

STATE OF MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES  
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GRATIOT-SAGINAW STATE GAME AREA  
GIANT CANADA GOOSE NESTING INVESTIGATION

by

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INTRODUCTION

During the spring of 1979, water impoundments on the Gratiot-Saginaw State Game Area were inspected for waterfowl use and wetland habitat evaluation. Incidental to these activities, investigations of nesting giant Canada geese (Branta canadensis maxima) were conducted.

The Gratiot-Saginaw State Game Area is located within the breeding range of giant Canada geese (Hanson 1965); however, breeding success was not apparent until the early 1970's. The recent success of this flock appears to be chiefly related to the development of 717 acres of water impoundments and level ditching islands constructed during the period from 1948-60. Prior to this period, the wetland habitat was not suitable for nesting geese.

STUDY OBJECTIVE

The purpose of this investigation was to gather data on the present status and breeding success of the flock for use in managing waterfowl habitat on the area.

ACKNOWLEDGEMENTS

The Gratiot-Saginaw Young Adult Conservation Corps (YACC) program provided the majority of the manpower for the investigation. Elizabeth Browne, YACC crew leader, deserves much credit for her contributions to this investigation.

STUDY AREA

The Gratiot-Saginaw State Game Area is located in the central portion of Lower Michigan (Fig. 1). This area consists of 13,097 acres of forested upland and lowland sites. Forty artificial impoundments comprising 717 wetland acres are interspersed throughout the area. Water levels in these impoundments fluctuate substantially with annual rainfall. With the



**STATE GAME AND WILDLIFE AREAS—**  
open to hunting except Leidy Lake & Crow Island

**STATE RECREATION AREAS—**  
open in part to hunting

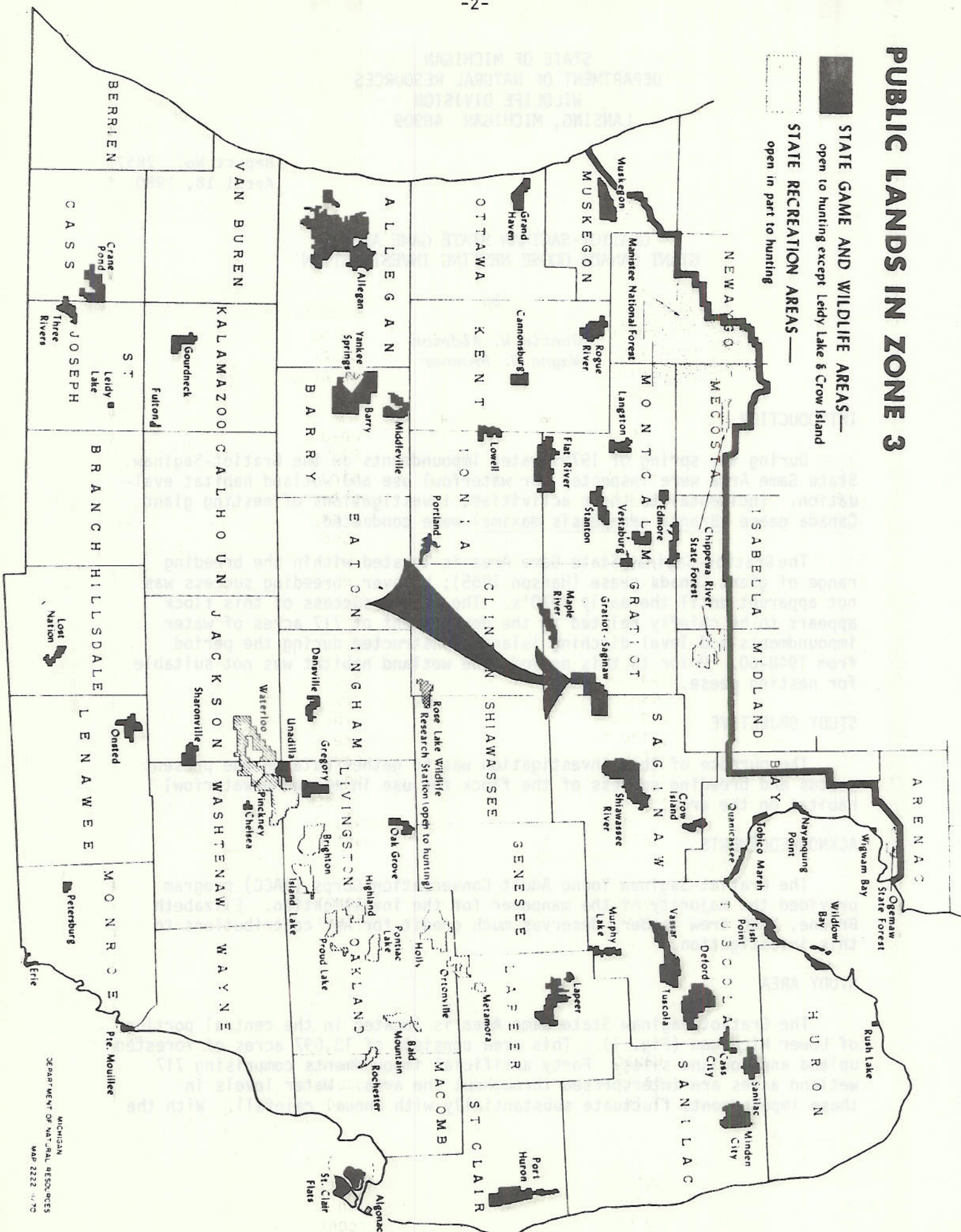


Figure 1. Gratiot-Saginaw State Game Area Location.



exception of the impounding dams and dikes, there are no means to control water levels. Twenty-two of these water impoundments or wetlands basins either have level ditching within their boundaries or are constituted entirely of this development.

Vegetation on these water impoundments was grouped into three types: woods, marsh, and island (level ditching mounds). Big tooth aspen (Populus grandidentata), pin oak (Quercus palustris), paper birch (Betula papyrifera) and tag alder (Alnus rugosa) are interspersed around the perimeter of the impoundments and level ditching sites. The dominant emergent marsh vegetation is composed of cattail (Typha latifolia) and sedges (Carex spp.). Island vegetation primarily consisted of paper birch, reed canary grass (Phalaris arundinacea), blackberry (Rubus spp.), rose (Rosa spp.) and willow (Salix spp.).

## METHODS

A census of Canada goose nests was made by inspecting the water impoundments in a canoe. Goose nests were located by the presence of the female on the nest or observed activity of the pair around the nest site. After the nest was located, the following information was recorded for each nest: (1) location, (2) nest site type (muskrat lodge, beaver lodge or level ditching dredge island), and (3) clutch size. Subsequent checks were made at two week intervals until nest completion or nest loss had occurred. Nest completions and losses were categorized as successful, preyed upon and deserted. Successful nests were those in which at least one egg hatched and the young left the nest.

All recovered unhatched eggs were opened to determine if they were fertile. Presence of a developed embryo was the criteria used for determining fertility.

## RESULTS

### Nesting Survey

Seventeen giant Canada goose nests were investigated in the Gratiot-Saginaw State Game Area (Fig. 2). The nests were located on 10 different floodings which ranged in size from 10 to 60 wetland acres (Table 1).

### Nesting Sites

Three types of nesting sites were utilized at Gratiot-Saginaw State Game Area. Of all the nests found, 88 percent were on level ditching dredge islands, 6 percent were on muskrat lodges, and 8 percent on beaver lodges (Table 2). The level ditching islands containing goose nests were surrounded by water, and covered with dense herbaceous vegetation, but were relatively free of dense brush and trees. Sherwood (1968) reported that nesting Canada geese at Seney National Wildlife Refuge selected islands without high, dense brush. Kaminski and Prince (1977) found that nesting giant Canada geese in Southeastern Michigan selected islands with a lower density of vegetation as compared to those islands not utilized.

### Clutch Size

The clutch size ranged from two to nine eggs per nest with an average of six eggs (Table 3).



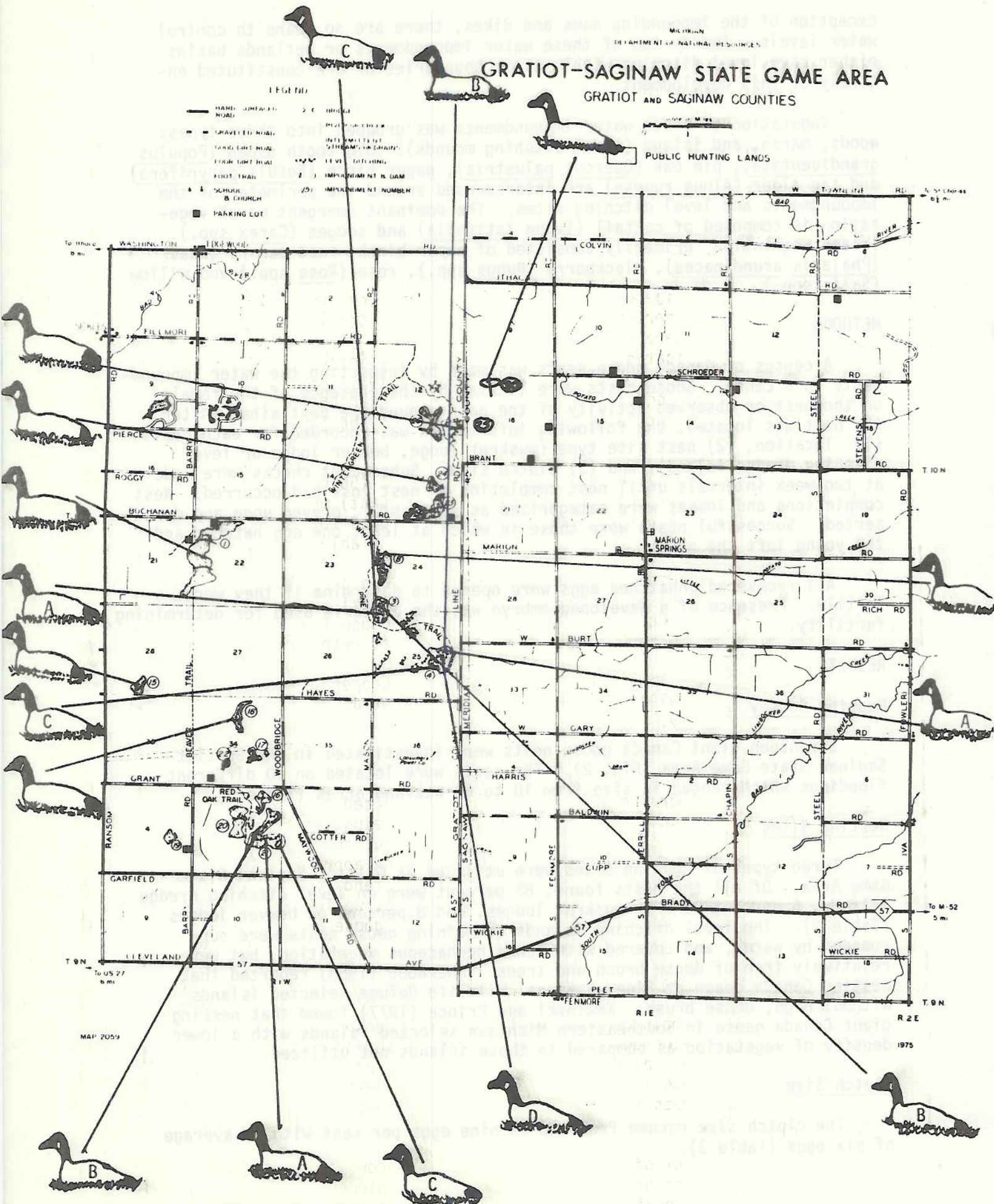


Figure 2. Location of 17 Giant Canada Goose Nests



### Nest and Egg Success

A nest was considered successful if at least one gosling departed the nest. Thirteen (76 percent) of 17 nests were successful (Table 3). The unsuccessful nests were attributed to predation (12 percent) and desertion (12 percent) as indicated in Table 4. The distinction between preyed upon and deserted nests was related to the nest condition. A preyed upon nest was one in which the eggs were destroyed. A deserted nest had intact eggs that were not being incubated. A deserted nest may be the result of predation on the goose.

Egg success for all eggs found was 55 percent (56 of 102 eggs, Table 3). Desertion (15 percent) and predation (15 percent) were the major causes of egg loss, while 12 percent of the eggs were judged to be infertile, and embryonic death occurred in another 4 percent (Table 5).

Nest success of the Gratiot-Saginaw giant Canada goose flock was similar to the southeastern giant Canada goose flock (Kaminski, Parker and Prince 1979) and the Marshy Point Manitoba giant Canada goose flock (Cooper 1978). The reported values were 82 percent and 75 percent, respectively.

Egg success was lower than that reported by Cooper (1978), Kaminski, Parker and Prince (1979). They recorded 67 percent and 70 percent egg success, respectively.

### Brood Sightings

Several early morning observations were conducted to obtain an index to gosling survival and brood size. However, the elusive behavior of the Gratiot-Saginaw giant Canada geese prevented all but two sightings of different broods. The behavior of these geese when approached was to fly or hastily swim for cover, leaving their young to fend for themselves. Although we succeeded in observing only two broods, we found many signs of their presence on various floodings, including goose and gosling droppings.

### Management Recommendations

To enhance and maintain the Gratiot-Saginaw goose flock, habitat maintenance and development is needed. Dense brush and trees should be removed from the level ditching islands to provide additional nesting sites for Canada geese. Based on observations of nest sites, islands free of brush and trees received the major use by nesting pairs of Canada geese.

The establishment of permanent herbaceous meadows adjacent to productive floodings must be undertaken as well. Supplemental grazing is needed to provide adequate food for the geese. The current grazing conditions on the floodings at Gratiot-Saginaw State Game Area are not sufficient for a larger giant Canada goose population.

TABLE 1. DISTRIBUTION OF KNOWN CANADA GOOSE NESTS  
ON GRATIOT-SAGINAW STATE GAME AREA, 1979

Flooding Number	Wetland Acreage	Number of Nests
25	15	1
2	60	1
21	60	3
4	37.5	4
24	23	1
18	15	1
3	24	3
15	18	1
30	21	1
8	10	1
TOTALS	283.5	17

	Muskrat Lodge	Beaver Lodge	*Level Ditching Islands	Total
Percent	(6)	(6)	(88)	(100)
			*Dredge material	



TABLE 3. CANADA GOOSE NEST AND EGG SUCCESS BY LOCATION  
GRATIOT-SAGINAW STATE GAME AREA, 1979

Flooding Number	Number of Nests	Successful Nests	% Success	Number of eggs per nest	Successful eggs per nest	% Success
25	1	1	100	5	5	100
4	4	2	50	(A) 7, (B) 6, (C) 6, (D) 8	(A) 0, (B) 4, (C) 5, (D) 0	34
24	1	1	100	7	5	72
2	1	1	100	5	5	100
21	3	3	100	(A) 7, (B) 7, (C) 7	(A) 5, (B) 5, (C) 7	81
18	1	1	100	9	5	56
3	3	2	67	(A) 2, (B) 2, (C) 9	(A) 2, (B) 1, (C) 0	23
15	1	1	100	3	3	100
30	1	1	100	6	4	67
8	1	0	0	6	0	0
TOTAL	10	13		102	56	
PERCENTAGE			76			55



TABLE 4. FATE OF 17 CANADA GOOSE NESTS  
GRATIOT-SAGINAW STATE GAME AREA, 1979

<u>FATE</u>	<u>NUMBER OF NESTS</u>	<u>PERCENT</u>
Successful	13	76
Deserted	2	12
Predated	2	12
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TOTAL	17	100

TABLE 5. FATE OF EGGS FROM 17 COMPLETED CANADA GOOSE NESTS  
GRATIOT-SAGINAW STATE GAME AREA, 1979

FATE	NUMBER OF EGGS	PERCENT
Successful	56	55
Deserted	15	15
Predated	15	15
Infertile	12	12
Embryonic death	4	4
TOTAL	102	101



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