



A survey of big game animals on a proposed strip mining site at Sarpy Creek in southeastern Montana  
by John Matthew Edwards

A thesis submitted in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE  
in Fish and Wildlife Management

Montana State University

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**Abstract:**

Field studies were conducted on a proposed strip mining site in 1975 and 1976 to obtain baseline information. The study area lies astride the western foothills of the Little Wolf Mountains. Vegetation in the region is mostly a ponderosa pine savannah with sagebrush flats to the west and north. A bottomland type occurs along Sarpy Creek and its two major tributaries: Horse Creek and East Fork Sarpy Creek. Due to the more mesic properties of these drainages, they have been put under intensive cultivation. Mule deer usage of these bottomlands increased during the summer months of the study. Two female mule deer were tagged with radio collars in late spring of 1976. Return data indicates a small sized home range during the summer. Fawn/doe counts were 75 and 59/100 does in 1975 and 1976, respectively. Antelope usage was almost exclusively in the sagebrush or field types. Antelope fawn/doe counts were 69/100 in 1975 and 39/100 in 1976. Patterns of usage indicate that any change in the water drainage systems will have a major impact on wildlife. The topography of the reclaimed land will be important in the distribution and abundance of wildlife in the area.

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*13 Sept. 1977*

A SURVEY OF BIG GAME ANIMALS ON A PROPOSED STRIP MINING SITE  
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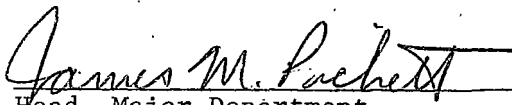
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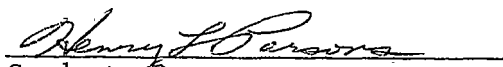
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Approved:

  
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## ABSTRACT

Field studies were conducted on a proposed strip mining site in 1975 and 1976 to obtain baseline information. The study area lies astride the western foothills of the Little Wolf Mountains. Vegetation in the region is mostly a ponderosa pine savannah with sagebrush flats to the west and north. A bottomland type occurs along Sarpy Creek and its two major tributaries: Horse Creek and East Fork Sarpy Creek. Due to the more mesic properties of these drainages, they have been put under intensive cultivation. Mule deer usage of these bottomlands increased during the summer months of the study. Two female mule deer were tagged with radio collars in late spring of 1976. Return data indicates a small sized home range during the summer. Fawn/doe counts were 75 and 59/100 does in 1975 and 1976, respectively. Antelope usage was almost exclusively in the sagebrush or field types. Antelope fawn/doe counts were 69/100 in 1975 and 39/100 in 1976. Patterns of usage indicate that any change in the water drainage systems will have a major impact on wildlife. The topography of the reclaimed land will be important in the distribution and abundance of wildlife in the area.

## INTRODUCTION

Portions of eastern Montana lie astride the Fort Union Formation. This geologic formation extends through four states and contains one of the largest coal reserves in the United States. This coal is usually located at a shallow depth and is easily extracted by strip mining. The recent "energy crisis" coupled with rising power demands and stricter air pollution laws has resulted in an increase in mining activities. The Westmoreland Corporation has been mining in the Sarpy Creek basin for three years and a mine at Colstrip has been open for a number of years. Additional mines have been proposed that would start operation in the near future.

This increase in mining activity has caused a considerable controversy. The primary objections raised against strip mining have centered upon the reclamation phase. One result of this controversy has been the passage of stricter reclamation laws. In 1973 the Montana legislature passed the "Strip Mining and Reclamation Act". Among other provisions the law states that: "...after the land has been backfilled, topsoiled and approved, the contractor shall prepare the soil and plant such legumes, grasses, shrubs and trees on the land affected as are necessary to provide a suitable permanent diverse vegetation cover capable of feeding and withstanding grazing pressure from a *quantity and mixture of wildlife and livestock*

(emphasis added) at least comparable to that which the land could have supported prior to the operation". This has been considered a landmark legislation for many reasons, one of which is the inclusion of wildlife in reclamation considerations. In order to fulfill these requirements it is imperative that accurate baseline information be obtained prior to the first mining cut.

In accordance with these requirements, field work was carried out in a portion of the Sarpy Creek basin that the Amax Mining Corporation has proposed to mine and has initiated purchase of leases. The study was conducted primarily during the spring of 1975 and the summers of 1975 and 1976 with additional investigations during the winter and spring of 1976. The specific objectives of the study were: 1) to characterize the vegetation present, 2) to gather quantitative data on the distribution, abundance and land use patterns of medium and large sized mammals, 3) to evaluate the data in order to identify any special characteristics that would be of importance in reclamation to insure the re-establishment and maintenance of wildlife at pre-mining levels.

## DESCRIPTION OF THE STUDY AREA

The Sarpy Creek study area is located in southeastern Montana approximately 30 miles (48 km) south of the town of Hysham (Fig. 1). It encompasses 36,493 acres (14,769 hectares) and is bounded on the west by Sarpy Creek, on the south by the East Fork Sarpy Creek, on the east by the Sarpy Creek-Armells Creek divide and on the north by the county road to Wilsons ranch. Elevations range from 3,080 feet (939 meters) in the northwestern portion to 3,600 feet (1,097 meters) in the southeast. The topography is characterized by rolling, sagebrush-covered hills in the lower areas which grade into the steep tree-covered hills and draws of the higher regions. With the exception of one state-owned section, the entire area is privately owned.

The major drainage system consists of Sarpy Creek and its two major tributaries, East Fork Sarpy Creek and Horse Creek. During the summers of 1975 and 1976, East Fork Sarpy Creek was the only creek that was not intermittent. In addition to these drainages and other natural springs and seepages, a minimum of 13 stockponds and 14 wells have been developed in the study area.

Climatological data were obtained from the United States Department of Commerce Weather Station Hysham 25 SSE located near the mouth of Horse Creek in the center of the study area. Average monthly and

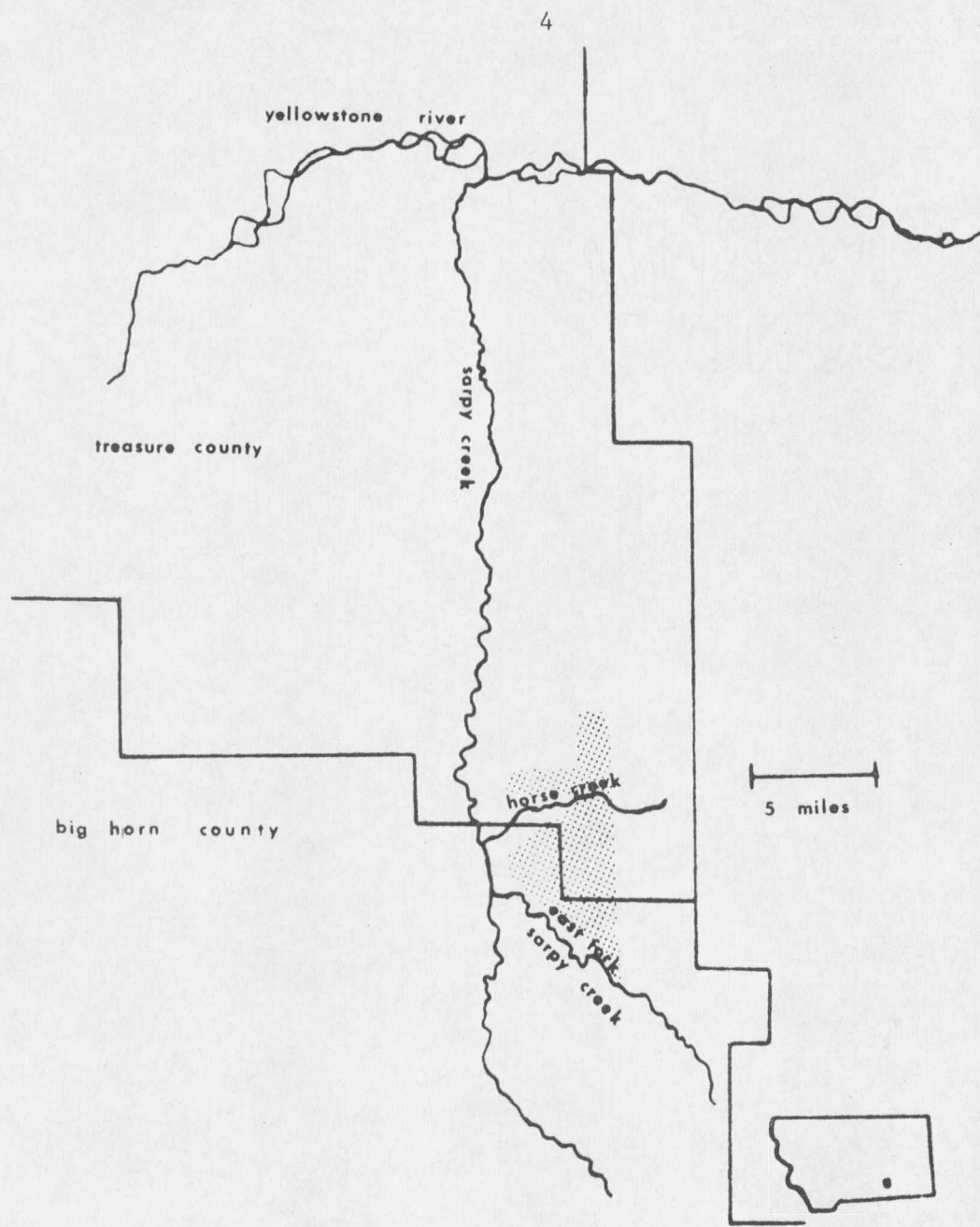


Figure 1. Map of the Study Area Showing Major Features.

yearly temperatures and precipitation amounts for the two years of the study are shown in Table 1.

The climate for this region is considered semi-arid with hot, dry summers and moderately cold, dry winters (Jackson 1971). Precipitation averaged 15 inches annually at Hysham 19 SSE from 1961 to 1970. February is the driest month (0.4 inches ave.) and June the wettest (2.6 inches ave.) month (Moshier and Fielder 1967).

The Fort Union Formation (Tongue River Member) is the principal geologic feature of this region. It was deposited in the Tertiary Paleocene Epoch and has a lithologic character of massive sandstones, light-colored clays, and thick coal beds (Thom 1935). The soils that have developed in the study area from this parent material are of two major associations: Flashier-Bainville and Bainville-Midway. The Flashier-Bainville association is moderately deep, dark-colored, sandy soils and moderately deep to shallow, light-colored loamy soils on strongly rolling to hilly uplands. The Bainville-Midway association is moderately deep to shallow, light-colored loams and clay loams on rolling to rough, broken land. Soils of these associations have low to moderate water storage capabilities (Moshier and Fielder 1967).





































































































































