SFNF Travel Management Planning
Air Quality and Climate Change Report DRAFT

Joe Viera
Air and Water Quality Liaison

12/18/2009

Summary

The amount of travel on the Santa Fe National Forest (SFNF) and the corresponding contribution to air quality and climate change will be impacted by many factors in addition to USFS designation of motorized roads and trails. These factors include changes in population, fuel prices, travel patterns, and other economic conditions. An accurate estimate of both total vehicle miles traveled and travel generated air pollutants on the SFNF under any alternative is not presently possible without more extensive traffic measurement. However, existing traffic counter data on "high" travel roads indicate less than 100 vehicles per day. The majority of routes may receive less than one vehicle per day.

Closure of unpaved roads to motorized traffic, as considered under Alternatives 2-5, would result in notable reductions in surface area that would be exposed to vehicle generated fugitive dust and tailpipe emissions. Assuming continued growth and reach in motorized travel and as measured by total linear mileage, either as a source area of fugitive dust or corridor where tailpipe emissions occur, Alternative 1 (No Action) exceeds all other alternatives. Alternative 3 reduces surface area exposed to vehicular fugitive dust and tailpipe emissions most.

While the location of traffic load, fugitive dust, and tailpipe emissions on any day in the SFNF would vary, the intent of travel management designation is to rationalize motorized use across the landscape. Travel management includes restrictions on cross-country motorized travel under all alternatives. Over time new sources of fugitive dust from such cross-country travel, as well as user-created roads and trails, would be expected to decline.

All action alternatives reduce unpaved soil surfaces that could be exposed to driving and wind erosion in the vicinity of Class 1 protected air quality areas. Beneficial air quality impacts in terms of reduced exposure to fugitive dust generation in airsheds near the San Pedro Park Wilderness, Pecos Wilderness, and Bandelier National Monument Class I areas are possible under all action alternatives, especially when high traffic days occur under windy conditions. Similar air quality benefits would be expected near the Dome Wilderness and Chama River Canyon Wilderness.

On the other hand, current traffic load on the SFNF represents a relatively minor source of fugitive dust and tailpipe emissions within airsheds that include the urban transportation network of Santa Fe, Albuquerque, Espanola, Los Alamos, and Pecos, as well as Highway 285, and I-25. Other regional sources of emissions influence air quality in these airsheds and include open burning, wildfire, and oil and gas development. While SFNF travel and resulting dust and tailpipe emissions is cumulative to these larger sources, it's scale under any alternative in reference to the larger transportation network in New Mexico is small. Given this context, discernible changes to visibility near Class I areas under all alternatives are unlikely.

DRAFT

Under all travel management alternatives, motorized travel and tailpipe emissions in the SFNF will contribute to New Mexico's greenhouse gas (GHG) emissions. However, numerous outside factors, not least the price of fuel, the state of the economy, personal preference, and alternate recreational opportunities will contribute to actual individual decisions to travel and thus emit GHG's from the Santa Fe National Forest. Changes in the mileage and configuration of designated motorized roads and trails under all travel management alternatives will modify travel opportunities but will not change the overall number or type of vehicles in New Mexico, nor their potential to emit GHG's.

Future GHG tailpipe emissions from vehicles used both on and off the SFNF may be more influenced by federal regulatory restrictions on mobile sources of air pollution as well as market penetration and adoption of less polluting 4-stroke engines on recreational vehicles. The cumulative effects of all alternative travel management designations of motorized roads and trails in the SFNF with respect to New Mexico's GHG emissions and climate change are considered marginal with reference to these other driving forces.

Background

The New Mexico Environment Department - Air Quality Bureau (AQB) regulates air quality under provisions of the federal Clean Air Act and state law. AQB considers air pollutant and emission inventories from stationary and mobile sources within New Mexico's major airsheds. Among these air pollutants, vehicle tailpipe emissions (NO_x, CO, VOCs) and fugitive dust (particulate matter: PM_{10} and $PM_{2.5}$) contribute to regional haze and visibility degradation in Class I protected air quality areas . All vehicles in New Mexico contribute to air pollution. However, on an individual basis an unregulated recreational vehicle can emit as much pollution in one hour as 20 automobiles in one hour (USEPA, 2002a).

Perhaps a greater concern than vehicle emissions is fugitive dust which can be substantive on dirt roads used by off-highway vehicles (OHVs) such as ATVs and dirt bikes. Dust generated by vehicle travel on unpaved surfaces is composed of particulate matter which in its finest form, $PM_{2.5}$, can become imbedded deep in the lungs and cause adverse health impacts including impaired lung function. Fugitive dust from roads can also impede photosynthesis in vegetation by blocking solar energy critical to plant growth (Trombuluk, 2000). The amount of dust generated in an area and the distance it is transported will vary depending on the local geology, topography, and meteorology.

Inhalable dust emissions from paved and unpaved roads have been estimated by measuring airborne concentrations of PM_{10} upwind and downwind of a road (Cowherd, 1984; Gillies *et al.*, 1999). Fine particle dispersion and dust plumes from vehicle and OHV traffic on dry, unpaved roads have been measured beyond 100 m (300+ ft) from the source (Padget *et al.*, 2007). Roads and trails, particularly new trails, increase the vulnerability of soils to generate particulate matter from driving and episodic wind erosion by changing the threshold at which individual soil particles become airborne (Goosens and Buck, 2008). Over the long-term, silt-textured soils appear to be most susceptible to unpaved surface driving and related PM_{10} emissions. The season, location, setting, as well as traffic speed and volume have a significant effect on fugitive dust emission potentials of both paved and unpaved roads (Etymezian, et.al., 2003).

DRAFT

Analysis Methods

Issues, Concerns, and Measures
The public expressed this concern related to air quality:

"Motorized travel causes fugitive dust and vehicle emissions that are harmful to human health and contribute to climate change."

The US Forest Service is also responsible for protecting air quality in Class I protected areas. The following measures form the basis for comparing the effects on air resources between travel management alternatives in this assessment:

Measure 1: Mileage of unpaved motorized roads and trails in five New Mexico airsheds covered by the Santa Fe National Forest.

Reason for measure: Unpaved roads and trails are one contributing source of airborne fugitive dust as well as travel corridors where vehicle tailpipe emissions originate. The linear mileage of designated motorized roads and trails on SFNF lands approximate where risk of travel generated air pollution and exposure exists. The same measure under each travel management alternative represents:

- the potentially exposed source area for fugitive dust and particulate matter associated with vehicular travel;
- the linear corridors along which tailpipe emissions and associated air pollutants (*ie.* CO, NO_x,VOCs) originate.

At a more localized scale, terrain and atmospheric conditions often constrain air movement. Ventilation of air pollution and dust is particularly impeded under stable or stagnant atmospheric conditions such as early morning cold air inversions.

Assumptions: Vehicular travel along any length of unpaved SFNF designated motorized route will affect air quality to some level. It is assumed that:

1. traffic will hold constant between alternatives 1-5.
2. concentrations of fugitive dust and tailpipe emissions will be highest up to 100 m from the source, in this case the designated motorized route (Padgett *et al.*, 2007).
3. more designated motorized routes in any area increase the risk of adverse exposure to dust and tailpipe emissions given the likelihood of vehicular travel to occur.

Limitations: The fate, transport, and dispersion of air pollutants from any source is highly complex. Air pollution impacts depend on such factors as terrain, wind speed, wind direction, atmospheric stability, precipitation as well as the distance and/or proximity of the sensitive receptor be it person, animal, or plant. Motorized road and trail mileage is an imperfect substitute for direct measurement of fugitive dust and tailpipe emissions. However, such measures as traffic counts, vehicle miles traveled, or average vehicle speed, all factors that could be used to characterize dust, particulate matter, and tailpipe emissions at a local level are not presently available. Air quality monitoring and direct measurement of dust and tailpipe emissions exposure on all routes considered for designated motorized vehicle use is considered neither practical nor economically feasible.

DRAFT

Measure 2: Mileage of designated motorized routes near Class 1air quality areas in the Santa Fe National Forest.

Reason for measure: Motorized travel on unpaved roads and trails in the SFNF generates fugitive dust and tailpipe emissions thatcontribute to regional haze and degradation of visibility near the San Pedro Parks and Pecos Wilderness Areas. The linear mileage of designated motorized roads and trails on SFNF (SFNF) lands approximate the extent of that risk.

Assumptions: same as assumptions measure 1.

Limitations: same as limitations under measure 1.

Measure 3: Relative vehicle travel and greenhouse gas emissions on designated motorized routes in the SFNF .

Reason for measure: Transportation and tailpipe emissions are one source of greenhouse gas emissions.

Assumptions: Vehicular travel along any length of SFNF designated motorized route will generate greenhouse gas emissions to some level. It is assumed that:

1. Traffic will hold constant between alternatives 1-5.
2. Amount of greenhouse gas emissions will hold constant between alternatives 1-5

Limitations: Mileage of motorized routes is not a direct measure of total emissions generated from travel on the Santa Fe National Forest. Such measures as traffic counts, vehicle miles traveled, vehicle type, or average vehicle speed are all factors that could be used to characterize greenhouse gas emissions at a local level, but are not presently available.

Methods

ESRI ArcMap 9.3.1geoprocessing tools were used to overlay and compare, generate statistics, and analyze SFNF travel management alternatives with New Mexico Environment Department – Air Quality Bureau airsheds. IMPROVE regional haze visibility and monitoring site data for the Bandelier National Monument were reviewed to understand the range of regional haze conditions in areas near SFNF Class I air quality areas (http://views.cira.colostate.edu/web/). New Mexico Department of Transportation traffic count data from 2006 for travel corridors near the SFNF were reviewed and compared to known traffic load on the SFNF to understand forest and non-forest traffic patterns in the airsheds.

Analysis Area

Direct & Indirect Effects

The geographic analysis area for direct and indirect effects on air resources from travel management contains portions of five airsheds in northern New Mexico, as defined by the AQB. This analysis area corresponds to where fugitive dust and vehicular emissions are likely to occur based on decisions regarding SFNF motorized road and trail designation and assumed future motorized travel. The temporal bounds for direct and indirect effects on air resources of travel management are from the publication of the motor vehicle use map through 2025 (*see* Cumulative Effects Basis report).

DRAFT

Cumulative Effects
Air quality as a public good is a local, regional, national, and global resource and knows no bounds. The area of geographic consideration for cumulative effects for this assessment is the Western States. The temporal analysis is the period 1987 – 2025.

Affected Environment

Air quality in New Mexico, including and surrounding the SFNF, with respect to National Ambient Air Quality Standards (NAAQS) criteria pollutants, regional haze, and visibility is relatively good in comparison with other US states. The notable exceptions are Bernalillo County, Albuquerque, and the metropolitan and urban areas adjacent to El Paso, TX. Due to prevailing winds, oil and gas development and electric power generation in the San Juan Basin and the Four Corners region is of increasing air quality concern in the SFNF as sources of air pollutants including nitrogen, mercury, lead, hydrocarbons and elevated ground-level ozone.

The EPA has designated all areas in the vicinity of the SFNF in attainment of the 2009 NAAQS. Lands under SFNF jurisdiction cover relatively minor portions of five AQB designated airsheds (Table 1). The majority of SFNF lands occur in Upper Rio Grande Airshed (16%) that also includes the cities of Santa Fe, Los Alamos, Espanola, and Taos.

Table 1 New Mexico airsheds affected by SFNF decisions on travel management as defined by the New Mexico Environment Department - Air Quality Bureau. Airsheds that include Class I protected air quality areas are denoted by *.

New Mexico Environment Department Air Quality Bureau Airshed	Total Airshed Acres	USFS Airshed Acres/%
Upper Rio Grande*	5,445,887	866,756/~16
Middle Rio Grande*	7,542,212	327,537/~4
Pecos River*	16,266,076	423,293/~3
Canadian River	11,314,854	74,218/<0.1
San Juan River	6,159,079	11,008/~0.1

These airsheds include the Pecos and San Pedro Parks Wilderness Areas, and Bandelier National Monument, all Class I protected air quality areas where prevention of significant deterioration of visibility is mandated by the Clean Air Act.

Direct and Indirect Effects
Effects common to all alternatives:
Air quality is impacted to some extent by vehicular travel on SFNF lands. No travel management alternative under consideration would eliminate motorized travel in the forest. All alternatives would retain some level of surface area exposed to driving and vehicle tread along designated routes and present sources of transportation induced fugitive dust and tailpipe emissions to people, wildlife, and vegetation.

The fate and transport of dust and tailpipe emissions on any day will be highly variable for all alternatives, contingent on weather and actual travel. It can be assumed that some level of nuisance exposure to fugitive dust or tailpipe emissions is possible under all alternatives, but any

DRAFT

direct or indirect dose-response effect to people, wildlife, and vegetation exposure from forest travel is difficult to isolate and identify.

Under all alternatives, some fugitive dust and tailpipe emissions from continued motorized travel on SFNF lands may marginally contribute to regional haze in the Pecos Wilderness, San Pedro Parks Wilderness, and Bandelier National Monument mandatory Class 1 air quality areas. The direct and indirect effects of travel management designation, given the relatively low traffic load in the forest, will be highest along and adjacent to the designated roads and trails. However, under all action alternatives, designated motorized road and trail densities adjacent to the latter Class I areas, as well as the Dome Peak Wilderness and Chama River Canyon Wilderness, will decline.

Quantifying vehicle miles traveled or actual emissions on SFNF lands under any alternative requires direct measurement of traffic activity. Extensive traffic count data characterizing motorized use does not presently exist. However, under all alternatives, some reduction of fugitive dust will likely result from closure of unpaved roads and trails. Direct and indirect effects will vary by location within all airsheds. Most seasonal closures proposed are weather-related, meaning routes would be closed during wet periods. Because limited dust would be generated during wet weather, these seasonal closures would have no effect on air quality. Closures for wildlife that also coincide with dry periods could also reduce the amount of dust generated by not having vehicles on routes during those periods.

Given the extremely minor contribution of motorized travel on USFS lands within the entire New Mexico transportation network within any 24-hour period, whether low or peak season, weekday or weekend, the direct and indirect effects on air resources of travel management under any of the alternatives, and specifically particulate matter concentrations, is marginal. Although it is understood that vehicle emissions contain greenhouse gases (GHGs) which ultimately contribute to global climate change, data on actual vehicle travel within the SFNF are not available to sufficiently quantify actual GHG emissions.

Alternative 1 – No Action

SFNF designation and management of motorized roads and trails as described under Alternative 1 (No Action) would result in the widest extent of legally drivable unpaved surface area in all airsheds (Table 2). The difference in linear miles of unpaved roads and trails between Alternative 1 and all action alternatives considered is notable (Tables 2 and 3). Alternative 1accounts for the highest mileage of designated motorized routes near the San Pedro Parks Wilderness, Pecos Wilderness, and Bandelier National Monument Class I protected air quality areas, as well as the Dome Peak Wilderness, and Chama River Canyon Wilderness.

Assuming the same traffic loads for all alternatives, fugitive dust and tailpipe emissions are expected to be generated in and transported to a greater extent through wind erosion under Alternative 1 than any of the other alternatives considered. Silty-textured soil types most at risk as a long-term source of fugitive dust from travel management decisions are relatively uncommon on the Santa Fe National Forest, occurring uniquely in the Coyote Ranger District and Upper Rio Grande Watershed. Alternative 1 (No Action) would designate more of these routes for motorized travel and thus potential exposure to disturbance from driving is greater than the other alternatives.

DRAFT

Table 2 Estimated mileage of USFS designated motorized roads and trails in the SFNF for travel management alternatives within the five impacted airsheds as defined by the New Mexico Environment Department Air Quality Bureau. Airsheds that include Class I protected air quality areas are denoted by *

Airshed	Alt. 1 Miles	Alt. 2 Miles	Alt. 3 Miles	Alt. 4 Miles	Alt. 5 Miles
Upper Rio Grande*	2674.9	1453.2	1066.5	1653.6	1348.7
Middle Rio Grande*	1368.3	604.9	429.6	727.1	656.1
Pecos River*	1266.6	427.3	326.5	549.1	463.6
Canadian River	86.6	43.3	42.2	52.7	43.3
San Juan River	60.8	23.4	16.6	27.8	24.6

Table 3 Change in mileage of USFS designated motorized roads and trails in the SFNF under travel management alternatives 2-5 as compared with the No Action (alternative 1) within the five effected airsheds.

Airshed	Alt. 2 %	Alt. 3 %	Alt. 4 %	Alt. 5 %
Upper Rio Grande	-46	-60	-38	-50
Middle Rio Grande	-56	-69	-47	-52
Pecos River	-66	-74	-57	-63
Canadian River	-50	-51	-39	-50
San Juan River	-62	-73	-54	-60

Alternative 2 – Proposed Action

SFNF designation and management of motorized roads and trails as described under Alternative 2 (Proposed Action) would dramatically reduce the extent of legally drivable unpaved surface area in all airsheds (Table 2), when compared with the no action (Alternative 1). The difference between unpaved road and trail that would be exposed to the direct and indirect effects of fugitive dust and tailpipe emissions from motorized travel under Alternative 2 (Proposed Action) and Alternative 1 (no action) ranges from a 66% reduction in the Pecos River airshed to a 46% reduction in the Upper Rio Grande airshed (Table 3).

Assuming similar OHV traffic loads, fugitive dust and tailpipe emissions from unpaved road driving are expected to be generated in and transported to less than half of the airsheds under the proposed action (Alternative 2) through wind erosion and dispersion than under the no action. Alternative 2 (Proposed Action) would designate few routes for motorized travel in high-risk silt-textured soils and thus potential exposure to disturbance from driving is less.

Alternative 2 reduces the mileage of designated motorized roads and trails near all three Class I protected air quality areas when compared with the No Action. Mileage reductions would be highest in the Pecos airshed (-66%) adjacent to the Pecos Wilderness Class I area, followed by

DRAFT

the Middle Rio Grande airshed near the San Pedro Peaks Class I air quality area (-56%), and by -46% in the Upper Rio Grande airshed near Bandelier National Monument, as well as Dome Peak Wilderness and Chama River Canyon Wilderness.

Alternative 3

Among all alternatives considered, SFNF designation and management of motorized roads and trails as described under Alternative 3 would reduce the extent of legally drivable unpaved surface area the most in all airsheds (Table 1). The difference between unpaved road and trail that would be exposed to the direct and indirect effects of fugitive dust and tailpipe emissions from motorized travel under alternative 3 and alternative 1 (no action) ranges from a 74% reduction in the Pecos River airshed to a 51% reduction in the Canadian River airshed (Table 2).

Alternative 3 reduces the mileage of designated motorized roads and trails near all three Class I protected air quality areas most among alternatives considered when compared with the No Action (Alternative 1). Mileage reductions would be highest in the Pecos airshed adjacent to the Pecos Wilderness Class I area, followed by the Middle Rio Grande airshed near the San Pedro Peaks Class I air quality area (-69%), and by -60% near Bandelier National Monument, as well as Dome Peak Wilderness and Chama River Canyon Wilderness, in the Upper Rio Grande airshed.

Assuming similar overall OHV traffic loads, fugitive dust and tailpipe emissions from unpaved road driving would be expected to be generated in and transported through wind erosion least under alternative 3. Alternative 3 would also designate the fewest routes for motorized travel in high-risk silt-textured soils in the Upper Rio Grande Watershed and thus potential exposure to disturbance from driving is minimized.

Alternative 4

SFNF designation and management of motorized roads and trails as described under Alternative 4 would reduce the extent of legally drivable unpaved surface in all airsheds to a lesser degree than alternatives 2, 3, or 5 (Table 1). Still, the difference between unpaved road and trail that would be exposed to the direct and indirect effects of fugitive dust and tailpipe emissions from motorized travel under alternative 4 and alternative 1 (no action) is notable and ranges from a 57% reduction in the Pecos River airshed to a 38% reduction in the Upper Rio Grande airshed (Table 2).

Alternative 4 reduces the mileage of designated motorized roads and trails near all three Class I protected air quality areas least among alternatives considered when compared with the No Action (Alternative 1). Mileage reductions would be highest in the Pecos airshed adjacent to the Pecos Wilderness Class I area, followed by the Middle Rio Grande airshed near the San Pedro Peaks Class I air quality area (-47%), and by -38% near Bandelier National Monument, as well as Dome Peak Wilderness and Chama River Canyon Wilderness, in the Upper Rio Grande airshed.

Assuming similar overall OHV traffic loads, fugitive dust and tailpipe emissions from unpaved road driving would be expected to be generated in and transported through wind erosion less under Alternative 3 than the no action but more than Alternatives 2, 4, and 5. Alternative 4 would also designate the fewer routes in high-risk silt-textured soils in the Upper Rio Grande Watershed than the no action. However, motorized travel and thus potential exposure to disturbance from driving on these risky silt textured soils will likely be higher under Alternative 4 than under Alternatives 2, 3, and 5.

DRAFT

Alternative 5
SFNF designation and management of motorized roads and trails as described under alternative 5 would reduce the extent of legally drivable unpaved surface in all airsheds to a lesser degree than Alternative 3, to a greater degree than Alternative 4, and depending on the airshed to either a lesser or greater degree than Alternative 2 (Table 2). Still, the difference between unpaved road and trail for motorized travel under alternative 5 and Alternative 1 (no action) is notable and ranges from a 63% reduction in the Pecos River airshed to a 50% reduction in the Upper Rio Grande and Canadian River airsheds (Table 3).

Alternative 5 reduces the mileage of designated motorized roads and trails near all three Class I protected air quality areas intermediary among alternatives considered when compared with the No Action (Alternative 1). Alternative 5 reduces designated motorized mileage near Class I areas more than either Alternatives 2 or 4 but less than Alternative 3. Alternative 5 mileage reductions would be highest in the Pecos airshed adjacent to the Pecos Wilderness Class I area, followed by the Middle Rio Grande airshed near the San Pedro Peaks Class I air quality area (-52%), and by -50% near Bandelier National Monument, as well as Dome Peak Wilderness and Chama River Canyon Wilderness, in the Upper Rio Grande airshed.

Assuming similar overall OHV traffic loads, fugitive dust and tailpipe emissions from unpaved road driving is expected to be generated in and transported through wind erosion less under Alternative 5 than either the no action or Alternative 4, but more than Alternative 3. Alternative 5 would also designate fewer routes in high-risk silt-textured soils in the Upper Rio Grande Watershed than the no action. Motorized travel and thus potential exposure to disturbance from driving on these risky textured soils is likely higher under alternative 5 than under alternatives 3.

Cumulative Effects
In addition to past, present, and reasonably foreseeable projects identified by the USFS interdisciplinary team, there are innumerable local, regional, and even international stationary and mobile sources of air pollution that contribute to air quality in New Mexico. With the important exception of smoke from wild land and prescribed fire, the majority of stationary and mobile sources of air pollution in the five airsheds occupied in part by the Santa Fe National forest, are urban, industrial, and transportation related.

Inbound smoke or transport of air pollutants from states further west, Four Corners power generation, or oil and gas facilities in the San Juan Basin are but some examples. Sources of air pollution in the five airsheds, in addition to traffic on SFNF designated motorized roads and trails include daily traffic on all non-USFS streets, roads, highways, and Interstate 25 in Santa Fe, Rio Arriba, Los Alamos, Sandoval counties. All are cumulative to existing and future generation of fugitive dust and tailpipe emissions that would follow travel designations on the Santa Fe National Forest.

Under all travel management alternatives, motorized travel and tailpipe emissions in the SFNF will contribute and be cumulative to other New Mexico's greenhouse gas (GHG) emissions. However, numerous outside factors, not least the price of fuel, the state of the economy, personal preference, and alternate recreational opportunities will contribute to actual individual decisions to travel and thus emit GHG's from the Santa Fe National Forest. Changes in the mileage and configuration of designated motorized roads and trails under all travel management alternatives will modify travel opportunities but will not change the overall number or type of vehicles in New Mexico, nor their potential to emit GHG's.

DRAFT

Future GHG tailpipe emissions from vehicles used both on and off the SFNF may be more influenced by federal regulatory restrictions on mobile sources of air pollution as well as market penetration and adoption of less polluting 4-stroke engines on recreational vehicles. The cumulative effects of all alternative travel management designations of motorized roads and trails in the SFNF with respect to New Mexico's GHG emissions and climate change are considered marginal with reference to these other regional and national sources of greenhouse gases.

Irreversible or Irretrievable Effects
No irreversible or irretrievable effects on air quality are expected under any of the travel management alternatives. The effect to air quality from fugitive dust and tailpipe emissions that could result from the designation of routes would be temporary following traffic over any period. As described, the designation of routes will have no effect on climate change. No permanent effects are expected from the selection of any of the action alternatives.

Effects of Plan Amendments on Air Quality
The proposed amendment to not allow motorized cross-country travel on the Forest could improve air quality by reducing the potential for dust raised by overland travel, as described earlier in this report. The amendments that propose to change acreage from one management area to another would have no effect on air quality because it is the use of routes that affects air quality.

Legal Consistency
Federal Clean Air Act (CAA, 1963, and last amended in 1990, 42 U.S.C. §7401 et seq.): The CAA underlies national control of air pollution to "protect and enhance" the quality of the nation's air resources. The U.S. Environmental Protection Agency (U.S. EPA) is the agency responsible for enforcement of the federal CAA and for establishing the national ambient air quality standards (NAAQS) for criteria pollutants. Criteria air pollutants are defined as those pollutants for which the Federal (and state) government has established air quality standards to protect public health, and for some pollutants also have established secondary standards designed to protect the environment. These include, but are not limited to vehicle tailpipe emissions and particulate matter.

Regional Haze Rule (1990 Clean Air Act Amendments), 40 CFR Part 51: In 1999, U.S. EPA passed the Regional Haze Rule, which calls for states to establish goals for improving visibility in mandatory Class I areas and to develop long-term strategies for reducing the emissions of air pollutants that cause visibility impairment. The Regional Haze Rule requires states to demonstrate "reasonable progress" toward improving visibility in each Class I area over a sixty-year period (to 2064), during which visibility should be returned to natural conditions. Class I areas include wilderness or National Parks greater than 5000 acres which existed on August 7, 1977. Fine particles affect visibility by absorbing and scattering light waves when the particles are suspended in the atmosphere, reducing the visual information reaching the eyes of a human observer.

The designation of motorized trails under travel management in the SFNF is in conformance with the Clean Air Act, the Regional haze rule and will help New Mexico maintain visibility in the Pecos and San Pedro Parks Class I mandatory areas.

DRAFT

Forest Plan Consistency
All action alternatives are consistent with the Forest Plan objectives for air quality.

Page	Applicable Forest Plan text	Consistent?	Reason
19	Protect air quality resource values in Class I Wilderness Areas	Yes	All action alternatives reduce the extent of unpaved surface area where traffic would contribute to degradation of Class I area air quality
80	F04 Management Activities will be planned so that air quality will meet applicable federal, state, and local regulations	Yes	All action alternatives foster state attainment of prevention of significant deterioration in Class I air quality areas.
128	In the Class I air quality areas (Pecos Wilderness except 1980 addition and San Pedro Peaks Wilderness) maintain high quality visual conditions.	Yes	All action alternatives advance maintenance of high quality visual conditions in the Pecos and San Pedro Parks Wildernesses.

References

US EPA (2002). Frequently Asked Questions from ATV Riders. Regulatory Announcement. United States Environmental Protection Agency. Air and Radiation Office of Transportation and Air Quality EPA 420-F-02-038 September 2002

US EPA, 2002a, Frequently Asked Questions: Environmental Impacts of Newly Regulated Nonroad Engines, EPA 420-F-02-033, 5 pp.

US EPA , 2002b, Regulatory Announcement: Emissions Standards for New Nonroad Engines, EPA420-F-02-037, 7pp.

US EPA (2004). Air Quality Criteria for Particulate Matter. National Center for Environmental Assessment, Office of Research and Development, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711; report no. EPA/600/P-99/002aF and EPA/600/P-99/002bF. October 2004. Available: http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_cr_cd.html

Etyemeziana, V., Kuhnsb, H., Gilliesb, J., Chowb, J., Hendricksonc, K., McGownc, M., Pitchfordd, M.. 2003. Vehicle-based road dust emission measurement (III): effect of speed, traffic volume, location, and season on PM10 road dust emissions in the Treasure Valley, ID. Atmospheric Environment 37 (2003) 4583–4593

Gillies, J.A., V.Etyemezian, V., Kuhns, H., Nikolic, D., Gillette D.A.. Effect of vehicle characteristics on unpaved road dust emissions. Atmospheric Environment 39 (2005) 2341–2347

Goossens, D., and Buck, B., 2009. Dust emission by off-road driving: Experiments on 17 arid soil types, Nevada, USA, Geomorphology 107 (2009) 118–138

DRAFT

Trombulak, S. C. and C. A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology 14: 18-30.

Definitions:

AIRSHED The air in a specific geographic region, in which air quality is managed. SFNF Forest Plan p. 187

CLASS I AIR QUALITY AREA A classification for the protection from visibility impairment from man-made air pollution under Section 169A of the 1977 Amendments to the Clean Air Act. In this Act, Congress had recognized the need to protect the aesthetic value of visibility in national parks and wilderness areas by establishing a national visibility goal in Section 169A. The section states that "Congress hereby declares as a national goal the prevention of any future, and the remedying of any exiting, impairment of visibility in mandatory Class I Federal areas which impairment results from man-made air pollution." SFNF Forest Plan p. 191

DRAFT