

Burning at Night: Benefits Behind the Glow

WHILE NIGHTTIME BURNS HAVE INCREASED RISKS, PROPER PLANNING, SKILL, AND IGNITION TECHNIQUES CAN MITIGATE THESE RISKS, POTENTIALLY ADDRESSING THE COMPLAINT ABOUT THE SCARCITY OF BURN DAYS.

by Bence Carter

A common complaint, but misconception, about prescribed fire is the lack of "good" burn days throughout the year. Often, landowners and managers get to the point of dropping the match, only to cancel as daytime conditions deteriorate and become unsuitable (low humidity, hot temperatures, or high winds). Another scenario involves continuously postponing burns due to risky fuel composition or conditions that could result in an intense fire. Could burning at night be the solution? While nighttime burns have increased risks, proper planning, skill, and ignition techniques can mitigate these risks, potentially addressing the complaint about the scarcity of burn days.

BENEFITS

Although evening prescribed fires are infrequently used and sometimes discouraged, their benefits should not be ignored. **First and foremost, evening prescribed fires typically have much lower intensity.** Increasing humidity, lower temperatures, and calmer winds all manipulate conditions on-site, resulting in smaller flame lengths and slower rates of spread. This scenario is ideal for young stands, lower or dense canopy stands, or stands where there is an elevated risk of scorching on trees. Heavier fuels, fuel ladders, and draped fuels could all impact residual trees, so "cooling and slowing the fire down" is an option with burning at night. An all-too-common scenario is an unthinned loblolly pine stand with patches of yaupon holly in the midstory and a thick layer of pine needles on the forest floor and draped on lower branches.

If wildlife management is a primary focus on your property, night burns could be the solution to creating that ideal habitat. As the sun goes down, humidity levels begin to rise. Lighter fuels are more easily affected, making some areas less likely to burn. This can result in night burns causing a patchy mosaic of well-burned and unburned areas. From a wildlife perspective, the results create a diversity of plant structure and species which can contribute to a variety of food and cover types in proximity.

CHALLENGES OF A NIGHT BURN

For all the benefits of prescribed fire at night, there are equally as many challenges that must be heavily considered. One obvious concern is the burn's crew safety when operating in evening conditions. It is imperative that crew members stay in frequent contact and are well-versed on the burn unit, ignition plan, and crew member responsibilities. Prior to conducting the burn, the burn boss should take the crew around the site in daylight and discuss potential hazards and the plan to successfully and safely execute the burn.

In the darkness of nighttime burns, flying embers are much more noticeable. Often, burning stumps or snags will put on quite a light show. Just because higher evening humidity levels typically reduce the probability of igniting lighter fuels and causing a Spotfire, these embers shouldn't be ignored. Monitor firebreaks and areas outside the burn unit to ensure there are no jumps.

An equal concern on-site, and an even bigger concern off-site, is what happens to the smoke. For anyone familiar with prescribed fire, the saying "down wind, down drain" is ingrained in their mind. For less experienced burners, this means that during the day, smoke will be influenced and pushed by the wind. In the evening, as surface temperatures and winds decrease, smoke will settle on-site or move into low areas like streams and rivers. Winds under 5 mph increase this risk. A major concern with this behavior is roads and bridge crossings where smoke could likely settle. Conduct smoke screening ahead of the burn to assess potential impacts and plan accordingly. PB-Piedmont (piedmont.dri.edu) is an online resource that assists in modeling for evening smoke movement.





Inversion occurs when cool air gets trapped below warm air that has risen from the surface, creating a barrier that can prevent smoke from rising. Be mindful of the signs that inversion might occur in the evening: calm winds, clear skies, and rapid nighttime cooling can all contribute to inversions and stagnant conditions, causing smoke to get trapped on-site or in low areas. Ideally, for night burns, identify weather conditions with lower humidity and a good dispersion index. Cold fronts moving in often bring evening winds that can aid in evening burn conditions. Using only backing fires can help reduce the amount of smoke on-site too.

Stagnant evenings with high humidity, temperatures, and low wind increase the risk of dense superfog forming when smoke mixes with water vapor in the air. This fog can cause zero visibility and become extremely dangerous if it settles on a road. The Low Visibility Occurrence Risk Index (LVORI) is a metric in fire weather forecasts that predicts the chances of this scenario. As dewpoint and temperature approach each other, the chances of fog establishing increase. Both metrics should be closely monitored for the evening, regardless of whether you plan a daytime or nighttime burn.



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Prescribed fire at night is not the solution for every challenging burn scenario. However, it is another tool that landowners and managers can use to achieve their management goals and increase prescribed fires in the southern landscape. If you choose to use these practices, be mindful of the heightened risks associated with evening burns and consider ways to mitigate them. As with any prescribed fire, whether day or night, always get a permit from the Alabama Forestry Commission. Ideally, also have a written burn plan and have an Alabama Certified Prescribed Burn Manager supervise the fire. ▲

The staff at the Alabama Forestry Foundation are available to offer guidance and assistance on prescribed fire questions, as well as a wide range of land management questions.

