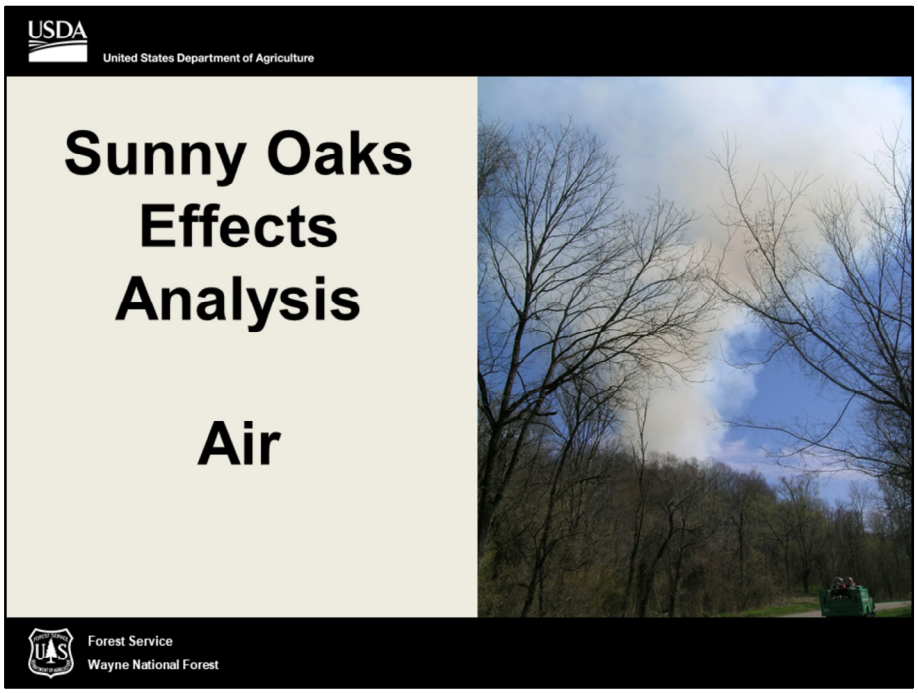
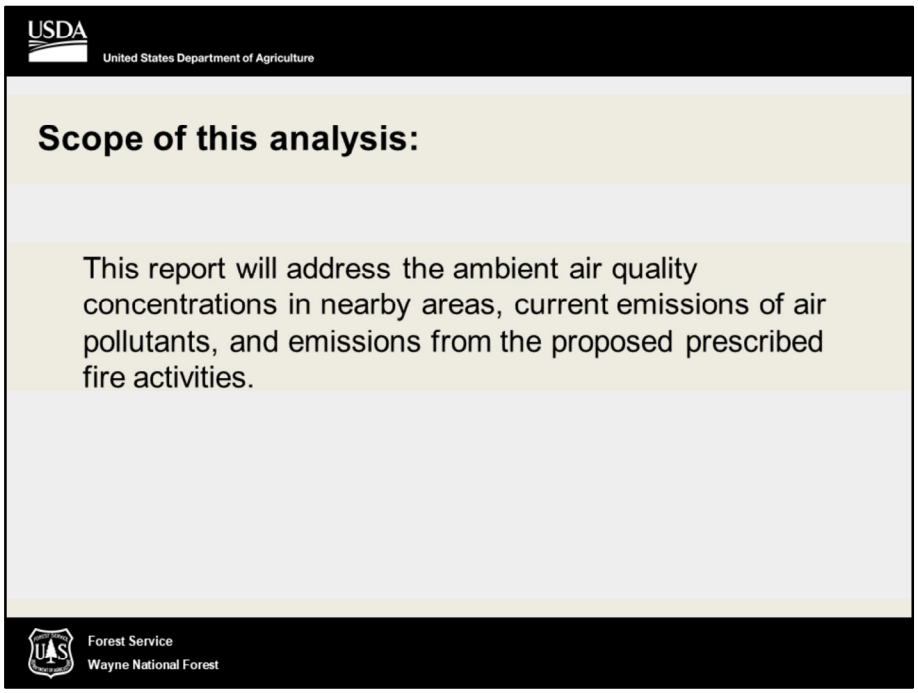
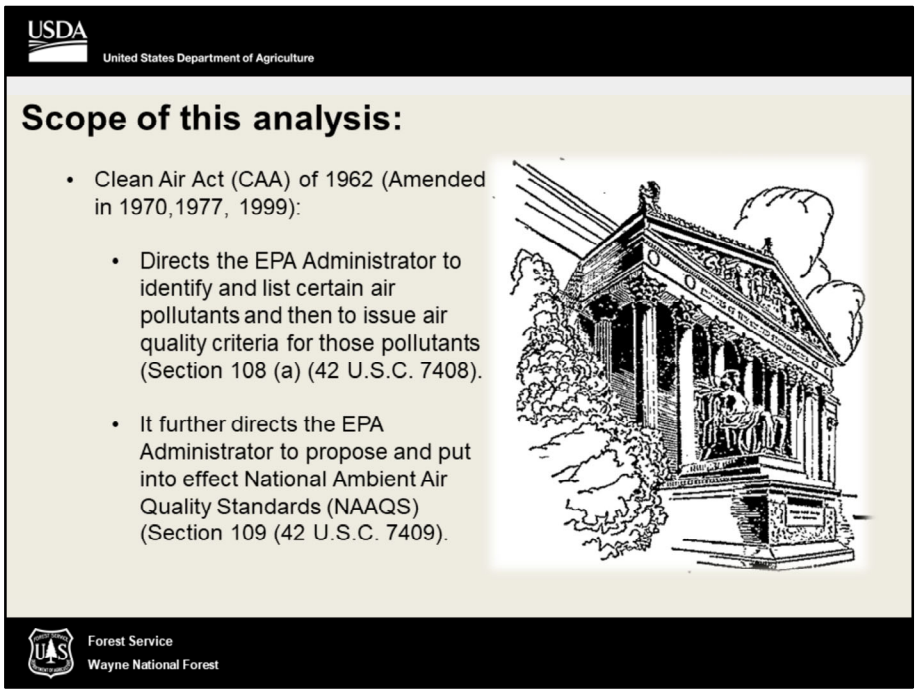


Hello. My name is Dan Anerino and I am the Fire Specialist for the Sunny Oaks project. Today, I'll be giving you a presentation about air emissions as they relate to prescribed fire.



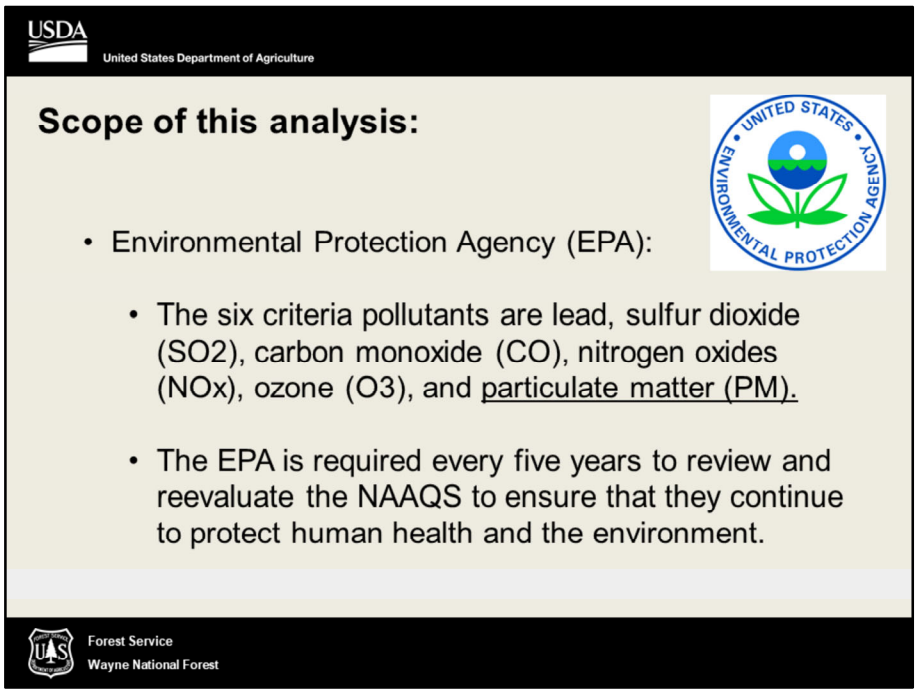
The reason that I'm going to specifically discuss air effects is because during our public scoping comment period, air quality specifically related to prescribe burning was brought up as a concern.

This report will address the ambient air quality concentrations in nearby areas, current emissions of air pollutants, and emissions from the proposed prescribed fire activities.



This forest service project falls under regulatory framework that outlines what we do as an agency in relation to air quality.

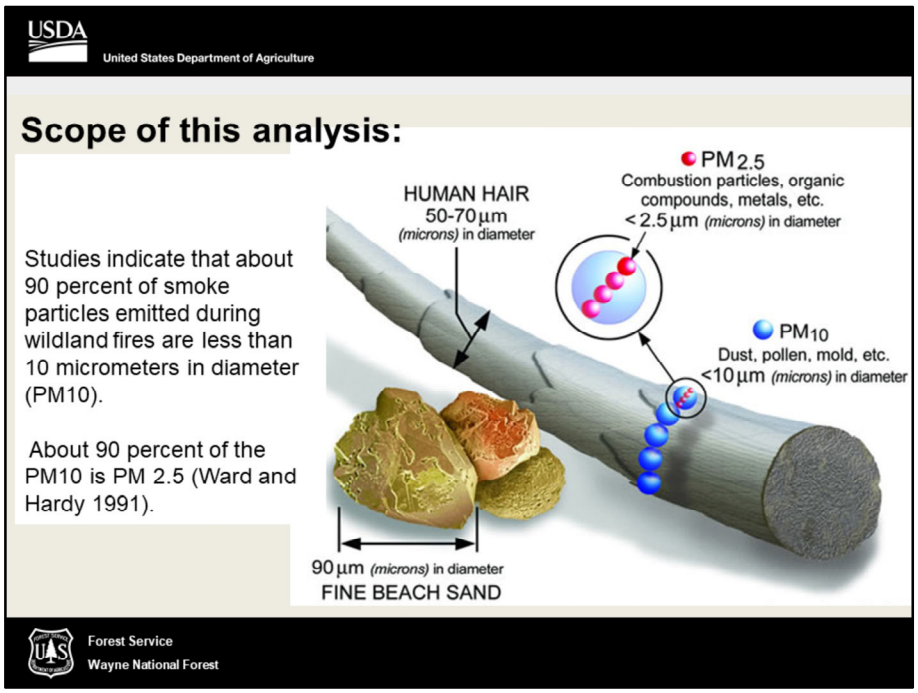
The framework starts with the Clean Air Act of 1962. The Clean Air Act directs the EPA Administrator to identify and list certain air pollutants and then to issue air quality criteria for those pollutants. It further directs the EPA Administrator to propose and put into effect National Ambient Air Quality Standards.



Tiered down from the Clean Air Act to the EPA, the EPA has developed six criteria pollutants to protect human health in the environment. Those six pollutants are lead, sulfur dioxide (SO2), carbon monoxide (CO), nitrogen oxides (NOx), ozone (O3), and particulate matter (PM).

Every 5 years, the EPA is required to review and reevaluate the NAAQS to ensure that they continue to protect human health and the environment.

Specifically, I'm going to discuss particulate matter. Though prescribed fires are short term in duration, particulate matter can have the greatest effect on the public. Nationally, particulate matter is used as the pollutant of measurement for both wildfire and prescribed fire smoke.



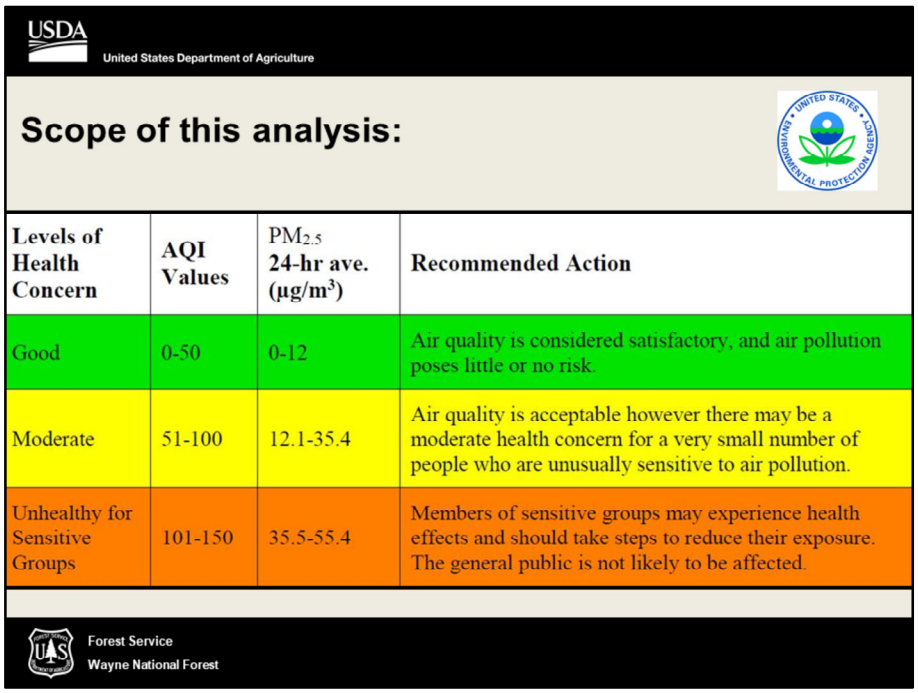
It's important to first understand what particulate matter is. Particulate matter is basically a mixture of microscopic solids and liquid droplets suspended in air.

This diagram demonstrates the size of particulate matter. The EPA breaks particulate matter into 2 size classes. PM meaning particulate matter, at a size of 10 micrometers in diameter and 2.5 micrometers in diameter.

Studies show that 90 percent of smoke particles emitted during wildland fires are less than 10 micrometers in diameter. About 90 percent of the PM10 is PM 2.5

As we look at the diagram, you will see a grain of sand in the lower left corner. The long gray cylinder is a human hair. On the hair, PM10 is outlined in blue. Resting on the PM 10 are 2.5 particles outlined in little red dots.

PM 2.5 pose a risk to human health because they can get deep into human lungs, and some may even get into the bloodstream.



Levels of Health Concern	AQI Values	$PM_{2.5}$ 24-hr ave. ($\mu g/m^3$)	Recommended Action
Good	0-50	0-12	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51-100	12.1-35.4	Air quality is acceptable however there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	35.5-55.4	Members of sensitive groups may experience health effects and should take steps to reduce their exposure. The general public is not likely to be affected.

As we continue with the presentation, it's important to remember that there are six criteria pollutants but we are only discussing PM2.5.

The EPA has regulated particulate pollution since 1971. The agency has revised the standards four times in 1987, 1997, 2006, and 2012 – to ensure they continue to protect public health and welfare.

The EPA developed the Air Quality Index to provide nationally uniform and easy-to-understand health advisories for several common air pollutants, including PM2.5.

The Air Quality Index provides cautions to people about the health risks associated with daily air quality.

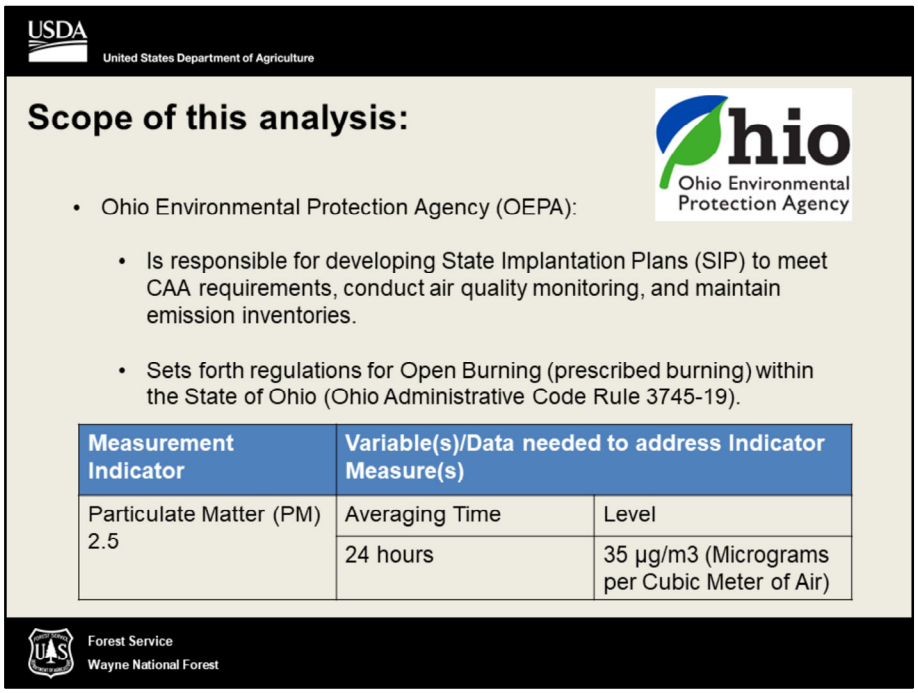
The chart shown provides the Air Quality Index categories and their meaning for PM2.5. The breakpoints listed in the chart are based on 24-hour averages.

The PM standards in the chart are in micrograms per cubic meter of air. At a "Good" index, 2.5 micrograms per cubic meter is between 0-12. The recommended action is that "air quality is considered satisfactory, and air pollution poses little or no risk"

At Moderate, between 12.1-35.4, Air quality is acceptable however there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.

Then the chart goes into the category of “Unhealthy for Sensitive Groups” at 35.5-55.4. In this category, members of sensitive groups may experience health effects and should take steps to reduce their exposure. The general public is not likely to be affected.

The index continues and degrades with air quality but we are only going to discuss these 3 categories.



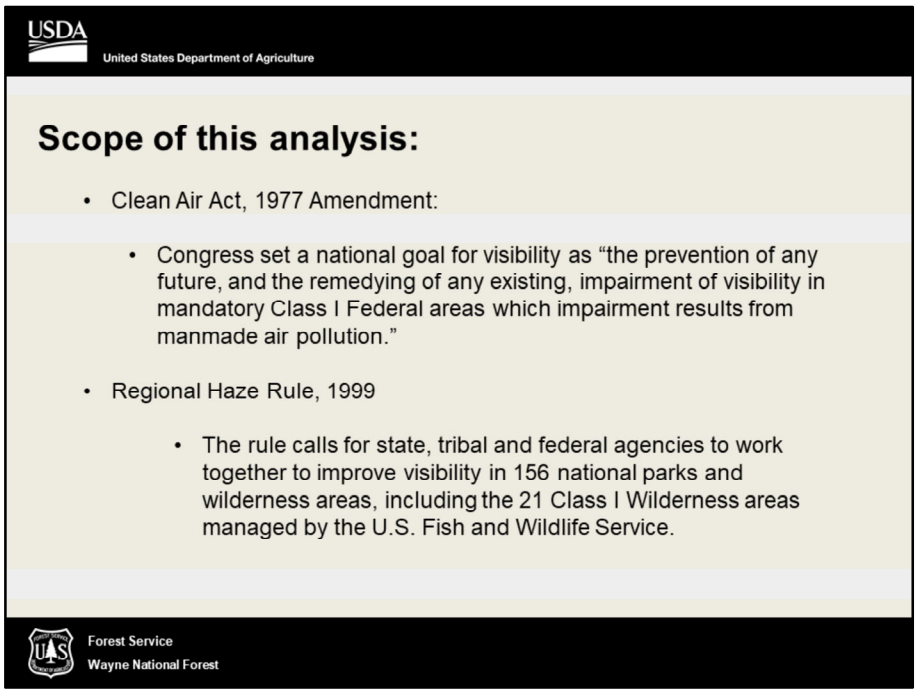
Tiered down from the EPA, we have the state EPA or the Ohio EPA Office. The State is responsible for developing State Implantation Plans (SIP) to meet Clean Air Act requirements, conduct air quality monitoring, and maintain emissions inventories.

They also set forth regulations on open burning or prescribed burning within the State of Ohio under the Ohio Administrative Code.

The standard on the chart is a national standard as well as the Ohio standard for particulate matter. There are two different ways the EPA measures PM 2.5. One is on an annual basis and the other is on a 24 hour average.

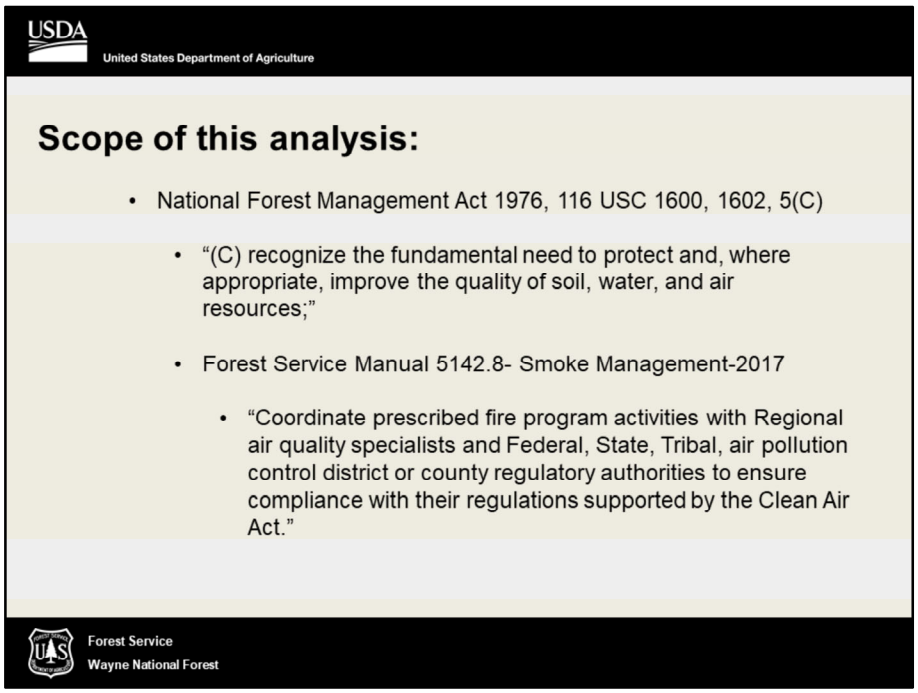
Because prescribed fire is a localized event and is short in duration, prescribed burning falls under the 24 hr. standard. The 24 hr. averaging standard for prescribed burning in the state of Ohio is 35 micrograms per cubic meter of air.

During prescribed burn implementation, emissions may near the 35 microgram level during peak burning times but over the 24 hour period, the average generally remains within the standard.



Going back to the Clean Air Act, there was an amendment in 1977 that enabled congress to set a national goal for visibility as "the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas which impairment results from manmade air pollution."

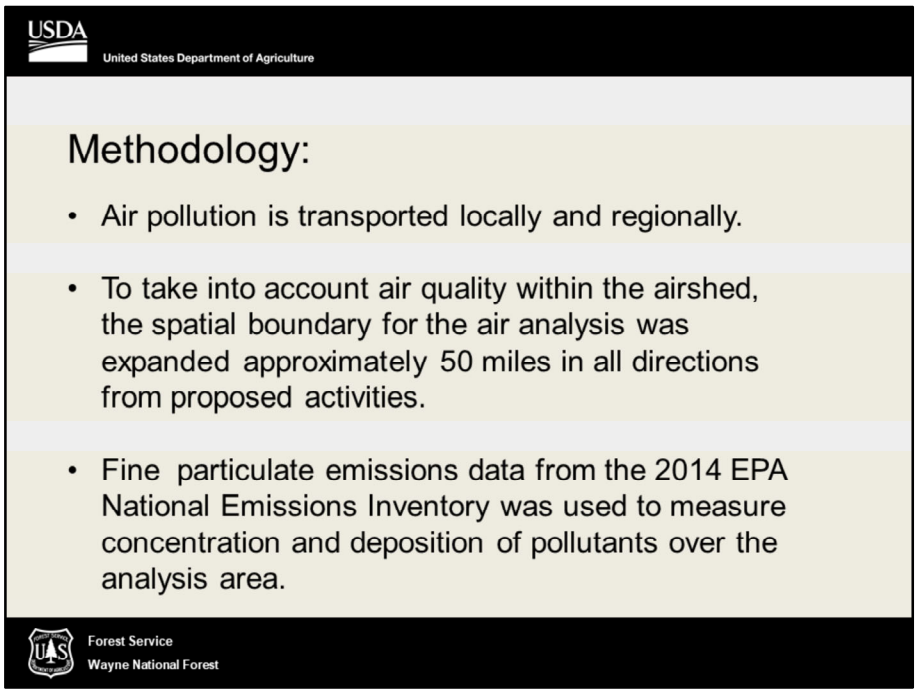
This amendment set the foundation for the regional haze rule in 1999. The rule calls for state, tribal and federal agencies to work together to improve visibility in 156 national parks and wilderness areas, including the 21 Class I Wilderness areas managed by the U.S. Fish and Wildlife Service.



This is the last slide in the presentation for the regulatory framework that I'll be discussing today.

The National Forest Management Act of 1976 recognized the fundamental need to protect and, where appropriate, improve the quality of soil, water, and air resources.

On the agency level of the Forest Service, we have the Forest Service Manual that contains smoke management direction and states that we will Coordinate prescribed fire program activities with Regional air quality specialists and Federal, State, Tribal, air pollution control districts or county regulatory authorities to ensure compliance with their regulations supported by the Clean Air Act.

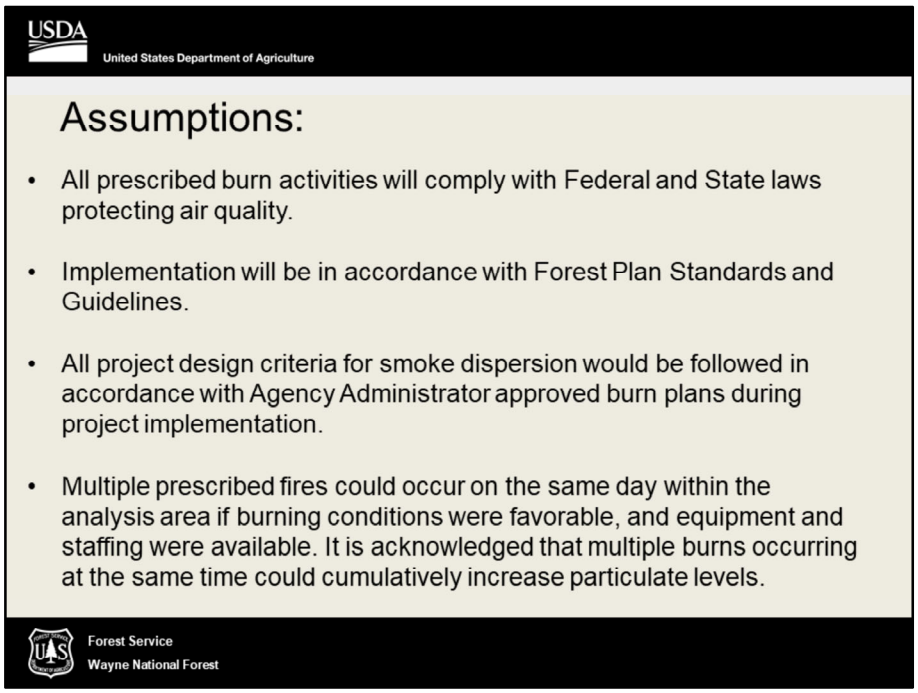


The methodology I used for this analysis.

We know that air emissions are transported both locally and regionally. This means that we can't just look at the airshed directly over the Sunny Oaks project area, we have to look at the airshed beyond the project area.

To account for this, I expanded the analysis by approximately 50 miles in all directions.

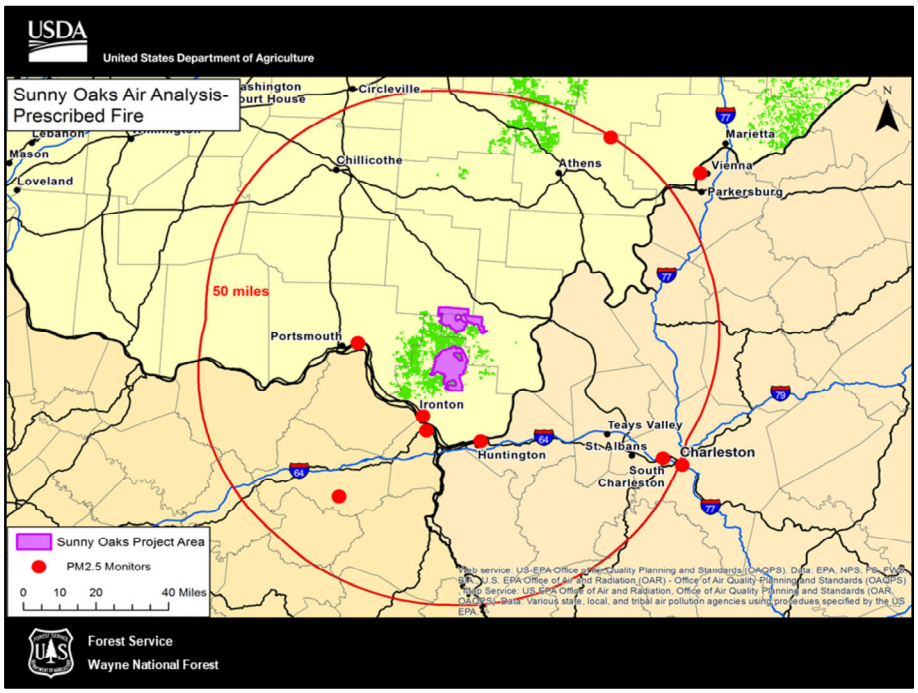
I used Fine particulate emissions data from the 2014 EPA National Emissions Inventory to measure concentration and deposition of pollutants over the analysis area.



The assumptions that I made for this analysis is that all prescribed burn activities will comply with Federal and State laws protecting air quality and that implementation will be in accordance with Forest Plan Standards and Guidelines.

All project design criteria for smoke dispersion would be followed in accordance with Agency Administrator approved burn plans during project implementation. Under the Sunny Oaks project, burn plans will be developed for each prescribed burn that we conduct. Each burn plan, will outline specific parameters for smoke dispersion for specific areas of implementation.

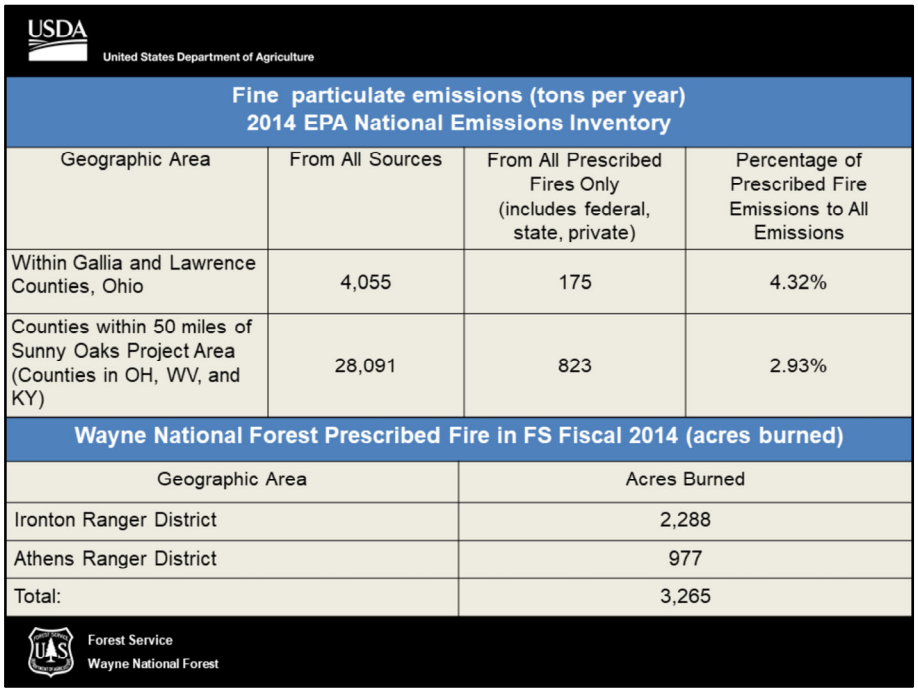
Additionally, multiple prescribed fires could occur on the same day within the analysis area if burning conditions were favorable, and equipment and staffing were available. It is acknowledged that multiple burns occurring at the same time could cumulatively increase particulate levels.



This is the analysis area, the Sunny Oaks project is outline in purple, the red radius circle is approximately 50 miles from the project area. All the red dots are PM2.5 EPA monitors.

In accordance with the Clean Air Act and Regional Haze Rule, there are no Class I Areas within the analysis area.

The two closest Class I areas near the proposed burn units are Dolly Sods and Otter Creek Wilderness Areas located 190 miles to the east in West Virginia.



USDA United States Department of Agriculture

Fine particulate emissions (tons per year)
2014 EPA National Emissions Inventory

Geographic Area	From All Sources	From All Prescribed Fires Only (includes federal, state, private)	Percentage of Prescribed Fire Emissions to All Emissions
Within Gallia and Lawrence Counties, Ohio	4,055	175	4.32%
Counties within 50 miles of Sunny Oaks Project Area (Counties in OH, WV, and KY)	28,091	823	2.93%

Wayne National Forest Prescribed Fire in FS Fiscal 2014 (acres burned)

Geographic Area	Acres Burned
Ironton Ranger District	2,288
Athens Ranger District	977
Total:	3,265

Forest Service
Wayne National Forest

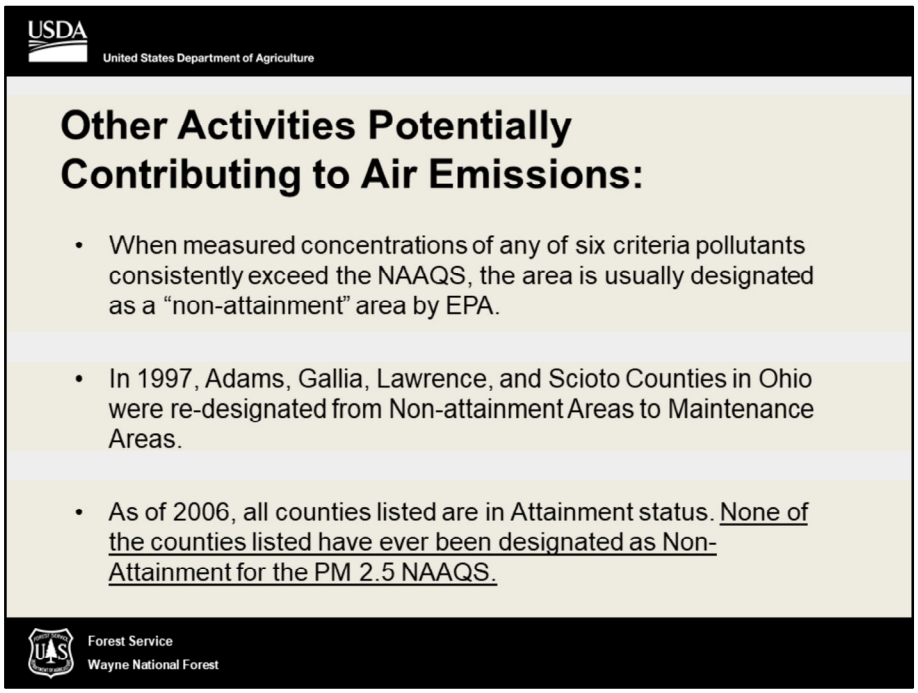
PM 2.5 monitors, such as on the previous slide, supplied data into the 2014 EPA National Emission Inventory which I used for the airshed analysis.

This chart shows particulate matter in tons per year. So within Gallia and Lawrence Counties where the Sunny Oak project lies; All sources that emit particulate matter such as cars and industry contributed approximately 4,055 tons per year. Of that entire value, approximately 175 tons were from prescribed fire on federal, state, and private lands. In comparison of both, prescribed fire accounted for approximately 4.32% of PM2.5 emissions.

Using this same analysis method, I expanded the area to include a 50 mile radius. Every county that intersected within the 50 mile radius boundary as analyzed. As you can see from all sources we have a total PM of 28,091 tons per year of which 823 tons per year were attributed to prescribed fire. This equates that approximately 2.93% of PM emissions were from prescribed fire.

To compare past prescribed fire implementation on the Wayne National Forest, let's take a look at how many prescribed burn acres the forest burned in fiscal year 2014. In 2014, on the Ironton Ranger District, the Wayne burned 2,288 acres and burned 977 acres on the Athens Ranger District for a total of 3,265 acres.

Under this project, we are proposing to burn between 2,000-4,000 acres per year which is comparable to past implementation within the airshed.



Other Activities Potentially Contributing to Air Emissions

When measured concentrations of any of the six criteria pollutants that we discussed earlier consistently exceed the National Air Quality Standards (NAAQS), the area is usually designated as a "non-attainment" area by the EPA.

If an area is determined to be in non-attainment but is recently meeting NAAQS, and has an appropriate EPA-approved planning document in place, the areas is termed a "maintenance area".

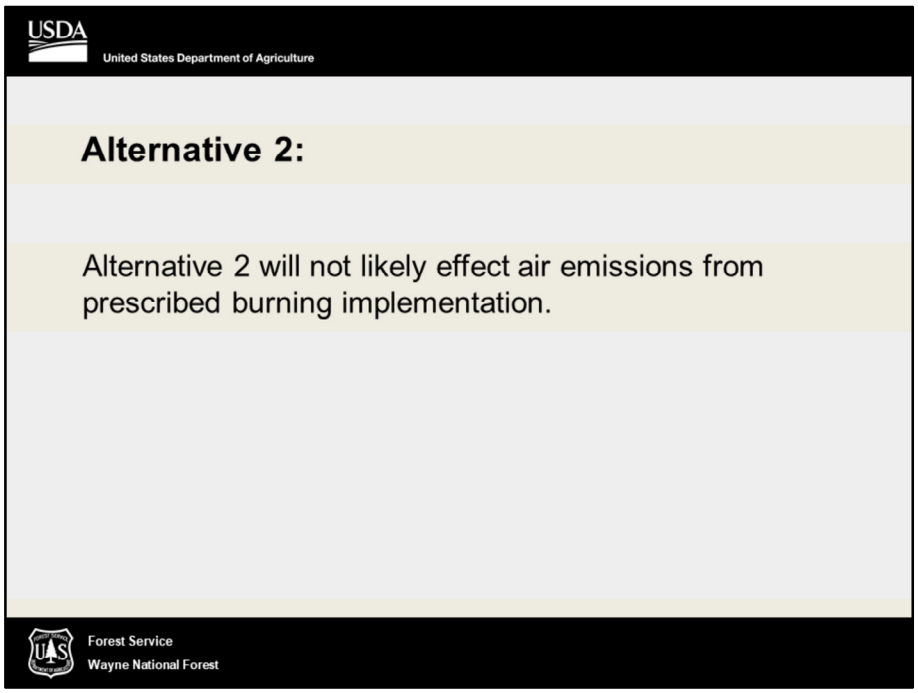
Based on the six criteria pollutants prior to 1997, Adams, Gallia, Lawrence, and Scioto Counties in Ohio were in non-attainment status.

In 1997, Adams, Gallia, Lawrence, and Scioto Counties in Ohio were re-designated from Non-attainment Areas to Maintenance Areas.

As of 2006, all counties listed are in Attainment status meaning that they are consistently beneath exceedances in air quality standards.

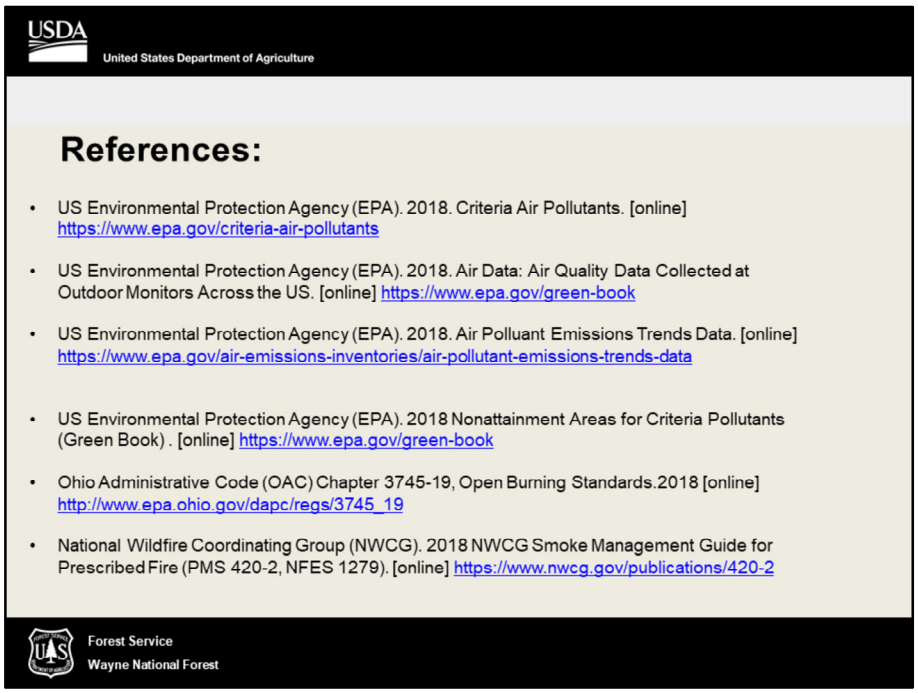
It's also important to note that none of the counties listed have ever been designated as

Non-Attainment for PM 2.5.

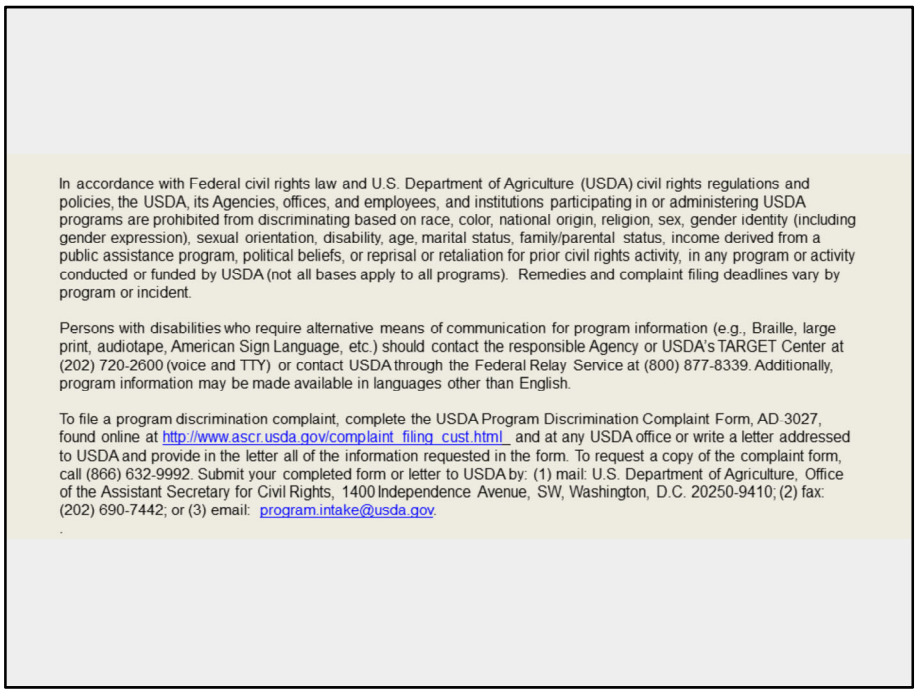


Alternative 2 will not significantly affect air emissions from prescribed burning implementation.

We are likely going to be in the same effect category.



And here are my references.



I want to thank you for your time today. I really enjoyed giving you this presentation. Have a great day.