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UNIVERSITY OF IDAHO

Moscow, Idaho

**PRESCRIBED BURNING EFFECTS ON
NUTRITION, PRODUCTION
AND BIG GAME USE OF KEY
NORTHERN IDAHO BROWSE SPECIES**

Duane Arthur Asherin

December 1973



PRESCRIBED BURNING EFFECTS ON NUTRITION, PRODUCTION AND
BIG GAME USE OF KEY NORTHERN IDAHO BROWSE SPECIES

A Dissertation

Presented in Partial Fulfillment of the Requirement for the

DEGREE OF DOCTOR OF PHILOSOPHY

Major in Wildlife Science

in the

UNIVERSITY OF IDAHO GRADUATE SCHOOL

by

DUANE ARTHUR ASHERIN

December 1973

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AUTHORIZATION TO PROCEED WITH FINAL DRAFT:

This dissertation of Duane A. Asherin for the Doctor of Philosophy degree with major in Wildlife Science and titled "Prescribed Burning Effects on Nutrition, Production and Big Game Use of Key Northern Idaho Browse Species" was reviewed in rough draft form by each Committee member as indicated by the signatures and dates given below and permission was granted to prepare the final copy incorporating suggestions of the Committee; permission was also given to schedule the final examination upon submission of two final copies to the Graduate School Office:

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Duane Arthur Asherin was born in Watertown, Wisconsin on October 13, 1940. He attended Lake Mills High School in Lake Mills, Wisconsin, and received his diploma in June, 1959. For the following four years he worked in the construction field and in September, 1963, he began undergraduate studies at the University of Wisconsin - Stevens Point. As an undergraduate, Duane assisted the Wisconsin Department of Natural Resources in a greater prairie chicken censusing project and also worked for the United States Geological Survey as a field assistant in the collection of ground water data. He received the degree of Bachelor of Science in the School of Applied Arts and Science, with majors in Conservation and Biology, in June, 1967.

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Mr. Asherin married the former Judith B. Maas on April 15, 1961. They presently enjoy four children: Lance A., Craig R., Steven P., and Deborah J.

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ABSTRACT

Prescribed burning effects on the production and nutritional quality of four northern Idaho key browse species were investigated in three spring burns (1967, 1948, and 1969) in each of two main study areas--the Lochsa and St. Joe River drainages--and in 1968 and 1969 prescribed burns on the University of Idaho's experimental forest. Big game use of burned and nonburned sites was also compared. Only dormant plant tissue was sampled for nutritional effects corresponding to the critical big game winter stress period.

Nutrient analyses of current annual growth (CAG) not longer than four inches from four key browse species--mountain maple (*Acer glabrum*), serviceberry (*Amelanchier alnifolia*), redstem ceanothus (*Ceanothus sanguineus*), and willow (*Salix* spp.)--indicate species specific responses to spring prescribed burning. Crude protein was significantly higher the first year after burning in 83.3 percent of the burned vs. nonburned comparisons for all species. This effect was absent by the end of the second year, suggesting spring burns are of low intensity. With one exception, redstem protein content was lower on burned compared to nonburned sites. Strictly maintenance forages are indicated by the protein content noted. Fat content generally was lower the first year but higher in the second and third years after burning. Willow was considerably higher in fat than any other species and redstem the lowest. Crude fiber was significantly lowered in 72.7 percent of the comparisons for all three years of burns, indicating increased overall digestibility. Crude fiber content increased, however, in mountain maple on burned sites. Ash showed no apparent trends for any browse species but was highest on controls and burns in willow. Calcium was lower in