EFFECTS OF PRESCRIBED RANGE BURNING ON WILDLIFE

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Introduction

Burning is the oldest known practice used by man to manipulate vegetation on grazing lands. Although it is not a cure-all for all the range problems but can be effective and prac tical tool in range improvement . The use of fire is frightening and many desirable prescribed burns do not get started mainly due to two fears; liability consequences and one's career at stake if fire gets away (Wright, 1974). Fire is an art not a science. As the skill in use of fire in range, wildlife and forest management develops fears and hesitations in adopting it as a tool, will gradually diminish.

Purpose of Range Burning

1. *Increased Forage Production*

Increase in forage production is probably the main reason for forage burning usually to suppress undesirable woody plants. Benefits may last five to ten years, seldom longer.

2. *Improved Forage Quality*

Forage quality may be improved because of higher nutrient content and digestibility or improved species composition.

3. *Better Utilization and Livestock Distribution*

Reduction or retardation of woody plant growth permits better distribution of stock and more uniform forage utilization.

4. *Improved Wildlife Habitat*

Manipulation of food and cover to bring into useful association those conditions needed by a wildlife species for reproduction and survival, is a major objective in the field of wildlife management. Successful wildlife management requires keeping subclimax associations in vigorous conditions, high density, proper composition and proper height so as to be in reach of browsing (Miller, 1963).

Although there are several methods by which this may be done, the use of fire as a "Tool" of successional disturbance for maintaining and developing wildlife habitat, will be discussed in this paper.

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Immediate Effect of Burning on Wildlife

Wildlife does not become panic stricken and die in confusion during forest and range fires (Vogl, 1973). The principal way such fires may adversely affect population densities of some animals is by altering the habitat and not by killing.

Effect of Burning on Range Ecosystems and Wildlife

The natural role of fire can be judged in an ecosystem by observing the response to fire exclusions which results into inadequate reproductions, overstocking, stagnation, diseases and insects as well as excessive fuel accumulation (Vogl, 1971).

The continued existence of aspen *(Populus tremuloides)* woodlands depends upon fire. It is seral to conifers. It provided browse for deer and elk in a fir-spruce forest in New Mexico, USA. However, after about six years a majority of the fire stimulated sprouts had grown out of reach of the big game. Prescribed burning and logging off is the only hope for retaining large populations of Moose in Alaska. Keeping the willow-birch-Aspen subclimax under 9, height for Moose requires fire at 15-20 year intervals (Spencer and Chaleton, 1953; Spencer and Hakala, 1964).

Burning in Pinyon-Juniper in Northern Arizona greatly benefitted cattle forage and was considered acceptable for deer (Mcculloch, 1969). Deer grazing following burning was greater on the burned areas and deer diets went heavily to forbs and grasses in all seasons of the year.

Bighorn sheep (*Ovis canadensis*) and mule deer (*Odocoileus hemionus*) grazed bluebunch wheatgrass (*Agropyron spicatum*) winter range for four years after fall burning of sagebrush (*Artemisia tridentata*). Utilization of bluebunch wheat grass was greater on burned sited than on adjacent unburned sites.

The usefulness of fire to stimulate forage production in stagnated grassland communities has been demonstrated by many researchers. Where burning is deemed advisabele to maintain a grassland aspect, it is suggested that the burning interval be not less than five years; this gives herbaceous plants adequate time to recover and set seeds (Pase and Granfelt, 1977).

Lotebush (*Zizyphus obtusifolia*) is a primary source of fall, winter and spring cover for bobwhite quail in the rolling plains of USA. It was recommended that burning large pastures, at least 10 large mesquites (*Prosopis glandulosa*) and four large lotebushes per hectare in each primary rest area should be ringed with seven meter fire breaks to insure adequate cover for quail (Renwald et al. 1978).

Burning Techniques

Knowing when to burn safely, efficiently and economically is the primary objective of any one who uses fire as a prescription. Following are the important consideration at the time of deciding prescribed burns (Cooper, 1963).

1. *Weather :*

(a) Humidity: Relative humidities should be between 30 to 60% and optimum around 40%.

(b) Wind : A complete calm or lack of any wind is unfavourable since flames tend to go straight up. Winds in he forest with speed from one to nine miles per hour at five feet level are equally effective if relative humidity and fuel moisture (about 8%) remained within the desirable zones.

(c) Temperature: Effective prescribed burns can be made during extreme temperature spells as long as moisture conditions are favourable and the proper techniques were employed.

II. *Fuel*

Size arrangement and condition influences decisions on when and how to burn more than fuel weights and volumes. Atleast a ton of available forest fuel distributed fairly evenly over an acre is necessary to support a prescribed fire.

III. *Season and time*

If high temperatures are sought in the case of controlling undesirables, summer or hot weather burning has been shown to be more effective than dormant season burning. Wind, speed and direction have been difficult to predict accurately during the summer months. During winter, the weather data is more reliable due to less drastic changes in wind speed and direction than in summer. Late spring burning should be avoided as many of the game birds are nesting at that time.

Daytime prescriptions are usually more effective and reliable than those made at night. Wind speed is generally greater and consequently less variable during the day while relative humidities are consistently lower. Both conditions are essential for successful fire treatment. When cool fires are desired, as in the case of hazardous fuel accumulations under dense stands of young pine night treatments have been successful in consuming fuel with little or no damage to the overstory.

Cost of Burning

The cost of burning is influenced by various factors such as size of area, protection required experience of crews, climate, purpose of burn, topography, vegetation or fuel load and accessibility. The largest cost of burning is due to the preparation of firelines and fire control trials.

Conclusion

Prescribed fires, in general, greatly increase the diversity of wildlife species as well as popul-

ation densities on all vegetation types.

Ideally a prescribed burn should be conducted during the dormanent season when the soil is wet, relative humidity is 20-60%, average wind velocities are 5-15 m.p.h. and air temperature is 65 to 75° F. For best results, burns should be conducted when preferred plants are dormant.

Successful wildlife management requires keeping subclimax associations in vigorous conditions, height density, proper condition, and proper height so as to be in reach of browsing.

Various studies have indicated that fires were not directly destructive to wildlife but such fires may have affected population densities of some animals by altering the habitat–not by killing.

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