

BURNING, HAYING, GRAZING, AND
NON-USE OF FLOOD MEADOW VEGETATION

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Flood meadow vegetation responds rapidly to land use practices. These responses are most easily observed in changes in yield and structure of this production. Management of flood meadow vegetation at the Malheur National Wildlife Refuge is critical to the long term objective of maintaining quality waterfowl habitat.

The objectives of this study were to evaluate the vegetative response to burning, and grazing plots which had been in non-use for three years and contrasting the response to haying and non-use of native flood meadows. Evaluations were made to determine herbage yield, crude protein, and structural attributes of the vegetation.

EXPERIMENTAL PROCEDURES

The study area was located on the Malheur National Wildlife Refuge, about 30 miles south of Burns, Oregon. A portion of a field with a history of being hayed was divided. One half continued to be hayed while the other was placed in non-use for a period covering three growing seasons. In fall of 1978, the non-use area was separated into plots which were burned, grazed, and left in non-use. Burning was done in early November. The burned and non-use plots were fenced, then yearling cattle grazed the hay aftermath and plot which had not been used for three years.

Herbage yield was estimated by clipping 15 quadrats on each area. After weighing, crude protein concentration was determined. Structure of the vegetation was measured using a modified Robel pole technique. Structural attributes measured included average height of vegetation and height at which the vegetation totally obstructed the pole. Twenty measurements were made in each plot. All measurements were made at peak standing crop which occurred during mid-July.

RESULTS AND DISCUSSION

Predictably, non-use resulted in the lowest herbage yield as compared to the other treatments (Figure 1). Herbage yield for the non-use plot was about 4,850 pounds per acre, or about 1,000 pounds per acre more than had been measured for the previous two years. It appeared that the low production of the previous two-year period resulted in a reduction in ground litter accumulation thus enabling a small increase in yield.

Grazing and haying resulted in about the same yield at 6,330 and 6,500 pounds per acre, respectively. The area grazed had about 7,000 pounds per acre of litter and current years production. Grazing which removed about 60 percent of this material, and physically altered the arrangement of the remaining vegetation produced the increased yield.

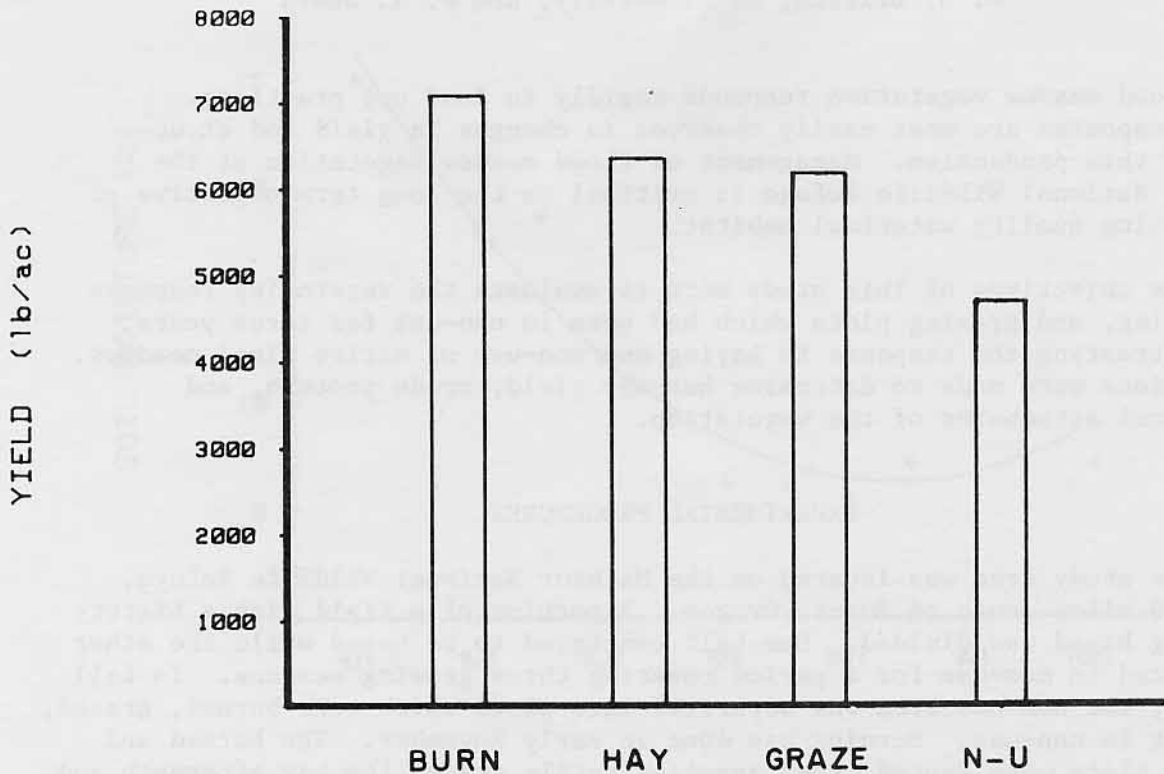


Figure 1. Average yield of herbage as measured one growing season after burn, hay, graze, and non-use (N-U) treatments.

The burned plot produced the most herbage with a yield of 7,230 pounds per acre. This result was surprising because some plant mortality was expected from burning. Although some mortality did occur, the plants that remained were larger and more productive.

The structure of the vegetation also was altered by the treatments (Figure 2). Burning produced the greatest maximum height at 49 inches but the lowest 100 percent obstruction height at 26 inches. This was probably because of the higher proportion of grass which resulted from burning. Grazing resulted in the highest 100 percent obstruction height with 33 inches. Non-use produced the lowest maximum height and 100 percent obstruction height at 40 and 26 inches, respectively. Haying resulted in intermediate values.

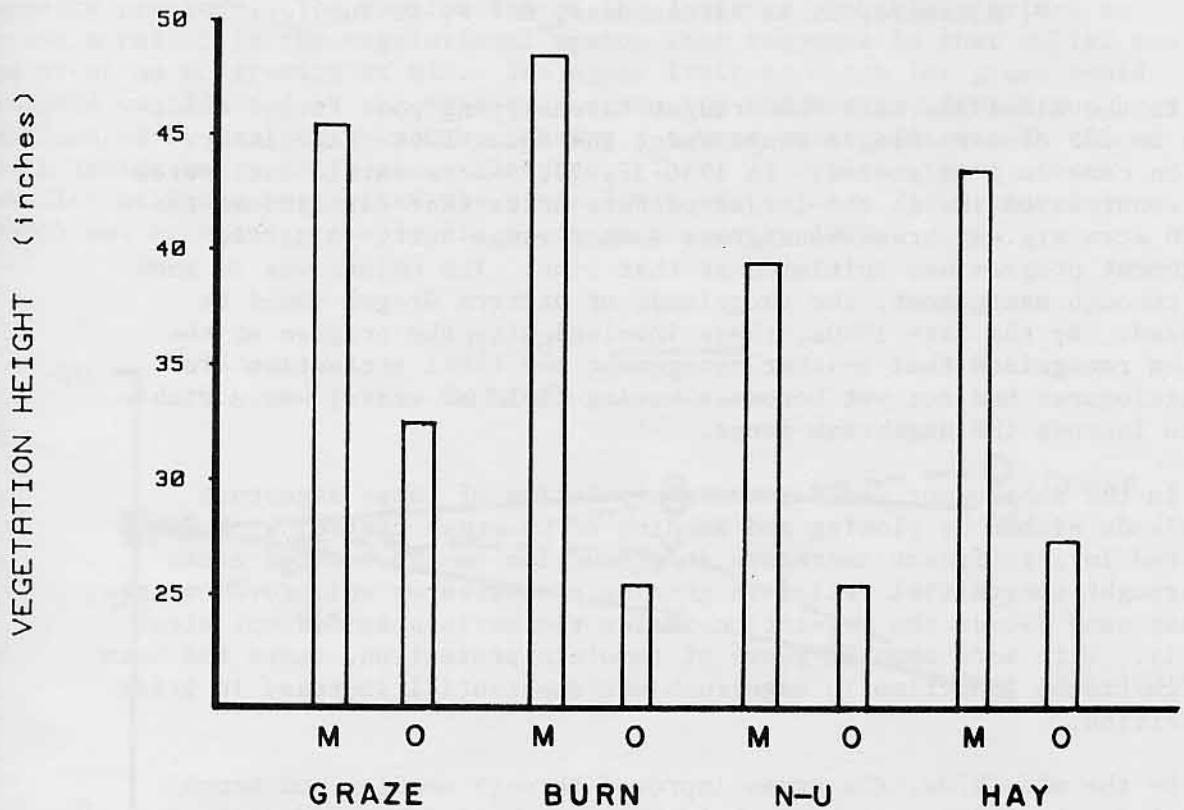


Figure 2. Average maximum vegetation height (M) and height of 100 percent obstruction (O) measured one growing season after treatments.

Crude protein determinations were made on the herbage harvested at peak stand crop. Only small differences were found, with the lowest average from the burned plot at 6.04 percent. Herbage from the hayed and non-use plots was similar at 6.33 and 6.42 percent, respectively. The highest crude protein was measured from the grazed plot at 6.82 percent. Crude protein concentration from the burned plot was lowest, probably because this area started growing about two weeks earlier than the others. Therefore, the plants were advanced in development when harvested.

Based on this study, burning provides the greatest maximum height and yield of vegetation after three years of non-use. Burning did not produce highest 100 percent obstruction height, a desirable waterfowl habitat characteristic. Evaluating all vegetative characteristics measured showed grazing produced the most desirable overall response assuming that the 100 percent obstruction height is a critical parameter.