

Waterfowl Breeding Ground Survey in
the St. John River Estuary, N.B.

1948 to 1964, and 1968.

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WATERFOWL BREEDING GROUND SURVEY

St. John Estuary, New Brunswick - 1968.

by

Bruce S. Wright, Director,
Northeastern Wildlife Station,
Fredericton, N. B.

The survey was again carried out over the same census runs, and between the same dates as in previous years. A total of \pm 180 miles of both perimeter and slough shoreline were counted in the estuary. All fourteen runs in 1968 were comparable to 1967.

Weather and water levels were favorable through the nesting and brood seasons. Low water was experienced during August, and as a result the ducks were concentrated on the major water areas.

RESULTS

The Waterfowl Distribution.

The main Grand Lake marshes showed a substantial decrease in 1968. Other decreases were noted along the Jemseg River and the adjacent sloughs. Gilbert, Ox, and Ram Islands also showed a slight decrease this year.

Increases over the low counts of 1967 were recorded at Grimross Neck and Mount Creek on the first count in July, but these had disappeared by the end of the census period. Middle Island showed a substantial increase, as did the

lower mainland sloughs south of the Trans-Canada Highway. Portobello Stream and the coves at its mouth showed an increase over the record low of 1967. Loders Creek, the Thoroughfare, and Maquapit Lake were almost unchanged.

The first comparable count on Foshay Lake was made in 1968, and it showed an increase over last year. The low water level prevented reaching the sloughs at the end of Otter Creek, but there was an increase in ducks using the main creek. The Timber Lakes also showed an increase this year.

The Species Composition.

The black duck was second to the blue-winged teal in the total count (567 to 575), but still showed a substantial increase over 1967 (567 to 463). Blue-winged teal migrated earlier in 1968 than in 1967, and 575 were counted as compared with 263. Green-winged teal were the reverse (162 compared with 178). Wood ducks were also down (145 to 176). Goldeneyes were badly down (45 to 101). Ring-necked ducks continued their decline and are now an unimportant minor species. Pintails were not seen in the estuary during the counts this year, but another minor species, widgeon, increased (57 from 13). Four mallards were noted as compared with 0 in 1967.

The total count in 1968 was 1,642 ducks compared with 1,314 in 1967. This increase of 328 ducks was made up of blue-winged teal, black ducks and widgeon. Nine of

the 14 runs showed an increase in 1968, and five showed a decrease. This compares favorably with 1967 when only five out of 13 showed an increase and eight showed a decrease. This indicates that the waterfowl of the St. John estuary had a more successful breeding season in 1968 than in 1967.

Comparison with 1945.

The total number of ducks in the survey has altered very little in the last 23 years (1700 in 1945, 1642 in 1968), but the species composition has altered drastically. In 1945 black ducks were twice as numerous as any other species but were only slightly above the 1968 count (608 to 567). Both blue-winged and green-winged teal were less numerous than they are today. Wood ducks have decreased drastically (301 to 145), as have ringed-necked ducks (230 to 14). Goldeneyes are only slightly below the 1945 count (45 to 52). There were no pintails, widgeon, or mallards present in 1945. The figure of 20 unidentified ducks in 1945 compares favorably with 73 in 1968, and suggests that the observers of 23 years ago were at least as skilled at identifying ducks as those of today.

It is encouraging to note that, while certain areas such as Portobello Stream have certainly had their local breeding population shot down very low, the overall picture is so slightly altered despite a massive increase in the number of hunters.

Table 1. Total Ducks Compared with 1967, and 1945.
on \pm 180 miles of shoreline.

Species	1968	1967	Change from 1967	1945
Black duck	567	463	Increase	608
Blue-winged Teal	575	263	Increase	370
Green-winged Teal	162	178	Decrease	119
Wood duck	145	176	Decrease	301
Goldeneye	45	101	Decrease	52
Ring-necked duck	14	37	Decrease	230
Pintail	-	16	Decrease	-
Widgeon	57	13	Increase	-
Mallard	4	-	Increase	-
Unidentified	73	67	Increase	20
	<hr/> 1,642	<hr/> 1,314	<hr/> Increase	<hr/> 1700

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WATERFOWL BREEDING GROUND SURVEY

1964

Saint John Estuary, N. B.

Canada

Bruce S. Wright, Director
Northeastern Wildlife Station
Fredericton, N. B.

The survey was carried out this year by the staff of the Northeastern Wildlife Station during the same dates, on the same sample area, and by the same method as in previous years. The survey has been conducted for a total of nineteen (19) years (1945, 1947-1964). This year the data is presented in a different manner. Actual counts are used instead of projecting a 93% survey to 100% as in the past. It was necessary to eliminate two runs, which were not counted continuously, in order to do this, and, therefore, this year's results will not be directly comparable with previous years. This change was made to facilitate comparisons with long-term trends (an 18-year average) and short-term trends (a 5-year average).

WEATHER AND WATERLEVELS

The most important factor in waterfowl production this year was the favorable weather and waterlevels during the nesting period. The usual second peak of the waterlevel curve did not materialize allowing more first nests to hatch successfully. Weather was favorable throughout the period.

PREDATOR CONTROL

No predator control operation was carried out this year. An outbreak of distemper in raccoons and foxes killed many in the area. However, raccoon predation on tree nesting species was comparable to 1963.

SPRING MUSKRAT TRAPPING

The season was again open for spring muskrat trapping and a study was carried out on the amount of waterfowl losses from this cause. It will be reported separately by Dilworth.

THE BROOD SURVEY

The brood season was at least a week ahead of 1963. More and larger broods were produced in 1964 than in any of the previous years of the survey. All species showed an increase in brood numbers, and except for Class 2 and 3 black ducks and Class 3 goldeneyes, the broods were the largest recorded. Both teals, being ground nesters in the lowlands, were especially favored by the waterlevel conditions and produced many large broods.

The number of wood duck nests found were not significantly different from 1963, but they contained larger clutches and this is reflected in the brood count.

The ring-necked duck doubled its brood production of 1963, and brood size increased appreciably. The first brood was seen almost two weeks earlier than the previous year.

Shovelers and wigeon increased to a higher level in the area than ever previously reported. The broods per day counted rose from 2.9 in 1963 to 4.1 in 1964 and the total broods counted rose from 212 in 1963 to 356 in 1964. These data are presented in Table 1.

THE MID-SUMMER CENSUS

The census was conducted between July 16 and August 17, 1964. The results are shown in Table 2 and 3.

The long-term trend (Table 2) shows that all species were well above the 18-year average with the largest increases in green-winged teal, wood ducks, and blue-winged teal. The wigeon and shovelers showed substantial increases among the marginal species. The heavily hunted black duck showed the smallest increase above the long-term average.

The short-term trend (Table 3) showed a record count for the past six years in four of the six major species. The species showing the largest increases from the 5-year average were, in order; green-winged teal, wood ducks, and ring-necked ducks. The blue-winged teal count was the highest for all species this year and is more than double the count of 1963. The high number of blue-wings this year is comparable to the record 1959 count of 915. Good populations of blue-wings have occurred for the past 5 years so the 97 percent increase from the average is not as great as for the other species.

Black ducks had a record count, and goldeneyes just below a record count.

The total count in 1964 is the highest on record being 154 percent above the long-term average and 108 percent above the short-term average.

PROSPECTS FOR THE HUNTING SEASON

The estuary holds more waterfowl at the date of writing (August 20, 1964) than at any time in the last 19 years. If the weather does not interfere, opening day of hunting season should be a very successful one.

EXPERIMENTAL POTHOLE BLASTING

Nine experimental potholes were blasted in the Portobello-Big Meadows region of the study area in August 1964. Their use by nesting waterfowl and muskrats will be closely followed in future years and the value of this management technique for large scale application in the area will be evaluated.

August 20, 1964

Northeastern Wildlife Station,
Fredericton, N. B.

TABLE I COMPARISON OF BROOD NUMBERS AND SIZES 1963-1964

Species and Age Class	Total and Average Brood			
	1963		1964	
	No.	Average	No.	Average
Black Duck				
Class I	14	6.8	14	7.4
Class II	17	6.5	20	6.3
Class III	14	6.9	25	6.8
Broody F	3	---	8	---
TOTAL	48	---	67	---
Blue-winged Teal				
Class I	8	8.0	40	8.2
Class II	10	6.1	20	9.2
Class III	17	6.9	28	7.4
Broody F	2	---	1	---
TOTAL	37	---	89	---
Green-winged Teal				
Class I	4	7.0	6	8.5
Class II	3	3.7	8	6.9
Class III	6	5.2	5	7.4
Broody F	2	---	2	---
TOTAL	15	---	21	---
Goldeneye				
Class I	20	5.6	30	6.4
Class II	5	4.6	18	5.4
Class III	5	5.2	7	4.3
Broody F	1	---	---	---
TOTAL	31	---	55	---
Ring-necked Duck				
Class I	12	6.6	31	8.2
Class II	8	6.1	10	7.5
Class III	--	---	3	7.1
Broody F	--	---	1	---
TOTAL	20	---	45	---

TABLE I (Cont'd)

Species and Age Class	Total and Average Brood			
	1963		1964	
	No.	Average	No.	Average
Wood Duck				
Class I	22	8.0	16	9.4
Class II	14	7.2	28	9.0
Class III	13	6.2	12	10.0
Broody F	5	---	4	---
TOTAL	54	---	60	---
Shoveler				
Class I	--	---	2	10.5
Class II	1	4.0	1	9.0
Class III	--	---	2	4.0
Broody F	--	---	--	---
TOTAL	1	---	5	---
Mallard				
Class I	1	14.0	--	---
Class II	1	14.0	--	---
Class III	--	---	--	---
Broody F	--	---	2	---
TOTAL	2	---	2	---
Widgeon				
Class I	1	9.0	5	8.6
Class II	--	---	--	---
Class III	--	---	--	---
Broody F	--	---	4	---
TOTAL	1	---	9	---
Hooded Merganser				
Class I	--	---	2	5.0
Class II	1	2.0	--	---
Class III	1	4.0	1	2.0
Broody F	--	---	--	---
TOTAL	2	---	3	---

TABLE I (Cont'd)

Species and Age Class	Total and Average Brood			
	1963		1964	
	No.	Average	No.	Average
Grand Totals				
Class I	82	7.0	146	7.9
Class II	59	6.1	105	7.6
Class III	57	6.5	83	7.2
Broody F	14	---	22	---
TOTAL	212	6.6	356	---
No. days counted	72		87	
Total broods	212		356	
Broods/day	2.9		4.1	

TABLE II LONG-TERM POPULATION TREND

Species	18-year average (1945, 47-63)	18-year range low to high	Count		Percent change from 18-year aver.
			1963	1964	
Black Duck	537	202 - 1262	448	644	+20
Green-winged Teal	73	8 - 184	184	397 ✓	+444
Blue-winged Teal	226	5 - 915	370	872	+286
Wood Duck	211	14 - 454	438	862 ✓	+410
Ring-necked Duck	96	5 - 209	102	163	+70
Common Goldeneye	55	12 - 139	43	94	+71
Others ^{2/}	17	1 - 53	39	56 ✓	+229
Total count	1215	317 - 2131	1624	3088	+154

✓ highest count on record

^{2/} others include counts of the following species, listed in order of importance: mallard, American widgeon, shoveler, pintail, hooded merganser, red-breasted merganser, and surf scoter. Also unidentified species are included.

TABLE III SHORT-TERM POPULATION TREND

Species	5-year average (1959 - 1963)	5-year range low - high	Count		Percent change from 5-year average
			1963	1964	
Black Duck	452	307 - 540	448	644 1/	+43
Green-winged Teal	107	50 - 184	184	397 1/	+271
Blue-winged Teal	442	218 - 915	370	872	+97
Wood Duck	334	159 - 438	438	862 1/	+158
Ringed-necked Duck	73	38 - 102	102	163 1/	+123
Common goldeneye	59	43 - 96	43	94	+59
Others <u>2/</u>	20	2 - 39	39	56 1/	+180
Total Count	1487	860 - 2131	1624	3088 1/	+108

1/ Highest count recorded for the past 6 years

2/ Others include counts of the following species, listed in order of importance; mallard, American widgeon, shoveler, pintail, hooded merganser, red-breasted merganser, and surf scoter. Also, unidentified species are included.

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WATERFOWL BREEDING GROUND SURVEY

1963

Saint John Estuary, N. B.

Bruce S. Wright, Director,
Northeastern Wildlife Station
Fredericton, N. B.

The survey was carried out in 1963 by the staff of the Northeastern Wildlife Station. This is the 17th consecutive year, and no changes in method, area, or timing were made. The count was completed on August 16, 1963.

Weather and Waterlevels

Spring weather and snow melting were later than usual in 1963. The ducks arrived on the breeding grounds slightly behind normal dates and breeding activity proceeded immediately upon arrival. The spring flood was not exceptional despite a heavy winter snowfall, and the runoff proceeded evenly without recurring peaks. Thus flood losses were at a minimum. The peak nesting period of the early nesting species, blacks, wood ducks, golden-eyes, and blue-winged teal, in the last half of May and June was warm and dry.

Weather and waterlevels therefore appeared to be excellent for waterfowl production throughout the nesting period.

The Spring Aerial Survey

This survey was not carried out by the Canadian Wildlife Service in 1963, and no measure of the breeding population returning was available except ground observation on the study area. No significant change was detected.

Predator Control

No organized predator control was carried out this spring as personnel were not available for it. Nest predation, particularly on tree nesting species, was heavy.

Spring Muskrat Trapping

A spring season for muskrats was again in force in 1963 and the usual losses of breeding ducks were suffered.

The Brood Survey

This survey was carried out in a more intensive manner in 1963 than in previous years because personnel of the muskrat study and the wood duck study were in the field continuously during the entire period.

The results are shown in Table I and compared with 1962. The 10-year average Class I black duck brood is 8.0 ducklings compared to 6.8 in 1963. This is the smallest average in the 17 years of the survey, and suggests a decrease in black duck reproductive rate this year. Rearing success was excellent and the smaller broods came through well.

Blue-winged teal had another good year in the estuary and again rearing success was high. Green-winged teal also had a successful breeding season.

The 10-year average Class I brood of goldeneyes is 7.3 compared to 5.6 in 1963, indicating another decrease in reproductive rate. Rearing success was again high.

The 10-year average Class I brood of ringnecks is 6.9 ducklings compared to 6.6 in 1963. No Class III broods of this species were present on the study area by August 16, which is not unusual for this late nesting species.

The 10-year average Class I brood of wood ducks is 8.7 ducklings compared with 8.0 in 1963, another species showing a decline in reproductive rate. Despite this decline the species had a successful year in the estuary and is now the most numerous duck, passing the black duck in numbers for the first time.

The total of Class I broods averaged smaller than in 1962, but rearing success was generally high. The increased manpower available in 1963 resulted in more days counted and more broods tallied, but the success of the counters increased only slightly from 2.6 broods per day in 1962 to 2.9 in 1963.

Black ducks, goldeneyes, and wood ducks are all nesting when the flood is at its height - and they all are partially or entirely tree nesters. Evidence of raccoon predation on tree nests was wide-spread and they were not controlled in 1963. This resulted in much renesting and is one possible cause of the drop in reproductive rate in these species this year. Another possible cause is reduced reproduction due to the presence of pesticides mainly DDT and its derivatives in the birds. Both the winter and summer ranges of these species have been subjected to DDT spraying for spruce budworm control and mosquito control over a period of years. Residues of this pesticide have been shown to retard reproduction in other birds, and a pilot study was started in 1963 by the US Fish and Wildlife Service to study its effect on black ducks. Certainly the drop in reproductive rate in ringnecks could not be charged to renesting following raccoon predation as they nest last, long after the flood has subsided and the concentration of raccoons has broken up.

A female black duck and her clutch of eggs were collected and sent to the Patuxent Wildlife Research Center for DDT analysis. They have not been reported upon at this date.

The Mid-Summer Census

This census was carried out between July 16 and August 16, 1963. It covered 68.6 miles of perimeter shoreline and 70.4 miles of slough shoreline. This is a 93% cruise of the shoreline of the study area. The results are shown in Table II and compared with 1962.

The first finding of this census was the displacement of the black duck by the wood duck as the most numerous species. The wood duck, ring-necked duck, and the green-winged teal showed increases, and the black duck, goldeneye, and blue-winged teal showed decreases. The decrease in black duck breeding success has already been mentioned, and this appears to be the only cause of this decline. Wood ducks have been increasing steadily over the last five years despite a below average brood size this year.

The total number of ducks on the area is only 3% below last year and does not constitute a significant change.

Prospects for the Hunting Season

The opening day shoot will be unchanged from 1962, but a larger number of wood ducks may be expected. Blue-winged teal are already passing through the area and the peak of the migration may have passed by October 1. If they are held by favorable weather they will constitute a good proportion of the opening day bag. Local ducks will again supply the majority of the bag on opening day, and weather conditions here and to the north will decide the number of migrants present to act as a buffer for the local breeders.

Management Discussion

The lack of adequate law enforcement complained of in the 1961 report has been eliminated by enforcement patrols of the RCMP and the Fish & Wildlife Branch of the New Brunswick Department of Lands & Mines. A generally much healthier respect for the law by the Saint John River gunner is now evident. Another result is the steady increase in the partially protected wood duck with the increased observance of the one-per-day limit.

Spring muskrat trapping is still a problem and a study is under way to bring out the details of the breeding biology of the muskrat under the severe waterlevel fluctuations of the Saint John River. When this information is available further consideration can be given to this problem.

The drying up of the marshes in late summer is an important factor to both ducks and muskrats. Any method of permanently increasing the amount of slough shoreline would increase the production of the area. Test blasting of potholes is proposed for 1964.

Predation losses are considered to be a major factor in nesting success. Predator control on raccoons and foxes during the period of maximum concentration at the peak of the flood should be organized for the spring of 1964.

August 19, 1963

Fredericton, N. B.

Table I Comparison of Brood Numbers and Sizes 1962-1963

Species and Age Class	Total and Average Brood			
	1962		1963	
	No.	Average	No.	Average
Black Duck				
Class I	8	8.1	14	6.8
Class II	3	5.0	17	6.5
Class III	--	---	14	6.9
Broody F	--	---	3	---
TOTAL	11	---	48	---
Blue-winged Teal				
Class I	6	8.0	8	8.0
Class II	6	7.3	10	6.1
Class III	5	4.4	17	6.9
Broody F	--	---	2	---
TOTAL	17	---	37	---
Green-winged Teal				
Class I	1	7.0	4	7.0
Class II	--	---	3	3.7
Class III	--	---	6	5.2
Broody F	--	---	2	---
TOTAL	1	---	15	---
Goldeneye				
Class I	7	6.4	20	5.6
Class II	4	4.0	5	4.6
Class III	--	---	5	5.2
Broody F	--	---	1	---
TOTAL	11	---	31	---
Ring-necked Duck				
Class I	1	7.0	12	6.6
Class II	10	5.6	8	6.1
Class III	--	---	--	---
Broody F	--	---	--	---
TOTAL	11	---	20	---

Table I (Cont'd)

Species and Age Class	Total and Average Brood			
	1962		1963	
	No.	Average	No.	Average
Wood Duck				
Class I	10	7.9	22	8.0
Class II	5	4.8	14	7.2
Class III	4	4.8	13	6.2
Broody F	--	---	5	---
TOTAL	19	---	54	---
Shoveler				
Class I	--	---	--	---
Class II	--	---	1	4.0
Class III	--	---	--	---
Broody F	--	---	--	---
TOTAL	--	---	1	---
Mallard				
Class I	--	---	1	14.0
Class II	--	---	1	14.0
Class III	--	---	--	---
Broody F	--	---	--	---
TOTAL			2	---
Widgeon				
Class I	--	---	1	9.0
Class II	--	---	--	---
Class III	--	---	--	---
Broody F	--	---	--	---
TOTAL	--	---	1	9.0
Hooded Merganser				
Class I	--	---	--	---
Class II	--	---	1	2.0
Class III	--	---	1	4.0
Broody F	--	---	--	---
TOTAL	--	---	2	---

Table I (Cont'd)

Species and Age Class	Total and Average Brood			
	1962		1963	
	No.	Average	No.	Average
Grand Totals				
Class I	33	7.6	82	7.0
Class II	28	5.5	59	6.1
Class III	9	4.6	57	6.5
Broody F	--	---	14	---
Total	70	6.4	212	6.6
No. days counted	27		72	
Total broods	70		212	
Broods/day	2.6		2.9	

Table II. Duck Population by Species 1959-1963

(93% cruise projected to 100%)

Species	1959	1960	1961	1962	1963	Change from 1962	
						Plus %	Minus %
Black Duck	641	498	363	616	511	--	17
Goldeneye	100	71	54	54	51	--	6
Ring-necked Duck	77	76	41	85	110	29	--
Blue-winged Teal	1,113	286	234	558	422	--	21
Green-winged Teal	162	54	95	132	206	56	--
Wood Duck	377	432	172	462	523	13	--
Mallard	5	11	2	18	10	--	--
Pintail	15	--	--	2	4	--	--
Shoveler	6	--	--	--	8	--	--
Widgeon	--	8	--	1	11	--	--
Hooded Merg.	--	--	--	--	8	--	--
Surf Scoter	--	--	--	--	1	--	--
Unidentified	--	--	--	--	1	--	--
TOTALS	2,496	1,436	961	1,928	1,866	--	3

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The survey was carried out in 1963 by the staff of the Northeastern Wildlife Station. This is the 17th consecutive year, and no changes in method, area, or timing were made. The count was completed on August 16, 1963.

Weather and Waterlevels

Spring weather and snow melting were later than usual in 1963. The ducks arrived on the breeding grounds slightly behind normal dates and breeding activity proceeded immediately upon arrival. The spring flood was not exceptional despite a heavy winter snowfall, and the runoff proceeded evenly without recurring peaks. Thus flood losses were at a minimum. The peak nesting period of the early nesting species, blacks, wood ducks, golden-eyes, and blue-winged teal, in the last half of May and June was warm and dry.

Weather and waterlevels therefore appeared to be excellent for waterfowl production throughout the nesting period.

The Spring Aerial Survey

This survey was not carried out by the Canadian Wildlife Service in 1963, and no measure of the breeding population returning was available except ground observation on the study area. No significant change was detected.

Predator Control

No organized predator control was carried out this spring as personnel were not available for it. Nest predation, particularly on tree nesting species, was heavy.

Spring Muskrat Trapping

A spring season for muskrats was again in force in 1963 and the usual losses of breeding ducks were suffered.

The Brood Survey

This survey was carried out in a more intensive manner in 1963 than in previous years because personnel of the muskrat study and the wood duck study were in the field continuously during the entire period.

The results are shown in Table I and compared with 1962. The 10-year average Class I black duck brood is 8.0 ducklings compared to 6.8 in 1963. This is the smallest average in the 17 years of the survey, and suggests a decrease in black duck reproductive rate this year. Rearing success was excellent and the smaller broods came through well.

Blue-winged teal had another good year in the estuary and again rearing success was high. Green-winged teal also had a successful breeding season.

The 10-year average Class I brood of goldeneyes is 7.3 compared to 5.6 in 1963, indicating another decrease in reproductive rate. Rearing success was again high.

The 10-year average Class I brood of ringnecks is 6.9 ducklings compared to 6.6 in 1963. No Class III broods of this species were present on the study area by August 16, which is not unusual for this late nesting species.

The 10-year average Class I brood of wood ducks is 8.7 ducklings compared with 8.0 in 1963, another species showing a decline in reproductive rate. Despite this decline the species had a successful year in the estuary and is now the most numerous duck, passing the black duck in numbers for the first time.

The total of Class I broods averaged smaller than in 1962, but rearing success was generally high. The increased manpower available in 1963 resulted in more days counted and more broods tallied, but the success of the counters increased only slightly from 2.6 broods per day in 1962 to 2.9 in 1963.

Black ducks, goldeneyes, and wood ducks are all nesting when the flood is at its height - and they all are partially or entirely tree nesters. Evidence of raccoon predation on tree nests was wide-spread and they were not controlled in 1963. This resulted in much renesting and is one possible cause of the drop in reproductive rate in these species this year. Another possible cause is reduced reproduction due to the presence of pesticides mainly DDT and its derivatives in the birds. Both the winter and summer ranges of these species have been subjected to DDT spraying for spruce budworm control and mosquito control over a period of years. Residues of this pesticide have been shown to retard reproduction in other birds, and a pilot study was started in 1963 by the US Fish and Wildlife Service to study its effect on black ducks. Certainly the drop in reproductive rate in ringnecks could not be charged to renesting following raccoon predation as they nest last, long after the flood has subsided and the concentration of raccoons has broken up.

A female black duck and her clutch of eggs were collected and sent to the Patuxent Wildlife Research Center for DDT analysis. They have not been reported upon at this date.

The Mid-Summer Census

This census was carried out between July 16 and August 16, 1963. It covered 68.6 miles of perimeter shoreline and 70.4 miles of slough shoreline. This is a 93% cruise of the shoreline of the study area. The results are shown in Table II and compared with 1962.

The first finding of this census was the displacement of the black duck by the wood duck as the most numerous species. The wood duck, ring-necked duck, and the green-winged teal showed increases, and the black duck, goldeneye, and blue-winged teal showed decreases. The decrease in black duck breeding success has already been mentioned, and this appears to be the only cause of this decline. Wood ducks have been increasing steadily over the last five years despite a below average brood size this year.

The total number of ducks on the area is only 3% below last year and does not constitute a significant change.

Prospects for the Hunting Season

The opening day shoot will be unchanged from 1962, but a larger number of wood ducks may be expected. Blue-winged teal are already passing through the area and the peak of the migration may have passed by October 1. If they are held by favorable weather they will constitute a good proportion of the opening day bag. Local ducks will again supply the majority of the bag on opening day, and weather conditions here and to the north will decide the number of migrants present to act as a buffer for the local breeders.

Management Discussion

The lack of adequate law enforcement complained of in the 1961 report has been eliminated by enforcement patrols of the RCMP and the Fish & Wildlife Branch of the New Brunswick Department of Lands & Mines. A generally much healthier respect for the law by the Saint John River gunner is now evident. Another result is the steady increase in the partially protected wood duck with the increased observance of the one-per-day limit.

Spring muskrat trapping is still a problem and a study is under way to bring out the details of the breeding biology of the muskrat under the severe waterlevel fluctuations of the Saint John River. When this information is available further consideration can be given to this problem.

The drying up of the marshes in late summer is an important factor to both ducks and muskrats. Any method of permanently increasing the amount of slough shoreline would increase the production of the area. Test blasting of potholes is proposed for 1964.

Predation losses are considered to be a major factor in nesting success. Predator control on raccoons and foxes during the period of maximum concentration at the peak of the flood should be organized for the spring of 1964.

August 19, 1963

Fredericton, N. B.

Table I Comparison of Brood Numbers and Sizes 1962-1963

Species and Age Class	Total and Average Brood			
	1962		1963	
	No.	Average	No.	Average
Black Duck				
Class I	8	8.1	14	6.8
Class II	3	5.0	17	6.5
Class III	--	---	14	6.9
Broody F	--	---	3	---
TOTAL	11	---	48	---
Blue-winged Teal				
Class I	6	8.0	8	8.0
Class II	6	7.3	10	6.1
Class III	5	4.4	17	6.9
Broody F	--	---	2	---
TOTAL	17	---	37	---
Green-winged Teal				
Class I	1	7.0	4	7.0
Class II	--	---	3	3.7
Class III	--	---	6	5.2
Broody F	--	---	2	---
TOTAL	1	---	15	---
Goldeneye				
Class I	7	6.4	20	5.6
Class II	4	4.0	5	4.6
Class III	--	---	5	5.2
Broody F	--	---	1	---
TOTAL	11	---	31	---
Ring-necked Duck				
Class I	1	7.0	12	6.6
Class II	10	5.6	8	6.1
Class III	--	---	--	---
Broody F	--	---	--	---
TOTAL	11	---	20	---

Table I (Cont'd)

Species and Age Class	Total and Average Brood			
	1962		1963	
	No.	Average	No.	Average
Wood Duck				
Class I	10	7.9	22	8.0
Class II	5	4.8	14	7.2
Class III	4	4.8	13	6.2
Broody F	--	---	5	---
TOTAL	19	---	54	---
Shoveler				
Class I	--	---	--	---
Class II	--	---	1	4.0
Class III	--	---	--	---
Broody F	--	---	--	---
TOTAL	--	---	1	---
Mallard				
Class I	--	---	1	14.0
Class II	--	---	1	14.0
Class III	--	---	--	---
Broody F	--	---	--	---
TOTAL			2	---
Widgeon				
Class I	--	---	1	9.0
Class II	--	---	--	---
Class III	--	---	--	---
Broody F	--	---	--	---
TOTAL	--	---	1	9.0
Hooded Merganser				
Class I	--	---	--	---
Class II	--	---	1	2.0
Class III	--	---	1	4.0
Broody F	--	---	--	---
TOTAL	--	---	2	---

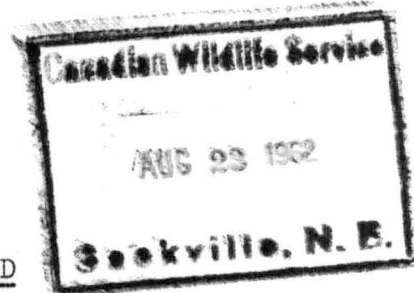
Table I (Cont'd)

Species and Age Class	Total and Average Brood			
	1962		1963	
	No.	Average	No.	Average
Grand Totals				
Class I	33	7.6	82	7.0
Class II	28	5.5	59	6.1
Class III	9	4.6	57	6.5
Broody F	--	---	14	---
Total	70	6.4	212	6.6
No. days counted	27		72	
Total broods	70		212	
Broods/day	2.6		2.9	

Table II. Duck Population by Species 1959-1963

(93% cruise projected to 100%)

Species	1959	1960	1961	1962	1963	Change from 1962	
						Plus %	Minus %
Black Duck	641	498	363	616	511	--	17
Goldeneye	100	71	54	54	51	--	6
Ring-necked Duck	77	76	41	85	110	29	--
Blue-winged Teal	1,113	286	234	558	422	--	21
Green-winged Teal	162	54	95	132	206	56	--
Wood Duck	377	432	172	462	523	13	--
Mallard	5	11	2	18	10	--	--
Pintail	15	--	--	2	4	--	--
Shoveler	6	--	--	--	8	--	--
Widgeon	--	8	--	1	11	--	--
Hooded Merg.	--	--	--	--	8	--	--
Surf Scoter	--	--	--	--	1	--	--
Unidentified	--	--	--	--	1	--	--
TOTALS	2,496	1,436	961	1,928	1,866	--	3



WATERFOWL BREEDING GROUND

SURVEY--1962

Saint John Estuary, N. B.

Bruce S. Wright, Director
Northeastern Wildlife Station
Fredericton, N. B.

The survey was carried out in 1962 by Field Assistants David Inch and Darrell Kitchen. This is the 16th. consecutive year of the survey.

Dry weather and rapidly falling waterlevels was the rule during the early nesting period, but from the end of June until mid-August the weather was exceptionally wet and cool with high waterlevels throughout the period. Predator central was carried out on the breeding grounds with considerably less success than last year because the spring flood did not reach a high enough level to cover the marshes and concentrate the predators. For details see Annual Report.

The brood season was characterized by high waterlevels and a good hatch in all species. Although only 27 days were spent in the area in 1962 compared with 53 days in 1961, more broods were tallied per day in 1962. Class III black duck broods were missed because of absence from the area. A comparison of the 1961 and 1962 brood tallies is shown in Table I.

The mid-summer census showed more ducks on the area than at any time since 1959, and double the number present at the same time last year. The ringnecks did not show up until the last few days of the census, and then they appeared in the largest numbers in the last five years. Black ducks increased substantially over last year, and wood ducks and blue-winged teal also showed strong increases. Green-winged teal increased slightly. The goldeneyes remained unchanged at a low level. Table 2 shows this comparison.

Black ducks, ringnecks, wood ducks and blue-winged teal are present in as large or larger numbers than at any time in the last five years so that prospects for the hunting season are good.

TABLE I.

Comparison of Brood Numbers and Size 1961-1962
as of August 17th.

SPECIES & CLASS	NO. & AVERAGE BROOD			
	1961 No. Avr.		1962 No. Avr.	
Black Duck				
Class I	11	8.4	8	8.1
Class II	4	6.5	3	5.0
Class III	3	6.3	--	---
Blue-winged Teal				
Class I	7	7.6	6	8.0
Class II	5	6.2	6	7.3
Class III	1	5.0	5	4.4
Green-winged Teal				
Class I	2	8.5	1	7.0
Class II	2	8.0	--	---
Class III	--	---	--	---
Goldeneye				
Class I	9	6.0	7	6.4
Class II	9	5.0	4	4.0
Class III	3	3.0	--	---
Ring-necked Duck				
Class I	5	5.0	1	7.0
Class II	1	7.0	10	5.6
Class III	--	---	--	---
Wood Duck				
Class I	10	7.6	10	7.9
Class II	8	8.1	5	4.8
Class III	2	7.0	4	4.8
(Pintail, Shoveler, Mallard, Widgeon, Others)				
Class I	9	6.2	--	---
Class II	1	7.0	--	---
Class III	--	---	--	---
GRAND TOTAL	92	6.7	70	6.4
Total Class I	53	7.0	33	7.6
Total Class II	30	6.6	28	5.5
Total Class III	9	5.2	9	4.6
No. Days Counted	53		27	
No. Broods	92		70	
Broods/Day	1.7		2.6	

TABLE 2.

Duck Population by Species 1958--1962

(93% cruise tally projected to 100%)

SPECIES	1958	1959	1960	1961	1962	Change from 1961	
						Plus %	Minus %
Black Duck	457	641	498	363	616	70	--
Com. Goldeneye	13	100	71	54	54	--	--
Ring-necked Duck	53	77	76	41	85	107	--
Blue-winged Teal	332	1,113	286	234	558	134	--
Green-winged Teal	75	162	54	95	132	39	--
Wood Duck	155	377	432	172	462	169	--
Mallard	1	5	11	2	18	800	--
Pintail	--	15	--	--	2	--	--
Shoveler	--	6	--	--	--	--	--
Widgeon	--	--	8	--	1	--	--
Unidentified	--	--	--	--	--	--	--
TOTALS	1,086	2,496	1,436	961	1,928	101	--

WOB
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WATERFOWL BREEDING GROUND SURVEY - 1961

ST. JOHN ESTUARY, N.B.

Bruce S. Wright, Director,
Northeastern Wildlife Station,
Fredericton, N.B.

The survey was done by the writer assisted by Field Assistant David Inch. This is the 15th consecutive year it has been carried out. The area examined and the technique is the same as in previous years.

The Spring Flight.

April was wet and cold but the ducks arrived on the study area only slightly later than a year ago. The aerial transects of the spring survey, which have been done in the past by the Canadian Wildlife Service, were done in 1961 by Brian C. Carter, Biologist, Fish and Wildlife Branch, New Brunswick Department of Lands and Mines. They showed no appreciable change from last year in the number of breeders arriving from the winter range.

Waterlevels.

Waterlevels in 1961 were very different from 1960. In 1960 the flood rose to a peak of 22 feet on May 16-17 and decreased steadily thereafter. In 1961 the water rose to 24.1 feet on May 16-17 and dropped to 15 feet on May 27. On May 25 thunderstorms entered the area and rain began to fall. In the next four days 4.92 inches of rain fell at the Fredericton Airport and the river rose to 24.9 feet by May 29. This rise of 9.9 feet after nesting was well underway caused serious flood losses to all ground nesting species, and to the lower tree nests. After this the water dropped steadily and renesting began.

Predator Control.

The Waterfowl Management Group, made up of sportsmens' organizations, private firms and individuals, again supported a predator control campaign in the breeding areas which was

conducted by the Northeastern Wildlife Station and the Department of Lands and Mines. Three men hunted and trapped for 73 days and took 132 predators during the nesting period. This is an average of 1.8 predators per day. Seventy-five raccoons, 48 red foxes, and 9 skunks made up the total. This is the fourth year of predator control in the area and no apparent decrease in predator numbers can be shown. At the end of the control period predator sign is very scarce in the area, but by the end of the season they have filled in again from outside areas. This is after the nesting period and does not affect the year's production of ducks. It was shown in 1960 that control resulted in a 59% increase in nest survival (1960 Report), so that annual predator control is necessary for maximum duck production in this area.

The annual flood makes predator hunting especially profitable in the estuary. When the water was at its height two men shot 19 raccoons and foxes in one day. This party averaged 3.4 predators per day by hunting, and only 0.125 per day by trapping. The hunting is done from a canoe and dogs are not used. Den trees and hay barns on the meadows are examined and the predators are shot with .22 rifles.

Spring Muskrat Trapping.

The spring muskrat trapping season was closed in 1961. This is a valuable aid to nesting ducks as many are taken in the muskrat traps. The Waterfowl Management Plan of 1959 contained this recommendation.

DDT Spraying.

The headwaters of the brooks running into the north end of the study area were sprayed with 1/4 lb. DDT per acre in early June. This is the second year of spraying in this area for spruce budworm control. The nearest spray was three miles from the study area and no effect could be detected.

The Laying Period.

The approximate date of first egg was computed for the Class I broods by assuming an average age when found of three days and an average size of seven ducklings in all broods of less than seven. A laying rate of 1.3 days per egg was assumed, and the incubation period was added.

This computation showed the first black duck eggs were laid on April 23 when the waterlevel was 12.3 feet. The last brood counted was laid on June 4 with a waterlevel of 18.0 feet. On April 30 the first wood duck eggs were laid, and on May 4 the first goldeneyes. On May 7 the first pintails began laying, and on May 13 the first green-wings. On June 1 the first blue-wings began laying, and on the 4th a lone brood of ringnecks was laid. There were no more ringneck eggs to be found for another month until the main laying period began on July 4. Mallards began laying on June 11, and widgeon on the 14th.

The waterlevel during the main black duck laying period varied from 22.3-14.0 feet. This indicates the black duck's habit of nesting far back from the main stream, or in tree crotches and holes. Blue-winged teal laid eggs when the waterlevel varied from 20.9 feet - 6.8 feet showing that in this region they too have learned to nest well back from the river. One lone ringneck clutch was laid when the water was at 18.0 feet but the main body did not begin laying until the water dropped to 6.3 feet.

The Brood Season.

The brood count in 1961 showed that the area was considerably less productive than in 1960. Floods removing first nests, and the fact that the males did not stay in the area to molt, greatly affected renesting in all species. A total of 92 broods were found in 53 days in 1961 as compared with 164 in 50 days in 1960.

Table 1 compares the brood numbers and sizes by species 1960-61. Less than half the number of black duck broods were seen this year, but they were larger broods. However by the time they reached Class III they were significantly smaller than a year ago. This was true also of blue-winged teal and goldeneye. The only other species where Class III ducklings were seen was wood ducks and they were only one brood.

The first brood was seen on June 3, a goldeneye, followed the next day by a black duck. On June 8 the first pintail brood appeared, and on the 19th the first green-wings. The first wood ducks were seen on June 21, and the first blue-wings on July 8. A lone ringnecked brood was seen on July 11, but it was not until August 9 that the next was seen and the main hatch was underway. Ring-neck ducklings take 49-55 days to reach flying age, so this year most of the young of this species will not be awing until mid-October two weeks after the season opens (Mendall, 1958). The first young mallards appeared on July 18, and the first widgeons on the 21st.

Waterlevels held up well during the brood period, and some broods may still be in the bush ponds. This would tend to make the decrease appear worse than it is.

The Male Molt.

About sixty male widgeon in various stages of mid-summer molt were seen in a gang near Musquash Island on July 7. No other molting concentration of any species was seen in the area for the rest of the period. This lack of males retards re-nesting attempts and contributes to the decrease in productivity.

The Mid-summer Census.

The census was carried out between July 15 - August 17 this year. The results, and the changes from 1960 in the various species are shown in Table 2. The only species to show an increase is the green-winged teal. All others show a decrease

with the wood duck showing the largest. This can only be attributed to over-hunting as it was not affected by the flood. The wood duck kill has kept pace with its increase in this region for some years, and the result is evident this season. The ring-necked duck also shows a serious decrease, and as most of the young birds will not be awing by opening day, it will play a much smaller part in the duck hunter's bag this fall. Blue-winged teal are present in about average numbers for this time of year, but green-wings are more abundant than usual.

An increase in nesting widgeon was most marked this year, which partially made up for the decrease in nesting ringnecks. A few pairs of pintails, shovellers, and mallards are nesting on the area, but they are not in important numbers. The main local species that will make up the bulk of the opening day kill are black ducks, blue-winged teal, and goldeneyes in that order.

The total duck population of the estuary is one-third below the 1960 level.

The Food Supply.

The food supply in the estuary is excellent. Waterlevels are such that large areas of wildrice and wildcelery, and other less choice duck foods, are available. This will hold migrants in the area until freeze-up.

Prospects for the Hunting Season.

The opening day shoot, which depends mainly on local ducks, will be poorer than last year. Wood ducks will be scarce. The only migrants that are important in this period are the blue-winged teal. The timing of this flight will make a big difference on the St. John. If it coincides with opening day it will fill the gap left by the reduced local production, but if it does not the shortage will be more apparent. The prospects from the important duck producing areas elsewhere are for a generally

reduced flight this fall, so that the scaup and other species coming into the estuary from the north and west later in the season may be expected to be in smaller numbers than last year. Black ducks will be the most abundant local species as they were least affected by the flood.

Management Discussion.

The greatest lack in waterfowl management in this area is the almost total absence of adequate law enforcement. Bag limits are ignored whenever the opportunity offers, and with impunity. The limit of one wood duck per day is almost universally ignored, and the wood duck decline indicates this.

Action to correct this could take the form of three large signs put up before opening day telling the daily bag limit, the possession limit, and stressing the need for conserving wood ducks. They could be erected at Sand Point where the hunters concentrate for the Portobello marshes, at Indian Point where the hunters start for the Grand Lake marshes, and at the junction of the lower interval road and Route 2 on the Sheffield Interval where the hunters enter to hunt the area below the turn-off to Jemseg. These would cover the main hunting areas between Fredericton and Jemseg. Another sign could be located at Lower Jemseg for the Foshay Lake hunters, and another at Queenstown for the Musquash Island hunters.

Check points manned by the Royal Canadian Mounted Police, the federal agency responsible for enforcing the migratory bird laws, could be installed at these locations. They could be assisted as required by the provincial game wardens.

The closure of spring muskrat trapping should be continued in 1962, and predator control during the nesting period should also be continued.

It was clearly shown this year that the greatest factor in the annual waterfowl production of the estuary is the timing of the spring flood. Flood losses wiped out any gains that were

made by predator control and the closure of spring trapping. In years when this happens we must expect to lose ground, and we must double our efforts to make good the loss by all possible means the following spring.

References

Mendall, Howard L. 1958. The ring-necked duck in the northeast. Univ. of Maine Bull. Vol. LX, June 20, No. 16.

Table 1. - Comparison of Brood Numbers and Size 1960-1961
as of August 17th.

Species & Class		No. & Average Brood			
		<u>1960</u>		<u>1961</u>	
		No.	Avr.	No.	Avr.
Blacks					
Class	I	25	7.3	11	8.4
"	II	6	7.3	4	6.5
"	III	4	7.3	3	6.3
BWT					
Class	I	12	7.0	7	7.6
"	II	3	7.3	5	6.2
"	III	7	6.3	1	5.0
GWT					
Class	I	1	7.0	2	8.5
"	II	2	9.0	2	8.0
"	III	-	--	-	--
Goldeneye					
Class	I	28	6.8	9	6.0
"	II	12	4.0	9	5.0
"	III	3	5.0	3	3.0
Ringneck					
Class	I	9	6.1	5	5.0
"	II	6	6.0	1	7.0
"	III	-	--	-	--
Wood Duck					
Class	I	29	7.2	10	7.6
"	II	6	5.0	8	8.1
"	III	4	5.6	2	7.0
(Pintail, Shoveler, Mallard, Widgeon, Others)					
Class	I	6	9.5	9	6.2
"	II	1	6.0	1	7.0
"	III	-	--	-	--
Grand Total		164	6.8	92	6.7
Total Class	I	110	7.2	53	7.0
"	II	36	5.7	30	6.6
"	III	18	6.1	9	5.2

Table 2. Duck Population by Species 1957-1961
(93% cruise tally projected to 100%)

Species	1957	1958	1959	1960	1961	Change from 1960	
						Plus %	Minus %
Black Duck	202	457	641	498	363	--	27
Com. Goldeneye	19	13	100	71	54	--	24
Ring-necked Duck	5	53	77	76	41	--	46
Blue-winged Teal	28	332	1113	286	234	--	18
Green-winged Teal	16	75	162	54	95	43	--
Wood Duck	41	155	377	432	172	--	60
Mallard	2	1	5	11	2	--	82
Pintail	--	--	15	--	--	--	--
Shoveler	--	--	6	--	--	--	--
Widgeon	--	--	--	8	--	--	--
Unidentified	4	--	--	--	--	--	--
Totals	317	1086	2496	1436	961		33

NORTHEASTERN WILDLIFE STATION

OPERATED COOPERATIVELY BY THE
WILDLIFE MANAGEMENT INSTITUTE OF WASHINGTON, D. C.

UNIVERSITY OF NEW BRUNSWICK, FREDERICTON, N. B.

BRUCE S. WRIGHT
DIRECTOR

July 24, 1961.

Dr Anthony J. Erskine,
Wildlife Biologist,
Canadian Wildlife Service,
Margaree Valley P.O.,
Inverness Co., N.S.

Dear Tony,

The attached table shows our brood count in the St John estuary to July 25. It is compared with the same period last year.

The spring survey showed no change in the breeding population, but we had a second peak flood which caused very considerable damage to waterfowl nests. As a result we have only 61 brood so far as compared with 141 last year. The hatching dates are almost two weeks late, and the broods are only just beginning to show.

Brood size seems to be standing up well.

We have more breeding wigeon than ever before, and a few more mallards which may be the result of the releases made by the Fish & Game Association in St John. Prospects for the hunting season will be many undersized birds with lots of pinfeathers. As there will be a much reduced flight from the west this year due to drought, and our own production is behind schedule, the overall prospect is not too bright.

Sincerely,

Bruce
Bruce S. Wright,
Director.

Table I.

Comparison of Brood Size 1960-61.
as of July 25th.

Species + Class	Average Brood			
	No.	1960 Avg.	1961 No.	Avg.
Blacks				
Class I	25	7.3	11	8.4
" II	4	9.0	1	7.0
" III	3	6.7	1	7.0
BWT				
Class I	11	7.3	4	7.0
" II	2	8.5	1	7.0
" III	5	7.0	—	—
GWT				
Class I	1	7.0	2	8.5
" II	1	9.0	1	9.0
" III	—	—	—	—
Goldeneye				
Class I	28	6.8	9	6.0
" II	10	3.8	8	4.8
" III	3	5.0	1	6.0
Ringneck				
Class I	6	6.0	2	6.0
" II	4	6.5	—	—
" III	—	—	—	—
Woodie				
Class I	27	7.8	10	7.6
" II	2	3.0	3	10.7
" III	3	6.0	—	—
(Pintail, Shoveller Am. Widgeon) Others				
Class I	5	10.0	7	6.4
" II	1	6.0	—	—
" III	—	—	—	—
Grand Total	141	7.0	61	7.1
Total Class I	103	7.3	45	7.2
" Class II	24	5.7	14	6.6
" Class III	14	6.3	2	6.5

} * Widgeon, Mallard
+ Pintail.

WATERFOWL BREEDING GROUND SURVEY

OF THE

ST. JOHN ESTUARY N.B.

1960

Bruce S. Wright, Director,
Northeastern Wildlife Station.
Fredericton, N.B.

The 1960 breeding season has been an exceptually favorable one for ducks. The spring and summer have be warm and dry with percipitation 25 - 50% below normal in most areas during April and May. Heavy snow on the headwaters of the river resulted in a prolonged spring run-off which reached its peak on May 16 as compared with April 29 in 1959. Although the peak waterlevel was 15.7 feet higher in 1960 than the year before, it did not have any adverse ^{effect} on waterfowl production.

The Spring Survey.

This survey was carried out by the Canadian Wildlife Service as in previous years. At the time the transects were flown in 1960 the river was 11 feet higher than in 1959, and most of the Study Area was still underwater. For this reason fewer ducks were seen on the Area, but the total tally for the estuary showed a slight increase. It was concluded that there had been no significant change in 1960 spring population of local breeding species.

Predator Control.

Predator control on the Study Area was carried on for the third consecutive year. The controlled area was extended to cover the river islands down to the Hampstead Ferry, an additional 25 miles downstream and covering the remainder of the best duck breeding areas at the head of the estuary. A total of 66 raccoons, 58 foxes, and 9 skunks were removed from the breeding areas before and during the nesting period this year. These 133 predators were taken by two two-man parties hunting den trees and barns at the peak of

the flood, and by trapping and digging out fox dens. This phase of the program was supported by grants from organizations, private clubs, business, and individuals (see attached list of sponsors.)

The N.B. Fish and Wildlife Branch provided the services of two wardens for the control parties. Experiments were carried out with raccoon calling in Texas and Florida prior to the opening of fieldwork, but not sufficient success was achieved to indicate the technique would be effective under local conditions. Further experiments using the recorded call of an injured sea-gull are planned. The use of poisoned eggs is considered too dangerous as live-stock are pastured on the breeding areas and farm dogs and cats would also be vulnerable.

The effect of predator control was measured in a series of dummy nests set out on two groups of islands. Group A consisted of two islands holding a normal raccoon and fox population which was not controlled. Group B was two other islands where the predator population was heavily controlled. Dummy nests were set on both groups in both tree and ground sites to as closely approximate natural nesting conditions as possible. They were visited only by canoe to avoid predators following the man tracks to the dummy nests. Any nest that remained intact for 28 days was considered to have hatched successfully. At the end of the period 78% of the tree nests had been destroyed and 79% of the ground nests. Raccoons had destroyed 69% of the tree nests and 63% of the ground nests. The remainder of the destroyed nests were taken by foxes and crows. There was no appreciable difference between the survival rate of tree and ground nests. On the controlled area 27% of the dummy nests survived to hatch, and on the uncontrolled area 17% survived. Predator control therefore resulted in a 59% increase in survival of nests.

Result.

It is recommended to the Fish & Wildlife Branch of the N.B. Department of Lands and Mines that every encouragement be given to raccoon hunting by all

practical methods in the estuary of the St. John River as a waterfowl management technique.

A comparison of natural production of waterfowl before and after predator control was made in 1960. Middle Island (347 acres) produced 1 brood of ducks in 1959 when the predators were uncontrolled, a production rate of 1 brood/347 acres. In 1960 after predator control this island produced 8 broods, or 1 brood/43 acres. The overall result of 3 years of predator control will be discussed later under the Brood Season.

DDT Spray.

A request was made to the N.B. Department of Lands & Mines to have the lower half of the brooks running into the Study Area exempted from the DDT spray program in 1960. This request was made because it was feared the resulting elimination of aquatic insects and mosquito larvae in the streams would adversely affect ducklings in the downy stage. This request was denied, and on May 26 the area was sprayed with ½ lbs of DDT per acre. As a result it was possible for the census crew to work in this area for the first time without shirts all summer, but it was not possible to find sufficient broods to indicate any change in brood size which could be attributable to the spray. The reduction in insects, particularly mosquitoes, was most marked, and thus the food supply of Class I broods was greatly diminished.

The Brood Season.

The brood season was late in getting underway with the first brood appearing on June 3rd. The weather remained warm and extremely dry and the sloughs began to dry up. Nesting success was the best in 10 years and 110 Class I broods were counted compared to 40 in 1959. At the end of the census on August 13 a total of 164 broods had been counted as compared with 88 the year before. Table 1 shows the waterfowl productivity of the area since 1957, the year before predator control was initiated. The spring count showed no

appreciable change in the number of breeders coming into the area this year, but the production of broods has tripled after 3 years of predator control. Other areas to the east and west of the study area have experienced increased brood production this year also, but the continued upward trend on the study area is too well correlated with the predator control campaign to be accidental.

As the brood season progressed the warm dry weather continued without a break and much rearing cover dried up. This made broods more vulnerable to predators than is usual in this region, and rearing success began to fall off. A fox was watched stalking a green-winged teal brood in a foot-wide ditch. Molting adults and non-flying young were very vulnerable. Table 2 shows the comparison of brood size in 1960 compared with 1959. The appreciable drop in brood size is attributable to poor rearing conditions due to drought.

The Mid-Summer Census.

This census was carried out between July 15 - August 15 as in previous years. The results are shown in Table 3. Despite the excellent nesting season and the increased number of broods, fewer ducks were on the area during the census than at the same time a year ago. Two factors are responsible for this. The first is that there were no concentrations of molting adults on the area this year. The second is that because of the very warm weather there was no southward movement of blue-winged teal into the area. This species alone made up almost $\frac{1}{2}$ the total ducks present in 1959. The census showed 1,113 in 1959, and 286 in 1960. The local breeders were all down with the exception of the wood duck. They molted on the area and had a successful year. Blacks and ringnecks both molted elsewhere.

A brood of American widgeon were found in 1960. This is a new nesting record for the estuary. The shovellers and pintails that nested last year did not return.

The Food Supply.

The food supply in the estuary is exceptional this year. There is a bumper crop of wildrice, and the submerged aquatics are available to ducks in great quantities due to the exceptionally low water.

Prospects for the Hunting Season.

The retarded migration of blue-winged teal augurs well for the hunting season. Usually the peak of this migration is over by the end of September. This year they may be here in numbers when the season opens October 1st. Local ducks may be slightly down from last year if the molters do not return. If they do there will be no appreciable change. The drought has undone the good that resulted from the high nesting success, and there may be fewer local blacks and ringnecks. Wood ducks will be plentiful.

The excellent food supply may be expected to hold migrants in the area longer than usual. This may make up for any decrease in local ducks, so the prospects for the season are no significant change from last year.

Summary.

There was no change in the number of breeders in the spring. They had the most successful nesting season in 10 years, but poor rearing success followed, and there was an appreciable drop in brood size reaching the flying stage. The food supply is exceptional due to low water and a bumper crop of wildrice. The warm weather has stopped all southward movement of blue-winged teal and this retarded migration will ensure that more are here for the hunting season. Prospects are for little change from last year despite the exceptional nesting success.

Cooperators in the Predator Control Program

- 1960 -

H. W. S. Allingham - Gagetown, N. B.

Harry Reid - Gagetown, N. B.

Keith and Bud Wilson - Saint John, N. B.

Burton Colter - Diamond Construction Co., Fredericton, N. B.

James S. Neill and Sons - Fredericton, N. B.

J. W. McMulkin and Sons Ltd. - Fredericton, N. B.

Fredericton Branch, N. B. Fish and Game Protective Association

The Wambi Club - Fredericton, N. B.

Tractors and Equipment Ltd. - Fredericton, N. B.

Fish and Wildlife Branch, N. B. Department of Lands and Mines

Table 1. Waterfowl Productivity of the Study Area

<u>Year</u>	<u>Total Days</u> ¹	<u>Total Broods</u>	<u>Productivity</u> <u>Broods/Day</u>	<u>Remarks</u>
1957	41	44	1.1	
1958	55	59	1.1	Predator control begins
1959	55	88	1.6	
1960	50 ²	164	3.3	

¹ May 15 - August 15, 1957 - 1959.

² June 3 (date of 1st brood) - August 13 (end of census) 1960.

Table 2. Comparison of Brood Size 1959-1960

<u>Species Class</u>		<u>Average Brood</u>		
		<u>1959</u>	<u>1960</u>	
<u>Blacks</u>	<u>Number</u>	<u>Average</u>	<u>Number</u>	<u>Average</u>
Class I	8	8.4	25	7.3
Class II	4	6.5	6	7.3
Class III	2	7.0	4	7.3
<u>BW Teal</u>				
Class I	19	8.7	12	7.0
Class II	5	8.2	3	7.3
Class III	13	7.6	7	6.3
<u>GW Teal</u>				
Class I	3	5.3	1	7.0
Class II	1	7.0	2	9.0
Class III	1	12.0	-	---
<u>Goldeneye</u>				
Class I	5	4.6	28	6.8
Class II	9	5.6	12	4.0
Class III	2	10.5	3	5.0
<u>Ringneck Duck</u>				
Class I	2	4.0	9	6.1
Class II	5	8.2	6	6.0
Class III	2	6.5	-	---
<u>Wood Duck</u>				
Class I	2	9.0	29	7.2
Class II	3	9.0	6	5.0
Class III	-	---	4	5.6
<u>Others</u>				
Class I	1	5.0	6	9.5
Class II	1	9.0	1	6.0
Class III	1	7.0	-	---
Grand Total	88	7.5	164	6.8
Total Class I	40	7.6	110	7.2
Class II	28	7.2	36	5.7
Class III	21	8.0	18	6.1

Table 3. Total Ducks by Species (100% cruise) Change from 1959

<u>Species</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>Plus %</u>	<u>Minus %</u>
Blacks	262	202	457	641	498	--	22
Com. Goldeneye	26	19	13	100	71	--	29
Ringneck	22	5	53	77	76	--	1
Blue-winged Teal	84	28	332	1,113	286	--	74
Green-winged Teal	23	16	75	162	54	--	54
Wood Duck	26	41	155	377	432	14	--
Mallard	--	2	1	5	11	--	--
Pintail	--	--	--	15	--	--	--
Shoveller	--	--	--	6	--	--	--
Am. Widgeon	--	--	--	--	8	--	--
Unidentified	9	4	--	--	--	--	--
Totals	451	317	1,086	2,496	1,436		

WATERFOWL BREEDING GROUND SURVEY

ST JOHN ESTUARY N.B. - 1959.

by

Bruce S. Wright, Director,
Northeastern Wildlife Station.

Waterlevels:

The spring of 1959 was characterized by very much lower waterlevels than that of 1958. The peak high in 1958 was 25 feet above mean sea level, and that for 1959 was 16.5 feet. A rise in June 1959 caused some nest losses by flooding among the late nesting marsh breeders such as ringnecks, but otherwise the season was favorable for nesting.

Spring Pairs Count:

The count of spring pairs carried out by the Canadian Wildlife Service in 1959 showed a slight decrease in the local breeding species which is within the sampling error of the method.

Table 1. Spring Count of Local Breeding Ducks, 1957 - 1959.

Canadian Wildlife Service.

Species	1957 May 9	1958 May 14	1959 May 12
Black Duck	435	270	267
Common Golden eye	288	106	83
Wood Duck	4	16	4
Ring-Necked Duck	63	111	125
Blue-winged Teal	12	23	21
Green-winged Teal	4	4	18
<u>Pintail</u>	-	8	9
Totals	806	538	527

This count indicates no significant change in the local breeding species between 1958 - 1959.

Predator Control:

Predator control was carried out for the second year on the study area in May and June. Forty-two raccoons, 15 foxes, 10 skunks, and 1 feral cat were removed making a total of 68 predators taken off the area during the nesting season May and June. This project will be reported in detail separately.

The Brood Survey:

All broods seen up to August 17 were recorded by age classes. A total of 88 broods were recorded as compared with 59 in 1958.

Table 2. Average Brood Size by Age Classes - 1959.

Species	Class I		Class II		Class III		Broody Tot	
	Tot Broods	Avr S.	Tot Broods	Avr S.	Tot Broods	Avr S.	Hens	Brds
Black Duck	8	8.4	4	6.5	2	7.0	-	14
Common Golden eye	5	4.6	9	5.6	2	10.5	-	16
Blue-winged Teal	19	8.2	5	8.2	13	7.6	-	37
Green-winged Teal	3	5.3	1	7.0	1	12.0	-	5
Wood Duck	1	11.0	3	9.0	-	-	1	4
Ring-necked Duck	2	4.0	5	8.2	2	6.5	-	9
Pintail	-	-	-	-	1	7.0	-	1
Shoveller	1	5.0	-	-	-	-	-	1
Unident	-	-	1	9.0	-	-	-	1
Totals	39	6.6	28	7.6	21	8.4	1	88

A spectacular increase in blue-winged teal nesting took place in 1959. Thirty-seven broods were recorded as compared with 8 in 1958, and large broods were the rule. Goldeneyes also showed an increase with 16 broods as compared with 5 in 1958. Blacks remained unchanged with 14 broods each year, and green-winged teal, wood duck, and ringnecks showed decreases in numbers of broods. Class I broods averaged slightly lower than last year, but both Class II and Class III broods were higher indicating that rearing conditions were better than a year ago. A pintail brood, and the first shoveller brood ever recorded here were found this year.

The Mid-Summer Count:

The total waterfowl population of the study area was computed from a 96% shoreline cruise between July 15 and August 17 as in previous years. The changes in waterfowl population that have occurred are indicated in Table 3.

Table 3. Waterfowl Population Changes since 1955.

<u>Species.</u>	<u>1955</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>
Black Duck	502	262	202	457	641
Common Goldeneye	57	26	19	13	100
Ring-necked Duck	98	22	5	53	77
Blue-winged Teal	175	84	28	332	1,113
Green-winged Teal	74	23	16	75	162
Wood Duck	45	26	41	155	377
Mallard	3	-	2	1	5
Pintail	14	-	-	-	15
Shoveller	-	-	-	-	6
Unidentified	24	9	4	-	-
Totals	992	451	317	1,086	2,496

The waterfowl population of the study area doubled in 1958, and doubled again in 1959. The present population is the highest in ten years. The

greatest increase was in blue-winged teal, but all other species also showed a large increase. Waterlevels were again favorable for nesting and rearing, but no appreciable change was noted in the spring count. Therefore the favorable circumstance that resulted in this large increase must have operated after the breeders arrived. This indicates that the removal of 132 predators from the study area during the breeding season of the past two years has materially increased the productivity of waterfowl in the area. This control was exercised before or during the period when the young raccoons and foxes were born, so the total reduction of predators was greater than the figure indicates.

Summary:

1. No appreciable change was noted in the spring count of breeders coming in to the area in 1959.
2. Waterlevels were lower than in 1958, but adequate water was available for rearing ducklings all summer. A rise during June flooded out the Grand Lake marshes after the ringnecks had started to nest and resulted in some flood losses to the marsh nesters. This resulted in renesting which set back these species.
3. Predator control was carried out for the second year on the study area and 68 predator were removed in May and June.
4. A spectacular increase in blue-winged teal nesting took place this year.
5. The mid-summer count showed that the waterfowl population had doubled for the second consecutive year, and was the highest in ten years.
6. Hunting prospects based on local bred ducks are the best in ten years, but migrants may be expected to be down as indicated by the decreased production to the west.

B.C. -
WOB
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WATERFOWL BREEDING GROUND SURVEY

ST. JOHN ESTUARY - 1958

by

Bruce S. Wright

Phenology:

The central and northern sections of New Brunswick had a rapid opening spring with temperatures in the seventies before April 15th. There was a heavy snow cover and this warm weather produced the highest spring freshet on the St. John river in more than twenty years. The waterfowl arrived on the study area at their normal time.

The high freshet subsided gradually allowing the ducks to nest above it, and there was no evidence of flood losses among the early nesters.

Spring Pairs Count.

An aerial count of spring pairs is carried out over the St. John river estuary by the Canadian Wildlife Service. Table I shows the total of the local breeding species counted on these transects in 1957 and 1958.

Table 1. Spring Count of Local Breeding Ducks St. John River

1957 - 1958.

(Canadian Wildlife Service).

SPECIES	1957	1958	
	<u>May 9</u>	<u>May 14</u>	
Blacks	435	299	
Goldeneye	288	119	
Wood Duck	4	10	
Ringneck	63	107	
Blue-winged Teal	12	25	
Green-winged Teal	4	3	
Totals	806	563	30% decrease.

These aerial transect counts indicate a 30% decrease in breeders in the spring of 1958. This decrease was made up entirely by scarcity of black ducks and goldeneyes.

Predator Control.

It has been obvious for some years that a very high raccoon population has built up on the study area, and in the St. John estuary generally. An experimental predator control program was operated during the nesting season in 1958. Fifty-nine raccoons, four foxes, and a weasel were removed from the area. The results of stomach analysis and examinations of reproductive tracts of the predators will be reported separately. These animals were shot in den trees during the flood, trapped, and a record was kept of road kills. At the end of the trapping period raccoon tracks were still common on the study area so the program did not achieve complete extirpation.

The Brood Survey.

All broods seen on the area up to August 16 were recorded by age classes. A total of 59 broods were counted as compared with 36 in 1957, 50 in 1956, and 76 in 1955.

Table 2 shows the average brood size by age class for 1958.

Table 2. Average Brood Size by Age Classes - 1958.

SPECIES	CLASS I		CLASS II		CLASS III		BROODY HENS	TOTAL BROODS
	BROODS	AV. SIZE	BROODS	AV. SIZE	BROODS	AV. SIZE		
BLACK DUCK	9	8.1	1	7.0	2	7.1	2	14
GOLDENEYE	-	-	2	2.5	3	3.0	-	5
BLUE-WINGED TEAL	2	7.1	1	9.0	4	6.2	1	8
GREEN-WINGED TEAL	-	-	2	6.0	3	10.0	1	6
WOOD DUCK	4	6.2	1	7.0	1	2.0	2	8
RINGNECK	3	7.0	8	4.6	5	7.0	1	17
UNIDENT	-	-	1	4.0	-	-	-	1
TOTALS	18	7.4	16	5.1	18	6.4	7	59

This table shows that nesting success was considerably better than in 1957, especially when it is remembered that there was a decrease in breeding pairs in blacks and goldeneyes. Ring-necks and blue-winged and green-winged teal showed the greatest increase in nesting success.

Brood survival was significantly poorer in Class I and Class II broods. Class III broods were also slightly smaller than last year.

The Mid-Summer Count.

The total waterfowl population on the study area was computed from a 92% shoreline count carried out between July 15 and August 16 as in previous years. Table 3 gives the results of this count and compares it with those of previous years.

Table 3. Waterfowl Population Changes since 1955.

SPECIES	1955	1956	1957	1958
BLACK DUCK	502	262	202	457
GOLDENEYE	57	26	19	13
RINGNECK	98	22	5	53
BLUE-WINGED TEAL	175	84	28	332
GREEN-WINGED TEAL	74	23	16	75
WOOD DUCK	45	26	41	155
MALLARD	3	-	2	1
PINTAIL	14	-	-	-
UNIDENTIFIED	24	9	4	-
TOTALS	992	451	317	1,086

Despite the large decrease in black ducks in the spring pairs count, the species has had an excellent breeding season and has come back well. Goldeneye did not show any appreciable recovery, and was the only species that did not. The two teals, wood ducks and ringnecks all showed strong recovery from the low of 1957.

Waterlevels in the area have been exceptionally high all summer and an excellent breeding season has resulted for all species except the goldeneye. The waterfowl population is now back to the level of 1955. A contributing factor to this success on the study area was the removal of 64 predators during the nesting season. As most of the raccoons were taken before the young were born, this constitutes a much larger reduction in predator population than the figure indicates. This program will be expanded next year.

Summary

1. Black ducks and goldeneyes showed an appreciable decrease in the spring count this year.
2. Waterlevels were high all summer and a predator control program removed 64 predators from the duck nesting area before the young raccoons were born.
3. An excellent breeding season was enjoyed by all species except goldeneyes.
4. At the end of the mid-summer count there were three times as many ducks on the study area as at the same time last year, and the population is back to the same level as 1955 for the first time since that year.
5. Hunting prospects are therefore better than they have been for the past three years.

Concluding Note (after completion of the above report):

Northeastern Wildlife Station,
Fredericton, N. B.,
August 21, 1958.

Heavy rains on the upper waters of the St. John river caused the waterlevel at Fredericton to reach 12.9 feet above summer low on August 21st. The holding boom of the Irving Pulp and Paper Co. at Burton carried away and extensive damage to wildrice beds was caused by the floating pulp. The flood also submerged all other aquatic vegetation beyond the reach of surface-feeding ducks. This will decrease the food supply in the upper estuary drastically and may be expected to reduce the number of waterfowl using the area during fall migration.

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GOLDENEYE	-	-	2	2.5	3	3.0	-	5
BLUE-WINGED TEAL	2	7.1	1	9.0	4	6.2	1	8
GREEN-WINGED TEAL	-	-	2	6.0	3	10.0	1	6
WOOD DUCK	4	6.2	1	7.0	1	2.0	2	8
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Waterlevels in the area have been exceptionally high all summer and an excellent breeding season has resulted for all species except the goldeneye. The waterfowl population is now back to the level of 1955. A contributing factor to this success on the study area was the removal of 64 predators during the nesting season. As most of the raccoons were taken before the young were born, this constitutes a much larger reduction in predator population than the figure indicates. This program will be expanded next year. 7??

Summary

1. Black ducks and goldeneyes showed an appreciable decrease in the spring count this year.
2. Waterlevels were high all summer and a predator control program removed 64 predators from the duck nesting area before the young raccoons were born.
3. An excellent breeding season was enjoyed by all species except goldeneyes.
4. At the end of the mid-summer count there were three times as many ducks on the study area as at the same time last year, and the population is back to the same level as 1955 for the first time since that year.
5. Hunting prospects are therefore better than they have been for the past three years.

Concluding Note (after completion of the above report):

Northeastern Wildlife Station,
Fredericton, N. B.,
August 21, 1958.

Heavy rains on the upper waters of the St. John river caused the waterlevel at Fredericton to reach 12.9 feet above summer low on August 21st. The holding boom of the Irving Pulp and Paper Co. at Burton carried away and extensive damage to wildrice beds was caused by the floating pulp. The flood also submerged all other aquatic vegetation beyond the reach of surface-feeding ducks. This will decrease the food supply in the upper estuary drastically and may be expected to reduce the number of waterfowl using the area during fall migration.

Report of the Waterfowl Breeding Ground Survey

in the

Saint John River Estuary - 1957

by

Alan E. Stiven

This report summarizes the results of the annual waterfowl breeding ground survey on the estuary of the Saint John River, New Brunswick. This survey was conducted by personnel of the Northeastern Wildlife Station for the past thirteen years, and was made this year by Donald Peer and the writer.

The survey consisted of two phases:

- (1) Brood counts, whereby observations were made of broods of ducklings so that they could be classified by species, age and brood size. By observing these broods over a period of time, an estimate of brood survival and mortality was made.
- (2) Fourteen scheduled trips were made during the period of July 16 to August 16 to determine the total number of waterfowl on the study area for comparison with other years.

Phenology

No actual ice break-up date could be given this year. The ice melted in the river and was carried away as slush. This was attributed to the lack of heavy spring rains. The peak flood was both lower in height and later (May 1) than the average. This was attributed to the functioning of a new hydroelectric dam above Fredericton and again to the lack of spring rains. These conditions presumably would have made for ideal nesting. Flooding was not believed responsible for any nesting losses. Precipitation was sufficient this summer to prevent any serious droughts. Wildrice began seeding during the last week of July and was plentiful throughout the study area. As was the case last year no large flocks of blue-winged teal or black duck were observed.

Brood Studies

Brood data were collected principally on the study area from the time of the appearance of the first black duck brood on May 22 until August 16. Only 36 broods were observed this year compared to 50 in 1956 and 76 in 1955. An additional 8 broody hens would give an indicated total

of 44 broods. Goldeneye, blue and green-winged teal appeared to have exhibited the most serious drops. Non duplication of broods was attempted.

Table I
Average brood size by age classes

Species	Class I		Class II		Class III		Broody Hens	Total Broods
	Broods	Av. Size	Broods	Av. Size	Broods	Av. Size		
Black duck	3	8.0	7	7.1	4	7.0	2	14
Goldeneye	1	14.0	1	10.0	3	6.6	-	5
Blue-winged teal	1	10.0	1	5.0	-	-	3	2
Green-winged teal	1	10.0	-	-	-	-	1	1
Wood duck	5	9.5	3	7.6	-	-	-	8
Ringneck	3	11.0	3	6.6	-	-	2	6
Totals	14	10.4	15	8.2	7	6.8	8	36

Brood data for 1957 are presented in Table I. Although an additional decrease in numbers of broods was observed this year, the duckling survival was reasonably good. The average size for all classes was slightly higher this year than in 1956 (8.0 for class I, 1956) and extremely higher than in 1955 (6.7 for class I, 1955).

Total Population Census

The total population of waterfowl by species, and the changes from 1954 are given in Table II. These data were collected from the fourteen scheduled trips of July 16 to August 16.

The year 1957 produced the lowest total waterfowl population since the study was undertaken. While fewer ducks returned to the study area to breed this year, this sparse population cannot be explained by a retarded phenology as it was in 1956.

All species with the exception of the wood duck showed a marked decrease in numbers from 1956. On the other hand the numbers of the wood duck have almost doubled. The numbers of the black duck, ringneck and blue-winged teal were considerably less.

Table II

Population Changes since 1954

Species	1954	1955	1956	1957
Black Duck	400	502	262	202
Goldeneye	35	57	26	19
Ringneck	28	98	22	5
Blue-winged Teal	5	175	84	28
Green-winged Teal	8	74	23	16
Wood Duck	14	45	26	41
Mallard	4	3	-	2
Pintail	-	14	-	-
Red-breasted Merganser	6	-	-	-
Unidentified	13	24	9	4
Total	513	992	451	317

The duck population per square mile of marsh since 1945 is shown in Table III. Waterfowl density determined from the period July 16 to August 16 was the lowest on record.

Table III

Duck Population per Square Mile of Marsh

Year	Ducks per Square Mile
1945	111
1946	53
1947	69
1948	84
1949	165
1950	157
1951	125
1952	153
1953	92
1954	33
1955	65
1956	30
1957	22

Species composition of waterfowl on the study area from 1955 to 1957 is given in Table IV. Although the black duck exhibited an increase in relative numbers over the past two years, all other species have decreased or remained stable.

Table IV
Species Composition

Species	1955 Percent	1956 Percent	1957 Percent
Black duck	53	58	64
Blue-winged Teal	18	19	6
Ringneck	10	5	9
Green-winged Teal	7	6	5
Goldeneye	6	6	2
Wood Duck	4	6	13
Pintail	1	-	-
Mallard	1	-	-

Conclusions

1. Water levels and weather conditions were more favorable for waterfowl production in 1957 than in 1956.
2. Brood success was not significantly different than last year, although an increase in brood size was noted.
3. While environmental factors pointed to a good production year, this was not realized and a substantial drop in population size occurred.
4. This year's sample of ducks was considerably smaller than that of previous years and it is possible that sampling error has been increased as a result, and that some of the apparent differences noted here may be due to this.

Fredericton, N. B.
August 19, 1957

It is believed that the retarded phenology, combined with a possible reduction in the numbers of ducks which returned here to breed in the spring, has resulted in an extremely poor brood season.

Table I
Average brood size by age classes

Species	Class I		Class II		Class III		Broody Hens	Total Broods
	Broods	Av. Size	Broods	Av. Size	Broods	Av. Size		
Black duck	-	-	4	5.3	7	5.3	2	13
Goldeneye	4	9.0	3	6.6	3	3.0	1	11
Blue-winged teal	1	9.0	1	6.6	3	6.0	1	6
Green-winged teal	2	5.0	1	10.0	1	5.0	-	4
Wood duck	1	13.0	2	2.5	2	7.5	2	7
Ringneck	4	7.0	3	3.7	2	3.5	-	9
Totals	12	8.0	14	5.2	18	5.1	6	50

The 1956 brood data are presented in Table I. Although reduced numbers of broods were observed this year, it can be seen that duckling survival is reasonably good. The decrease in average brood size from 8.0 of Class I to 5.2 of Class II, to 5.1 of class III, is comparable with previous years.

Total Population Census

Total numbers of ducks occurring on the study area since 1954 are tabulated in Table II. The black duck has dropped to an all-time low, and all other species of ducks were found in fewer numbers than in 1955. The over-all population level appears to be much like that of 1954. It seems possible that while there may have been fewer ducks - especially blacks - which returned here to breed in the spring, resulting in sparse local production, that part of the drop can be explained by the retarded phenology. As noted above, census figures are this year not swollen by early flocking at assembly points and by early migrants.

The goldeneye and the ringneck are the only species in addition to the black duck which were found in fewer numbers than in 1954. The green-winged teal, the blue-winged teal, and the wood duck, while showing population decreases from 1955, exhibit substantially higher population levels than they did in 1954.

Table II
Population Changes since 1954

Species	Total Population		
	1954	1955	1956
Black Duck	400	502	262
Goldeneye	35	57	25
Ringneck	28	98	22
Blue-winged Teal	5	175	84
Green-winged Teal	8	74	23
Wood Duck	14	45	26
Mallard	4	3	-
Pintail	-	14	-
Red-breasted Merganser	6	-	-
Unidentified	13	24	9
Total	513	992	451

The duck population per square mile of marsh since 1945 is shown in Table III. Waterfowl density, determined as of the period July 16 to August 16, is the lowest on record.

Table III

Duck Population per Square Mile of Marsh

<u>Year</u>	<u>Ducks per Square Mile</u>
1945	111
1946	53
1947	69
1948	84
1949	165
1950	157
1951	125
1952	153
1953	92
1954	33
1955	65
1956	30

Because the population level appears to be extremely low this year, it is possible that hunters who would normally bag local ducks at the beginning of the season will be unsuccessful. It is also a possibility, however, that ducks will be in fair supply due to an influx from other areas but they will be physically underdeveloped.

Species composition of waterfowl on the study area since 1954 is given in Table IV. Although black ducks are present in a slightly greater proportion than they were a year ago, and ringnecks in a decreased proportion, most species occurred in virtually unchanged relative numbers.

Table IV
Species Composition

Species	1954 Per Cent	1955 Per Cent	1956 Per Cent
Black Duck	81	53	58
Blue-winged Teal	1	18	19
Ringneck	6	10	5
Green-winged Teal	2	7	6
Goldeneye	7	6	6
Wood Duck	2	4	6
Pintail	-	1	-
Mallard	1	1	-

Conclusions

The waterfowl population appears to be reduced from 1955 to a level approximating that of 1954. The black duck and the goldeneye have suffered the most severe decline, with the former species at an all-time low.

The entire spring and summer has been characterized by a retarded phenology. Therefore, while it is possible that local hunters will be almost as successful as last year, with a larger proportion of underdeveloped ducks constituting the bag, it seems probable that fewer local ducks came north to breed in 1956.

Fredericton, N. B.
August 22, 1956.

Report of the Waterfowl Breeding Ground Survey
in the

Saint John River Estuary - 1956

by

Donald Reid

This report summarizes the results of the annual waterfowl breeding ground survey of the Northeastern Wildlife Station. The inventory has been conducted for twelve consecutive years in the estuary of the Saint John River, New Brunswick, and was made this year by Donald Peer and the writer.

The survey consists of two phases: (1) brood counts, whereby observations are made of broods of young ducklings so that they may be classified as to species, age, and brood size. A series of observations provides an estimate of duckling survival and mortality, and consequently a production trend measurement.

(2) Fourteen scheduled trips are made during the period July 16 to August 16 to determine total numbers of waterfowl on the study area for comparison with other years.

Phenology

The waterfowl breeding season has been characterized by an extremely retarded phenology. The break-up of the ice on the river and the arrival of most species of ducks at Fredericton occurred close to the long-term average dates. The sub-normal temperatures of May and June, however, resulted in a two or three week retardation of the growth of vegetation, together with a comparably late nesting and hatching season. Wild rice, which normally has commenced to seed by July 30, did not do so this year until August 15. In previous years the waterfowl survey in this area has tabulated large flocks of blue-winged teal and black ducks during the census period. Ordinarily, these would be local young ducks flocking together at assembly points, and in some cases, early migrants drifting south. To date, there has been very little evidence of the early flocking or migrating, and because of the late phenology, in part, total census figures are lower than they were in 1955.

Brood Studies

Only fifty broods were counted this year compared to 89 in 1955. Fewer class I and class II ducklings were observed, but there was a slight increase in the number of class III broods on the study area.

The black duck and the goldeneye exhibit the most serious drop in local production: in 1955 there were 22 and 26 broods respectively tabulated; in 1956 there were but 13 and 11.

NORTHEASTERN WILDLIFE STATION

BRUCE S. WRIGHT
DIRECTOR

OPERATED COOPERATIVELY BY THE
WILDLIFE MANAGEMENT INSTITUTE OF WASHINGTON, D. C.

UNIVERSITY OF NEW BRUNSWICK, FREDERICTON, N. B.

Waterfowl Breeding Ground Survey in

The St. John River Estuary - 1955

This report summarizes the results of the 1955 waterfowl breeding ground survey in the estuary of the St. John River, New Brunswick. The annual survey has been conducted by personnel of the Northeastern Wildlife Station for eleven consecutive years, and was made this year by H. Gray Merriam, Alan J. Stiven and the writer.

The survey consists of two phases: (1) brood counts, whereby observations are made of broods of ducklings so that they may be classified as to species, age, and brood size. These data are collected not only by station personnel throughout the waterfowl study area, but also by interested cooperators throughout southern New Brunswick.

(2) Fourteen scheduled trips are made during the period of July 16 to August 16 to determine total numbers of waterfowl on the study area for comparison with other years. Broods are also counted on the population census trips.

Phenology

Black ducks were the first of the waterfowl to arrive at Fredericton this year. They appeared on April 2 -- almost a week later than their average arrival date of March 27. The break-up of the ice on the St. John occurred on April 14, two days later than in 1954. The peak flood occurred on April 25, also a week later than the average, but the level of the river has declined steadily since that time.

Weather conditions and water levels have generally been much more favorable for breeding ducks than last year. There have been no known nesting losses due to flooding, and although the summer has been relatively hot, precipitation has been sufficient to prevent a serious drought. Aquatic food plants have developed normally and wild rice, which had commenced to seed by August 2, seems to be plentiful enough to provide food for early migrants as well as for local ducks.

Brood Studies

Brood data were collected principally on the study area from the time of the appearance of the first black duck brood on May 24 until August 16, but observations throughout southern New Brunswick are included in Table I.

Seventy-six broods were observed which could be classified as to species, age, and brood size. An additional eleven broody hens and two unidentified broods were counted for an indicated total of 89 broods. Although this compares favorably with the total of 30 broods in 1954, brood success is not as high this year as in 1952 or 1953 when 150 and 115 broods were counted respectively. These totals are not corrected for duplicate counts on subsequent trips.

Table I.

Average Brood Sizes by Age Classes

Species	Class I.		Class II.		Class III.		broody hens	total broods
	Broods	Av. size	Broods	Av. size	broods	Av. size		
Black Duck	5	7.4	6	4.5	6	5.8	5	22
Goldeneye	11	5.4	8	3.8	3	6.6	4	26
Blue-winged Teal	6	8.5	2	5.0	1	15	1	10
Wood Duck	3	8.3	3	4.3	3	1.7	1	10
Ring-necked Duck	6	7.7	3	8.3	2	6.0		11
Green-winged Teal	2	5.5	3	4.0				5
Mallard			1	12	1	8		2
Pintail	1	6						1
Unidentified	2	6						2
Totals	36	6.7	28	5.0	16	5.9	11	89

The larger number of broods counted in 1955 than in 1954 with comparable coverage, and the fair average brood sizes, indicate that this year's brood season has been moderately successful.

Total Population Census

Total population changes and percentage increases over 1954 are tabulated in Table II. Unusually large increases are evident in the ringneck, both teal, and the wood duck, and the total number of waterfowl utilizing the study area appears to be almost double that of 1954.

The large decrease reported last year may have been more apparent than real as the flooded conditions existing during the census period enabled the ducks to stay in the flooded timber where they were missed in the count. If this was so, the over-all increase of 193% shown by the survey this year will be high, but the increase is large enough to indicate a significant upward trend.

The sizeable increase in the census of blue-winged teal suggests that an early southward migration may have been underway. A portion of that increase, however, is a result of increased local production; ten broods were counted this year; only one was observed in 1954.

Table II

Population Changes From 1954

Species	Total Population 1954	1955	Per Cent Increase
Black Duck	400	502	125 25
Goldeneye	35	57	163 63
Ringneck	28	98	350 250
Blue-winged Teal	5	175	3500
Green-winged Teal	8	74	925
Wood Duck	14	45	321
Mallard	4	3	--
Pintail	--	14	--
Red-breasted Merganser	6	--	--
Unidentified	13	24	--
Total	513	992	193 93

The duck population per square mile of marsh since 1945 is shown in Table III. Although waterfowl density this year is still far below the successful years of 1949, 1950, and 1952, there is a significant upward trend from the low of 1954.

Table III

Duck Population per Square Mile of Marsh

<u>Year</u>	<u>Ducks per Square Mile</u>
1945	111.9
1946	53.5
1947	69.4
1948	84.1
1949	165.2
1950	157.6
1951	125.1
1952	153.3
1953	92.1
1954	33.9
1955	65.6

Species composition of waterfowl on the study area for 1954 and 1955 is given in Table IV. Although the black duck exhibited a decrease in relative numbers this year, this is merely a reflection of the proportionately greater population increases of the ringneck, both teal, and the wood duck.

Table IV
Species Composition

Species	1954 Per Cent	1955 Per Cent
Black Duck	81	53
Blue-winged Teal	1	18
Ringneck	6	10
Green-winged Teal	2	7
Goldeneye	7	6
Wood Duck	2	4
Pintail	-	1
Mallard	1	1

Conclusions

1. Water levels and weather conditions have been much more favorable for waterfowl in 1955 than they were last year.
2. Brood success has not been as high this year as it was in 1952 or 1953, but three times as many broods were observed on the study area as in 1954.
3. All species of ducks have exhibited population increases this year. An early southward migration of blue-winged teal partially accounts for the increase in that species, but brood data indicate increased local production.
4. Although the outlook for a successful hunting season is considerably improved over last year, local hunters cannot expect to bag as many ducks as they did in 1950, 1951, or 1952.

Donald Reid,
Station Biologist.

August 19, 1955,
Fredericton, N. B.

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WILDLIFE MANAGEMENT INSTITUTE
WIRE BUILDING, WASHINGTON 5, D. C.

WATERFOWL BREEDING GROUND SURVEY IN THE ST. JOHN ESTUARY - 1954

Introduction:

This report is a summary of the results of the 1954 waterfowl breeding ground survey in the estuary of the St. John River, New Brunswick.

This is the tenth year in which the annual survey has been conducted by personnel of the Northeastern Wildlife Station, and because coverage and techniques are essentially the same as in previous years, the data are comparable. The survey was made this year by the writer, assisted by Barry Meadows.

Phenology:

The waterfowl breeding season has been characterized by a general retarded phenology and by a cool, wet spring and summer.

The break-up of the ice on the St. John River occurred on April 12, compared with March 28 of 1953. The peak flood did not occur until April 24 and 25, compared with the five-year average of April 17, and with the peak occurring on April 3 in 1953. The water level of the river has been subjected to violent fluctuation throughout the summer, and excessive precipitation in the month of June probably resulted in the flooding of many late-nesting ducks --not only ringnecks but also puddle ducks attempting to renest for the second and third time.

The first black duck brood was not observed until May 31, although the average date for the appearance of broods on the study area is May 16.

Although the total mileage of slough shoreline on the study area was severely reduced in 1953 to 74.4 miles by dry, hot weather and by the filling of electric power reservoirs up river, it has this year been regained for a total of 108.5 miles. A comparison of the precipitation of the two years from June 1 to August 20 is presented in Table I. Although rainfall was less in July of 1954 than in 1953, this was compensated by cool, cloudy weather and by almost daily rainfall during early August. Indicative of the high water level is the statistic released by the Department of Northern Affairs and National Resources that stream flow of the St. John River during the month of July, 1954 was 213 per cent above normal.

TABLE I. PRECIPITATION COMPARISON

	1953	1954
June	2.00	6.42
July	6.29	3.14
August	1.37	3.32
(to Aug. 20 only)		
Total	9.66	12.88

From Department of Transport, Fredericton Airport

The high water level has not only contributed to the factors which have resulted in an apparent reduction of the local waterfowl population, but it has also flooded most of the wild rice beds which normally attract large numbers of migrating ducks during the hunting season.

Brood Studies:

Brood data were collected on the study area and adjacent water bodies from late May until August 24. The data are classified in Table II. A total of 30 broods and broody females was counted in contrast to 115 broods in 1953 and to 150 broods in 1952 with the same intensity of coverage. The totals are not corrected for possible duplicate counts. Decreased numbers of broods of all species were observed, and the figures are so small in most cases that hatching success and brood survival cannot be validly determined.

TABLE II. BROOD DATA - 1953 and 1954

Species	Class I		Class II		Class III		
	No. broods Observed	Av. Brood Size	No. broods Observed	Av. Brood Size	No. broods Observed	Av. Brood Size	Broody hens
Black Duck							
1953	8	8.0	12	7.7	17	7.6	-
1954	1	9.0	2	9.5	3	6.3	2
B.W.T.							
1953	12	9.2	9	6.3	4	5.5	-
1954	1	7.0	-	-	-	-	-
G.W.T.							
1953	-	-	-	-	-	-	-
1954	-	-	1	4.0	1	1.0	-
Wood Duck							
1953	12	8.2	3	7.0	3	5.7	-
1954	-	-	-	-	1	10.0	-
Ringneck							
1953	18	7.9	8	5.4	1	5.0	-
1954	2	6.5	3	6.0	2	4.5	1
Goldeneye							
1953	14	7.0	5	5.4	4	5.8	-
1954	3	7.0	2	3.5	3	3.1	1
Mallard							
1953	-	-	-	-	-	-	-
1954	-	-	-	-	-	-	1

Especially severe is the decreased numbers of blue-winged teal and wood duck broods. It is possible that the abnormally high water level has enabled broods to stay in cover in which they could not be found--notably the flooded dense maple peripheries of the water areas. Unusual numbers of broodless blue-winged teal and wood duck females, however, were tabulated. The only blue-winged brood observed throughout the period of study was a Class Ia brood on the late date of August 15.

It is believed that the retarded phenology combined with the recurrent flooding has resulted in an extremely poor brood season.

Census of Total Population:

Total population counts are normally made on the study area on 14 scheduled trips during the period of July 15 to August 15. Due to inclement weather, the final census run in 1954 was not made until August 20. The late season, however, enables a comparison to be made with previous years.

Total population changes and percentage decreases from 1953 are tabulated in Table III. The over-all reduction in the total number of ducks from 1953 of 64 per cent speaks for itself, especially when it is noted that 1953 exhibited an over-all decrease of 40 per cent from 1952. As with the broods, it is possible that the high water conditions enabled flying birds to take refuge in dense cover in which they could not be found and to scatter over areas which are normally dry, resulting in only a paper or theoretical decrease.

TABLE III. POPULATION CHANGES FROM 1953

Species	Total Population 1953	1954	Per Cent Decrease from 1953
Black Duck	738	400	-46
Blue-winged Teal	363	5	-99
Wood Duck	122	14	-89
Ringneck	65	28	-57
Green-winged Teal	20	8	-60
Am. Goldeneye	79	35	-56
Mallard	2	4	-
Pintail	2	-	-
Red-breasted Merganser	-	6	-
Unidentified	-	13	-
Total	1391	513	-64

Species composition of waterfowl on the study area for 1953 and 1954 is given in Table IV. Although the black duck exhibited a composition increase from 53 per cent to 81 per cent, this is obviously due to the greater population decreases of all other species.

TABLE IV. SPECIES COMPOSITION

Species	1953	1954
	Per Cent	Per Cent
Black Duck	53	81
American Goldeneye	6	7
Ringneck	5	6
Wood Duck	9	2
Green-winged Teal	1	2
Blue-winged Teal	26	1
Mallard	1	1

Number of ducks per square mile of marsh on the study area since 1945 are given in Table V. Because the total population appears to be smaller this year than in any year since 1945, it is probable that the majority of hunters who would normally bag local ducks at the beginning of the season will be unsuccessful. It is possible that migrant ducks will provide good shooting in the estuary of the St. John River, but with the flooding of the wild rice and other choice food species there will be little inducement for migrants to utilize this area.

TABLE V. DUCK POPULATION PER SQUARE MILE OF MARSH

<u>Year</u>	<u>Ducks/sq. mile</u>
1945	111.9
1946	53.5
1947	69.4
1948	84.1
1949	165.2
1950	157.6
1951	125.1
1952	153.3
1953	92.1
1954	33.9

Comparison of Ground and F.W.S. Aerial Surveys:

The U. S. Fish and Wildlife Service has conducted aerial surveys to determine breeding population trends on the St. John River since 1952. The total

Numbers of ducks tabulated on the transects lying within the Northeastern Wildlife Station study area are given in Table VI, in comparison with the total waterfowl population as determined by the ground crews. It is evident that no correlation is possible at this time.

It is believed that the wide divergence of figures for 1954 is due to a late spring migration, that a large portion of the 3320 ducks counted by the aerial crew is representative of groups of migrating birds which did not remain in this area to breed.

TABLE VI. COMPARISON OF GROUND AND F.W.S. AERIAL SURVEYS

	<u>1952</u>	<u>1953</u>	<u>1954</u>
F.W.S. Aerial Survey	1304	2328	3320
Ground Survey	2316	1391	513

Conclusion:

The 1954 waterfowl breeding season in the St. John estuary has been among the least successful since 1945.

The violently fluctuating river level is believed to have caused considerable nest losses, and the flooding has enabled successful broods as well as flying birds to utilize dense cover types where they could not be located.

All waterfowl species showed serious population decreases, with an over-all decrease of 64 per cent from 1953. In view of the paucity of local birds and the flooding of wild rive beds which would normally attract migrants, the prospects for the hunting season are extremely poor.

Donald B. Reid
Station Biologist

August 25, 1954
Fredericton, N. B.

Broods observed in 1954 in the estuary of the St. John River,
N.B.

June 25

Pontobello

4-1-0

Blacks	0 + 1 (IIb)
Goldeneye	F + 8 (IIb), F + 5 (Ia), F + 18 (Ia)
Woods	0 + 2 (IIa), 0 + 2 (IIb), F + 5 (IIa)
Unident.	0 + 3 (Ib), 0 + 2 (Ia)

June 26

Musquash and Long Is.

Goldeneye	F + 8 (Ia), F + 14 (Ic), F + 11 (Ib), F + 10 (Ic)
Blacks	F + 9 (III) F + 16 (Ic), F + 12 (Ic)

June 28

Coys and Harts Lakes

Goldeneye	F + 3 (IIa)
Blacks	F + 4 (IIb), F + 7 (IIc)

June 29

Gilbert & Ox Islands

Blacks	F + 6 (IIa), F + 5 (IIc)
Woods	F + 6 (IIb), F + 4 (Ib)
Goldeneye	F + 9 (Ia), F + 5 (IIa)

July 12

Oromocto River

Goldeneye	0 + 1 (IIa), F + 3 (Ib), F + 2 (Ia), F + 4 (IIb)
	0 + 1 (IIc)
Blacks	F + 7 (IIa)
Woods	F + 6 (IIb)

July 14

Lakeville, French Lake, Maquapit Lake,
Grand Lake, Raft Channel Is and Sloughs in between

Goldeneye	F + 5 (IIc), F + 3 (IIc), F + 7 (IIa), 0 + 1 (IIb)
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G.W. Teal	F + 8 (IIb)
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July 15

Lower Half of Loders Creek

Blacks	F + 7 (IIc)
Woods	F + 6 (IIb), F + 4 (IIc)

Slough #15

G.W. Teal	F + 9 (IIa)
Ringneck	F + 8 (Ia)
B.W. Teal	F + 7 (IIb)

Main River Sheffield-Jemseg & Sloughs

Goldeneye	F + 7 (IIc)
Blacks	F + 10 (IIb)
Ringneck	F + 7 (Ia)

July 16

Oromocto Is. P & S.

Woods	F + 7 (IIa), F + 9 (Ic)
Blacks	F + 5 (IIc), F + 9 (IIb)
Goldeneye	F + 4 (IIc), F + 7 (IIa)
Ringneck	F + 9 (Ia).
B.W. Teal	F + 7 (IIb).
G.W. Teal	F + 3 (IIc).

July 17

Musquash & Long Is.

Blacks	F + 7 (IIc), F + 6 (III), F + 7 (II6)
Goldeneye	F + 9 (IIb), F + 8 (IIc)
Ringneck	F + 9 (Ib), F + 7 (Ib), F + 10 (Ib), F + 8 (Ia)

July 20

Middle, Golbert, Ox Islands,
Island Opp. B.M. 20, Swan Lake.

Blacks	F + 5 (III), F + 5 (III), F + 8 (IIc)
Woods	F + 7 (IIc), F + 6 (IIc)
Boldeneye	F + 4 (IIa)

July 21

Slough #7

Ringneck	F + 11 (Ic)
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July 22

Portobello

Goldeneye	D + 4 (III)
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I would not have found many of these broods if the dog had not flushed them from heavy cover.

The brood season seems to have been quite late this year as up until July 22 very few Class III broods were observed.

WILDLIFE MANAGEMENT INSTITUTE
WIRE BUILDING, WASHINGTON 5, D. C.



WATERFOWL BREEDING GROUND SURVEY IN THE ST. JOHN ESTUARY - 1953

Introduction:

This is the 9th consecutive year of the survey, and as the method has not changed all results are comparable.

Phenology:

The break-up of the river at Fredericton in 1953 occurred twenty days earlier than the 126-year average. The ice began to move on March 28, but blacks had arrived two days before, which was nine days later than in 1952. The two teals and wood ducks arrived on schedule, but the ringnecks were 14 days earlier than last year, arriving on the study area on March 31. Mallards were noted on April 10, compared with May 3 last year. It appears therefore that the early arrivals were either on schedule or a little late, but the late arrivals were ahead of schedule.

The peak flood occurred on April 3, compared with a 5-year average of April 17. Little fluctuation was noted during the normal period of drop-off, but on July 29 there was a sudden rise of over 2 feet which probably washed out some ringneck nests.

May was a very wet month, but June and July were dry and hot and the water level fell rapidly. By the end of the census on August 17 the total miles of slough shoreline on the study area had shrunk from 108.5 miles in 1952 to 74.4 miles in 1953. This greatly affected the number of ducks using the area in the latter part of the summer.

Hatching Success and Brood Survival:

Table I shows the hatching success and brood survival during the 1953 breeding season compared with 1952, and with the 1945-53 average. There was a noticeable decrease in breeding waterfowl on the study area in 1953. A total of 150 broods were found in the course of the study in 1952, but only 115 broods were found in 1953 with the same amount of fieldwork. The break-down by species is shown in the table.

TABLE I. HATCHING SUCCESS AND BROOD SURVIVAL - 1953

Species	Class I		Class II		Class III		Remarks
	No Broods	Dkls/ Brood	No Broods	Dkls/ Brood	No Broods	Dkls/ Brood	
Blacks							
Avr. 45-53	16.1	7.7	11.1	6.2	14.8	6.9	
1952	8	8.0	12	7.7	17	7.6	
1953	8	7.5	9	6.1	7	7.0	
BW Teal							
Avr. 45-53	2.8	6.5	3.6	6.2	4.5*	6.9*	* 8 yrs only
1952	4	6.0	3	7.7	5	8.2	
1953	12	9.2	9	6.3	4	5.5	
GW Teal							
Avr. 45-53	2.3*	7.4*	2.6*	6.6*	4.2°	5.9°	* 7 yrs only
1952	-	-	3	8.7	4	5.8	+ 8 yrs only
1953	-	-	-	-	-	-	o 6 yrs only
Wood Duck							
Avr. 45-53	7.4*	6.4*	9.1	6.0	7.5	5.6	* 8 yrs only
1952	3	8.7	12	6.5	6	5.8	
1953	12	8.2	3	7.0	3	5.7	
Ringneck							
Avr. 45-53	19.2	7.0	14.7	6.4	6.4*	5.5*	* 8 yrs only
1952	11	8.2	16	6.4	1	4.0	
1953	18	7.9	8	5.4	1	5.0	
Golden-eye							
Avr. 45-53	21.6*	6.2*	9.3	4.9	8.3	4.6	* 8 yrs only
1952	18	6.7	15	5.8	12	4.2	
1953	14	7.0	5	5.4	4	5.8	

A definite decrease in well-grown broods was apparent in all species except blue-wing teal. The bluewings held up to the 8-year average, but all the other breeding species were well below. No great change in brood size was noted for the older broods, but among the downy ducklings the bluewings again showed considerably larger than average broods and the change from 2.8 broods per year on the area as an average of the past eight years to 12 broods in 1953 is considered significant.

The wood duck was the only other species in which a larger than average number of young broods was found. The black duck, the principal species of the region, had a poor year in the estuary of the St. John in 1953. Considerably fewer than average broods were found although brood survival appeared unaffected.

Population Changes from 1952.

Table II shows the changes in total waterfowl population on the study area since 1952. There is an overall decrease of 40% from last year at the end of the survey on August 17. This is considered to be mainly due to the low water levels which has dried up most of the sloughs.

TABLE III. POPULATION CHANGES FROM 1952.

Species	Total Population 1952	1953	Per Cent Increase or Decrease from 1952
Blacks	1,405	738	- 48
B.W. Teal	160	363	+127
Wood Duck	333	122	- 63
Golden-eye	127	79	- 38
Ringneck	210	65	- 69
G.W. Teal	78	20	- 74
Mallard	3	2	-
Pintail	-	2	-
TOTAL	2,316	1,391	- 40

Species Composition on the Study Area.

The greatest change in species composition is noted in the blue-winged teal. This species rose from 7% of the population in 1952 to 26% in 1953, and the number of broods found show that this is an increase in breeding population and is not caused by early migrants. The black duck still remains the mainstay of the population with 53% of the total, a drop of 7% from 1952. Wood ducks decreased from 14% - 9% and ringnecks decreased from 9% - 5%. The other species showed no significant changes in their relative positions in the breeding population.

TABLE III. SPECIES TRENDS SINCE 1945

Species	% Increase or Decrease from 1945							
	'46	'47	'48	'49	'50	'51	'52	'53
Blacks	-49	- 9	-24	+84	+111	+58	+128	+20
B.W. Teal	-88	-87	-70	-31	-44	-39	-58	- 5
Wood Duck	-80	-68	+16	+82	+23	-25	+ 7	-61
Golden-eye	-63	+189	+85	-41	- 5	+81	+140	+15
Ringneck	+ 3	-49	-18	+11	+11	-21	-11	-73
G.W. Teal	-14	-78	-74	+33	+23	+29	-37	-83
TOTAL	-54	-42	-26	+43	+37	+ 8	+34	-20

Black ducks are still above the 1945 level, as are golden-eyes, but all other species are below. The total population is smaller this year than in any year since 1948. Again this is probably the result of water conditions, and may have no bearing on the fall hunting when the migration is under way. If the fall rains bring the river up to its normal level the supply of wildrice and other choice foods should ensure a good crop of migrants for the hunters, but those who are depending on the local ducks at the beginning of the season may be disappointed.

Conclusion.

The 1953 breeding season in the St. John estuary was characterized by a very wet month of May followed by very dry and hot months of June and July. The river fell rapidly, and with the exception of one rise in late July which may have flooded some ringneck nests, there should have been negligible flood losses. The river was so low by mid-August that most of the sloughs were dry, and the census shows a big decrease in the numbers of ducks using the area.

The only species to show a significant increase was the blue-wing teal, which bred in greater numbers in the estuary this year than in any of the previous nine years. The other breeding species showed large decreases.

The prospects for the hunting season will depend entirely upon the water levels. If the rains are late and the sloughs remain dry well into the fall, the area available to ducks in the estuary will be considerably reduced and the early season shooting can be expected to be below average. If the dry period ends before the shooting season, normal conditions may be expected with migrants, but local birds will be in short supply.

B. S. Wright, Director
Northeastern Wildlife Station

August 17th, 1953
Fredericton, N. B.

WILDLIFE MANAGEMENT INSTITUTE

Dedicated to Wildlife Restoration
Wire Building, Washington 5, D.C.

WATERFOWL BREEDING GROUND SURVEY IN THE ST. JOHN ESTUARY - 1952

Introduction

This is the eighth consecutive year that the survey has been carried out and as the method has not changed, all results are comparable.

Phenology

Canada geese were the first of the waterfowl to arrive on the study area this year. They appeared on March 13 and were 17 days earlier than their average arrival date of March 30. Next to arrive were the black ducks on March 17 as compared with their average arrival date of March 27. The blacks were closely followed by the goldeneyes on March 19 (average March 26), wood ducks on April 6 (average April 8), ring-necked ducks on April 13 (average April 19), brant on April 20 (average April 11), blue-winged teal on April 29 (average April 19), pintails on May 3 (average April 23), green-winged teal also on May 3 (average April 21), mallards on May 3 (average April 16), and scaup on May 5 (average April 16).

The ice broke up in the St. John River on April 13 which was nine days later than last year but was four days earlier than the 126-year average of April 17.

The annual freshet was slow in attaining its full height, but due to a very wet spring and early summer the water level was consistently higher than normal during the breeding season. The continuous high water held back the development of many of the aquatic plants in the area--many of the species (notably wild rice) had not seeded by the middle of August. There was little water fluctuation to disturb the ground-nesting species of ducks.

Hatching Success and Brood Survival

Table I shows the hatching success and brood survival for 1952 and compares this year with the average for the years 1945 to 1952 inclusive.

A larger number of broods were observed than in the past two years in spite of the difficulty of locating Class I broods which stayed in the primary rearing covers longer than usual due to the higher water level. This year most classes of broods were larger than usual and the decrease in brood size from Class I to Class II was in most cases small. When the water level started to drop in late June and the broods were forced into more open water the reduction in brood size was more evident. In general all brood sizes were larger than the average this year. Higher water levels appear to mean more and better cover with better protection for the broods during their early life, and consequently larger Class I and II broods result.

Table I. Hatching Success and Brood Survival - 1952

Species	Class I	Class II		Class III		Remarks	
	No. Broods	Dkls/ Brood	No. Broods	Dkls/ Brood	No. Broods		Dkls/ Brood
<u>Blacks</u>							
Av. (45-52)	17.2	7.7	11.4	6.2	15.8	6.6	
1952	8	8.0	12	7.7	17	7.6	
<u>B-w Teal</u>							
Av. (45-52)	1.6	6.2	2.9	6.2	4.6#	7.1#	# 7 years only
1952	4	6.0	3	7.7	5	8.2	
<u>G-w Teal</u>							
Av. (45-52)	2.3#	7.4#	2.6 ^o	6.6 ^o	4.2@	5.9@	# 6 years only ^o 7 years only
1952	-	-	3	8.7	4	5.8	@ 5 years only
<u>Wood Duck</u>							
Av. (45-52)	6.7#	6.3#	9.9	5.9	8.1	5.6	# 7 years only
1952	3	8.7	12	6.5	6	5.8	
<u>Ring-neck</u>							
Av. (45-52)	19.4	6.9	15.6	6.5	7.2#	5.6#	# 6 years only
1952	11	8.2	16	6.4	1	4.0	
<u>Goldeneye</u>							
Av. (45-52)	22.7#	6.1#	9.9	4.8	8.9	4.5	# 7 years only
1952	18	6.7	15	5.8	12	4.2	

Species Composition of the Breeding Population

The black duck is still the most abundant breeding species on the study area and has increased greatly over last year. The population is at present the largest since this breeding ground survey was started in 1945. All the remaining breeding species except the two species of teal show an increase over last year.

Table II. Species Composition of the Breeding Population

<u>1952</u>		
Species	Total Population	Per Cent
Blacks	1405	60.7
B-w Teal	160	6.9
Wood Duck	333	14.3
Ring-neck	210	9.1
G-w Teal	78	3.4
Am. Goldeneye	127	5.5
Mallard	3	0.1
Total	2316	100.0

The wood duck, the ring-necked duck and the American goldeneye have all increased in importance from last year; but the two species of teal have decreased, especially the blue-winged teal.

Population Trends from 1945

The population trends on the study area are measured by using the breeding population of the first year of the study (1945) as a base, and measuring the percentage of increase or decrease of each species during the following years.

The waterfowl population as a whole has increased greatly and is 22.5 per cent greater than last year. Black ducks are present in greater numbers

than ever before in this study. This year they are 128 per cent more abundant than they were in 1945. Wood ducks and goldeneyes are also more abundant than they were in 1945, being 7 per cent and 140 per cent greater in numbers respectively. Green-winged teal, blue-winged teal and ring-necked ducks are all less abundant than they were in 1945 although ring-necked ducks are more common than they were last year.

Table III. Population Trends from 1945 (per cent)

<u>1945</u>	Species	1946	1947	1948	1949	1950	1951	1952
616	Blacks	-49	- 9	-24	✓84	✓111	✓58	✓128
311	Wood Duck	-80	-68	✓16	✓82	✓23	-25	✓7
380	B-w Teal	-88	-87	-70	-31	-44	-39	- 58
236	Ring-neck	✓3	-49	-18	✓11	✓11	-21	- 11
123	G-w Teal	-14	-78	-74	✓33	✓23	✓29	-37
53	Goldeneye	-63	✓189	✓85	-41	- 5	✓81	✓140
	Average	-54	-42	-26	✓43	✓37	✓8	✓34

Table IV shows the duck population per square mile of open marsh on the study area and for the first time since 1949 shows an increase although it still has not reached the high of that year.

Table IV. Duck Population per Square Mile of Open Marsh

Year	Ducks per Square Mile
1945	111.9
1946	53.5
1947	69.4
1948	84.1
1949	165.2
1950	157.6
1951	125.1
1952	153.3

Conclusion

The 1952 season has been a successful breeding season, and while the population has not yet reached the high of 1949, all species show an increase over last year with the exception of the two species of teal. The black duck population is the highest that has been recorded since this survey began in 1945. The American goldeneyes appear to be recovering from their low of 1950 and this is their second year of increase. The green-winged and blue-winged teal have decreased again after their slight upward swing of last year. There is a slight increase in wood duck and ring-necked duck over last year.

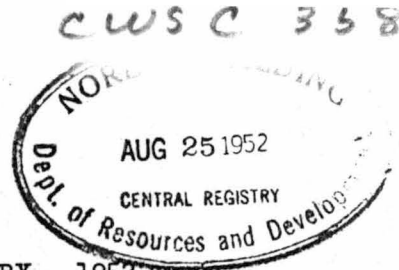
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August 15, 1952

'sgd' Brian C. Carter
Station Biologist

WILDLIFE MANAGEMENT INSTITUTE

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WIRE BUILDING, WASHINGTON 5, D. C.



WATERFOWL BREEDING GROUND SURVEY IN THE ST. JOHN ESTUARY - 1952

Introduction

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Phenology

Canada geese were the first of the waterfowl to arrive on the study area this year. They appeared on March 13 and were 17 days earlier than their average arrival date of March 30. Next to arrive were the black ducks on March 17 as compared with their average arrival date of March 27. The blacks were closely followed by the goldeneyes on March 19 (average March 26), wood ducks on April 6 (average April 8), ring-necked ducks on April 13 (average April 19), brant on April 20 (average April 11), blue-winged teal on April 29 (average April 19), pintails on May 3 (average April 23), green-winged teal also on May 3 (average April 21), mallards on May 3 (average April 16), and scaup on May 5 (average April 16).

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	No. Broods	Dkls/ Brood	No. Broods	Dkls/ Brood	No. Broods	Dkls/ Brood	
<u>Blacks</u>							
Av. (45-52)	17.2	7.7	11.4	6.2	15.8	6.6	
1952	8	8.0	12	7.7	17	7.6	
<u>B-w Teal</u>							
Av. (45-52)	1.6	6.2	2.9	6.2	4.6#	7.1#	# 7 years only
1952	4	6.0	3	7.7	5	8.2	
<u>G-w Teal</u>							
Av. (45-52)	2.3#	7.4#	2.6°	6.6°	4.2@	5.9@	# 6 years only ° 7 years only
1952	-	-	3	8.7	4	5.8	@ 5 years only
<u>Wood Duck</u>							
Av. (45-52)	6.7#	6.3#	9.9	5.9	8.1	5.6	# 7 years only
1952	3	8.7	12	6.5	6	5.8	
<u>Ring-neck</u>							
Av. (45-52)	19.4	6.9	15.6	6.5	7.2#	5.6#	# 6 years only
1952	11	8.2	16	6.4	1	4.0	
<u>Goldeneye</u>							
Av. (45-52)	22.7#	6.1#	9.9	4.8	8.9	4.5	# 7 years only
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The population trends on the study area are measured by using the breeding population of the first year of the study (1945) as a base, and measuring the percentage of increase or decrease of each species during the following years.

The waterfowl population as a whole has increased greatly and is 22.5 per cent greater than last year. Black ducks are present in greater numbers than ever before in this study. This year they are 128 per cent more abundant than they were in 1945. Wood ducks and goldeneyes are also more abundant than they were in 1945, being 7 per cent and 140 per cent greater in numbers respectively. Green-winged teal, blue-winged teal and ring-necked ducks are all less abundant than they were in 1945 although ring-necked ducks are more common than they were last year.

Table III. Population Trends from 1945 (per cent)

Species	1946	1947	1948	1949	1950	1951	1952
Blacks	-49	- 9	-24	/84	/111	/58	/128
Wood Duck	-80	-68	/16	/82	/ 23	-25	/ 7
B-w Teal	-88	-87	-70	-31	- 44	-39	- 58
Ring-neck	/ 3	-49	-18	/11	/ 11	-21	- 11
G-w Teal	-14	-78	-74	/33	/ 23	/29	- 37
Goldeneye	-63	/189	/85	-41	- 5	/81	/140
Average	-54	-42	-26	/43	/ 37	/ 8	/ 34

Table IV shows the duck population per square mile of open marsh on the study area and for the first time since 1949 shows an increase although it still has not reached the high of that year.

Table IV. Duck Population per Square Mile of Open Marsh

<u>Year</u>	<u>Ducks per Square Mile</u>
1945	111.9
1946	53.5
1947	69.4
1948	84.1
1949	165.2
1950	157.6
1951	125.1
1952	153.3

Conclusion

The 1952 season has been a successful breeding season, and while the population has not yet reached the high of 1949, all species show an increase over last year with the exception of the two species of teal. The black duck population is the highest that has been recorded since this survey began in 1945. The American goldeneyes appear to be recovering from their low of 1950 and this is their second year of increase. The green-winged and blue-winged teal have decreased again after their slight upward swing of last year. There is a slight

increase in wood duck and ring-necked duck over last year.

The breeding season was very successful with blacks, blue-winged teal, and wood duck showing a decrease in brood mortality with a consequent increase in brood size.

August 15, 1952

Brian C. Carter
Station Biologist

Dr. ^{H.T.} ~~Solomon~~
Dr. Solomon

Mr. ~~Ross~~ ^{Mr. Ross}
Mr. ~~Feiner~~ ^{Mr. Feiner}

WATERFOWL BREEDING GROUND SURVEY IN THE ST. JOHN ESTUARY, NEW BRUNSWICK, 1950

Brian C. Carter

Introduction

This is the sixth year that the survey has been carried out. The method of sampling has not changed so all results are comparable.

Phenology

As usual, the blacks were the first species to arrive on the study area this year. They arrived on March 31 as compared with March 28, 1949, April 4, 1948, and March 26, 1947. The blacks were followed by the wood duck (April 5), golden-eyes (April 7), mallards (April 13), Canada geese (April 14), ring-necked ducks (April 17), green-winged teal (April 25), and blue-winged teal (May 5). By this time black, golden-eye and wood duck nesting was well under way. The first black duck brood was seen on June 5, as compared with May 17, 1949, May 14, 1948, and May 18, 1947. The first flightless blacks were seen on July 7 this year, June 27 in 1949, July 9 in 1948 and June 23 in 1947.

The ice broke up in the St. John River on April 21 this year, which was later than the last three years (April 5, 1949, April 9, 1948, and April 19, 1947).

The flood was quite high but did not stay at its peak as long as usual. The level dropped to about half flood height quickly and very gradually thereafter. All through the brood season the water level was five to six feet higher than the average level for that time of year. These conditions do not seem to have affected the nesting or breeding success of the waterfowl.

Hatching Success and Brood Survival

Table 1 shows the hatching success and brood survival for 1950 and compares this year with the average for the years 1945 to 1950.

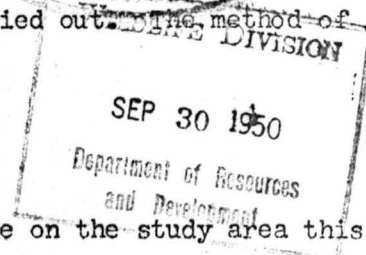


Table 1 - Hatching Success and Brood Survival

Species	Before Reaching Water		Class I		Class II		Class III		Remarks
	No.	DKLS/	No.	DKLS/	No.	DKLS/	No.	DKLS/	
	Broods	Brood	Broods	Brood	Broods	Brood	Broods	Brood	
Blacks									
Av. (45-50)	5#	10.0#	20.3	7.9	11.8	5.9	15.8	6.2	# 1 year
1950	-	-	6	5.8	9	5.0	14	4.6	
B. W. Teal									
Av. (45-50)	-	-	1.3	6.8	3.2	5.8	4.4#	7.2#	# 5 years
1950	-	-	1	4.0	3	8.7	4	6.3	
G. W. Teal									
Av. (45-50)	-	-	2.4#	6.7#	2.5	6.2	5.0 ^o	5.6 ^o	# 5 years
1950	-	-	-	-	3	9.0	5	5.2 ^o	^o 3 years
Wood Duck									
Av. (45-50)	-	-	7.6#	6.3#	10.0	5.9	8.7	5.8	# 5 years
1950	-	-	5	7.4	12	6.1	12	5.3	
Ring-neck									
Av. (45-50)	-	-	23.2	6.7	17.0	6.6	8.4	5.6	
			16	8.0	20	7.2	7	6.3	
Golden-eye									
Av. (45-50)	-	-	25.2#	6.2#	9.5	4.6	8.2	4.9	# 5 years
1950	-	-	14	7.8	4	7.5	4	2.3	

Class I ... Up to 1/4 grown, i.e. in the down

Class II ... 1/4 - 3/4 grown.

Class III ... 3/4 grown to awing.

Less broods were seen this year (in many cases well below the average) because of the higher water level of the river during the brood season. The primary rearing covers did not dry up until much later than usual this year, and consequently the broods were not forced out into the less dense vegetation of the secondary rearing covers where they could be seen until the water level went down towards the end of the brood season. By this time many of the earlier nesting species were awing. Except for the black ducks and the blue-winged teal, most classes of broods were larger than the six year average. There was a slight increase of duckling mortality this year in all species except the ring-neck, which shows a decrease. Brood survival as a whole was a little below the average of previous years with the golden-eye showing the largest decrease.

Species Composition of the Breeding Population

The species composition of the breeding population is shown in Table 2.

Table 2 - Species Composition

Species	Total Population	Per Cent
Blacks	1302	54.7
Wood duck	347	14.5
Ring-neck	299	12.5
B-w teal	214	9.1
G-w teal	159	6.4
Golden-eye	61	2.1
Mallard	8	0.3
Unident	7	0.3
Scaup	2	0.1
Total	2389	100.0

This table shows that black ducks have increased about nine per cent in importance on the area over last year. This is the second time in the past six years that the black ducks have increased their relative importance. Ring-necks, golden-eye, and green-winged teal have also increased in importance, but wood ducks, blue-winged teal, and mallards have decreased slightly from last year.

Population Trends from 1945

The population trends on the study area can be measured by using the breeding population of the first year of the study (1945) as a base datum and measuring the increase or decrease of each species during the following years. These trends are shown in Table 3.

Table 3 - Population Trends from 1945

Species	1946	1947	Percent 1948	1949	1950
Blacks	-49	-9	-24	784	7111
Wood duck	-80	-68	716	782	723
B-w teal	-88	-87	-70	-31	-44
Ring-neck	73	-49	-18	711	732
G-w teal	-14	-78	-74	733	723
Golden-eye	-63	7189	785	-41	-5
Unident	-27	-	79	79	-69
Average	-54	-42	-26	743	737

The black ducks have shown another large increase over the 1945 level and are in larger numbers than at any time since this study began. Green-winged teal and wood duck show an increase over 1945 but are slightly less in numbers than last year. Blue-wing teal are still below the 1945 level and are about 16 per cent less than last year. Ring-necks show an increase of about 14 per cent over last year and are 32 per cent higher than 1945. The golden-eye show a large increase over last year (63%) but are still 5 per cent lower than in 1945, however, this may be the start of an upward trend. The total breeding population is, for the second time in six years, above the 1945 level, and shows an average increase of 37 per cent over that level but is 3 per cent less than last year.

Table 4 shows the total duck population per square mile of open marsh on the study area. A steady increase is shown by this table from 1946 to 1949 with a slight drop-off this year.

Table 4 - Duck Population per Square Mile of Open Marsh

<u>Year</u>	<u>Ducks/sq. mile</u>
1945	111.9
1946	53.5
1947	69.4
1948	84.1
1949	165.2
1950	157.6

Conclusion

The 1950 season has been one of the most successful seasons for breeding waterfowl in the St. John Estuary in the last six years, being only slightly poorer than last year. The black duck, the most important game species, has for the second time in succession shown a large gain over the 1945 level. Three other species, green-winged teal, wood duck, and ring-necked duck all show increases over 1945. The largest increase was made by the golden-eye which showed a gain of 63 per cent over last year. The golden-eye and the blue-winged teal are the only two species which show no gain over the 1945 level.

Waterfowl Breeding Ground Survey, 1949, in the St. John
Estuary, New Brunswick.

By

Bruce S. Wright

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No attempt is made to tally territorial drakes in the manner used in the West as the terrain makes this system difficult to use. Hatching success and brood survival data are gathered, and a census of a 32,500 acre Study Area is carried out every year between July 16th and August 17th to measure the annual production.

The Method of Sampling:

The estuary of the St. John River contains about 38,000 acres of late summer waterfowl habitat, and the Study Area of 32,500 acres makes up 86% of the available habitat. There is 182 miles of shoreline in the Area, and it is cruised on foot and by canoe and the ducks tallied as to whether they are on a perimeter or slough shoreline. The ducks per mile of shoreline is computed for both types of shoreline and the total population is arrived at by applying the sample to the whole. The per cent cruise of the Area has varied from 51% in 1946 to 98% in 1945 and 1947, thus the cruise tally very closely approximates the total population.

Phenology:

Blacks arrived on the Study Area on 3/28 this year as compared with 4/4/48 and 3/26/47. The break-up at Fredericton, at the upstream end of the Area, was on 4/5/49, and on 4/9/48 and 4/19/47. Wood Ducks and Canada Geese arrived on 4/6, and Mallards the next day. Green-winged Teal and Ringnecks arrived on 4/9, and Bluewings and Scaup on 4/15. By this time the Blacks had started nesting. The

first Black Duck brood was seen on 5/17 as compared with 5/14/48, 5/18/47 and 5/14/46. The first flying young Blacks were seen on 6/22 but they must have been hatched farther south as the Area was not open at the date this clutch was laid. The first flightless Black was seen five days later on 6/27 as compared with 7/9/48 and 6/23/47.

There was practically no flood this year, which eliminated a usually serious loss of early nests. Climatic conditions were exceptionally favorable to breeding waterfowl in the Maritime Provinces.

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The following table shows the hatching success and brood survival for 1949 and compares this year with the average of the years 1945-1949. For Black Ducks this is a full five-year average, but for the other species no data were obtained in one or more of these years and the actual number of years by species is shown in the table.

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Hatching Success and Brood Survival.....1949.

Species	Before reaching water.		Class I		Class II		Class III		Remarks
	No.	Dkls/	No.	Dkls/	No.	Dkls.	No.	Dkls/	
	Broods.	Brood.	Broods.	Brood.	Broods.	Brood.	Broods.	Brood.	
<u>Blacks:</u>									
Avr(45-49)	-	-	23.2	8.0	12.4	5.7	16.2	6.3	
1949	5	10.0	43	7.1	30	5.5	51	6.6	
<u>B.W. Teal.</u>									
Avr(45-49)	-	-	1.4	6.3	3.2	5.5	4.5#	7.1#	#4 yrs
1949	-	-	1	5.0	8	6.2	4	8.0	
<u>G.W. Teal.</u>									
Avr.(45-49)	-	-	2.4	5.5	2.4	6.1	5.0#	5.8#	#2 yrs
1949	-	-	3	5.0	3	6.0	5	5.6	
<u>Wood Duck.</u>									
Avr(45-49)	2	-	8.2#	5.6#	9.4	5.7	8.0	6.5	#4 yrs
1949	-	-	18	5.5	28	5.2	20	5.6	
<u>Ring-Neck.</u>									
Avr(45-49)	-	-	24.6	6.6	16.4	6.4	8.7#	6.0#	#4 yrs
1949	-	-	39	6.6	20	5.7	18	5.3	
<u>Golden-Eye.</u>									
Avr(45-49)	-	-	28.0#	6.2#	10.6	4.3	9.0	5.0	#4 yrs
1949	-	-	35	5.3	15	3.9	11	4.4	

Class I = Up to 1/4 grown, i. e. in the down.

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Five Black Duck broods were found with the female leading them to water and they averaged ten ducklings per brood. This is slightly above average hatching success for this area. Many more broods of all three classes were found this year than average, but this in itself was not an indicator of an increased population as the number of observers were not the same each year. The downy broods were definitely smaller than average, but they numbered slightly above average by the time they reached the flying stage. This was true for all species except the Ring-Neck, the Golden-Eye, and the Wood Duck, and indicates a slight decrease in duckling mortality among Black Ducks and the two teals. Brood survival as a whole was average with three species above and three below the average of the previous years.

The average brood sizes for Black Ducks are based on the count of 259 broods containing 1,826 young ducks in the past five seasons. The other species are represented by proportionately smaller numbers consistent with the number of breeders on the area.

Species Composition of the Breeding Population:

The species composition of the breeding population is shown in Table II.

Table II. Species Composition.

Species	Total Population.	%
Blacks	1,138	46
Wood Duck	561	23
Ring-Neck	264	11
B. W. Teal	263	11
G. W. Teal	164	6
Mallard	34	1
Golden-Eye	32	1
Unident.	24	1
Total	2,480	100

This table shows that Black Ducks have increased ten per cent over last year in importance on the Area and now make up 46% of the breeding population. Wood Ducks decreased 6%, and Green-Winged Teal increased from 2% to 6% this year. Golden-Eye decreased from 7% to 1%, and Mallards appeared in the tally for the first time following last summer's planting in the Area. Bluewings increased slightly in importance and rose to 11% of the total, but Ring Necks dropped off from 15% to 11%.

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Table III. Population Trends from 1945.

<u>Species</u>	<u>1946%.</u>	<u>1947%.</u>	<u>1948%.</u>	<u>1949%.</u>
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Wood Duck	-80	-68	+16	+82
B. W. Teal	-88	-87	-70	-31
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Unident.	-27	-	+ 9	+ 9
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Black Ducks show a spectacular **increase** this year, and for the first time in five years they are above the 1945 level. Wood Ducks also are above any year since the study began, as are Ring-Necks and Green-Winged Teal. Blue-Winged Teal are still below the 1945 level, and Golden-Eyes have shown a spectacular drop off since they peaked in 1947. This problem is being investigated as a thesis assignment by a member of the Station's staff. The breeding population as a whole is above the 1945 level, for the first time this year, showing an average of 43%.

Conclusion:

The 1949 season has been the most successful one for breeding waterfowl in the St. John Estuary in the last five years. The most important game species, the Black Duck, has made important gains and is for the first time in five years above the 1945 level. All species with the exception of Blue-Winged Teal and Golden-Eye are above the 1945 level. The prospects are therefore excellent for the fall flight from this area. Banding is proceeding at the three northern banding stations at Tinker Harbour, Labrador; Grand Codroy River, Newfoundland; and at Baie Johan Beetz, Quebec. Storms handicapped the banding operations in Labrador and in Newfoundland in August, but satisfactory progress is being made.

Northeastern Wildlife Station,
University of New Brunswick,
Fredericton, N. B.
August 25, 1949.

P Y 2713
Waterfowl Breeding Ground Survey, 1949, in the St. John
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By

Bruce S. Wright

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27B

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Northeastern Wildlife Station,
University of New Brunswick,
Fredericton, N. B.
August 25, 1949.

Geo. F. Royer

27

THE 1948 SPRING DUCK FLIGHT ON THE
SAINT JOHN RIVER. IN NEW BRUNSWICK

The break-up of the river ice in 1948 occurred on April 9th, some ten days earlier than in 1947, although it was still eleven days later than 1946.

In spite of the earlier break-up date most species of duck arrived in the Study Area within a week of their arrival last year.

The annual spring freshet in the Saint John River was again later than normal this year, and it did not reach its peak until May 23rd. This may have proved to be a disadvantage to the earlier ground-nesting species, for when the high water arrived many nests may have been flooded out necessitating re-nesting and a subsequent reduction in brood size. Information as to whether this occurred will be obtained during the brood-count survey now under way.

For the past three years the numbers of Black Ducks and Golden-eyes arriving in the Study Area have been checked to determine the percentage of birds which were paired on arrival. Wood Ducks have been included in this compilation this year. The larger number of ducks checked this year is partly accounted for by the increased time spent in the area and partly by increase in the population of the area. In all, nine hundred and ninety-seven Black Ducks, one thousand and twenty-four Golden-eyes and three hundred and thirty-six Wood Ducks were recorded.

Sixty-nine percent of the Black Ducks were paired on arrival, which is a slight increase over 1947. The Golden-eyes were 64 percent paired, which is a large increase over 1947 when they were 40 percent paired upon arrival. The Wood Ducks showed 76 percent paired.

The spring flight in 1948 in general shows a slight increase in Black Ducks and Wood Ducks, with the migration for all species except Ringnecks, reaching its peak during the last week in April.

The most abundant species seen in the Study Area this year is the Golden-eye which made up 39 percent of the total.

The Black Ducks seem to have increased slightly over last year and comprise 38 percent of the total.

Third in abundance are the Wood Ducks (13 percent) which show a decided increase over 1947.

Green-winged Teal are to be found in small numbers (3 percent of the total) but it is doubtful if there is any increase over last year.

The Blue-winged Teal are still very scarce (2 percent) in the Study Area.

Ringnecks seem to have about their normal population to date and so far they are 4 percent of the total.

Nesting is in progress in the intervalles and river bottom lands, especially among the Golden-eyes, Blacks and Wood Ducks.

During May 290 man-hours were spent in a systematic search for nests on all the twenty-two islands in the Saint John

River within thirty miles of Fredericton. Only six nests were found which were all in trees. These consisted of three Golden-eye, two Wood Duck and one Black Duck.

A young female raccoon was found in the Black Duck's nest. She had destroyed all the eight eggs that were in the nest.

With the exception of, perhaps, the Black Duck's , none of the nests found had complete clutches.

Three broods were seen during the nesting survey. These were seen on May 27th, 28th, and 31st. This compares favourably with last year when the first brood seen was on May 26th, and on May 14th. in 1946. From the dates of the first broods seen, the beginning of the incubation period would be about April 29th.

Thus, despite the difference in the chronology of the past three seasons, the beginning of the nesting period seems to remain at about the last week in April.

Observations concerning the habits during the early part of the day of the three most abundant species - Black Ducks, Golden-eyes, and Wood Ducks - were carried out during April.

The conclusions of these observations are that:-

At dawn, the majority of Black Ducks are to be found in the small creeks and flooded pot-holes in the fields.

As the sun rises and becomes fully visible the Black Ducks leave the pot-holes and creeks and fly out to the flooded timber. They are usually found in the thickly timbered country along the water's edge, and are very seldom found in the open water. They

stay in this type of cover until dusk.

The Golden-eyes are nearly always found in open water. From dawn until three hours after they are found in single pairs or in courting groups. After that time they gather into flocks in the deep water. Although still paired, they keep together until dusk when they again break up.

The Wood Ducks are not often seen in the creeks and pot-holes but mostly in the edges of the flooded timber where they can be found at almost any time of the day.

From the break up until the close of the muskrat trapping season on April 30th the writer lived with one of the best trappers of the Study Area and checked his results. This year proved to be one of the poorest seasons on record for the region. 1451 trap days yielded 37 rats and 13 ducks. Two of the ducks escaped leaving a foot behind. All the breeding species of the area were represented in the catch which consisted of three Black Ducks, four Wood Ducks, and one each of Green-winged Teal, Blue-winged Teal, Ringneck, and Golden-eye. Of these eleven only six were alive when they were found, the remainder having been killed by predators or drowned by the weight of the trap. All the birds were caught by traps set on notched, floating logs.

Conclusions.

At the end of a month and a half of observing the migration and the settling in of the residents afterwards, our conclusions are that there is a slight increase in Black Ducks, Golden-eyes, and Wood Ducks, with the three other breeding species remaining at about the same level as last year.

These conclusions are made from the impressions of the Station Staff, backed by the available data. They will be checked against the mid-summer census when a more accurate increase or decrease can be determined.

Brian C. Carter

B.C. Carter
Technical Assistant
Northeastern Wildlife Station
Fredericton, N.B.

June 2, 1948