



A study of waterfowl production on two rest rotation grazing units in northcentral Montana
by Frank Mathew Gjersing

A thesis submitted to the Graduate Faculty 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:

A study of waterfowl production on reservoirs in two rest-rotation grazing systems was conducted in Phillips County, Montana from 1968-1970. Five reservoirs, subjected to normal grazing, were selected as controls outside of each area. Pair populations increased during the years of census with the greatest increase between years occurring on the south area in pasture 4 which was rested the previous year. A decrease on this area occurred in pasture 5 which was grazed in the fall of the previous year. Increases in breeding pairs on the north area occurred in those pastures which were grazed during the fall of two consecutive seasons. Brood production increased over the three year period on the rest-rotation areas but controls remained fairly constant on the south area and increased on the north area. Largest increases in brood production between years occurred in pasture 4 of the south area from 1969-70. Average brood size was less on controls than on the rest-rotation pastures. With an average of 6 ducks per brood, about 9 ducks per acre of water were produced to flying stage. Data were obtained relative to waterfowl use and pond type, depth and age. Quantitative and qualitative measurements of shoreline and upland vegetation were made. Increases in canopy coverage of three shrub types and of numbers of "key" grasses were found to occur on the south area.

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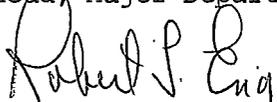
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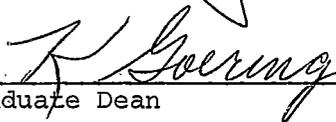
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ABSTRACT

A study of waterfowl production on reservoirs in two rest-rotation grazing systems was conducted in Phillips County, Montana from 1968-1970. Five reservoirs, subjected to normal grazing, were selected as controls outside of each area. Pair populations increased during the years of census with the greatest increase between years occurring on the south area in pasture 4 which was rested the previous year. A decrease on this area occurred in pasture 5 which was grazed in the fall of the previous year. Increases in breeding pairs on the north area occurred in those pastures which were grazed during the fall of two consecutive seasons. Brood production increased over the three year period on the rest-rotation areas but controls remained fairly constant on the south area and increased on the north area. Largest increases in brood production between years occurred in pasture 4 of the south area from 1969-70. Average brood size was less on controls than on the rest-rotation pastures. With an average of 6 ducks per brood, about 9 ducks per acre of water were produced to flying stage. Data were obtained relative to waterfowl use and pond type, depth and age. Quantitative and qualitative measurements of shoreline and upland vegetation were made. Increases in canopy coverage of three shrub types and of numbers of "key" grasses were found to occur on the south area.

INTRODUCTION

In an attempt to improve watersheds and increase forage production for livestock on western ranges, rest rotation grazing systems (Hormay, 1961) are becoming increasingly popular with land managers. Each of these systems requires that certain pastures within the system receive periodic seasonal rest from grazing. Frequently there is a need for the construction of additional stock ponds.

Previous studies, although not directly concerned with rest rotation systems, have shown the effects of grazing on waterfowl production (Bue *et al.* 1965, Drewien 1968; and Kirsh 1969). The purpose of this study was to determine the effects of certain rest rotation systems on waterfowl production in northcentral Montana.

DESCRIPTION OF THE AREA

Two study areas were located in Phillips County in northcentral Montana, one 12 miles south (Milk River Association Pasture) and one 50 miles north (Liebel-Math Pasture) of Malta (Figure 1). These areas included 20,650 and 4,320 acres respectively. Gieseke (1926) describes the physiography of the area as rolling plains dissected by deeply intrenched streams and coulees. Rough, broken land is found along most of the streams and in the more feebly glaciated areas.

The climate is semiarid, characterized by low rainfall, great temperature extremes, and a large number of sunny days (Gieseke *op. cit.*). The mean annual precipitation is 11.84 inches and the mean annual temperature is 42.8°F. Respective precipitation for 1968 and 1969 was 1.14 and .48 inches below average. In 1970, precipitation was 1.75 inches above normal. Average temperatures for the period April through July for 1968, 69, and 70 were 59.1, 57.3, and 58.7°F respectively.

Fifty six reservoirs were located on the two study areas, 33 on the south area and 23 on the north. The reservoirs were of two types: pit type or "dugouts" and retention dams (Figure 2).

The vegetation is mainly a grassland community. Crested wheatgrass (*Agropyron cristatum*), bluestem (*Agropyron smithii*), needleleaf sedge (*Carex eleocharis*), blue grama (*Bouteloua gracilis*), junegrass (*Koeleria cristata*), sandberg bluegrass (*Poa secunda*) and needle-and-

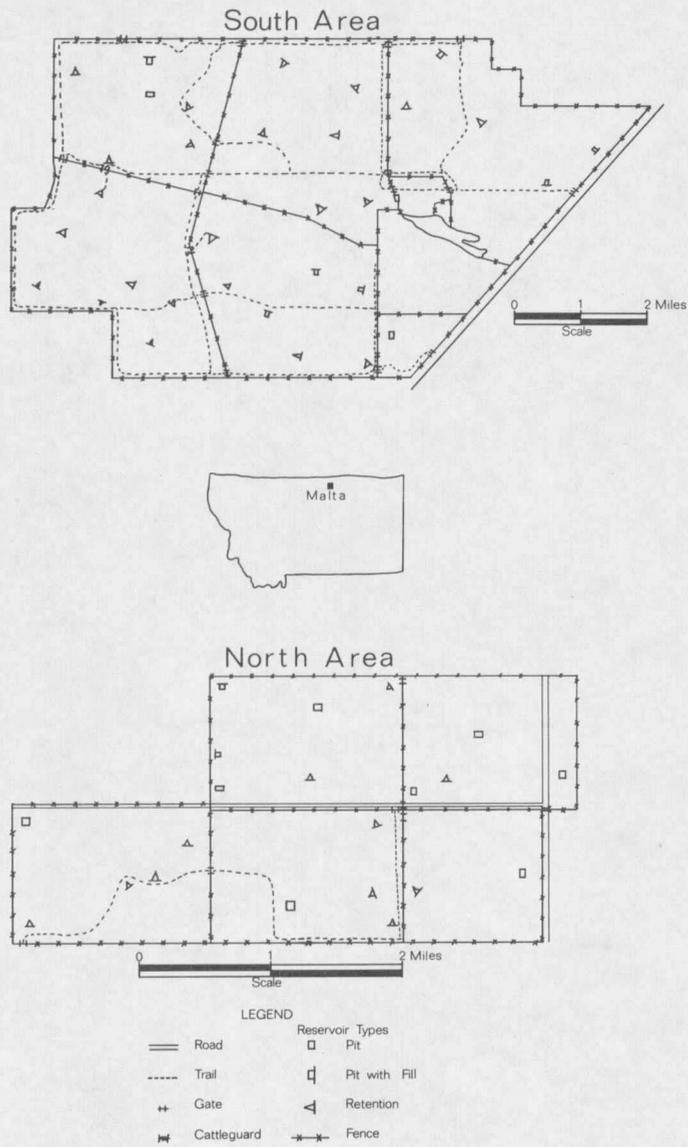


Figure 1. Map of the south and north study areas.

