Conservation officials set objectives for each prescribed burn it conducts, typically in the spring or fall. Objectives can include removing dead or downed fuel; selecting for native, fire-dependent species; setting-back or killing exotic or invasive species; and promoting new growth.

Register photos by Katie Hammond

BURNING FOR BIODIVERSITY

Conservation's prescribed fires renew the ecosystem

By KATIE HAMMOND
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(Above) Southeast Iowa boasts a cooperative burn crew. Many of the conservation agencies have only two or three staff available to help with prescribed fire and most of plans call for six or more wildland firefighters. This photo was taken at Virginia Grove Wildlife Area, owned and managed by Louisa County Conservation, after a 51-acre burn of the recently acquired Mabeus addition. The burn includes staff from Louisa County Conservation, The Nature Conservancy, and Burr Oak Land Trust. Shown are, front from left, Claire Hamilton, Katie Hammond, Mitchell Griffin, Erin Hosto and Gemma Tursi. In back are Carter Johnson, Dale Maxon, William Blair, Noah Robb, Luke Perkins, Jacob Ewart, Sarah Lawinger, and Jason Taylor. **(Left) During a recent burn**, Jason Taylor of the Burr Oak Land Trust flew a drone to record video of the prescribed fire from the sky. The video footage will be used in presentations and training exercises to help new wildland firefighters learn about fire tactics and behavior.

People looking to the horizon over the past few weeks have no doubt witnessed columns of smoke rising into the sky. If they were on conservation land, those fires were intentional.

Fires that are intentionally lit on conservation land are often called prescribed fires. They are given that name because a burn plan, ranging from two to 30 or more pages, is written for each specific burn unit, or area where the intentional burning will take place. Burn plans contain the prescription for the fire.

There are several factors that go into a fire's prescription: objectives, fuels, topography, weather, burn breaks, hazards, and more.

Succession is a natural process. If conservation suppresses fire, the prairies and wetlands would soon become overtaken by trees.

One of the main reasons conservation burns is to increase biodiversity. Having a prairie with a large number of grasses and flowers that bloom throughout the growing season provides nectar for pollinators and provides beauty. Willows are quick to populate without disturbance along with locust, buckthorn, and red cedar, to name a few.

Fire is not the answer to all management goals, but it is a very effective tool when used wisely. Many woodlands in the area are dominated by oaks and hickories. Without fire and a selective harvest of trees, it is difficult for oak seedlings to grow. Shade-tolerant tree species begin to take over the forest floor. Oak seedlings require direct sunlight.

Humans have used fire for thousands of years to help manage native ecosystems including prairies, wetlands, and woodlands. Conservation sets objectives for each burn. Objectives can include removing dead or downed fuel; selecting for native, fire-dependent species; setting-back or killing exotic or invasive species; and promoting new growth.

Much prescribed burning is done during the spring and fall, outside of the main growing season, although historically lightning was responsible for quite a few summer fires.

The timing of fires hurts or promotes different species. For example, a summer burn favors prairie flowers and sets back the faster growing and less desirable reed-canary grass.

Fuels are also important to consider when writing a burn plan. Fine fuels such as grasses are deemed one-hour fuels. This group contains anything with a stem of 0-1/4-inch. Within one hour, these fuels can go from too wet (morning dew) to readily available to burn (dry as a bone).

Fine fuels burn up quickly and quickly spread across a grass field or prairie. In timber burns, conservation typically burns a mix of oak leaf litter. The fires have lower flame lengths than grassland burns and travel slower.

Topography is another important factor for prescribed burning. Fire moves quickly up slopes due to flames preheating the fuels above. Sometimes topography or trees block wind, allowing the fire to move in a direction contrary to the wind. Valleys are often cooler and damper than slopes or ridges and south-facing slopes receive more sunlight, making them drier than north-facing slopes.

Weather is another important factor. As a general rule, Louisa County's days begin cool and damp. As the sun makes its way to its apex, it gets hotter and drier, with the warmest temperatures typically in late afternoon/evening. Hotter and drier means more fire intensity and quicker movement.

Wind speed and direction are the first things to look at. Different fuel types, slopes and what is surrounding the burn unit can play a role in determining which way burners want the wind to blow and how fast. Light and variable winds typically are not good for fire because without a prevailing wind, people can't predict which way the fire will move. Slope and the fire itself begin to determine the direction. When wind is greater than 15 mph, burning fuels can be carried aloft, making a fire difficult to control.

An eye-level wind speed of 5-12 mph allows burners to predict fire behavior.

Smoke management also plays a big role in wind direction. When burning, people do not want to completely smoke out a neighbor, road, or confined animal enclosure.

Another critical factor of weather is relative humidity (RH). RH is the amount of moisture or water vapor in the air. At 100% RH it is raining. When RH dips below 25% it is so dry it becomes difficult to maintain control. RH is difficult because people cannot see it or easily feel it. Having a positive weather report with the lowest predicted RH and a tool to measure RH will allow wildland firefighters to make good weather-related decisions.

Prior to setting the fire, conservation creates burn breaks around the area to be burned to help contain the fire. A fire break can be manmade such as a plowed field, scratched line, or gravel road. It could also be a natural break such as a stream or river. They range from 2 feet to more than 15 feet wide depending on the type of fuel both inside and outside of the break. A good rule of thumb is for your break to be two to three times wider than the height of the fuel.

The best breaks are removed of any fuel and contain only mineral soil, water, or a road. Mowed trails can work well, especially if the grass is green and the extra fuel has been blown out of the burn unit. Wider breaks allow the burn crew to easily get turned around when needed, stay out of the heat, and provide more time in case of a fire creeping or spotting outside the burn unit.

Hazards on a fireline can come in many different shapes and sizes. A snag (dead tree) is one of the biggest hazards. They can fall over, catch on fire, or, if they are hollow, can become a chimney with flames shooting out the top.

Wet areas can be a hazard if burn crews are operating equipment. Getting stuck can be dangerous for the operator or the equipment if fire is advancing.

Fences and ditches can be a hazard if a person is unable to get across as needed.

Overhead power lines can pose a problem if there is heavy smoke.

All hazards should be identified and mitigated prior to starting a burn. This could include marking escape routes with bright flagging, cutting down or marking hazard trees, and identifying wet areas on a map. Conservation shares hazards during briefings and makes sure everyone on the crew is aware. Safety is the main goal.

Situational awareness is one of the most important tools in a fire. Conservation crews continually gather information as they observe the fire and make decisions based on current and expected fire behavior. These changes in weather, topography, fuel, and moisture affect the way a fire behaves. Understanding these complex relationships allows conservation to make decisions based on predictions and stay safe on the fireline.