1967 Waterfowl Production Survey
Missaquash Marsh- N.B.-N.S.Border

by

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December 13, 1967

PRELIMINARY DATA
NOT FOR PUBLICATION

102.33

PROJECT HISTORY SHEET

Project No. 0 2-1-1 Date December, 1967

Title 1967 Waterfowl Production Survey, Missaquash Marsh

Investigator A. D. Smith

Date of approval of project plan _____

Date of submission of progress report _____

THIS HISTORY SHEET ACCOMPANIES: (check one)

Project Plan _____ Progress report _____

Completion report x Draft manuscript _____

Proposal for shift of emphasis _____

Other (describe) _____

a) PUBLICATIONS AND REPORTS ARISING FROM THE PROJECT: (Bibliographic references; proposed titles)

b) PAPERS DELIVERED: _____

c) PUBLICATIONS OR PAPERS PROPOSED: _____

FINANCIAL STATUS (to be completed at Ottawa)

Year	Investigator	Estimate	Disbursement	Cost to date

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The 6,000 acre Missaquash Marsh located along the interprovincial boundary (Figure 1) is an important segment of the Border Region wetlands.

Helicopter brood surveys were flown in 1967 to assess waterfowl production on the site and to determine the usefulness of using a helicopter for waterfowl surveys. Also, it was believed that brood data would be useful criteria for evaluating recent management development on the Missaquash.

Description

Two general types of waterfowl habitat occur on the area. Eighty-seven per cent of the wetland comprises extensive areas of bog, interspersed with numerous wooded "islands" and some 30 small, shallow ponds and lakes. Although not used extensively for production, the many ponds and lakes provide important migration habitat. The principal production habitat is in a 750 acre impoundment created in August, 1965. It is maintained by a dyke and water control structure at the western extremity of the marsh.

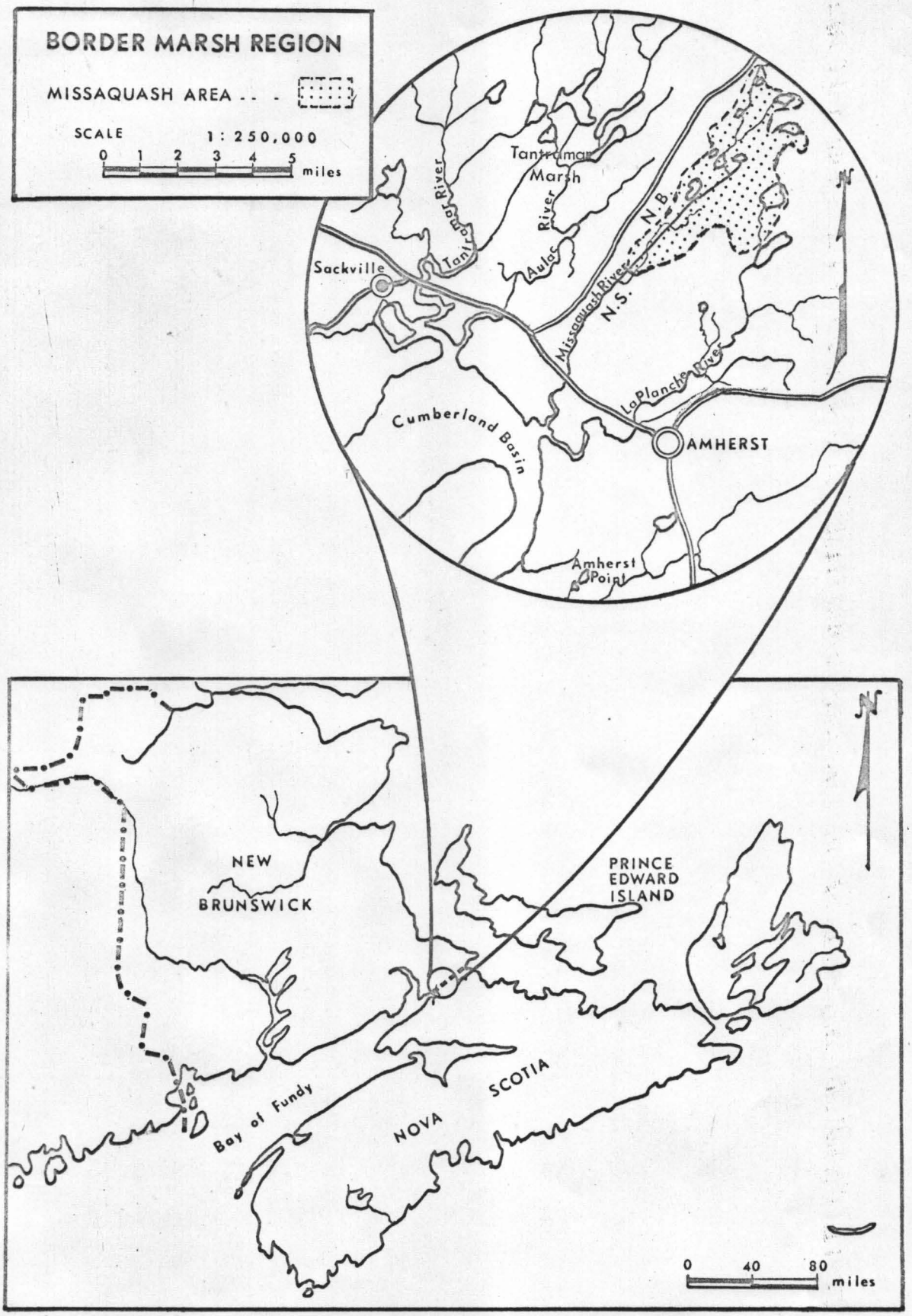

Fig. 1. Map of Maritime Provinces with Border Marsh Region enlarged to show location of the Missaquash Area.

Water depth within the impoundment varies from 12 to 20 inches with depths from 2 to 4 feet in the numerous ditches and channels. A 30-foot wide, 7 to 9 foot deep, canal, formerly used for drainage, runs east-west through the centre of the flooded area.

Extensive areas of cord-grass (Spartina pectinata) and meadow-sweet (Spiraea latifolia) still remain on the flooded marshland. Emergent aquatic species such as bur-reed (Sparganium eurycarpum), cat-tail (Typha latifolia) and bulrush (Scirpus validus) occur along open water areas. Floating and submerged aquatic vegetation is common in nearly all open water areas within the impoundment as well as in some of the upper lakes and potholes.

Methods

Two surveys were flown (at approximately a one-month interval) using a Bell 47 J 2 "Ranger" helicopter provided by the Department of Transport at no cost to the Canadian Wildlife Service. The helicopter was flown upwind at heights of 10-15 feet at an approximate ground speed of 10 mph. In that fashion two observers positioned behind the pilot could cover a transect approximately 50 feet wide.

Provincial Waterfowl Biologist Fred Payne accompanied the writer on the first survey and Canadian Wildlife Service Wildlife Technician Ronald Hounsell was the second observer during the July survey. No attempt was made to measure any appreciable difference in observer ability.

Because brood cover on the impoundment was extremely dense, the entire area was searched by flying transects at 50 foot intervals. The upper lakes and potholes were surveyed along the shorelines and over extensive areas of aquatic vegetation bordering open water areas. The entire marsh was surveyed in approximately five hours.

Weather and Water Levels

The first survey was flown between the hours of 2 and 8 P.M. on June 27. The weather was clear and sunny, with wind gusting from the west to 15 mph. Water levels were exceptionally high due to unusually heavy rains during the period June 15 to 20.

Overcast conditions with fog patches occurred during the second survey on July 25 from 10 A.M. to 4 P.M. Winds were generally light and water levels were down to normal.

Discussion and Results

The combination of engine noise and down draft from the helicopter rotor usually was sufficient to reveal females and their broods. Generally the hen would flush and fly a short distance or engage in a distraction display in front of the helicopter. Her brood could normally be spotted nearby; however, on close approach of the helicopter, the ducklings readily dived. In most instances, therefore, only an approximation of the brood size and age class could be

recorded. In nine cases during the course of the two surveys hens were observed in active distraction displays; however, their broods could not be found in the dense cover, but were recorded as actual brood sightings.

No active nest searching was undertaken; however, in a few cases when a hen was flushed from dense cover close by, the helicopter was set down and the area searched on foot. No nests were discovered during the course of the two surveys.

Fourteen broods of five species were recorded on the first survey (Table 1). The combination of a late spring breakup, and subsequent late nesting season, along with high water levels, probably accounts for the small number of broods. In addition, a sudden increase in water levels of up to 1.5 feet during mid-June undoubtedly caused nest flooding and subsequent desertion. A Black Duck nest containing nine eggs which was found on June 13, was under a foot of water when checked on June 26.

Thirty-eight broods of six species were seen during the second survey (Table 2). In each survey about four-fifths of the broods observed were on the impoundment.

Table 3 summarizes the results of the two surveys and estimates total production. Based on location and age class, eight of the broods observed during the first survey were believed to have been recorded again during the second. Consequently the estimated number of broods as a result of

Table 1. June 27 Survey, Summary of Waterfowl Broods Seen

Species	Impoundment		Upper Lakes	Total
	North side	South side		
Black Duck	-	2	-	2
Pintail	2	3	-	5
Blue-winged Teal	1	-	-	1
Green-winged Teal	1	2	2	5
Wood Duck	-	-	-	-
Ring-necked Duck	1	-	-	1
Total	5	7	2	14

Table 2. July 25 Survey, Summary of Waterfowl Broods Seen

Species	Impoundment		Upper Lakes	Total
	North side	South side		
Black Duck	1	2	1	4
Pintail	2	-	-	2
Blue-winged Teal	4	3	-	7
Green-winged Teal	6	4	1	11
Wood Duck	-	1	-	1
Ring-necked Duck	3	4	6	13
Total	16	14	8	38

Table 3. Waterfowl Brood Summary of the two Production Surveys - June-July 1967, and Estimate of total Production

	Total number of broods observed	Estimated actual broods	Range of observed brood size	Estimated average brood size	Estimated total number of young	Per cent of total
Black Duck	6	5	4 - 12	6	30	10.2
Pintail	7	5	4 - 6	5	25	8.5
Blue-winged Teal	8	7	2 - 8	6	42	14.2
Green-winged Teal	16	13	4 - 9	7	91	31.0
Wood Duck	1	1	2	-	2	.7
Ring-necked Duck	14	13	2 - 10	8	104	35.4
Total	52	44			294	100.0

both surveys was 44. The most abundant species were Ring-necked Duck and Green-winged Teal with 13 broods each, followed by Blue-winged Teal with seven, Black Duck and Pintail with five each, and a single Wood Duck brood.

The average brood size for each species was calculated to the nearest whole number from the average of the approximated individual brood sizes. The figure of 294 ducklings represents the estimated total for broods of all age classes during the times of the surveys (Table 4). It may not be representative of the total number of birds hatched nor of the total number fledged.

Estimates of production since 1960 (Table 5) cannot be precisely compared with the 1967 data because methods, observers, effort, and area covered varied each year. However, the high production figures for 1966 and 1967 are believed to be attributable to the increased quantity and quality of wetland resulting from the new impoundment.

Conclusions

The use of a helicopter was an effective method of surveying an otherwise difficult and time-consuming marsh unit. An estimated total of 44 broods was recorded during the ten hours of survey time. A full three weeks (three separate surveys) were required by one investigator on foot and by canoe, to survey the marsh in 1966, which resulted in 53 broods.

Table 4. Summary of assigned Age Class Groupings* of the Waterfowl Broods

Species	Class							
	Ia	Ib	Ic	IIa	IIb	IIc	III	Unknown
June 27 Survey								
Black Duck	-	-	-	1	-	-	-	1
Pintail	-	-	-	1	1	-	-	3
Blue-winged Teal	1	-	-	-	-	-	-	-
Green-winged Teal	2	-	2	-	-	-	-	1
Ring-necked Duck	1	-	-	-	-	-	-	-
Total	4	0	2	2	1	0	0	5
July 25 Survey								
Black Duck	-	-	-	-	-	2	1	1
Pintail	-	-	-	-	-	-	2	-
Blue-winged Teal	-	1	2	1	-	1	1	1
Green-winged Teal	-	1	-	2	1	4	1	2
Wood Duck	-	-	-	1	-	-	-	-
Ring-necked Duck	1	-	2	4	3	2	1	-
Total	1	2	4	8	4	9	6	4

* According to Gollop & Marshall (1954).

Table 5. Recorded Brood Production on the Missaquash Marsh 1960-67*

Year	Black Duck	Mallard	Pintail	Ring-necked Duck	Green-winged Teal	Blue-winged Teal	Wood Duck	Total
1960	1	1	-	2	2	6	-	12
1962	4	-	-	14	2	2	-	22
1963	2	-	-	9	4	9	-	24
1964	2	1	-	6	1	3	-	13
(Impoundment created August 1965)								
1966	6	1	3	16	17	9	1	53
1967	5	-	5	13	13	7	1	44

* - No data available for 1961 and 1965.

- 1960-64 surveys by N.S. Provincial Forest Ranger - Ground observations during June and July.

- 1966 Survey - Ground observations by one observer during the course of a summer research project on the area. May to September.

Although no cost was involved in the helicopter charter during the 1967 survey, the cost of using a private helicopter of the "Ranger" series would have been $130 per hour. The resulting cost per brood would have been approximately $30. However, if only the highly productive impoundment section of the marsh were surveyed cost per brood could be reduced by 50 per cent.

The total of 44 broods of six species, comprising an estimated 294 ducklings, does not represent the total production on the site. Undoubtedly some broods were missed and any broods resulting from re-nesting following the mid-June flooding would not have been recorded. A mid-August survey would have been useful to record any such late broods.

Thirty-four (77 per cent) of the recorded broods were observed on the two-year-old artificial impoundment. Creation of that area not only added 750 acres of available habitat to the Missaquash wetland, but it greatly increased the quality of the marsh. Pintail and Wood Duck were first recorded in 1966, probably as a result of the newly created area.

Production on the remainder of the marsh unit was only ten broods which produced an estimated 75 young. Therefore, the impoundment may be said to have been responsible for an increase in recorded waterfowl production of 219 ducklings.

Production appears to have responded favourably to management that has greatly increased the quantity and quality of the Missaquash wetland.