

Reducing Smoke Exposure from Wildland Prescribed Fires on the Great Plains Prairies

March and April are the months for conducting “prescribed burns” on native wildland grass prairies. Smoke from the burns can lower the air quality in downwind communities and may cause health problems. You can protect your health by reducing your exposure to wildland smoke.

Wildland Controlled Burning

During March and April, expanses of prairie in Kansas and Oklahoma are burned to help preserve the tallgrass prairie. The burns help to control invading plants, such as Eastern red cedar, sumac, and dogwood, and provide better forage for cattle.

Prescribed burning also lowers the risk of wildfires.

Why burn native wildland prairies?

A prescribed burn is a controlled fire used to manage the wildland prairie ecosystem. (See box at left.) However, smoke from the burns can reduce air quality and harm health.

For burns to be safe and effective, weather and wildland conditions must be ideal. When these conditions occur, many landowners take advantage of the opportunity to burn. But air pollution from the wildland burns may affect local residents, as well as downwind communities.

To keep air quality at acceptable levels, burn managers and landowners can use smoke modeling and dispersion prediction tools to plan their burns. (See the [Kansas Flint Hills Smoke Management](#) website.)

Can wildland smoke affect my health?

Smoke from wildland fires is a mixture of gases and coarse and fine particles produced when wood, vegetation, and other organic materials burn. In addition to the large amounts of particulate matter (PM), fire releases gases that can contribute to formation of ozone. The biggest health threat is from fine particles (PM_{2.5} or 2.5 micrometers and smaller) that enter through your respiratory system, and can contribute to lung and heart disease. Recent studies show that long-term exposure to PM_{2.5} can age blood vessels and lead to the buildup of calcium. This increases the likelihood of cardiovascular events like heart attack and stroke.

Who is at the highest risk for breathing wildland smoke?

Large amounts of smoke can make anyone sick. However, most healthy adults will recover quickly from smoke exposure and will not suffer long-term health problems.

Some immediate effects of breathing wildfire smoke:

- Coughing
- Breathing problems
- Stinging eyes
- Scratchy throat
- Runny nose
- Irritated sinuses
- Wheezing and shortness of breath
- Chest pain
- Headaches
- Asthma attack
- Tiredness
- Fast heartbeat

The health risk of breathing fine particles in smoke varies throughout your lifetime. The risk is usually the greatest for the very young, older adults, and those with existing respiratory conditions.

Sensitive groups are at greater risk of health effects from breathing fine particles in smoke or polluted air, and may have serious symptoms. People in these groups should limit their exposure to wildfire smoke:

- Children, since their airways are still developing, and they breathe more air per pound of body weight than adults
- Pregnant women and unborn children
- People with pre-existing respiratory and cardiovascular disease (COPD, asthma, heart disease)

If you are in one of these groups, talk to your primary healthcare provider about your exposure. Check the air quality index (AQI, discussed below) each day for the air quality forecast and information about ways to reduce exposure.

You can protect your health by reducing smoke exposure.

Listen and watch for news or health warnings about smoke:

- Local air quality reports
- U.S. Environmental Protection Agency's [Air Quality Index \(AQI\)](https://cfpub.epa.gov/airnow/index.cfm?action=airnow.calculator) (<https://cfpub.epa.gov/airnow/index.cfm?action=airnow.calculator>)
- Public health messages about safety measures on [AirNow](http://www.airnow.gov) (www.airnow.gov)

Stay indoors.

An air-conditioned building with doors and windows closed can usually reduce exposure to outdoor air pollution by **at least a third**. Newer homes are “tighter” and keep the air outside your home out more effectively than older, drafty homes. If possible, do the following:

- Set your home air conditioning system to “recirculate.” Recirculating indoor air keeps outdoor smoke from being drawn inside.
- Set your central air conditioning fan to circulate air continuously.
- Replace filters in central heating and air conditioning systems and room air conditioners. Replace the central air handler filter with a pleated medium- or high-efficiency particle (HEPA) filter.

Keep pollutants out of indoor air.

When outside air is unsafe, keep indoor air safe by avoiding these activities:

- Smoking
- Using gas, propane, and wood-burning stoves and furnaces
- Spraying aerosol products
- Frying or broiling meat
- Burning candles and incense
- Using your vacuum cleaner

Reduce physical activity to avoid breathing in air pollutants.

Outdoor exercise can raise your risk of health effects because:

- You can increase your air intake as much as 10 to 20 times over your resting level.
- You can breathe more pollution deep into your lungs.
- You may breathe through your mouth, bypassing the natural filtering of the nasal passages and delivering more pollution to the lungs.

If you are physically active, rest often and drink plenty of water.

Commute/travel with caution.

- **Never** use your vehicle as a shelter; drive it to a safe location or leave the area.
- **Always** avoid driving into dense smoke over roadways.
- If driving is necessary, keep the windows and vents closed and use the “recirculate” setting on the air conditioner to keep out smoke and particles.
- If you drive a newer model car, briefly open windows or vents when smoke levels are low to avoid becoming groggy from carbon dioxide buildup. Carbon dioxide levels can rise quickly in newer cars when vents and windows are closed and you use the recirculate setting.
- Before you travel to a state park or wildland preserve, check to see if any prescribed burns are planned.

Monitor respiratory symptoms.

Chemicals in wildland smoke can irritate your lungs, making breathing difficult and asthma symptoms worse.

- If you have asthma or another lung disease, follow your respiratory health management plan and your doctor’s advice about medicines.
- If your symptoms worsen, call your doctor.
- If you have moderate to severe heart or lung disease, consider staying with relatives or friends who live away from the smoke during the fire event.

Do not rely on dust masks for protection.

- Paper "comfort" or "dust" masks commonly found at hardware stores trap large particles, such as sawdust, but may not protect your lungs from smoke.
- An "N95" mask, worn properly, will offer some protection.
- If you decide to keep a mask on hand, see the [Respirator Fact Sheet](https://www.cdc.gov/niosh/npptl/topics/respirators/factsheets/respfact.html) provided by CDC's National Institute for Occupational Safety and Health.
(<https://www.cdc.gov/niosh/npptl/topics/respirators/factsheets/respfact.html>)

For more information:

- [Wildfire Smoke: A Guide for Public Health Officials](https://www3.epa.gov/airnow/wildfire_may2016.pdf) is a guide that helps local public health officials be prepared for smoke events, adequately communicate health risks, and take measures to protect the public. This helpful resource is the product of a collaborative effort by scientists, air quality specialists, land managers, and public health professionals from federal, state, and local agencies. (https://www3.epa.gov/airnow/wildfire_may2016.pdf)
- The Centers for Disease Control (CDC) offers additional information about smoke at: <https://www.cdc.gov/disasters/wildfires/index.html>