



Spring, summer, and fall use of stockponds by Canada geese in southeastern Montana  
by Aaron Lloyd Hamilton

A thesis submitted in partial fulfillment of MASTER OF SCIENCE in Fish and Wildlife Management  
Montana State University

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Abstract:

Nesting habitat, production, and movements of Canada geese were studied in 1976 and 1977 on stockponds in southeastern Montana. No physical or vegetational trends were found that would satisfactorily explain the use of a particular reservoir for nesting. Contrasting water levels between 1976-1977 and the change in security of existing islands may have resulted in few islands being selected for nesting activities. Intensive grazing by cattle, especially during the low water period in 1977, created a less attractive area both for nesting and brood rearing. Paired geese entered the study area by 1 April, 1977. Peninsulas were the most common nesting site and grassland was the most commonly used cover type. Forty-eight percent of the nests were successful. No evidence of re-nesting was found. The average clutch size was 5.53 eggs/nest. Little brood movement was observed in 1976, however, broods moved extensively between reservoirs in 1977. These overland movements contributed to a 55% mortality of goslings prior to flight stage. Nonbreeders entered the study area by 19 April, 1977, left by the end of May, and returned by the end of August.

Boles Reservoir and Trail Creek Reservoir Units were used as major feeding sites both in 1976 and 1977. Geese, both river and stockpond residents, were observed on these units by the end of July both years. Large reservoirs positioned close to large blocks of winter wheat appears to attract these geese. Utilization of wheat fields usually begins once the harvest is completed. River geese appear to use certain routes and reservoirs while traveling to these feeding sites. The Boles Reservoir Unit attracted geese from Hathaway downstream to Terry, Montana, and the Trail Creek Reservoir Unit, from Hathaway upstream to the Bighorn River. By 18 November, 1977, cold weather had resulted in the freeze-up of reservoirs and the virtual exodus of Canada geese from the area. Hunter access within much of the study area is influenced by landowner-hunter relationships on private land. Currently, most of this land is closed to hunting or available to a small segment of the hunting public.

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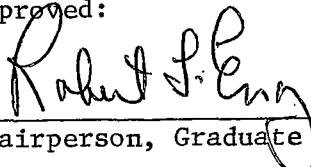
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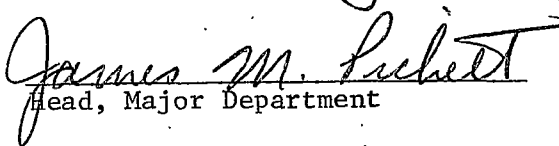
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## ABSTRACT

Nesting habitat, production, and movements of Canada geese were studied in 1976 and 1977 on stockponds in southeastern Montana. No physical or vegetational trends were found that would satisfactorily explain the use of a particular reservoir for nesting. Contrasting water levels between 1976-1977 and the change in security of existing islands may have resulted in few islands being selected for nesting activities. Intensive grazing by cattle, especially during the low water period in 1977, created a less attractive area both for nesting and brood rearing. Paired geese entered the study area by 1 April, 1977. Peninsulas were the most common nesting site and grassland was the most commonly used cover type. Forty-eight percent of the nests were successful. No evidence of renesting was found. The average clutch size was 5.53 eggs/nest. Little brood movement was observed in 1976, however, broods moved extensively between reservoirs in 1977. These overland movements contributed to a 55% mortality of goslings prior to flight stage. Nonbreeders entered the study area by 19 April, 1977, left by the end of May, and returned by the end of August. Boles Reservoir and Trail Creek Reservoir Units were used as major feeding sites both in 1976 and 1977. Geese, both river and stockpond residents, were observed on these units by the end of July both years. Large reservoirs positioned close to large blocks of winter wheat appears to attract these geese. Utilization of wheat fields usually begins once the harvest is completed. River geese appear to use certain routes and reservoirs while traveling to these feeding sites. The Boles Reservoir Unit attracted geese from Hathaway downstream to Terry, Montana, and the Trail Creek Reservoir Unit, from Hathaway upstream to the Bighorn River. By 18 November, 1977, cold weather had resulted in the freeze-up of reservoirs and the virtual exodus of Canada geese from the area. Hunter access within much of the study area is influenced by landowner-hunter relationships on private land. Currently, most of this land is closed to hunting or available to a small segment of the hunting public.



## INTRODUCTION

Large numbers of stockponds have been built or subsidized by various governmental agencies in recent years greatly increasing the waterfowl potential of southeastern Montana (Smith, 1953; Rundquist, 1973). Concurrently, numbers of Canada geese (*Branta canadensis*) have greatly increased during the fall migration in the lower Yellowstone Valley, especially on the river (Hinz, 1974). Hunter numbers and waterfowl harvests in this area have greatly increased within the last ten years. With the closing of certain sections of the Yellowstone River to waterfowl hunting, the hunting public seeks opportunities elsewhere.

Increased utilization of stockponds by geese is occurring, probably as a result of successful production and subsequent homing. Hinz (1974) found some intermingling between river and stockpond geese, especially in late summer and early fall. This study was initiated to determine the spring, summer, and fall use of stockponds by Canada geese and the possible relationships of these geese to populations on the lower Yellowstone River.

Field work was conducted from July through early September, 1976 and from late March through late November, 1977.

## DESCRIPTION OF THE STUDY AREA

The study area was located in Rosebud, Custer, and Prairie counties, north of the Yellowstone River (Fig. 1) and included approximately 3,795 Km<sup>2</sup> (1,440 mi<sup>2</sup>). The boundaries were the Yellowstone River on the south, Custer Creek on the east and county roads on the north and west. These boundaries do not reflect major changes in land use or vegetational characteristics, rather they reflect well defined topographic features delineating an area of known Canada goose occupancy. Approximately 83% of the land is privately owned with the remaining Federal land largely controlled by limited access across private land.

Giesecker (1953) divided the area into three prominent physiographic types, rough broken, sharply rolling, and gently rolling land. The rough broken land or breaks form the stream banks for the Yellowstone River and the creeks draining the area. These breaks are sandstone-capped buttes and ridges in which shales locally outcrop. The shales are composed of bentonite, which erodes into steep, almost vertical faces. The sharply rolling land includes high rounded hills and ridges, with gullied valley slopes. Both of these areas are unsuitable for farming and are used for livestock grazing. The gently rolling land is suitable for farming.

Elevations within the study area vary from 773 m (2,535 ft) at Forsyth to 725 (2,377) at Miles City. The northern area, which represents the Yellowstone-Missouri Divide, is approximately 975 m

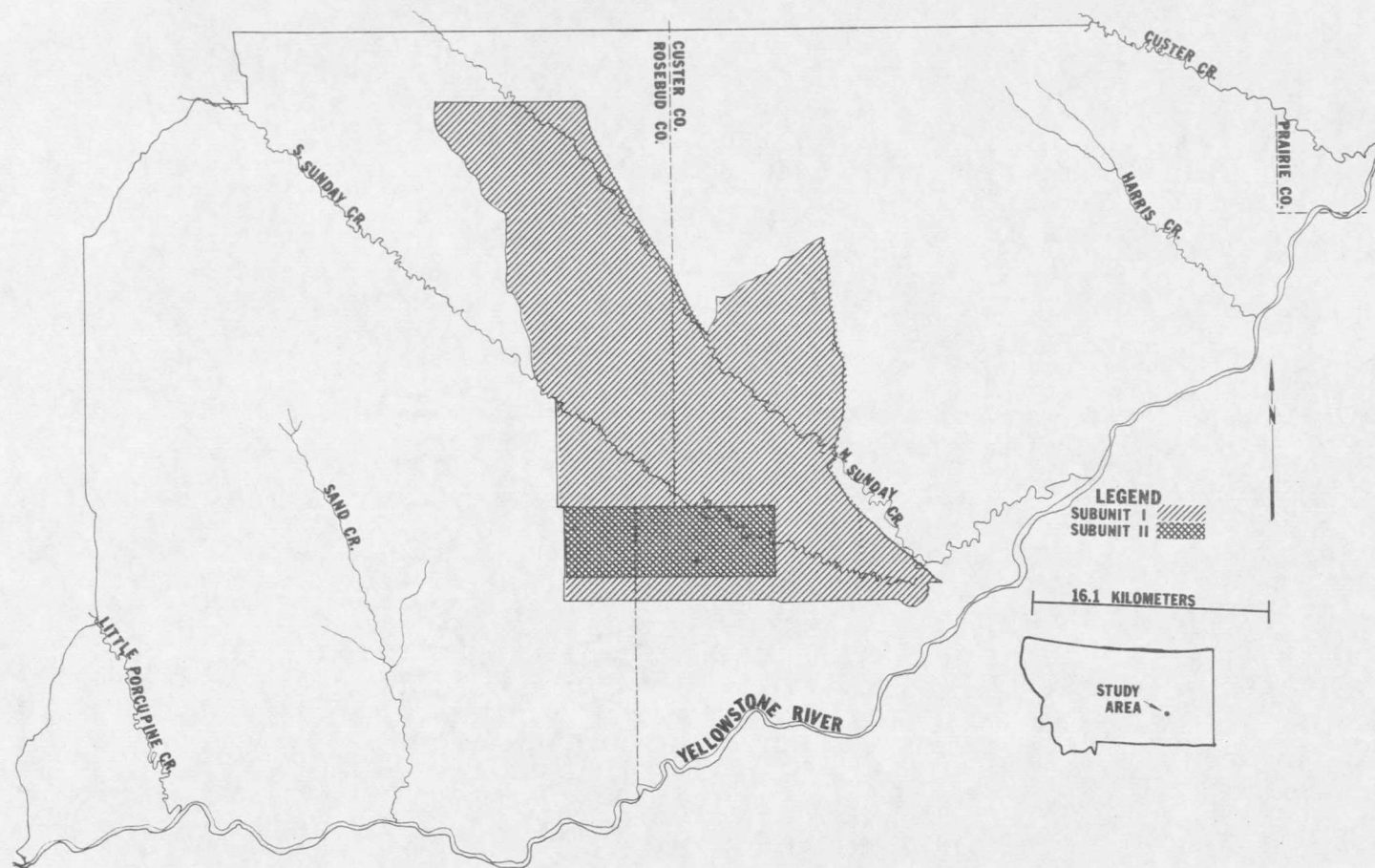


Figure 1. Map of the study area showing major features and position of Subunits I and II.

(3200 ft) in elevation.

The major streams draining the area are Little Porcupine, Sand, Sunday, Harris, and Custer Creeks. Sunday Creek, which is formed by the North and South forks, drains most of the study area. All are intermittent.

The climate is characterized by moderately low annual precipitation, a dry atmosphere, hot summers, cold winters, and a large proportion of sunny days (DeYoung et al., 1940). Average annual temperature and total precipitation, as well as 29 year means, were obtained at Miles City FAA AP (Table 1). Mean annual temperature and total precipitation for Miles City during 1941-1970 were 7.4 C (45.3 F) and 35.4 cm (13.9 in), respectively. For 1975, 1976, and 1977 the mean annual temperatures were 6.7 C (44.1 F), 8.6 C (47.4 F), and 7.7 C (45.9 F), respectively. Annual precipitation for these three years totaled 51.0 cm (20.1 in), 27.4 cm (10.8 in), and 40.1 cm (15.8 in), respectively (U. S. Department of Commerce, 1975-1977).

Vegetational characteristics of portions of the study area have been described by Schladweiler (1976) and Hinz (1974). The study area can be divided into two general types: sagebrush-grassland uplands and riparian. Big sage (*Artemisia tridentata*) is the predominant shrub in the uplands, with silver sage (*Artemisia cana*) found locally in wetter sites. Dominant forbs include hairy goldaster (*Chrysoopsis villosa*), pussytoes (*Antennaria* spp.), and fringed sagewort (*Artemisia*













































































































































