Smoke Management

Fact Sheet

A fire always creates smoke. Smoke is made of tiny particles and trace gases from matter burning and lifting into the air. For prescribe burns, we want to make as little smoke as possible to protect our communities from its harmful effects on health and safety.

Wildfires Vs. Prescribed Fire Smoke

- **Wildfires produce a lot of smoke!**
  - Wildfire will burn anything in its path, produce a lot of smoke and not on ideal days. There will be smoke that can make the air quality very poor, stay around longer, and be harmful to your health.
  - Because they are out of control, they don't just burn vegetation but structures and materials that may produce toxic chemicals and pollute the air.

  - Prescribed fires produce a lot less smoke and for shorter times. There are ways to "manage" and minimize smoke on a controlled burn, but not on wildfires.

What Makes More Smoke & What Makes Smoke Move Around?

The amount and direction of smoke changes with weather, fuels, terrain, and the size of the burn.

Where & What Are You Burning?

- **What are you burning?**
  - Grasses, bushes, trees, and logs burn differently. Dead plants also burn differently than living plants! Also be aware of hazardous plants like poison oak burning, as its oils can be in the smoke and still give some people a rash.

Light smoke from burning grass

More smoke from a smoldering log and duff

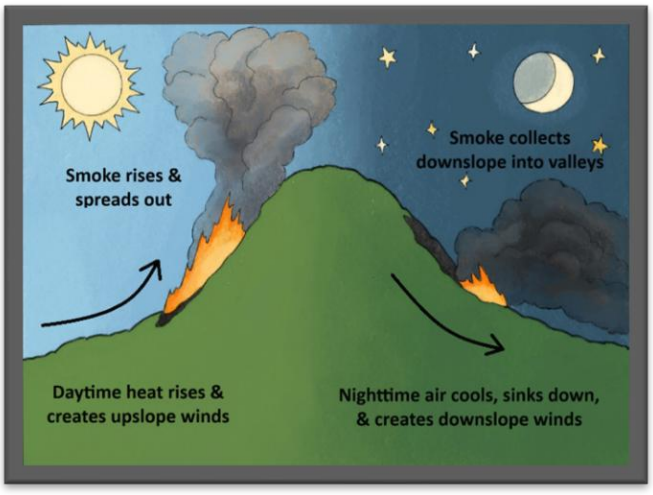
- **How much fuels are you burning?**
  - Do you have vegetation all clumped together your burn area? Or are they spread out? Is there a continuous, connected group of fuels?
  - More fuels clumped together means more smoke!

- How wet is the vegetation? Dryer fuels will tend to have less smoke. Wetter fuels will tend to produce more smoke and are less likely to burn completely.

- **Where is your burn area located?**
  - Are you in a valley, on a hill, on a mountain side? Your terrain influences where smoke goes. In hilly or mountainous areas, smoke moves into valleys and drainages during the night, tending to move from high points to lower points on the terrain.
  - Is your burn near schools, daycares, nursing homes, or hospitals? These are considered areas sensitive to smoke. Smoke may harm people's health. These are areas to be more careful in managing the direction and amount of smoke, or the day of the burn (when school is out). Notifying people in advance can give them a chance to take measures to protect themselves, like closing windows.
  - Smoke can decrease visibility on roads and airports and cause delays.

How Does Weather Affect Smoke?

Wind is the most important part of weather affecting smoke. Where you are on a mountain, or the terrain, can affect the wind.



Daily wind changes in mountains

- **Wind:**
  - It's important to know which direction is coming and going from. It may help the smoke disperse, but it also may spread the smoke and impact nearby communities.
  - Little to no wind will cause smoke to spread low and not rise. Your fire may take longer to burn and spread with no wind. This is not ideal for a prescribed burn.
  - Ideal winds are light. They can direct your fire in the right direction and help smoke rise.
  - Strong winds will spread smoke around. It can also be dangerous and spread embers outside your burn area. This can cause fires to pop up elsewhere and turn into a wildfire.
  - Be aware of the potential for wind gusts and how they can affect your fire's behavior. Note that draws and other ups and downs in topography can affect wind speed and direction.
- **Effects of the Terrain**:
  - Heat rises and so does smoke! Smoke rises in the day, just like warmer air coming up. At night, air cools and lowers, and smoke lowers too.
- **How big of an area are you burning?**
  - The bigger the area, the more smoke you'll make! If you have a large area you want to burn, consider burning it in smaller sections. Burning smaller areas means making less smoke.

Ways to Manage Smoke:

Burn smaller burn areas at a time. If you have a large area to burn, you can burn it in smaller sections. Less burned means less smoke for that day. Start with a section under an acre if you are new to prescribed fires.

Burn in weather good for burning:

- Not too wet or dry, not too cold or hot, and not too strong or little a wind.

Understand and follow local, state, federal, and tribal prescribed fire laws and regulations. Check online, call, or go in person to your local Air Quality District. For Nevada County, you can go to Northern Sierra Air Quality Management District

If you have a lot of fuels, remove them from your burn unit or pile them in open areas and burn them first.

- Make sure you follow regulations for pile burning. Burning piles will lower the intensity of your prescribed burn and lower the chance of it going out of control.

When you are done burning, make sure everything is out and no longer hot!

- Drown smoldering logs that are burning for a long time and dead plant material on the ground (duff). Smoldering is when there is smoke but no flames from logs and duff. It means something is still burning and can catch fire again.
- Put water on smoking areas and mix it with dirt until there's no more smoke.
- Once you think it's no longer hot and smoking, feel the area with the back of your hand. Does it still feel hot? Add more water, mix, and repeat!

Basic Smoke Management Practice (BSMP)	When should the BSMP be applied?
1. Identify, map, and avoid impacting smoke sensitive areas	Before / During
2. In high smoke risk areas, explore alternative methods to burning	Before
3. Understand and follow local, state, federal, and tribal prescribed fire laws and regulations	Before / During / After
4. Enhance smoke management skills through training and experience	Before / During / After
5. Notify appropriate parties (neighbors, public agencies, authorities) of intent to burn	Before
6. Monitor changing weather conditions and respond to unintended smoke impacts	Before / During / After
7. Be aware of other burning activity and sources of pollution in your area	Before / During
8. Use a test fire to verify expected smoke dispersion	During
9. Only burn when smoke dispersion conditions are favorable	During
10. When possible, use ignition patterns and methods which minimize smoke production	During
11. Minimize impacts from smoldering smoke	During/After