

Utah Forest Facts

EXTENSION

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Prescribed Fire on Public Lands

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This fact sheet helps readers understand prescribed fire planning and implementation on public lands.

Background

Fire has been used by humans to manipulate the surrounding environment for millennia. In the forests of North America before European settlement, Native Americans used fire to aid in hunting, clearing areas for travel, vegetation cover type conversion, crop management, and more. In modern times, we still use fire to accomplish a variety of objectives because it is often the most ecologically sound and efficient tool available. Generally, land managers refer to prescribed fire as the formal application of fire by humans to achieve land management objectives.

During the last two decades, prescribed fire and the use of wildfire has become a more accepted practice in western forests. A major goal of prescribed fire is to restore forest structure and function, attributes which increase resiliency to the negative impacts sometimes associated with unplanned fire events. The current policy of federal land management agencies such as the Forest Service is to encourage the use of fire when conditions are appropriate.



Dense stands with large accumulations of dead material now dominate many western forests

Given the probable increased use of fire in the future, it is important that the general public has an understanding of what prescribed fire is and

how it is planned and implemented. The purpose of this fact sheet is to describe the common planning and implementation procedures used to carry out prescribed fires on federal public lands in the United States.

Planning

In order to use prescribed fire on federal land, the potential environmental effects must be

documented using the procedures described in the National Environmental Policy Act of 1969. Typically, resource specialists and land managers come together from one or multiple agencies to evaluate the potential effects of a specific project and to conduct pre-project planning or “scoping.” During pre-project planning, the purpose and need of a particular project is determined, as well as the possible treatments that might be used to accomplish the project goals.

The level of environmental review varies depending upon the potential effects and controversy of the project. This ranges from a categorical exclusion

for the least amount of review to an environmental impact statement for the most. The public can comment on the proposed project during the process and seek to have an impact on the final decision. The final approved project as detailed in a *record of decision* outlines necessary actions (if any) to mitigate unacceptable environmental effects. For prescribed fire projects, the actions usually include post-burn erosion control, timing the burn to avoid wildlife conflicts, and not burning particularly sensitive areas.

The Burn Plan

Once the project has been approved, the local prescribed fire manager begins preparing a burn plan. The prescribed fire manager considers a variety of factors during this stage, including the range of acceptable weather conditions needed to accomplish the objectives (the prescription), the overall complexity, and the timing. In the West, a time during the spring or fall is usually chosen to maximize the chances of seeing favorable weather conditions and to ensure the available resources to implement the burn. All prescribed fire burn plans must follow the procedures outlined in the Interagency Prescribed Fire Planning and Implementations Procedures Guide (see <http://www.nwcg.gov/pms/RxFire/rxfireguide.pdf>).

The major components of every burn plan include the go/no-go checklist, complexity analysis, prescription, communication plan, test fire, ignition plan, holding plan, contingency plan, and considerations for smoke management. Every burn plan must be reviewed and approved by another qualified prescribed fire manager for technical accuracy as well as by the land manager responsible for all activities on the unit, also called the agency administrator.

Once the burn plan has been approved, the prescribed fire manager prepares for implementation by contacting the appropriate adjoining agencies, private landowners, and state air quality managers.

Smoke management considerations play a large part in the planning process. Individual states have the authority to manage air quality within their boundaries, thus specific regulations and procedures are unique to each state. In most states, the procedures consist of submission of the burn plan or smoke management plan to the state air quality agency well in advance of the burn. This



Firefighters preparing to ignite a backfire

information should include estimated smoke emissions and duration of the burn. Immediately prior to ignition, the prescribed fire manager must ask for approval to burn in consideration of the weather conditions and other smoke producing activities in the area.

Pre-implementation planning considerations also include site preparation such as constructing

and preparing necessary fireline to hold the fire, establishing and securing access to water to aid in holding operations, and committing the necessary personnel to ignite and keep the burning operation under control.

Implementation

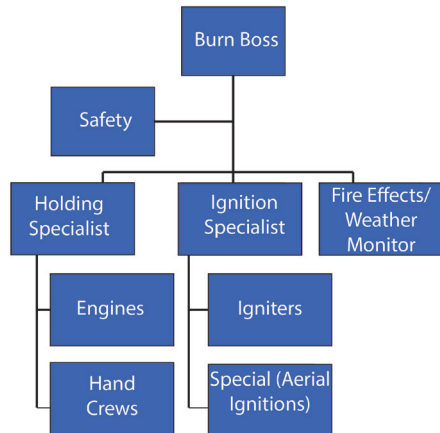
Perhaps the most important and least understood part of the prescribed fire process is the implementation phase. This is the time when prescribed fire managers along with firefighters put their skills and experience to work in order to safely and efficiently accomplish the goals and objectives.

In order to be successful during implementation, a clear command organization must be in place along with detailed ignition, holding, and contingency plans.

Organization

On every fire there is an organizational structure in place. The system used nationwide is called the Incident Command System and establishes an interagency classification of positions that all agencies recognize. The organization on wildfires and prescribed fires are similar.

The burn boss is in charge of all prescribed fire operations and reports to the agency administrator. Holding and ignition specialists are in charge of coordinating holding and ignition operations, respectively, and report to the burn boss. Firefighters either work on holding or ignition operations with the majority of personnel assigned to holding. Miscellaneous positions include the safety officer and a fire effects, weather, and smoke monitor.



Typical organization on a prescribed fire.

Ignition

The go/no-go checklist is the final requirement before ignition and is used to guarantee that all of the necessary precautions have been taken. Elements in the checklist include ensuring that all administrative items are complete and up to date (e.g. burn plan approval and notifications) and that there are no extenuating circumstances that might interfere with successful completion of the burn. If all elements in the checklist are complete, the burn boss has the authority to initiate the test fire.

A test fire is required to verify that the observed fire behavior is within an acceptable range. It is lit in an area that has fuels that are representative of the area as a whole and where the fire can be easily put out in case the observed fire behavior is not within the range needed to meet the objectives. If the test fire is successful, then implementation of the ignition plan can begin.

There is a wide array of ignition techniques that can be used on prescribed fires, each designed to produce the needed fire behavior to accomplish the stated objectives. For example, in grassland fuel types, the objective might be to remove non-native grasses or to improve foraging capacity by removing

woody shrubs. This is best accomplished using “head fires” that rapidly consume cured grasses and spread quickly, thereby producing the energy needed to lift the smoke column high into the atmosphere. In forests that have been fire-free for extended periods, various types of “backing” fires are used to slowly consume excess fuel while providing maximum control. Ignition by hand with three to eight people is common, but where there are large areas to burn, ignitions may be performed by air, using a helicopter with an ignition device.

Ignition operations for any one burn can last from one to several days. Each day of burning, the go/no-go checklist and test fire must be redone and clearance from the state smoke management agency must be obtained.



A backing fire burns underneath a young pine stand

Holding

The holding plan is perhaps the most important part of a prescribed fire burn plan as it ensures that there are enough firefighters and equipment on site to hold the fire. Their job is to prevent any undesired advance of the fire and to contain any spot fires that might occur outside of the containment lines. Prescribed fire managers use a combination of experience, personal judgment, and computer modeling to estimate the number of firefighters needed.

Small spot fires are a common occurrence outside of containment lines, but are easily dealt with, as the firefighters are prepared to deal with them. Firefighters on site are usually given 24 hours to contain any spot fires before the prescribed fire is considered a wildfire.

Contingency

The contingency plan is a plan of last resort required for every prescribed burn that details in advance the actions needed to provide additional firefighters if the fire proves too difficult to control. Contingency resources include additional personnel and equipment not on site that can be called upon when extra help is needed. Before the prescribed fire is ignited, the burn boss checks to make sure that that planned contingency resources are available.

If both the contingency resources and the resources already present can't contain the fire, then the prescribed fire is declared a wildfire.



Firefighters holding a section of fireline

Meeting Objectives

The purpose of prescribed fire is to accomplish specific land management objectives. The most often-cited objectives include reducing the risk of intense or severe fire behavior, preparing sites for seedling establishment, restoring natural processes, and improving wildlife habitat.

To ensure that these objectives have been met, tree and surface fuel characteristics are measured before and after the prescribed fire. Mortality of smaller trees is often desired while the killing of larger trees is avoided.

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There is a wide range of potential effects from prescribed fires that can be considered advantageous. Short term effects during the first year following the treatment are the most dramatic and include tree mortality, blackened bark on trees, and bare ground. Sometimes these visual effects raise concern among the general public but they are often necessary to maximize long term benefits. For example, decreasing live tree density decreases the risk of intense crown fires. Bare ground provides an ideal seed bed for grasses to increase forage capacity for livestock and wildlife.

In some forest types, repeated application of prescribed fire over many years can maintain and enhance the effectiveness and benefits that fire provides. It is widely believed that the long term benefits provided by prescribed fire outweigh some of the perceived negative short term impacts from nuisance smoke and decreases in visual attractiveness. The continued use of prescribed fire will be needed to assure long term sustainability of forest resources.

Conclusion

Successfully planning for and implementing a prescribed fire is a complex process that involves a variety of experts from various backgrounds. The process described here has been developed over many years based on lessons learned and experiences gained. There is little doubt that the process will continue to evolve as prescribed fire managers adapt to changing environmental and socio-political conditions. There are a variety of information sources on prescribed fire that can be answer specific questions. Local offices of land management agencies are often the best resources for questions and to learn more about local prescribed fire projects.

More information on the importance of prescribed fire can be found at forestry.usu.edu, by clicking on the *Video* link and viewing *The Missing Fires* video.