



Canada goose production and water level relationships on the Madison River, Montana
by Donald Arthur Childress

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:

Canada goose production and nesting habitat were studied from 1970-1971 on a portion of the Madison River which is influenced by-water control. Nesting data were recorded from 21 nests in 1970 and 39 nests in 1971. The nesting season began approximately March 23 in both years with peak hatch occurring during the first week of May. The average clutch size for the two years was 5.64.

An 80 percent nest success was found with deserted and destroyed nests each equalling 8.33 percent. Successful nests produced 5.31 goslings per nest. Color-marked broods in 1971 did not indicate that brood grouping had a distinct origin from different sections of the river. However, they did suggest that grouping of broods was related to gosling age. Average brood sizes at mid-May were 5.12 and 5.24 in 1970 and 1971 respectively. Fifty-two nests were located on islands. Islands used appeared to be related to preference as well as availability. Based on acreage available, islands less than 1/10 acre were the most preferred with progressively less preference shown for larger islands. Willow was the most often used cover type for nesting geese although type of cover did not appear to be important so long as concealment was provided. Geese selected nest sites on points or sides of islands where ice flow had reduced the density of vegetation and afforded greater visibility. Flooding of goose nests was not evident in this study. Water levels did not reach a stage to flood nests until after the major portion of nests had been completed. A comparison of hatching period and flooding on the Jefferson and Missouri Rivers, which have no water controls, showed a probable high loss of nests would have occurred in 1971.

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Signature Donald A. Childress

Date December 6, 1971

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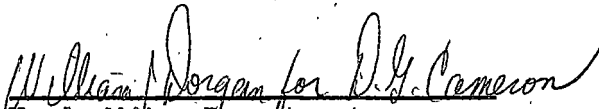
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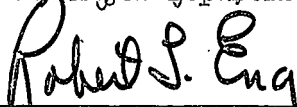
MASTER OF SCIENCE


in

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ABSTRACT

Canada goose production and nesting habitat were studied from 1970-1971 on a portion of the Madison River which is influenced by water control. Nesting data were recorded from 21 nests in 1970 and 39 nests in 1971. The nesting season began approximately March 23 in both years with peak hatch occurring during the first week of May. The average clutch size for the two years was 5.64. An 80 percent nest success was found with deserted and destroyed nests each equalling 8.33 percent. Successful nests produced 5.31 goslings per nest. Color-marked broods in 1971 did not indicate that brood grouping had a distinct origin from different sections of the river. However, they did suggest that grouping of broods was related to gosling age. Average brood sizes at mid-May were 5.12 and 5.24 in 1970 and 1971 respectively. Fifty-two nests were located on islands. Islands used appeared to be related to preference as well as availability. Based on acreage available, islands less than 1/10 acre were the most preferred with progressively less preference shown for larger islands. Willow was the most often used cover type for nesting geese although type of cover did not appear to be important so long as concealment was provided. Geese selected nest sites on points or sides of islands where ice flow had reduced the density of vegetation and afforded greater visibility. Flooding of goose nests was not evident in this study. Water levels did not reach a stage to flood nests until after the major portion of nests had been completed. A comparison of hatching period and flooding on the Jefferson and Missouri Rivers, which have no water controls, showed a probable high loss of nests would have occurred in 1971.

INTRODUCTION

The Great Basin Canada Goose, Branta canadensis moffitti, a common breeder along river and impoundment systems throughout its range, is noted to concentrate its nesting activities where rivers form numerous channels and islands (Craighead and Craighead, 1949). Flooding is an annual threat to nesting success for these geese and several studies have shown flooding to be a major source of nest loss (Craighead and Craighead, 1949; and Klopman, 1958). When subjected to annual water fluctuations in a river habitat, a major portion of the productivity can be lost in any given year.

The Madison River above Ennis Lake has an abundance of islands and harbors a breeding flock of Canada geese. Water levels are partially controlled on this stretch of river by a power dam. Annual banding operations by the Montana Fish and Game Department provide some insight on the numerical status of this flock. Thus the opportunity existed to study the relationship between water levels and goose production. Objectives of this study were to determine the breeding population and its success, to evaluate nesting habitat and to determine the water level-nesting success relationships.

The field study was conducted on a part-time basis from April to June, 1970, full-time from June to mid-September, 1970, and from April to mid-September, 1971.

DESCRIPTION OF STUDY AREA

The study area, located on an approximate 4.5 mile segment of the Madison River between Ennis and McAllister, Montana (Figure 1) includes an area of approximately 11,260 acres. Ennis Lake, in the north end of the area is 3,800 acres. The valley is bounded by the Jefferson Mountains on the west and the Madison Range on the east. The river at McAllister, drains an area of 2,186 square miles. Average discharge of the river is 1,675 cfs with a recorded maximum discharge of 7,750, having occurred in June, 1943, and a minimum of 210 in August, 1959. Two dams owned by the Montana Power Company influence the water flow along the Madison River; Madison Dam at McAllister, and Hebgen Dam 64 miles upstream from McAllister. From Ennis Lake to approximately 5 miles upstream the river is of a braided character with more than 400 islands (Figure 2).

The vegetation of the area is characterized by three types: meadow, river island and marsh. The meadow type supports bluegrass (Poa spp.), dandelion (Taraxicum spp.), thistle (Cirsium spp.), cinquefoil (Potentilla spp.), sedges (Carex spp.), and rushes (Juncus spp.). Many of the islands have an overstory of black cottonwood (Populus trichocarpa) and water birch (Betula occidentalis). The island understory is composed most commonly of red dogwood (Cornus stolonifera), woods rose (Rosa woodsii), western snowberry (Symphoricarpos occidentalis), goldenrod (Solidago spp.), cow-parsonip (Heracleum lanatum), nettle (Utrica spp.), raspberry (Rubus spp.), reedgrass

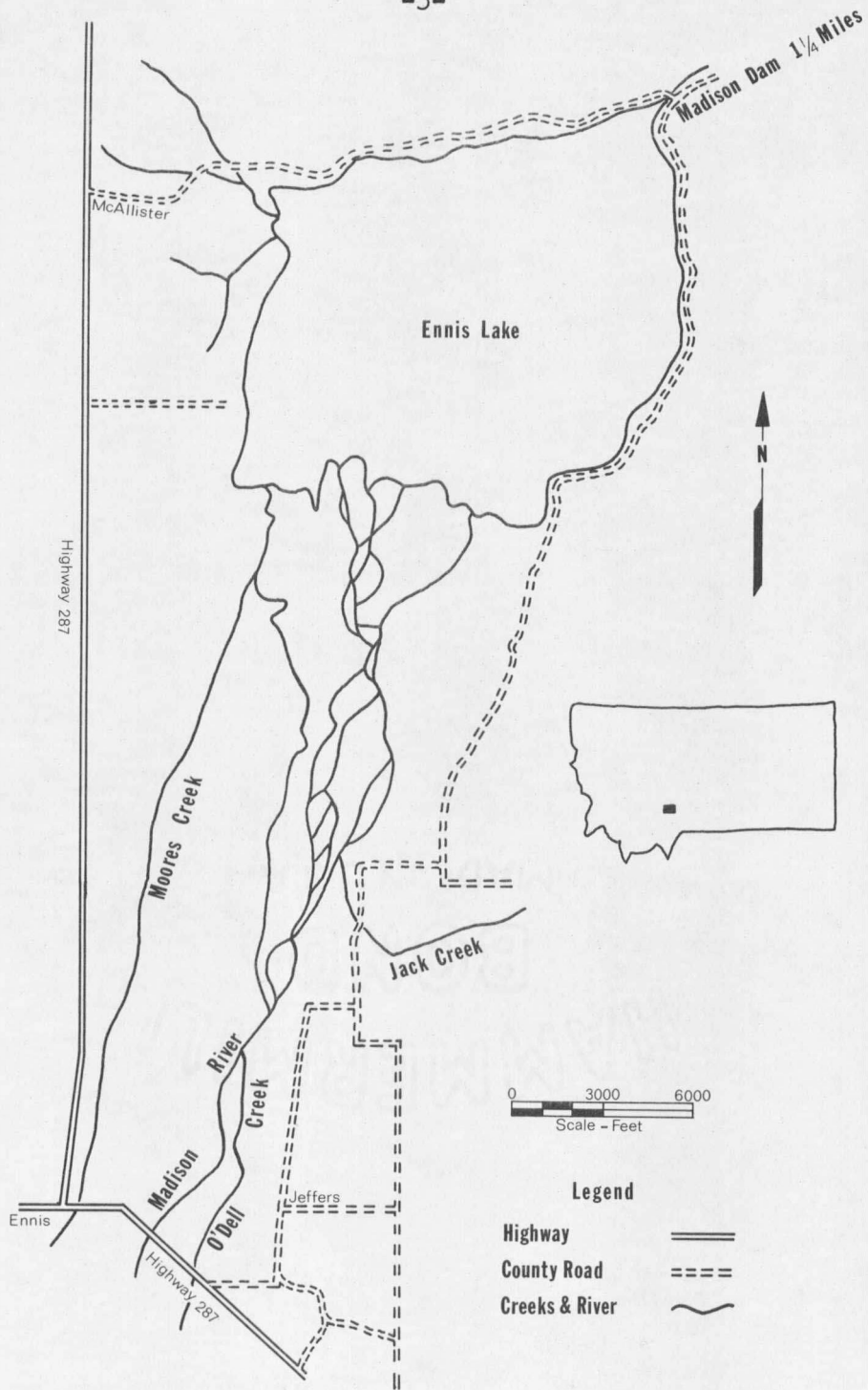


Figure 1. Map showing location of study area.



Figure 2. Aerial view of the channels area of the Madison River above Ennis Lake.

