

# RANGELAND FIRE EFFECTS

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# Fire as a Management Tool in Southeast Idaho--A Case Study

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## Abstract

Prescribed burning is becoming an accepted land treatment method. Bureau of Land Management policy allows use of the method and requires prescribed fire planning prior to burning.

Prescribed burns in sagebrush grassland areas north and west of St. Anthony, Idaho, significantly improved vegetation composition for big game. Shrubs decreased from 65 percent to 25 percent, grasses increased from 18 percent to 25 percent, and forbs increased from 17 percent to 22 percent. The land treatment enhanced desired plant growth, minimized detrimental affects to the land, and was cost-effective.

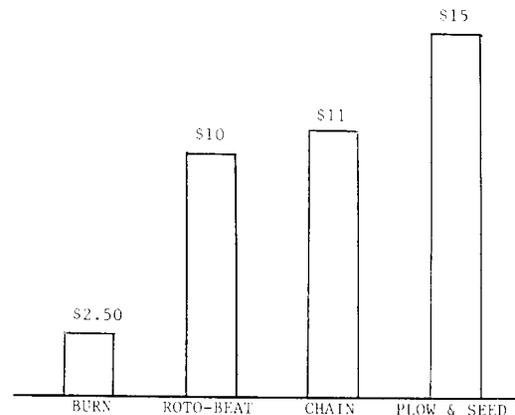
## Introduction

In recent years a growing number of individuals from the public and professionals of natural resource management have begun to accept and support the concept of fire as a land management tool. Historically, wide acceptance was slow despite claims by early pioneers of range science and plant ecology that under proper conditions burning is beneficial to the range. The vast majority of the public held the view that all fires are hazardous and should be suppressed as quickly as possible at all costs. More and more, however, professionals and interested non-professionals alike are beginning to see the beneficial results of fires under controlled conditions.

During the past decade the Bureau of Land Management (BLM), in keeping with the recent trend, has made considerable changes in its fire management policies. No longer does the BLM hold to its old belief that its task in fire management is solely to suppress fires. It now recognizes fire as a valuable resource management tool that can be used to enhance wildlife habitat and improve range conditions. In addition to the environmental considerations, it has come to recognize that in many cases fire is the most cost-effective land treatment method available (Figure 1). Specifically, Bureau policy has changed to allow limited suppression plans where the control of fire is extremely difficult and/or where the resource values do not warrant the expense of usual suppression activities. The policy allows managers to use fire as a management tool and requires them to prepare a prescribed fire plan in advance of natural or intentional ignition.

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Figure 1. Land Treatment Costs Per Acre.



The fire suppression program in the Idaho Falls District, which encompasses 2.5 million acres of public land in southeast Idaho, is one of the larger programs in the Bureau. During the last 7 years an average of 75 fires occurred burning 20,500 acres per year at an average of 300 acres per fire. The District's first prescribed burn plan was developed in 1978. Initially, the plan was hampered by lack of commitment at all levels of the Bureau, by lack of expertise at the District level and by inadequate land use planning. The District largely overcame these problems by training a District multi-disciplinary team of both line and staff personnel.

Three primary factors helped the District move into its fire management program. Firstly, the completion of the Sands Habitat Management Plan (HMP) in 1978 provided the basis for the program. This plan, which includes 200,000 BLM acres, 85,000 State acres, 100,000 private acres and 20,000 State Fish and Game acres, emphasizes the manipulation of vegetation to improve elk habitat. During its development it became apparent that controlled burning was the primary tool needed to achieve the plan objectives. The second major factor was the issuance of the Bureau's Interim Management Guidelines for Wilderness Areas in 1979. These guidelines direct BLM to begin planning to protect sensitive areas, such as the Sands HMP area, from unnecessary damage created by fire suppression activities. The third factor was the completion of the District's Big Desert Planning Unit Environmental Impact Statement (EIS) in 1981. This EIS paved the way for development of fire management plans within a one million-acre area of the District.

From 1979 to 1981, the District's prescribed burning program was centered in the Sands HMP area north and west of St. Anthony,

Idaho. Vegetation in the District, which has elevations from 4,500 feet to 8,000 feet, ranges from typical cold desert varieties of grass, sagebrush and juniper at the lower elevations to fir and pine at the higher elevations. The prescribed burns were located primarily in the sagebrush grassland community. They were designed to remove the competition of sagebrush and to enhance the growth of the other more desirable shrubs, grasses and forbs. The principle species within the HMP area are listed below:

Shrub

big sagebrush (Artemisia tridentata)  
 antelope bitterbrush (Purshia tridentata)  
 common chokecherry (Prunus virginiana)  
 rabbitbrush (Chrysothamnus spp.)  
 mountain snowberry (Symphoricarpos oreophilus)

Grass

needle-and-thread (Stipa comata)  
 blue grass (Poa spp.)  
 fescues (Festuca spp.)  
 Indian rice grass (Oryzopsis hymenoides)

Forb

arrowleaf balsamorhiza (Balsamorhiza sagittata)  
 mule's-ear wyethia (Wyethia amplexicaulis)  
 mullein (Verbascum spp.)  
 lupines (Lupinus spp.)  
 sticky geranium (Geranium viscosissimum)  
 common buckwheat (Eriogonum spp.)  
 larkspur (Delphinium spp.)  
 foothill death camas (Zygadenus paniculatus)

Under the Sands HMP, the primary objective is to increase forage for wildlife that use the area during spring, fall and winter. Inhabiting wildlife includes 2,000 elk, 1,400 deer, 5,000 antelope and 100 moose. The burned areas allow the wildlife to stay at higher elevations two to three weeks longer in fall and spring while providing additional forage for both wildlife and livestock. The prescription used for the HMP burns evolved from early trial and error efforts based on an established formula. The resulting prescription, designed so that only 50 percent of the area is burned, is shown below:

<u>Prescription Parameters</u>	<u>Units</u>	<u>Range</u>
Burning Index	Flame height in tenths of feet	30-45
Windspeed	Miles Per Hour	5-18
Temperature	Degrees Fahrenheit	65-75
Relative Humidity	Percent	12-23
Soil Moisture	Percent	50

The growth stage of the vegetation is a very important aspect of the prescription. District personnel encountered major problems during early attempts at burning because they were trying to burn at the wrong time of year.

They soon discovered that the vegetation must be cured and dormant for best results. This places less stress on the plants and achieves better recovery. At times, they learned it is necessary to wait for a hard freeze to dry out some of the finer fuels. They conduct their burns in the fall, usually September and October. Most often, the burns were covered with snow within two or three weeks after the burn. This has proved to have a positive effect on vegetation recovery, particularly bitterbrush. In the Sands HMP area, positive changes in vegetation composition after burning at the right time of year have been dramatic and are shown below:

<u>Vegetation Type</u>	<u>Composition Before Burn</u>	<u>Composition After Burn</u>
Shrubs	65%	25%
Grasses	18%	25%
Forbs	17%	22%

After burning, studies consistently indicated a significant increase in grass production. The amount has varied by year, but even in drought years production has been from two to three times greater than in unburned areas.

Some interesting changes to bitterbrush were discovered. A general reduction in plant numbers occurred, ranging from a high of 50 percent to a low of 10 percent with an average reduction of 30 percent. The extent of reduction was controlled proportionate to the intensity of the fire. Studies show that even burns removing up to 30 percent of the plants had an insignificant negative impact since many of those lost were unimportant to wildlife because they were either decadent or unavailable for wildlife consumption. In areas where any loss of bitterbrush would be unacceptable, spring burning should be considered. District surveys indicate high bitterbrush losses from summer burns. Although most plants resprouted in the fall, few survived the winter. In all the District's prescribed burns, however, a good increase in leader growth occurred. The average leader growth of bitterbrush on burned and unburned areas is shown below:

<u>Years After Burn</u>	<u>Burned Area</u>	<u>Unburned Area</u>
1	10.58 cm	2.97 cm
3	3.43 cm	2.12 cm

In summary, prescribed burns conducted at the right time of year have resulted in a significant increase of native grasses and forbs. Prescribed fire has provided the land manager a cost effective tool that has enhanced desired plant growth and minimized detrimental affects to the land. Given the following special considerations and precautions, this tool, from all indications, has excellent potential for future land treatment applications:

1. Design a large enough burn to avoid grazing problems.
2. Do not permit livestock grazing for two years after burning.
3. Area must have ample composition of desirable species.
4. Burn must stay within the prescription.
5. Immediately suppress a prescription should it exceed the threshold limits of the prescription.
6. Do professional work.