John M. McGee Department of Zoology and Physiology University of Wyoming Project Number 195

There is increasing evidence that fire has played an important role as a natural factor in influencing the structure, dynamics, and evolution of forest ecosystems, particularly in western North America. Park biologists at Grand Teton National Park are in the process of developing a firevegetation management plan for the major vegetational habitat types within the Park. A prescribed burn was scheduled for an old Douglas-Fir forest located on Blacktail Butte as part of an experimental study aimed at determining whether it would be desirable to implement a program of prescribed burning as a substitute for the formally occurring natural fires.

The purpose of this investigation is to study the short-term effect of the burn on birds and mammals in the forest area which is subjected to the prescribed burn. Park biologists are conducting an investigation of the effect of the burn on vegetation of the area, and this study will provide the much needed parallel study of the fauna. By providing before-burn and after-burn inventories of the species of birds and mammals, and of their abundance, in the area, the immediate effect of the burn on these animals will be ascertained. In addition, a species diversity, habitat complexity relationship will be investigated. A nearby area on Blacktail Butte which will not be burned was studied as a control, to provide information on temporal changes in the fauna related to factors other than burning.

Birds were censused by an observer who walked a fixed transect line in the area. The specific method followed is that described by Haapanen, 1965. The location of each individual seen or heard was marked on a map of the site, and its activity noted (feeding, singing, etc.). A compilation of these data will enable me to determine the species present, their density, whether they are nesting, whether they are transients, etc. The field observations will be converted to an estimate of the standing crop biomass. The density of small mammals will be determined from data obtained from a live-trapping program. Sherman traps were set out, two traps per station spaced at ten meters on a rectangular grid measuring 50 meters by 170 meters. Individuals were toe clipped to allow for identification on recapture. A multiple recapture statistical method, such as that proposed by Manly and Parr, 1968, will be used to determine density of small mammals. A live-trapping program similar to that described for small mammals was employed to census medium-sized mammals. Twenty number 2 size Havahart traps were set out on a transect line through the burn area. Individuals were toe clipped and released. The data will be treated along the same lines as that proposed for small mammals. Larger mammals were

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Unfortunately, the prescribed burn did not take place as scheduled due to poor weather conditions. Consequently after-burn studies have been postponed until the summer of 1974 when the burn has been rescheduled to take place. At this writing, only a description of the burn and control sites on Blacktail Butte can be given.

intensity in the burn and control areas.

The two study sites are very similar in vegetation and faunal composition and diversity. A preliminary analysis of vegetational data compiled by Dr. Lloyd Loope, research biologist for the National Park Service, indicates that Douglas-Fir (Pseudotsuga menziesii), Aspen (Populus tremuloides), and Scouler's willow (Salix scouleriana) were common to both sites. The understory species of herbaceous plants common to both sites included Calamagrostis rubescens, Arnica cordifolia, and Pachistima sp. Further analysis including age class-size determinations of the Douglas-Fir and Aspen trees will be conducted in a future study.

The avifauna of both sites were quite similar in composition and diversity. The Chipping sparrow (Spizella passerina) and Oregon junco (Junco oreganus) were the most abundant birds on both sites. In addition, the Robin (Turdus migratorius), Audubon's warbler (Dendroica auduboni), Mountain chickadee (Parus gambeli), Western tanager (Piranga ludoviciana), and Swainson's thrush (Hylocichla ustulata) were frequently seen and heard. Three species of raptorial birds were observed on both sites, the Redtailed hawk (Buteo jamaicensis), Kestrel (Falco sparverius), and Long-eared owl (Asio otus). The long-eared owl was observed nesting at the bottom of the burn site in a large Douglas-Fir tree.

Small mammals were censused during two trapping periods on both sites, a seven day period during early July and a ten day period during early August. Ten species of small mammals were trapped or observed during the seventeen days of trapping. Three species, the Boreal red-backed vole (Clethrionomys gapperi), Deer Mouse (Peromyscus maniculatus), and the Least Chipmunk (Eutamias minimus) comprised greater than 90% of the total captures during both periods on both sites. Elk (Cervus canadensis), Mule deer (Odocoileus hemionus) and Moose (Alces alces) were frequently seen on both study sites.

At this time the writer is in the process of expanding the investigation to include three other major vegetational habitats within the park, lodgepole pine, aspen, and sagebrush. The data gathered during this past summer will be incorporated into this study as well as climatic and microenvironmental data to be collected on Blacktail Butte. This expanded study will hopefully give a more thorough understanding of the relationships between fire, vegetation, and wildlife by which the Park Service can form a comprehensive fire-vegetation-wildlife management plan for Grand Teton National Park.

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## Literature Cited

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