benefits

Year	Control Scenario	Benefits (\$million)
2010	A2 to B1	\$224
	A2 to B3	\$1022
2040	A2 to B1	\$791
	A2 to B3	1463

² Benefits in 2010 would be up to 27% higher if an adjustment for income growth were applied. Likewise, in 2040 the total benefits would be up to 82% higher. These values were calculated by EPA for the Heavy Duty Diesel regulatory impact analysis. EPA's Science Advisory Board has concurred with the methodology for the calculation in its review of EPA's health-related analyses, but has been silent regarding the acceptability of these specific values used for assessing visibility benefits. While the concept of an income growth adjustment is reasonable, there are significant uncertainties concerning its value.

This analysis considers the value of residential visibility improvements to be a supplemental estimate of SAMI-related visibility.³ Under scenario B1, the value of residential visibility improvements is \$224 and \$791 million (2000\$) for 2010 and 2040, respectively.⁴ Under scenario B3, the value of residential visibility improvements is \$1,022 and \$1,463 for 2010 and 2040, respectively.

Limitations and Uncertainties

The estimates of recreational and residential visibility valuation are uncertain and controversial. There are many potential sources of information that could shift the results up or down. Assumptions were made using available data to estimate visibility valuation (using techniques from prior federal visibility assessments) associated with improved visual air quality at Class I areas in the SAMI region under SAMI's strategies.

Observations and Conclusions

The above table: Class I Visibility Results, shows that 80% of the benefits for visibility improvement are for non-residents who live outside the SAMI region. The per park recreational visibility benefits show that across the scenarios, the Great Smoky Mountains National Park and Shenandoah receive the bulk of the benefits based on visibility improvements and how these benefits are apportioned.

Sense of Place /Stewardship Objectives

This [topic](#), Sense of Place/Stewardship (SOP/S), of the SAMI assessment addresses the quality of life associated with living in a specific area. Its objective is to expand the impact analysis of air pollution policies beyond traditional "endpoints", to explore relationships in the Appalachian mountains between air pollution and "What makes this place this place?" to local residents.

SOP

The US Environmental Protection Agency developed a broad definition of SOP in the Community Social and Cultural Profiling Guide (1997): "[the] local values, beliefs, and behaviors as they relate to community life and the surrounding natural environment." These include: community capacity and activism; community interaction and information flow; demographic information; economic conditions and employment; education; environmental awareness and values; geographic and administrative boundaries; governance; infrastructure and public services; local arts, history, and tradition; local identity; local leisure and recreation; natural resources and landscape; property ownership, management, and planning; public safety and health; and religious and spiritual practices.

Stewardship

³ The analysis creates a distinction between primary and supplemental benefits to highlight the uncertainty present within each estimate. Primary benefits, though uncertain, are a better estimate of the magnitude of recreational visibility benefits. Supplemental estimates of the value of improvements in residential visibility are more uncertain than the primary benefits.

⁴ See footnote [2](#).

Stewardship is a set of distinct values often associated with unique, irreplaceable, environmental assets for which there is a desire to maintain the essence of a place for future generations. It further involves accepting or assigning continuing responsibility for preserving what residents' value about the place they live.

SOP is oriented towards past and present while stewardship is aimed at preservation for future generations. Both SOP/S share common components such as personal experiences and opinions, a combination of facts and myths and variations among individuals. Many elements are intertwined such as: peoples sense of family and community and history. The environment is just one aspect. The economy (types of employment, income levels, cost of living and architecture) is another variable.

Methods

Information on residents' feelings about SOP/S was gathered through 6 focus groups held at three locations. Since every town or city in the southern Appalachians has unique characteristics that would lead to a different SOP for each location and it was impossible to study every location, three places were chosen. These were:

- Traditional Appalachian economy, Madison, West Virginia, a small coal mining town in Boone County, located 35 miles southwest of Charleston, WV.
- Tourist and recreation destination, Asheville, North Carolina, a rapidly growing city that is an important tourism and recreation center in the Carolina mountains. Asheville is also a growing retirement destination.
- Growing metropolitan area, Knoxville, Tennessee, the largest city in the immediate mountain area. Knoxville has a diverse economy, with tourism (as a major gateway to the Smoky Mountain recreational destinations), a high tech sector (through the University of Tennessee, Oak Ridge National Laboratory, and the Tennessee Valley Authority), and traditional Appalachian manufacturing.

Two focus groups were held in each location. Participants were recruited via random telephone solicitation in Madison and newspaper advertisements in Asheville and Knoxville. A topic guide was developed and followed in the discussion process. It was divided into 4 key sections: "What makes (this place) (this place)?, where do you see this place heading in a generation?, what are the essential aspects of the (this place economy), and what about the environment makes (this place), (this place)? Participants were instructed not to try to agree, but to express their own thoughts. As with all focus group research, the small sample size (3 locations, 48 people) does not represent the full population, but is an illustrative sample. The focus group sessions were recorded and transcribed.

Results

Focus group participants seemed to understand the concepts of way of life and environmental stewardship. They spoke about responsibility, preservation, and conservation of both the environment and way of life. Madison focus group participants, talked about stewardship in terms of "putting things right" with respect to the environment and "restoration" with respect to their way

of life, leaving jobs for the future, zoning and planning. They wanted to make sure that coal-mining companies that altered the land left it in usable condition (not necessarily its *original* condition) after they were through with it. This implied a kind of social contract between area residents and these industries: companies that left the land with no restoration after completing their mining were the objects of contempt. Most of all, Madison participants wanted to retain their way of social life as a close knit, caring community. They were concerned about attracting young people to stay in their community and deeply pessimistic, even fearful about the future of their town. They believe that additional environmental regulations would reduce the availability of jobs in the area. They were doubtful that new jobs would be created. They wanted coal mining to continue as mining wages, because the mining jobs tend to be the best-paying in the area. Few non-mining “good jobs” exist in Madison. [For the two other cities quotes are included, but none are offered here.]

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Asheville participants talked about stewardship issues in terms of the conflict between individual rights and the good of the community in land-use zoning. They saw zoning as a “hugely contentious issue,” with large consequences for preservation of Asheville residents’ way of life. The dominant view was that land use zoning in what participants perceived to be the public interest was a good thing, in order to prevent Asheville from turning into a “giant trailer park,” or a little Atlanta, “where you have convenience store, grocery store, house, house, house.” Asheville participants also spoke about effective planning on the local level: how this had already paid off in an aesthetically pleasing urban area, and how it would continue to work to preserve Asheville residents’ quality of life. A number of participants talked about gardening, and even a “gardening mentality,” which cultivates now for benefits in the future.

Focus group participants’ sense of Knoxville revolved around (1) the Smoky Mountains and other mountains in the area, (2) the University of Tennessee, and (3) a feeling of division, or dualism, that splits the city in various ways. Throughout the discussions, participants expressed an understanding that the environment, economy, and culture are all interrelated.

In particular, the influence of the mountains can be seen in “the independence of the people – they’re stubborn.” In addition, the people are “neighborly ... and there’s a lot of good in that,” “very caring,” “hospitable [and] friendly.” Participants perceived other regional traits: “When you need somebody to do something and you need a volunteer to step forward, this part of the world is there.” And: “the people seem to have more of a sense of self in this area ... knowing where they came from. The history ... you have a big comfort and a sense of where you belong and where you’re going.”

Though there are individual differences, the six focus groups’ discussion of stewardship were similar in the following views:

- Not all area residents would agree on all the elements that would make up a desirable future. Second, participants felt that the probable way their area’s environment or way of life or both would be preserved were political. All six focus groups had a significant political content, (*although politics was not included in the topic guide*). The Knoxville discussions were a good example. Participants perceived a lack of effective future city

planning. Poor communication between government and citizens and fighting between city and county contributed to Knoxville residents' lack of confidence in planning for the future. As one person said, "You've got those two separate entities that are fighting when what they should [do] is come together for the better of the community."

- If the environment is going to be properly stewarded, it will be "government" that will have to do the job. There were differences regarding which level of government – city, county, state, regional, national – ought to be the responsible party. Then whether government stewardship of the environment would be successful, or even necessary. In Knoxville, University of Tennessee educational programs were also anticipated to influence the future.
- Not personally responsible for environmental and social problems, others were. In Madison, these "others" were industry and government. In Knoxville, the "others" were tourists, whose cars bring pollution; Oak Ridge; power plants in other states; and developers. In Asheville, the city of Charlotte, N.C.; out-of-state power plants; and anti-zoning residents were the primary culprits. Focus group participants did accept that their own automobiles helped cause pollution, to some extent.
- Concerned about economic matters like jobs, more than the environment, but generally they would prefer to have both.

[This entire section should be deleted. It was not the consensus observations of all SEWG stakeholders.]

Conclusions

SOP/S has implications for SAMI region air policies. The region is very diverse, and residents differ deeply in their opinions. The environment is a strong element in their SOP. The outdoors, especially the mountains, hold a special place in people's sense of what makes their place special. Air quality is seen as critical for tourism and recreation. Cost of living and job losses are major concerns. Lower income participants are worried that they may be forced to leave. There is a uniform awareness of local, state and federal government's role in protecting the quality of life.

Lifestyles

Objective

Lifestyles is a qualitative assessment of the potential impacts of complying with SAMI strategies on individual households (not the effect of cleaner air on household well being and health). Improving air quality requires restrictions on emission generating activities of both consumers and producers. Restricting consumer activities affects household well being directly because individuals must seek alternatives to activities (including the consumption of goods and services) that are affected by emission reduction strategies. Restricting the activities of producers affects households' well being indirectly through effects on prices and employment.

Methods

Lifestyles is a qualitative and not comprehensive study that was developed from reviewing the SAMI strategies and developing types of effects:

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The SEWG agreed upon the following observations:¶
 <#>SOP/S reflects citizens' views of an externality caused by air pollution - The air we breathe and the mountains we view are considered ¶free and an integral part of the environment we live in". With this free good, everyone believes that someone else is responsible for polluting or damaging it (no ownership of the problem), and that someone else will be responsible for cleaning it up. ¶
 <#>The mountain environment is an integral part of the citizen ¶sense of place - what makes their community special¶
 <#>In lower income areas, such as Madison, the environmental resource is viewed as the key to economic survival, jobs, and family livelihood. Because employment and income are essential to them, environmental resources used by them (and the industries in their area) are perceived to be necessary to sustain their way-of-life (for them and their children). ¶
 <#>In communities with higher incomes, jobs are not as directly linked to an environmental resource, but they view the environment (i.e., the mountain view) as a key element of what makes their community special. They use the environment as a recreational resource and/or tie it to the economy through tourism and/or real estate. ¶
 <#>Planning for the future is important to citizens.¶
 <#>Many feel ¶small voices" are not heard when decisions are made that impact the future of their economy.¶
 Many feel city, county, State, or Federal government will provide what is needed to sustain the community's well being. Perceptions are that government will either provide jobs or supplemental income, or plan for smart growth decisions, or maintain the environment in the way they are accustomed to (i.e., the government will maintain the mountain view that makes the area special, or citizens hope that coal or other environmental resources will continue to provide for their economic well-being).

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- Direct effects are elements of strategies affecting consumer goods or activities generating emissions.
- Indirect effects are elements of strategies affecting producers of goods and services generating emissions.

SAMI strategies were used in order to characterize the qualitative effects on consumer lifestyles.

The focus is on how restrictions on both consumer and producer activities affect lifestyles. Case study industries were chosen that must make large emission reductions. Air quality improvements resulting from implementing the SAMI strategies are also likely to have positive affects such as potential improvements in health, visibility, and opportunities for recreation. Some of these benefits have been estimated and described in other components of SAMI's integrated assessment and are not described further in this lifestyles assessment.

Direct Impacts on Consumers

The SAMI strategies affect consumers directly through emission reduction for vehicles and residential fuel combustion. Reduced vehicle emissions are to be achieved by more stringent emission controls for onroad vehicles, the gradual market penetration of onroad zero emission vehicles (ZEVs), reductions in the growth of onroad vehicle miles traveled (VMTs), and substituting ZEVs for nonroad gasoline lawn, garden, and recreational vehicles. Plans for reducing emissions from residential fuel combustion include efficiency improvements for residential natural gas combustion, and substituting natural gas for residential wood and coal combustion. Each of these measures will affect household well being by requiring changes in consumer behavior.

Consumers will incur additional costs associated with higher emission standards for onroad vehicles and replacing conventional vehicles with ZEVs. Given the current state of technology, the performance of ZEVs is inferior to that of conventional vehicles. There are also safety concerns about ZEVs.

From the perspective of consumers, there are both potential advantages and disadvantages associated with strategies to reduce VMT growth rates. Advantages include the amenities and lower expense of telecommuting, ridesharing and public transportation, and the convenience of high occupancy vehicle lanes. Reducing VMT growth rates will also reduce highway congestion. Potential disadvantages include possible loss in worker productivity, loss of workplace amenities, the inconvenience of ridesharing and public transportation, and the tax burden of subsidies to public transportation. Nonroad ZEVs have lower operating costs than gasoline vehicles. However, the up front cost of ZEVs is higher, and ZEVs may, in some cases, have inferior performance relative to gasoline vehicles.

There are also potential advantages and disadvantages associated with strategies to reduce emissions from residential fuel combustion (fireplaces, wood stoves etc.). The potential advantages include cleanliness, convenience, reliability, and efficiency improvements. Potential disadvantages include the costs of switching to natural gas and loss of aesthetics and aromatics. Localized unavailability of natural gas supplies is another potential problem.

Indirect Impacts: Price and Employment Impacts

The analysis of potential price and employment impacts focuses on ten “case study” industries. These include electric utilities, textiles, paper and paperboard, chemicals, primary metals, natural gas transmission, coal mining, liquid fuel providers, and railroads. Each of these industries is expected to be affected by the SAMI strategies.

The SAMI strategies have the potential for causing price increases in the following industries: electric utilities, textiles, paper and paperboard, chemicals, primary metals, and natural gas transmission. Each of these industries is expected to have higher production costs and may attempt to pass on some of these costs through price hikes. However, their ability to do so will be limited by the availability of substitutes and by competition from producers outside the SAMI region.

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Coal prices are more likely to decrease than increase under the SAMI strategies. The demand for coal is likely to fall because the SAMI strategies call for switching away from coal combustion to fuels with lower emissions, particularly natural gas. The exception is if scrubbers can clean local coal and it is more advantageous to use due to lower transportation costs.

Price effects for railroads, trucking and liquid fuel providers are uncertain. The demand for rail services is likely to increase because of converting truck traffic to rail. However, this effect will be offset, at least partially, by lower demand for coal traffic. The trucking industry is expected to incur increased operating costs because of higher emission standards and conversion to heavy duty ZEVs. These higher costs will tend to increase prices in the industry. In contrast, converting truck traffic to rail will decrease demand for trucking services, and tend to depress prices. The demand for liquid fuel will likely fall because of market penetration of ZEVs and reductions in VMT growth rate. However, the reduction in demand, especially under strategy B3, is substantial enough to change the structure of the industry, reduce spatial competition, and possibly increase distribution costs. The effects of the strategies on liquid fuel prices are uncertain at this point in time.

Employment losses resulting from the SAMI strategies could occur in the following industries: electric utilities, textiles, paper and paperboard, chemicals, and primary metals since each of these industries is expected to incur higher production costs as a result of the strategies. Higher prices could reduce the demand for their products, causing firms to reduce output and employment. Also, some firms in these industries could become unprofitable and close down operations.

Employment losses in the coal mining, liquid fuel provider, and trucking industries are also likely because of reduced demand. The trucking industry is also expected to experience higher operating costs as a result of the strategies.

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The employment impacts on the natural gas transmission and railroad industries are uncertain. As noted earlier, the natural gas transmission industry is expected to incur higher operating costs. However, the demand for transmission services is likely to increase as a result of fuel switching strategies. Railroads will pick up new traffic diverted from trucking, but are likely to lose coal traffic.

Of the ten case study industries, projected baseline employment for the SAMI region is largest in the trucking industry. However, employment in the coal mining industry is concentrated largely in two states, Kentucky, and especially West Virginia. This raises the potential for adverse impacts on local economies.

While this analysis focuses on employment losses, we note that the SAMI strategies could generate positive employment impacts in some industries. Examples include potential employment gains in the tourist industry (due to improved air quality) and increases in employment associated with manufacturing, installing, operating, and maintaining emission controls.

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Observations

Across all sources, strategy B3 calls for larger emission reductions than B1. As a result B3 will have larger impacts on households in 2010 and 2040. Restrictions on consumer activities and price impacts tend to be smaller in the long run. Over time, consumers have better opportunities to adapt and to find substitutes for higher priced goods and services. Employment effects also tend to be small in the long run. While length of unemployment spells are likely to vary considerably depending on individuals' circumstances, the economy tends to absorb available labor resources in the long run though not always with equivalent employment and compensation. An example would be with mining towns or manufacturing towns where the industries have shut down.

While these factors tend to mitigate impacts in the long run, other factors may worsen impacts. Both strategies B1 and B3 call for progressively larger emission reductions over time, suggesting larger impacts on households. Also, employment impacts may be increased in the long run if producers outside the SAMI region, both domestic and abroad, increase capacity in industries affected by the strategies.

Uncertainty

Uncertain technological advances could mitigate some of the impacts of the strategies by providing more environmentally friendly consumer goods and more efficient low-emission production technologies. The rate at which agencies outside the SAMI region adopt strategies for emissions generated by producers is also uncertain. International competition adds uncertainty. The employment impacts of the SAMI strategies will be mitigated if producers outside the region face similar emission controls. Long-run expansion of capacity outside the SAMI region might mitigate price impacts, but have negative employment impacts.

Summary

SAMI decided early in its design of the SE analysis to focus on a few topic areas of the dozens of areas where socioeconomic effects are likely to be felt in response to air quality management actions. As a result of that decision, the SAMI analysis cannot be considered a comprehensive cost-benefit analysis and costs cannot be compared to benefits. Even within the six topics that SAMI selected, two topics – human health and competitiveness – were not taken to completion. The four topics that were taken to completion may be useful to policy makers in evaluating the implications of their decisions on society and on our economies. Since the inception of SAMI different rules and regulations have been promulgated such as the Heavy-Duty Diesel rule and the

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NO_x SIP call. As other programs are implemented, costs, benefits and lifestyle impacts of implementing the SAMI strategies will be less.

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The results of the socioeconomic analysis may also be useful as SAMI and the SAMI States disseminate the results of the Integrated Assessment. As the SE analysis suggests both positive and negative effects are likely to be seen in communities throughout the SAMI region. Low-income communities are particularly sensitive about jobs. All communities feel a connectedness to the mountains and many feel that “government” should do something about a perceived deterioration in the environmental quality of the mountains. As with any major environmental management action, positive and negative societal effects are likely. Sharing the results of the SAMI analysis broadly is likely to improve understanding of the possible effects as States implement the SAMI recommendations.

References:

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Assessment of Lifestyle Impacts of Alternative SAMI Air Quality Strategies, Prepared by Jerome T. Bentley, Robert Horst, Donald Wise, Mathech, Inc. 202 Carnegie Center, Suite 111 Princeton, New Jersey 08540

Phase I Final Report: Options for Performing SAMI’s Socioeconomic Assessment, Prepared by GHL Incorporated 1020 Nineteenth Street NW, Suite 520, Washington, DC 20036 and Mathtech, Inc., 202 Carnegie Center, Suite 111 Princeton, New Jersey 08540, August 1998

[This entire section should be deleted. As previously stated under SOP/S, this language was never agreed to by all SEWG stakeholders. It has problems with both tone and content. It presents SOP/S as unidimensional concepts focused on air quality; whereas they are both multi-dimensional, with air quality being just one small factor among many. Also, when this language was offered to the work group by EPA, it was offered in the context of the SOP/S topic, not as the sole take home message from the SEWG analysis. Further, the tone of the message to “low” and “high” income areas is condescending and inappropriate.]

Deleted: Lessons Learned /General observations:¶
¶ Many communities in the SAMI 8-State region will be affected by the selected strategy either negatively and/or positively, thus, communication with the citizens affected is important. ¶
The early sections of the final SAMI report and/or outreach efforts for SAMI should be sensitive to the differences in views across communities.¶
Low-income areas that may lose jobs due to SAMI strategy implementation need to have an explanation of why SAMI is taking action. SAMI could communicate with them and help them understand the need for controls. SAMI’s communication efforts can remove the feeling that “big brother is making decisions that will hurt them. Some may need to realize that if their area is already in transition to a different way of life, that this transition will continue if SAMI strategies will impact their environmental resource (i.e., coal). Express that SAMI does not intend to change their sense of place, but that preserving the environment for the future is needed.¶
For higher income areas, communication through the report or outreach should focus on the expectation that we will have clearer mountain views by 2040. Make the citizens aware of SAMI and communicate responsibly with them. ¶
The SAMI report should speak to the changes that occur over time regardless of the impact of SAMI. In some areas, they are advancing from manufacturing jobs to more high-tech jobs. In other areas, one environmental resource is phasing out and another is transitioning in (i.e., coal to lumber). Their sense of place will evolve with these changes, but SAMI’s influence on the air and views in the mountain region will help to maintain their current “Appalachian feel of the area.

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was not comprehensive enough to form conclusions and therefore these topics did not become finished reports.		