
HIERARCHICAL FORAGING ECOLOGY OF YELLOWSTONE BISON AND DEVELOPMENT OF REMOTE SENSING TECHNIQUES FOR MANAGEMENT OF BISON AND OTHER HERBIVORES ACROSS THE INTERMOUNTAIN WEST

Tom Olenicki *, Ecology Department, Montana State University, Bozeman, Montana 59715 1

Lynn Irby, Ecology Department (retired), Montana State University, Bozeman, Montana 59715

To help address the controversy concerning movement of bison outside Yellowstone National Park and identify potential areas for bison relocation, we determined seasonal foraging habitat selection by bison at 4 hierarchical levels, the dominant hierarchical level of selection by Yellowstone bison, inter-annual consistency of use of grazing locations, and developed remote-sensing techniques for determining spatio-temporal estimates of herbaceous vegetation availability and forage utilization at a landscape scale. Without accounting for differences in sward biomass among vegetation types, selection of vegetation types was inconsistent among hierarchical levels. However, development and use of a biomass index accounted for differences in offtake rate among vegetation types that resulted in consistent selection across hierarchical levels for upland vegetation types over mesic lowland types. Monitoring of known feeding sites over successive years further indicated preference of upland vegetation types. Results suggest the feeding site level as the dominant level of selection and that Yellowstone bison exhibit behavior expected of energy maximizers in both the short- and long-term. Remote sensing techniques providing spatially-explicit estimates of standing crop of herbaceous vegetation were developed at 4 locations across diverse habitat in MT and Yellowstone Park, WY. Estimates of forage utilization were developed for the Yellowstone Park location. Results of this project increase our understanding of the spatial and temporal dynamics of bison foraging ecology both inside and outside Yellowstone

National Park and offer remote-sensing techniques relevant to the management of all grazing herbivores throughout the intermountain west.