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Temporal and Geographic Distribution of Recoveries of Black Duck
and Green-winged Teal banded at Atlantic Flyway Cooperative
Banding Sites in the Atlantic Provinces and Eastern Quebec

WR Whitman
Canadian Wildlife Service
December 1979

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Temporal and Geographic Distribution of Recoveries of Black Duck
and Green-winged Teal Banded at Atlantic Flyway Cooperative
Banding Sites in the ~~Maritime~~ ^{Atlantic} Provinces and Eastern Quebec

not always clear whether only bandings under Coop program or all bandings
were used; this should be stated in the introduction. (incl. those before 1965 in some areas) BJB

not clear if direct & indirect recoveries were combined, or if such even being
was validated; this is very important, - they were combined (cf. Figs. 11 & 12),
& validation was done, but this was implicit in text rather than explicit.

W. R. Whitman
Canadian Wildlife Service
December 1979

Introduction

An Atlantic Flyway Cooperative Banding program was initiated in 1965 sponsored by the Atlantic Flyway States and the U.S.F.W.S. The program ^{and} has continued annually since that time ^{was} being administered and supervised primarily by the Canadian Wildlife Service. During that time, numerous banding sites have been operated in the Atlantic Region and eastern Quebec with varying degrees of success. Among the most successful ^{areas} sites are Baie Johan Beetz, ¹⁾ P.E.I., ^{6) eastern} N.B.-N.S. Border Area, ⁴⁾ Saint John River, ^{3) lower} Tabusintac, ⁵⁾ Debert, ⁷⁾ Cape Breton and ⁸⁾ Louis Lake. Recoveries from bandings ⁱⁿ at those ^{areas} sites are analyzed in this report. Figure 1 shows locations of ^{these} eight banding ^{areas} sites.

The objective of this analysis is to discuss and evaluate the ^{movements and} harvest characteristics of Black Duck and Green-winged Teal banded ⁱⁿ at eight ^{areas} sites. The variables ~~compared~~ ^{are compared} are total recoveries, age, sex and type of recovery ^{are compared} to identify migration routes, harvest locations, and harvest rates of various regional population segments. Recoveries are sorted into eight areas in the Maritime provinces for purposes of evaluation. Other Canadian and U.S.A. recoveries are sorted by province and state. Table 1 and Figure 2 define recovery areas in the Maritime Provinces.

*no mention here of Nfld. + Labrador, though recoveries
are analyzed later...*

no mention that Baie Johan Beetz bandings from 1947 included.

1. Baie Johan Beetz
- ~~6~~ 2. Prince Edward Island
- ~~4~~ 3. N.B.-N.S. Border
- ~~3~~ 4. Saint John River
- ~~2~~ 5. Tabusintac
- ~~7~~ 6. Cape Breton
- ~~5~~ 7. Debert
8. Louis Lake

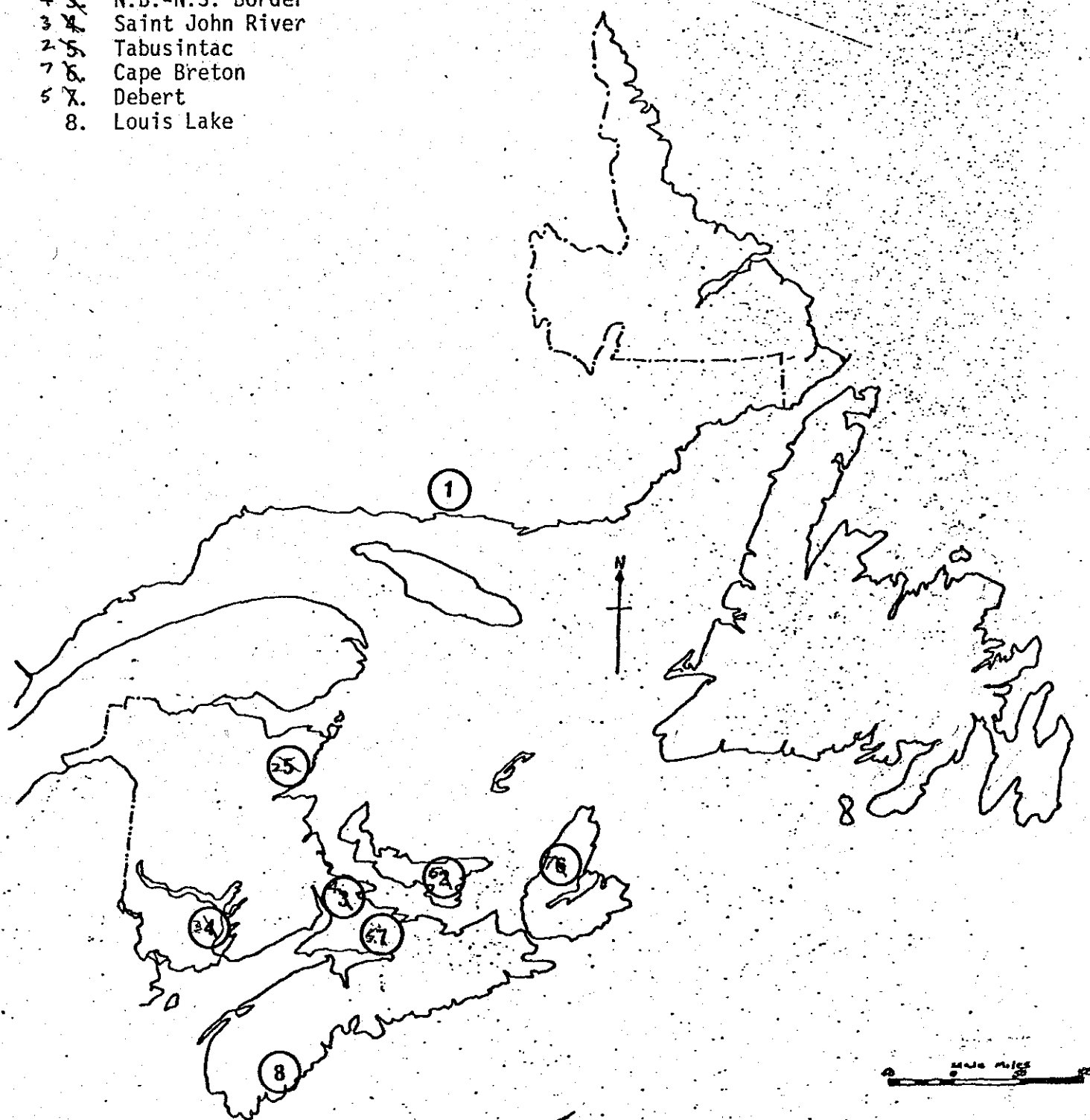


Figure 1. Location of Eight Atlantic Flyway Cooperative Banding Stations

Add Nfld. + Labrador stations, since they are discussed too.

- 5. Prince Edward Island
- 4. N.B.-N.S. Border
- 3. Saint John River
- 2. Southeastern N.B.
- 1. Northeastern N.B.
- 6. Northwestern N.S.
- 7. Northeastern N.S.
- 8. Southern N.S.

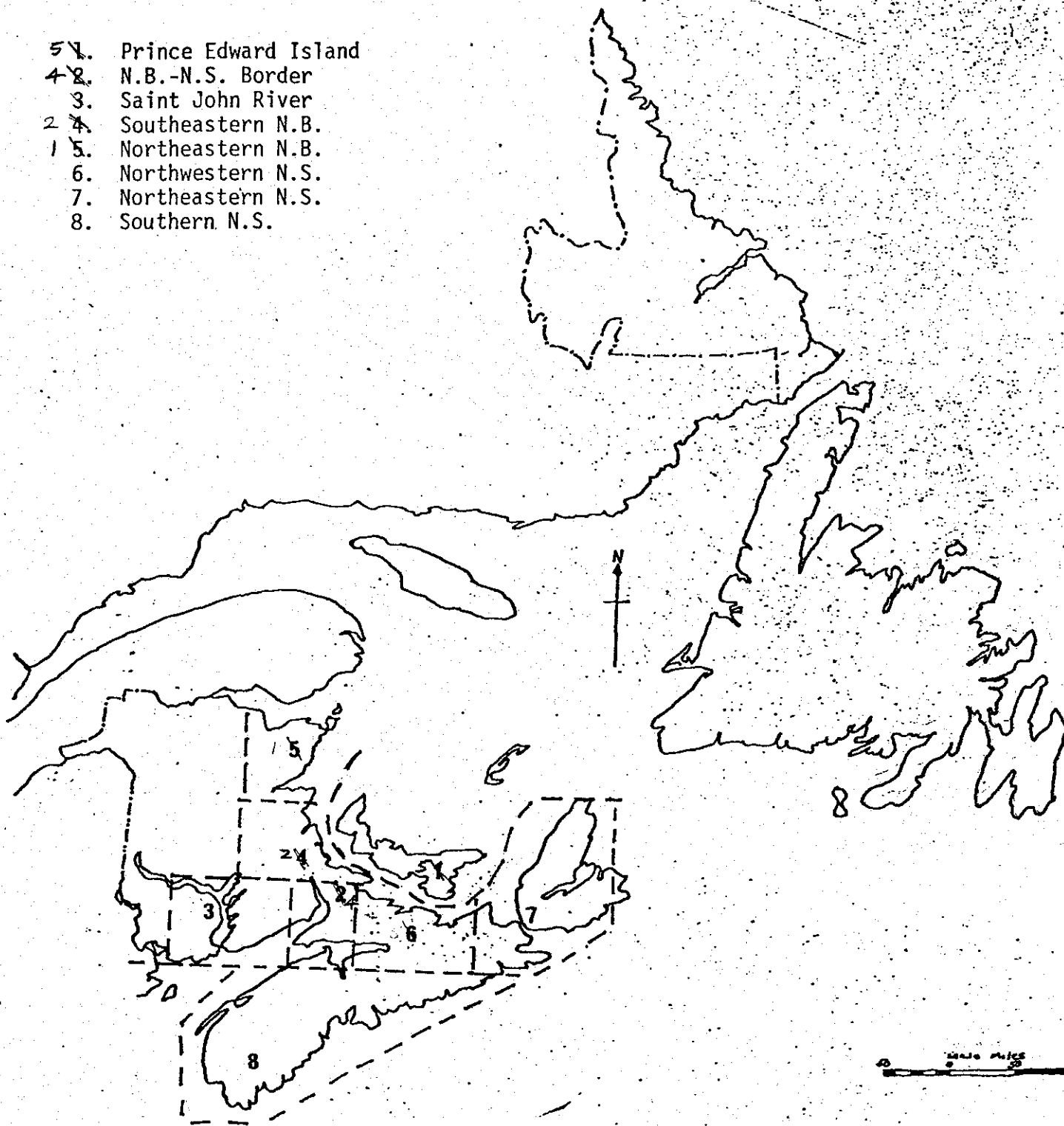


Figure 2. Location of Recovery Areas in the Maritime Provinces

Table 1. Location of Eight Recovery Areas in the Maritime Provinces

Recovery Area	Degree Blocks
P.E.I.	460-0620; 460-0640 460-0630
N.B.-N.S. Border	450-0640
Saint John River	450-0660; 450-0650
Southeastern N.B.	460-0640; 460-0650
Northeastern N.B.	470-0640; 470-0650
Northeastern Nova Scotia	450-0600; 460-0600 450-0610; 460-0610
Northwestern Nova Scotia	450-0620; 450-0630
Southern Nova Scotia	Remainder of Nova Scotia

Location and Description of Banding Sites

Baie Johan Beetz

Baie Johan Beetz is located in degree block (500-0620) in south-eastern Quebec on the north shore of the Gulf of St. Lawrence near Anticosti Island. Although that area is not situated within the boundaries of the Atlantic Region, but waterfowl staging in that area contribute significantly to the Regional harvest. Since the late 1940's and in particular between the initiation of the Cooperative Banding Program in 1965 and 1977, a total of 10,418 Black Duck and 10,915 Green-winged Teal have been banded at the Baie Johan Beetz station. Of that number, 1,624 Black Duck and 1,100 Green-winged Teal have been recovered, and 943 and 714 respectively have adequate recovery information to be used in this analysis.

400 GWT banded + 364 recovered BA 1961 (Morris 1967)

This station has been operated primarily by personnel from the ^{CWS-} Quebec Region with assistance of Cooperative Funds. ^{The only techniques used has been} ~~Standard funnel~~ type bait traps, ~~have been the only techniques used~~ which have resulted in ^{banding of} ~~between 3⁰⁰ and 500 Black Duck and a similar number of Green-winged Teal being~~ ~~banded annually in normal~~ ^{most} years.

Prince Edward Island

This ^{area designation} ~~station is the only one of its kind in that it represents~~ ^{covers} all banding within ^{the} ~~an~~ entire ^{as} ~~Atlantic~~ Province, ^{as} ~~P.E.I.~~ includes parts of ^{only} ~~three~~ degree blocks - 460-0620; 460-0630, 460-0640. ^{These include} ~~and represents~~ good production habitat, major staging areas and significant wintering habitat. ^{Pre-season} ~~Banding~~ in P.E.I. was conducted primarily under the Cooperative Banding Program, although a large amount of winter banding has been conducted ^{and earlier by CWS} by provincial personnel. ^{In} A total of 11,449 Black Duck and 1,696 Green-winged Teal ^{were} ~~have been~~ banded in the province between 1942 and 1977, of which ~~recoveries of~~ 2,282 Black Duck and 194 Green-winged Teal ^{were} ~~have been~~ ^{recovered} ~~obtained~~. Of ^{these} ~~the total recoveries~~, 914 Black Duck and 152 Green-winged Teal have sufficient recovery data to be included in this report, ~~Recoveries analyzed do not include most adult~~ ^{including} birds banded during the winter.

?
adults

The P.E.I. stations ^{have} ~~has~~ been operated by a variety of personnel including provincial, CWS and students hired by the Cooperative fund. The primary banding technique has been the standard bait trap; however, the airboat was used successfully for several years, and some dog banding of local birds ^{was done} ~~has occurred~~. Around 500 Black Duck and an equal number of Green-winged Teal have been banded in ^{some} ~~many~~ years by a combination of techniques.

N.B.-N.S. Border Area

This ^{sample} station includes birds banded in both New Brunswick and Nova Scotia ^{near} along the border between the two provinces. ^{but} It is included entirely within degree block 450-0640. ^{at} and represents ^{both} breeding and migrant populations. ^{but} No significant numbers of either Black Ducks or Green-winged Teal winter in the Border Area. Banding has been conducted almost entirely under the Cooperative Program, by use of bait traps, airboat, and to a very limited extent dogs. ^{In all,} A total of 8483 black duck and 2310 green-winged teal ^{were} have been banded in the NB-NS border area between 1940 and 1977, of which 1560 black ducks and 267 green-winged teal have been recovered. Of ^{these} the total recoveries, 1035 black duck and 155 green-winged teal ^{recoveries} are analyzed in this report.

The NB-NS border stations ^{have} has been operated entirely by CWS personnel assisted by students employed under the Cooperative Program. ^{mentioned above} Extensive use has been made of both bait trap and nightlighting techniques, [the combination of which has resulted in quotas of both species being banded in most years.]

no previous mention of "quotas" -
give numbers - or omit mention.

St. John River

NEWS was only
2 in 1947...

The St. John River ^{area} ~~banding station~~ includes all of the ^l Lower St. John River ^v Valley, ~~and is contained almost entirely~~ within ^{the} two degree blocks 450-0660 and 450-0650. Banding ⁱⁿ ~~at this station~~ ^{area} dates back to the 1930's when personnel from the Northeast Wildlife Station were active in the area. Since 1965 ~~and the initiation of the Atlantic Flyway Cooperative Banding Program~~, banding has been conducted primarily by ^a ~~the~~ USFWS airboat, with assistance ~~being provided~~ by CWS and the N.B. Dept. of Natural Resources. During that time, ~~a total of~~ 7,264 black ducks and 1,420 green-winged teal were banded, of which 1,299 black ducks and 160 green-winged teal ^{were} ~~have been~~ recovered. In this analysis 1,037 black duck and 125 green-winged teal recoveries ^{were} ~~are~~ used. ~~(Recoveries having insufficient data were disregarded.)~~

omit here -
broken down given
in this report

All age classes of both species are well represented by recoveries. Black duck include 29 adults, 671 hatching year and 340 locals while green-winged teal include 43 adults, 44 hatching year and 38 locals.

The St. John River ^v Valley is the ^{single} most important waterfowl production area in the Atlantic Region; ~~therefore~~ ^{immature} birds banded ^{there} ~~at that~~ ^{probably?} ~~station~~ ^{that} primarily represent a breeding population. Habitat in the Valley ^{provides} ~~also serves as~~ major staging areas in the fall, but very few waterfowl are known to winter in the area.

Tabusintac, New Brunswick

The Tabusintac ^{area} ~~Banding station~~ is located in ^{It} ~~(degree blocks)~~
470-0650 and 470-0640 in northeastern New Brunswick. ~~The Tabusintac area~~
represents good production habitat, and ^{also} serves as a major staging area for
fall migrants. Banding in the area was initiated ~~[under the Atlantic~~
~~Flyway Cooperative Banding Program]~~ in 1968 and continued annually through
1973. During that time ~~a total of~~ 2028 black ducks and 607 green-winged
teal were banded. Of those ~~numbers~~ ^{were} 379 black ducks and 69 green-winged
teal ~~have been~~ recovered. ~~[Recoveries having sufficient data for analysis~~
~~include 18 adult, 273 hatching year and 6 local black duck and 11 adult~~
~~and 46 hatching year green-winged teal.]~~ ~~[Black ducks provided the only~~
~~local recoveries of which all but one were recovered directly in eastern~~
~~New Brunswick.~~ ^{in the same fall} ~~The other was an indirect recovery from Rhode Island.]~~

not here -
in results

273
2186
2459

Debert Sanctuary

Banding at Debert, ~~Nova Scotia~~, was primarily conducted during the late 1960's and early 1970's ~~under the Atlantic Flyway Conservative ?~~ ~~Banding Program~~; however, a few recoveries ^{were} have been received from bandings as early as 1950 and as recent as 1977. ~~The banding site is located in~~

degree block 450-0630 near Truro, Nova Scotia, For purposes of this analysis, ^{is} ~~the~~ degree block ~~of the banding site~~ is lumped with the adjacent block 450-0620 ^{to} to form the zone designated as Northwestern Nova Scotia. Debert has been the only banding station of significance in that zone.

A total of 1429 black ducks and 157 green-winged teal ^{were} ~~have been~~ banded at that station, of which 222 and 19 recoveries ^{have been} received. respectively. After excluding all ^{those with} ~~recoveries~~ having insufficient data, ^{recoveries} ~~a~~ ^{total of} 172 black duck and 16 green-winged teal were available for analysis. [Due to an extremely limited number of green winged teal recoveries, only a total analysis of distribution is possible. Also only three recoveries of local black ducks have been obtained; thus, are not considered individually but are included in the total.]

Louis Lake

The Louis Lake banding station, is situated in the ~~recovery area~~ designated as southern Nova Scotia, which includes all of the province south of 45° latitude. More specifically Louis Lake lies in degree block 430-0640 near the settlement of Port Joli. Recoveries from that area represent birds banded from 1964 to 1976; however, the majority were banded in the late 1960's and 1970's during late September by airboat nightlighting.

A total of 520 black ducks and 3051 green-winged teal ^{were} banded at Louis Lake. Of ^{those} ~~that number~~, 92 black ducks and 347 green-winged teal ^{were} ~~have been~~ recovered, including 57 black duck and 288 green winged teal ^{respectively} with ^{adequate} ~~sufficient~~ recovery data ~~to include in this analysis~~. [Few recoveries of black duck again render comparisons of individual characteristics questionable; therefore, discussion is limited to comparison of totals. In the case of birds of both species banded as locals, no comparisons can be made since only one local black duck recovery has been received.]

+ here -
in result

Cape Breton

Nov. Scotia,
Banding was conducted on Cape Breton Island under the Cooperative Banding Program from 1967 to 1971, in both breeding and staging areas, ~~Sites~~ *where* banding was conducted *include* ⁱⁿ Middle River, Mabou River, Judique Pond, Whycocomagh, Nyanza Pond, and Lake Ainslie. ^(460-0600 + 460-0610) During the five year banding period, ~~a total of~~ 1219 black ducks and 152 green-winged teal were banded. The Cape Breton banding station ~~falls~~ ^{lies} within the recovery area designated as Northeastern Nova Scotia which includes all of the province north of 45° and east of 62°. Total recoveries ^{banding in} from that area include 217 black ducks and 11 green-winged teal, Sufficient data on recoveries of ~~of which only~~ 164 black duck and 8 green-winged teal ^{recoveries had} ~~were available to include in this~~ ~~report~~

The major banding technique employed in Cape Breton was the standard funnel type bait trap. Airboat nightlighting was tried in some sections of Lake Ainslie with limited success. Banding was discontinued in 1971 because of the low success ~~obtained~~ per unit of effort.

if these are to be discussed, they should be mapped in Fig. 1.

and
Newfoundland/Labrador

Banding stations were operated at Grand Codroy and Birchy Basin
¹⁹⁴⁷⁻⁵¹
in Newfoundland during ~~the late 1940's and early 1950's~~ and in 1965-66, *respectively*.

A total of 1,392 black ducks and 1,663 green-winged teal were banded during
~~that time~~ ^{those periods}. Of the total ~~banded~~, 223 black ducks and 173 green-winged teal
~~have been recovered~~ ^{were}. In Labrador, banding stations were operated ~~during~~

⁽¹⁹⁴⁷⁻⁵¹⁾ ⁽¹⁹⁵⁴⁻⁵⁵⁾ ^(1962, 1966)
~~approximately the same periods~~ in Tinker Harbour, Nain, and Lobstick Lake.

A total of 922 black ducks and 405 green-winged teal were banded of which
222 black duck and 39 green-winged teal ^{*respectively*} ~~have been recovered~~ ^{were}.

Distribution of Recoveries

Baie Johan Beetz

Baie Johan Beetz ~~appears to~~ represents a major staging area for Black Duck and Green-winged Teal produced in eastern Quebec and Labrador where human populations and thus harvest are very low. Very few birds have been banded as locals at this station, and few recoveries have been reported from the area of banding ~~which tend to support this assumption~~. Total recoveries of Black Duck and Green-winged Teal from bandings at Baie Johan Beetz used for analysis in this report are 943 and 714 respectively.

Recoveries define a major migration route for both species south from Baie Johan Beetz to the Maritime Provinces and southwest to New England and the southern U.S.A. This route is shown in Figures 3 and 4. Variation in routes exist between Black Duck and Green-winged Teal. Black Duck appear to ~~migrate further south in the Maritimes and~~ contribute much more heavily to the harvest in southern Nova Scotia, than do Green-winged Teal, *which migrate through there earlier in the fall.* Also blacks do not migrate as far south or west in the U.S.A. as the teal although Black Duck recoveries have been received from Kentucky, Tennessee and California. Greenwings, on the other hand, ~~consistently~~ *and also westward across the south,* migrate south through the Mississippi Flyway, to Mississippi, Arkansas and Louisiana, in significant numbers. The largest harvest areas for Black Duck ^{are} ~~is~~ P.E.I. and southern Nova Scotia in Canada and from Maine to New Jersey in the U.S.A.; ~~therefore, it appears that~~ a significant proportion of the Black Duck harvested in P.E.I. and Nova Scotia are produced in eastern Quebec and Labrador. Green-winged Teal contribute most heavily to the harvest in P.E.I., eastern New Brunswick and the Saint John River in Canada

likely a misread number?

and in the Atlantic Coast states ^{from} south of New England ^{Smith} in the U.S.A. ^{Maine, New Jersey} North and ^{North and} Carolina, South Carolina, and Florida are the most significant harvest areas for greenwings.

In total, both species contribute ~~more~~ heavily to the U.S.A. ^{owing to the low hunting pressure in the immediate hunting area.} Over 60 percent of all recoveries of both species are from the U.S.A. Temporally, ^{the} greenwings are harvested ~~at a much higher rate~~ ^{falls off rapidly after} during early October in the Maritimes, ^{(Fig. 6) which} ~~this may suggest an earlier~~ migration by teal, thus making them ^{then later in} ~~available on opening day of~~ the hunting season. Unlike the teal, Black Duck are harvested most heavily between late November and early January. ~~This undoubtedly shows that the blacks~~ arrive in southern Nova Scotia prior to or during the late hunting season. ~~and likely form an important part of the wintering population. At the same~~ time, blacks also arrive in southern New England, New York and New Jersey ^{during} coinciding with prime hunting time. ^{All} in those areas ~~which~~ represent a major wintering grounds for Baie Johan Beetz Black Duck. Figures 5 and 6 show the temporal and geographic distribution of Black Duck and Green-winged Teal banded at Baie Johan Beetz.

^{T. G. T. in table of p. 8} Females of [?] both species are harvested more heavily in Canada than males suggesting that females migrate earlier and, therefore, arrive prior to opening day in the Maritimes. This is particularly true for Green-winged Teal which show ^{three-quarters of the birds} ~~the heaviest harvest rate occurs~~ during the first week of October. Black Duck of both sexes are most heavily harvested in southern Nova Scotia and the U.S.A. during December. The total number of recoveries of male Black Duck significantly exceeded females while the reverse was true for Green-winged Teal. Female Green-winged Teal are ^{more} apparently heavily harvested in the U.S.A. which may be a result of

Blacks (but not GWT)
M:F ratio higher in U.S. than Canada
" in N.S. than N.B.
" in N.B. than Que.

i.e. all shot men were breeding areas.

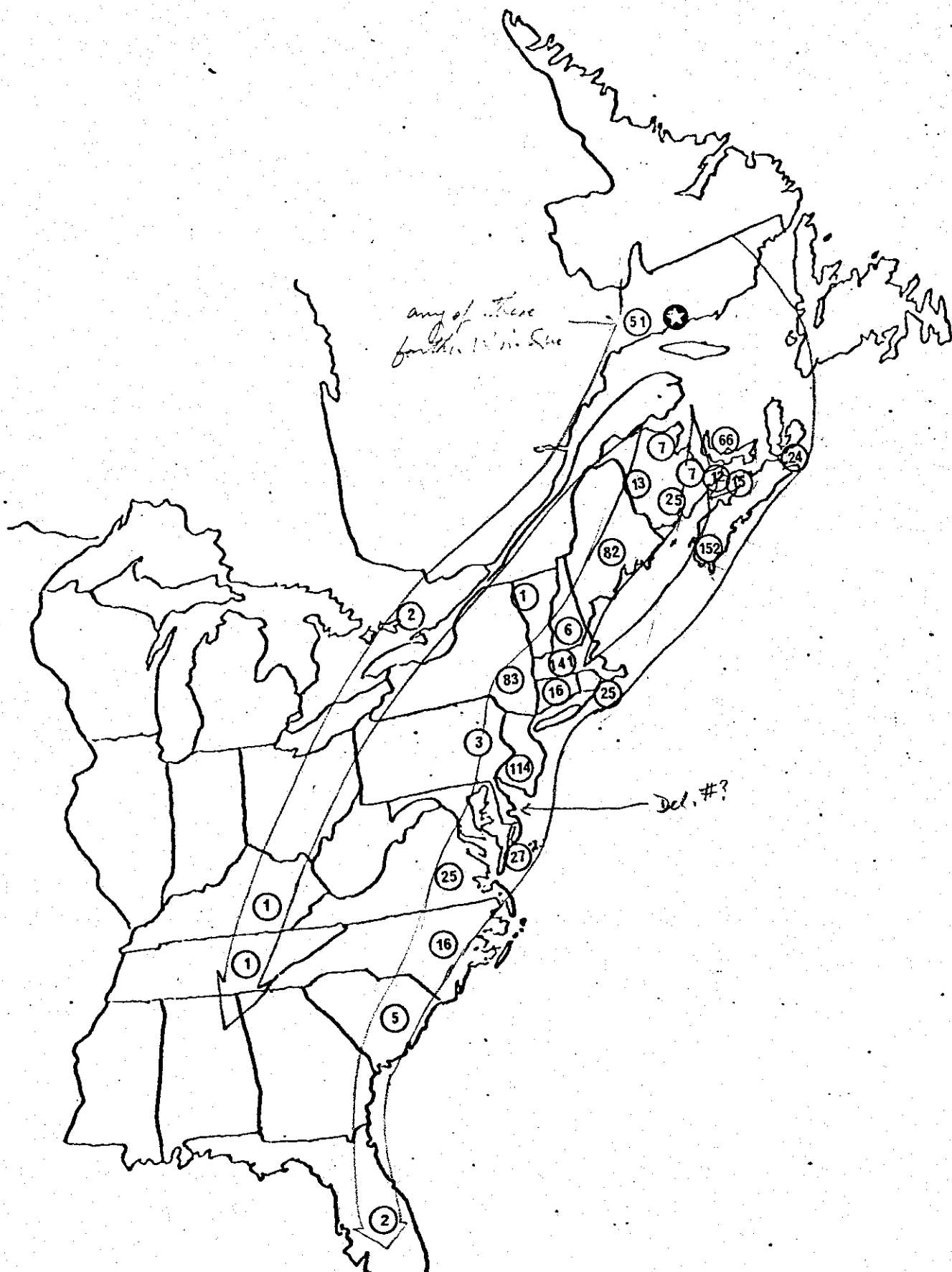


Figure 3. Geographic Distribution of Recoveries of Black Duck Banded at Baie Johan Beetz, Quebec.

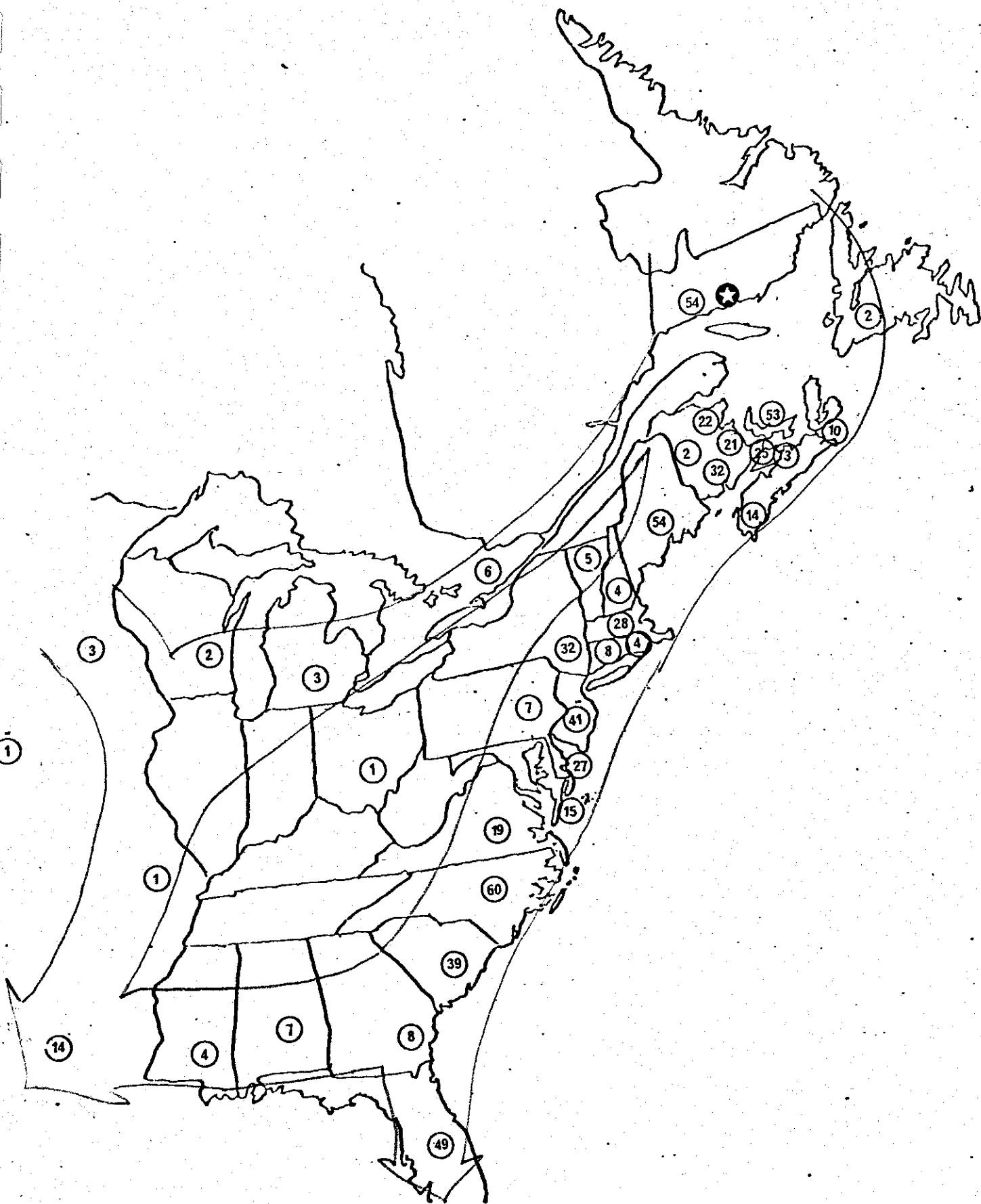


Figure 4. Geographic Distribution of Recoveries of Green-winged Teal Banded at Baie Johan Beetz, Quebec.

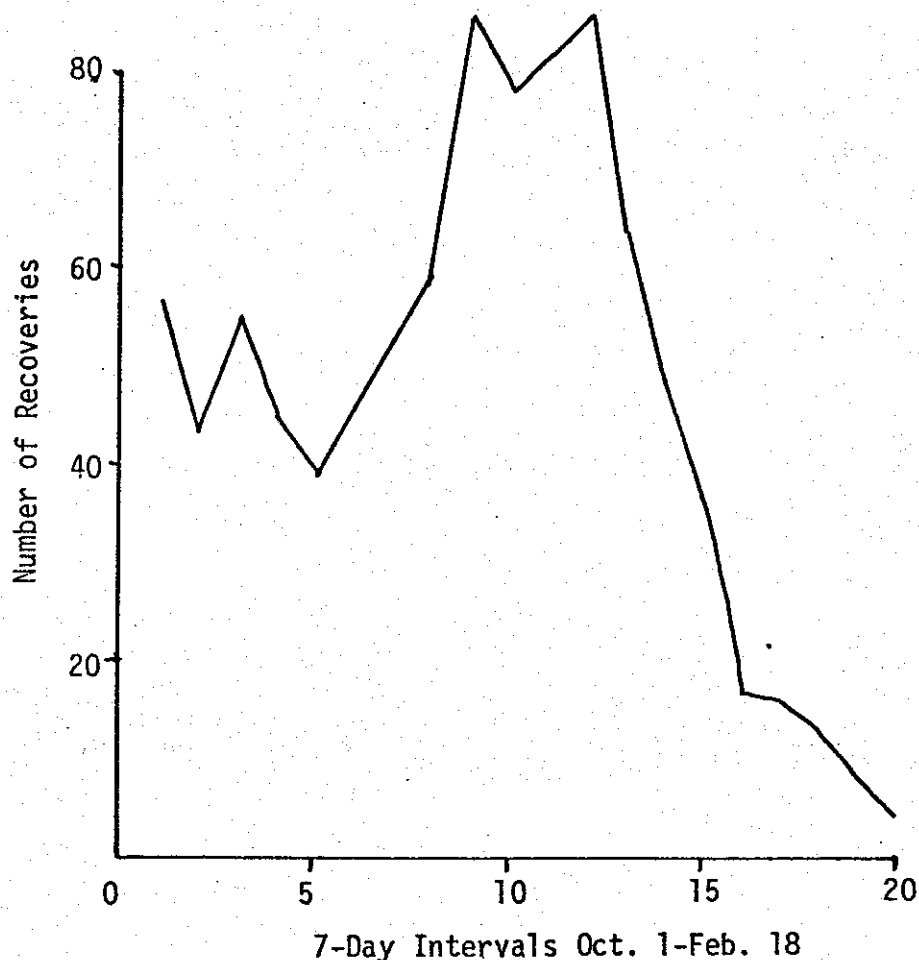


Figure 5. Temporal and Geographic Distribution of All Recoveries of All Black Duck Banded at Baie Johan Beetz, Quebec

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	374	39.7	4.9
P.E.I.	66	7.0	0.3
NB-NS	12	1.3	0.1
St. John River	25	2.6	0.6
S.E. New Brunswick	7	0.7	0.2
N.E. New Brunswick	7	0.7	0.4
Other New Brunswick	13	1.4	0.1
N.W. Nova Scotia	15	1.7	0.0
N.E. Nova Scotia	24	2.5	0.0
Southern Nova Scotia	152	16.2	0.1
Ontario	2	0.2	0.1
Quebec	51	5.4	2.9
USA Total	569	60.3	1.2
Maine	82	8.7	0.8
Massachusetts	141	14.9	0.1
Other New England	47	5.0	0.0
New York	83	8.8	0.1
New Jersey	114	12.1	0.0
Virginia	25	2.6	0.0
Maryland	27	2.9	0.0
Other USA	50	5.3	0.1
Grand Total	943	100	

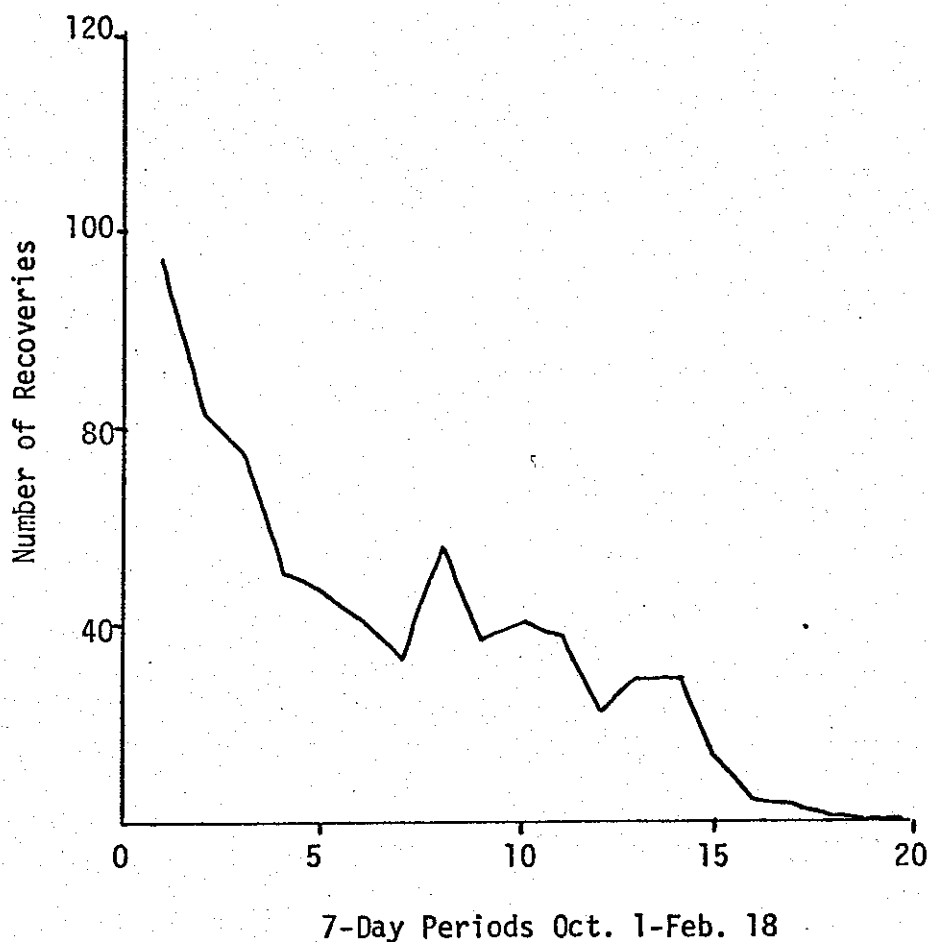


Figure 6. Temporal Distribution of All Recoveries of All Green-winged Teal Banded at Baie Johan Beetz

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	277	38.8	12.7
P.E.I.	53	7.4	2.1
NB-NS Border	25	3.5	1.2
St. John River	32	4.5	2.4
Other New Brunswick	45	6.3	2.8
S. Nova Scotia	37	5.2	0.6
Other Nova Scotia	23	3.2	0.7
Other Canada	62	8.7	2.9
USA Total	437	61.2	3.4
Maine	54	7.6	2.7
Massachusetts	28	3.9	
Other New England	21	2.9	
New Jersey	41	5.7	
New York	32	4.5	
North Carolina	60	8.4	
South Carolina	39	5.5	
Florida	49	6.9	
Other USA	113	15.8	.7
Grand Total	714	100	16.1

14 in Fig. 4

112 in Fig. 4

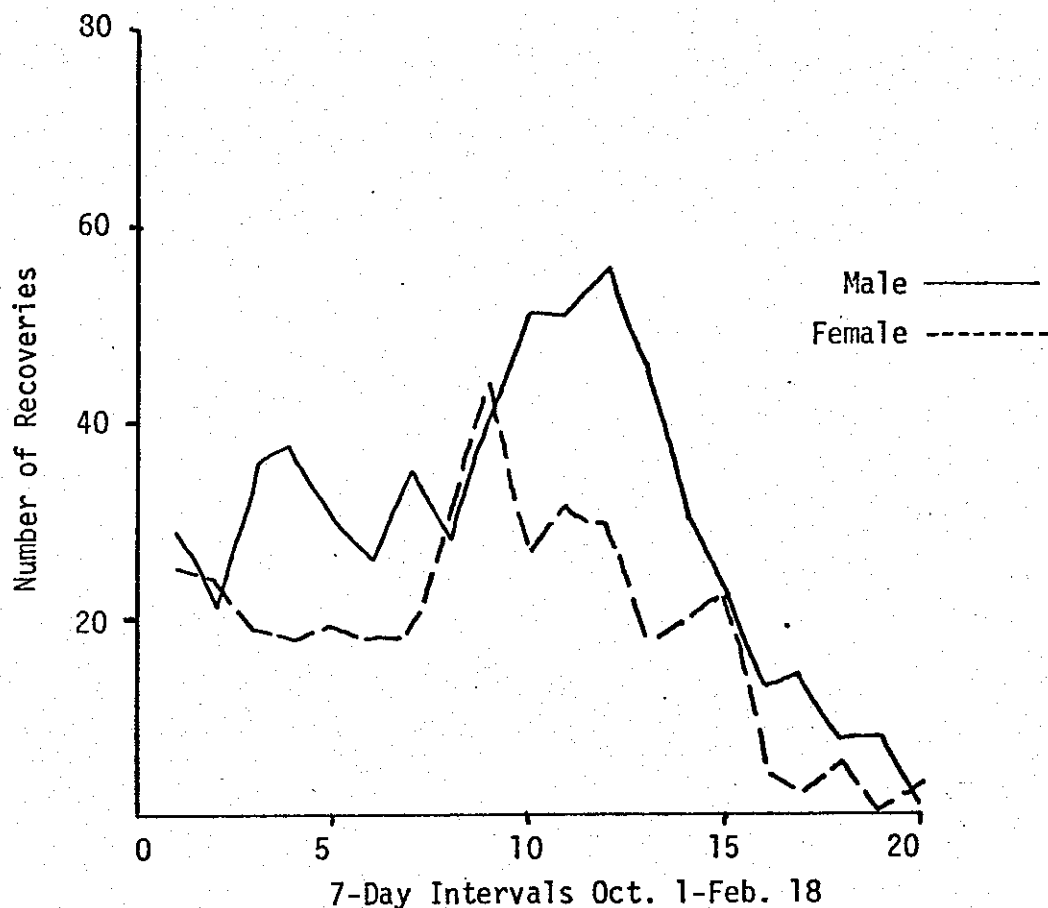


Figure 7. Temporal and Geographic Distribution of Recoveries of Male and Female Black Duck Banded at Baie Johan Beetz, Quebec

		Male			Female		
	Recovery Location	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.
378 here vs. 374 3 + 31 = 68 (vs. 66 in Fig. 3)	Canada Total	212	37.5	3.5	166	43.9	6.9
	P.E.I.	37	6.5	0.4	31	8.2	0.0 ?
	NB-NS	4	0.8	0.0	8	2.1	0.3
	St. John River	11	1.9	0.3	14	3.7	1.0
	SE N.B.	3	0.5	0.3	4	1.0	0.3
	NE N.B.	3	0.5	0.5	4	1.0	0.3
	Other N.B.	7	1.2	0.2	6	1.6	0.0
	NW N.S.	10	1.8	0.0	5	1.3	0.0
	NE N.S.	18	3.2	0.0	6	1.6	0.0
102 + 52 = 154 (vs. 152 in Fig. 3)	S. N.S.	102	18.1	0.0	52	13.8	0.3
	Ontario	1	0.2	0.2	1	0.3	0.0
	Quebec	16	2.8	1.6	35	9.3	4.7
565 here vs. 569 82 in Fig. 3	USA Total	353	62.5	1.6	212	56.1	0.5
	Maine	55	9.8	1.2	28	7.4	0.2
	Massachusetts	84	14.9	0.0	57	15.1	0.3
40 in Fig. 3	Other New England	29	5.1	0.0	18	4.8	0.0
83 in Fig. 3	New York	53	9.4	0.2	32	8.5	0.0
10 in Fig. 3	New Jersey	74	13.1	0.0	41	10.8	0.0
	Virginia	13	2.3	0.0	12	3.2	0.0
27 in Fig. 3	Maryland	16	2.8	0.0	9	2.4	0.0
2 in Fig. 3 (1 missing)	Other USA	29	5.1	0.2	15	3.9	0.0
	Grand Total	565			378		

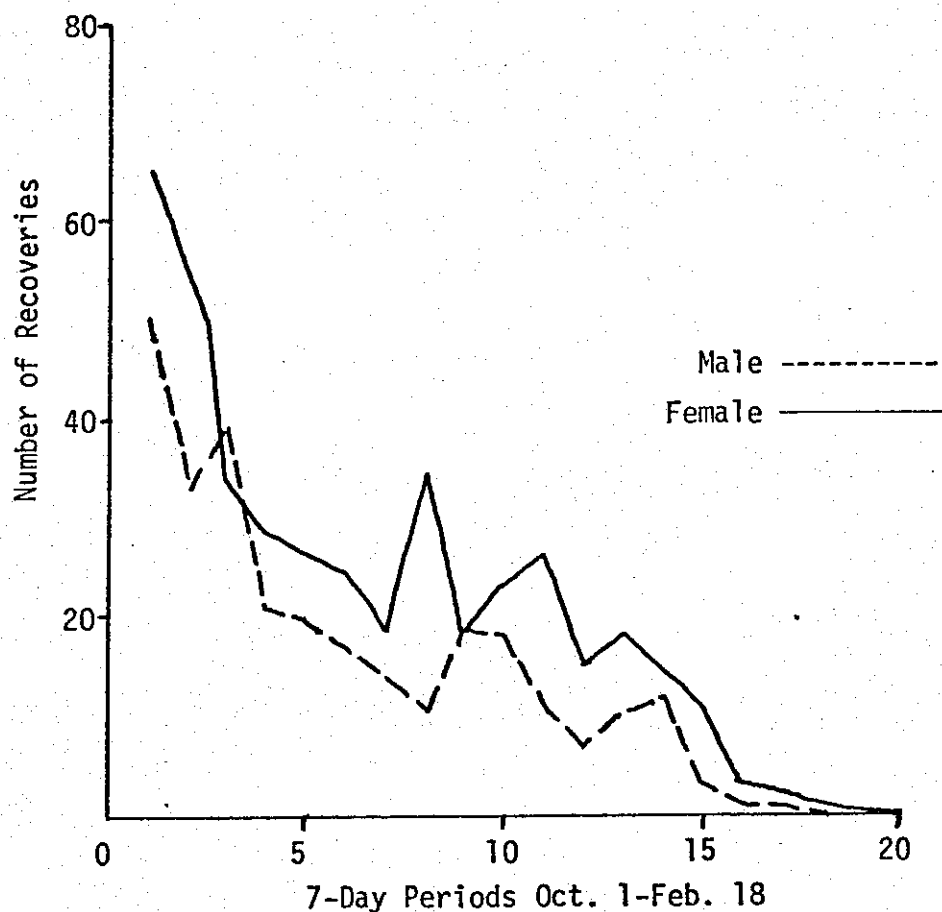


Figure 8. Temporal and Geographic Distribution of Male and Female Green-winged Teal Recoveries Banded at Baie Johan Beetz, Quebec

Recovery Location	Male			Female		
	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.
Canada Total	131	43.67	86.27	146	35.35	73.85
✓ P.E.I.	25	8.33	9.80	28	6.78	15.38
✓ NB-NS Border	12	4.00	5.88	13	3.15	7.69
✓ Saint John River	18	6.00	19.61	14	3.39	12.31
✓ Other N.B.	24	8.00	21.57	21	5.08	13.85
✓ S. Nova Scotia	14	4.67	3.92	23	5.57	3.08
✓ Other N.S.	11	3.67	5.88	12	2.90	4.62
✓ Other Canadian	27	9.00	19.61	35	8.47	16.92
4 in Fig. 6 - USA Total	169	56.33	13.73	267	64.65	26.15
✓ Maine	20	6.67	11.76	34	8.23	20.00
✓ Massachusetts	14	4.67		14	3.39	
✓ Other New England	5	1.67		16	3.87	
✓ New Jersey	14	4.67		27	6.54	
✓ New York	17	5.67		15	3.63	
✓ North Carolina	25	8.33		35	8.47	
✓ South Carolina	10	3.33		29	7.02	
✓ Florida	27	9.00		22	5.33	
Fig. 4 - Other U.S.A.	37	12.33		59	14.28	
Grand Total	300			413		

all 0's?

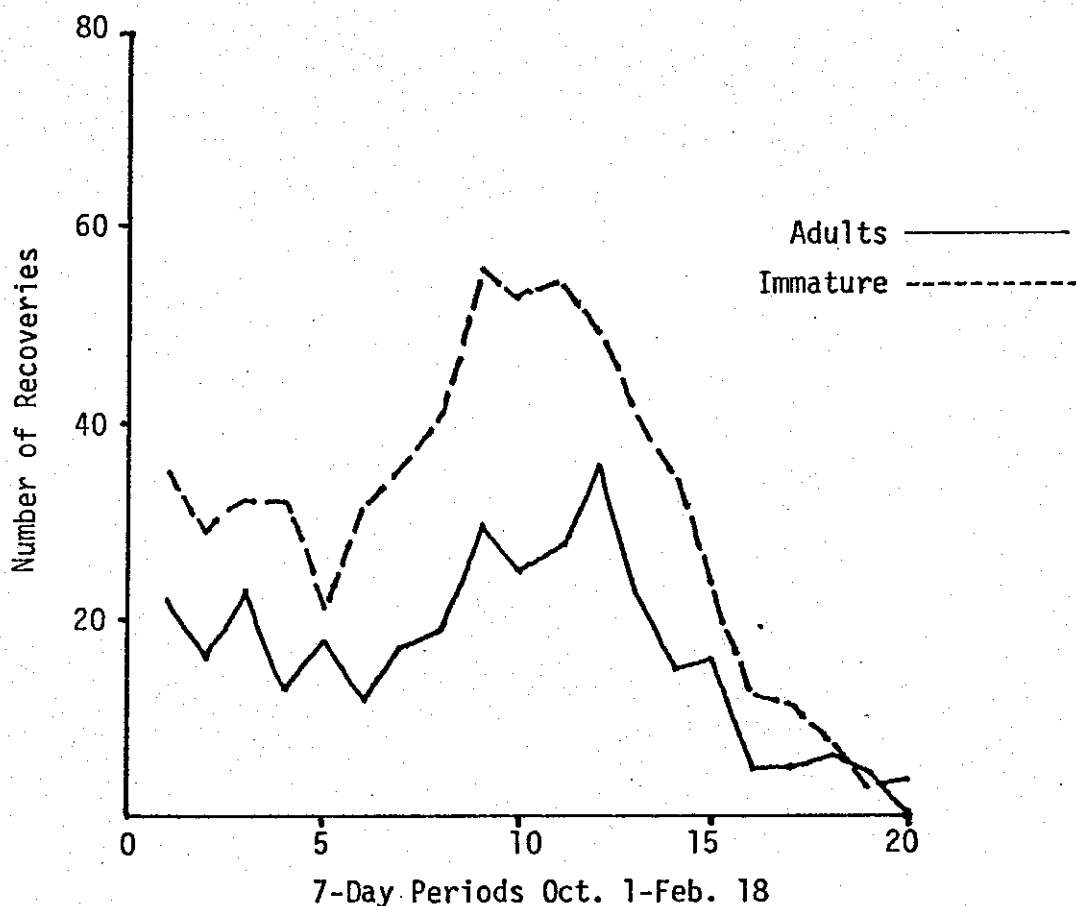


Figure 9. Temporal and Geographic Distribution of Recoveries of Adult and Hatching Year Black Duck Banded at Baie Johan Beetz, Quebec

Recovery Location	Adults			Hatching Year		
	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.
74 in Fig. 5 — Canada Total	116	33.7	4.7	253	42.2	5.0
66 in Fig. 3 — P.E.I.	15	4.4	0.0	53	8.8	0.5
✓ NB-NS	2	0.6	0.0	10	1.7	0.2
✓ St. John River	11	3.2	1.2	14	2.3	0.3
✓ SE N.B.	2	0.6	0.3	5	0.8	0.2
✓ NE N.B.	4	1.2	0.6	3	0.5	0.3
✓ Other N.B.	5	1.4	0.3	8	1.3	0.0
✓ NW N.S.	3	0.9	0.0	12	2.0	0.0
✓ NE N.S.	7	2.0	0.0	17	2.8	0.0
152 in Fig. 3 — S. Nova Scotia	54	15.6	0.0	100	16.8	0.2
1 in Fig. 3 — Ontario				1	0.2	
51 in Fig. 3 — Quebec	13	3.8	2.3	30	5.0	3.3
569 in Fig. 5 — USA Total	228	66.3	1.7	346	57.8	0.8
✓ Maine	44	12.8	1.6	38	6.3	0.3
141 in Fig. 3 — Massachusetts	55	16.0	0.0	85	14.2	0.2
48 in Fig. 3 — Other New England	19	5.5	0.0	28	4.8	0.0
✓ New York	20	5.8	0.0	63	10.6	0.3
14 in Fig. 3 — New Jersey	42	12.2	0.0	83	13.8	0.0
✓ Virginia	13	3.8	0.0	12	2.0	0.0
in Fig. 3 — Maryland	14	4.1	0.0	11	1.8	0.0
7 in Fig. 3 — Other USA	21	6.1	0.1	26	4.3	0.0
(Del. missing) Grand Total	344			599		

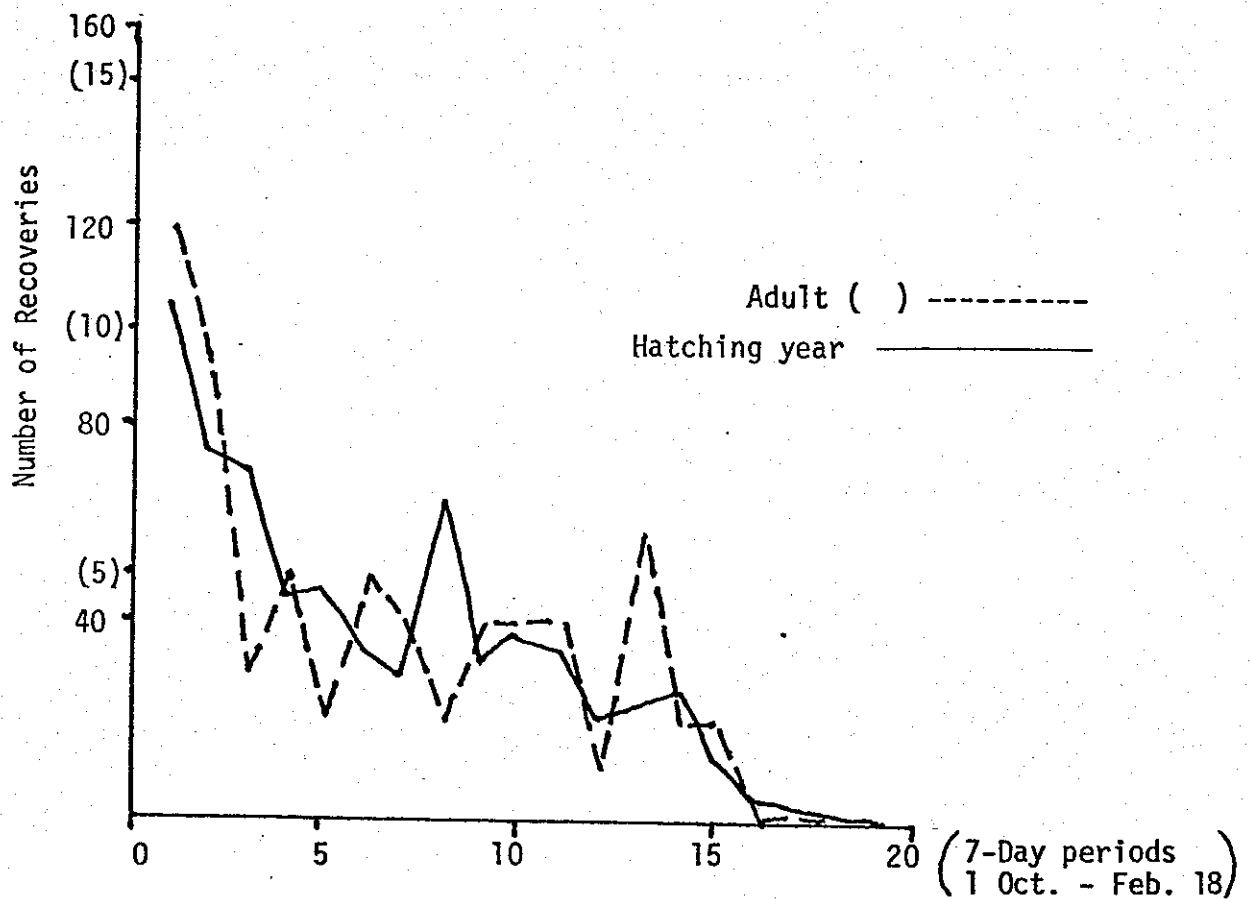


Figure 10. Temporal and Geographic Distribution of Adult and Hatching Year Green-winged Teal Banded at Baie Johan Beetz

Recovery Location	Hatching Year			Adult		
	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.
Canada Total	253	39.04	79.81	24	36.9	13.8
P.E.I.	47	7.25	12.50	6	9.3	3.2
NB-NS Border	23	3.55	6.73	2	3.1	1.5
Saint John River	29	4.48	14.42	3	4.6	4.6
Other N.B.	42	6.48	18.27	3	4.6	1.5
S. Nova Scotia	33	5.09	2.88	4	6.1	1.5
Other N.S.	19	2.93	4.81	4	6.1	1.5
Other Canadian	60	9.26	20.19	2	3.1	
USA Total	395	60.96	20.19	41	63.1	4.6
Maine	47	7.25	15.38	6	9.2	4.6
Massachusetts	29	6.48		0	0.0	
Other New England	20	3.09		1	1.5	
New Jersey	39	6.02		2	3.1	
New York	28	4.32		5	7.7	
North Carolina	55	3.49		5	7.7	
South Carolina	36	5.56		3	4.6	
Florida	39	6.02		9	13.8	
Other U.S.A.	102	15.74		10	15.3	
Grand Total	648			65		

musculata tail
(not 100%
rec. in 1st wk)

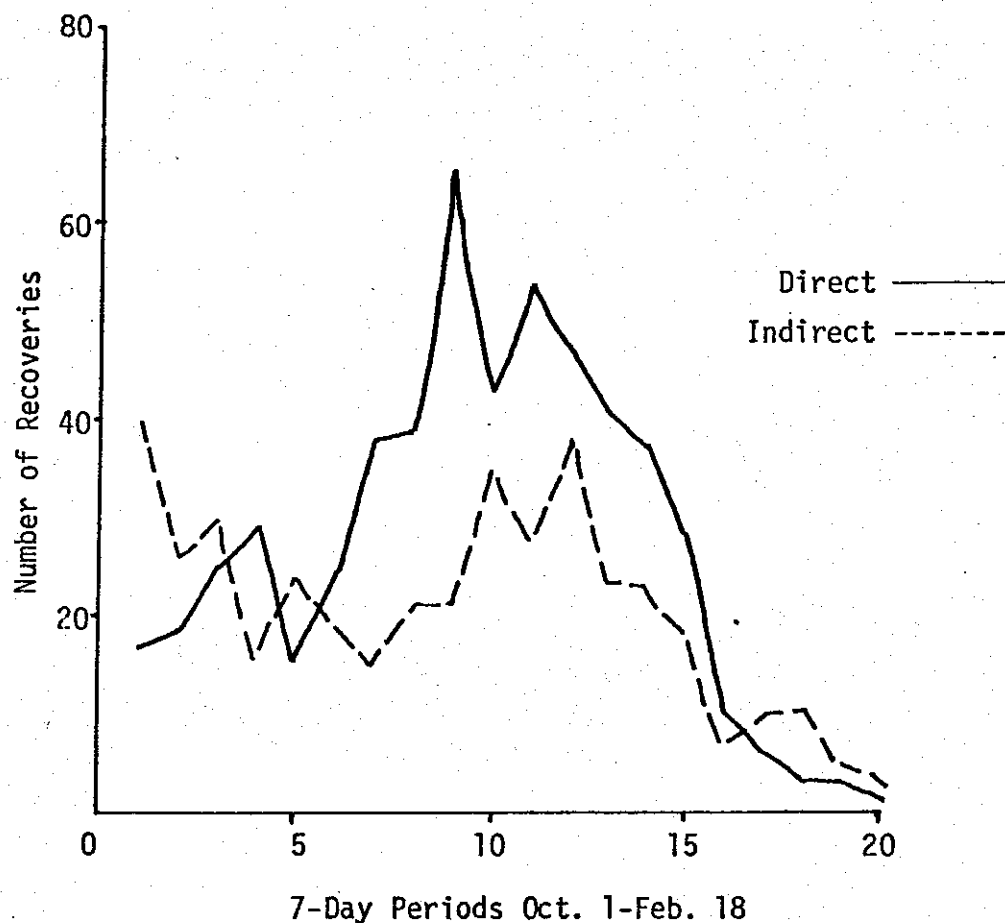


Figure 11. Temporal and Geographic Distribution of Direct and Indirect Recoveries of Black Duck Banded at Baie Johan Beetz, Quebec

Recovery Location	Direct			Indirect		
	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.
✓ Canada Total	206	39.2	2.5	168	40.2	7.9
✓ P.E.I.	31	5.9	0.0	35	8.5	0.7
✓ NB-NS	8	1.5	0.2	4	0.9	0.0
✓ St. John River	17	3.2	0.6	8	2.0	0.7
✓ S.E. N.B.	4	0.8	0.0	3	0.7	0.5
✓ N.E. N.B.	5	0.9	0.6	2	0.5	0.2
✓ Other N.B.	5	0.9	0.0	8	1.9	0.2
✓ N.W. Nova Scotia	11	2.1	0.0	4	0.9	0.0
✓ N.E. Nova Scotia	18	3.4	0.0	6	1.4	0.0
✓ S. Nova Scotia	88	16.9	0.2	64	15.3	0.0
✓ Ontario	1	0.2	0.0	1	0.2	0.2
✓ Quebec	18	3.4	0.9	33	7.9	5.4
✓ USA Total	319	60.8	0.3	250	59.8	1.8
✓ Maine	35	6.7	0.6	47	11.2	1.2
✓ Massachusetts	74	14.1	0.2	67	16.1	0.0
48 in Fig. 3 — Other New England	27	5.1	0.0	20	4.8	0.0
✓ New York	53	10.1	0.0	30	7.2	0.3
✓ New Jersey	75	14.3	0.0	39	9.3	0.0
✓ Virginia	18	3.4	0.0	7	1.7	0.0
✓ Maryland	13	2.5	0.0	14	3.3	0.0
28 of Del. in Fig. 3 — Other USA	24	4.6	0.0	26	6.2	0.3
Grand Total	525			418		

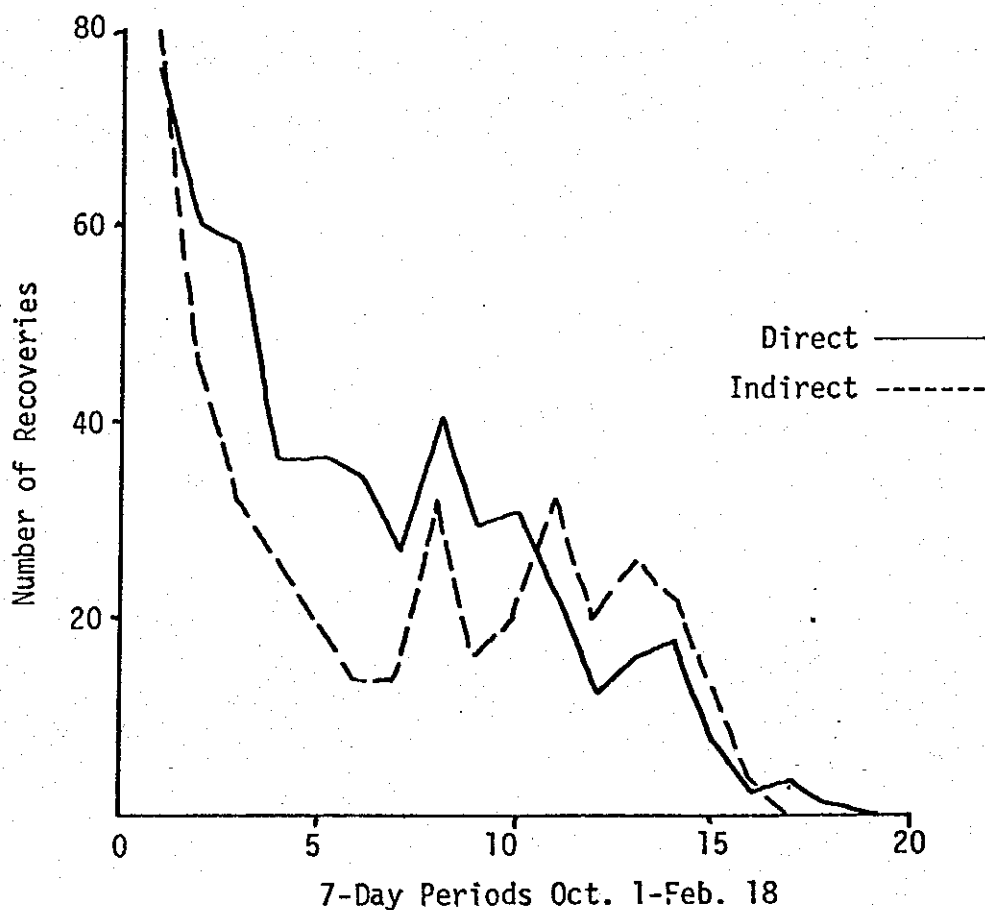


Figure 12. Temporal Distribution of Direct and Indirect Recoveries of All Green-winged Teal Banded at Baie Johan Beetz

Recovery Location	Direct			Indirect		
	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.	No. Rec.	% of Tot. Rec.	% Rec. 1st wk.
✓ Canada Total	217	43	12.9	60	28.7	12.4
✓ P.E.I.	40	7.9	1.7	13	6.2	2.9
✓ NB-NS Border	20	4	1.4	5	2.4	9.6
✓ St. John River	26	5.2	2.4	6	2.9	2.4
✓ Other N.B.	34	6.7	2.8	11	5.3	2.9
14 in Fig. 4 — S. Nova Scotia	34	6.7	0.8	3	1.4	0.0
✓ Other N.S.	15	3	0.6	8	3.8	9.6
✓ Other Canada	48	9.5	3.2	14	6.7	2.4
✓ USA Total	288	57	2.2	149	71.3	6.2
✓ Maine	40	7.9	2.2	14	6.7	3.8
✓ Massachusetts	25	5	0.0	3	1.4	0.0
✓ Other N.E.	15	3	0.0	6	2.9	0.0
✓ New Jersey	26	5.1	0.0	15	7.2	0.0
✓ New York	27	5.3	0.0	5	2.4	0.0
✓ North Carolina	37	7.3	0.0	23	11	0.0
✓ South Carolina	20	4.0	0.0	19	9.1	0.0
✓ Florida	33	6.5	0.0	16	7.6	0.0
12 in Fig. 4 — Other USA	65	12.9	0.0	48	23	2.4
Grand Total	505	100	15.1	209	100	18.6

differential migration (and a tendency for females to winter further south.)

Figures 7 and 8 show the temporal and geographic distribution of Black Duck and Green-winged Teal by sex.

A larger percentage of adult Black Duck and Green-winged Teal are harvested in the U.S.A. than hatching year birds. Hatching year Green-winged Teal have an exceptionally high recovery rate during the first week of October in the Maritime provinces. Recoveries of adult greenwings during that period is also high relative to Black Duck. This further supports the assumption that greenwings migrate earlier, and ~~thus~~ are available on opening day of the hunting season in the Maritimes and subjected to heavy harvest. Inexperienced and more abundant hatching year greenwings rate highest in the kill. Figures 9 and 10 show distribution of Black Duck and Green-winged Teal by age.

As expected, a larger percentage of indirect recoveries of both species are from the U.S.A. than direct recoveries. Other harvest rates and distribution patterns followed closely those demonstrated by the total recoveries. The only variation worthy of note may be in the case of recoveries of indirect female Green-winged Teal where over 79% of all recoveries were from the U.S.A. This is notably higher than any other group. Figures 11 and 12 show the temporal and geographic distribution of direct and indirect recoveries of Black Duck and Green-winged Teal, respectively.

Prince Edward Island

Unlike Baie Johan Beetz, Black Duck and Green-winged Teal banded on P.E.I. are ~~composed of a high percentage of~~ ^{predominantly} locally produced birds. This is particularly true for Black Duck as supported by recoveries of 300 locals. In total, 914 Black Duck and 191 Green-winged Teal recoveries

all winter S of Canada but relatively more 80% in N. Can. south than in New England bog.

PH NB No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

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have been obtained from bandings on P.E.I. All recoveries for which ~~one~~
~~or more of the following were unknown are excluded.~~ (1) recovery date; ~~or~~
~~(2) recovery coordinates; and (3) recovery information entirely lacking~~ ^{were} ~~were excluded~~
In addition, ~~most recoveries of unknown age are excluded since they~~
^{as were} ~~represent recaptures during intensive winter banding programs and are~~
~~not a result of sport harvest.~~

Black Duck recoveries define a migration route ^{west?} southward through
the Saint John River Valley and more prominently ^{south} ~~northwestern~~ Nova Scotia
to southern Nova Scotia and the southern New England States, New York and
New Jersey. The most southern extremity of the migration terminates in
North Carolina. Green-winged Teal migrate westerly ^{through} ~~to the~~ New Brunswick
~~Nova Scotia border area~~ and south through Nova Scotia to New England and
the southeastern states. A secondary route may exist along a westerly
course to Quebec and Ontario and south through Ohio and Kentucky to ~~Alabama,~~
~~Mississippi and as far west as~~ Louisiana, demonstrating a mixing with
Mississippi Flyway populations. Figures 13 and 14 show the geographic
distribution of recoveries of Black Duck and Green-winged Teal banded on
P.E.I.

Of the total number of recoveries of Black Duck banded on P.E.I.,
over 91% were recovered in the Maritimes with another 0.5% coming from
Quebec and Labrador. Over 80% of all recoveries were returned from P.E.I.;
however, in the case of Green-winged Teal only 48% of the total recoveries
were from the Maritimes with ~~slightly over~~ 36% being from P.E.I. Only 8.1%
of Black Duck recoveries are from the U.S.A. ^{compared} ~~opposed~~ to 52% for Green-
winged Teal. The temporal distribution of both species is similar with the
highest recovery rate occurring during the first week of October in Canada.

Again P.E.I. accounts for the largest proportion of first week recoveries for both species. U.S.A. recoveries, although more numerous in the case of Green-winged Teal, are distributed over a longer period at a lower rate of harvest. The rate of recovery of Black Duck increases late in January; however, much of that increase is attributed to recoveries obtained during the winter banding program and does not represent sport harvest. Figures 15 and 16 show the temporal and geographic distribution of Black Duck and Green-winged Teal banded on P.E.I. *significantly?*

less than 10% of total recoveries
how much without winter captures?
→ By age, a higher percentage (94.7) of adult Black Duck were recovered in Canada than either immatures (91.3) or locals (90.3). Of the Canadian recoveries, P.E.I. accounted for the largest percentage varying from 85.5% in adults and 81.7% in locals to 75.9% in immatures. Southern Nova Scotia was the second largest recovery area, accounting for 3.6% of the adults, 10.1% of the immatures and 6.0% of the locals. In the U.S.A., Massachusetts, New York and New Jersey accounted for the majority of the recoveries. Harvest of adults by sport hunting occurred primarily on P.E.I. during October. High numbers of recoveries occurring in late January and February were primarily attributed to recaptures during the winter banding program. Recovery peaks during late November and December were nearly all a result of harvest in southern Nova Scotia and the U.S.A. Figure 17 shows the temporal and geographic distribution of all adult Black Duck recoveries from birds banded on P.E.I. Recoveries of hatching year Black Duck were highest during October with 13.1% occurring during the first week compared to 6.0% for adults. As in adults most hatching year recoveries were from P.E.I. with the January-February peak being accounted for by recapture during the winter banding program (Figure 18). Recoveries

from southern Nova Scotia and the U.S.A. displayed the same temporal pattern as did adults.

The proportion of local Black Duck recovered during October was nearly three times (38.3% in the first week) that of hatching year birds. Thirty-seven percent of all banded local Black Duck were recovered during the first week of October on P.E.I. No first week recoveries were recorded from either southern Nova Scotia or ^{U S A} P.E.I. Some recoveries of locals were recorded from New England in late October; however, no recoveries were reported from southern Nova Scotia until mid-November (Figure 19).

Recoveries of both male and female Black Duck followed roughly the same geographic and temporal distribution pattern although the number of female recoveries ^{consistently} exceeded males ^{in all areas} by 162. A slightly higher percentage of males (22.9) were recovered in early October than females while more females tended to be recovered in January and February as a result of winter banding. Again over 90% of both males and females were recovered in Canada with most of those occurring on P.E.I. Figure 20 shows the temporal and geographic distribution of male and female Black Duck recoveries.

Direct recoveries of P.E.I. Black Duck were almost 2.5 times ~~greater than~~ the number of indirect recoveries. On a percentage basis direct Canadian recoveries were ^{7.1%} ~~12%~~ greater than indirect, and southern Nova Scotia was the only Canadian location where ^{the proportion of} indirect recoveries ^{that of} substantially surpassed direct recoveries. The highest recovery rate occurs during the first week of October for direct recoveries; but by mid-November both types were recovered at an approximately equal rate and follow a similar distribution pattern throughout the remainder of the year. Peaks of both types of recoveries in January and February are

again attributed to winter banding. Figure 21 shows the temporal and geographic distribution of direct and indirect recoveries of Black Duck banded on P.E.I. ^{It} In the case of Green-winged Teal, ^{more than half} ~~the majority~~ of direct recoveries were also taken in Canada while indirect recoveries were primarily from the U.S.A. For both types of recoveries, the highest rate occurred during the first week of October in Canada. In the U.S.A., states south of New England accounted for the majority of the recoveries. Recoveries from mid-November to mid-January occur primarily in the U.S.A. and at a closely similar rate throughout that period. Figure 22 compares the temporal and geographic distribution of direct and indirect recoveries of Green-winged Teal banded on Prince Edward Island.

Direct recoveries of Green-winged Teal males in all age classes were highest during early October in Canada; however, direct recoveries of adult and hatching year females were significantly higher in the U.S.A. through December and January. Direct recoveries of local females were several times greater in Canada early in the season than in the U.S.A. With the exception of hatching year males, all indirect recoveries were significantly greater in the U.S.A. Hatching year males showed similar recovery percentages in both direct and indirect with over 60 percent being recovered in Canada during early October. The percentage of hatching year males recovered on Prince Edward Island were notably greater for direct than indirect. Table 2 and Figures 23-25 compare the temporal and geographic distribution of direct and indirect recoveries of Green-winged Teal by sex and age.

Based on analyses of band recoveries of Prince Edward Island Black Duck, it is apparent that the Island population is ^{relatively} ~~highly~~ sedentary

Samples too small to be useful separately

insufficient
f BD
Section...

Harvest Locations for Black Duck Banded in Prince Edward Island

Location	% of Total Recoveries			
	All Ages	Adult	Imm.	Local
New Brunswick	1.8	0.4	0.7	0.7
Nova Scotia	9.2	1.7	5.4	2.1
P.E.I.	80.5	23.3	30.4	26.8
Other Canadian	0.5	0.3	0.1	0.1
New England	3.2	0.5	1.5	1.2
Other USA	5.0	0.8	2.1	2.1

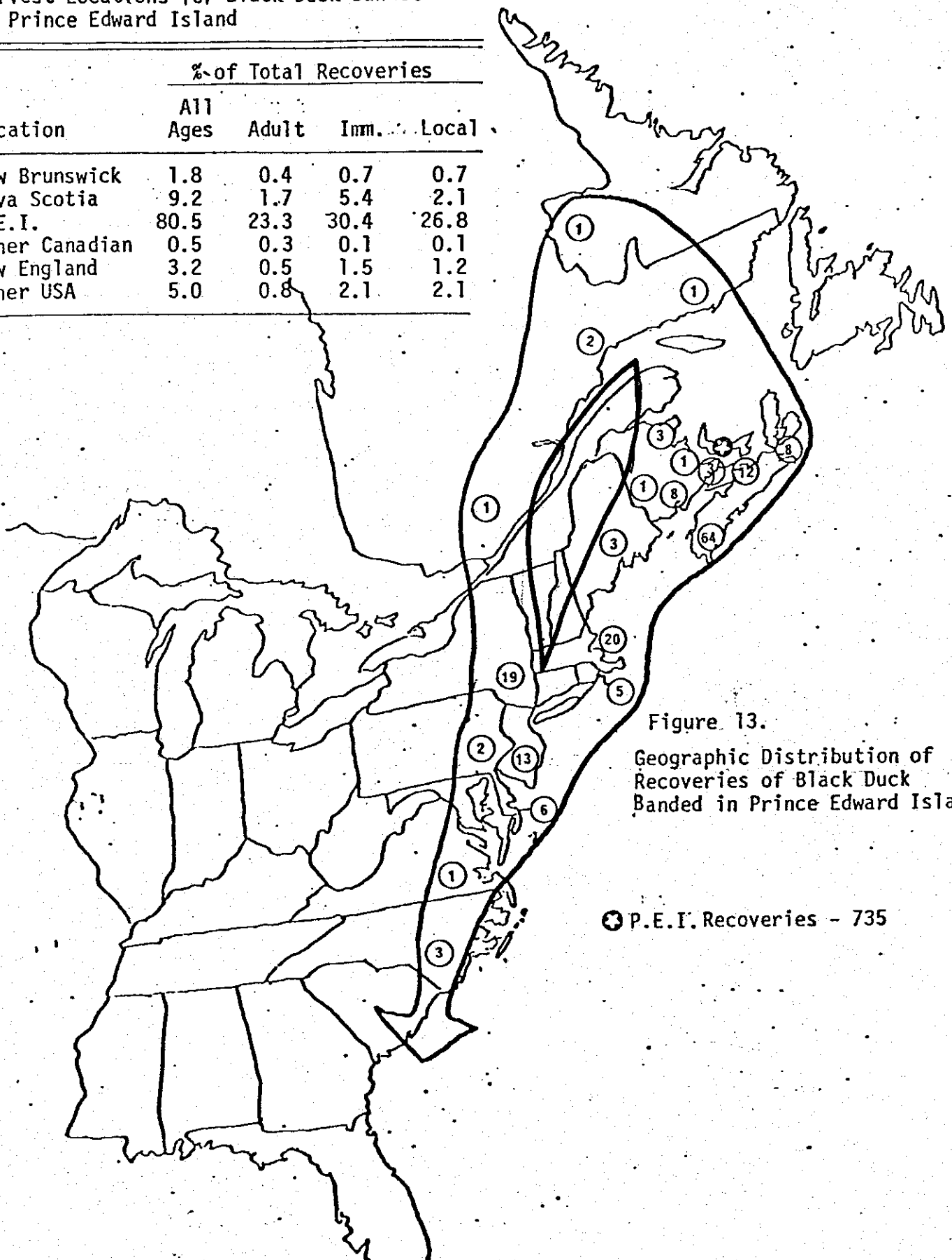


Figure 13.
Geographic Distribution of
Recoveries of Black Duck
Banded in Prince Edward Island

⊗ P.E.I. Recoveries - 735

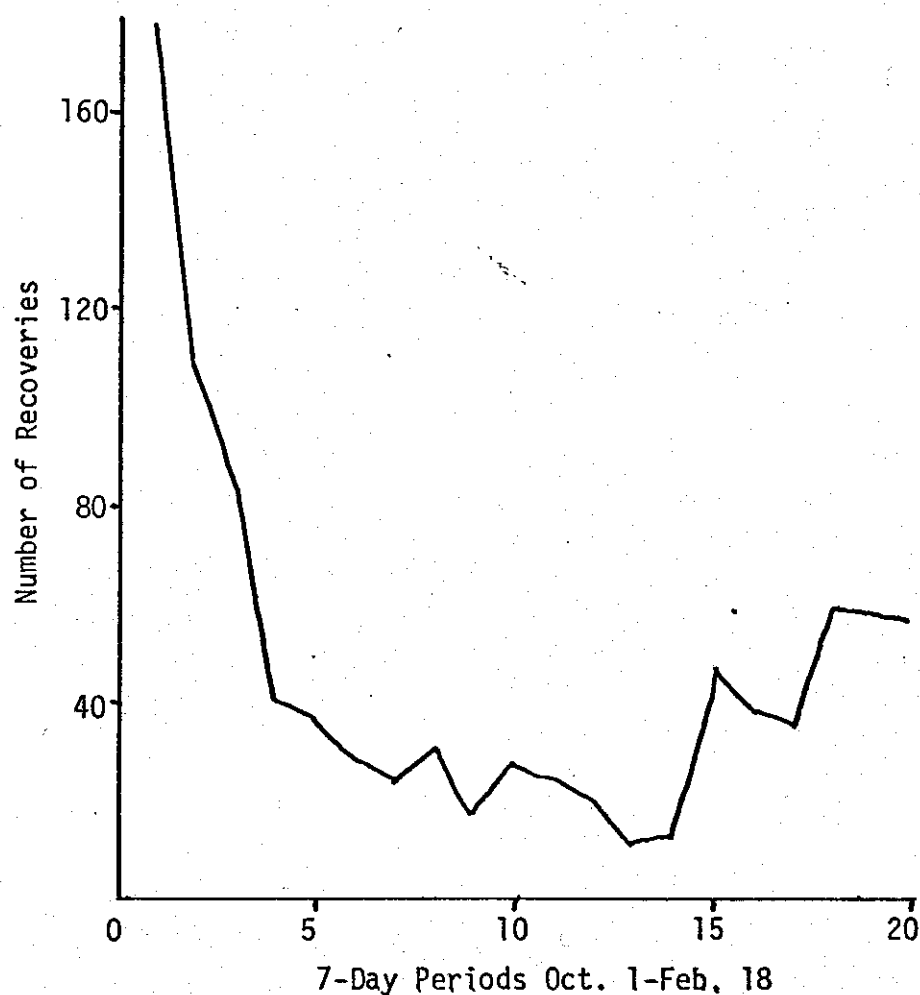


Figure 15. Temporal and Geographical Distribution of Total Recoveries of Black Duck Banded on Prince Edward Island

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	840	91.9	19.2
P.E.I.	735	80.5	17.9
NB-NS Border	3	0.3	0.2
St. John River	8	0.9	0.5
S.E. New Brunswick	1	0.1	0.0
N.E. New Brunswick	3	0.3	0.3
Other New Brunswick	1	0.1	0.0
N.W. Nova Scotia	12	1.3	0.1
N.E. Nova Scotia	8	0.9	0.0
Southern Nova Scotia	64	7.0	0.0
Other Canadian	5	0.5	0.2
USA Total	74	8.1	0.2
Massachusetts	20	2.2	0.0
Maine	3	0.3	0.0
Rhode Island	5	0.5	0.0
Other New England	2	0.2	0.0
New York	19	2.1	0.0
New Jersey	13	1.4	0.0
Other U.S.A.	12	1.3	0.2
Grand Total	914		

added in Fig. 13

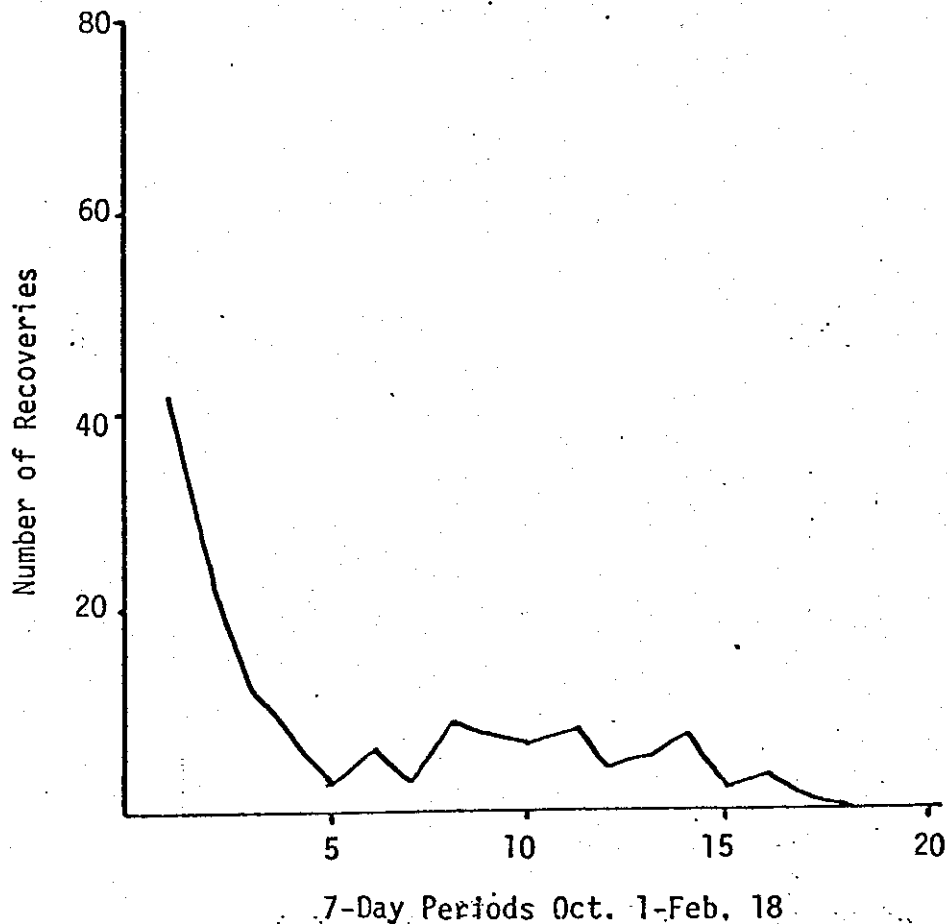
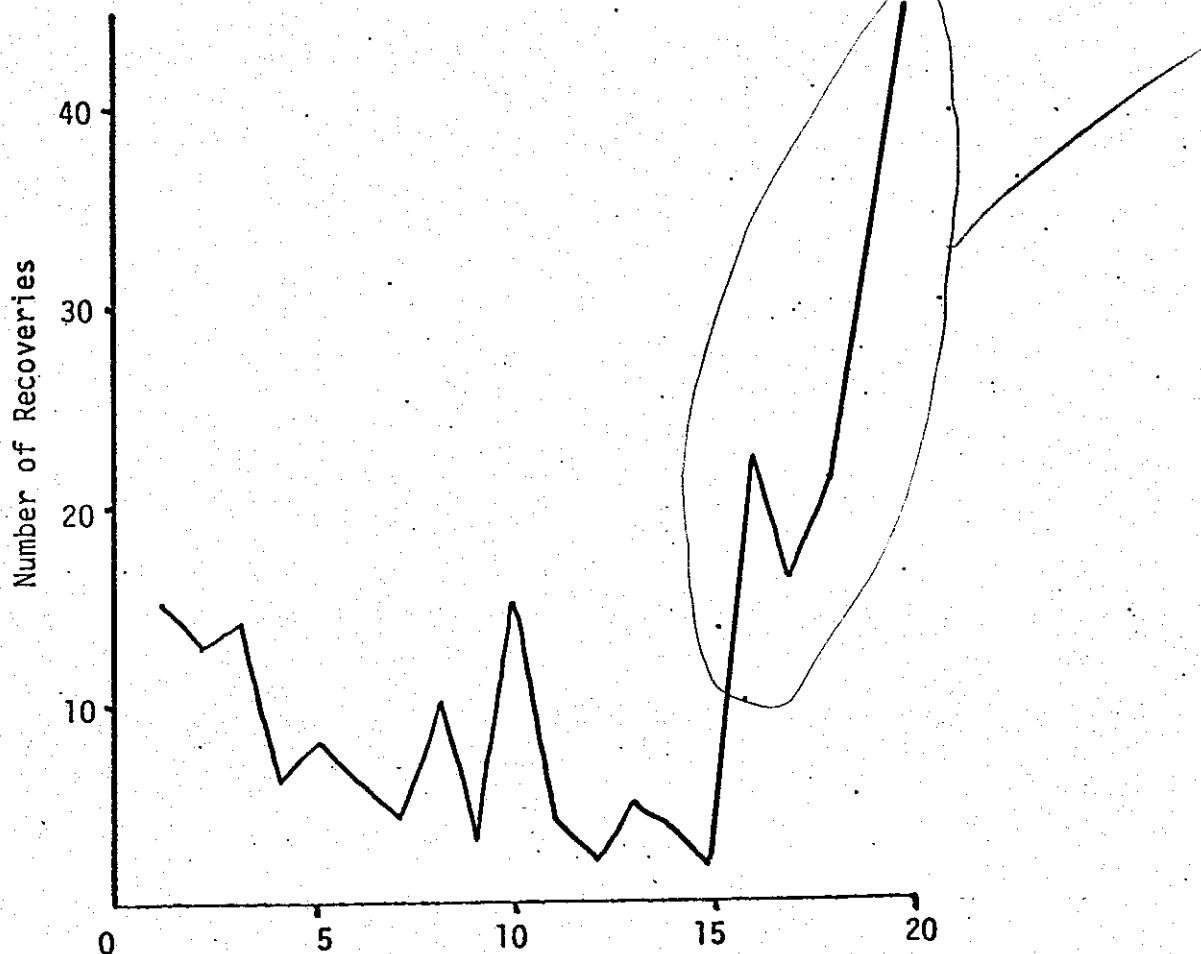


Figure 16. Temporal Distribution of All Recoveries of All Green-winged Teal Banded on Prince Edward Island.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	73	48	23.7
P.E.I.	55	36.2	17.1
NB-NS Border	6	3.9	2.6
St. John River	1	.7	.66
Other New Brunswick	5	3.3	1.3
Southern Nova Scotia	2	1.3	.66
Other Canada	2	1.3	.66
Other Nova Scotia	2	1.3	.66
USA Total	79	52	3.9
Maine	3	2	1.3
Massachusetts	2	1.3	0
Other New England	5	3.3	0
New Jersey	6	3.9	.6
New York	7	4.6	1.3
North Carolina	12	7.9	.6
South Carolina	7	4.6	0
Florida	9	5.9	0
Other U.S.A.	28	18.4	0
Grand Total	152	100	27.6



7-Day Periods Oct. 1-Feb. 18

Figure 17. Temporal Distribution of All AHY Black Duck Banded on Prince Edward Island

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	235	94.7	6.0
P.E.I.	212	85.5	4.4
✓ St. John River	1	0.4	0.4
✓ N.E. New Brunswick	3	1.2	1.2
✓ N.W. Nova Scotia	4	1.6	0.0
✓ N.E. Nova Scotia	3	1.2	0.0
✓ Southern Nova Scotia	9	3.6	0.0
✓ Other Canadian	3	1.2	0.0
✓ USA Total	13	5.3	0.0
✓ Maine	1	0.4	0.0
— Massachusetts	3	1.2	0.0
— Other New England	1	0.4	0.0
✓ New York	4	1.7	0.0
✓ New Jersey	2	0.8	0.0
— Other USA	2	0.8	0.0
Grand Total	248		

for Fig. 17-19 continued

2-9+7=20 in Fig. 13

3+3=6 in Fig. 13

3-6+5=12 in Fig. 13

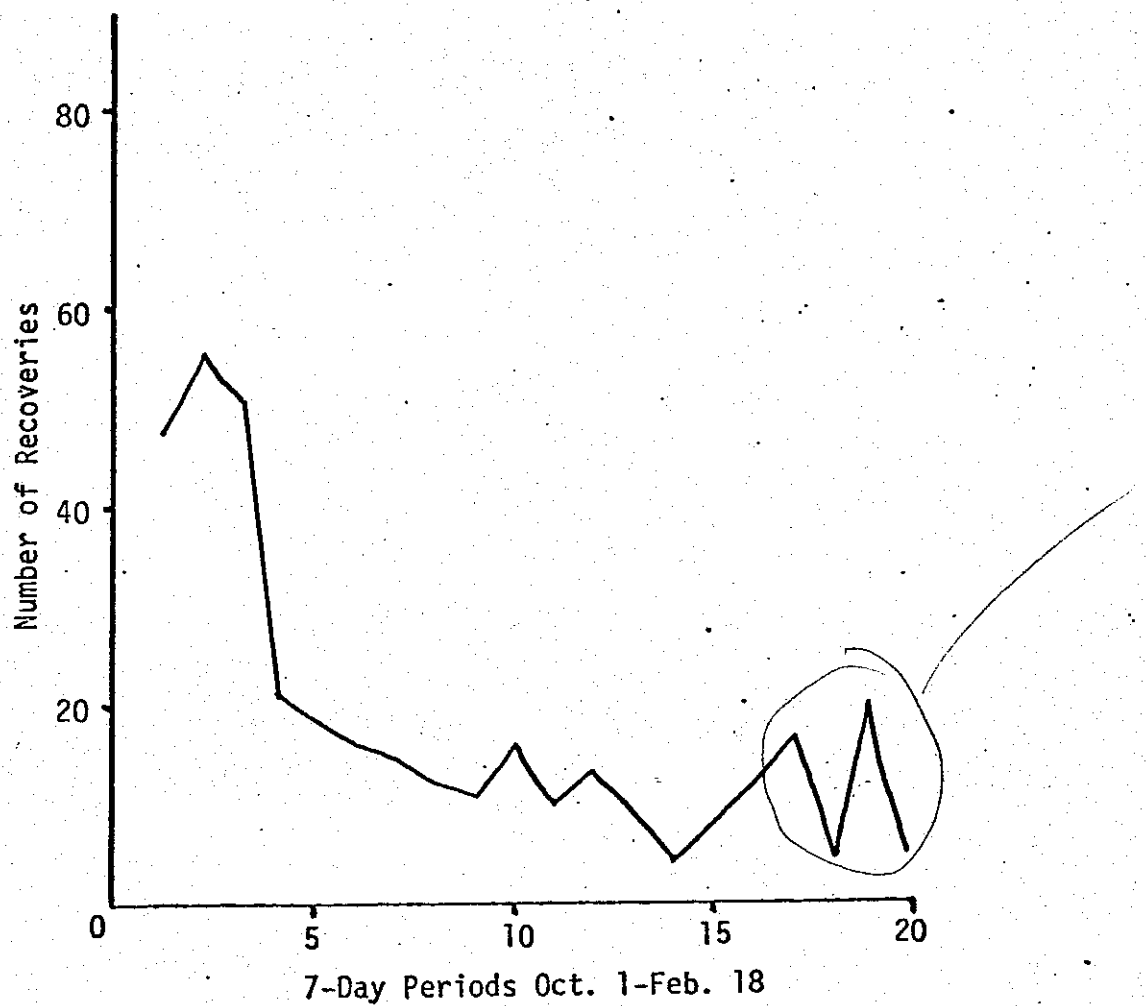


Figure 18. Temporal Distribution of All HY Black Duck Banded on Prince Edward Island

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	334	91.3	12.6
P.E.I.	278	75.9	11.2
✓ NB-NS Border	1	0.3	0.0
✓ St. John River	4	1.1	0.8
✓ S.E. New Brunswick	1	0.3	0.0
✓ N.W. Nova Scotia	8	2.2	0.3
✓ N.E. Nova Scotia	4	1.1	0.0
✓ Southern Nova Scotia	37	10.1	0.0
✓ Other Canadian	1	0.3	0.3
✓ USA Total	32	8.7	0.5
✓ Maine	2	0.5	0.0
Massachusetts	9	2.5	0.3
Other New England	3	0.8	0.0
✓ New York	9	2.5	0.0
✓ New Jersey	3	0.8	0.0
Other USA	6	1.6	0.2
Grand Total	366		

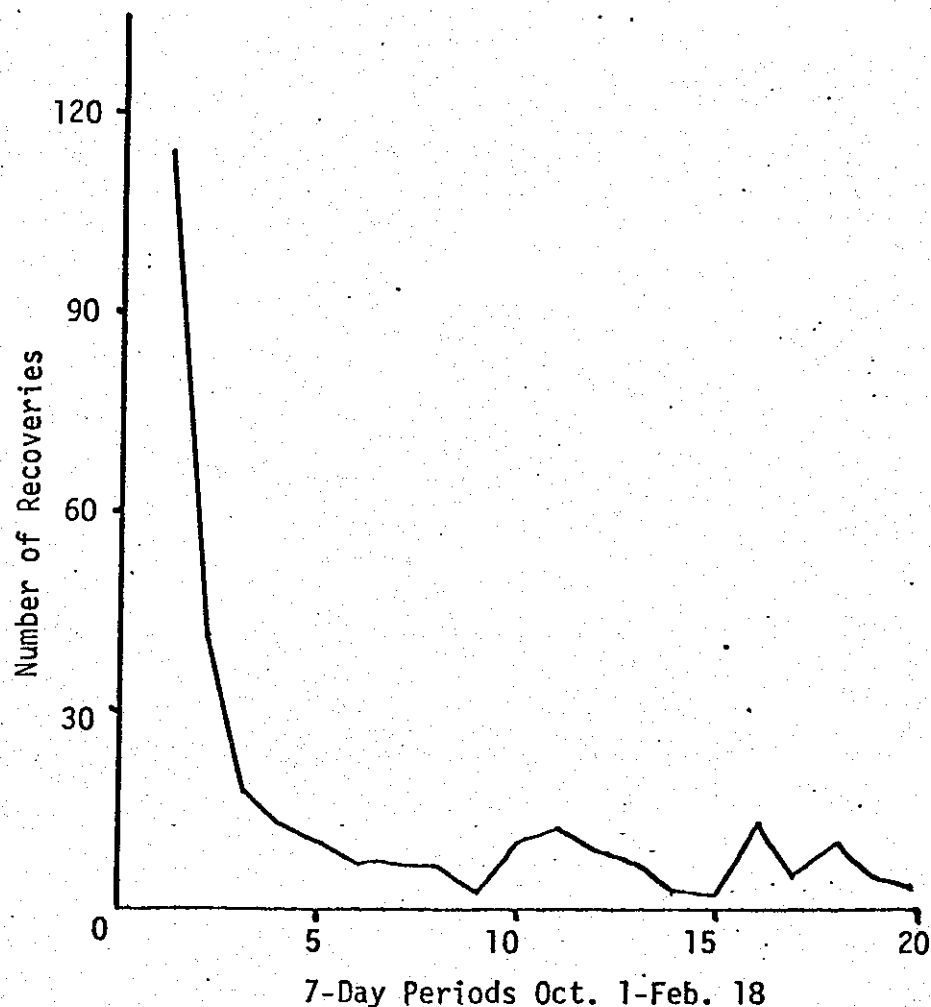


Figure 19. Temporal Distribution of All Recoveries of All Local Black Duck Banded on Prince Edward Island

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	271	90.3	38.3
P.E.I.	245	81.7	37.0
✓ NB-NS Border	2	0.7	0.7
✓ St. John River	3	1.0	0.3
✓ Other New Brunswick	1	0.3	0.3
✓ N.E. Nova Scotia	1	0.3	0.0
✓ Southern Nova Scotia	18	6.0	0.0
✓ Other Canadian	1	0.3	0.0
✓ USA Total	29	9.7	0.0
Massachusetts	7	2.3	0.0
Rhode Island	3	1.0	0.0
✓ New York	6	2.0	0.0
✓ New Jersey	8	2.7	0.0
Other USA	5	1.7	0.0
Grand Total	300		

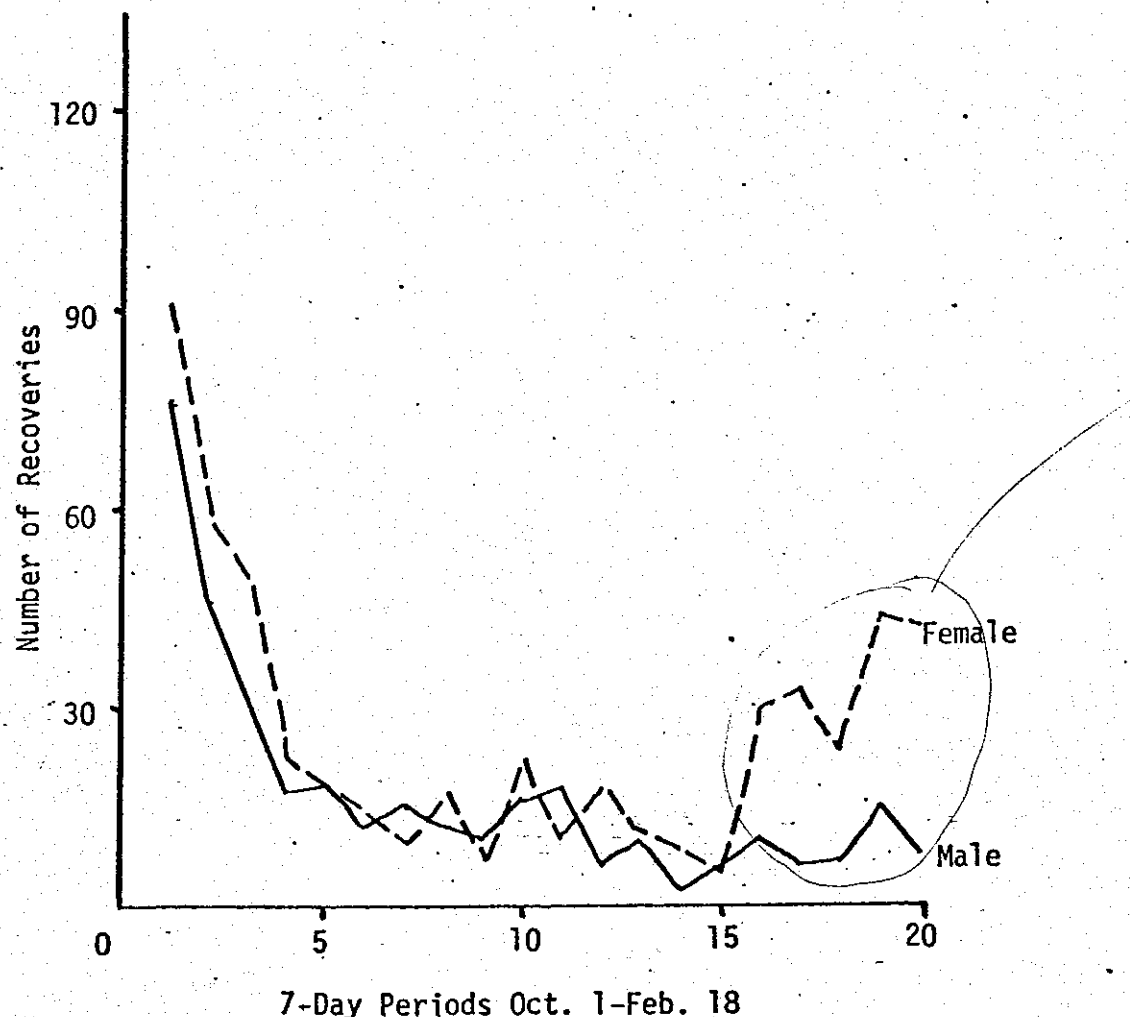


Figure 20. Temporal Distribution of All Recoveries of Male and Female Black Duck Banded on Prince Edward Island.

Recovery Location	Number of Recoveries		% of Total Recoveries		% Recoveries 1st week	
	Male	Female	Male	Female	Male	Female
✓ Canada Total	346	494	92.0	91.8	22.9	16.7
P.E.I.	309	426	82.2	79.2	22.1	14.9
NB-NS Border	1	2	0.3	0.4	0.0	0.4
St. John River	3	5	0.7	0.9	0.8	0.6
N.E. New Brunswick	0	3	0.0	0.5	0.0	0.6
S.E. New Brunswick	1	0	0.3	0.0	0.0	0.0
Other New Brunswick	0	1	0.0	0.2	0.0	0.0
N.W. Nova Scotia	4	8	1.2	1.5	0.0	0.2
N.E. Nova Scotia	0	8	0.0	1.5	0.0	0.0
Southern Nova Scotia	25	39	6.6	7.2	0.0	0.0
Other Canadian	3	2	0.7	0.4	0.0	0.0
✓ USA Total	30	44	8.0	8.2	0.2	0.2
Maine	0	3	0.0	0.5	0.0	0.0
Massachusetts	8	12	2.2	2.2	0.0	0.0
Other New England	5	2	1.3	0.4	0.2	0.0
New York	6	13	1.6	2.5	0.0	0.0
New Jersey	6	7	1.6	1.3	0.0	0.0
Other USA	5	7	1.3	1.3	0.0	0.2
Grand Total	376	538				

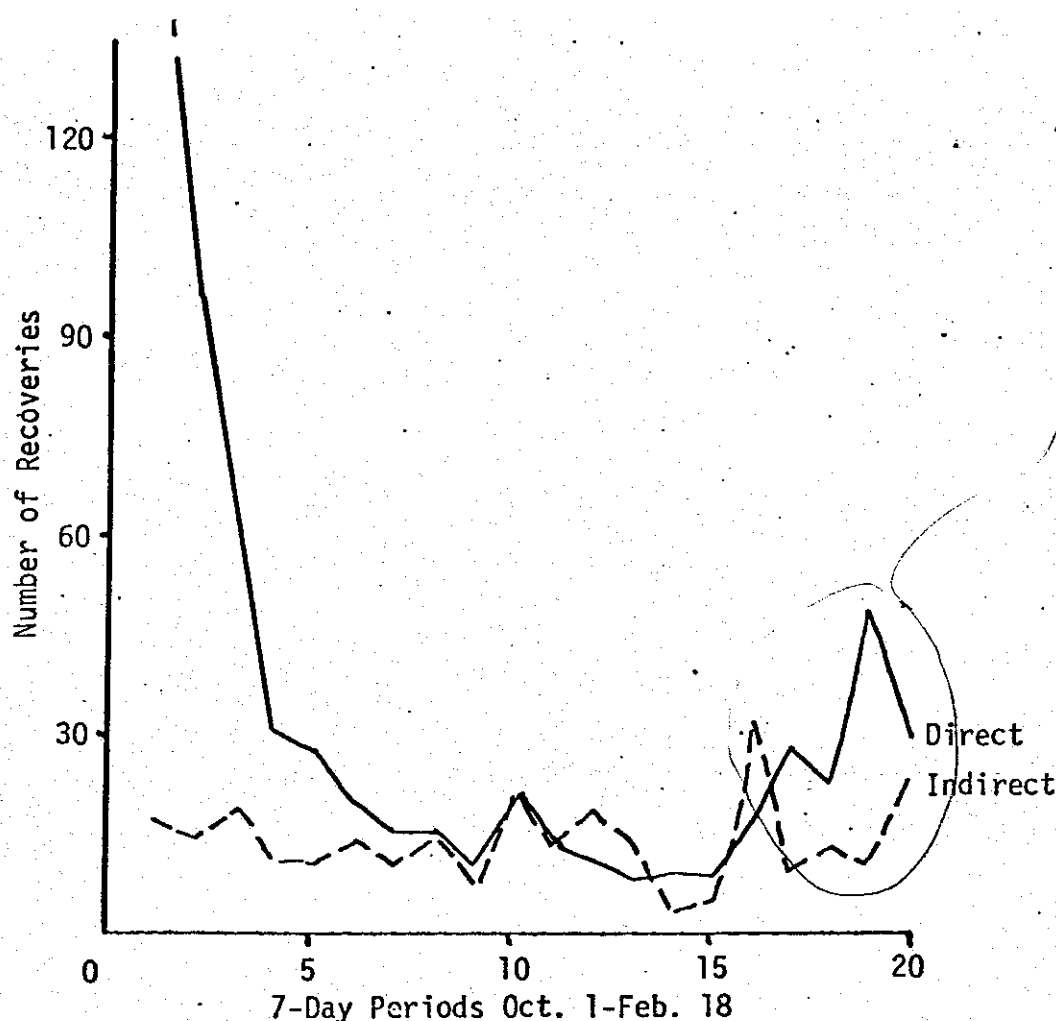


Figure 21. Temporal Distribution of All Direct and Indirect Recoveries of Black Duck Banded on Prince Edward Island

Recovery Location	Number of Recoveries		% of Total Recoveries		% Recoveries 1st week	
	Dir.	Ind.	Dir.	Ind.	Dir.	Ind.
✓ Canada Total	608	232	94.0	86.9	24.7	6.0
✓ P.E.I.	545	190	84.2	71.2	23.0	5.2
✓ NB-NS Border	3	0	0.5	0.0	0.3	0.0
✓ St. John River	5	3	0.8	1.1	0.6	0.4
✓ N.E. New Brunswick	3	0	0.5	0.0	0.5	0.0
✓ S.E. New Brunswick	1	0	0.1	0.0	0.0	0.0
✓ Other New Brunswick	1	0	0.1	0.0	0.0	0.0
✓ N.W. Nova Scotia	9	3	1.4	1.1	0.1	0.0
✓ N.E. Nova Scotia	4	4	0.6	1.5	0.0	0.0
✓ Southern Nova Scotia	33	31	5.2	11.6	0.0	0.0
✓ USA Total	39	35	6.0	13.1	0.1	0.4
✓ Maine	1	2	0.2	0.7	0.0	0.0
20 in Fig. 13 — Massachusetts	10	9	1.6	3.5	0.0	0.0
5 in Fig. 13 — Other New England	4	3	0.6	1.1	0.1	0.0
✓ New York	8	11	1.2	4.1	0.0	0.0
13 in Fig. 13 — New Jersey	8	6	1.2	2.2	0.0	0.0
✓ Other USA	8	4	1.2	1.5	0.0	0.4
Grand Total	647	267				

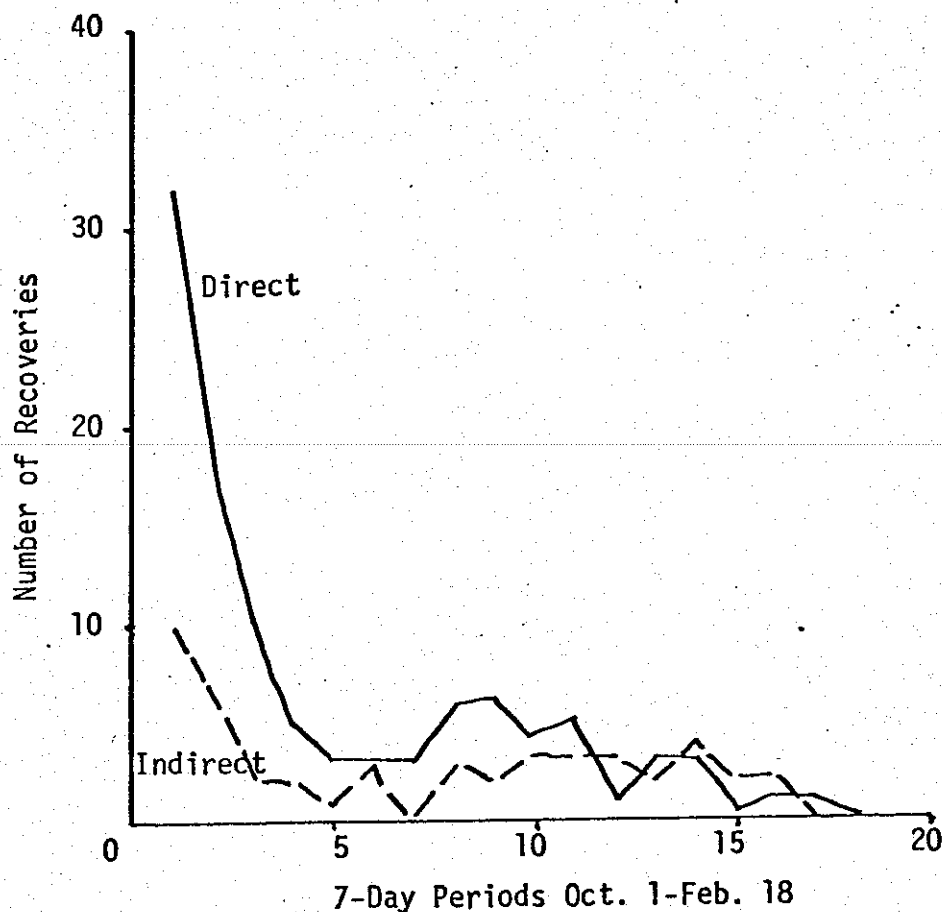


Figure 22. Temporal Distribution of Direct and Indirect Recoveries of All Green-winged Teal Banded in Prince Edward Island.

Recovery Location	Number of Recoveries		% of Total Recoveries		% Recoveries 1st week	
	Dir.	Ind.	Dir.	Ind.	Dir.	Ind.
✓ Canada Total	58	15	55.8	31.3	26.9	16.7
✓ P.E.I.	49	6	47.1	12.5	22.1	6.2
✓ NB-NS Border Area	4	2	3.8	4.2	2.9	2.1
✓ St. John River	0	1	0.0	2.0	0.0	2.1
✓ Other New Brunswick	4	1	3.8	2.1	1.0	2.1
5 in Fig. 14 — Southern Nova Scotia	0	2	0.0	4.2	0.0	2.1
✓ Other Nova Scotia	1	1	1.0	2.1	1.0	0.0
✓ Other Canadian	0	2	0.0	4.2	3.8	2.1
✓ USA Total	46	33	44.2	68.7	1.9	4.2
✓ Maine	3	0	2.9	0.0	0.0	0.0
✓ Massachusetts	1	1	1.0	2.1	0.0	0.0
4 in Fig. 14 — Other New England	4	1	3.8	2.1	0.0	0.0
✓ New Jersey	4	2	3.8	4.2	1.9	2.1
✓ New York	5	2	4.8	4.2	0.0	0.0
✓ North Carolina	4	8	3.8	16.6	0.0	2.1
✓ South Carolina	3	4	2.9	8.3	0.0	0.0
✓ Florida	7	2	6.7	4.2	0.0	0.0
30 in Fig. 14 — Other USA	15	13	14.4	27.0	0.0	0.0
Grand Total	104	48				

Figure 23. Temporal Distribution of Indirect Recoveries of AHY Female Green-winged Teal Banded on Prince Edward Island.

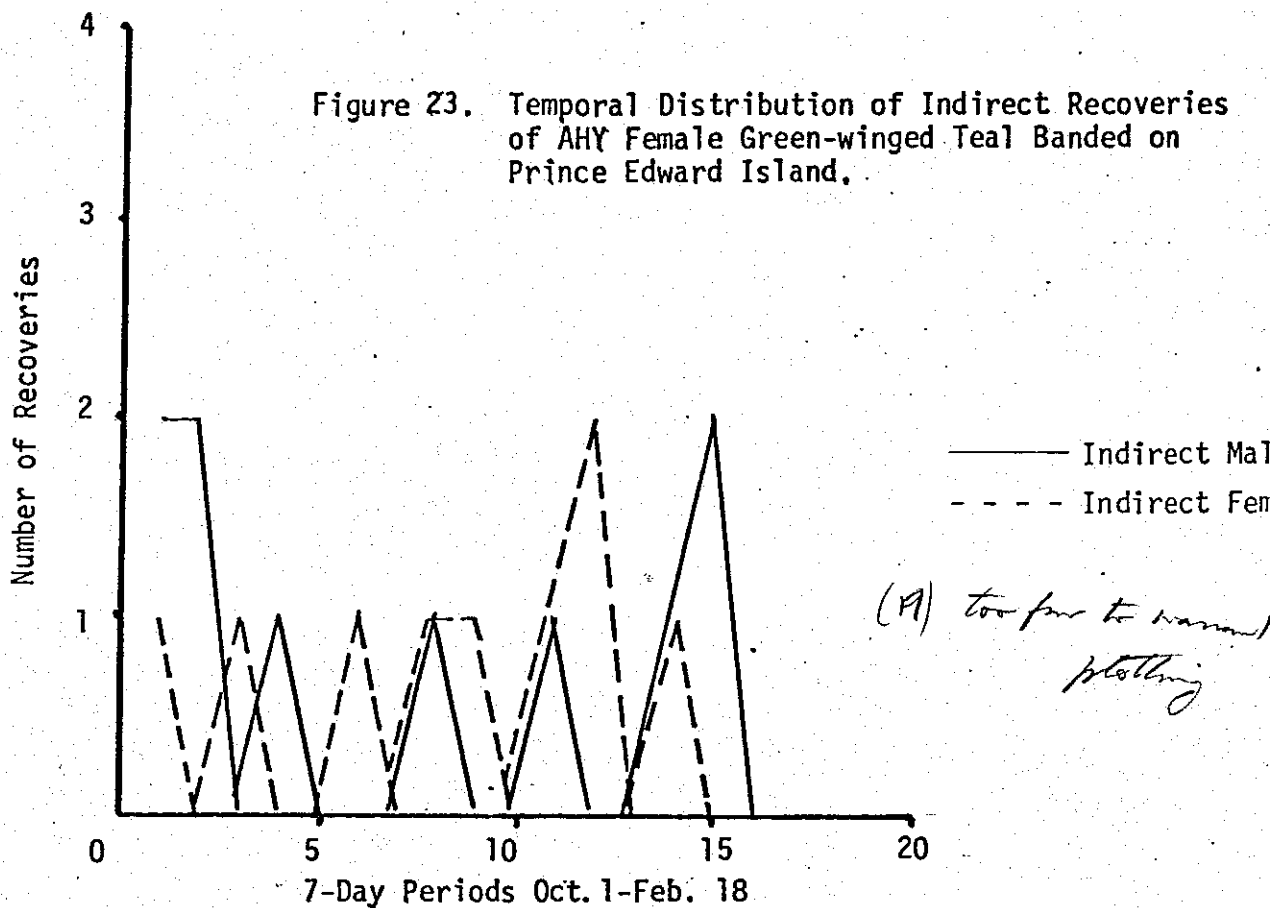


Figure 23B. Temporal Distribution of Direct Recoveries of AHY Green-winged Teal Banded on Prince Edward Island.

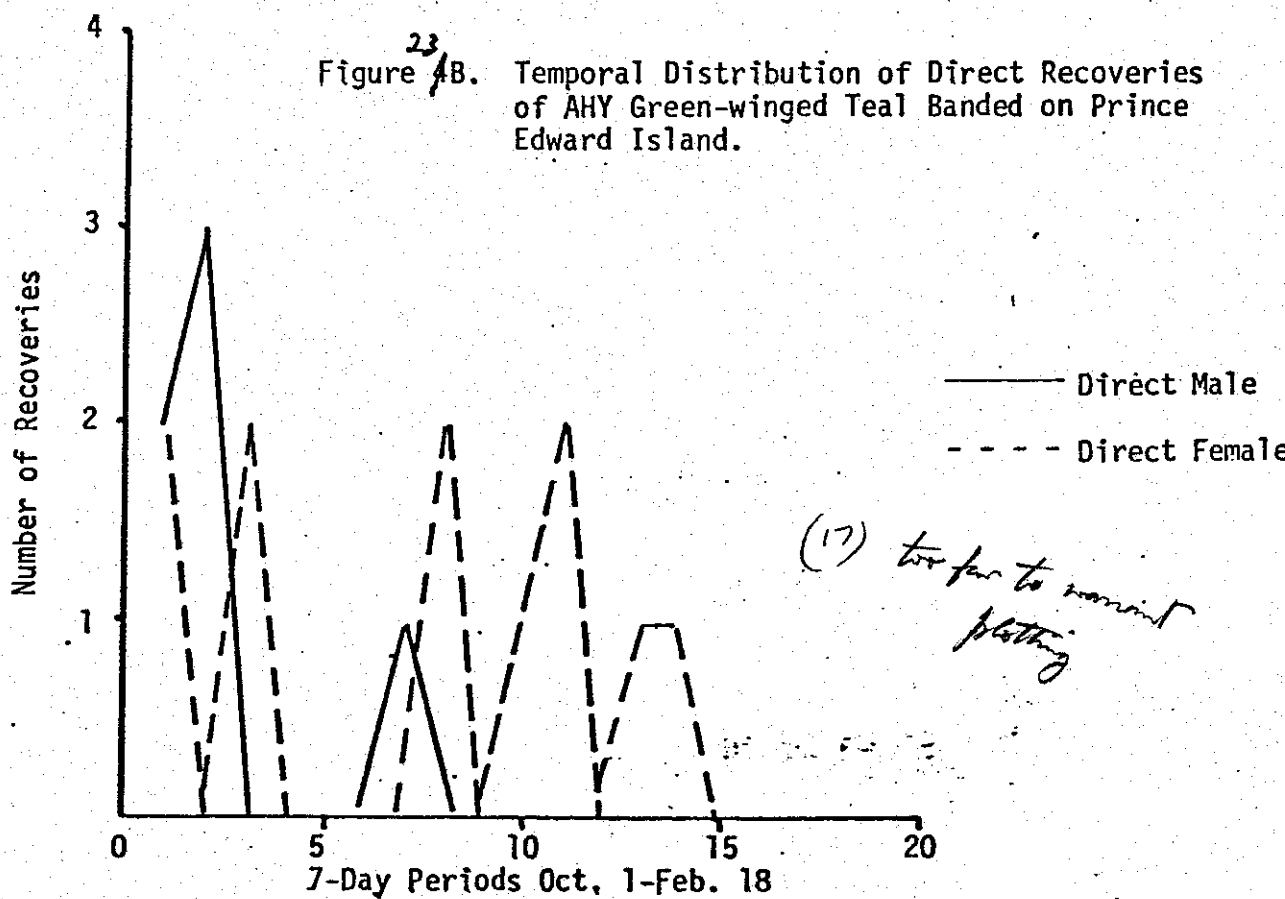


Figure 24. Temporal Distribution of Direct Recoveries of Hatching Year Green-winged Teal Banded on Prince Edward Island.

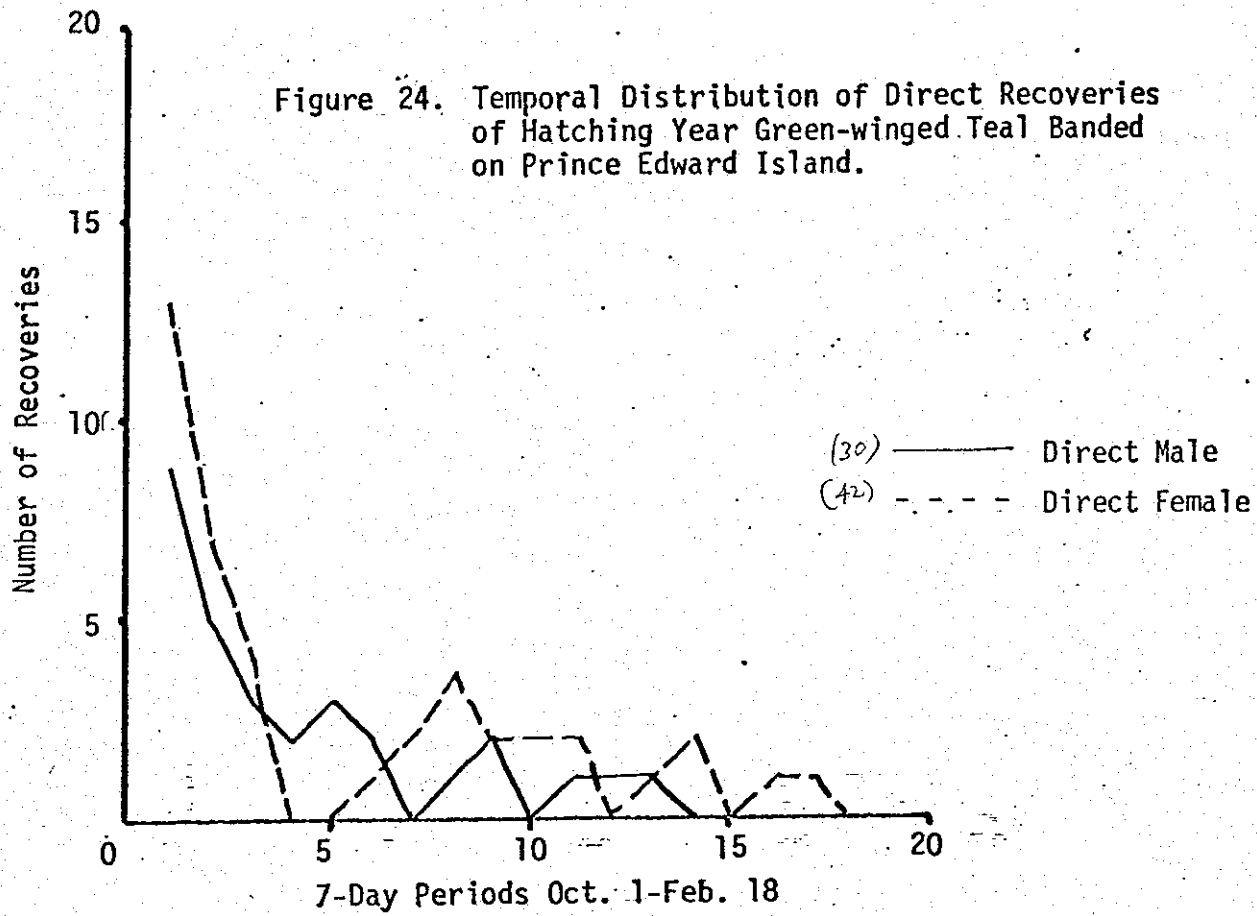
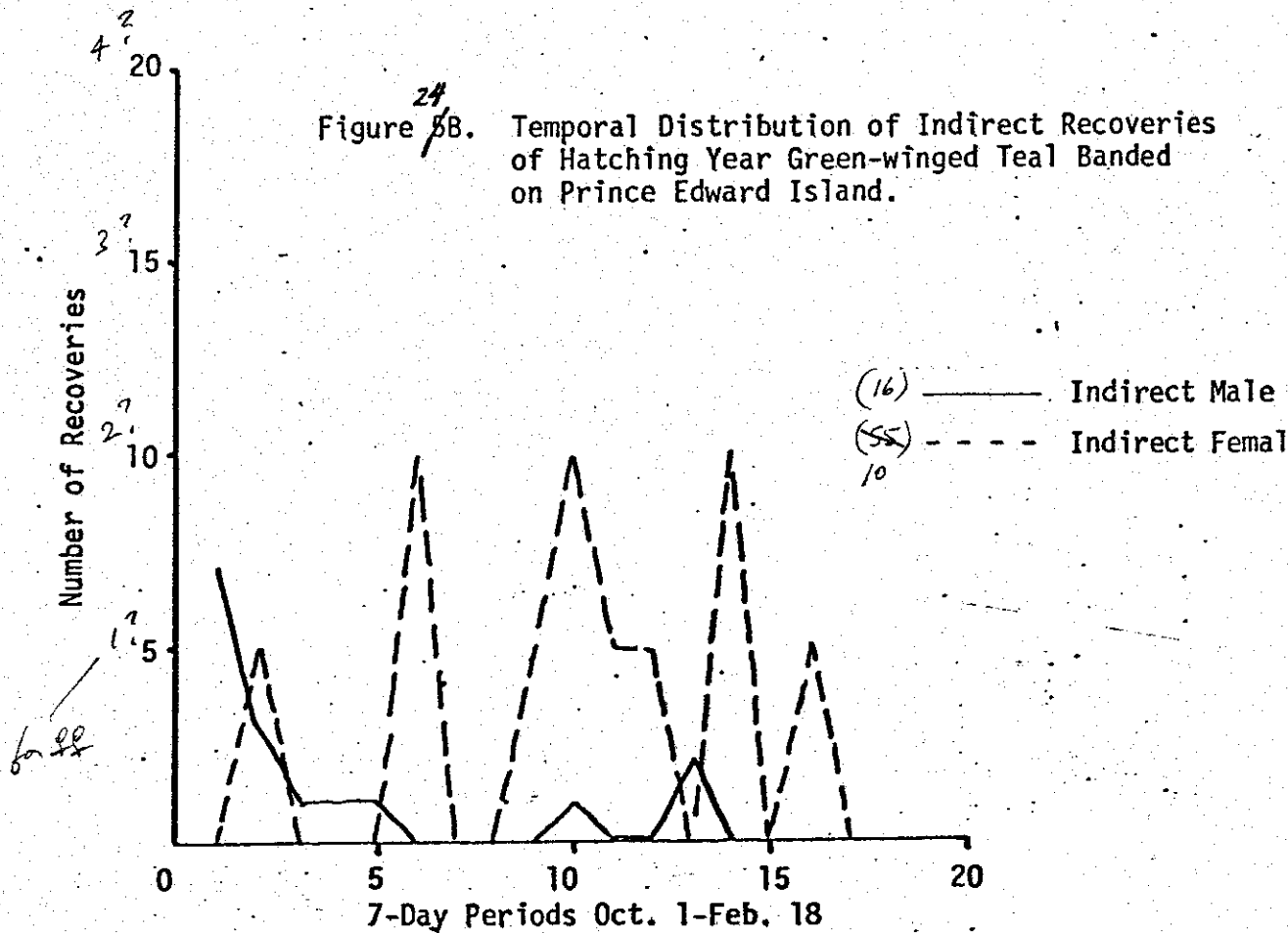


Figure 24B. Temporal Distribution of Indirect Recoveries of Hatching Year Green-winged Teal Banded on Prince Edward Island.



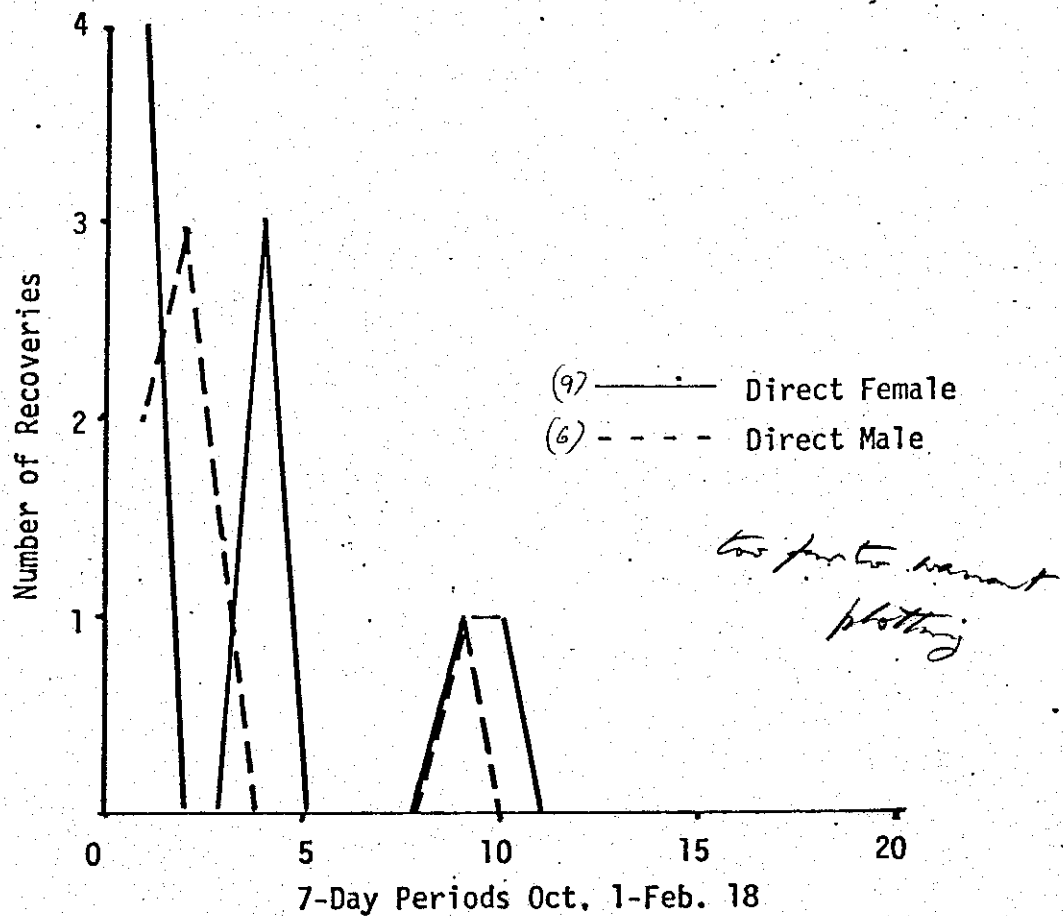


Figure 25. Temporal Distribution of Direct Recoveries of Local Green-winged Teal Banded on Prince Edward Island.

sample too small for this much segregation

Table 2. Geographic Distribution of Direct and Indirect Recoveries of Green-winged Teal Banded on Prince Edward Island by Sex and Age.

Recovery Location	Percent of Total Recoveries in Each Sex and Age Class					
	Direct Recoveries					
	Male			Female		
	AHY	HY	L	AHY	HY	L
Canada Total	66.6(4)	66.6(20)	71.4(5)	36.4(4)	43.9(18)	77.8(7)
P.E.I.	66.6(4)	60.0(18)	57.1(4)	36.4(4)	31.7(13)	66.7(6)
NB-NS Border					7.3(3)	11.1(1)
St. John River						
Other New Brunswick		3.33(1)	14.3(1)		4.9(2)	
Southern Nova Scotia						
Other Nova Scotia		3.33(1)				
Other Canadian						
USA Total	33.4(2)	33.33(10)	28.6(2)	63.6(7)	56.1(23)	22.2(2)
Maine		3.33(1)			4.9(2)	
Massachusetts		3.33(1)				
Other New England		6.66(2)		9.1(1)	2.4(1)	
New Jersey			18.1(2)	4.9(2)		
New York	16.7(1)		14.3(1)		7.3(3)	
North Carolina				9.1(1)	7.3(3)	
South Carolina				9.1(1)	4.9(2)	
Florida		16.66(2)	14.3(1)	9.1(1)	7.3(3)	
Other USA	16.7(1)	13.33(4)		9.1(1)	17.1(7)	22.2(2)
Grand Total	(6)	(30)	(7)	(11)	(41)	(9)

(continued)

Table 2. (cont'd.)

Recovery Location	Percent of Total Recoveries in Each Sex and Age Class					
	Male			Female		
	AHY	HY	L	AHY	HY	L
Canada Total	30(3)	62.5(10)	0.0(0)	22.2(2)	0.0(0)	
P.E.I.	20(2)	25.0(4)				
NB-NS Border		12.5(2)				
St. John River		6.25(1)				
Other New Brunswick		6.25(1)				
Southern Nova Scotia	10(1)			11.1(1)		
Other Nova Scotia				11.1(1)		
Other Canadian		12.5(2)				
USA Total	70(7)	37.5(6)	100.0(2)	77.8(7)	100.0(11)	
Maine						
Massachusetts	10(1)					
Other New England		6.25(1)				
New Jersey	10(1)				9.1(1)	
New York		12.5(2)				
North Carolina	20(2)			22.2(2)	36.3(4)	
South Carolina		12.5(2)	50.0(1)		9.1(1)	
Florida	20(2)		50.0(1)			
Other USA	10(1)	6.25(1)		55.6(5)	45.5(5)	
Grand Total	(10)	(16)	(2)	(9)	(11)	

^{heavily} and ~~highly~~ harvested by Prince Edward Island hunters during early October. Percentages of birds banded in other areas recovered on Prince Edward Island suggest that ^{much of} the ~~harvested population~~ on Prince Edward Island is ~~highly~~ ³ local in origin (Table 5).

Black Duck
Table 3. Percent of Total Recoveries from Prince Edward Island for Seven Banding Locations

Banding Location	Total Recoveries	Number of P.E.I. Recoveries	% Recovered on P.E.I.	
Baie Johan Beetz	943	70	7.4	<i>little local pressure</i>
N.B.-N.S. Border	1035	45	4.3	
Debert	172	4	2.3	<i>reverse direct</i>
Tabusintac	301	3	1.0	<i>off course</i>
Cape Breton	139	11	7.9	<i>little local pressure</i>
Louis Lake	111	3	2.7	<i>reverse direct</i>
Saint John River	1082	10	0.9	<i>off course</i>

The most significant contribution of Black Duck from outside of Prince Edward Island is from eastern Quebec and Labrador as suggested by recoveries of birds banded at Baie Johan Beetz. [The N.B.-N.S. Border area appears to contribute the second largest number of birds to the Prince Edward Island harvest followed by Cape Breton and the Saint John River.] On a percentage basis, Cape Breton contributes the ^{next} largest proportion to Prince Edward Island; however, Prince Edward Island and Cape Breton birds mix ~~to a high degree~~ during pre-season banding and thus the significance of their contribution is difficult to evaluate.

Recoveries from winter banding programs and from the late season harvest in southern Nova Scotia suggest that Prince Edward Island Black Ducks winter primarily ⁱⁿ ~~from~~ southern Nova Scotia ^{as also in} to Prince Edward Island. ~~Few recoveries in the U.S.A.~~ from Massachusetts to New Jersey show that the contribution to the eastern U.S.A. wintering population is small ^{though regular}. The single most important wintering area for Prince Edward Island Black Duck is probably [?] ~~on~~ the Island itself.

The harvest of Prince Edward Island Black Duck may be at or approaching a maximum sustainable rate. Using an estimated 30 ² percent band reporting rate, ~~approximately 55 percent~~ of all Black Duck banded as locals on Prince Edward Island have been recovered, ^{and} ~~plus~~ 40 ² percent of all hatching year birds. Since a large percentage of all recoveries ^{of birds} are taken on Prince Edward Island during October, restriction of the harvest in that province early in the season would be the most effective means of reducing the overall kill should ^{this} ~~such a reduction~~ become necessary. To date there is no evidence to support restriction of harvest of the Prince Edward Island Black Duck population. Over ~~a ten year period~~, 1969-1978, the estimated kill has varied from ~~a low of~~ 6,898 in 1973 to ~~a high of~~ 22,124 in 1976 with a 10 year average of 14,150. A general increase ~~in~~ ~~harvest~~ is apparent over the 10 year period, with estimates being at or above the long term average since 1974.

~~Because~~ ^{As} Prince Edward Island Black Duck are primarily utilized by hunters in Atlantic Canada, ~~it should be a major responsibility of~~ CWS-AR ^{should} ~~to~~ monitor population dynamics to ensure that overharvest and/or declines due to other factors do not occur. Banding is one means by which populations are monitored; however, in view of the vast accumulation of

by Martin's standards only

banding data, it may be feasible to suspend ~~future~~ banding temporarily, projecting past data to arrive at survival and mortality rates in conjunction with the harvest and species composition survey. A brief moratorium (2-3 years) would free ^{banding} funds to be used in other areas ~~or for other purposes.~~

Unlike the Black Duck on Prince Edward Island, the Green-winged Teal ^{banded there are} ~~resource is~~ not a major ^{component of} ~~contributor~~ to the Atlantic Region sport harvest. Green-winged Teal are harvested ~~equally if not~~ more heavily in the U.S.A. than in Canada. The percentage harvested during the first week of October on Prince Edward Island is ~~also~~ far below that ^{for} of Black Duck, although 75 [%] ~~percent~~ of all Canadian Green-winged Teal ^{recoveries of} ~~recoveries are~~ ^{are from that province} ~~from~~ Prince Edward Island. Based upon the ^{low} ~~percentage~~ of birds banded outside Prince Edward Island ^{that} ~~which~~ ^{there} ~~are recovered on the island,~~ the majority of Green-winged Teal harvested on Prince Edward Island are of local origin. As ^{with} ~~in the case of~~ the Black Duck, the most important ~~single~~ source of Green-winged Teal from outside the province is ~~from~~ eastern Quebec and Labrador, ~~based on recovery data from bandings~~ at Baie Johan Beetz. Over 7 [%] ~~percent~~ of all recoveries of Green-winged Teal ~~banded at that station~~ ^{were} ~~are~~ from Prince Edward Island. The N.B.-N.S. border area is the second largest source, with 3.9 [%] ~~percent~~ of its ~~total~~ recoveries ~~coming~~ from Prince Edward Island. ~~Some~~ ^{those} recoveries from birds banded in Cape Breton ~~would~~ support preseason mixing of ~~the two~~ population segments.

The major wintering ground for Green-winged Teal banded on Prince Edward Island is ~~obviously~~ in the U.S.A. south of New England. Harvest late in the year in the southern states is equal to or surpasses the Canadian harvest. ~~Few recoveries from southern Nova Scotia support this conclusion.~~

In recent years, some concern has been expressed ^{over} for the status of Green-winged Teal in the Atlantic Region. Declining numbers of breeding pairs and broods in some surveys ~~coupled with an apparently declining~~ ^{have} harvest on Prince Edward Island ~~has~~ contributed to this concern. The ~~estimated~~ annual kill on Prince Edward Island between 1969 and 1978 ~~has~~ fluctuated from ~~a low of 4,859~~ ⁶⁰ in 1973 to ~~a high of 14,401~~ ⁰ in 1970; however, the kill has been below the 10 year average since 1971 and has shown a gradual downward trend since 1974. Although this is not a sufficient ^{by conclusive} indication to warrant any immediate change in harvest regulations, the future status and trends within Green-winged Teal populations in the Atlantic Region should receive ~~some~~ ^{further attention} priority.

~~Limiting~~ factors which may be acting to reduce Prince Edward Island Green-winged Teal populations are likely associated with the wintering grounds. Based upon a ~~30 percent~~ ^{70% band reporting?} recovery rate, the ~~overall~~ harvest of Green-winged Teal banded on Prince Edward Island is about 38 ~~percent~~ ^{2%}; ~~In total~~, the harvest is divided roughly 50-50 by sex but varies slightly by age. Hatching year birds accounted for 41 ~~percent~~ ^{2%} of the harvest while adults and locals accounted for 36 and 28 ~~percent~~ ^{2%}, respectively. Relative to Prince Edward Island Black Duck, these recovery rates are low. In general, male Green-winged Teal are ~~most~~ ^{more} heavily harvested in Canada while females, ~~are much more heavily harvested in the U.S.A.~~ Adult and ~~hatching year females~~, the potential breeding stock for the Prince Edward Island population, are ~~most~~ ^{much more} heavily harvested on the wintering grounds. That harvest, when added to natural mortality ~~incurred~~ during migration and the Canadian kill, may be excessive. ~~Perhaps a means of focusing~~ more attention ^{to} on wintering populations ^{of teal} is needed.

end off to sig figs

4 + 36 + 28
= 105 2(??)

N.B.-N.S. Border Area

Over 74 ⁷⁰~~per~~ cent of all recoveries of black duck banded in the NB-NS border area were from Canada, ^{nearly all from the Maritimes.} Of that number, nearly ⁴⁷~~48~~ per cent ^{were in} came from the NB-NS border area and ^{nearly} ~~approximately~~ 14 ²⁰~~per~~ cent from Southern Nova Scotia. ~~Overall the Maritime Provinces accounted for 73.6 per cent of all recoveries.~~ USA recoveries (25.8 ²⁰~~per~~ cent) were primarily from New England, New York and New Jersey, with Massachusetts reporting the largest number ^{for any} ~~on an individual~~ state basis. The major ~~southward~~ migration route of birds banded in the border area appears to be south and westward along the coasts of New Brunswick and Nova Scotia to southern Nova Scotia, Maine, Massachusetts, New York, and New Jersey. The primary wintering ground ~~for border area black duck~~ is along the Atlantic coast of the USA from southern New England to Virginia; however, ^{recoveries in December & January} ~~significant numbers probably winter~~ on Prince Edward Island and more particularly in southern Nova Scotia. ~~In the latter location most recoveries occur in late December and throughout January suggesting that those birds have reached their wintering terminus. To a lesser extent, recoveries from Prince Edward Island in mid-December may~~ ^{probably} represent wintering birds.

Temporally, the distribution of the harvest shows the largest kill occurring in Canada, ^{??} particularly on Prince Edward Island, during early October. Southern Nova Scotia accounts for most of the January kill while November and December are major harvest periods in the USA. Figures 26 and 27 show the temporal and geographic distribution of the harvest of black duck banded in the NB-NS border area.

Unlike the black duck, most recoveries of green-winged teal (58.7%) banded in the NB-NS Border area ^{were} ~~are~~ from the USA. [←] Of the total, 58.7% ~~per cent were recovered in the USA~~ with nearly 41% ^{per cent} of those coming from states south of New Jersey. The major migration route for border area greenwings is ~~southwest~~ through southern Nova Scotia to southern New England and along the Atlantic Coast as far ~~south~~ as Florida. Recoveries also suggest a ^{small} westward movement converging with Mississippi populations ~~as shown in~~ (Figure 28). The southern states from North Carolina to Florida appear to be the major wintering area for border area greenwings.

Seventy-eight per cent of the border area green-winged teal harvested in Canada ^{were} ~~are~~ taken in the area of banding, ^{with} of which 47% ~~per cent~~ ^{are} taken during the first week of October. Most of the remaining Canadian harvest occurs ^{red} in Prince Edward Island and southern Nova Scotia later in the season. In the USA, most recoveries ^{were} ~~are~~ from the wintering grounds south of New Jersey (76%). North Carolina, South Carolina and Florida account ^{ed} for most of those recoveries. ~~Timing of~~ the harvest in the USA ^{was} ~~is~~ primarily in December and January, ^{and} ~~no~~ recoveries by sport harvest occurred in early October (Figure 29).

no of m seasons?

Temporally, the harvest of black duck banded in the NB-NS Border area ^{was} ~~is~~ similar for all ages. The only notable exception occurs ^{red} in the harvest of adult birds where the greatest kill apparently occurs ^{red} during the second and third weeks of October as opposed to the first week in other age groups. Geographically the distribution ^{was} ~~is~~ also closely similar for all ages, particularly for adults and hatching year birds. Local birds, however, appear ^{ed} to be harvested more heavily in Canada than other age groups. Over 55% ~~per cent~~ of all birds banded as locals ^{were} ~~are~~ recovered

in the NB-NS border area as opposed to less than 45 per cent for both adults and hatching year birds. This high kill of local birds occurs ^{red} early in October and ~~may~~ suggests an excessive harvest of local production. Figures 30-32 show the temporal and geographic distribution of the harvest of black duck banded in the NB-NS border area by age class.

The temporal distribution of recoveries of green-winged teal is also similar for all age classes with the greatest kill occurring in October. The highest recovery period for locals and hatching year birds is the first week of October whereas adults ^{were} are most commonly recovered during the second week. Geographically, locals and hatching year green-winged teal ^{were} are recovered about equally in the USA and Canada; however, adults ^{were} are much more commonly harvested in the USA south of New Jersey. In Canada the highest recovery location was the NB-NS border area which accounted for 37.5 per cent of the locals; 38.6 per cent hatching year and 20.7 per cent adults. In the USA, the southern states accounted for the most recoveries in all age classes. Figures 33-35 show the temporal and geographic distribution of green-winged teal recoveries by age class.

Total recoveries of female black duck exceeded males by 345; however, on a percentage basis the distribution of harvest by sex is ^{more} closely similar. Males ^{were relatively} ~~tended to be~~ more heavily harvested in the NB-NS border area and southeastern New Brunswick early in the season while females were more commonly harvested on the wintering grounds in southern Nova Scotia and the USA. The percentage of female black duck recovered in southern Nova Scotia was five per cent higher than males and six per cent higher in the USA. The temporal distribution of male and female recoveries are closely comparable with the highest kill occurring in early October in the area of banding. Variation in the harvest of males

and females ^{was} ~~is~~ relatively minor and ^{did} ~~does~~ not appear to present any cause for concern. Figure 36 shows the temporal and geographic distribution of recoveries of male and female black duck banded in the NB-NS border area.

Some significant differences ^{were} ~~are~~ noted in the distribution of green-winged teal by sex. Recoveries of females ^{were} ~~are~~ primarily from the USA (76.5 per cent). Males ^{have} ~~are~~ more commonly recovered during the first week of October whereas females ^{have} ~~that are~~ primarily recovered in December (Figure 37). The greatest difference in the harvest of males and females occurs ^{red} ~~in~~ hatching year and adult birds where 82 per cent and 77 per cent of the females ^{have} ~~are~~ taken in the USA respectively. Local males and females ^{have} ~~are~~ more evenly harvested between the USA and Canada, 54.5 per cent and 45.5 per cent, respectively. The NB-NS border area accounted for most of the Canadian recoveries of both sexes.

Distribution of recoveries of black duck by type, sex and age ^{did} ~~does~~ not vary ^{much} ~~abnormally~~ from the pattern shown by total recoveries; therefore, there is probably no need to treat each category separately. The geographic distribution of direct and indirect recoveries of black duck banded in the NB-NS border area by sex and age is shown in Table 4. Temporal distribution follows ^{it} ~~follows~~ closely the patterns already discussed.

Both direct and indirect recoveries of green-winged teal were most commonly taken in the USA. Over 72 per cent of the indirect recoveries were in the USA as well as slightly over 50 per cent of the direct recoveries. Again the southern states accounted for most of the USA recoveries while the border area reported most of the Canadian recoveries. The period of highest recovery in both direct and indirect was the first week of October while recovery rates in December and January were at a

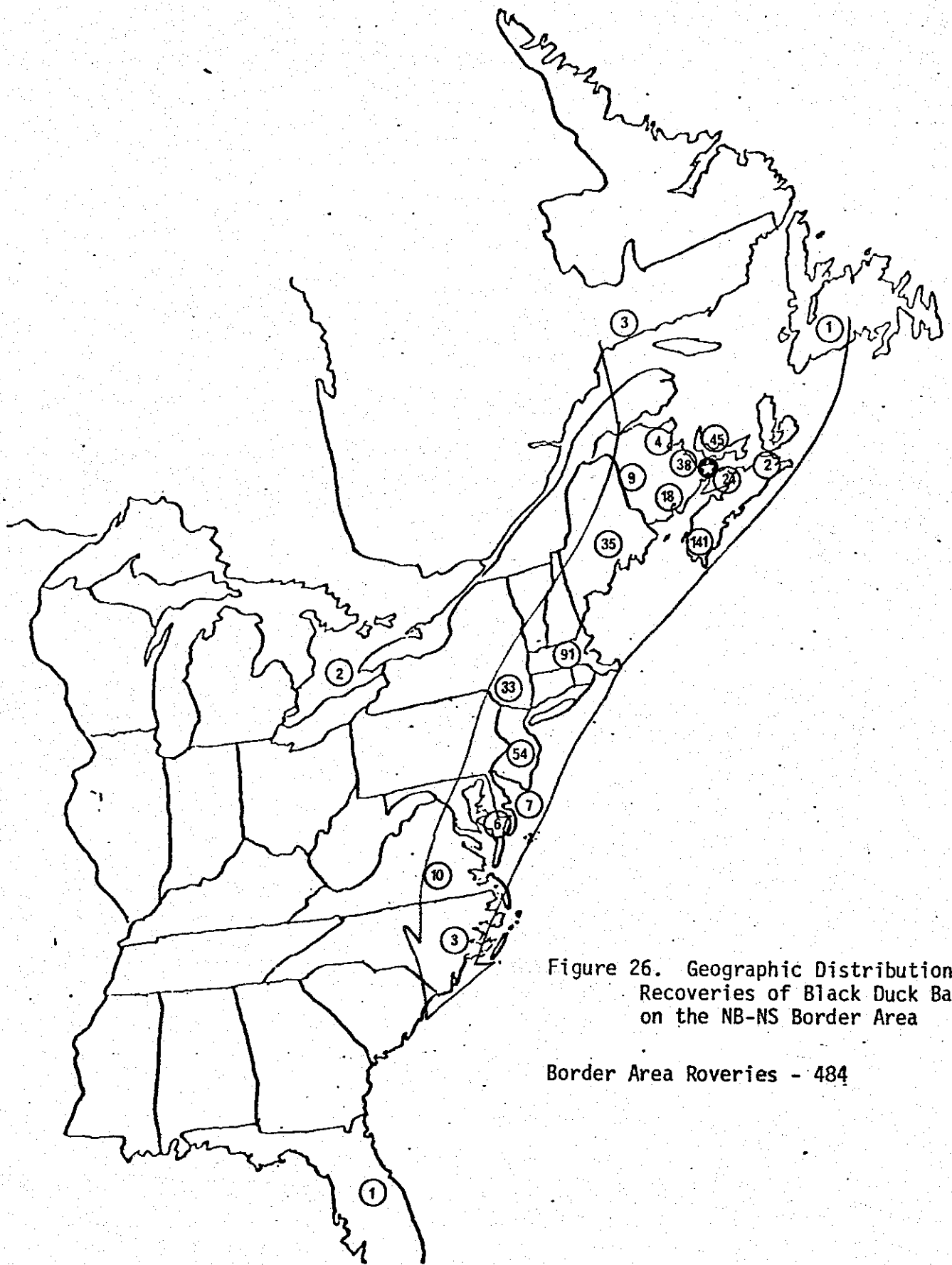


Figure 26. Geographic Distribution of Recoveries of Black Duck Banded on the NB-NS Border Area

Border Area Recoveries - 484

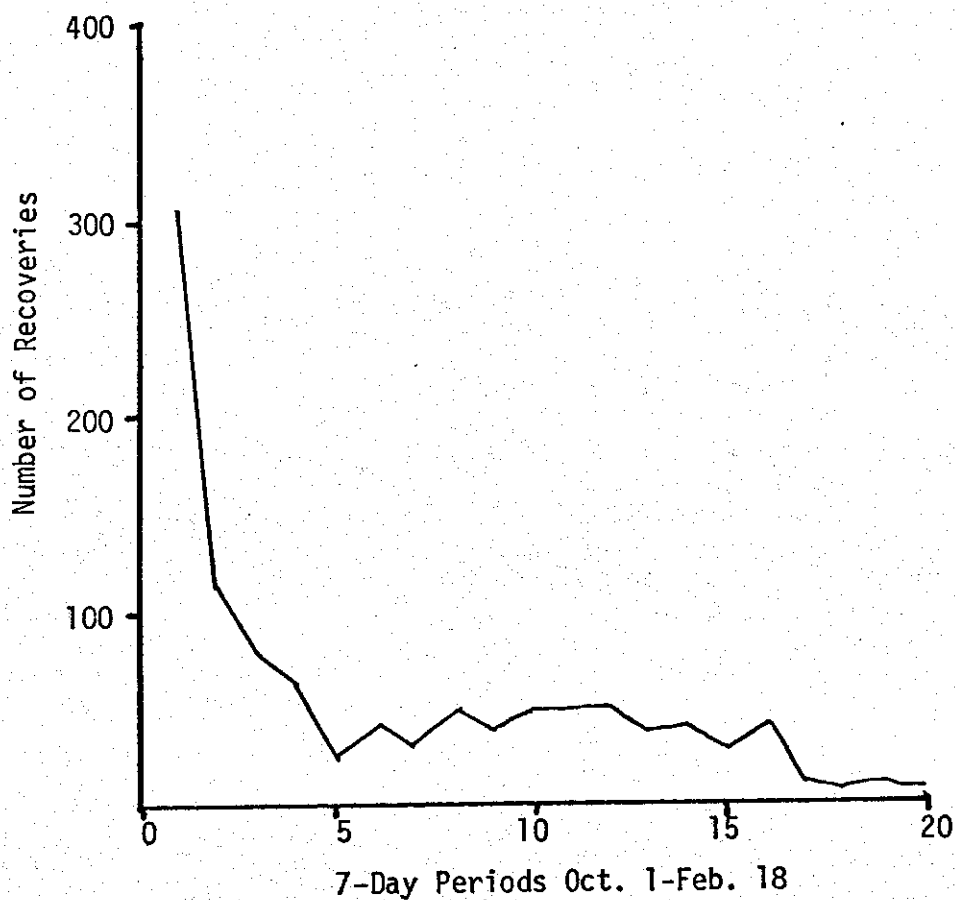


Figure 27. Temporal and Geographic Distribution of All Recoveries of All Black Duck Banded on the NB-NS Border Area

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
✓ Canada Total	768	74.2	28.5
✓ P.E.I. ✓	45	4.3	0.4
✓ NB-NS Border ✓	484	46.7	24.0
✓ St. John River ✓	18	1.7	1.0
✓ SE New Brunswick ✓	38	3.6	2.0
✓ NE New Brunswick ✓	4	0.4	0.2
✓ Other New Brunswick ✓	9	0.8	0.1
✓ NW Nova Scotia ✓	24	2.3	0.7
✓ NE Nova Scotia ✓	2	0.2	0.0
✓ S. Nova Scotia ✓	141	13.6	0.0
✓ Other Canadian ✓	6	0.6	0.1
USA Total	267	25.8	1.0
✓ Maine ✓	35	3.4	0.7
✓ Massachusetts ✓	91	8.8	0.2
✓ Other New England ✓	27	2.6	0.1
✓ New York ✓	33	3.2	0.0
✓ New Jersey ✓	54	5.2	0.0
✓ Other USA ✓	27	2.6	0.0
✓ Grand Total	1035		

✓ 105 + 22 = 127
(Fig. 30-32)

✓ app. w/ Fig. 26

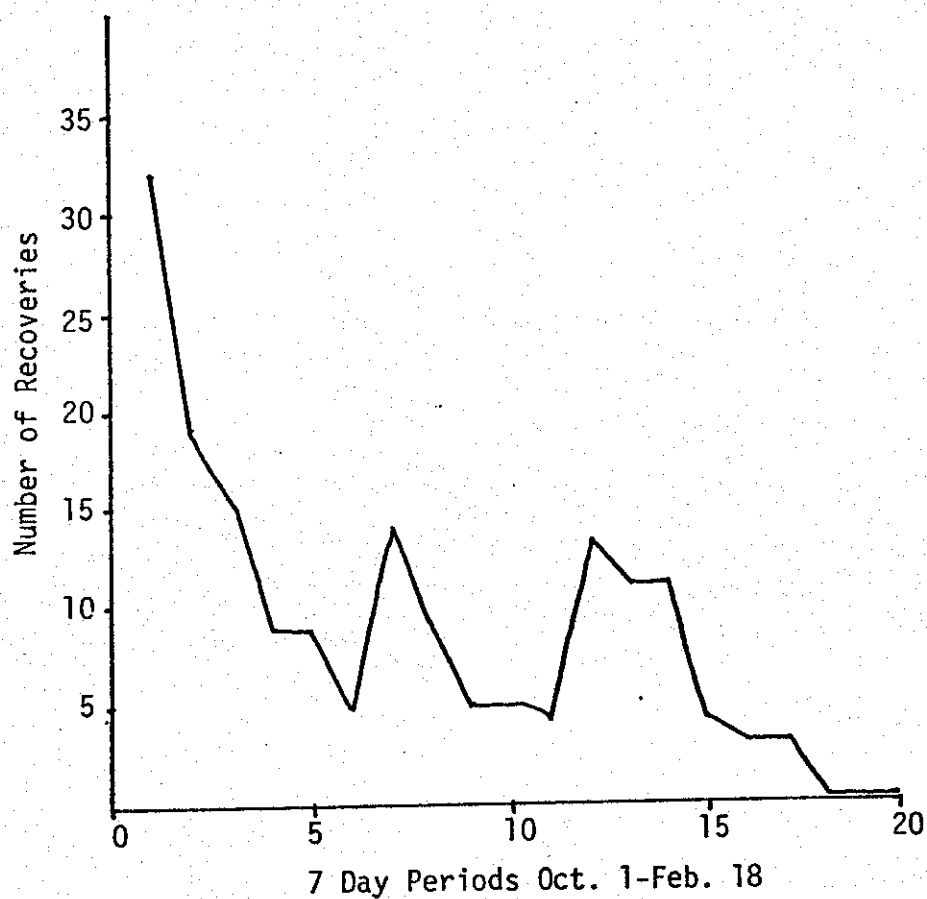


Figure 29. Temporal and Geographic Distribution of All Recoveries of All Green-winged Teal Banded on NB-NS Border

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
✓ Canada Total	64	41.3	19.4
✓ P.E.I. ✓	6	3.9	2.6
✓ NB-NS Border ✓	50	32.3	13.5
✓ St. John River ✓	1	0.6	0.64
✓ Other New Brunswick ✓	2	1.3	1.3
✓ S. Nova Scotia ✓	4	2.6	0.64
✓ Other Nova Scotia ✓	0	0	0
✓ Other Canada ✓	1	0.6	0.64
✓ USA Total	91	58.7	1.3
✓ Maine ✓	0	0	0
✓ Massachusetts ✓	3	1.9	0
✓ Other New England ✓	3	1.9	0
✓ New Jersey ✓	12	7.7	0
✓ New York ✓	4	2.6	0
✓ North Carolina ✓	10	6.5	0
✓ South Carolina ✓	13	8.4	0
✓ Florida ✓	14	9	0
✓ Other USA ✓	32	20.7	1.3
✓ Grand total	155	100	20.7

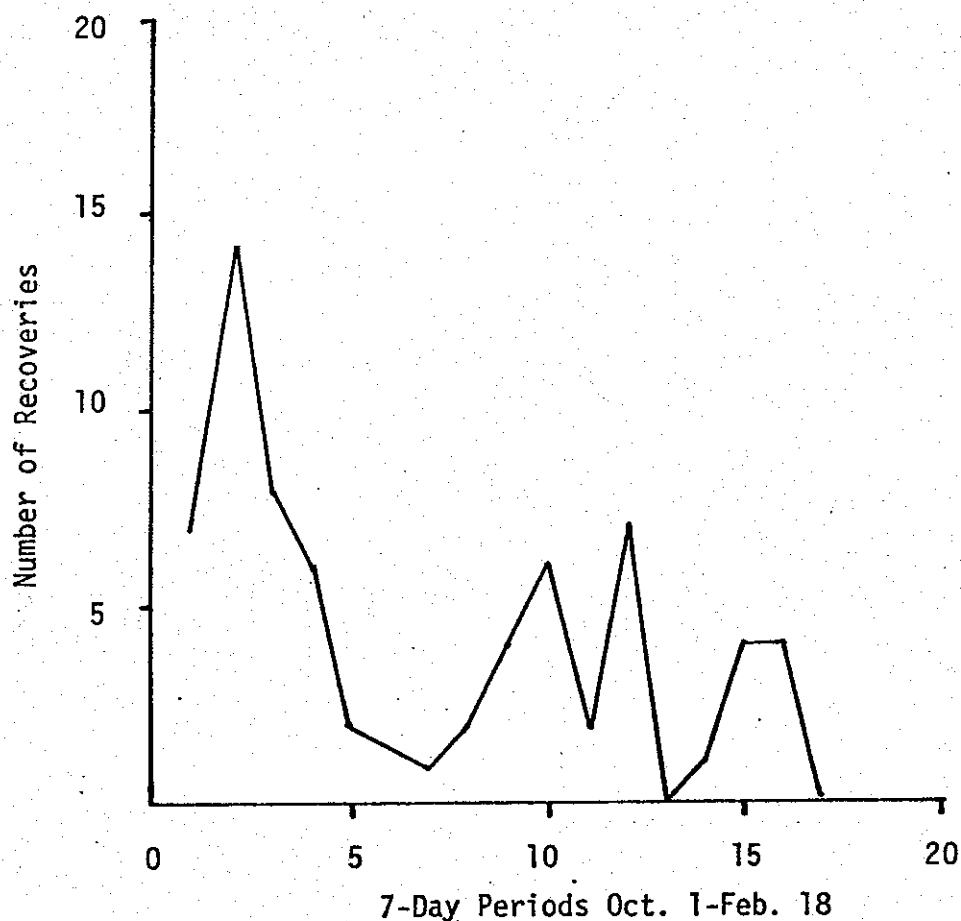


Figure 30. Temporal and Geographic Distribution of All Recoveries of Adult Black Duck Banded in the NB-NS Border

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	52	75.4	11.6
P.E.I.	3	4.3	0.0
NB-NS Border	30	43.6	10.1
St. John River	0	0.0	0.0
SE New Brunswick	3	4.3	0.5
NE New Brunswick	0	0.0	0.0
Other New Brunswick	2	2.9	0.0
NW Nova Scotia	4	5.8	0.0
NE Nova Scotia	0	0.0	0.0
S Nova Scotia	10	14.5	0.0
Ontario	0	0.0	0.0
Quebec	0	0.0	0.0
Nfld.-Labrador	0	0.0	0.0
USA Total	17	24.6	0.0
Maine	2	2.9	0.0
Massachusetts	7	10.1	0.0
Other New England	1	1.5	0.0
New York	3	4.3	0.0
New Jersey	3	4.3	0.0
Other USA	1	1.5	0.0
Grand Total	69		

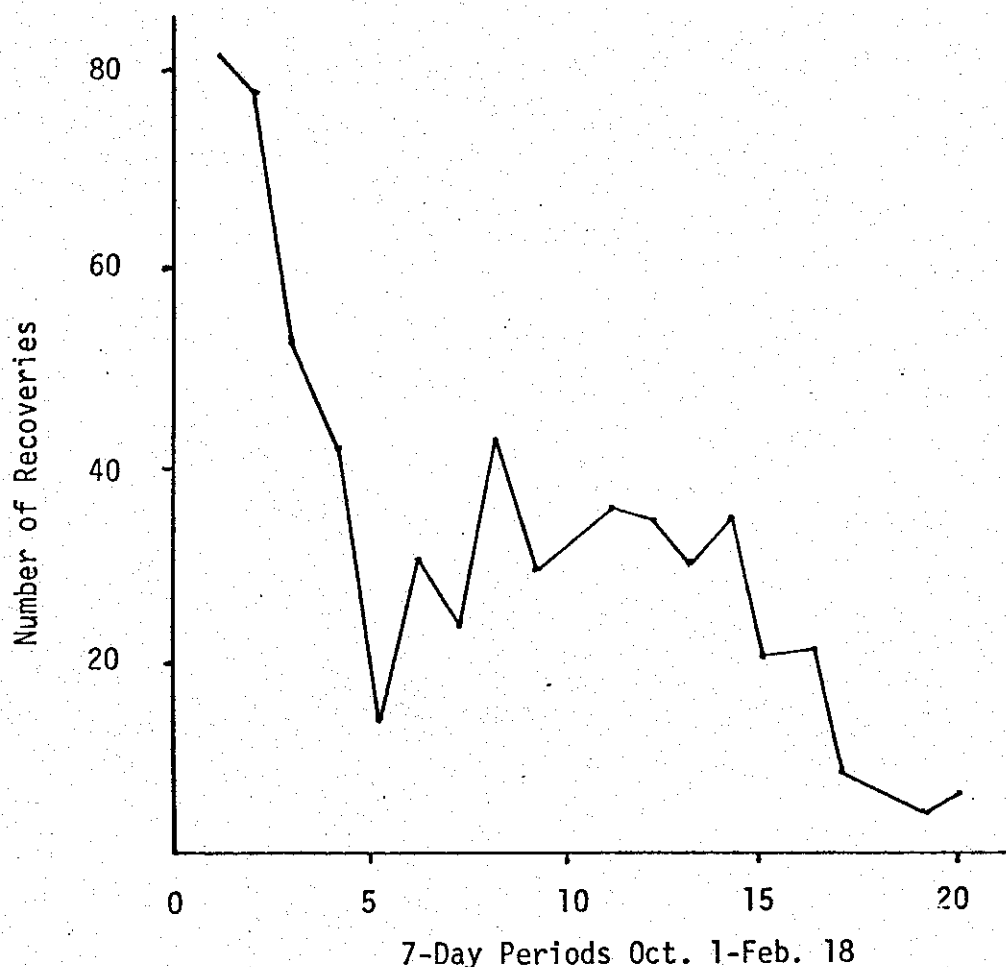


Fig. 31. Temporal and Geographic Distribution of all Recoveries of Hatching Year Black Duck Banded on the NB-NS Border

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	528	72.2	25.7
P.E.I.	32	4.4	0.5
NB-NS Border	323	44.2	21.2
St. John River	11	1.5	0.4
S.E. New Brunswick	24	3.3	1.9
N.E. New Brunswick	4	0.5	0.3
Other New Brunswick	5	0.7	0.1
N.W. Nova Scotia	18	2.5	0.9
N.E. Nova Scotia	1	0.1	0.0
Southern Nova Scotia	105	14.4	0.0
Ontario	1	0.1	0.0
Quebec	3	0.4	0.1
Nfld.-Lab.	1	0.1	
U.S.A. Total	203	27.8	1.0
Maine	26	3.6	0.7
Massachusetts	74	10.1	0.3
Other New England	23	3.1	
New York	18	2.5	
New Jersey	40	5.5	
Other U.S.A.	22	3.0	
Grand Total	731	100.0	

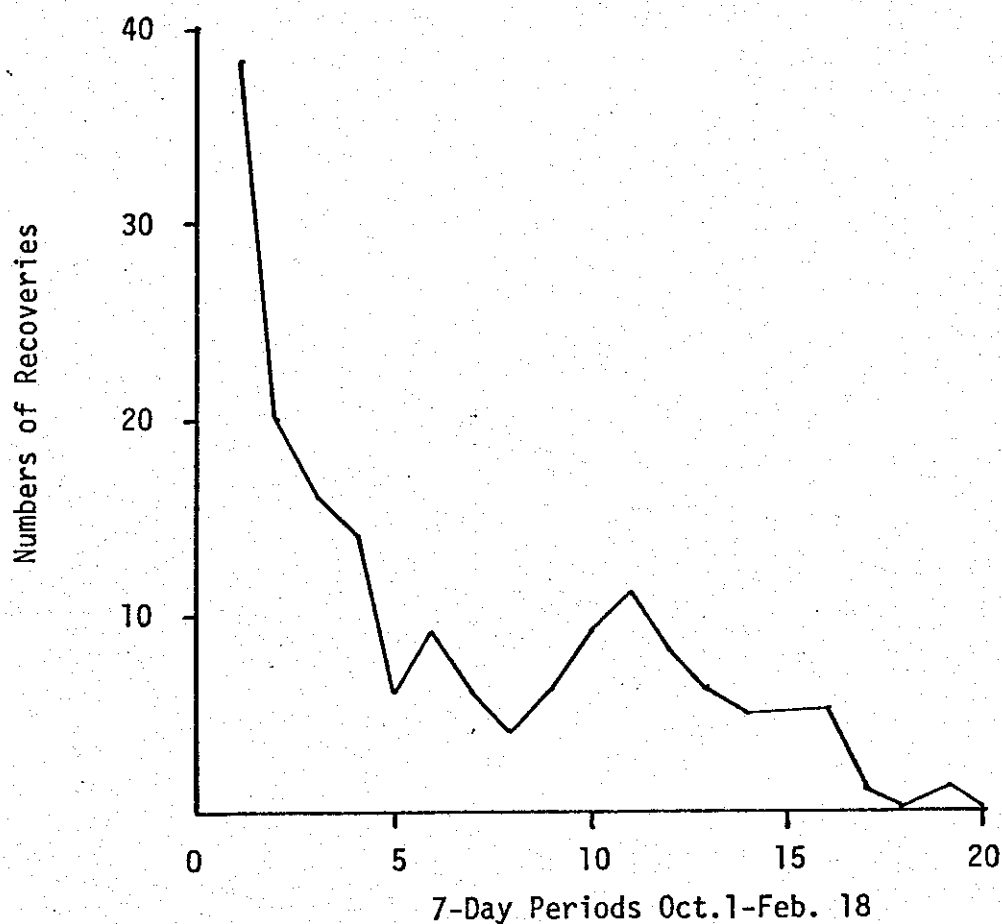


Figure 32. Temporal and Geographic Distribution of all Recoveries of Local Black Duck Banded in the NB-NS Border Area

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	188	80.0	42.1
P.E.I.	10	4.3	0.5
NB-NS Border	131	55.7	36.6
St. John River	7	3.0	2.5
SE New Brunswick	11	4.7	2.5
NE New Brunswick	0	0.0	0.0
Other New Brunswick	2	0.9	0.0
NW Nova Scotia	2	0.9	0.5
NE Nova Scotia	1	0.5	0.5
Southern Nova Scotia	22	9.5	0.5
Ontario	1	0.5	0.5
Quebec	0	0.0	0.5
Nfld.-Lab.	0	0.0	0.5
USA Total	47	20.0	1.3
Maine	7	3.0	0.8
Massachusetts	10	4.2	0.0
Other New England	3	1.3	0.5
New York	12	5.1	0.5
New Jersey	11	4.7	0.5
Other USA	4	1.7	0.5
Grand Total	235		

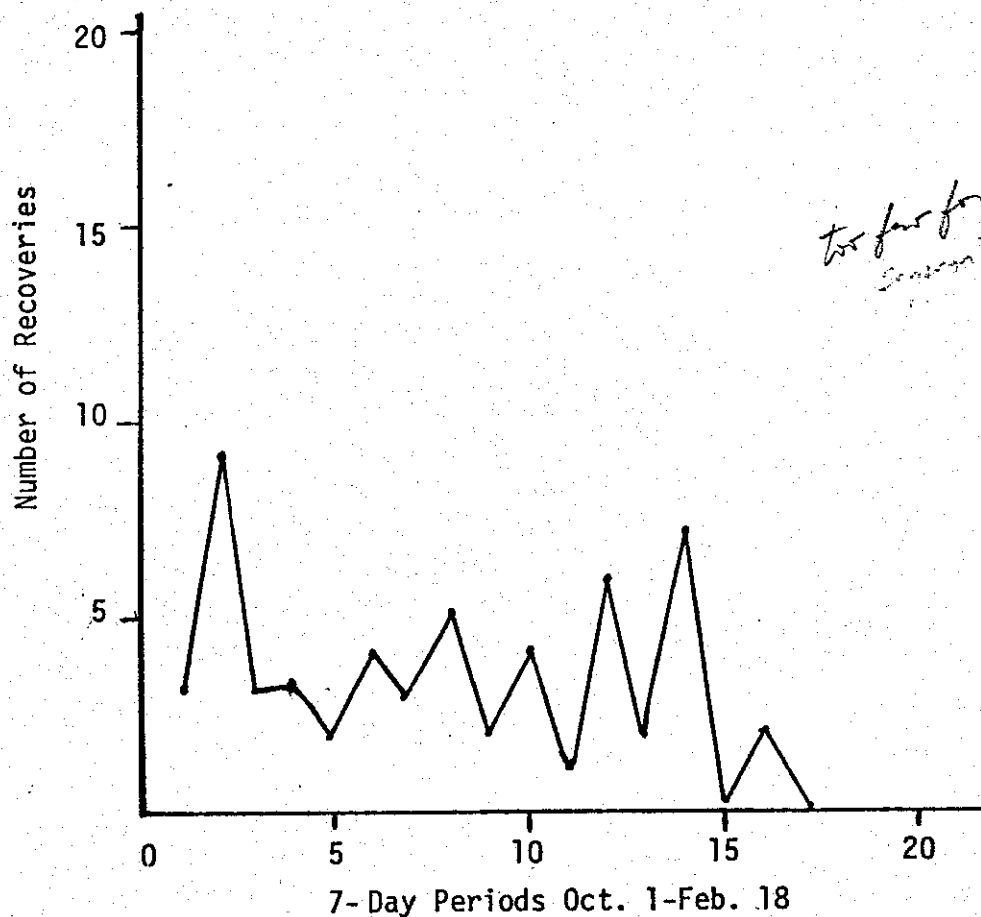


Figure 33. Temporal and Geographic Distribution of All Recoveries of AHY Green-winged Teal Banded in the NB-NS Border Area

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	15	28.3	5.7
P.E.I.	2	3.8	1.9
NB-NS	11	20.7	1.9
St. John River	0	0.0	0.0
Other New Brunswick	0	0.0	0.0
S Nova Scotia	2	3.8	0.0
Other Nova Scotia	0	0.0	0.0
Other Canadian	0	0.0	0.0
USA Total	38	71.7	0.0
Maine	0	0.0	0.0
Massachusetts	1	1.9	0.0
Other New England	2	3.8	0.0
New Jersey	5	9.4	0.0
New York	1	1.9	0.0
Other USA	29	54.7	0.0
Grand Total	53	100	

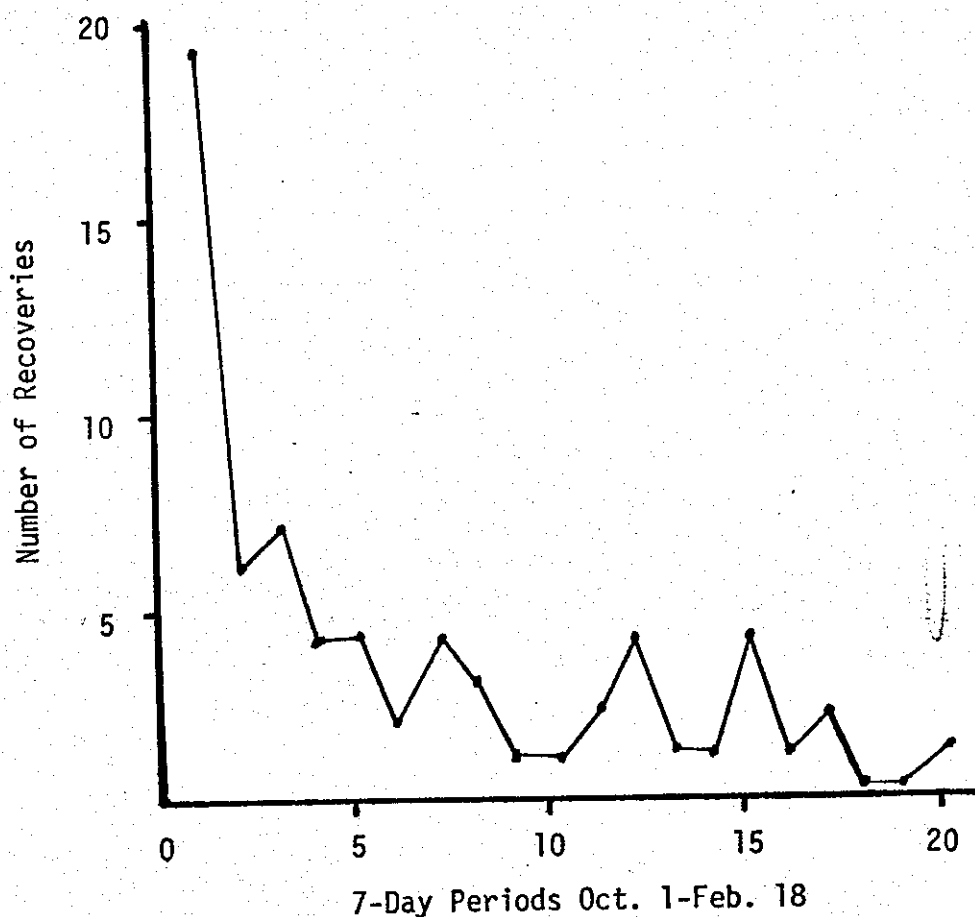


Figure 34. Temporal and Geographic Distribution of All Recoveries of HY Green-winged Teal Banded in the NB-NS Border Area

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	33	47.1	25.7
P.E.I.	2	2.9	1.4
NB-NS	27	38.6	18.6
St. John River	1	1.4	1.4
Other New Brunswick	1	1.4	1.4
S Nova Scotia	1	1.4	1.4
Other Nova Scotia	0	0.0	0.0
Other Canadian	1	1.4	1.4
USA Total	37	52.9	1.0
Maine	0	0.0	0.0
Massachusetts	1	1.4	0.0
Other New England	1	1.4	0.0
New York	1	1.4	0.0
New Jersey	5	7.2	0.0
Other USA	29	41.5	1.4
Grand Total	70	100	

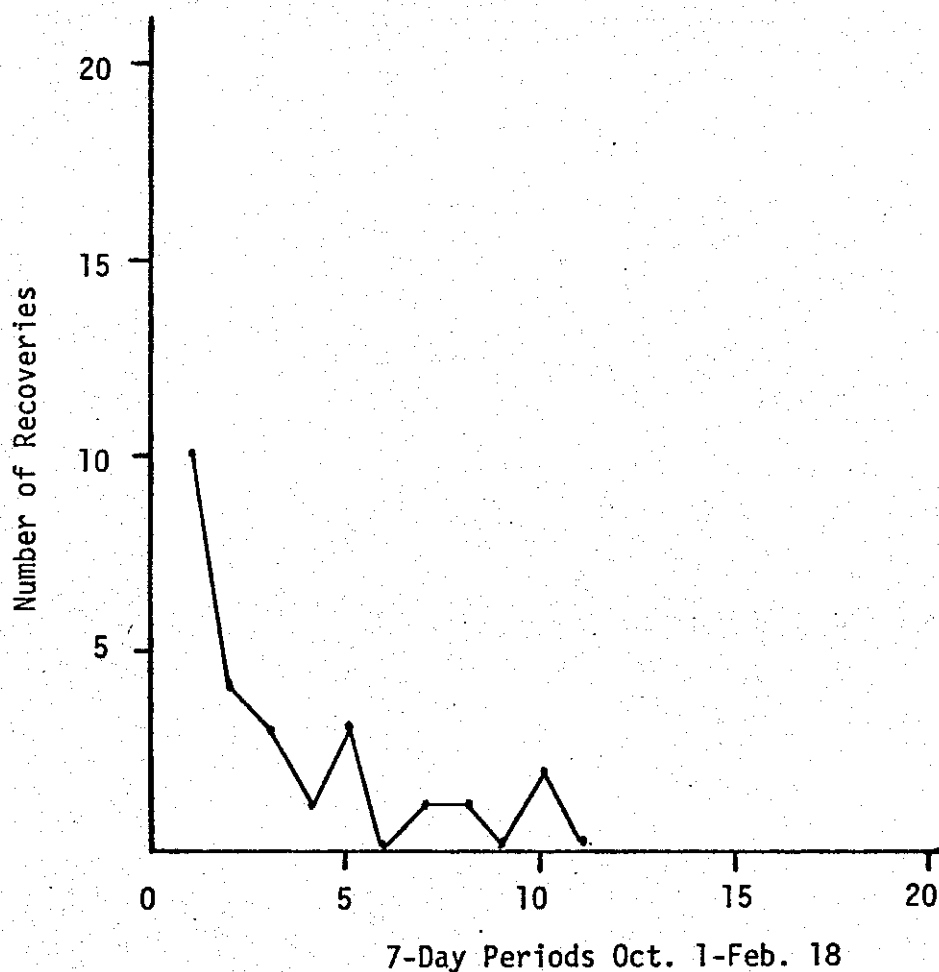


Figure 35. Temporal and Geographic Distribution of All Recoveries of Local Green-winged Teal Banded on the NB-NS Border

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	16	50.0	28.1
P.E.I.	2	6.3	6.3
NB-NS	12	37.5	18.7
St. John River	0	0.0	0.0
Other New Brunswick	1	3.1	3.1
S Nova Scotia	1	3.1	0.0
Other Nova Scotia	0	0.0	0.0
Other Canadian	0	0.0	0.0
USA Total	16	50.0	0.0
Maine	0	0.0	0.0
Massachusetts	1	3.1	0.0
Other New England	0	0.0	0.0
New Jersey	2	6.3	0.0
New York	2	6.3	0.0
Other USA	11	34.3	3.1
Grand Total	32	100	

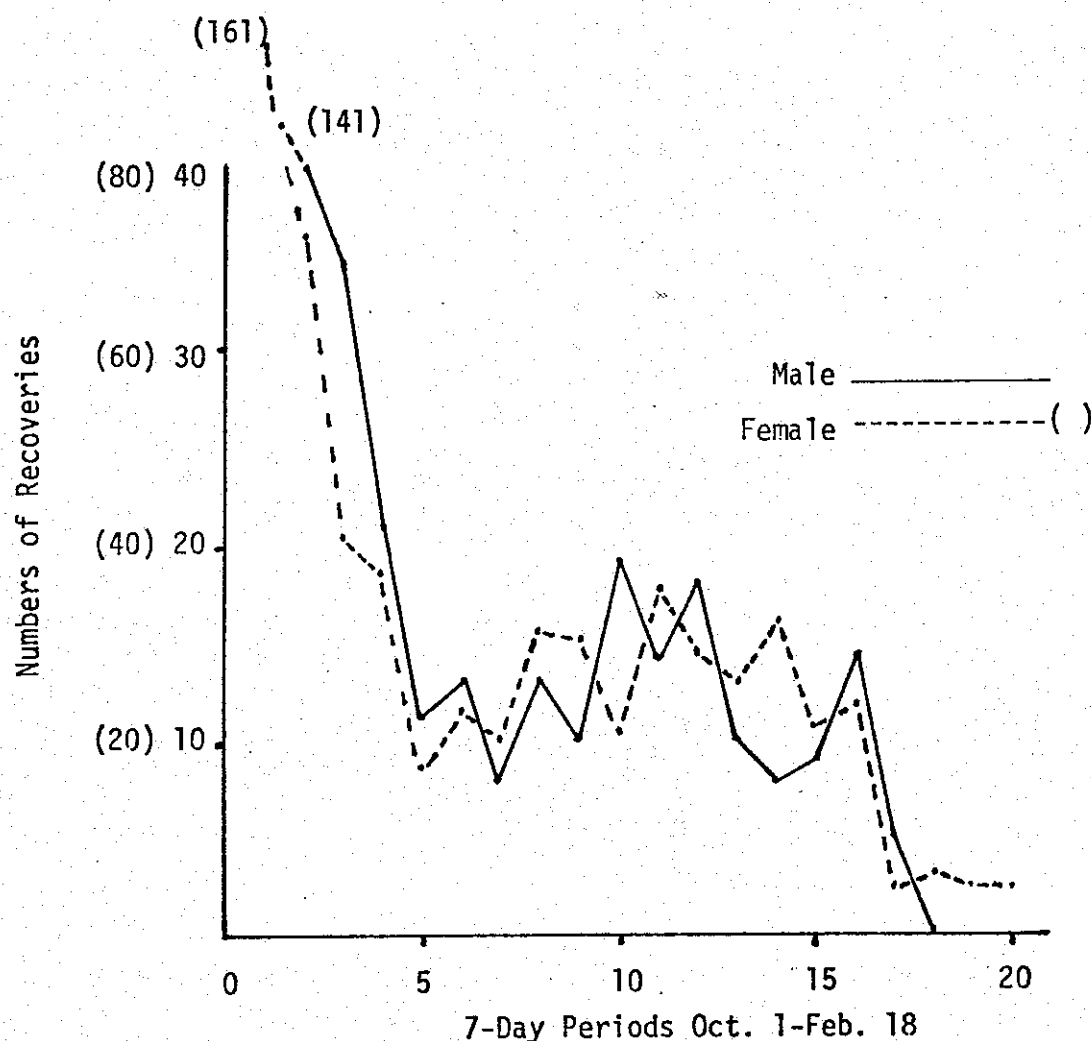


Fig. 36. Temporal and Geographic Distribution of Recoveries of Male and Female Black Duck banded in the NB-NS Border Area

Recovery Location	Male			Female		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
✓ 768 Canada Total	307	77.7		459	71.7	23.6
✓ P.E.I.	15	3.8	??	30	4.7	
✓ 484 NB-NS Border	214	54.2	??	269	42.0	
✓ St. John River	5	1.3	none?!	13	2.0	??
✓ SE New Brunswick	16	4.1		22	3.4	??
✓ NE New Brunswick	1	0.2		3	0.5	none?!
✓ Other NB	3	0.8		6	0.9	
✓ NW Nova Scotia	9	2.3		15	2.3	
✓ NE Nova Scotia	1	0.2		1	0.2	
✓ 141 Southern NS	40	10.1		97	15.2	
✓ Ontario	0	0.0		2	0.3	
✓ Quebec	2	0.5		1	0.2	
✓ Nfld.Lab.	1	0.2		0	0.0	
✓ 267 USA Total	88	22.3		181	28.3	
✓ Maine	10	2.5		25	3.9	
✓ Massachusetts	30	7.7		62	9.7	
✓ 27 Other New England	8	2.0		20	3.1	
✓ New York	13	3.3		20	3.1	
✓ New Jersey	17	4.3		37	5.8	
✓ Other USA	10	2.5		17	2.6	
✓ Grand Total	395			640		

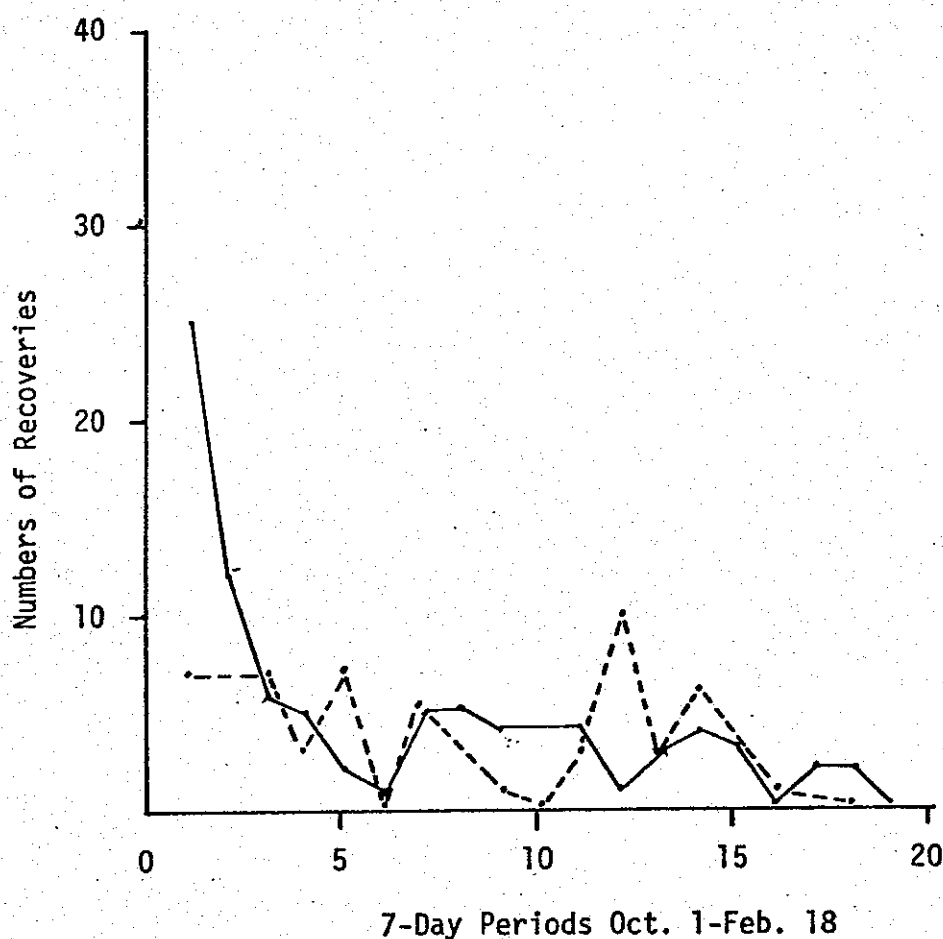


Figure 37. Temporal and Geographic Distribution of Male and Female Recoveries of Green-winged Teal Banded in the NB-NS Border Area

Recovery Location	Male			Female		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
✓ Canada Total	48	55.2	27.6	16	23.5	8.8
✓ P.E.I.	5	5.8	3.4	1	1.5	1.5
✓ NB-NS	37	42.6	16.1	13	19.1	7.3
✓ St. John River	1	1.1	1.1	0	0.0	0.0
✓ Other NB	2	2.3	2.3	0	0.0	0.0
✓ S Nova Scotia	2	2.3	1.1	2	2.9	0.0
✓ Other Nova Scotia	0	0.0	0.0	0	0.0	0.0
✓ Other Canada	1	1.1	1.1	0	0.0	0.0
✓ USA Total	39	44.8	1.1	52	76.5	1.5
✓ Maine	0	0.0	0.0	0	0.0	1.5
Massachusetts	1	1.1	0.0	1	1.5	1.5
Other New England	2	2.3	0.0	0	0.0	1.5
✓ New York	1	1.1	0.0	3	4.4	1.5
✓ New Jersey	3	3.5	0.0	9	13.3	1.5
Other USA	32	36.8	1.1	39	57.3	1.5
✓ Grand Total	87	100		68	100	

Table 4. Geographic Distribution of Direct and Indirect Recoveries of Black Duck Banded in the NB-NS Border Area by Sex and Age

Recovery Location	Percent of Total Recoveries in Each Sex and Age Class					
	Direct Recoveries					
	Male			Female		
	AHY	HY	L	AHY	HY	L
Canada Total	85.7(12)	78.7(144)	85.1(86)	76.9(20)	77.9(261)	80(8)
P.E.I.	7.1(1)	4.4(8)	4.0(4)	3.8(1)	4.2(14)	4(4)
NB-NS Border	64.4(9)	56.3(103)	65.3(66)	42.3(11)	52.8(177)	58(5)
St. John River	0.0(0)	1.1(2)	3.0(3)	0(0)	2.1(7)	3(3)
SE New Brunswick	7.1(1)	3.8(7)	4.9(5)	7.7(2)	3.6(12)	4(4)
NE New Brunswick	0.0(0)	0.0(0)	0.0(0)	0(0)	0.3(1)	0(0)
Other New Brunswick	0.0(0)	0.0(0)	1.0(1)	3.8(1)	0.3(1)	1(1)
NW Nova Scotia	0.0(0)	2.8(5)	2.0(2)	3.8(1)	2.4(8)	0(0)
NE Nova Scotia	0.0(0)	0.5(1)	0.0(0)	0(0)	0(0)	0(0)
Southern Nova Scotia	7.1(1)	9.8(18)	4.9(5)	15.5(4)	12.2(41)	9(9)
Other Canadian	0.0(0)	0.0(0)	0.0(0)	0(0)	0(0)	1(1)
USA Total	14.3(0)	21.3(39)	14.9(15)	23(1)	22.1(74)	20(2)
Maine	0.0(0)	3.3(6)	1.0(1)	0(0)	2.4(8)	5(5)
Massachusetts	14.3(0)	4.9(9)	5.9(6)	3.8(1)	6.9(23)	3(3)
Other New England	0.0(0)	3.3(6)	1.0(1)	3.8(1)	3.0(10)	3(3)
New York	0.0(0)	2.2(4)	4.0(4)	3.8(1)	1.8(6)	3(3)
New Jersey	0.0(0)	5.4(10)	2.0(2)	7.7(2)	5.9(20)	5(5)
Other USA	0.0(0)	2.2(4)	1.0(1)	3.8(1)	2.1(7)	1(1)
Grand Total	100(14)	100(183)	100(101)	100(26)	100(335)	100(100)

(continued)

Table 4. Geographic Distribution of Direct and Indirect Recoveries of Black Duck Banded in the NB-NS Border Area by Sex and Age

Recovery Location	Percent of Total Recoveries in Each Sex and Age Class					
	Male			Female		
	AHY	HY	L	AHY	HY	L
Canada Total	68.7(11)	67.6(44)	62.5(10)	61.5(8)	53.4(29)	61.1(1)
P.E.I.	0.0(0)	1.5(1)	6.2(1)	7.7(1)	6.1(9)	5.5(0)
NB-NS Border	43.8(7)	41.5(27)	12.6(2)	15.4(2)	10.8(16)	27.9(0)
St. John River	0.0(0)	0.0(0)	0.0(0)	0.0(0)	1.3(2)	5.5(0)
SE New Brunswick	0.0(0)	3.1(2)	6.2(1)	0.0(0)	2.0(3)	5.5(0)
NE New Brunswick	0.0(0)	1.5(1)	0.0(0)	0.0(0)	1.3(2)	0.0(0)
Other New Brunswick	6.2(1)	1.5(1)	0.0(0)	0.0(0)	2.0(3)	0.0(0)
NW Nova Scotia	6.2(1)	1.5(1)	0.0(0)	15.4(2)	2.7(4)	0.0(0)
NE Nova Scotia	0.0(0)	0.0(0)	0.0(0)	0.0(0)	0.0(0)	5.5(0)
Southern Nova Scotia	12.5(2)	12.3(8)	37.5(6)	23.0(3)	35.8(38)	11.2(0)
Other Canadian	0.0(0)	4.6(3)	0.0(0)	0.0(0)	1.4(2)	0.0(0)
USA Total	31.3(5)	32.4(21)	37.5(6)	38.5(5)	46.6(69)	38.9(0)
Maine	12.5(2)	1.5(1)	0.0(0)	0.0(0)	7.5(11)	5.5(0)
Massachusetts	6.3(1)	16.9(11)	6.2(1)	30.8(4)	20.9(31)	0.0(0)
Other New England	0.0(0)	1.5(1)	0.0(0)	0.0(0)	4.0(6)	0.0(0)
New York	6.3(1)	4.6(3)	6.2(1)	7.7(1)	3.4(5)	22.2(0)
New Jersey	6.2(1)	3.2(2)	12.5(2)	0.0(0)	5.4(8)	11.2(0)
Other USA	0.0(0)	4.6(3)	12.5(2)	0.0(0)	5.4(8)	0.0(0)
Grand Total	100(16)	100(65)	100(16)	100(13)	100(148)	100(1)

too far to segregate this much

lower level but over a much longer period. Figures 38 and 39 show the temporal and geographic distribution of direct and indirect recoveries.

The distribution of direct and indirect recoveries of black duck followed a predicted distribution. Significantly more direct recoveries were taken in Canada, specifically in the NB-NS border area, whereas indirect recoveries outnumbered direct in the USA. No obvious variations from the predicted norm were noted either temporally or geographically. Figure 40 compares the temporal and geographic distribution of direct vs indirect recoveries.

Border area green-winged teal ^{were} ~~are~~ harvested most heavily in the USA and ~~do~~ ^{did} not contribute significantly to the Canadian kill except in the Border Area itself. Recoveries of green-winged teal banded outside of the NB-NS border area suggest ^{ed} ~~ed~~ that a high percentage of the birds banded in the border area ^{were} ~~are~~ of local origin (Table 5).

Table 5. Green-winged Teal Recovered in the NB-NS Border Area from Birds Banded Elsewhere

Banding Location	Recoveries in NB-NS Border	% of Total Recoveries
Baie Johan Beetz	25	3.5
Prince Edward Island	6	3.9
St. John River	3	2.4
Tabusintac	1	1.7
Debert	1	6.2
Louis Lake	2	0.7
Cape Breton	0	0.0

The greatest outside contribution to border area populations appear ^{ed} ~~ed~~ to come from eastern Quebec and Labrador, Prince Edward Island, and the

The percentage of
St. John River. ~~Recoveries~~ ^{was similar} of Prince Edward Island green-winged teal
in the border area ~~is equal~~ to the recovery of border area birds on
Prince Edward Island which is probably an indication ~~of the degree to~~
~~which~~ ^{that} the two populations mix prior to the season.

Where? Border area?
was measured?
The harvest of green-winged teal over the 10 year period, 1969-78,
~~has~~ [≡] fluctuated widely but ~~does~~ [≡] not show a general pattern of decline as
~~is~~ ^{was} the case on Prince Edward Island. The harvest was high between 1969
and 1971 but reached its lowest estimate in 1972. Harvest remained
relatively low from 1972 through 1975 but increased during the last three
years to a level approximating the earlier estimates. Banding success in
the Region and production surveys have also varied widely. In conclusion,
data remains insufficient to suggest any need for changes in harvest manage-
ment; ~~however, it appears that any overharvest that may occur would result~~
~~on the southern wintering grounds where the largest proportion of the~~
~~harvest occurs.~~ ^{As with the} Similar to Prince Edward Island populations, male green-
winged teal ^{are} most heavily harvested in the border area while females
~~particularly adults and immatures~~ ^{are} are much more heavily harvested in the
southern states. ~~This may suggest that~~ ^{may} males ~~migrate~~ later than females,
thus being more vulnerable to Canadian hunters. In any case, it is the
female segment, representing potential breeding stock, that is ^{heavily} harvested
in the USA; therefore, the most logical place to reduce harvest should that
become necessary is on the southern wintering grounds.

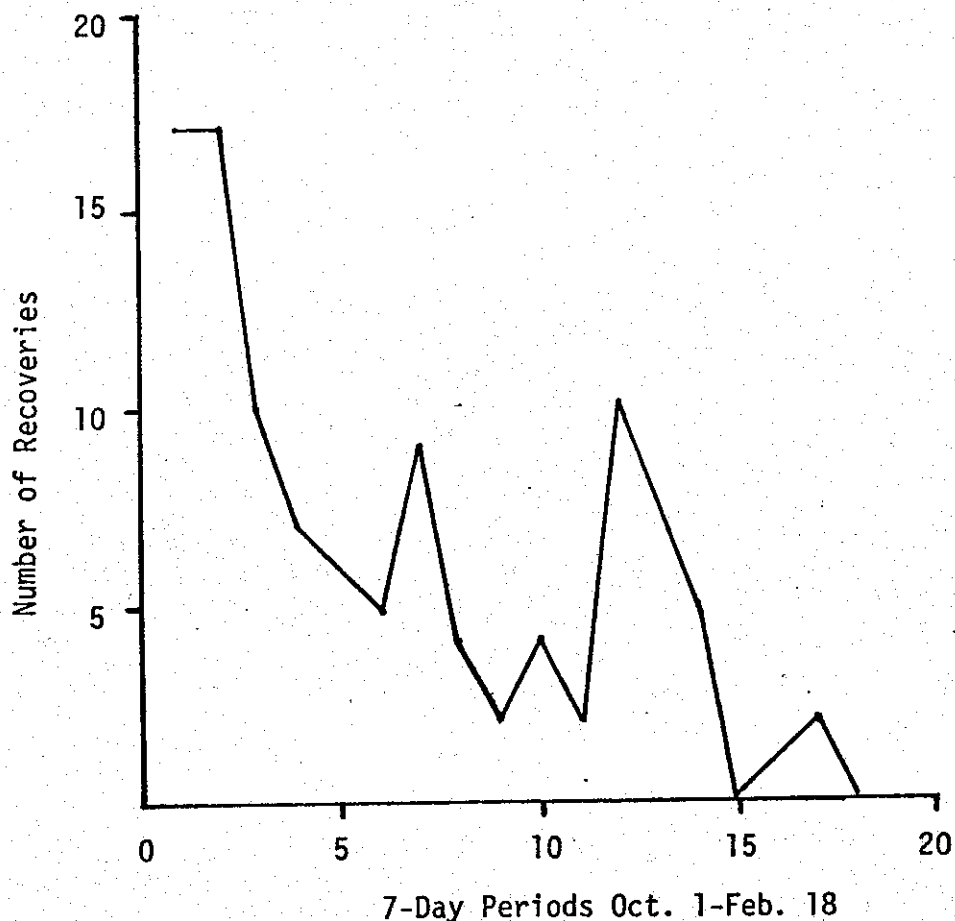


Figure 38. Temporal and Geographic Distribution of Direct Recoveries of All Green-winged Teal Banded on NB-NS Border

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	48	49.5	17.5
P.E.I.	5	5.2	3.1
NB-NS Border	38	39.2	12.4
St. John River	0	0.0	0.0
Other New Brunswick	1	1.0	1.0
S Nova Scotia	4	4.1	1.0
Other Nova Scotia	0	0.0	0.0
Other Canada	0	0.0	0.0
USA Total	49	50.5	0.0
Maine	0	0.0	0.0
Massachusetts	2	2.1	0.0
Other New England	1	1.0	0.0
New Jersey	5	5.2	0.0
New York	3	3.1	0.0
North Carolina	5	5.2	0.0
South Carolina	8	8.2	0.0
Florida	7	7.2	0.0
Other USA	18	18.5	0.0
Grand Total	97	100	17.5

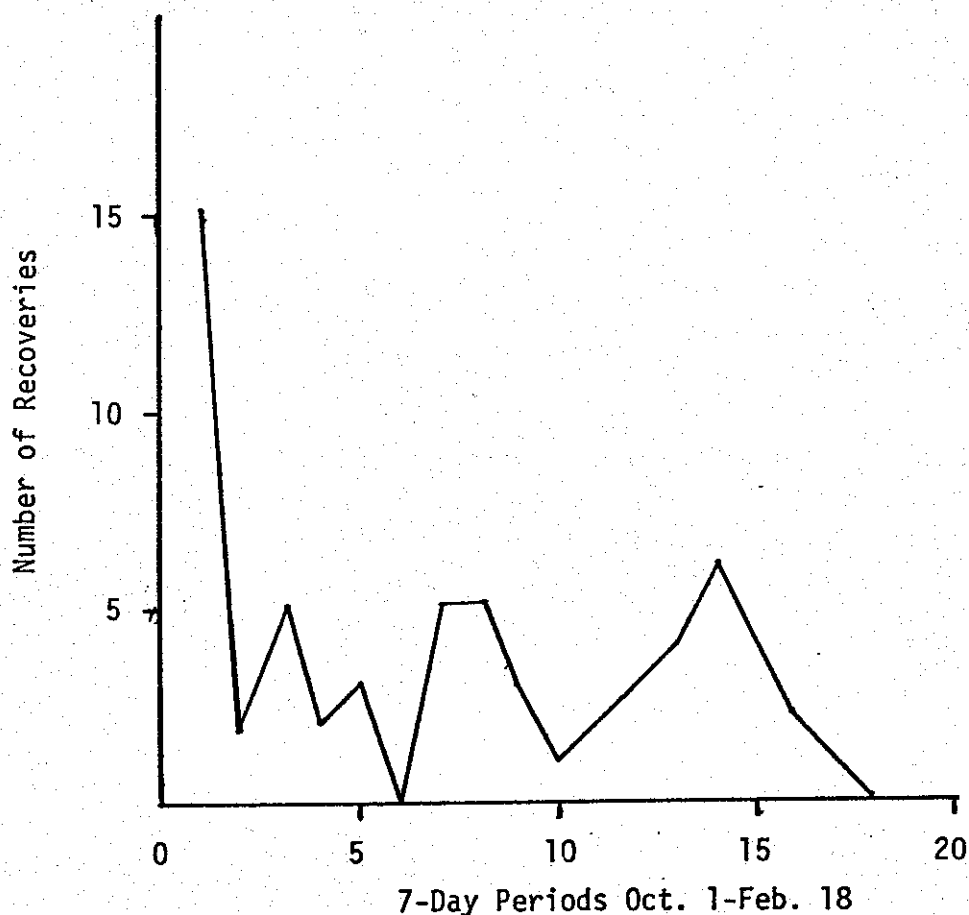


Figure 39. Temporal and Geographic Distribution of Indirect Recoveries of All Green-winged Teal Banded on NB-N S Border

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	16	27.6	22.4
P.E.I.	1	1.7	1.7
NB-NS Border	12	20.7	15.5
St. John River	1	1.7	1.7
Other New Brunswick	1	1.7	1.7
S Nova Scotia	0	0.0	0.0
Other Nova Scotia	0	0.0	0.0
Other Canadian	1	1.7	1.7
USA Total	42	72.4	3.5
Maine	0	0.0	0.0
Massachusetts	1	1.7	0.0
Other New England	2	3.5	0.0
New Jersey	7	12.1	0.0
New York	1	1.7	0.0
North Carolina	5	8.6	0.0
South Carolina	5	8.6	0.0
Florida	7	12.1	0.0
Other USA	14	24.1	3.5
Grand Total	58	100	25.9

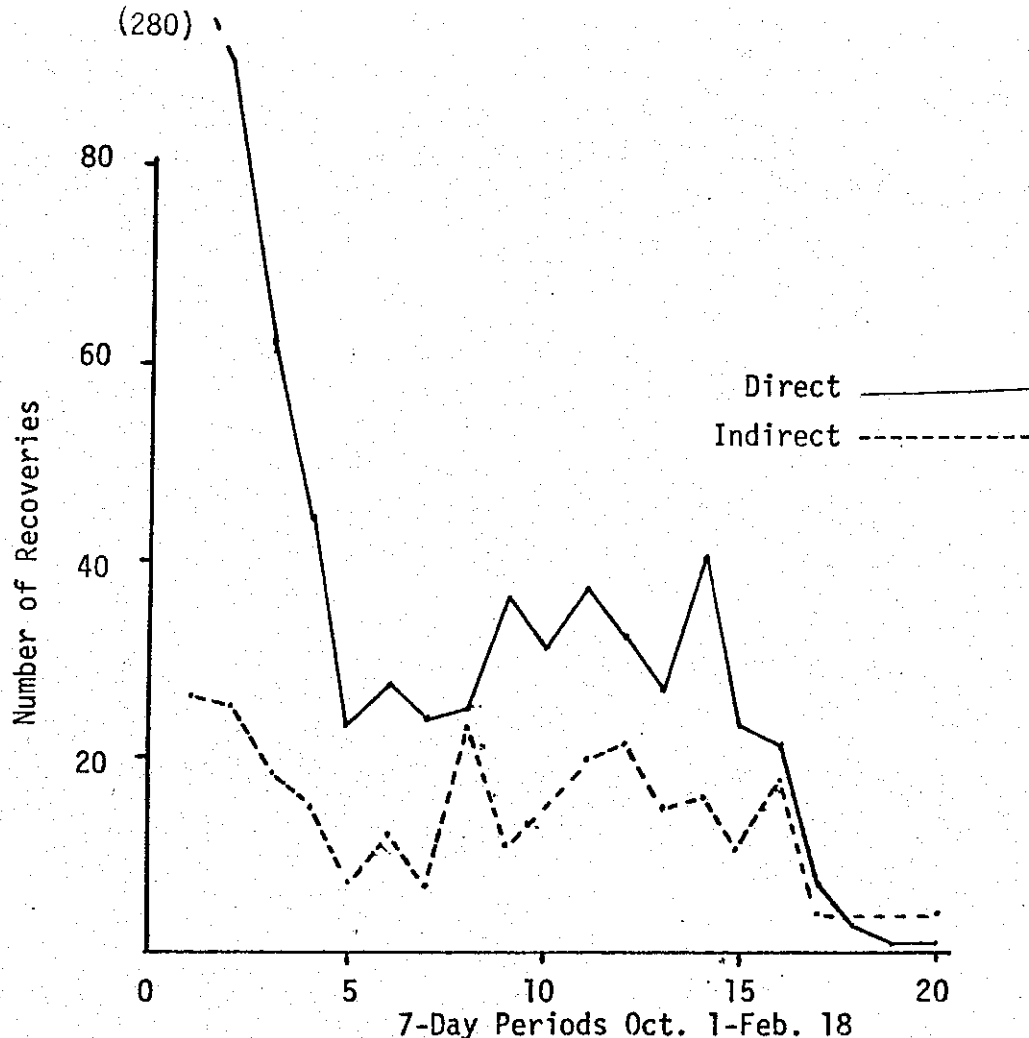


Figure 40. Temporal and Geographic Distribution of Direct and Indirect Recoveries of All Black Duck Banded in the NB-NS Border Area

Recovery	Direct			Indirect		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	603	79.4	35.7	163	59.1	8.3
✓ P.E.I.	32	4.2	0.7	13	4.7	0.0
✓ NB-NS Border	424	55.9	30.1	59	21.3	6.1
✓ St. John River	15	2.0	1.2	3	1.1	0.0
✓ SE New Brunswick	31	4.1	2.5	7	2.5	0.7
✓ NE New Brunswick	1	0.1	0.1	3	1.1	0.7
✓ Other NB	4	0.5	0.0	5	1.8	0.4
✓ NW Nova Scotia	16	2.1	1.1	8	2.7	0.0
✓ NE Nova Scotia	1	0.1	0.0	1	0.4	0.0
✓ Southern NS	78	10.3	0.0	59	21.3	0.0
✓ Ontario	1	0.1	0.0	1	0.4	0.0
✓ Quebec	0	0.0	0.0	3	1.2	0.4
✓ Nfld.-Lab.	0	0.0	0.0	1	0.4	0.0
USA Total	156	20.6	0.4	113	40.9	1.1
✓ Maine	20	2.6	0.3	15	5.4	0.7
✓ Massachusetts	44	5.8	0.0	48	17.4	0.4
✓ Other New England	21	2.8	0.1	7	2.5	0.0
✓ New York	18	2.4	0.0	15	5.4	0.0
✓ New Jersey	39	5.2	0.0	15	5.4	0.0
✓ Other USA	14	1.8	0.0	13	4.8	0.0
✓ Grand Total	759	100.0		276	100.0	

St. John River

Recoveries of black duck and green-winged teal banded in the St. John River defined a migration route southwestward along the coast of the Atlantic States. A few of both species pass ^{ed} through southern Nova Scotia but ^{their numbers were} are insignificant relative to ^{those from} the more northern and eastern banding stations. The primary harvest area of black duck outside of Canada ^{extended through} ~~is confined to~~ New England, New York ^{to} and New Jersey, with ^{a few} some being taken as far ~~south~~ as South Carolina. Recoveries from Quebec probably identify ^{ed} the origin of ~~the~~ migrant population using the St. John River; however, most birds banded at this station ^{were probably} ~~are undoubtedly~~ of local origin. Single recoveries as far west as Ontario and Tennessee ^{confirmed} ~~suggest~~ that the ^{main} migration route ^{was} ~~is~~ restricted ~~almost entirely~~ to a narrow band along the eastern seaboard (Figure 41).

Although following a similar route to the black duck, green-winged teal migrated ^{ed} further south with ~~major harvest areas occurring south of New Jersey in~~ the Carolinas and Florida (Figure 42). Recoveries in the Mississippi Flyway suggest ^{ed} mixing of Flyway populations but to a lesser extent ~~for~~ than other banding stations. Unusual and erratic movements of greenwings ^{were} ~~are~~ demonstrated by single recoveries from California and Europe.

^{Two-thirds} ~~Over 66%~~ of the black duck banded in the St. John River were ^{recovered} in the Maritime Provinces, ^{with} ~~of that number~~ nearly 56% ~~were recovered~~ in the area of banding. In the USA, Maine, Massachusetts, New York and New Jersey accounted for most recoveries. In the case of green-winged teal, more were recovered in the USA (58.7%) than in Canada (40.5%).

Temporally, ^{49.2} ~~forty nine percent~~ of all black duck banded in the St. John River were recovered during the first week of October in Canada including ² ~~44 per cent~~ in the area of banding (Figure 43). First week

5-10-50 season
at home
recoveries in the USA were confined to the state of Maine. USA recovery rates were highest between mid-November and mid-January. For green-winged teal the highest recovery period also occurred during the first week of October in Canada (Figure 44) with much lower rates occurring from late October through February in the USA.

Female black duck were harvested more heavily in Canada (72.4%) than males (61.4%). Possibly this reflects ^{ed}an earlier movement of males out of Canada to the US wintering grounds, thus making them more vulnerable to opening day harvests south of the border. Females ^{were}~~are~~ also harvested more heavily than males (55% vs 43%) during the first week of October in Canada, particularly ⁱⁿ the area of banding. This further suggests ^{ed}that females ^{were}~~are~~ more available ~~and~~ or more vulnerable on the opening day of the hunting season. Figures 45 and 46 show the temporal and geographic distribution of recoveries of male and female black duck banded in the St. John River, respectively.

Unlike the black duck, a larger percentage of female green-winged teal (79%) ^{was}~~are~~ harvested in the USA than males (43%). This is consistent with recoveries of green-winged teal banded at other stations in the Region. Almost half (45.6%) of all recoveries of males were taken during the first week of October in Canada whereas only a small percentage (14) of females were recovered in the same period. Females recovered in the USA were taken primarily between mid-November and early January while recoveries of males in the USA tended to occur later. Figures 47 and 48 show the temporal and geographic distribution of recoveries of male and female green-winged teal banded in the St. John River, N.B. respectively.

All age classes of black duck ^{were}~~are~~ heavily harvested in the areas of banding. Local age birds show ^{ed}the highest recovery rate (61%) followed by adults (55%) and hatching year (53%). Also in all age classes the

period of greatest harvest ^{was} ~~is~~ during the first week of October. This high kill of local birds early in the season may be a significant limiting factor to the black duck population in the St. John River Area. Figures 49-51 show the temporal and geographic distribution of recoveries of black duck by age class.

Recoveries of green-winged teal in all age classes show ^{ed} a closely similar pattern both temporally and geographically. Although most recoveries in each class were from the USA, the period of highest recovery was the first week of October in Canada. Most USA recoveries occurred in states south of New Jersey. Figures 52-54 show the temporal and geographic distribution of recoveries of green-winged teal banded in the St. John River by age class.

Over 78% of all black duck recoveries were taken during the first hunting season after banding. Of those direct recoveries 73% were from Canada primarily in the area of banding ($6\frac{2}{3}\%$). The high percentage of direct recoveries ($54\frac{6}{10}$) taken during the first week of October in the Maritime Provinces (48.9% in St. John River) may be cause for concern for potential overharvest of that population segment. Indirect recoveries were primarily from the USA (54%) in states north of New Jersey. The US harvest of this population segment appears ^{to} ~~to~~ occur primarily from mid-November to early February with the highest rate occurring in early December. Figures 55 and 56 show the temporal and geographic distribution of direct and indirect recoveries of black duck banded in the St. John River.

Most recoveries, of both direct (55.9%) and indirect (64.3%), types of green-winged teal were from the USA. Also first week recoveries (October 1-7) in Canada were notably lower than for black duck; however, temporally the distribution of the two recovery types for green-winged teal ^{were} ~~are~~ roughly

similar. Figures 57 and 58 show the temporal and geographic distribution of direct and indirect recoveries of green-winged teal banded in the St. John River.

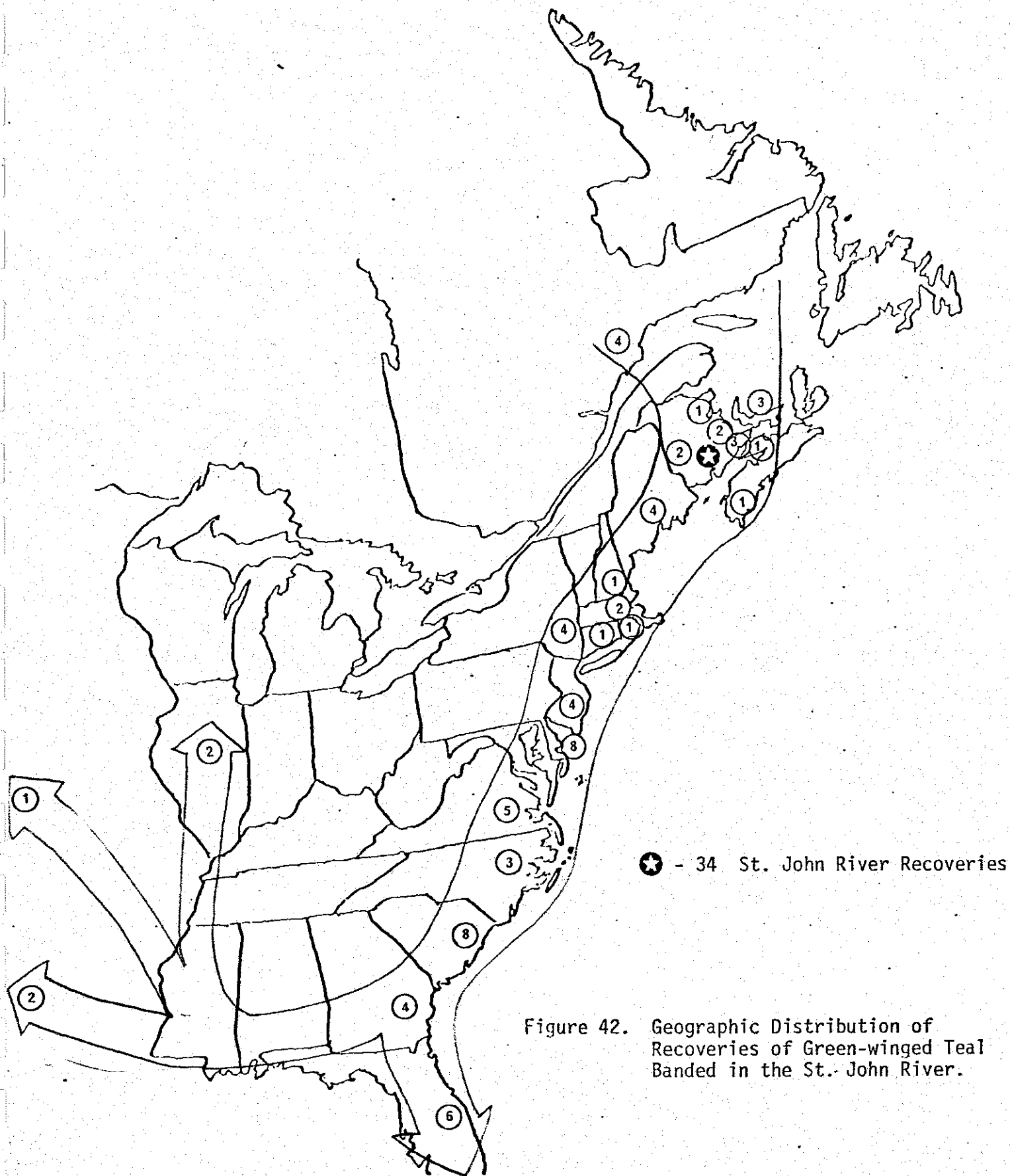


Figure 42. Geographic Distribution of Recoveries of Green-winged Teal Banded in the St. John River.

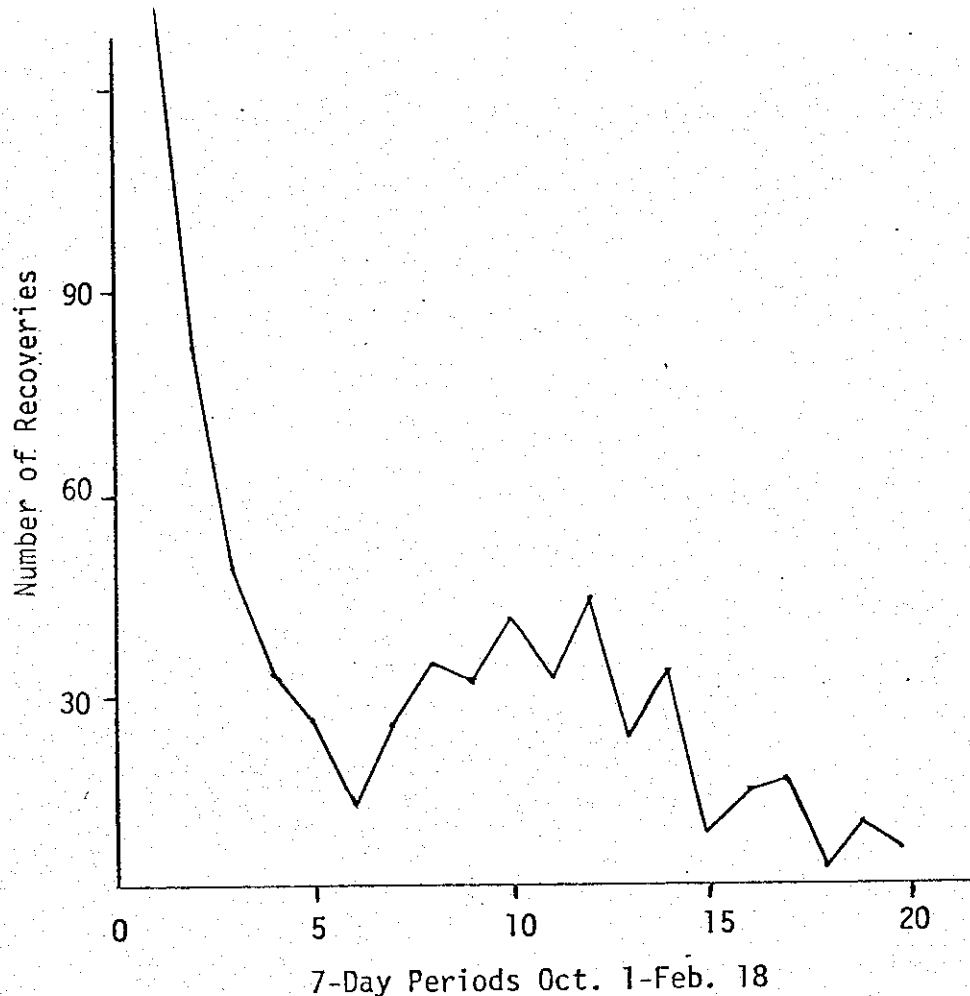


Figure 43 . Temporal and Geographic Distribution of All Recoveries of Black Duck Banded in St. John River, New Brunswick.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week	in Fig. 43-5
✓ Canadian Total ✓	694	66.92	49.2	694
✓ P.E.I. ✓	9	.87	0.1	✓
✓ NB-NS Border ✓	9	.87	0.5	✓
✓ St. John River ✓	579	55.83	43.8	✓
✓ Other New Brunswick ✓	57	5.50	4.4	61
✓ Southern Nova Scotia ✓	26	2.51	0.1	✓
✓ Other Nova Scotia ✓	7	.68	0.2	8
✓ Other Canadian ✓	7	.68	0.1	✓
USA Total ✓	343	33.08	2.2	341
✓ Maine ✓	98	9.45	2.2	✓
✓ Massachusetts ✓	69	6.65		✓
✓ Other New England ✓	38	3.66		✓
✓ New Jersey ✓	62	5.98		50
✓ New York ✓	29	2.80		✓
✓ North Carolina ✓	10	.96		✓
✓ South Carolina ✓	2	.19		✓
✓ Florida	-			✓
Other USA ✓	35			✓
Grand Total ✓	1037			1040

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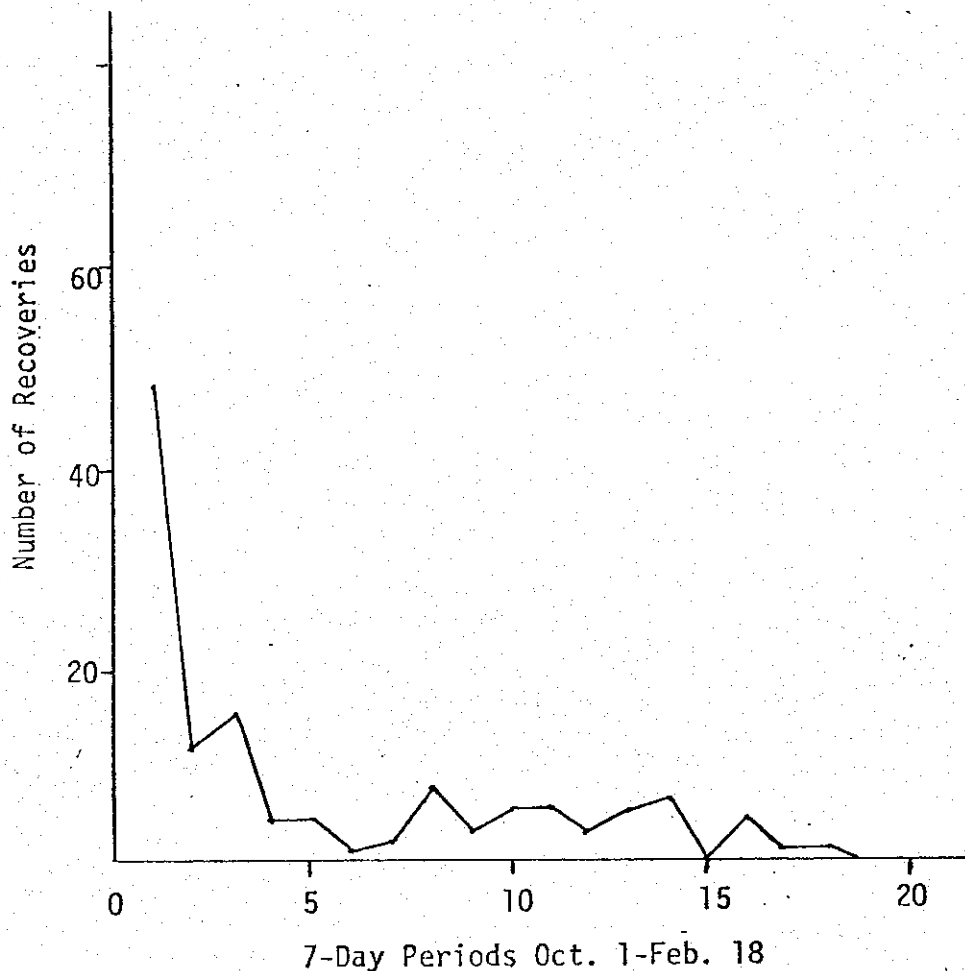


Figure 44. Temporal and Geographic Distribution of All Recoveries of All Green-winged Teal Banded at Saint John River.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week	Fig. 52-54
✓ Canadian Total ✓	51	40.5	31.0	✓
✓ P.E.I. ✓	3	2.4	1.6	✓
✓ NB-NS Border ✓	3	2.4	.8	✓
✓ St. John River ✓	34	26.9	22.2	✓
✓ Other New Brunswick ✓	5	3.9	4.0	✓
✓ Southern Nova Scotia ✓	1	.8	0.0	✓
✓ Other Nova Scotia ✓	1	.8	.8	✓
✓ Other Canadian ✓	4	3.2	1.6	✓
USA Total ✓	74	58.7	7.1	✓
Maine ✓	7	5.6	3.1	✓
Massachusetts ✓	3	2.4	.8	✓
Other New England ✓	5	3.9	0.0	✓
New Jersey ✓	6	4.8	0.0	7
New York ✓	9	7.1	2.4	8
North Carolina ✓	5	3.9	0.0	4
South Carolina (12 in Figs 47+48)	10	7.9	0.0	✓
✓ Florida ✓	6	4.8	0.0	✓
Other USA (21 in Figs 47+48)	23	18.3	.8	24
Grand Total	126	100.0	38.1	✓
Europe (included in Grand Total)	1	.8		

Fig. 42

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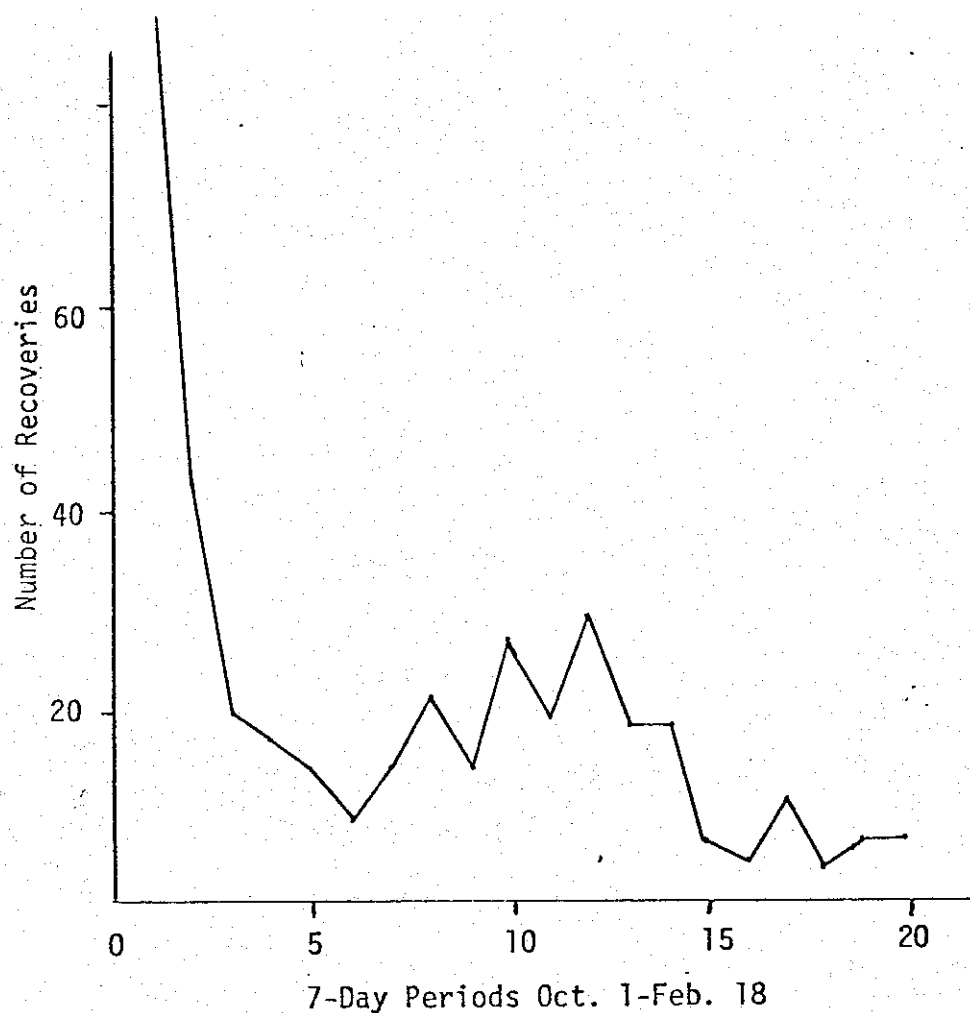


Figure 45 . Temporal and Geographic Distribution of Male Black Duck Recoveries Banded at St. John River.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	318	61.39	43.2
P.E.I.	4	.77	
NB-NS Border	6	1.16	0.8
St. John River	257	49.61	38.2
Other New Brunswick	28	5.40	4.1
Southern Nova Scotia	16	3.09	
Other Nova Scotia	3	.58	
Other Canadian	4	.77	0.2
USA Total	200	38.61	2.9
Maine	65	12.55	2.9
Massachusetts	37	7.14	
Other New England	19	3.67	
New Jersey	33	6.37	
New York	18	3.47	
North Carolina	5	.96	
South Carolina	2	.39	
Florida	-		
Other USA	21	4.05	
Grand Total	518		

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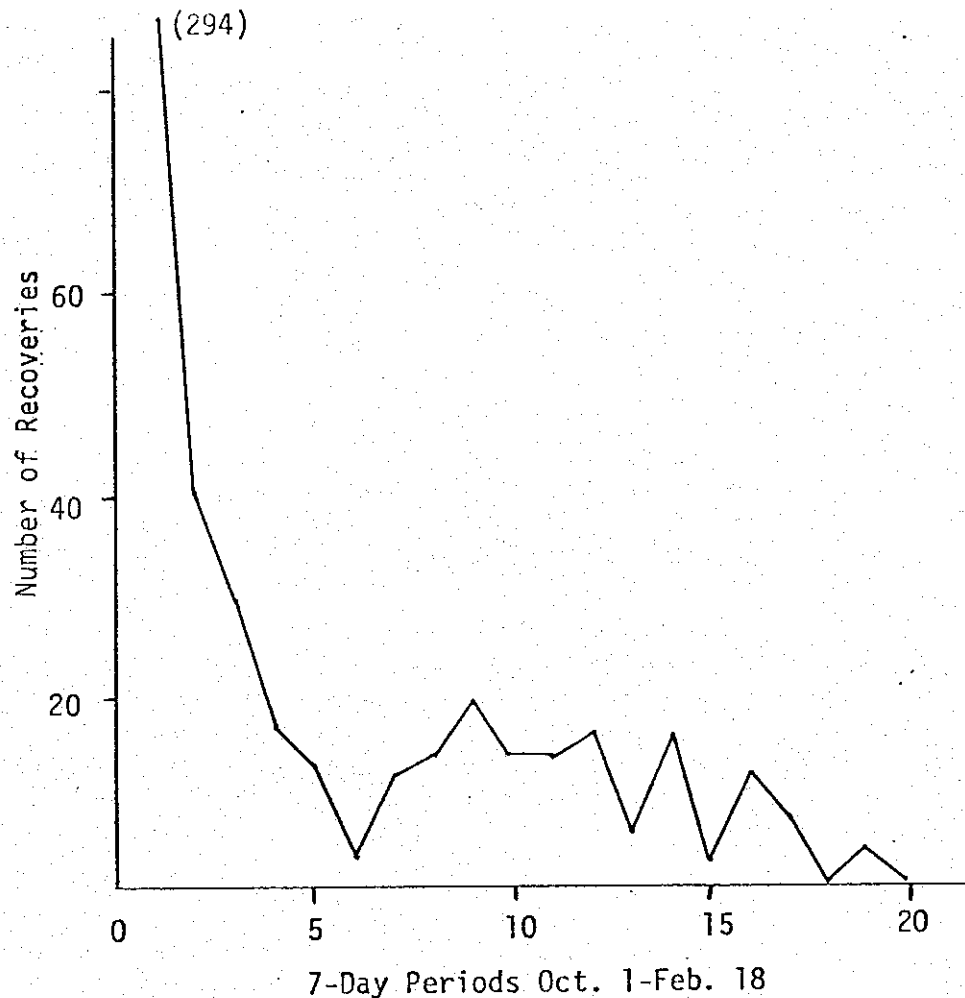


Figure 46 . Temporal and Geographic Distribution of Female Black Duck Recoveries banded at Saint John River

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	376	72.45	55.1
P.E.I.	5	.96	0.2
NB-NS Border	3	.58	0.2
St. John River	322	62.04	49.3
Other New Brunswick	29	5.59	4.8
Southern Nova Scotia	10	1.93	0.2
Other Nova Scotia	4	.77	0.2
Other Canadian	3	.58	
USA Total	143	27.55	1.5
Maine	33	6.36	1.5
Massachusetts	32	6.17	
Other New England	19	3.66	
New Jersey	29	5.59	
New York	11	2.12	
North Carolina	5	.96	
South Carolina	-		
Florida	-		
Other USA	14	2.70	
Grand Total	519		

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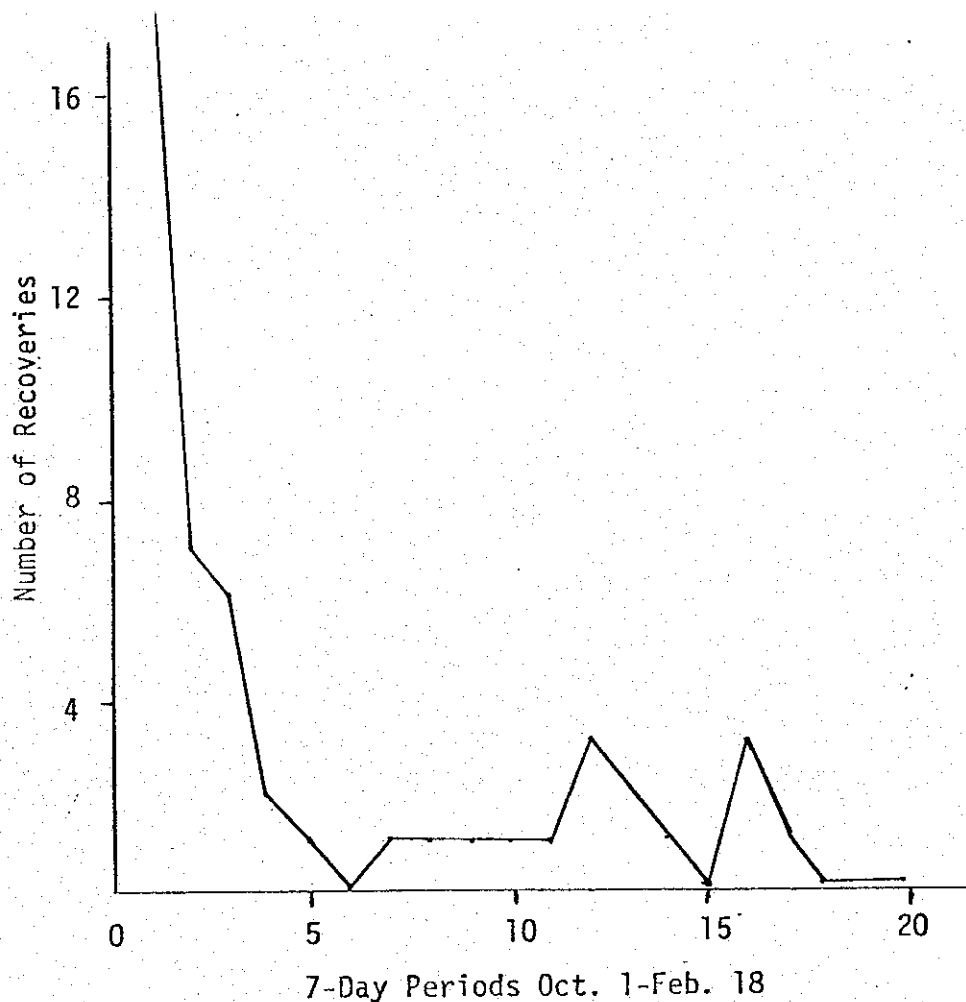


Figure 47. Temporal and Geographic Distribution of All Male Green-winged Teal Recoveries Banded at Saint John River.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	39	57.35	45.6
P.E.I.	1	1.47	
NB-NS Border	3	4.41	1.5
St. John River	27	39.71	33.8
Other New Brunswick	4	5.88	5.9
Other Nova Scotia	1	1.47	1.5
Other Canadian	3	4.41	2.9
USA Total	29	42.65	8.8
Maine	3	4.41	4.4
Massachusetts	1	1.47	
Other New England	2	2.94	
New Jersey	2	2.94	
New York	5	7.35	2.9
North Carolina	2	2.94	
South Carolina	4	5.88	1.5
Florida	5	7.35	
Other USA	5	7.35	
Other USA	5	7.35	
Grand Total	68		

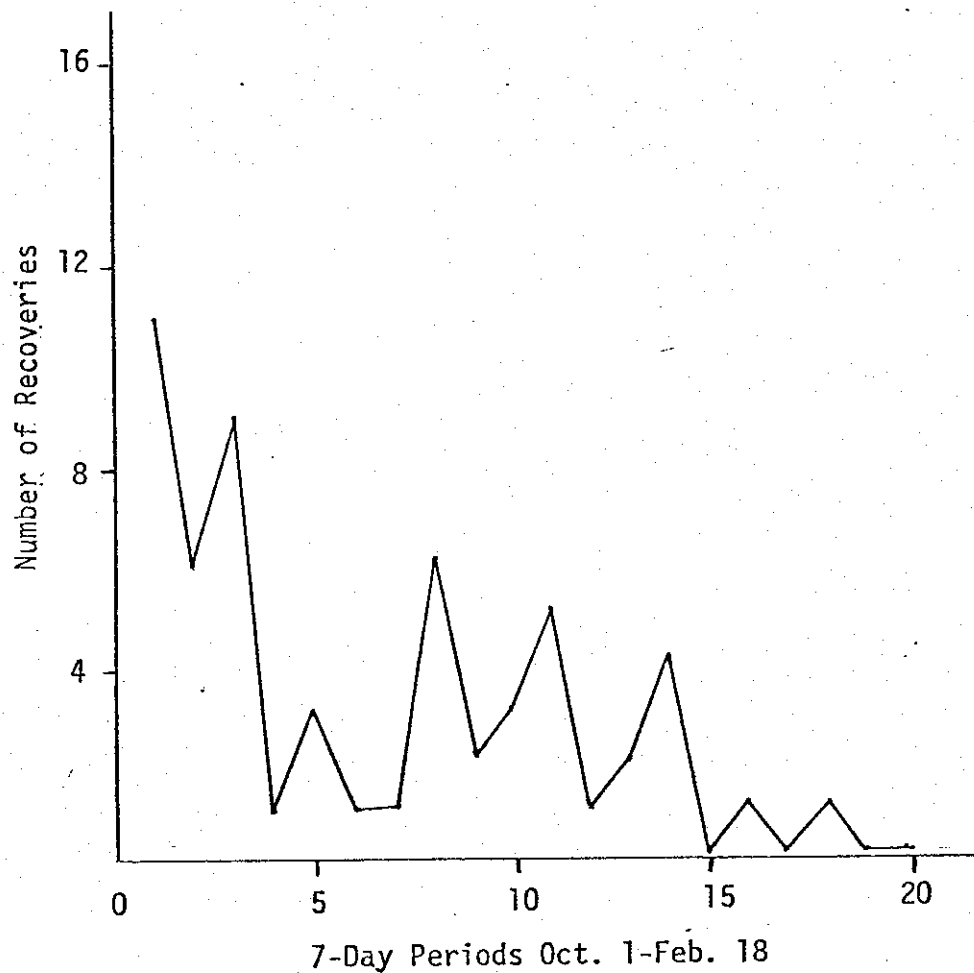


Figure 48 . Temporal and Geographic Distribution of All Female Green-winged Teal Recoveries Banded in the St. John River Area.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	12	21.05	14.0
P.E.I.	2	3.51	3.5
NB-NS Border	-		
St. John River	7	12.28	8.8
Other New Brunswick	1	1.74	1.7
Southern Nova Scotia	1	1.74	
Other Nova Scotia	-		
Other Canadian	1	1.74	
USA Total	45	78.95	5.3
Maine	4	7.02	1.7
Massachusetts	2	3.51	1.7
Other New England	3	5.26	
New Jersey	4	7.02	
New York	4	7.02	1.7
North Carolina	3	5.26	
South Carolina	8	14.05	
Florida	1	1.74	
Other USA	16	28.07	
Grand Total	57		

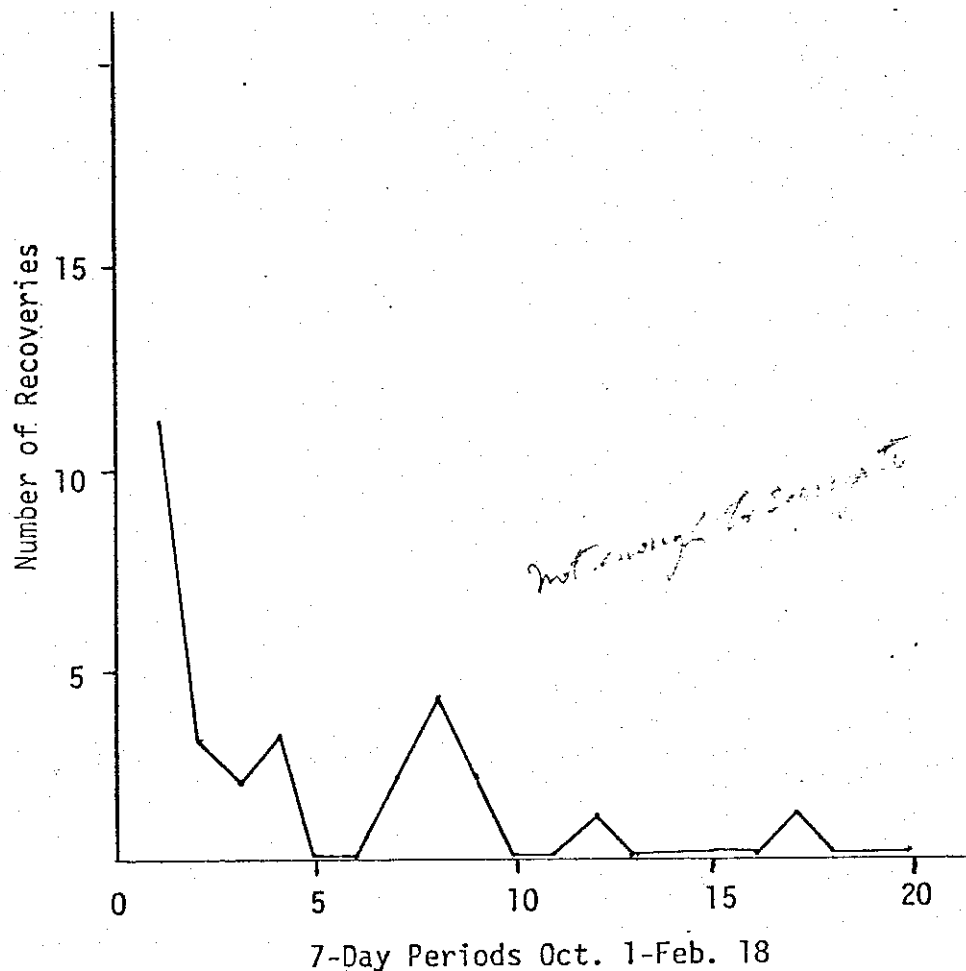


Figure 49. Temporal and Geographic Distribution of Adult Black Duck Recoveries Banded at Saint John River.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	19	65.52	34.5
P.E.I.	-		
St. John River	16	55.17	31.0
Other New Brunswick	1	3.45	3.4
Southern Nova Scotia	-		
Other Nova Scotia	2	6.90	
Other Canadian	-		
USA Total	10	34.48	3.4
Maine	2	6.90	3.4
Massachusetts	3	10.34	
Other New England	3	10.34	
New Jersey	2	6.90	
Grand Total	29		

*totals for Tables 49-51
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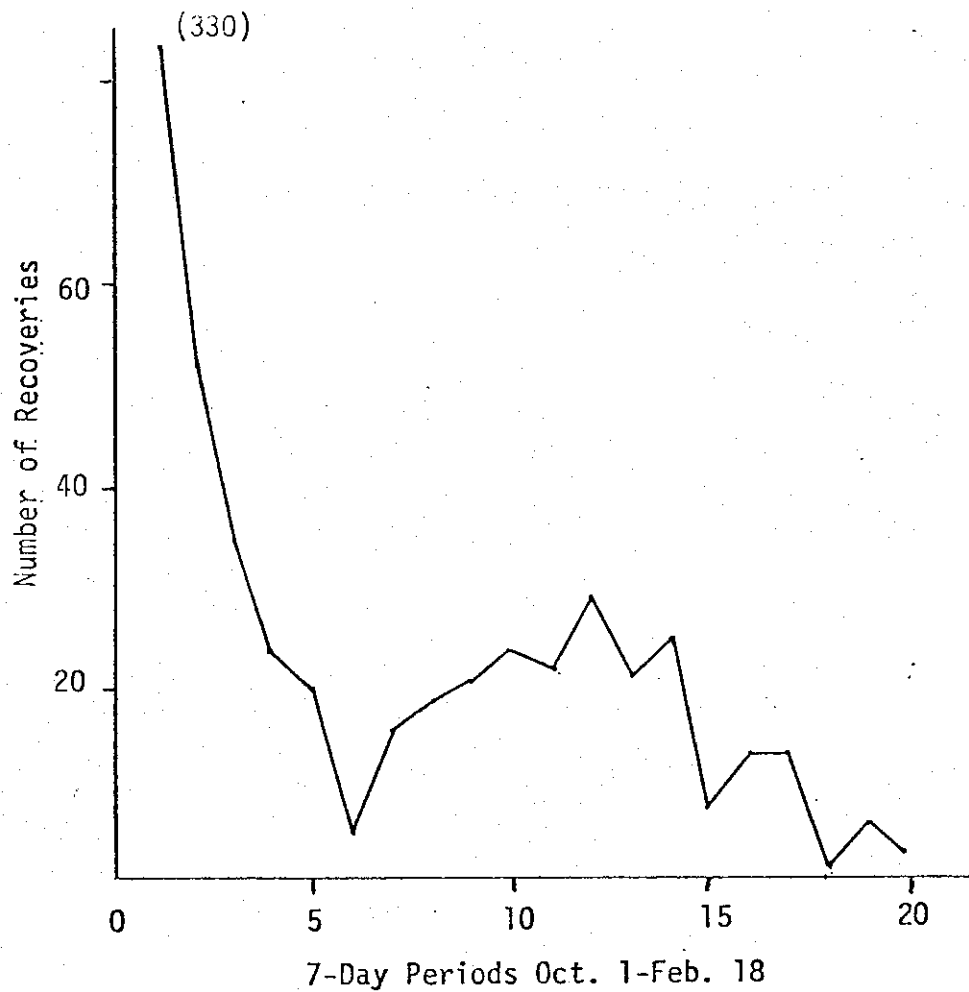


Figure 50. Temporal and Geographic Distribution of Hatch Year Black Duck Recoveries Banded at St. John River.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	439	65.42	46.8
P.E.I.	6	.89	0.1
NB-NS Border	8	1.19	0.7
St. John River	357	53.20	41.7
Other New Brunswick	33	4.92	3.6
Southern Nova Scotia	24	3.58	0.3
Other Nova Scotia	5	.74	0.1
Other Canadian	6	.89	0.1
USA Total	232	34.58	2.4
Maine	66	9.84	2.4
Massachusetts	47	7.00	
Other New England	28	4.17	
New Jersey	43	6.41	
New York	21	3.13	
North Carolina	6	.89	
South Carolina	2	.30	
Florida	-		
Other USA	19		
Grand Total	671		

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Number of Recoveries

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7-Day Periods Oct. 1-Feb. 18

Figure 51 . Temporal and Geographic Distribution of "Local" Black Duck Recoveries Banded at St. John River.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	241	70.88	55.0
P.E.I.	3	.88	
NB-NS Border	1	.29	
St. John River	206	60.59	48.5
Other New Brunswick	27	7.94	23.8
Southern Nova Scotia	2	.59	
Other Nova Scotia	1	.29	0.3
Other Canada	1	.29	
USA Total	99	29.12	1.5
Maine	30	8.82	1.5
Massachusetts	19	5.59	
Other New England	7	2.06	
New Jersey	15	4.41	
New York	8	2.35	
North Carolina	4	1.18	
South Carolina	-		
Florida	-		
Other USA	16	4.71	
Grand Total	340		

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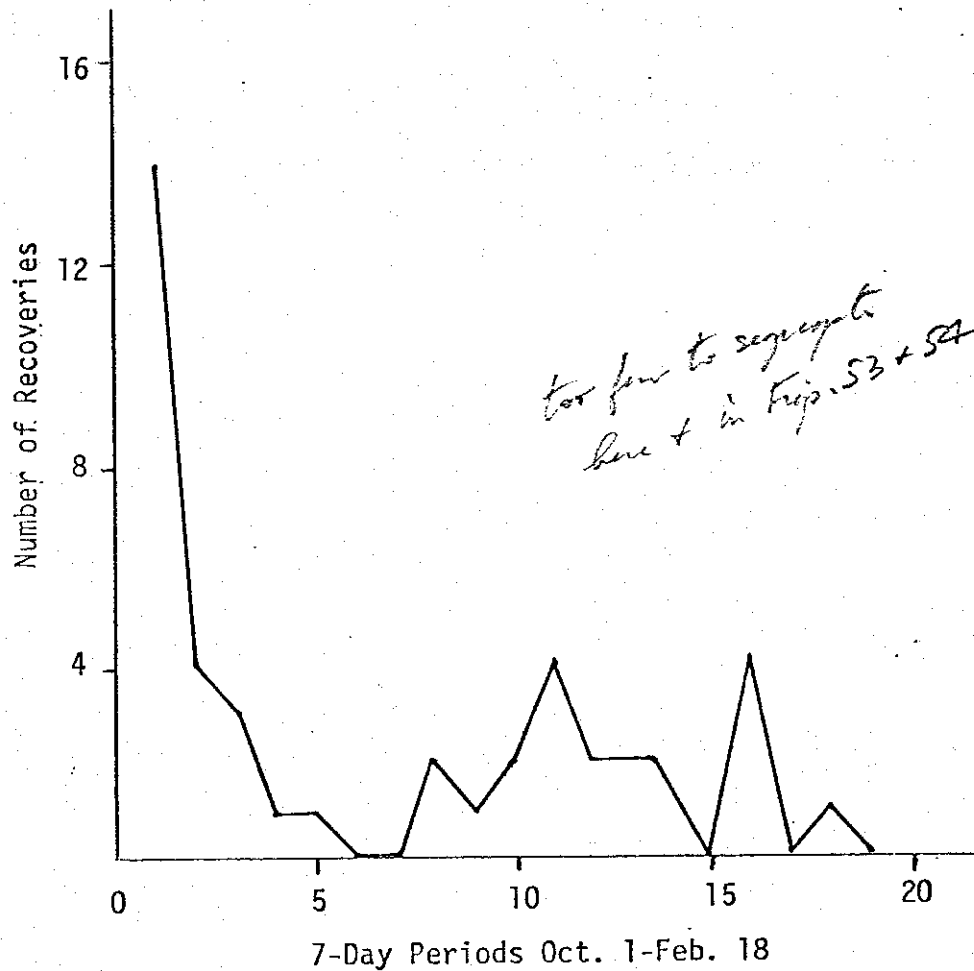


Figure 52. Temporal and Geographic Distribution of Adult Green-winged Teal Recoveries Banded at St. John River.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	17	39.53	30.2
P.E.I.	2	4.65	4.6
NB-NS Border	2	4.65	2.3
St. John River	8	18.60	13.9
Other New Brunswick	3	6.98	7.0
Other Nova Scotia	1	2.33	2.3
Other Canadian	1	2.33	
USA Total	26	60.47	2.3
Maine	2	4.65	
Massachusetts	1	2.33	
New Jersey	3	6.98	
New York	1	2.33	
North Carolina	2	4.65	
South Carolina	6	13.95	
Florida	4	9.30	
Other USA	7	16.28	
Grand Total	43		

*USA figures don't all agree
- Fig. 44*

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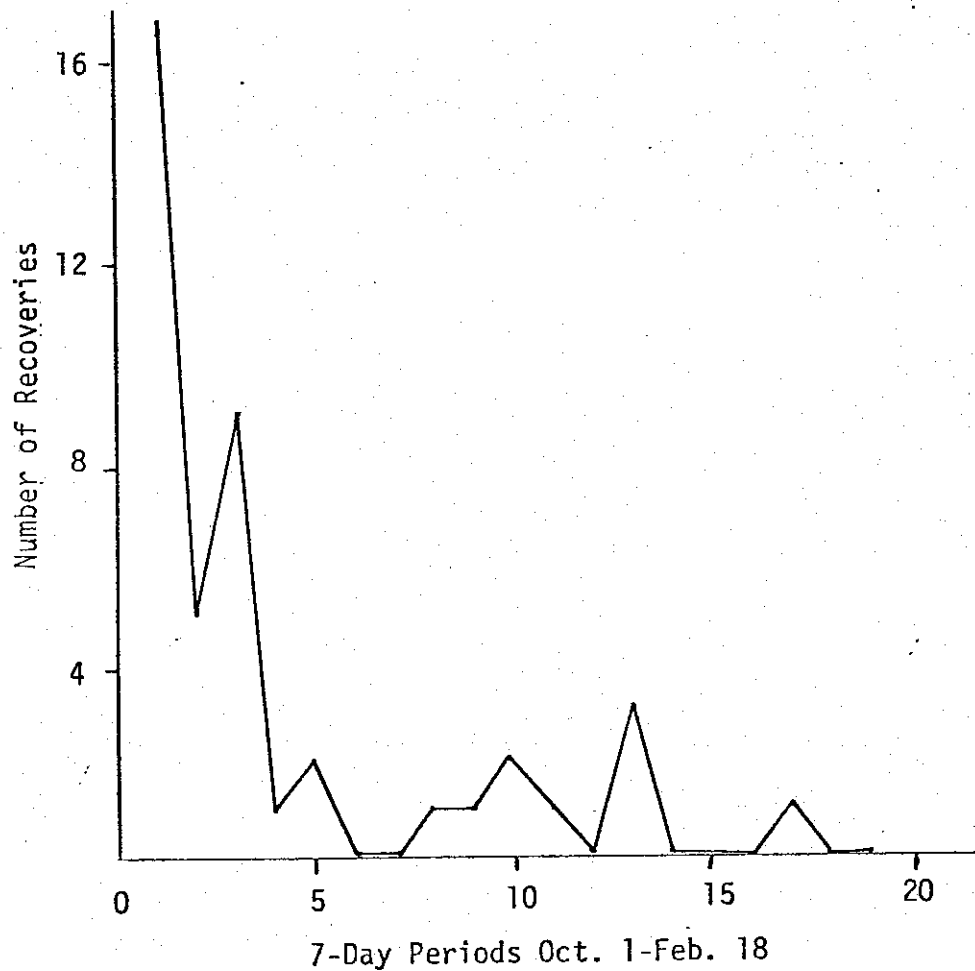


Figure 53 . Temporal and Geographic Distribution of Hatch Year Green-winged Teal Recoveries Banded at St. John River

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	19	43.18	29.5
P.E.I.	1	2.27	
NB-NS Border	1	2.27	
St. John River	14	31.82	27.3
Southern Nova Scotia	1	2.27	
Other Canadian	2	4.55	2.3
USA Total	25	56.82	9.1
Maine	3	6.82	4.5
Massachusetts	2	4.55	2.3
Other New England	3	6.82	
New Jersey	3	6.82	6.8
New York	3	6.82	2.3
North Carolina	1	2.27	
South Carolina	2	2.27	
Florida	2	2.27	
Other USA	6	13.64	
Grand Total	44		

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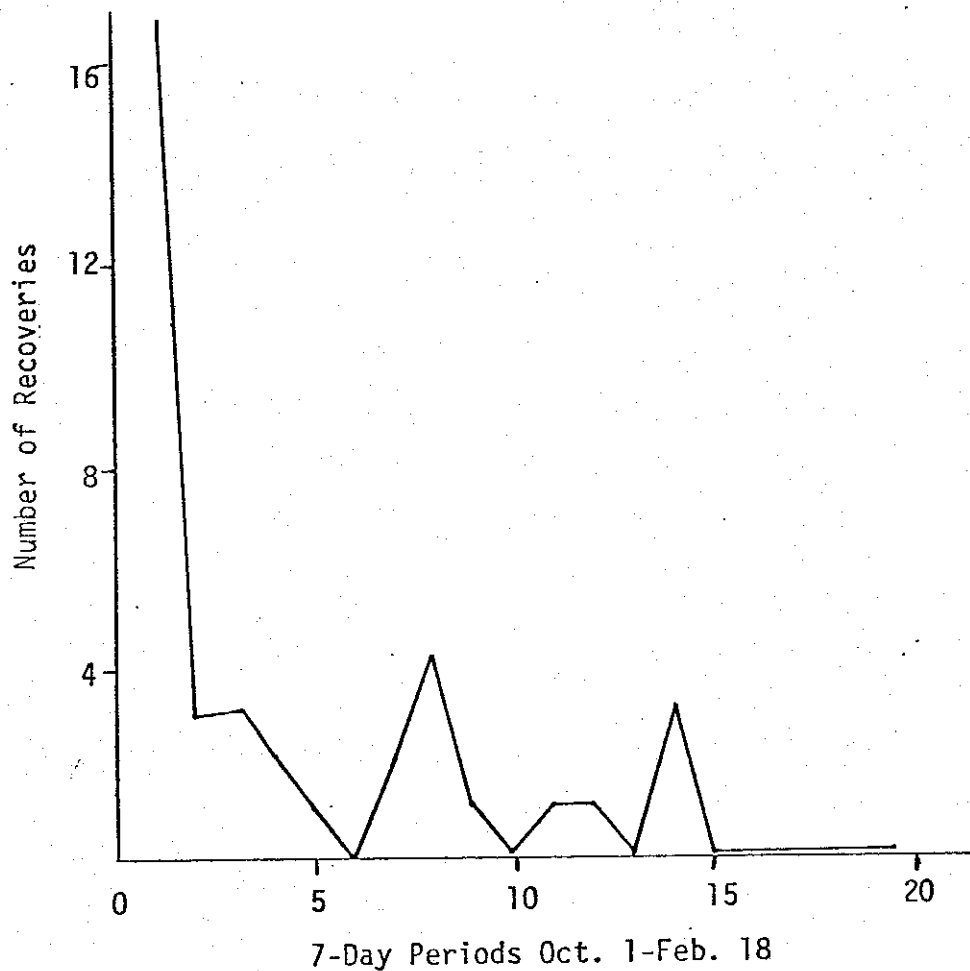


Figure 54. Temporal and Geographic Distribution of Local Green-winged Teal Recoveries Banded at St. John River

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	15	39.47	34.2
P.E.I.	-		
NB-NS Border	-		
St. John River	12	31.58	26.3
Other New Brunswick	2	5.26	5.3
Other Canadian	1	2.63	2.6
USA Total	23	60.53	2.6
Maine	2	5.26	5.3
Other New England	2	5.26	
New Jersey	1	2.63	
New York	4	10.53	2.6
North Carolina	1	2.63	
South Carolina	2	5.26	
Other USA	11	28.95	2.6
Grand Total	38		

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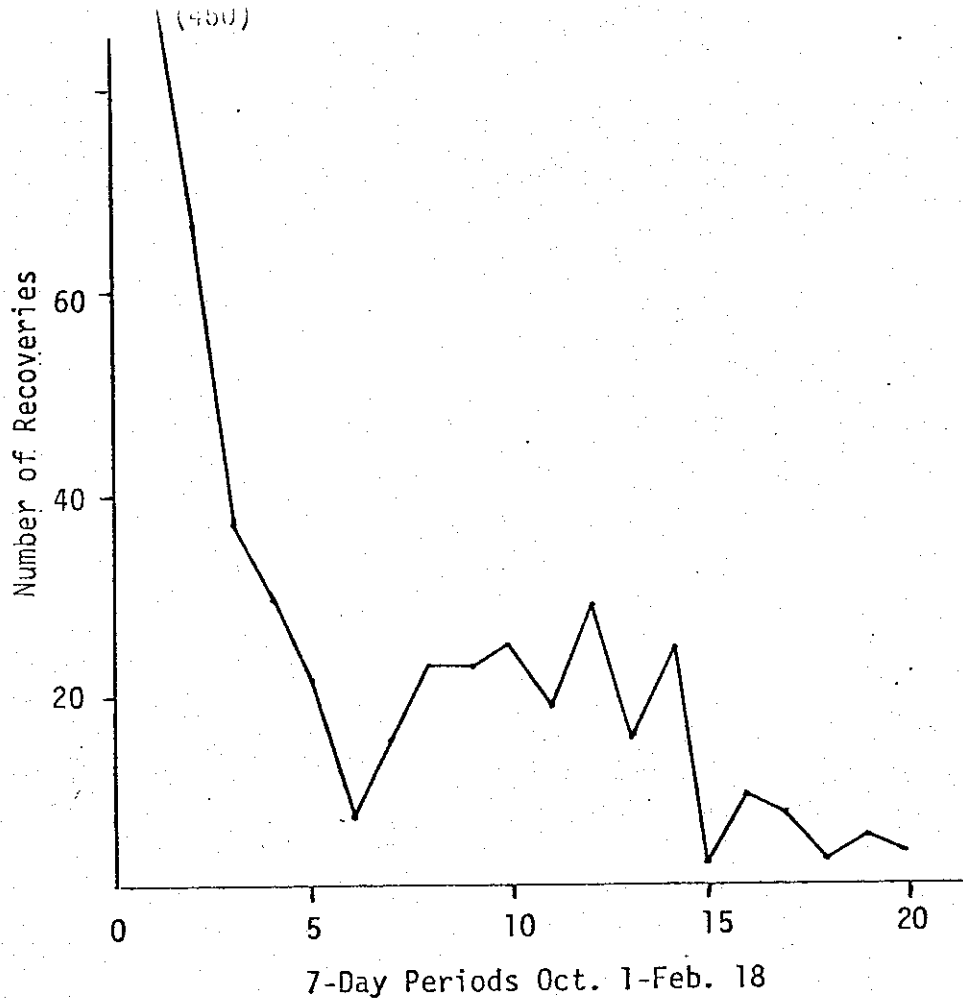


Figure 55 . Temporal and Geographic Distribution of Direct Black Duck Recoveries Banded at St. John River.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	596	73.04	54.6
P.E.I.	8	.98	0.1
NB-NS Border	6	.74	0.4
St. John River	505	61.89	48.9
Other New Brunswick	49	6.00	4.6
Southern Nova Scotia	18	2.21	0.2
Other Nova Scotia	6	.74	0.2
Other Canadian	4	.49	0.1
USA Total	220	26.96	1.7
Maine	57	6.99	1.7
Massachusetts	45	5.51	
Other New England	24	2.94	
New Jersey	41	5.02	
New York	19	2.32	
North Carolina	7	.86	
South Carolina	2	.24	
Florida	-		
Other USA	25	3.06	
Grand Total	816		

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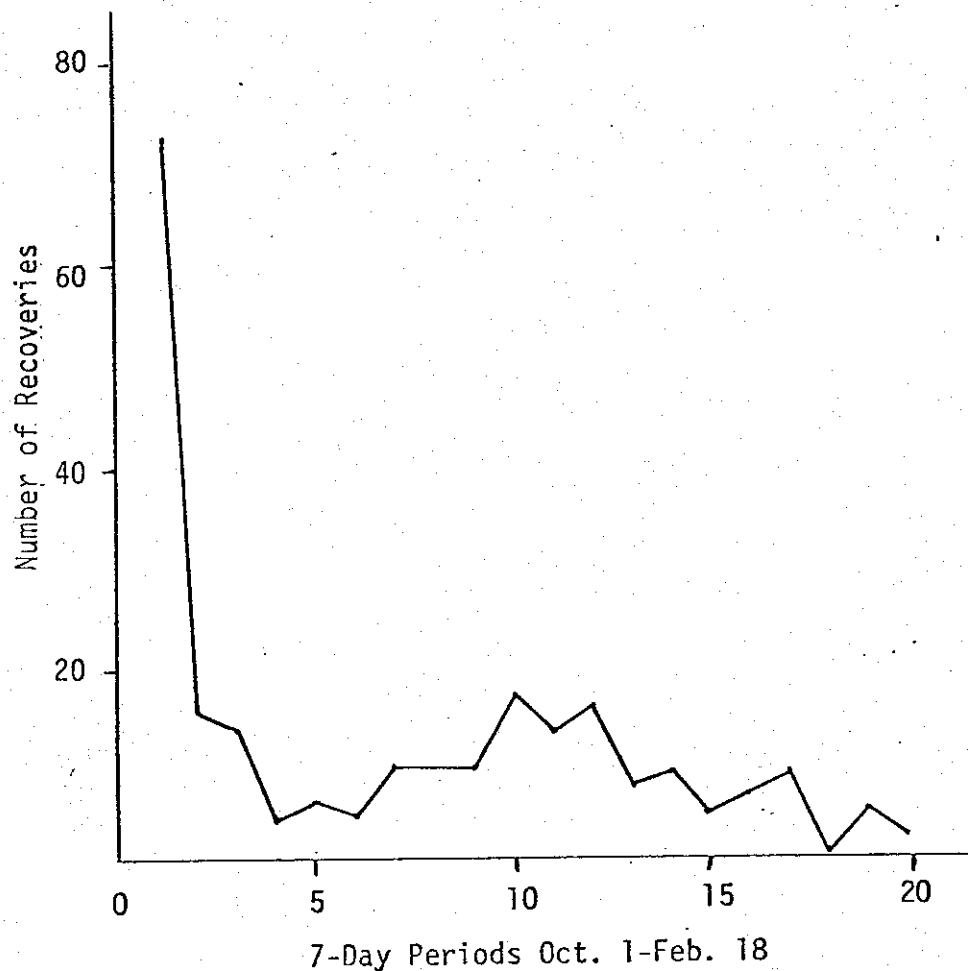


Figure 56 . Temporal and Geographic Distribution of Indirect Black Duck Recoveries Banded at St. John River

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	103	45.98	29.0
P.E.I.	1	.45	
NB-NS Border	3	1.34	0.9
St. John River	74	33.04	24.5
Other New Brunswick	12	5.36	3.6
Southern Nova Scotia	9	4.02	
Other Nova Scotia	1	.45	
Other Canadian	3	1.34	
USA Total	121	54.02	3.6
Maine	41	18.30	3.6
Massachusetts	24	10.71	
Other New England	14	6.25	
New Jersey	19	8.48	
New York	10	4.46	
North Carolina	3	1.34	
South Carolina	-		
Florida	-		
Other USA	10	4.46	
Grand Total	224		

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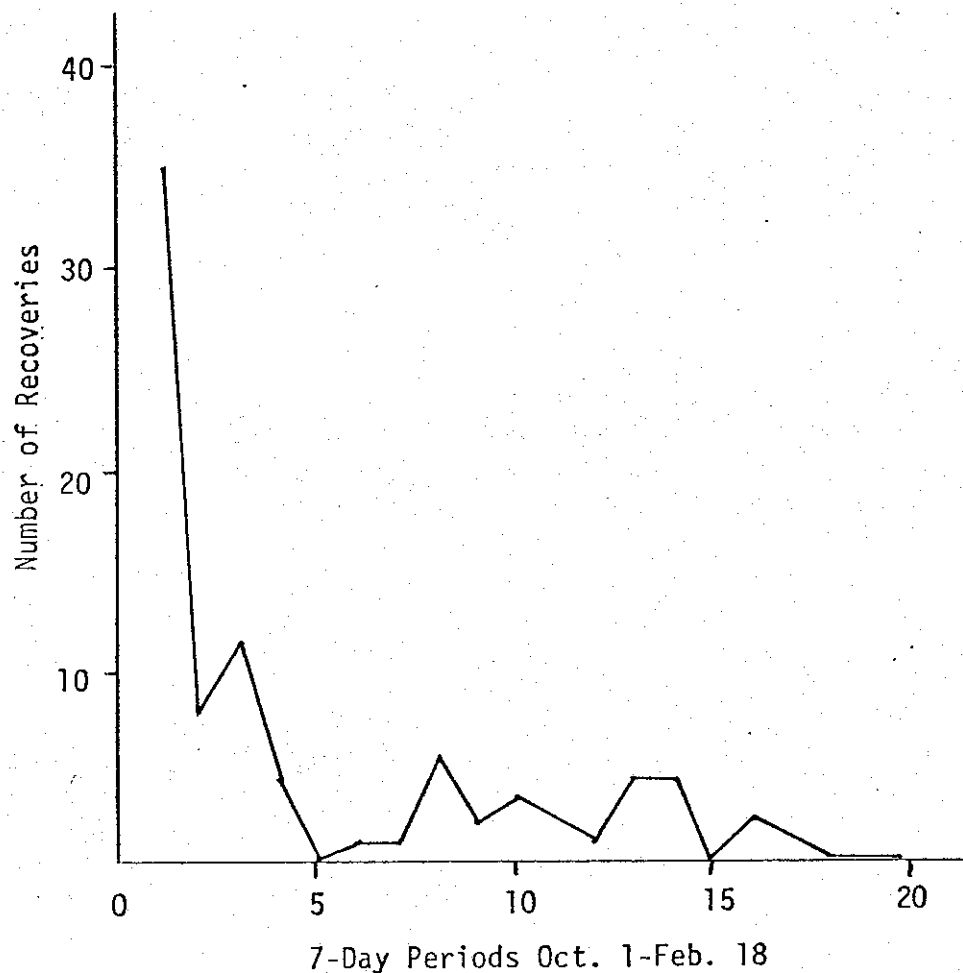


Figure 57. Temporal and Geographic Distribution of Direct Recoveries of All Green-winged Teal Banded on St. John River

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	36	42.9	33.3
P.E.I.	2	2.4	1.2
NB-NS Border	0	0.0	0.0
St. John River	27	32.1	25.0
Other New Brunswick	3	3.6	3.6
Southern Nova Scotia	0	0.0	0.0
Other Nova Scotia	1	1.2	1.2
Other Canadian	3	3.6	2.4
USA Total	47	55.9	8.3
Maine	6	7.1	3.6
Massachusetts	1	1.2	0.0
Other New England	4	4.8	0.0
New Jersey	5	5.9	0.0
New York	7	8.3	3.6
North Carolina	3	3.6	0.0
South Carolina	6	7.1	0.0
Florida	4	4.8	0.0
Other USA	11	13.1	1.2
Grand Total	84	100.0	41.7
Europe (included in Grand Total)	1	1.2	

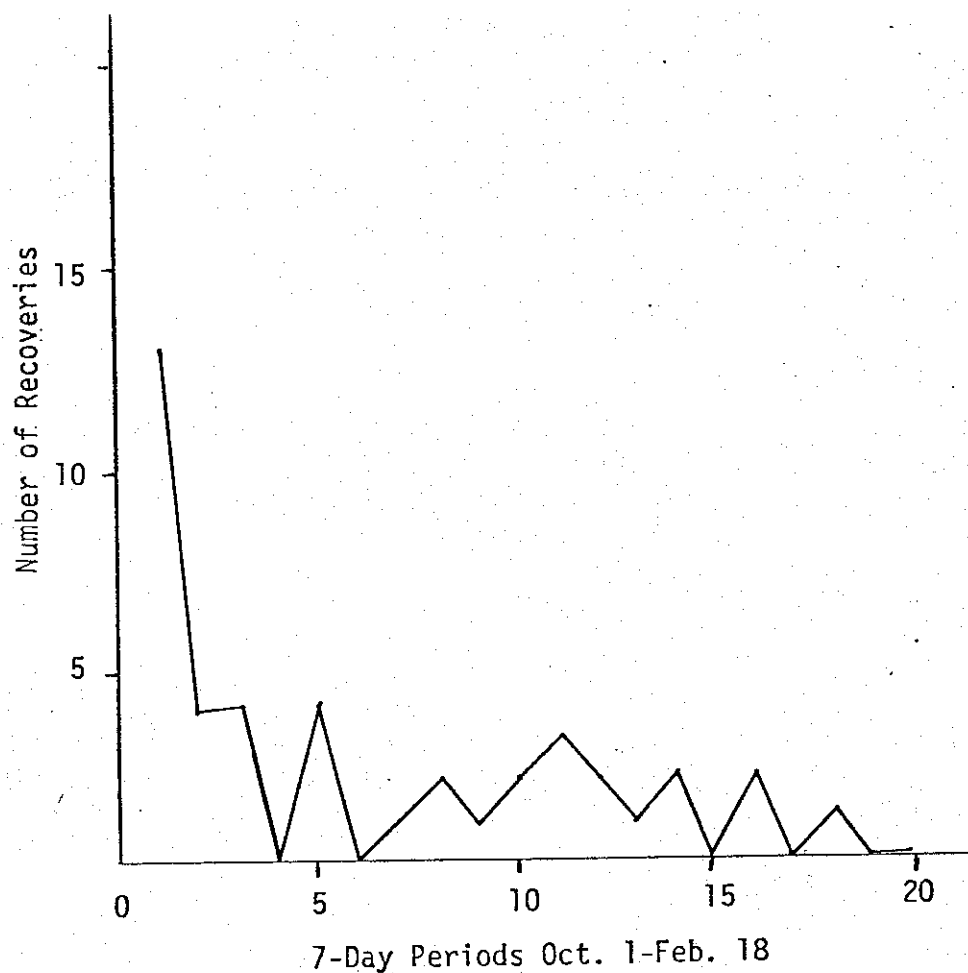


Figure 58 . Temporal Distribution or Indirect Recoveries of All Green-winged Teal Banded at St. John River

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	15	35.7	26.2
P.E.I.	1	2.4	2.4
NB-NS Border	3	7.1	2.4
St. John River	7	16.6	16.6
Other New Brunswick	2	4.76	4.8
Southern Nova Scotia	1	2.4	0.0
Other Nova Scotia	0	0.0	0.0
Other Canadian	1	2.4	0.0
USA Total	27	64.3	4.8
Maine	1	2.4	2.4
Massachusetts	2	4.76	2.4
Other New England	1	2.4	0.0
New Jersey	1	2.4	0.0
New York	2	4.76	0.0
North Carolina	2	4.76	0.0
South Carolina	4	9.5	0.0
Florida	2	4.76	0.0
Other USA	12	28.6	0.0
Grand Total	42	100	31

Tabusintac, New Brunswick

In total 63% of all black duck recoveries were taken in Canada with over 44% coming from the area of banding. Southeastern New Brunswick and southern Nova Scotia ^{here} are the next largest Canadian recovery areas while nearly 2% of the recoveries ^{come} from eastern Quebec suggesting that some ~~part~~ of the northeastern New Brunswick ~~population of~~ black duck originates in that area. Maine and Massachusetts were the largest USA recovery areas although recoveries ~~have been~~ ^{have} received from as far south as Georgia. The primary migration path is south through southe~~ast~~^{eastern} New Brunswick ~~and the St. John River Valley~~ to Maine and southern Nova Scotia. The ~~terminus of the~~ migration appears to extend further south than black duck banded in southern New Brunswick and Nova Scotia. Major wintering areas are situated along the coasts of Maine, Massachusetts and New Jersey (Figure 59 and 60).

Green-winged teal recoveries ^{were} ~~are~~ divided almost equally between the USA (50.9%) and Canada (49.1%). The Tabusintac banding area was the single largest recovery location (36.8) followed by the States of Maine, New York, North Carolina and South Carolina. Most first week recoveries were from Canada in the Tabusintac area (31.6%). Only 7% of the total recoveries were taken during the first week of October in the USA of which 5.3% were from the State of Maine. Figure 61 shows the temporal and geographic distribution of recoveries of green-winged teal banded at Tabusintac, New Brunswick. Migration routes for green-winged teal ^{were} ~~are~~ similar to those for black duck (Figure 62) except that the terminus of the migration extends ^{further} south.

Some variations in recovery distribution were noted for both species. For black duck, adult birds were harvested much more heavily

in the USA (61.1%) whereas hatching year birds were primarily taken in Canada (63.7%) particularly near Tabusintac (45.0%). In the USA, Maine, Massachusetts and New Jersey were the ^{major} highest recovery locations. Temporally, the distribution of both age groups of black duck were ~~close~~ similar with nearly all early October recoveries being taken in Canada. Figure 63 shows the temporal and geographic distribution of recoveries of black duck banded at Tabusintac by age class.

In the case of green-winged teal, slightly more than half of the adult recoveries (54.5%) were from the USA, and hatching year birds were recovered equally in the USA and Canada. In both classes, most recoveries were taken near Tabusintac early in October. Maine and New York were the largest USA recovery areas. Figure 64 shows the distribution of recoveries of green-winged teal banded at Tabusintac by age class.

For both species, a larger proportion of the recoveries were females than males; however, unlike the black duck a significantly larger proportion of female green-winged teal were harvested in the USA. Of the Canadian recoveries of black duck 49.6% of the males and 38.4% of the females were taken near Tabusintac. Southern Nova Scotia was the next largest Canadian black duck recovery area accounting for slightly over 6% of the total recoveries in both sexes. Green-winged teal recovery areas were proportionately similar to the black duck.

In the USA, green-winged teal females, particularly ^ladults, were harvested much more heavily than in Canada. New England and the Carolinas accounted for most recoveries although some were taken as far south as Florida and as far west as Louisiana. Few black duck recoveries were ^{made} taken south of New Jersey with the majority being from New England. Recovery

2 spp. had
more eggs shot in US

rates during the first week of October in Canada were high for both species whereas USA recoveries during the same period were low in all cases except green-winged teal females for which 10% of the total recoveries were taken in early October.

Direct recoveries of both black duck and green-winged teal occurred primarily during the first week of October in Canada. High numbers of recoveries during the first year, particularly for the black duck, ^{were} ~~are~~ comparable to recoveries from other stations and sufficient to suggest that harvest locally may be excessive. Indirect recoveries of black duck ^{were} ~~are~~ most common in coastal states from Maine to New Jersey where 64.3% of all recoveries occur. Green-winged teal ^{were} ~~are~~ even more heavily harvested indirectly in the USA (83.3%); ~~however,~~ the largest recovery areas ^{were} ~~are~~ ~~those states~~ south of New York. Temporally, the distribution of recoveries ^{was} ~~is~~ similar in both species except indirect green-winged teal for which the number of recoveries during the first two weeks of October equal ^{led} ~~the~~ number taken in early December. Figures 67-69 show the temporal and geographic distribution of direct and indirect recoveries of black duck and green-winged teal banded at Tabusintac.

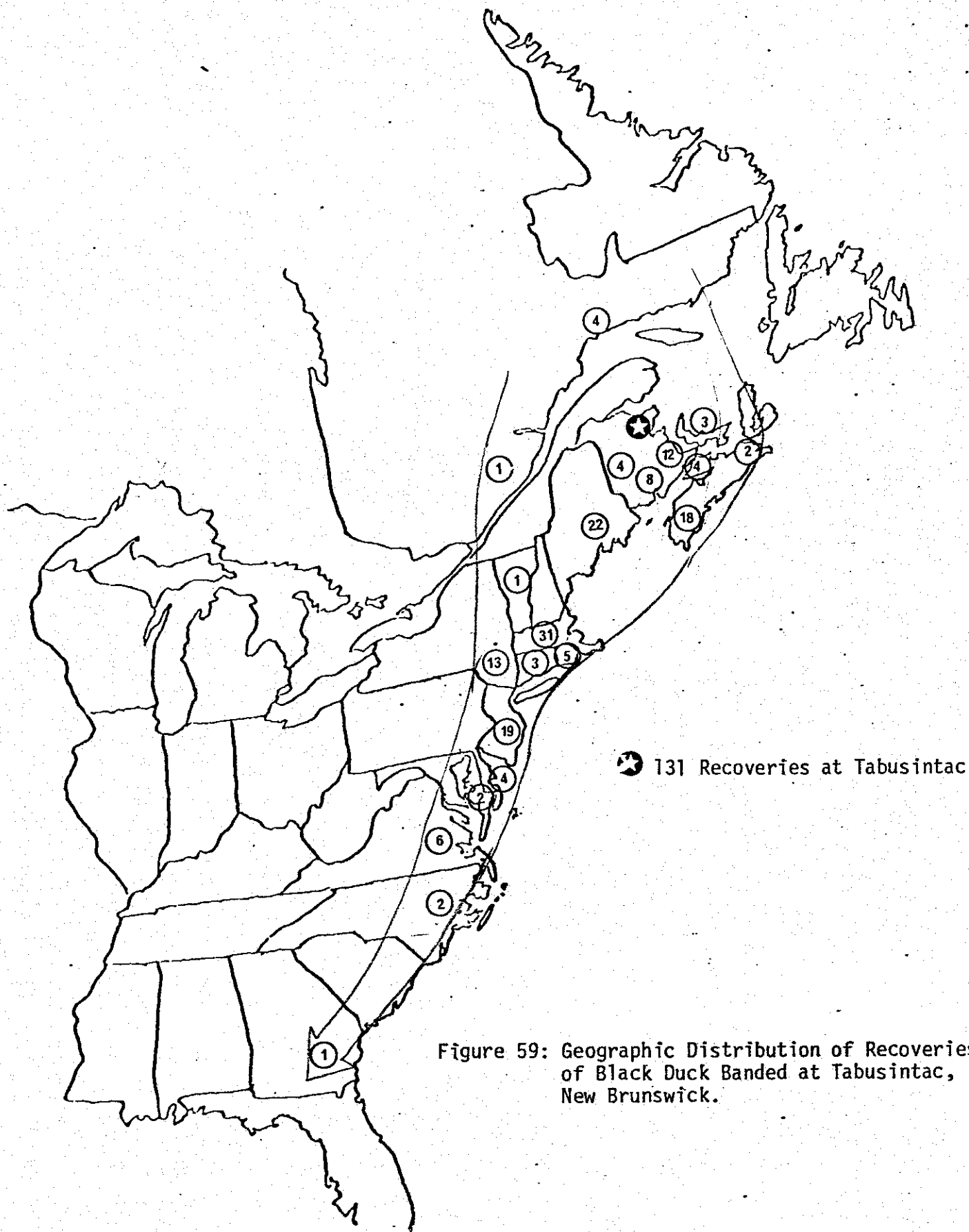


Figure 59: Geographic Distribution of Recoveries of Black Duck Banded at Tabusintac, New Brunswick.

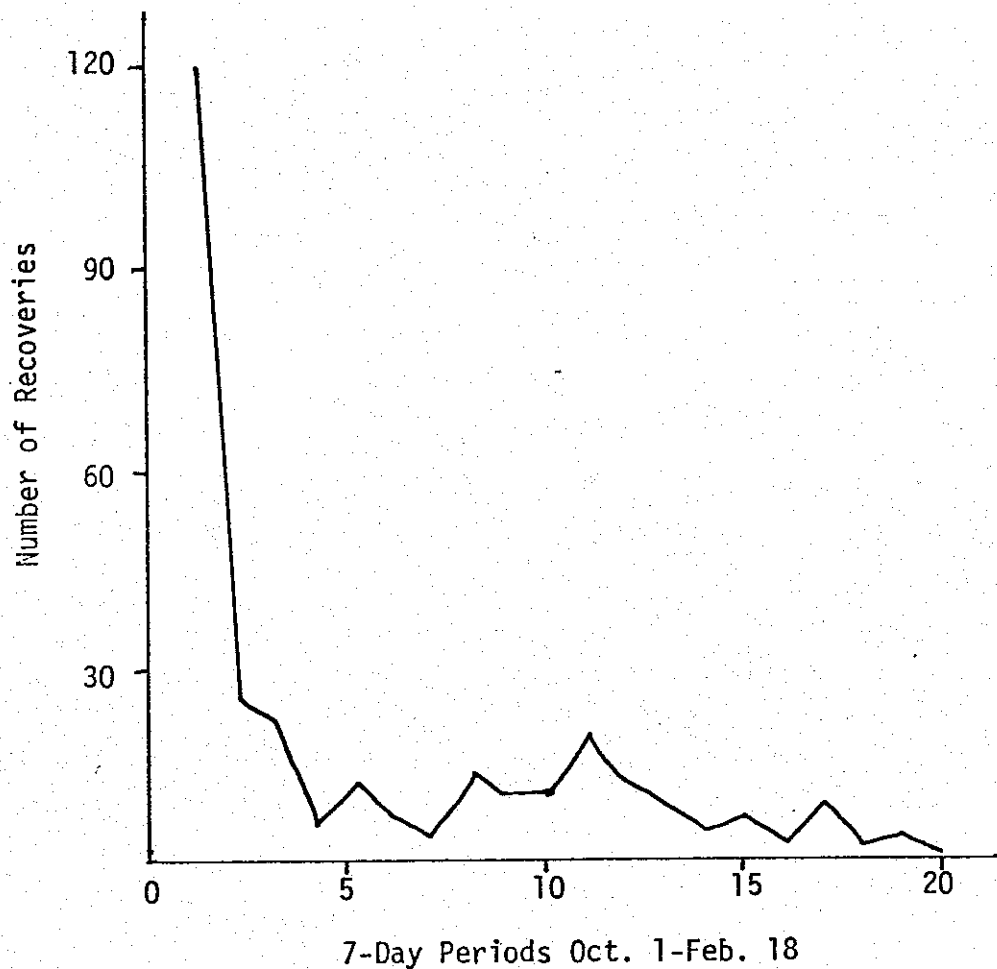


Figure 60. Temporal and Geographic Distribution of Black Duck Banded in Tabusintac.

Recovery Location	Number of Recoveries	% of Total Recoveries
Canada Total	187 ✓	63.0
P.E.I.	3 ✓	1.0
NB-NS <i>border</i>	4 ✓	1.4
St. John River	8 ✓	2.6
SE New Brunswick	12 ✓	4.0
Other New Brunswick	4 ✓	1.4
NE New Brunswick	131 ✓	44.1
NE Nova Scotia	2 ✓	0.7
Southern Nova Scotia	18 ✓	6.1
Quebec	5 ✓	1.7
USA Total	110 <i>109 in Fig. 59</i>	37
Maine	22 ✓	7.4
Massachusetts	31 ✓	10.4
Other New England	9 ✓	3.0
New Jersey	19 ✓	6.4
New York	13 ✓	4.4
Other USA	16 <i>15 in Fig. 59</i>	5.4
Grand Total	297	

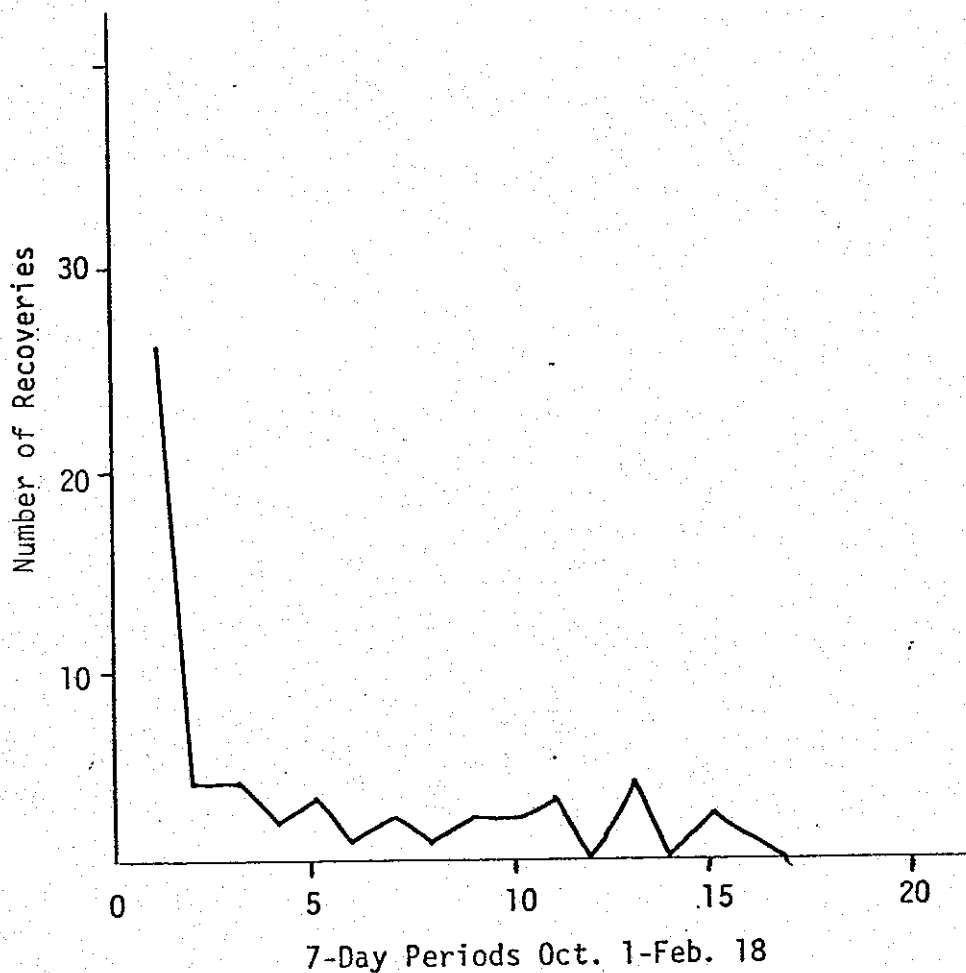


Figure 61. Temporal and Geographic Distribution of ALL Recoveries of ALL Green-winged Teal Banded in Tabusintac.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	28 ✓	49.1	38.6
P.E.I.	1 ✓	1.75	1.75
NB-NS Border	1 ✓	1.75	1.75
St. John River	1 ✓	1.75	1.75
N.E. New Brunswick	21 ✓	36.8	31.6
S. Nova Scotia	2 ✓	3.5	0
Other Nova Scotia	1 ✓	1.75	0
Other Canada	1 ✓	1.75	1.75
USA Total	29 ✓	50.9	7
Maine	5 ✓	8.8	5.3
Massachusetts	2 ✓	3.5	0
Other New England	1 ✓	1.75	0
New Jersey	2 ✓	3.5	0
New York	4 ✓	7	0
North Carolina	4 ✓	7	0
South Carolina	4 ✓	7	0
Florida	2 ✓	3.5	0
Other USA	5 ✓	8.8	1.75
Grand Total	57 ✓	100	45.6

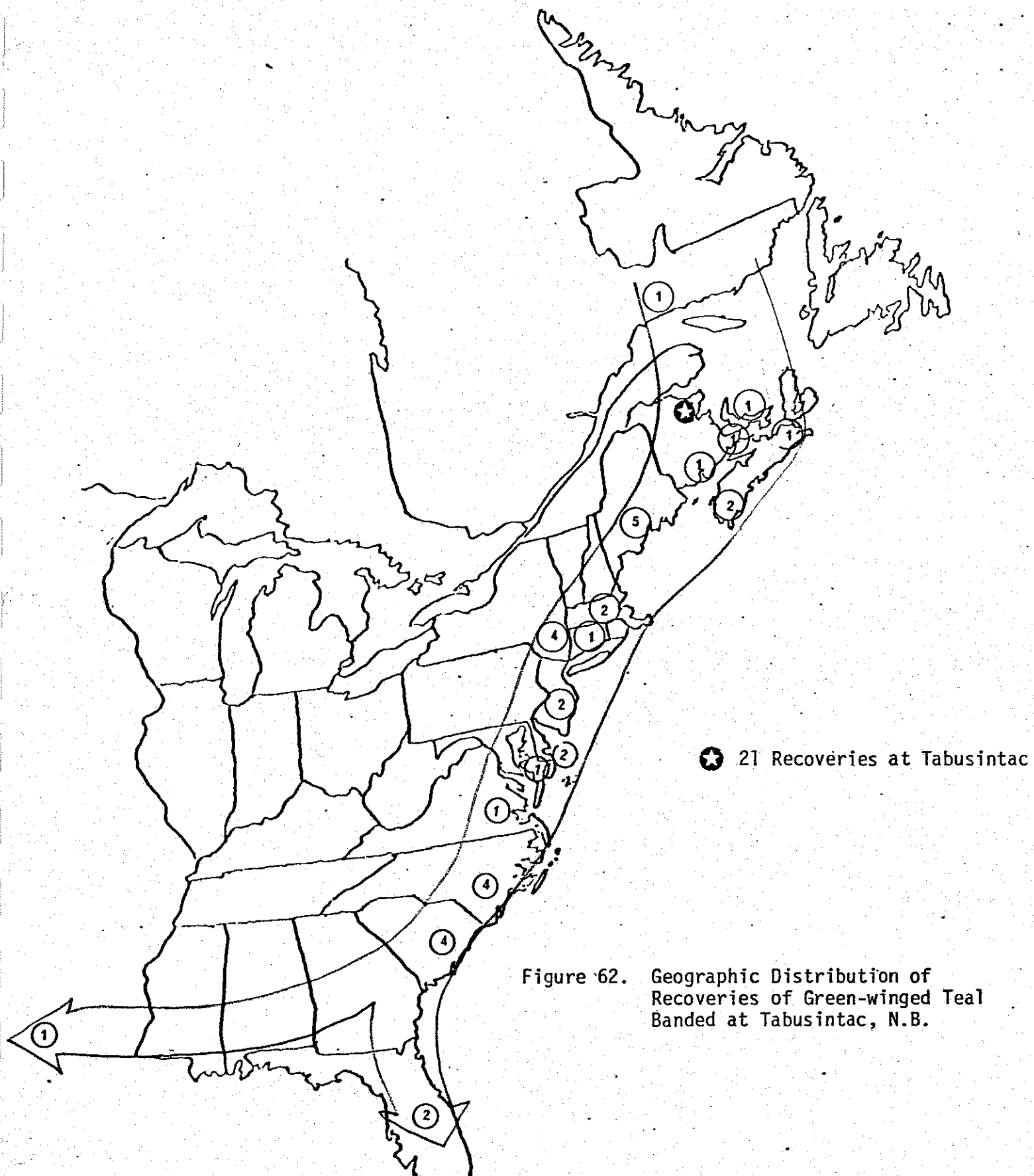


Figure 62. Geographic Distribution of Recoveries of Green-winged Teal Banded at Tabusintac, N.B.

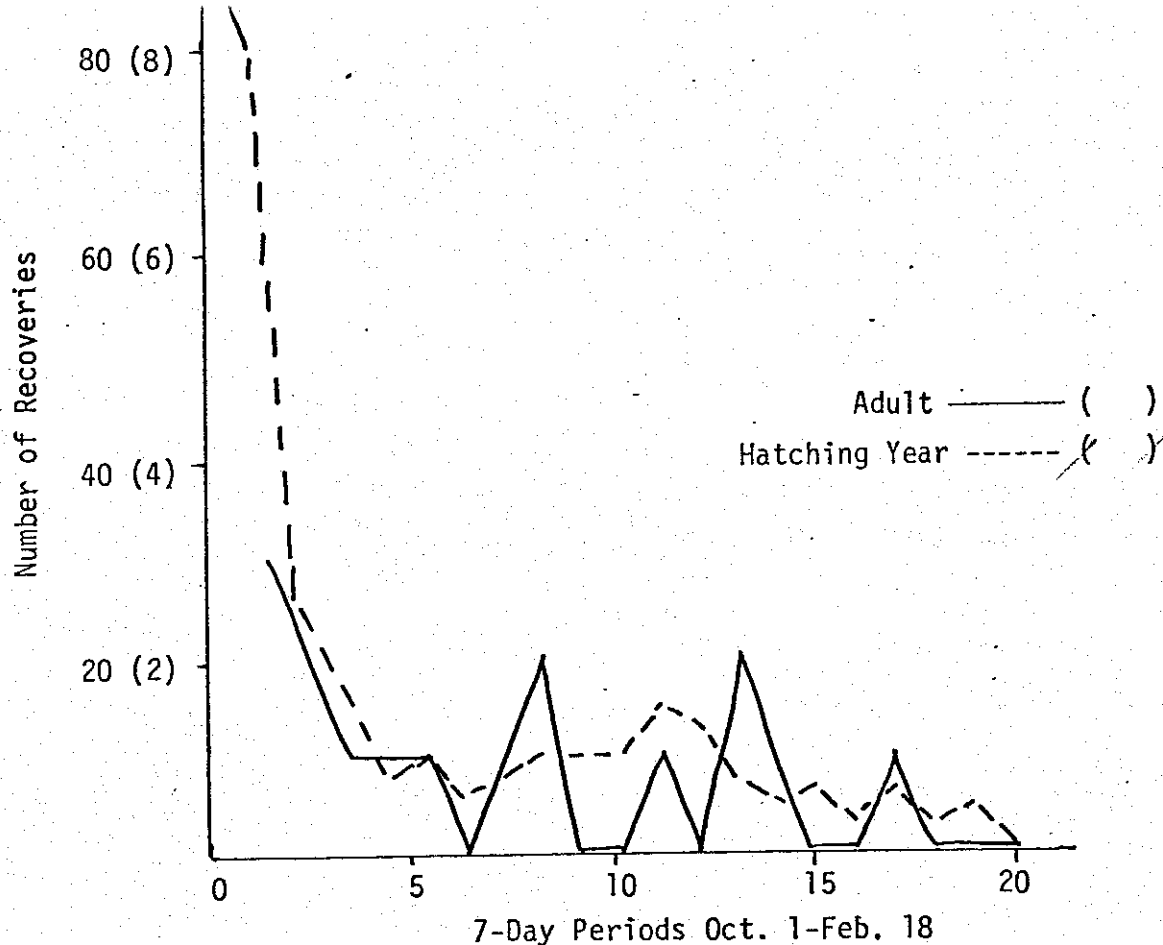


Figure 63. Temporal and Geographic Distribution of Recoveries of Adult and Hatching Year Black Duck Banded in Tabusintac, New Brunswick.

Recovery Location	Adult			Hatching Year		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	7	38.9	22.2	174	63.7	38.8
P.E.I.	0	0.0	0.0	3	1.1	0.0
NB-NS Border	1	5.6	5.5	3	1.1	0.4
St. John River	1	5.5	0.0	7	2.6	1.8
S.E. New Brunswick	0	0.0	0.0	11	4.0	3.2
Other New Brunswick	0	0.0	0.0	4	1.5	1.5
NE New Brunswick	3	16.7	17.1	123	45.0	31.1
NE Nova Scotia	1	5.6	5.6	1	0.4	0.4
S. Nova Scotia	1	5.5	0.0	17	6.2	0.0
Quebec	0	0.0	0.0	5	1.8	0.4
USA Total	11	61.1	0.0	99	36.3	0.7
Maine	4	22.2	0.0	18	6.6	0.7
Massachusetts	3	16.7	0.0	29	10.6	0.0
Other New England	1	5.5	0.0	7	2.6	0.0
New Jersey	3	16.7	0.0	16	5.9	0.0
New York	0	0.0	0.0	12	4.4	0.0
Other USA	0	0.0	0.0	17	6.2	0.0
Grand Total	18	100		273	100	

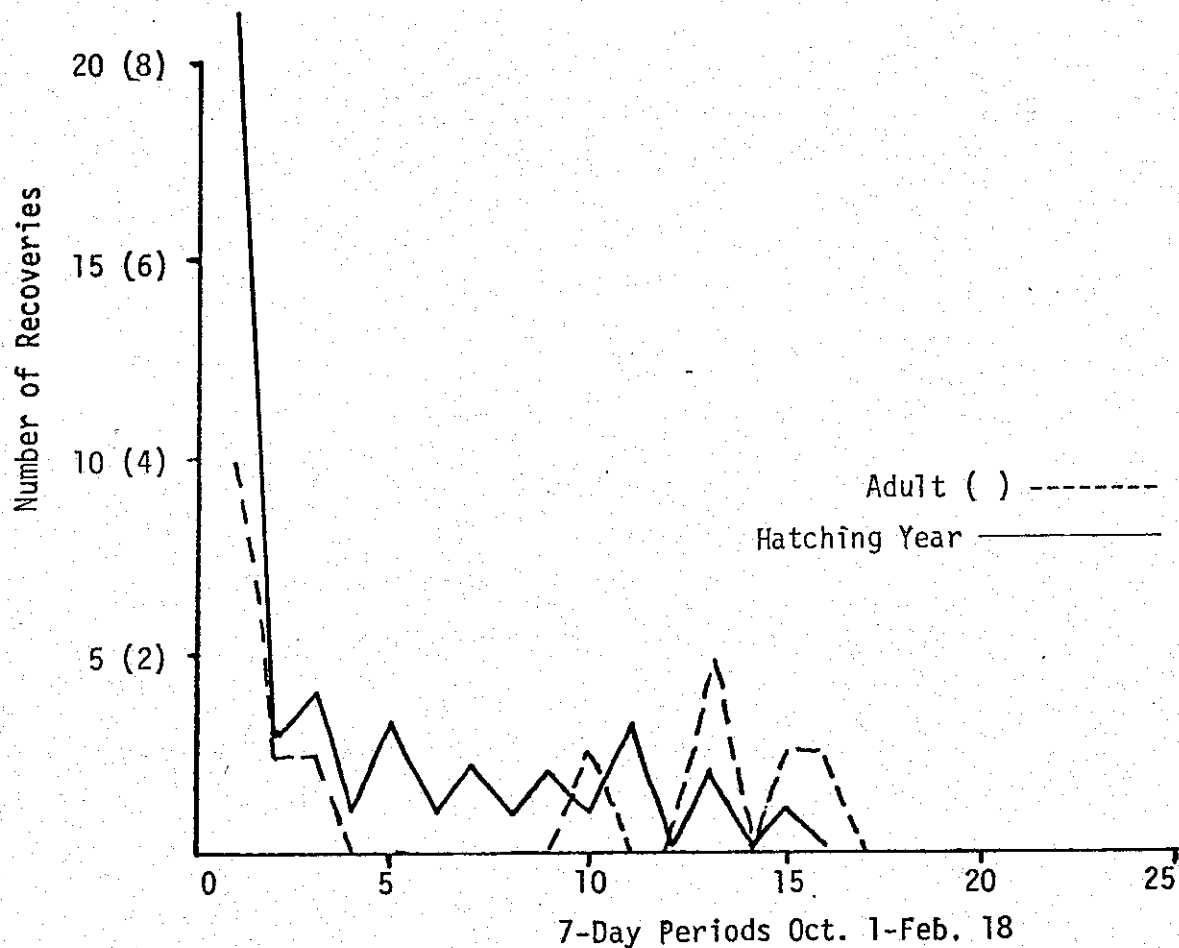


Figure 64. Temporal and Geographic Distribution of Recoveries of Green-winged Teal Banded at Tabusintac by Age Class.

Recovery Location	Adult		Hatching Year	
	Number of Recoveries	% of Total Recoveries	Number of Recoveries	% of Total Recoveries
Canada Total	5	45.45	23	50.00
P.E.I.			1	2.17
NB-NS Border			1	2.17
St. John River			1	2.17
NE New Brunswick	4	36.36	17	36.96
Southern Nova Scotia	1	9.09	1	2.17
Other N.S.			1	2.17
Other Canadian			1	2.17
USA Total	6	54.55	23	50.00
Maine	1	9.09	4	8.90
Massachusetts			2	4.35
Other New England			1	2.17
New Jersey			2	4.35
New York			4	8.40
North Carolina	3	27.27	1	2.17
South Carolina	2	18.18	2	4.35
Florida			2	4.35
Other USA			5	10.87
Grand Total	11		46	

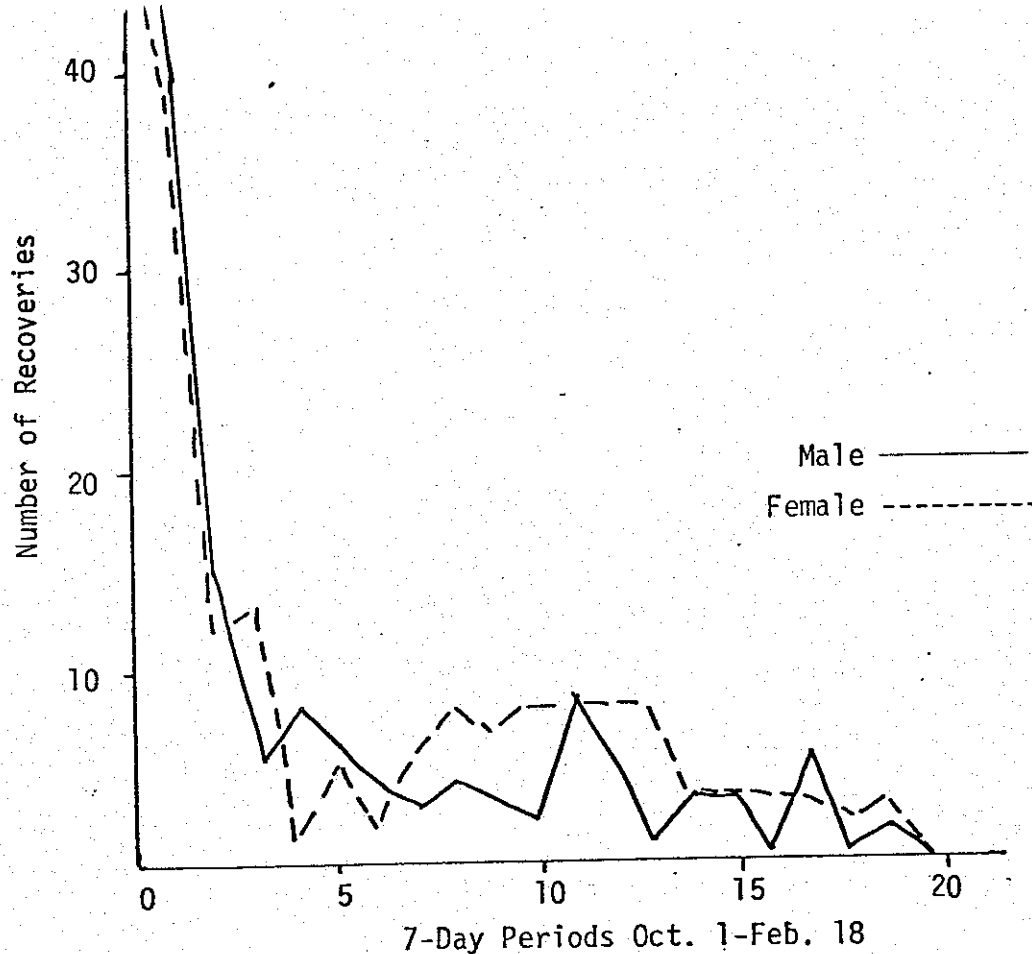


Figure 65. Temporal and Geographic Distribution of Recoveries of Male and Female Black Duck Banded at Tabusintac, N.B.

Recovery Location	Male			Female		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	86	67.7	38.6	95	57.9	37.2
P.E.I. <i>NS-42 Borden</i>	0	0.0	0.0	3	1.8	0.0
St. John River	4	3.1	2.4	4	2.5	1.2
SE New Brunswick	6	4.7	3.1	5	3.0	3.0
NE New Brunswick	53	49.6	30.7	63	38.4	29.4
Other New Brunswick	2	1.6	1.6	2	1.2	1.2
NE Nova Scotia	0	0.0	0.0	2	1.2	1.2
S. Nova Scotia	8	6.3	0.0	10	6.1	0.0
Quebec	1	0.8	0.0	4	2.5	0.6
USA Total	41	32.3	1.6	69	42.1	1.8
Maine	8	6.3	1.6	14	8.5	1.2
Massachusetts	8	6.3	0.0	24	14.6	0.0
Other New England	4	3.1	0.0	4	2.5	0.0
New Jersey	10	7.9	0.0	9	5.5	0.0
New York	4	3.1	0.0	8	4.9	0.6
Other USA	7	5.6	0.0	10	6.1	0.0
Grand Total	127	100		164	100	

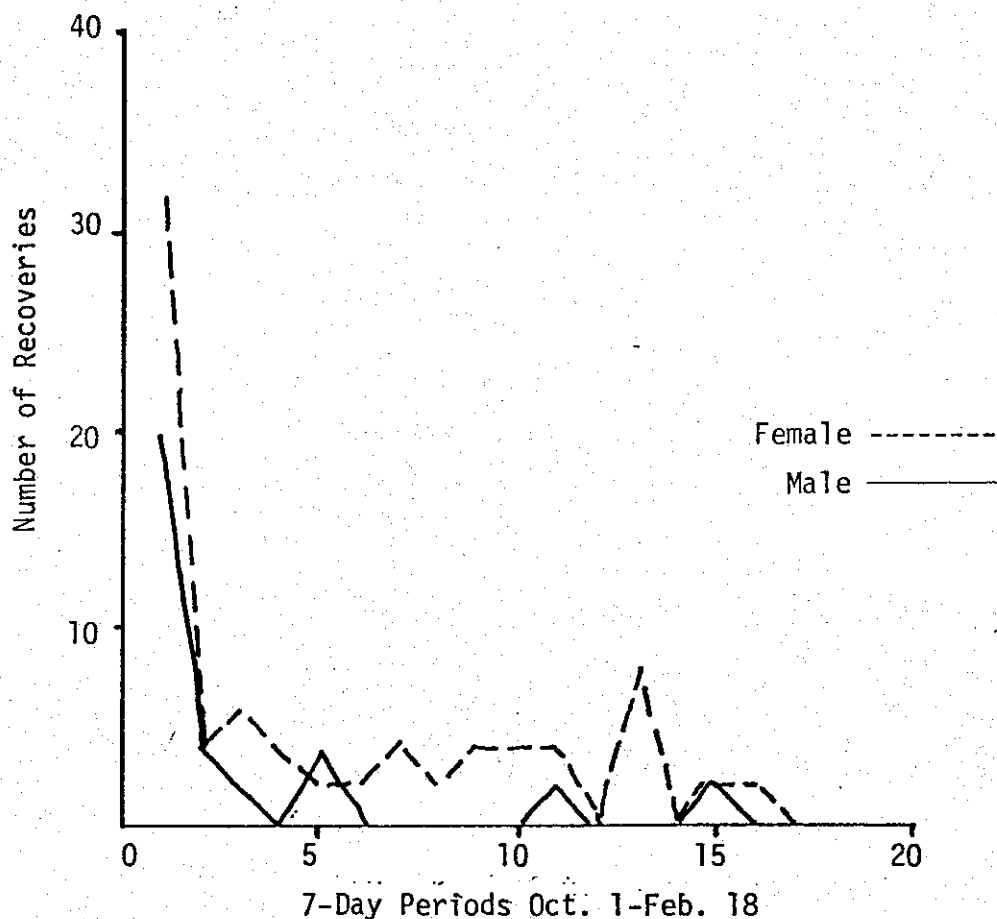


Figure 66. Temporal and Geographical Distribution of Recoveries of Male and Female Green-winged Teal Banded at Tabusintac.

Recovery Location	Male			Female		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canadian Total	12	70.59	58.8	16	40.00	30.0
P.E.I.				1	2.50	2.5
NB-NS Border	1	5.88	5.9			
St. John River				1	2.50	2.5
NE New Brunswick	10	58.82	52.9	11	27.50	22.5
S. Nova Scotia	1	5.88		1	2.50	
Other N.S.				1	2.50	
Other Canadian				1	2.50	2.5
USA Total	5	29.41		24	60.00	10.00
Maine				5	12.50	7.5
Massachusetts				2	5.00	
Other New England				1	2.50	
New Jersey	1	5.88		1	2.50	
New York	2	11.76		2	5.00	2.5
North Carolina	1	5.88		3	7.50	
South Carolina				4	10.00	
Florida	1	5.88		1	2.50	
Other USA				5	12.50	
Grand Total	17			40		

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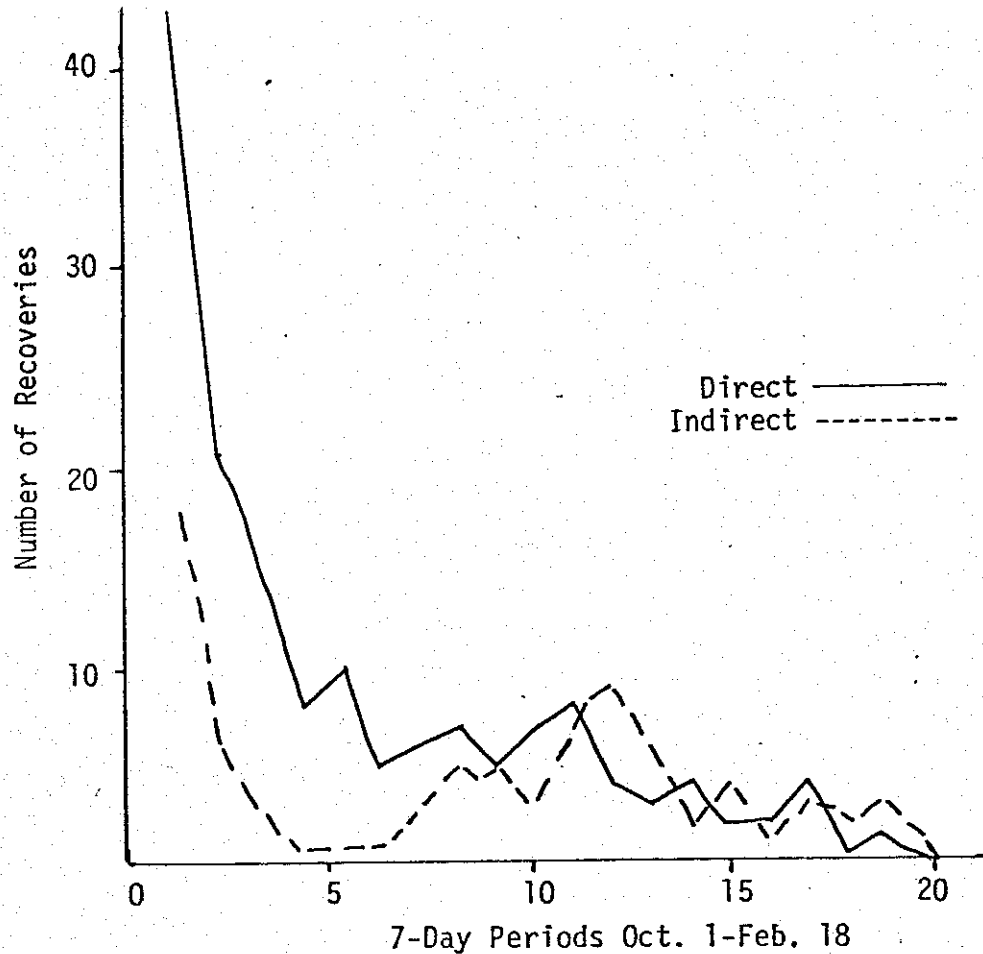


Figure 67. Temporal and Geographic Distribution of Direct and Indirect Recoveries of Black Duck Banded in Tabusintac, N.B.

Recovery Location	Direct			Indirect		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	151	72.9	44.9	30	35.7	20.2
P.E.I.	3	1.5	0.0	0	0.0	0.0
NB-NS <i>Borden</i>	2	1.0	0.0	2	2.4	2.4
St. John River	5	2.4	1.4	3	3.6	2.4
SE New Brunswick	10	4.8	3.9	1	1.2	1.2
NE New Brunswick	112	54.1	37.2	14	16.7	11.8
Other New Brunswick	4	1.9	1.9	0	0.0	0.0
NE Nova Scotia	1	0.5	0.5	1	1.2	1.2
S. Nova Scotia	11	5.4	0.0	7	8.3	0.0
Quebec	3	1.5	0.0	2	2.4	1.2
USA Total	56	27.1	0.5	54	64.3	1.2
Maine	13	6.3	0.5	9	10.7	1.2
Massachusetts	16	7.8	0.0	16	19.1	0.0
Other New England	5	2.4	0.0	3	3.6	0.0
New Jersey	10	4.8	0.0	9	10.7	0.0
New York	3	1.5	0.0	9	10.7	0.0
Other USA	9	4.3	0.0	8	9.5	0.0
Grand Total	207	100		84	100	

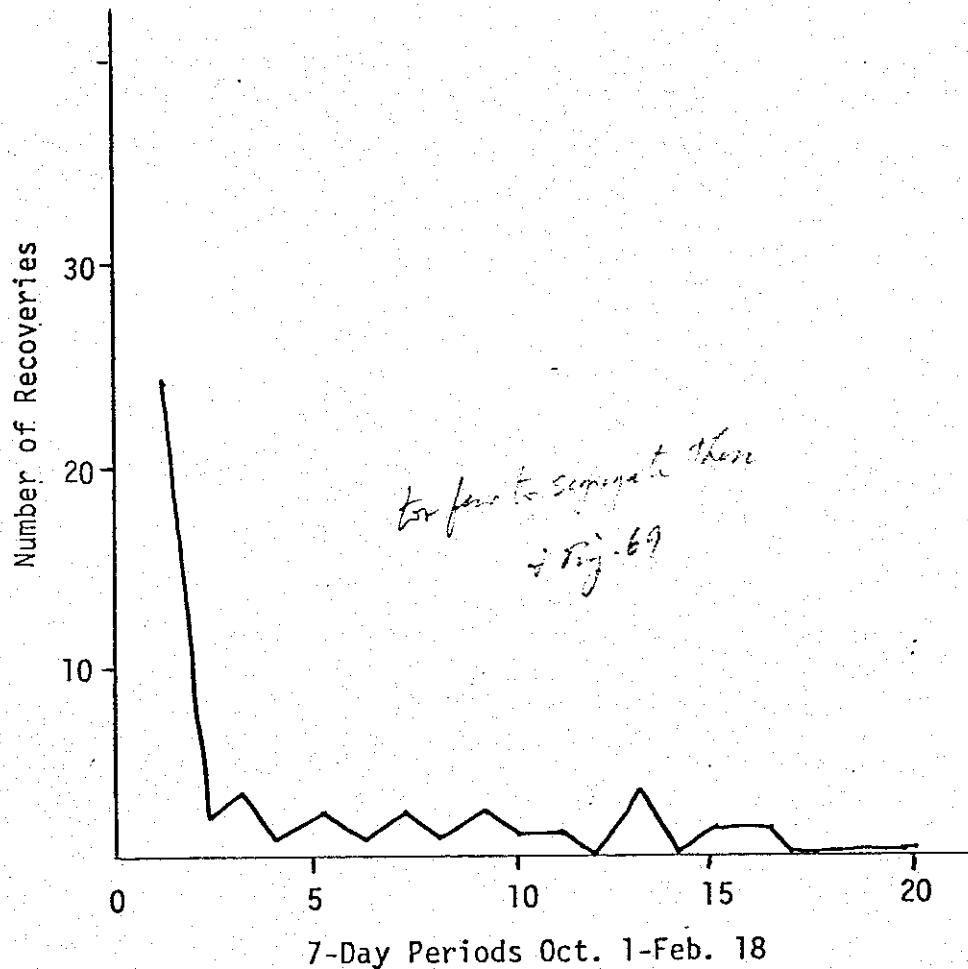


Figure 68. Temporal Distribution or Direct Recoveries of ALL Green-winged Teal Banded at Tabusintac.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	26	57.7	46.6
P.E.I.	1	2.2	2.2
NB-NS Border	1	2.2	2.2
St. John River	1	2.2	2.2
N.E. New Brunswick	20	44.5	37.8
S. Nova Scotia	1	2.2	0
Other Nova Scotia	1	2.2	0
Other Canada	1	2.2	2.2
USA Total	19	42.2	6.7
Maine	4	8.9	6.7
Massachusetts	2	4.4	0
Other New England	1	2.2	0
New Jersey	0	0	0
New York	3	6.7	0
North Carolina	3	6.7	0
South Carolina	3	6.7	0
Florida	2	4.4	0
Other USA	1	2.2	0
Grand Total	45	100	53.3

NJ does not agree c Fig 61

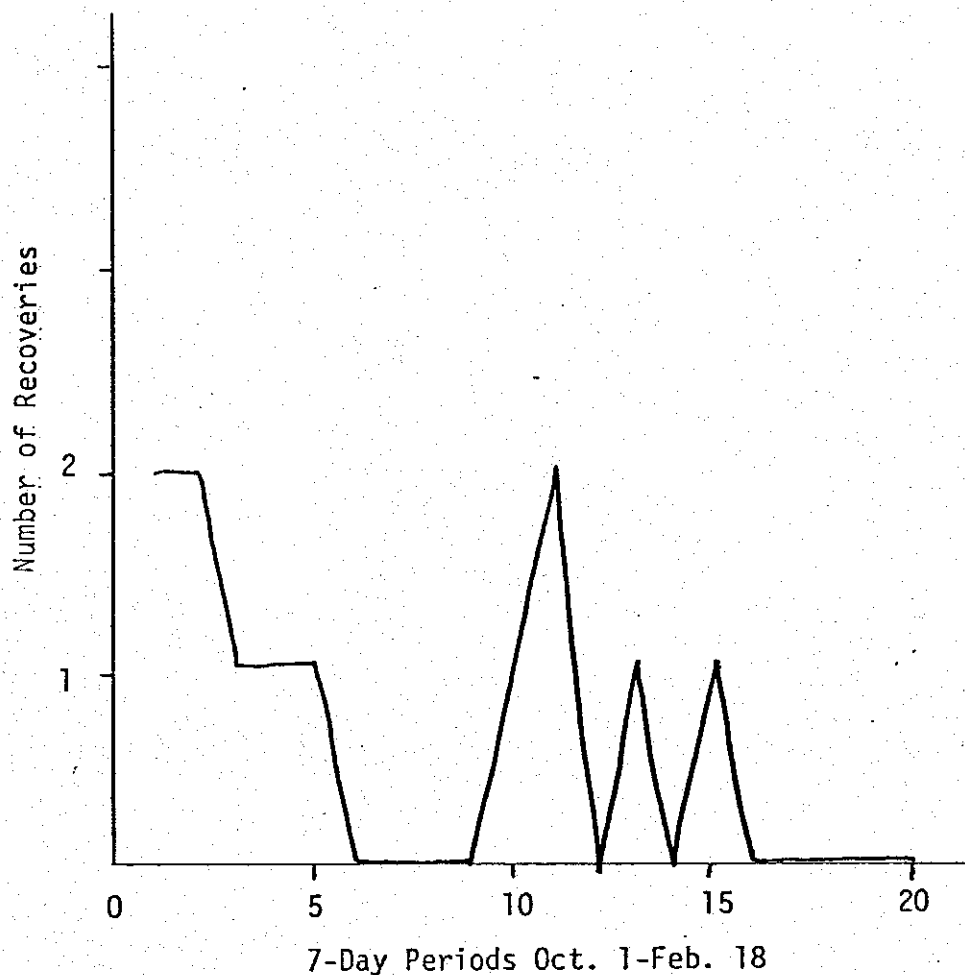


Figure 69. Temporal Distribution of Indirect Recoveries of ALL Green-winged Teal Banded at Tabusintac

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	2	16.7	8.33
P.E.I.	0	0	0
NB-NS Border	0	0	0
St. John River	0	0	0
N.E. New Brunswick	1	8.33	8.33
S. Nova Scotia	1	8.33	0
Other Nova Scotia	0	0	0
Other Canada	0	0	0
USA Total	10	83.3	8.33
Maine	1	8.33	0
Massachusetts	0	0	0
Other New England	0	0	0
New Jersey	1	8.33	0
New York	1	8.33	0
North Carolina	1	8.33	0
South Carolina	1	8.33	0
Florida	0	0	0
Other USA	4	33.33	8.33
Grand Total	12	100	16.7

Debert Sanctuary

Black duck banded at Debert ^{included} ~~represent~~ a high proportion of resident birds which undoubtedly winter ^{el/} within the province. Over 82% of all black duck recoveries were from Canada ^{with} of which 52.3% ~~were~~ from the Debert area and 22.7% from southern Nova Scotia. Again an excessive harvest of resident black duck may be suggested. In the USA major harvest areas were Massachusetts, ~~New York~~ and New Jersey. Temporally, few recoveries were taken during the first week of October relative to other banding stations. Also peaks in harvest ~~occurred~~ from mid-December to mid-January ~~and coincided~~ with the late hunting season in Nova Scotia. These facts [?] further support the conclusion that black duck banded at Debert are highly sedentary, wintering primarily in Southern Nova Scotia (Figure ⁷⁰ ~~60~~). The migration path appears to ^{pass through} ~~be south to~~ southern Nova Scotia, where a large percentage overwinter, ~~with the remainder continuing south to~~ Massachusetts, New York, New Jersey and south to North Carolina (Figure ⁷¹ ~~61~~).

In the case of green-winged teal, ^{too} ~~so~~ few recoveries have been obtained ^{to allow any conclusions} ~~that little can be said~~ about distribution. Based on 16 recoveries, ¹⁰ ~~62.5%~~ were taken in Canada with ⁹ ~~56.2%~~ coming from the Debert area. New Jersey, South Carolina and Florida accounted for all of the USA recoveries. All recoveries (⁷ ~~43.8%~~) during the first week of October were from Canada -- ⁶ ~~37.5%~~ from Debert Area and ¹ ~~6.3%~~ from the NB-NS Border area. Figure ⁷² ~~62~~ shows the temporal and geographic distribution of recoveries of green-winged teal banded at Debert Sanctuary.

A high percentage of both adult (81.2) and hatching year (82.4) black duck were harvested in Canada, particularly in southern Nova Scotia and the Debert area. In the USA the New England states, New York and

New Jersey accounted for most recoveries. Temporally, distribution of both age classes were similar with periods of high kill corresponding to the late hunting season in southern Nova Scotia and to late October in the Debert area. Recoveries during the first week of October were confined entirely to Canada. Figure ⁷³~~63~~ shows the temporal and geographic distribution of recoveries of adult and hatching year black duck banded at Debert.

The distribution of recoveries by sex is also closely similar to that demonstrated by total recoveries and age classes. Figure ⁷⁴~~64~~ supports this comparison.

~~A comparison of the distribution of direct and indirect recoveries continues to demonstrate~~ the highly sedentary nature of black duck banded at Debert. Over 80% of all direct and indirect recoveries were from Canada primarily the Debert area and southern Nova Scotia. ~~This suggests that Debert black duck do not leave the province in significant numbers and probably overwinter along the coast of southern Nova Scotia.~~ Figure ⁷⁵~~65~~ compares the distribution of direct and indirect recoveries.

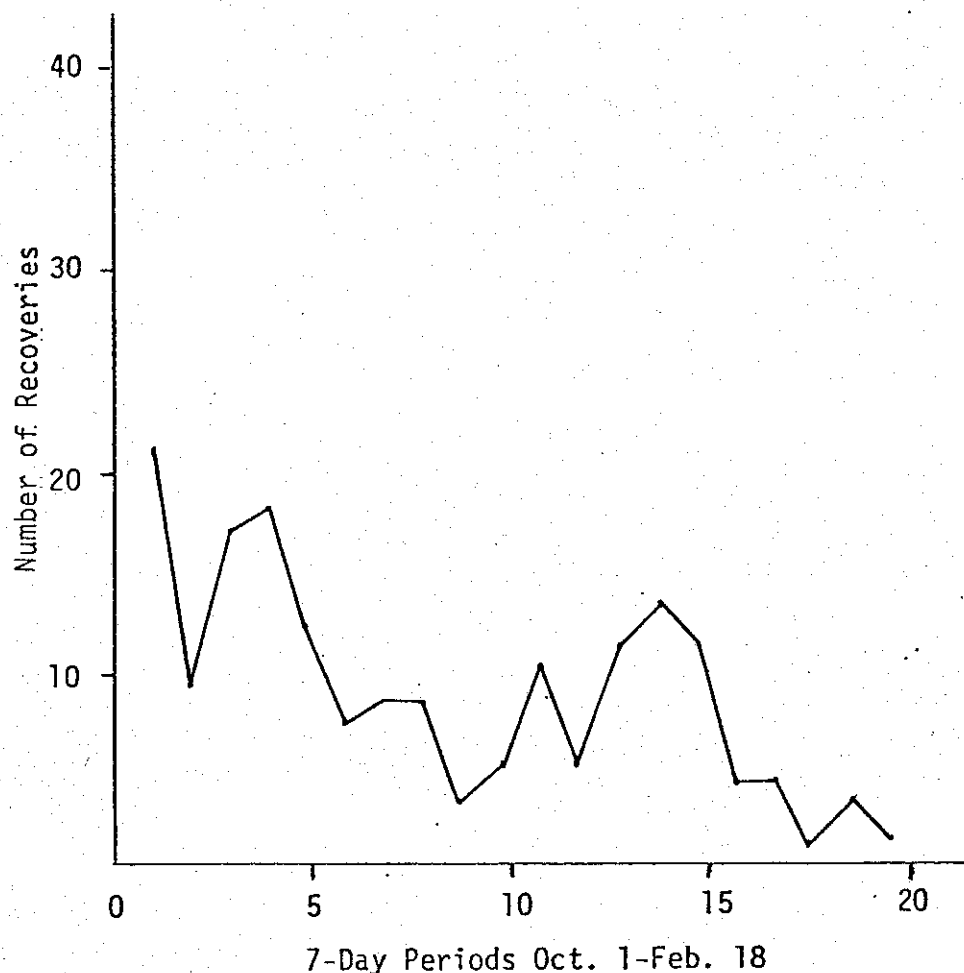


Figure 70 . Temporal and Geographic Distribution of All Recoveries of All Black Duck Banded at Debert, Nova Scotia

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	142 ✓	82.6	12.2
P.E.I.	4 ✓	2.3	0.0
NB-NS Border	2 ✓	1.2	0.0
St. John River	0 ✓	0.0	0.0
SE New Brunswick	1 ✓	0.6	0.0
Other New Brunswick	0 ✓	0.0	0.0
NW Nova Scotia	90 ✓	52.3	9.8
NE Nova Scotia	5 ✓	2.9	1.2
Southern Nova Scotia	39 ✓	22.7	0.6
Ontario	0 ✓	0.0	0.0
Quebec	1 ✓	0.6	0.6
USA Total	30 <i>29 in Fig. 71</i>	17.4	0.0
Maine	1 ✓	0.6	0.0
Massachusetts	6 ✓	3.5	0.0
Other New England	0 ✓	0.0	0.0
New Jersey	8 ✓	4.6	0.0
New York	4 ✓	2.3	0.0
Other USA	11 <i>10 in Fig. 71</i>	6.4	0.0
Grand Total	172	100.	

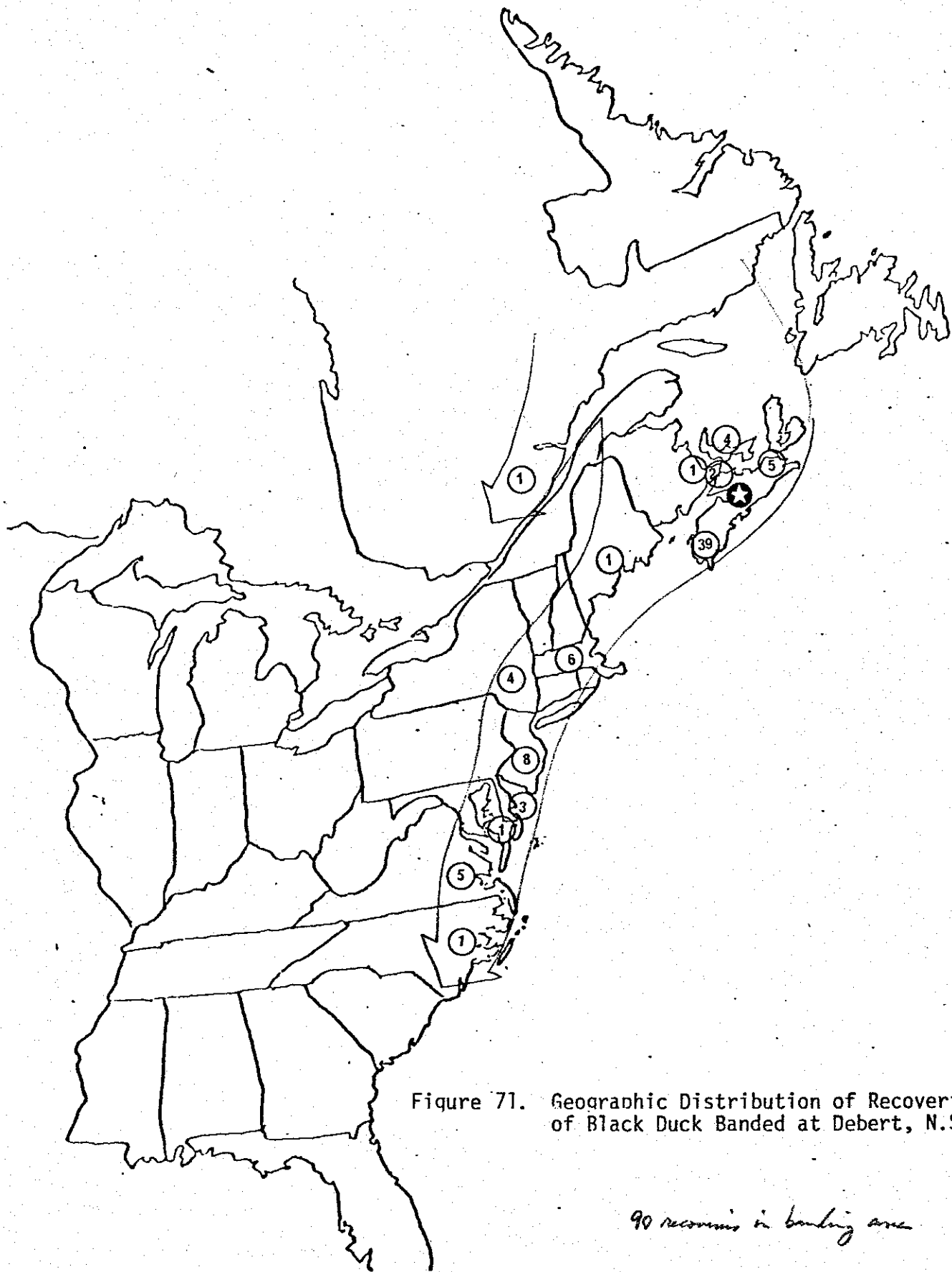


Figure 71. Geographic Distribution of Recoveries of Black Duck Banded at Debert, N.S.

90 recoveries in banding area

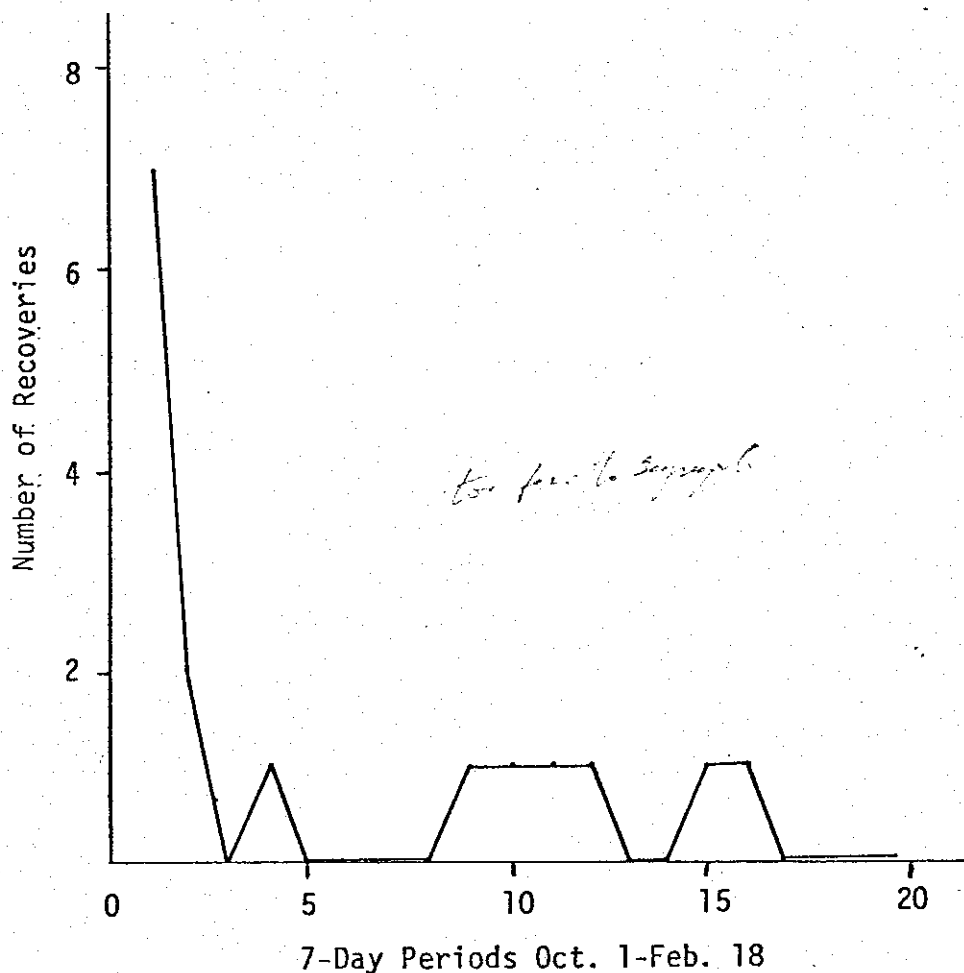


Figure 72. Temporal and Geographic Distribution of All Recoveries of All Green-winged Teal Banded at Debert Sanctuary

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	10	62.5	43.8
P.E.I.	0	0.0	0.0
NB-NS Border	1	6.3	6.3
St. John River	0	0.0	0.0
Other New Brunswick	0	0.0	0.0
Southern Nova Scotia	0	0.0	0.0
NW Nova Scotia	9	56.3	37.5
Other Canadian	0	0.0	0.0
USA Total	6	37.5	0.0
Maine	0	0.0	0.0
Massachusetts	0	0.0	0.0
Other New England	0	0.0	0.0
New Jersey	2	12.5	0.0
New York	0	0.0	0.0
North Carolina	0	0.0	0.0
South Carolina	1	6.3	0.0
Florida	2	2.5	0.0
Other USA	1	6.3	0.0
Grand Total	16	100	

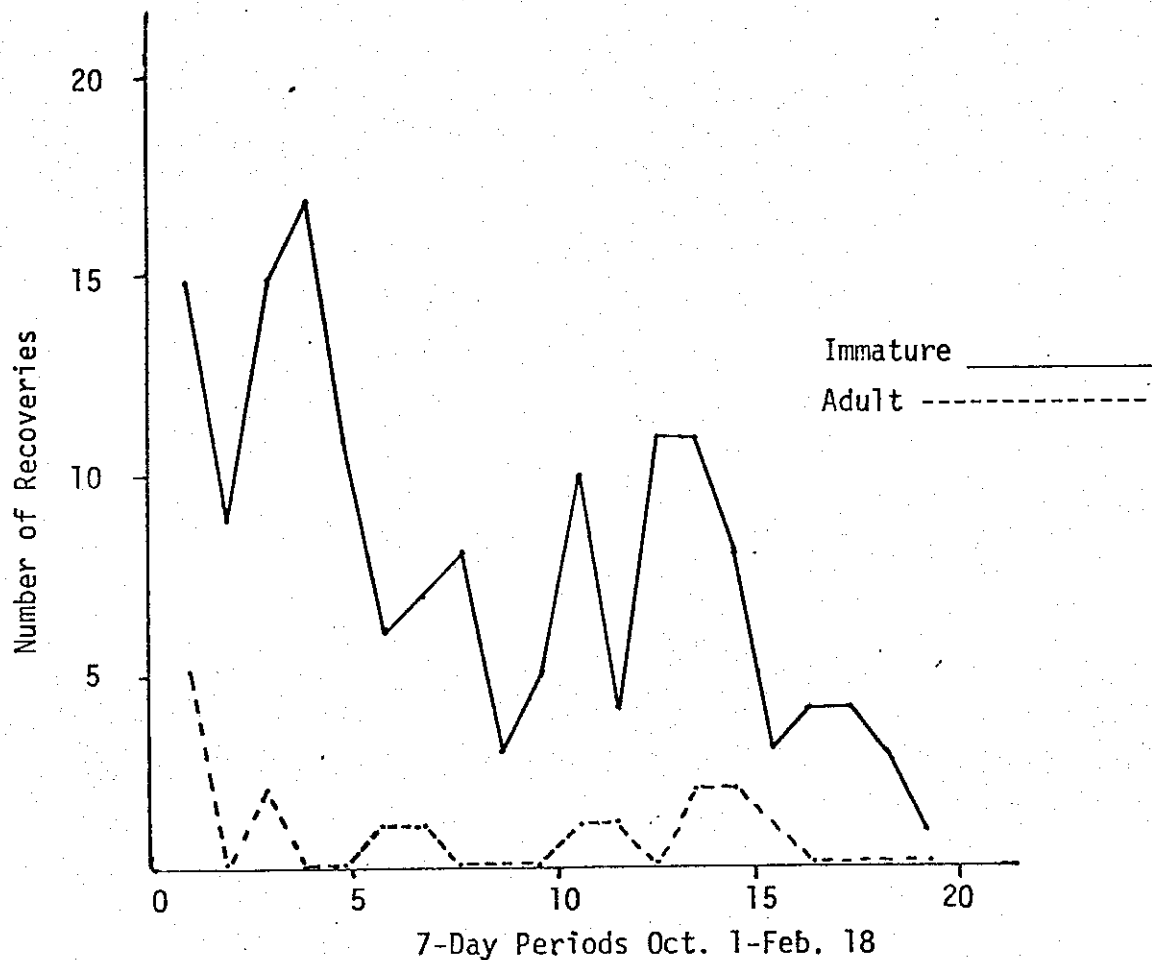


Figure 73. Temporal and Geographic Distribution of Recoveries of Adult and Hatching Year Black Duck Banded on Debert Sanctuary

Recovery Location	Adults			Hatching Year		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canadian Total	13	81.2	31.3	126	82.4	9.8
P.E.I.	0	0.0	0.0	4	2.6	0.0
NB-NS Border	0	0.0	0.0	2	1.3	0.0
SE New Brunswick	0	0.0	0.0	1	0.7	0.0
NW Nova Scotia	7	43.7	25.0	81	52.9	7.7
NE Nova Scotia	0	0.0	0.0	5	3.3	0.7
Southern Nova Scotia	6	37.5	6.3	32	20.9	0.7
Quebec	0	0.0	0.0	1	0.7	0.7
USA Total	3	18.8	0.0	27	17.6	0.0
Maine	0	0.0	0.0	1	0.7	0.0
Massachusetts	0	0.0	0.0	6	3.9	0.0
New Jersey	1	6.3	0.0	7	4.6	0.0
New York	0	0.0	0.0	4	2.6	0.0
Other USA	2	12.5	0.0	9	5.8	0.0
Grand Total	16	100		153	100	

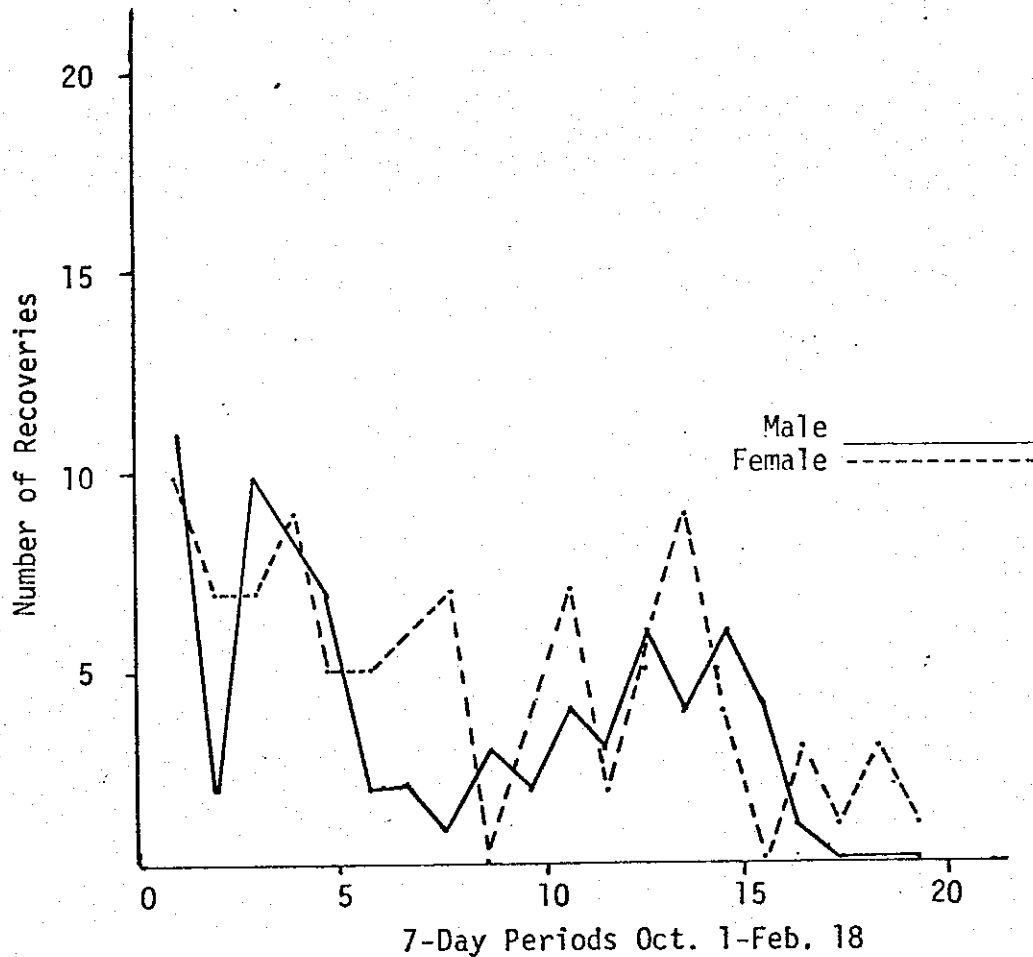


Figure 74. Temporal and Geographic Distribution of Recoveries of Male and Female Black Duck Banded in Debert Sanctuary.

Recovery Location	Male			Female		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canadian Total	65	84.4	14.3	77	81.1	10.5
P.E.I.	2	2.6	0.0	2	2.1	0.0
NB-NS Border	0	0.0	0.0	2	2.1	0.0
SE New Brunswick	0	0.0	0.0	1	1.1	0.0
NW Nova Scotia	45	58.4	13.0	45	47.4	7.4
NE Nova Scotia	1	1.3	1.3	4	4.2	1.1
Southern Nova Scotia	17	22.1	0.0	22	23.1	1.0
Quebec	0	0.0	0.0	1	1.1	1.0
USA Total	12	15.6	0.0	18	18.9	0.0
Maine	0	0.0	0.0	1	1.0	0.0
Massachusetts	2	0.0	0.0	5	5.3	0.0
Other New England	0	0.0	0.0	0	0.0	0.0
New Jersey	3	3.9	0.0	5	5.3	0.0
New York	2	2.6	0.0	2	2.1	0.0
Other USA	5	6.5	0.0	5	5.2	0.0
Grand Total	77	100		95	100	

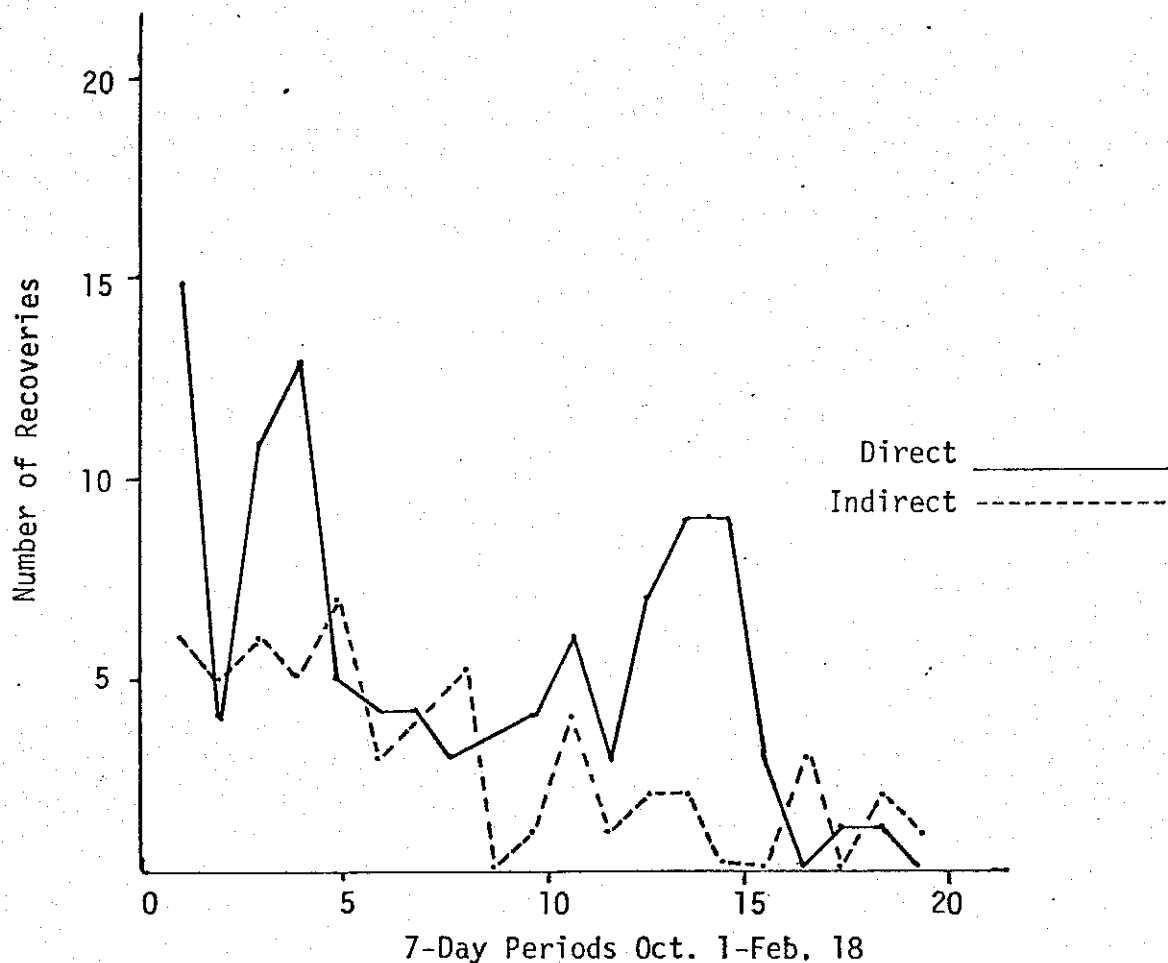


Figure 75. Temporal and Geographic Distribution of Direct and Indirect Recoveries of Black Duck Banded in Debert Sanctuary

Recovery Location	Direct			Indirect		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canadian Total	84	81.5	14.7	58	84.1	8.7
P.E.I.	2	1.9	0.0	2	2.9	0.0
NB-NS Border	2	1.9	0.0	0	0.0	0.0
SE New Brunswick	1	1.0	0.0	0	0.0	0.0
NW Nova Scotia	53	51.5	11.6	37	53.7	7.3
NE Nova Scotia	2	1.9	1.0	3	4.3	0.0
S Nova Scotia	24	23.3	1.9	15	21.8	0.0
Quebec	0	0.0	0.0	1	1.4	1.4
USA Total	19	18.5	0.0	11	15.9	0.0
Maine	0	0.0	0.0	1	1.4	0.0
Massachusetts	4	3.9	0.0	3	4.3	0.0
New York	2	1.9	0.0	2	2.9	0.0
New Jersey	4	3.9	0.0	4	5.9	0.0
Other USA	9	8.8	0.0	1	1.4	0.0
Grand Total	103	100	0.0	69	100	

Louis Lake

Black duck banded at Louis Lake represent a highly resident population. Eighty-six percent of all recoveries ^{were} ~~are~~ from Canada, ~~of~~ which ^{with} ~~over~~ 75% ~~are~~ from southern Nova Scotia. Recoveries from eastern New Brunswick, northern Nova Scotia and Prince Edward Island may support the ^{hybridization} ~~prediction~~ that black duck utilizing those areas winter in southern Nova Scotia ^{but} ~~although~~ the percentages produced in those areas is uncertain. In the USA, Massachusetts represents ^{ed} ~~the~~ largest recovery area followed by New Jersey with no recoveries being reported further north than Massachusetts nor further south than Virginia. Obviously few birds migrate south from Nova Scotia but those that do follow a course from southern Nova Scotia to Massachusetts south to Virginia (Figure ⁷⁶ ~~66~~).

The highest recovery rate occurs ^{red} ~~during~~ the second week of October coincident with the opening of the hunting season in southern Nova Scotia. An extended period of high recovery rate begins ^a ~~in~~ in early November and continues ^d ~~to~~ to late January. Although this period covers ^{ed} ~~most~~ hunting seasons in the USA, a high percentage of the recoveries during that period ^{came} ~~probably come~~ from the second season in southern Nova Scotia (Figure ⁷⁷ ~~67~~).

Distribution by sex, age and type of recovery ^{was} ~~is~~ closely similar in all cases on a percentage basis; however, notably more females were recovered than males. The significance of this is unclear since the percentage of recoveries of both sexes ^{was} ~~are~~ ^{similarly} ~~roughly equally~~ distributed temporally and geographically, although slightly more females were recovered in the USA. Figures ⁷⁸ ~~68~~ to ~~80~~ compare distribution by sex, age and type of recovery.

Unlike green-winged teal recoveries from other banding stations in the Maritimes, more recoveries of green-winged teal ^{were} ~~are~~ reported from Canada (56.9%) than the USA (43.1%). Recoveries from southern Nova Scotia, primarily in the degree block of banding, account^{ed} for 50% of the total recoveries alone. Very small ^{number} ~~percentages~~ ^{were} ~~are~~ recovered at scattered locations in the remainder of the Atlantic Region and Ontario. In the USA, ^{+ South + Florida were} North Carolina ~~was~~ the most significant recovery area, accounting for 19.9 ~~7.3%~~ of the total recoveries. Remaining USA recoveries ^{were scattered} ~~extend from~~ ~~Maine to Florida~~ through the coastal states and as far west as Minnesota in the north and Louisiana in the south. Major recovery states are New Jersey, Virginia, North Carolina, South Carolina, and Florida accounting for 24.8% in aggregate (Figure 81).

The major migration route for Louis Lake green-winged teal ^{was} ~~is~~ southward along the Atlantic Coast to the Carolinas and Florida with the largest number apparently wintering south of New Jersey (Figure 82). Recoveries in Newfoundland and the eastern Maritimes ^{ed} ~~may~~ suggest ~~that~~ some portion of the Louis Lake green-winged teal are produced in those [?] areas. Western recoveries from Ontario, Minnesota, Louisiana, Arkansas and Mississippi Flyway possibly extending south to Louisiana.

The temporal distribution varies ^d ~~slightly~~ from other banding sites in that the largest recovery period ^{was} ~~is~~ during the second week of October, ~~This corresponds~~ ^{ng} ~~closely~~ with the opening of the hunting season in the Louis Lake area. Peaks in late November, December and early January coincided with open seasons in the southern USA as well as the second part of the split season in southern Nova Scotia.

A larger percentage of males (62.4%) ^{were} ~~are~~ recovered in Canada than females (54.5%). This is consistent with recovery patterns of

green-winged teal banded at other Maritime sites for which differential migration has been posed as a possible explanation. The most significant harvest area for both sexes ^{was} ~~is~~ southern Nova Scotia while the Carolinas and Florida report ^{ad} ~~the~~ largest number of recoveries from the USA. Figure 83 and 84 compare the temporal and geographic distribution of recoveries of male and female green-winged teal banded at Louis Lake.

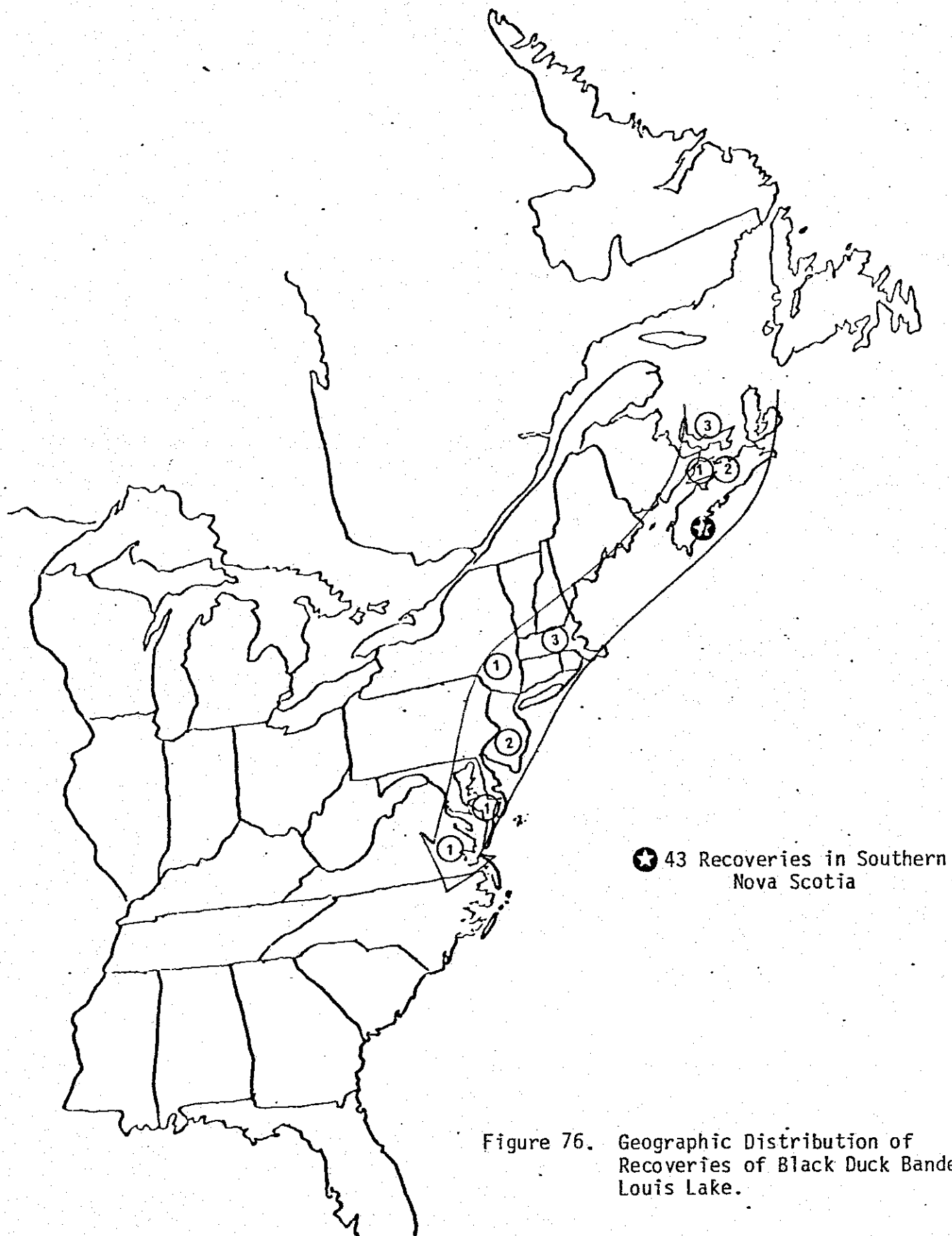
No green-winged teal ^{here} banded as locals ~~have been recovered~~ ^{at} from Louis Lake. Recoveries of adults and hatching year birds ~~are~~ ^{were} similarly distributed although a slightly greater proportion of hatching year birds ~~are~~ ^{were} recovered in Canada (58.1%) than adults (50%). Figures 85 and 86 compare the temporal and geographic distribution of recoveries of adult and hatching year green-winged teal banded at Louis Lake.

Direct and indirect recoveries varied as expected. Most direct recoveries (63.0%) were from Canada while most indirect (61.1%) were from the USA. Areas of recovery in both the USA and Canada were the same for both types of recoveries. Figures 87 and 88 compare direct and indirect recoveries of green-winged teal banded at Louis Lake.

green-winged teal banded at other Maritime sites for which differential migration has been posed as a possible explanation. The most significant harvest area for both sexes is southern Nova Scotia while the Carolinas and Florida report the largest number of recoveries from the USA. Figure 83 and 84 compare the temporal and geographic distribution of recoveries of male and female green-winged teal banded at Louis Lake.

No green-winged teal banded as locals have been recovered from Louis Lake. Recoveries of adults and hatching year birds are similarly distributed although a slightly greater proportion of hatching year birds are recovered in Canada (58.1%) than adults (50%). Figures 85 and 86 compare the temporal and geographic distribution of recoveries of adult and hatching year green-winged teal banded at Louis Lake.

Direct and indirect recoveries varied as expected. Most direct recoveries (63.0%) were from Canada while most indirect (61.1%) were from the USA. Areas of recovery in both the USA and Canada were the same for both types of recoveries. Figures 87 and 88 compare direct and indirect recoveries of green-winged teal banded at Louis Lake.



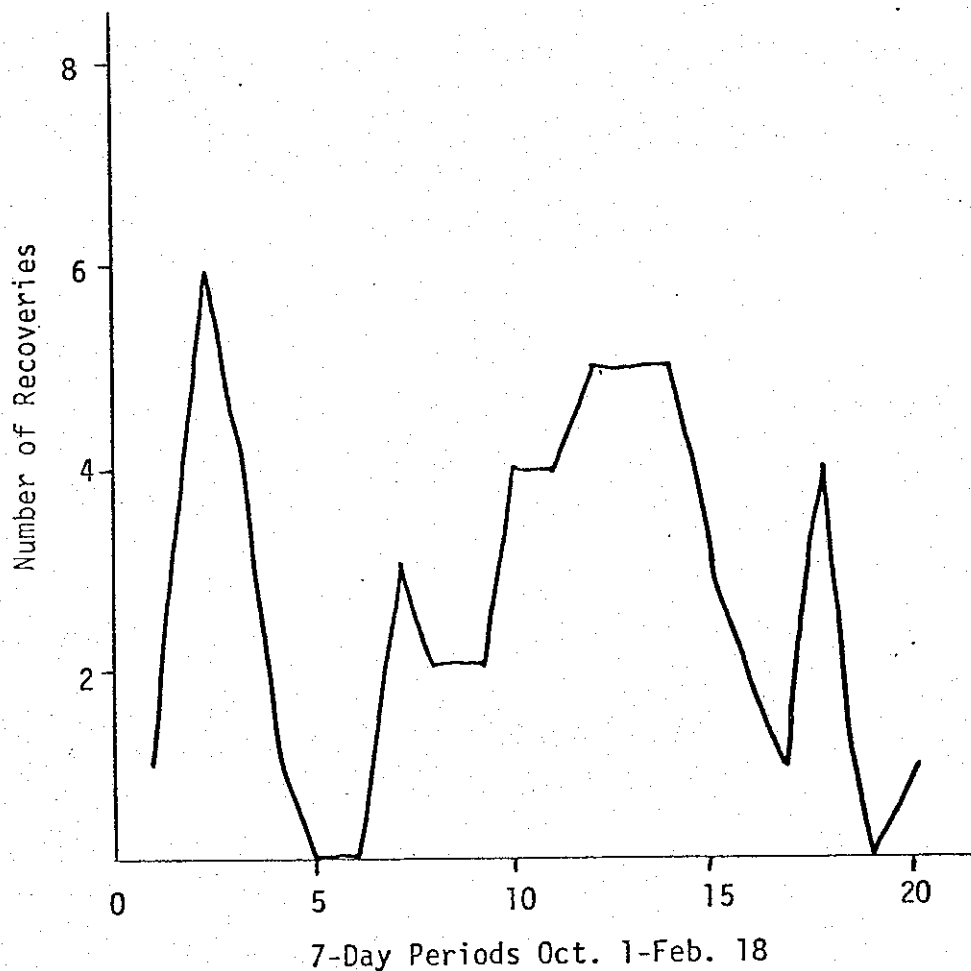


Figure 77 . Temporal and Geographic Distribution of All Recoveries of All Black Duck Banded at Louis Lake.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	49 ✓	86.0	1.8
P.E.I.	3 ✓	5.4	1.8
NB-NS <i>Borden</i>	1 ✓	1.7	0.0
NW Nova Scotia	2 ✓	3.5	0.0
S. Nova Scotia	43 ✓	75.4	0.0
USA Total	8 ✓	14.0	0.0
Massachusetts	3 ✓	5.4	0.0
New Jersey	2 ✓	3.5	0.0
New York	1 ✓	1.7	0.0
Maryland	1 ✓	1.7	0.0
Virginia	1 ✓	1.7	0.0
Grand Total	57 ✓	100	

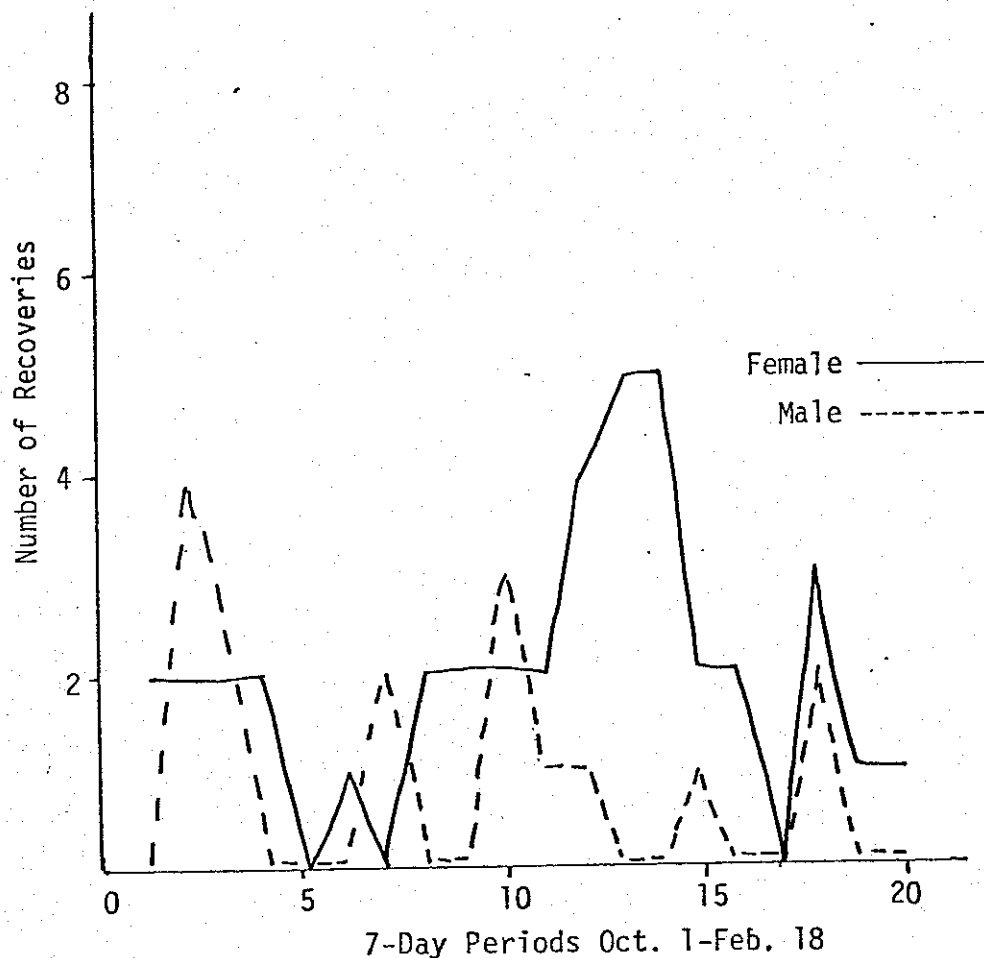


Figure 78. Temporal and Geographic Distribution of Recoveries of Male and Female Black Duck Banded at Louis Lake.

Recovery Location	Male			Female		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	14	87.5	0.0	34	85.0	5.0
P.E.I.	0	0.0	0.0	3	7.5	2.5
NB-NS	0	0.0	0.0	1	2.5	0.0
NW Nova Scotia	0	0.0	0.0	2	5.0	2.5
S. Nova Scotia	14	87.5	0.0	28	70.0	0.0
USA Total	2	12.5	0.0	6	15.0	0.0
Massachusetts	0	0.0	0.0	3	7.5	0.0
New Jersey	0	0.0	0.0	2	5.0	0.0
New York	1	6.2	0.0	0	0.0	0.0
Maryland	0	0.0	0.0	1	2.5	0.0
Virginia	1	6.3	0.0	0	0.0	0.0
Grand Total	16	100		40	100	

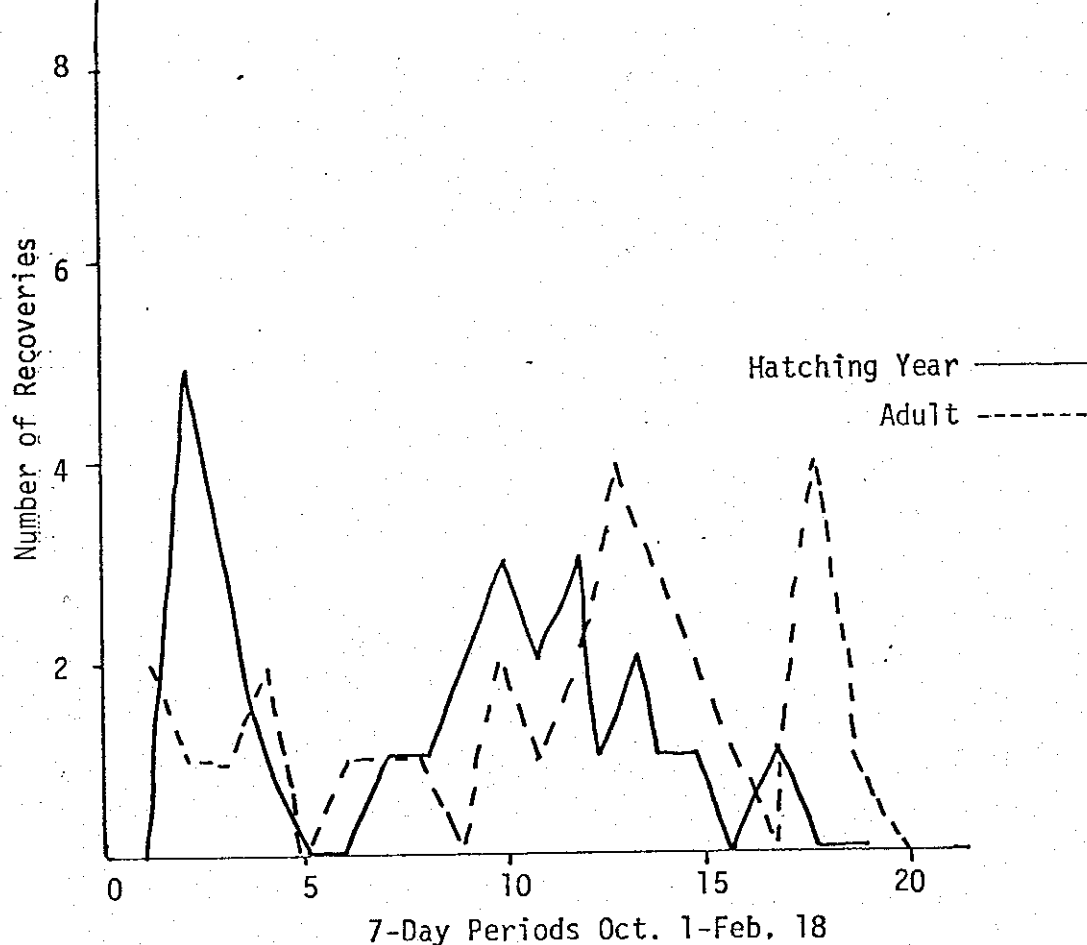


Figure 79. Temporal and Geographic Distribution of Recoveries of Adult and Hatching Year Black Duck Banded at Louis Lake.

Recovery Location	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	27	93.1	6.9	21	77.8	0.0
PEI	2	6.9	3.5	1	3.7	0.0
NB-NS	1	3.4	0.0	0	0.0	0.0
St. John River	0	0.0	0.0	0	0.0	0.0
NW Nova Scotia	12	6.9	3.4	0	0.0	0.0
S. Nova Scotia	22	75.9	0.0	20	74.1	0.0
USA Total	2	6.9	0.0	6	22.2	0.0
Massachusetts	2	6.9	0.0	1	3.7	0.0
New York	0	0.0	0.0	1	3.7	0.0
New Jersey	0	0.0	0.0	2	7.4	0.0
Maryland	0	0.0	0.0	1	3.7	0.0
Virginia	0	0.0	0.0	1	3.7	0.0
Grand Total	29	100		27	100	

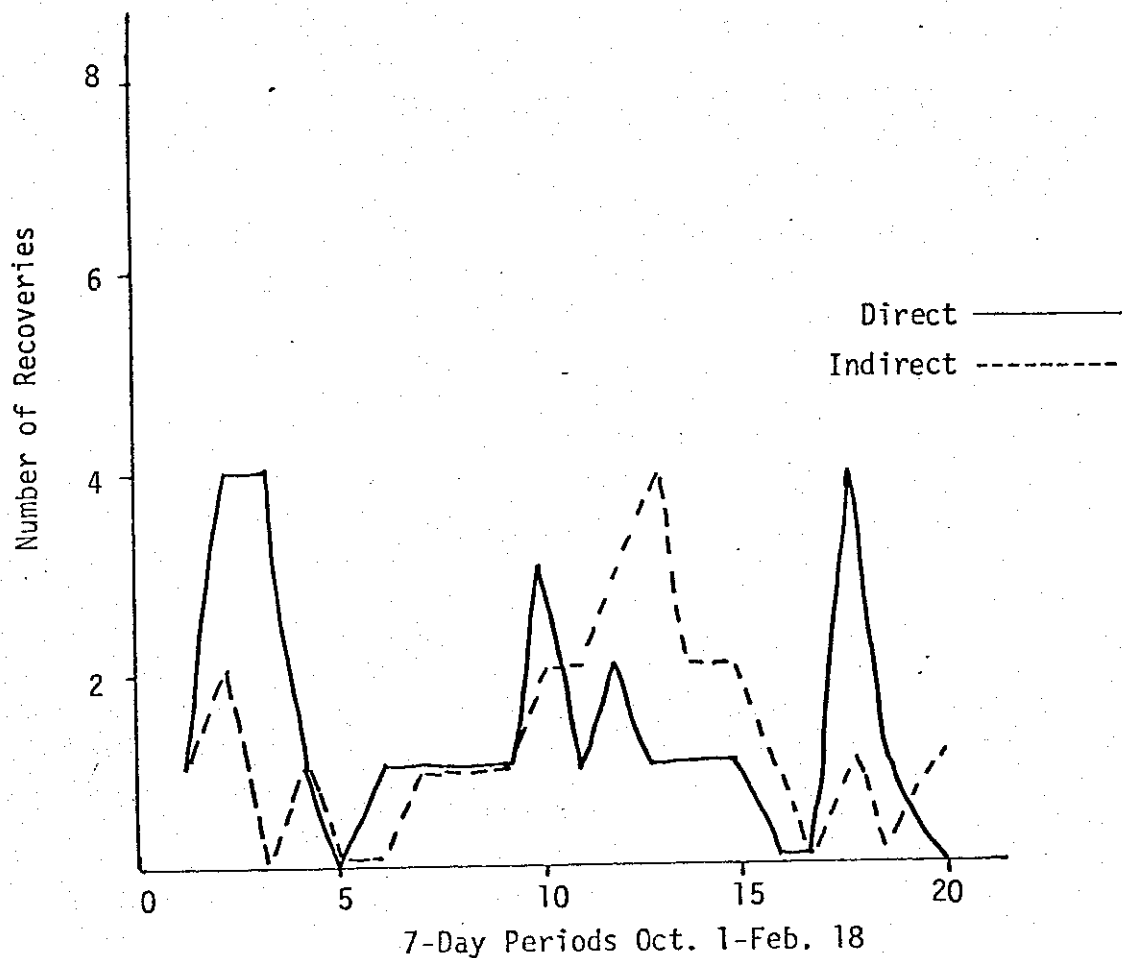


Figure 80. Temporal and Geographic Distribution of Direct and Indirect Recoveries of Black Duck Banded at Louis Lake.

Recovery Location	Direct			Indirect		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	27	87.1	3.2	21	84	4.0
P.E.I.	1	3.2	0.0	2	8	4.0
NB-NS <i>Bowling</i>	0	0.0	0.0	1	4	0.0
NW Nova Scotia	2	6.5	3.0	0	0	0.0
S. Nova Scotia	24	77.4	0.0	18	72	0.0
USA Total	4	12.9	0.0	4	16	0.0
Massachusetts	2	6.5	0.0	1	4	0.0
New York	0	0.0	0.0	1	4	0.0
New Jersey	1	3.2	0.0	1	4	0.0
Maryland	0	0.0	0.0	1	4	0.0
Virginia	1	3.2	0.0	0	0	0.0
Grand Total	31	100		25	100	

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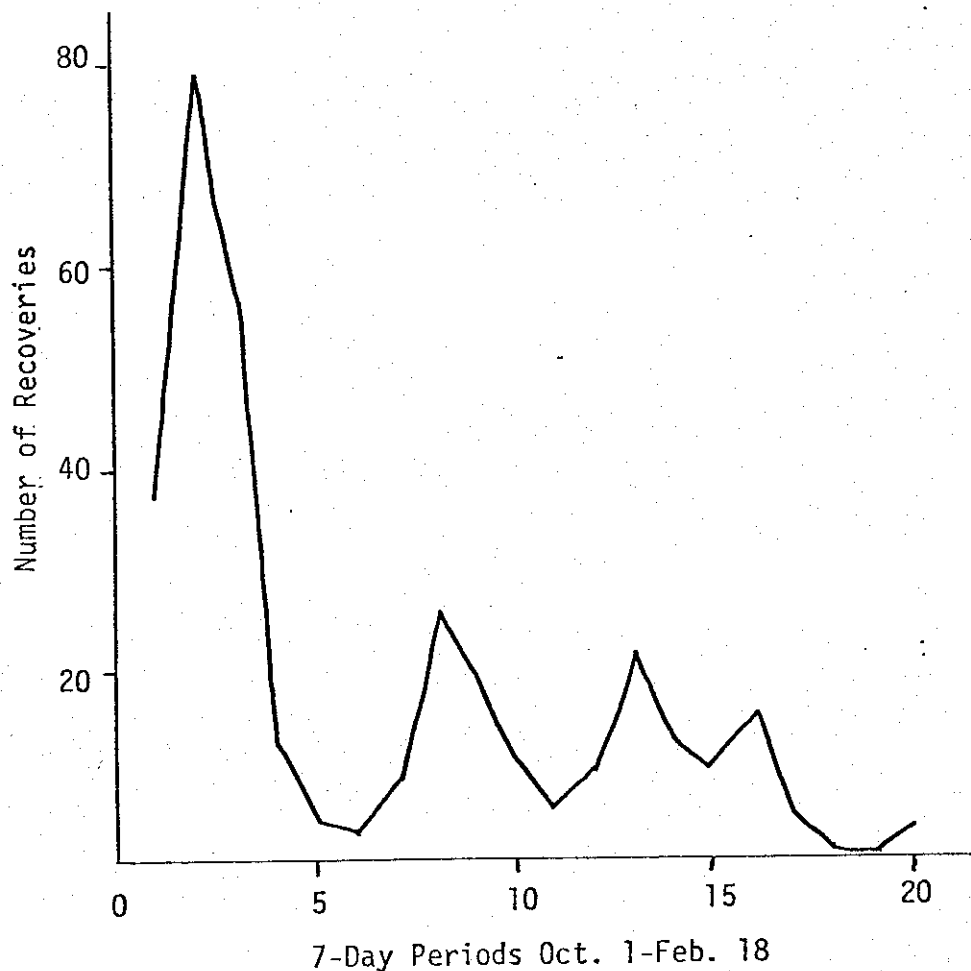


Figure 81. Temporal Distribution of All Recoveries of All Green-winged Teal Banded at Louis Lake.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	✓164✓	56.9	10.4
P.E.I.	✓2✓	0.7	0.35
NB-NS Border	✓4✓	1.4	0.35
St. John River	✓4✓	1.4	0.35
Other New Brunswick	✓1✓	0.3	0.0
S. Nova Scotia	✓144✓	50	7.6
Other Nova Scotia	✓6✓	2.1	0.7
Other Canada	✓3✓	1.0	1.0
USA Total	✓124✓	43.1	1.7
Maine	✓6✓	2.1	1.0
Massachusetts	✓9✓	3.1	0.0
Other New England	✓3✓	1.0	0.0
New Jersey	✓14✓	4.9	0.0
New York	✓3✓	1.0	0.35
North Carolina	✓21✓	7.3	0.0
South Carolina	✓18✓	6.3	0.0
Florida	✓18✓	6.3	0.0
Other USA	32✓	11.1	0.35
Grand Total	✓288✓	100	100

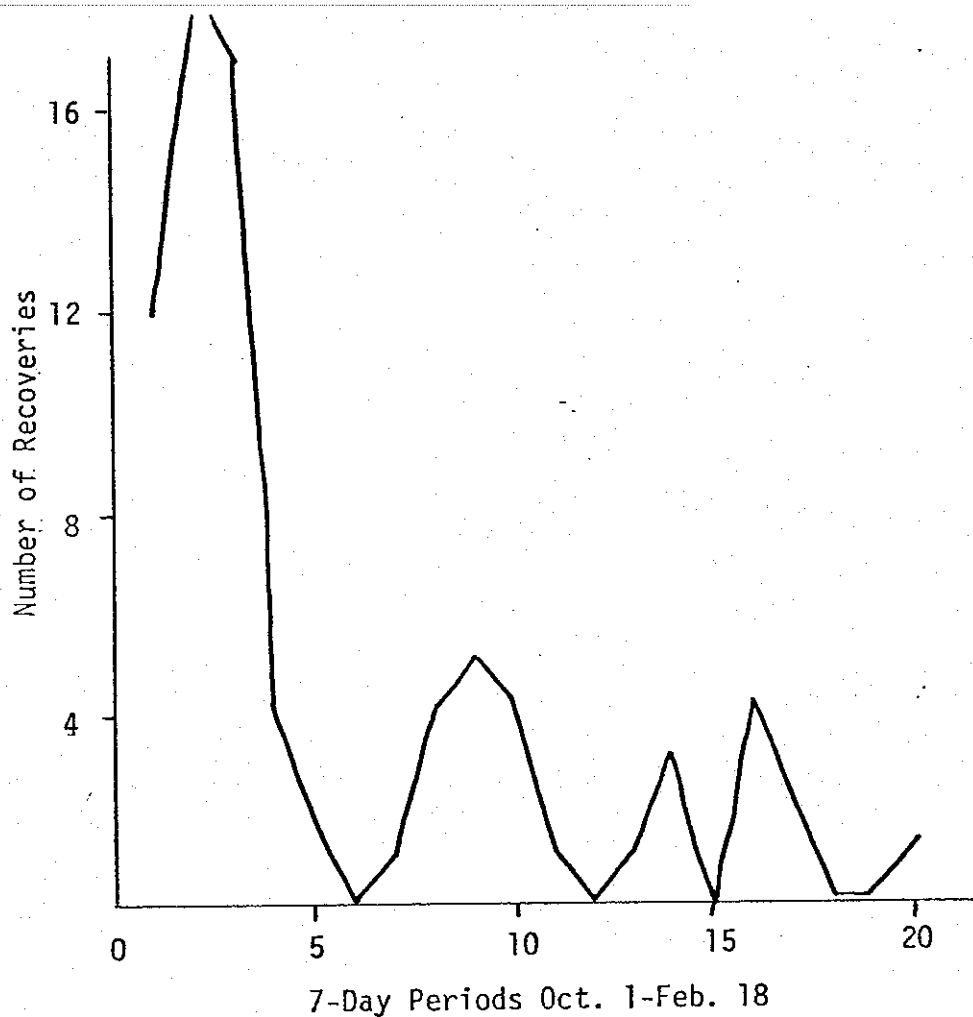


Figure 83. Temporal and Geographic Distribution of Male Green-winged Teal Recoveries Banded at Louis Lake.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	58	62.37	11.8
P.E.I.			
NB-NS Border	1	1.08	1.1
St. John River	3	3.22	1.1
Other New Brunswick	1	1.08	
Southern Nova Scotia	48	51.61	6.4
Other Nova Scotia	3	3.22	1.1
Other Canadian	2	2.15	2.1
USA Total	35	37.63	1.1
Maine	3	3.22	1.1
Massachusetts	4	4.30	
Other New England	2	2.15	
New Jersey	4	4.32	
New York			
North Carolina	8	8.60	
South Carolina	4	4.30	
Florida	5	5.38	
Other USA	5	5.38	
Grand Total	93	100.00	

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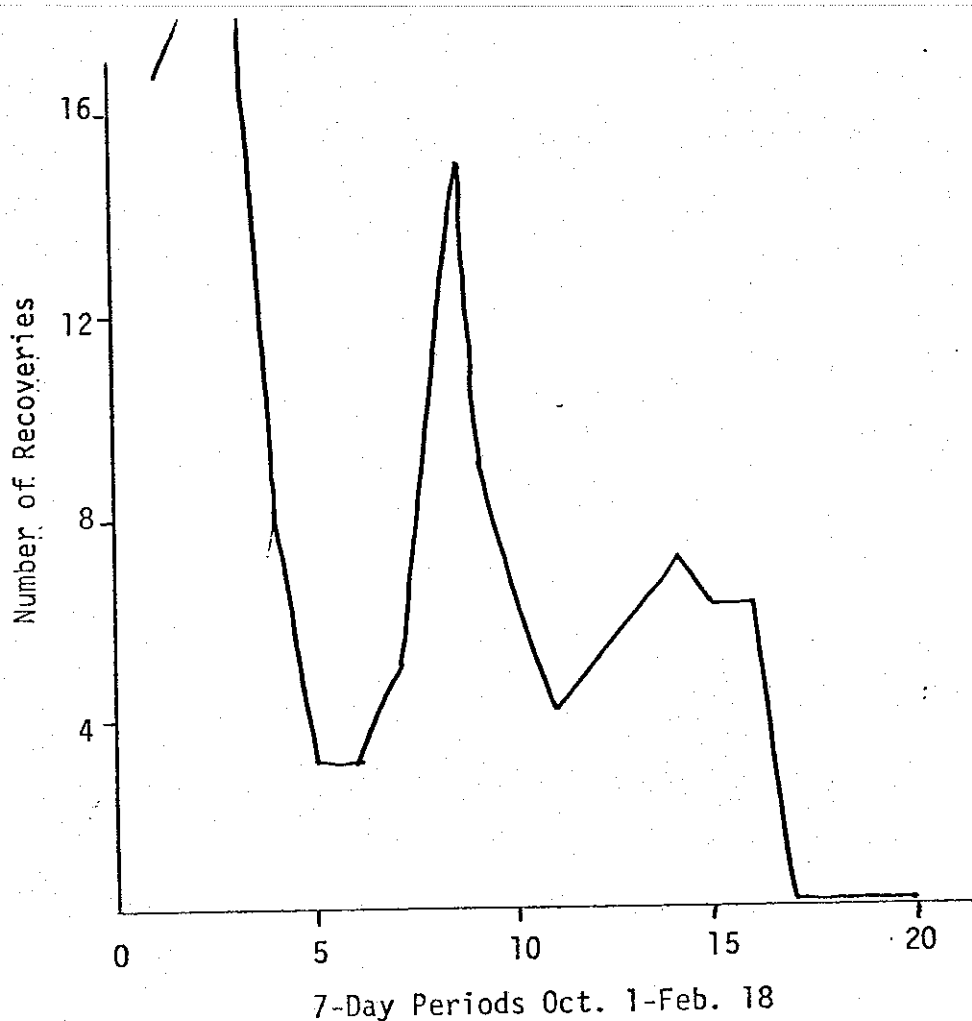


Figure 84. Temporal and Geographic Distribution of Female Green-winged Teal Recoveries Banded at Louis Lake.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	106	54.36	9.7
P.E.I.	2	1.02	0.5
NB-NS Border	3	1.54	0.0
St. John River	1	0.51	0.0
Other New Brunswick			
Southern Nova Scotia	96	49.23	8.2
Other Nova Scotia	3	1.54	0.5
Other Canadian	1	0.51	0.5
USA Total	89	45.64	2.1
Maine	3	1.54	1.0
Massachusetts	5	2.56	0.0
Other New England	1	0.51	0.0
New Jersey	10	5.13	0.0
New York	3	1.54	0.5
North Carolina	13	6.67	0.5
South Carolina	14	7.18	0.0
Florida	13	6.67	0.0
Other USA	36	18.46	0.0
Grand Total	195	23100?	

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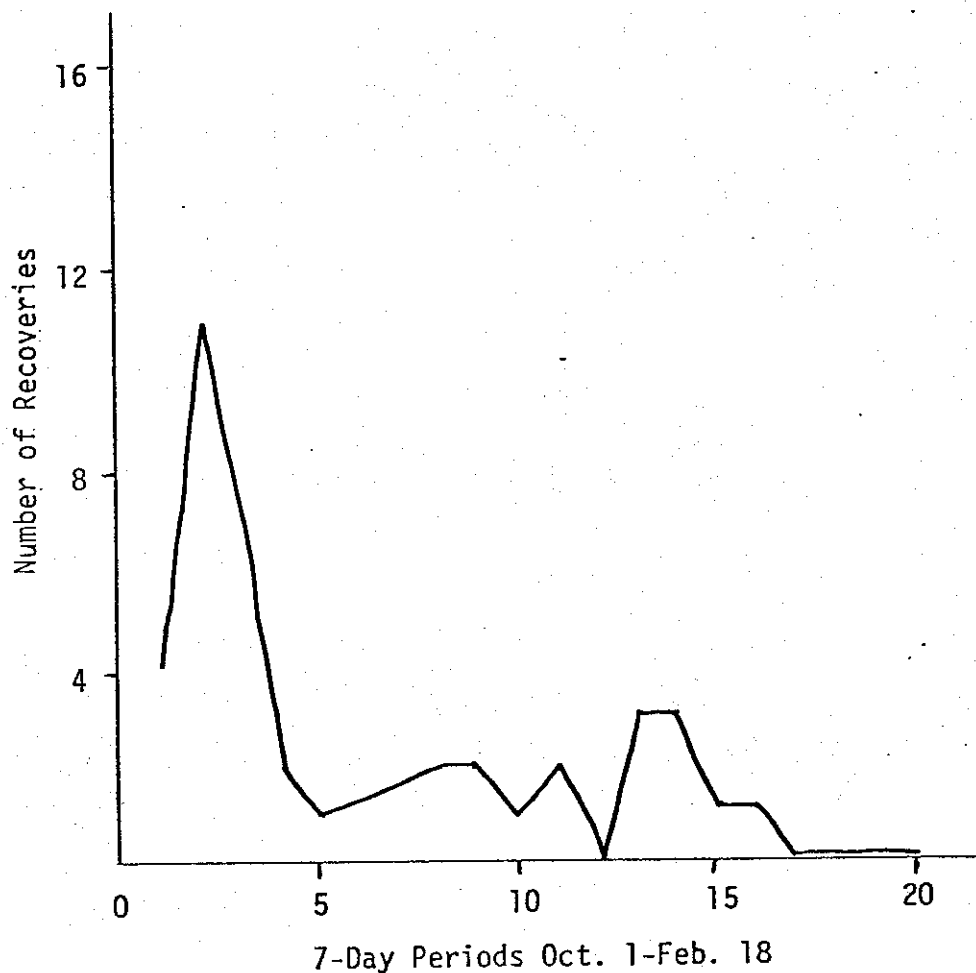


Figure 85. Temporal and Geographic Distribution of Adult Green-winged Teal Recoveries Banded at Louis Lake.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canadian Total	20	50.00	7.5
P.E.I.			
NB-NS Border			
St. John River	1	2.50	
Other New Brunswick			
Southern Nova Scotia	19	47.50	7.5
Other Nova Scotia			
Other Canadian			
USA Total	20	50.00	2.5
Maine			
Massachusetts	1	2.50	
Other New England	1	2.50	
New Jersey	2	5.00	
New York			
North Carolina	4	10.00	
South Carolina	5	12.50	
Florida	4	10.00	
Other USA	3	7.50	2.5
Grand Total	40	4	

NS, NY, other USA figures (Figs. 85+86)

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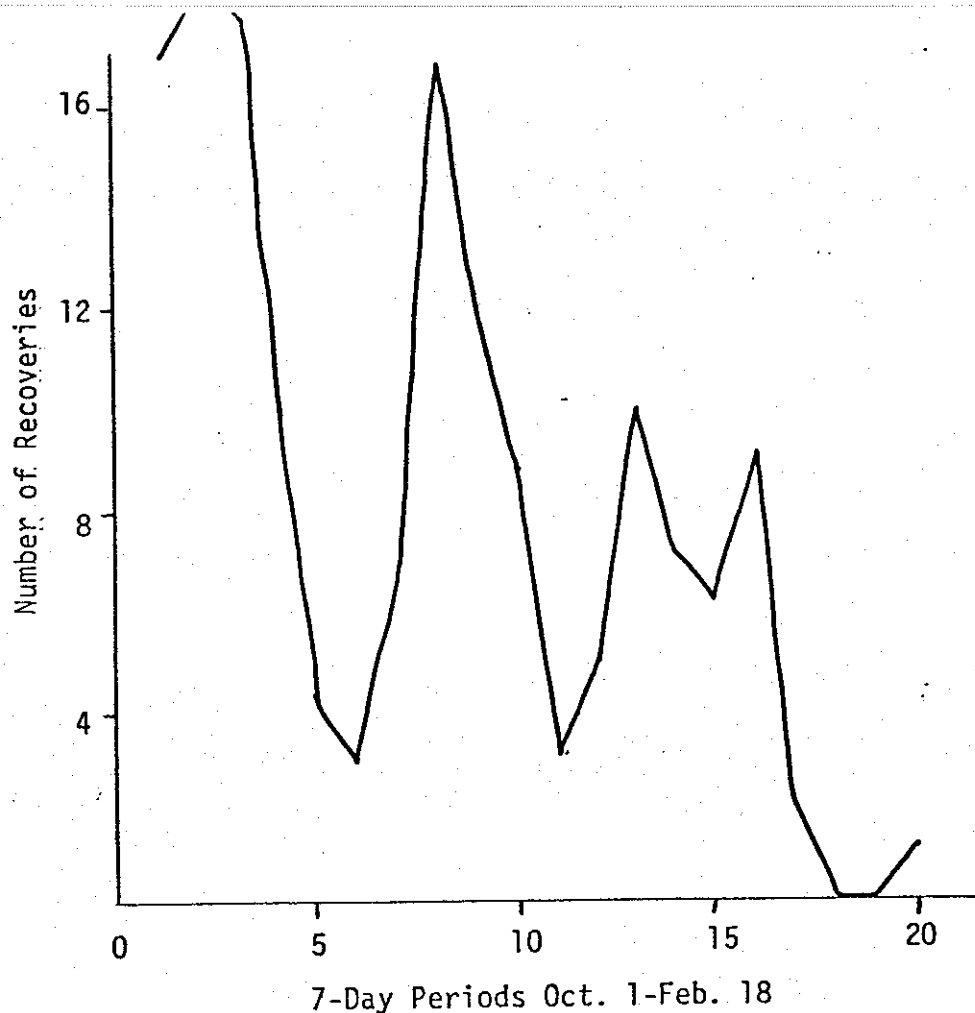


Figure 86 . Temporal and Geographic Distribution of Hatching Year Green-winged Teal Recoveries Banded at Louis Lake.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	144	58.06	10.9
P.E.I.	2	0.80	0.4
NB-NS Border	4	1.61	0.4
St. John River	3	1.21	0.4
Other New Brunswick	1	0.40	0.0
Southern Nova Scotia	125	50.40	7.7
Other Nova Scotia	6	2.42	0.8
Other Canadian	3	1.21	1.2
USA Total	104	41.94	1.6
Maine	6	2.42	1.2
Massachusetts	8	3.22	0.0
Other New England	2	0.80	0.0
New Jersey	17	6.85	0.0
New York	6	2.42	0.4
North Carolina	17	6.85	0.0
South Carolina	13	5.24	0.0
Florida	14	5.64	0.0
Other USA	21	8.47	0.0
Grand total	248	31	

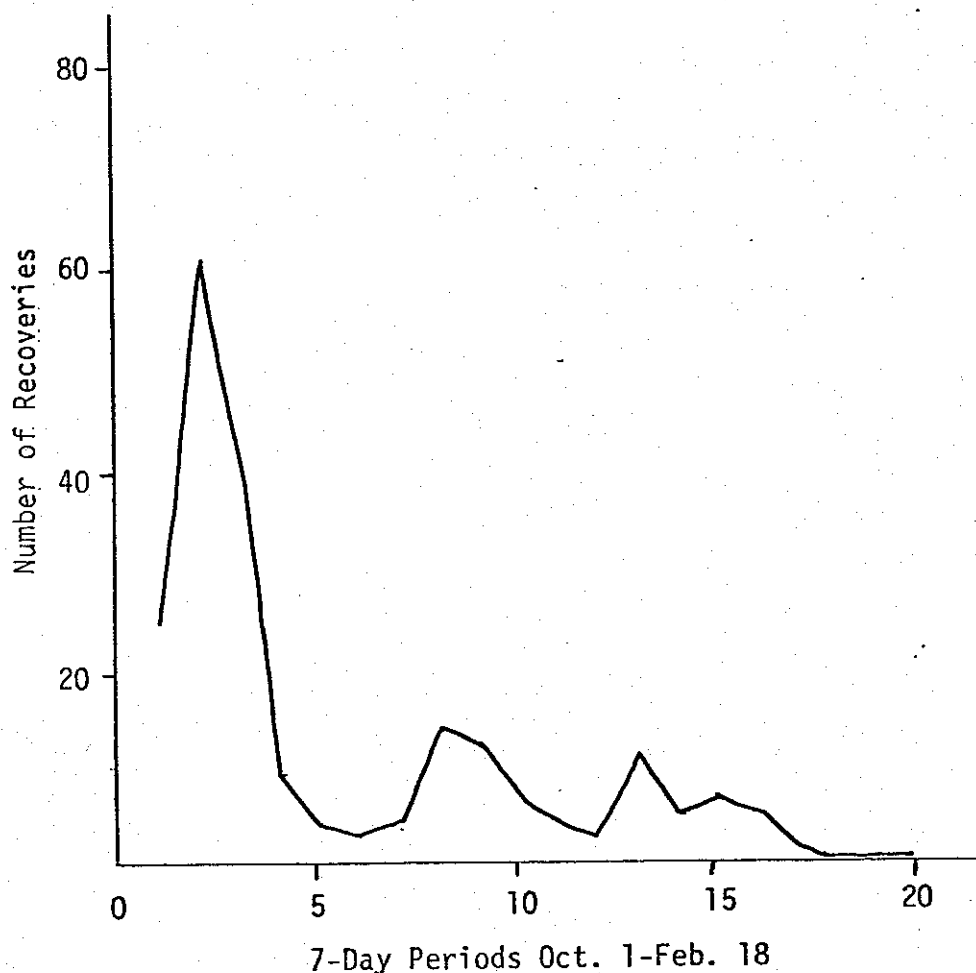


Figure 87. Temporal and Geographic Distribution of Direct Recoveries of All Green-winged Teal Banded at Louis Lake.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	136	63	11.1
P.E.I.	2	0.9	0.5
NB-NS Border	2	0.9	0.0
St. John River	1	0.5	0.0
Other New Brunswick	0	0.0	0.0
S. Nova Scotia	125	57.9	9.7
Other Nova Scotia	6	2.8	0.9
Other Canada	0	0.0	0.0
USA Total	80	37	0.5
Maine	3	1.4	0.5
Massachusetts	2	0.9	0.0
Other New England	3	1.4	0.0
New Jersey	9	4.2	0.0
New York	2	0.9	0.0
North Carolina	14	6.5	0.0
South Carolina	14	6.5	0.0
Florida	12	5.5	0.0
Other USA	21	9.7	0.0
Grand Total	216	100	11.6

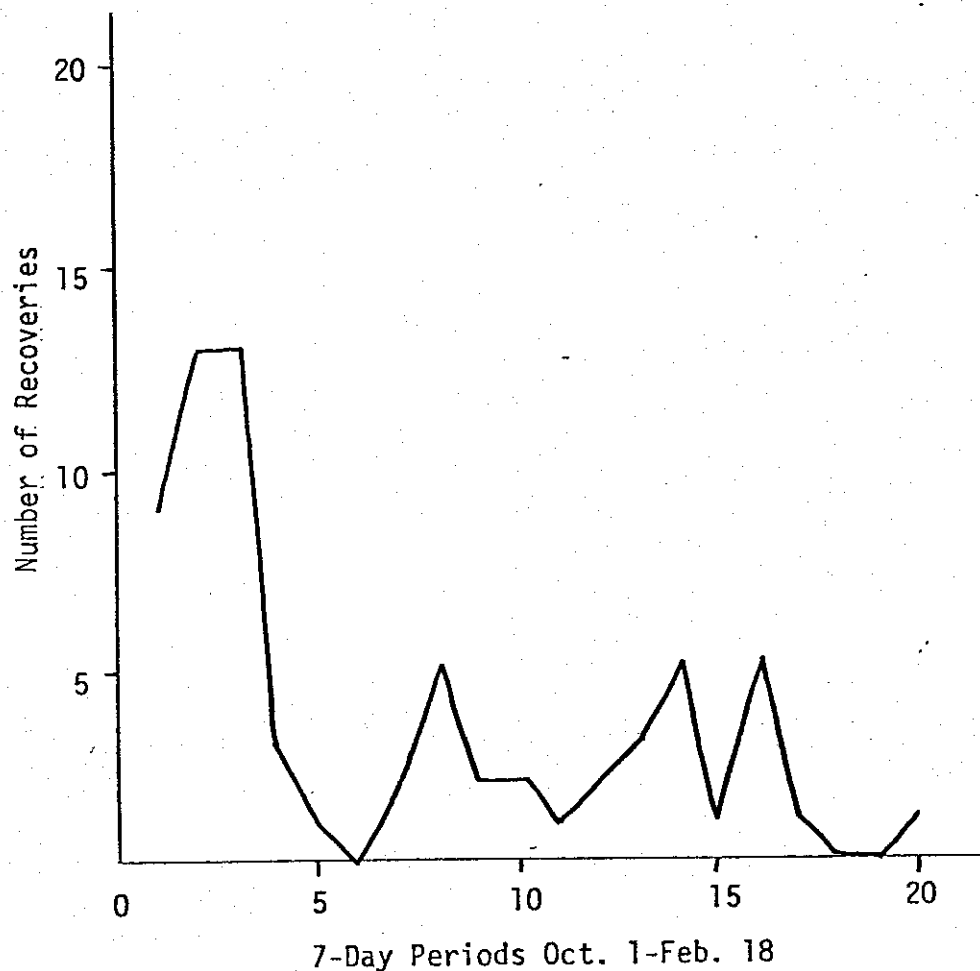


Figure 88 . Temporal and Geographic Distribution of Indirect Recoveries of All Green-winged Teal Banded at Louis Lake.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	28	38.9	8.3
P.E.I.	0	0.0	0.0
NB-NS Border	2	2.7	1.4
St. John River	3	4.2	1.4
Other New Brunswick	1	1.4	0.0
S. Nova Scotia	19	26.4	1.4
Other Nova Scotia	0	0.0	0.0
Other Canadian	3	4.2	4.1
USA Total	44	61.1	5.6
Maine	3	4.2	2.8
Massachusetts	7	9.7	0.0
Other New England	0	0.0	0.0
New Jersey	5	6.9	0.0
New York	1	1.4	1.4
North Carolina	7	9.7	0.0
South Carolina	4	5.6	0.0
Florida	6	8.3	0.0
Other USA	11	15.3	1.4
Grand Total	72	100	13.9

Cape Breton

Cape Breton ^{has relatively} ~~represents an area of~~ low waterfowl production per unit area and serves as a staging area and migration corridor for birds from Prince Edward Island and Newfoundland. Low numbers of recoveries of birds banded in that area render ^{ed} analyses highly speculative; however, results ^{ed} tend to confirm past impressions. Limited recoveries defined ~~a~~ migration routes south through ~~southern~~ Nova Scotia to New England, New Jersey and North Carolina for both species. ~~The southern extension for~~ green-winged teal reaches ^d to Florida, while black duck reach ^{ed} only as far as North Carolina. Southern Nova Scotia appears ^d to be the major wintering area in Canada, while New England and New Jersey winter ^{ed} the majority of Cape Breton birds in the USA. Figure 89 defines the geographic distribution of black duck and green-winged teal banded in Cape Breton.

Black duck ^{were} ~~are~~ harvested most heavily on Cape Breton (68%) with the second largest recovery area ~~being located~~ in southern Nova Scotia (13%). ~~In total~~ over 88% of all black duck recoveries ^a come from Prince Edward Island and Nova Scotia. Green-winged teal, ^{may have been as} ~~on the other hand,~~ appear to be more heavily harvested in the USA. ~~Only 37% of all recoveries of green-winged teal come from Canada with the majority of the remainder coming from areas south of New England.~~

Temporally, periods of highest kill coincide ^d with opening of hunting seasons. ~~This is particularly true for the~~ black duck, ~~for which~~ the greatest number of recoveries occurred during the first and second weeks of October and again in late November. January peaks reflect ^{ed} ~~the result of~~ hunting in the USA. The highest recovery period for green-winged teal occurred during the second week of October. Figure 90 shows the temporal

and geographic distribution of recoveries of black duck and green-winged teal banded in Cape Breton.

Due to a very small number of recoveries (8) of green-winged teal, there is no value in attempting to draw conclusions by sex, age or type of recovery. ^{for that species} Recoveries of black duck, however, ~~are sufficient to illustrate~~ some harvest characteristics. In total, females ^{ed/} tend to be more heavily harvested in Canada than males. This ^{was} is particularly evident on Cape Breton Island (N.E. Nova Scotia) where over ⁴ 79% of all female recoveries ^{were made compared} ~~are taken as opposed~~ to 62% for males. ^{Conversely} Likewise, significantly more males (17%) ^{were} ~~are~~ recovered in southern Nova Scotia than females (9%). ~~This may suggest that~~ ^{may} males migrate earlier than females in Cape Breton, thus being less susceptible to harvest in that area of the island that opens October 1. Males ^{were} ~~are~~ more heavily harvested in southern Nova Scotia and the USA than females, which further suggests ^{ed/} that males ^{ed/} tend to migrate from Cape Breton and winter further south than females. Temporally, the distributions of both sexes ^{were} ~~are~~ closely similar. Figure 91 shows the temporal and geographic distribution of recoveries of male and female black duck banded in Cape Breton.

Recoveries of adult and local age black duck ^{were} ~~are~~ very limited in number, ^{so} ~~thus~~ ^{comments could} few valid ^{their} ~~observations can~~ be made regarding harvest patterns. Both adults and locals ^{were} ~~are~~ heavily harvested in Canada (95 and 92 per cent respectively) with most recoveries coming from Cape Breton. Adult recoveries ^{were} ~~are~~ notably greater on Prince Edward Island than any other age class. (16%) ~~followed by locals (8%). This may reflect a movement of adults to Prince Edward Island for wintering and a preseason mixing of locals.~~ Over 87% of hatching year recoveries ^{were} ~~are~~ from Canada with 71% ~~coming~~ from the Cape Breton area. Less than 4% ^{were} ~~are~~ taken on Prince Edward Island. A relatively high

proportion of adults ^{were} ~~are~~ recovered in southern Nova Scotia, suggesting that the population is ^{mostly} ~~highly~~ resident ⁱⁿ to Nova Scotia. Temporally, the distribution of recoveries ^{was} ~~is~~ as expected. Figure 92 ^{and Table 6} shows temporal and geographic of recoveries of adult, hatching year, and local black duck banded in Cape Breton.

Over 85% of all direct recoveries ^{came} ~~come~~ from Cape Breton (73.4%) and southern Nova Scotia (11.9%), as well as 75% of all indirect recoveries. This again reflects a highly sedentary population which ^{is} harvested almost entirely within Nova Scotia. As expected there ^{were relatively} ~~are~~ more indirect recoveries from the USA than direct; however, the percentage ^{was} ~~of the total~~ is small in both cases. ^{were} ~~In addition~~ no recoveries ~~are~~ reported ~~from areas~~ outside of Prince Edward Island and Nova Scotia in Canada. Figure 93 shows the temporal and geographic distribution of direct and indirect recoveries of black duck banded in Cape Breton.

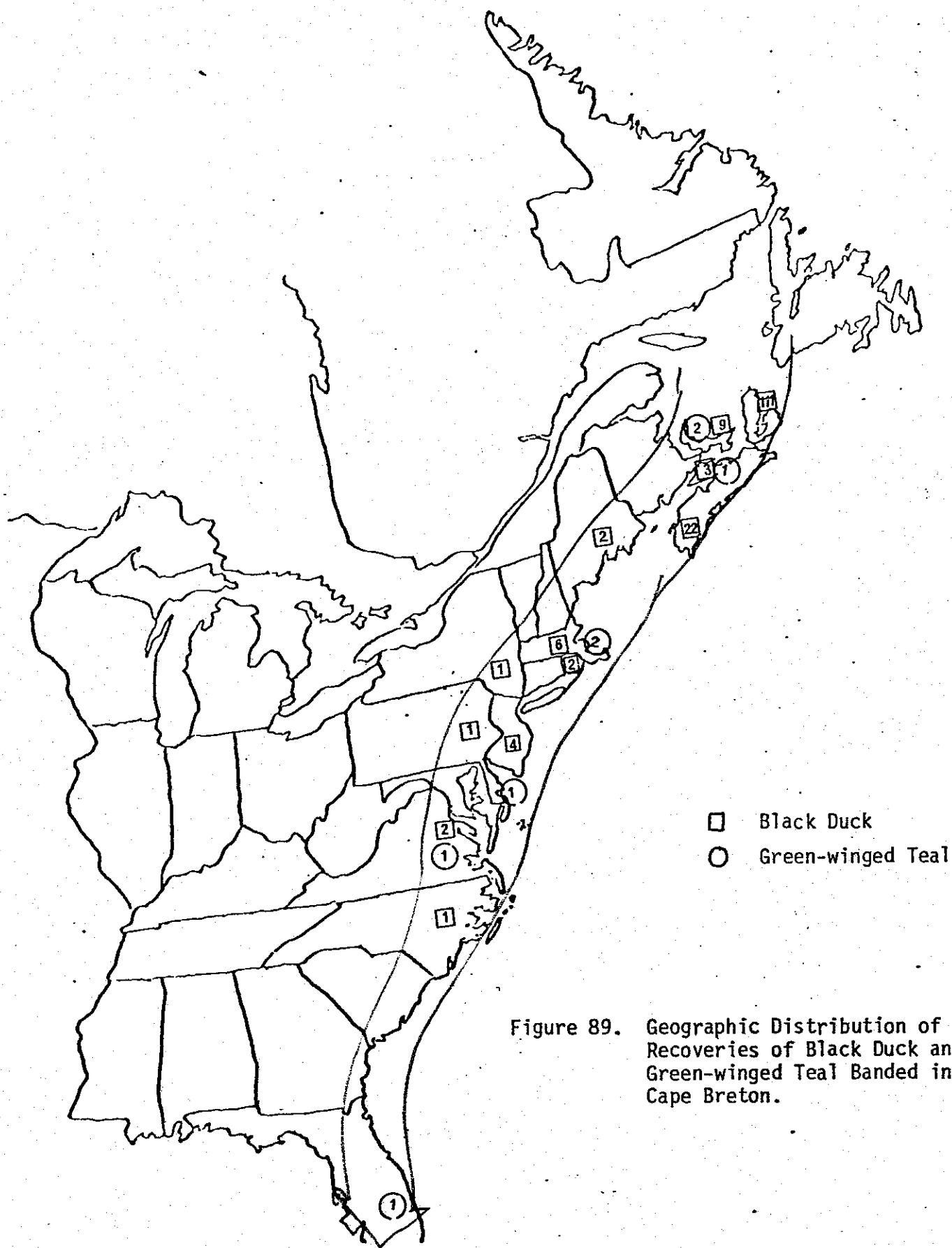


Figure 89. Geographic Distribution of Recoveries of Black Duck and Green-winged Teal Banded in Cape Breton.

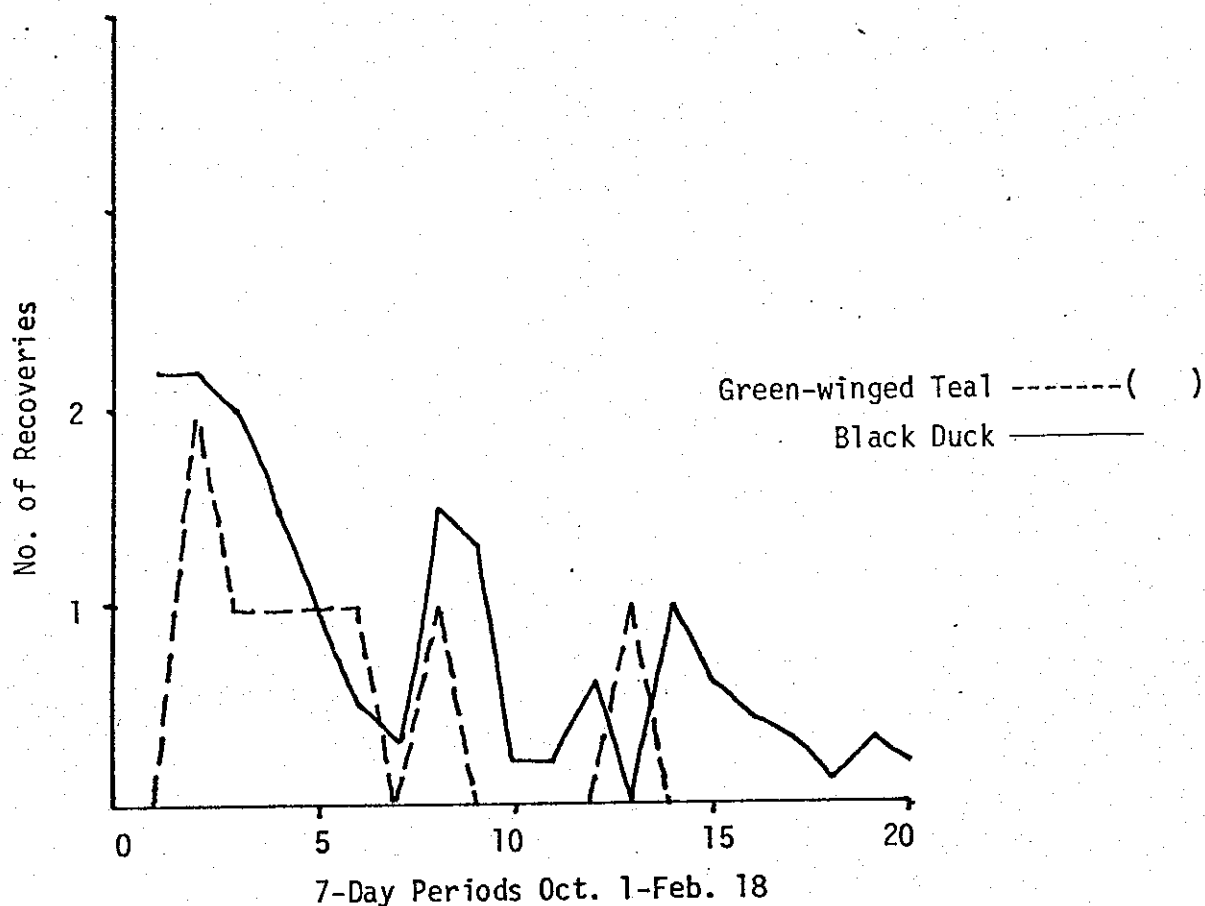


Figure 90. Temporal and Geographic Distribution of Recoveries of Black Duck and Green-winged Teal Banded in Cape Breton

Recovery Location	Black Duck			Green-winged Teal		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canadian Total	145	88.41	13.41	3	37.5	
P.E.I.	9	5.49		2	25.0	
NB-NS Border						
Saint John River						
Other N.B.						
Southern N.S.	22	13.41				
N.E. Nova Scotia	111	67.68		1	12.5	
N.W. Nova Scotia	3	1.82				
USA Total	19	11.59		5	62.5	
Maine	2	1.22				
Massachusetts	6	3.66		2	25.0	
Other New England	2	1.22				
New Jersey	4	2.44				
New York	1	0.61				
North Carolina	1	0.61				
South Carolina						
Florida				1	12.5	
Other USA	3	1.82		2	25.0	
Grand Total	164			8		

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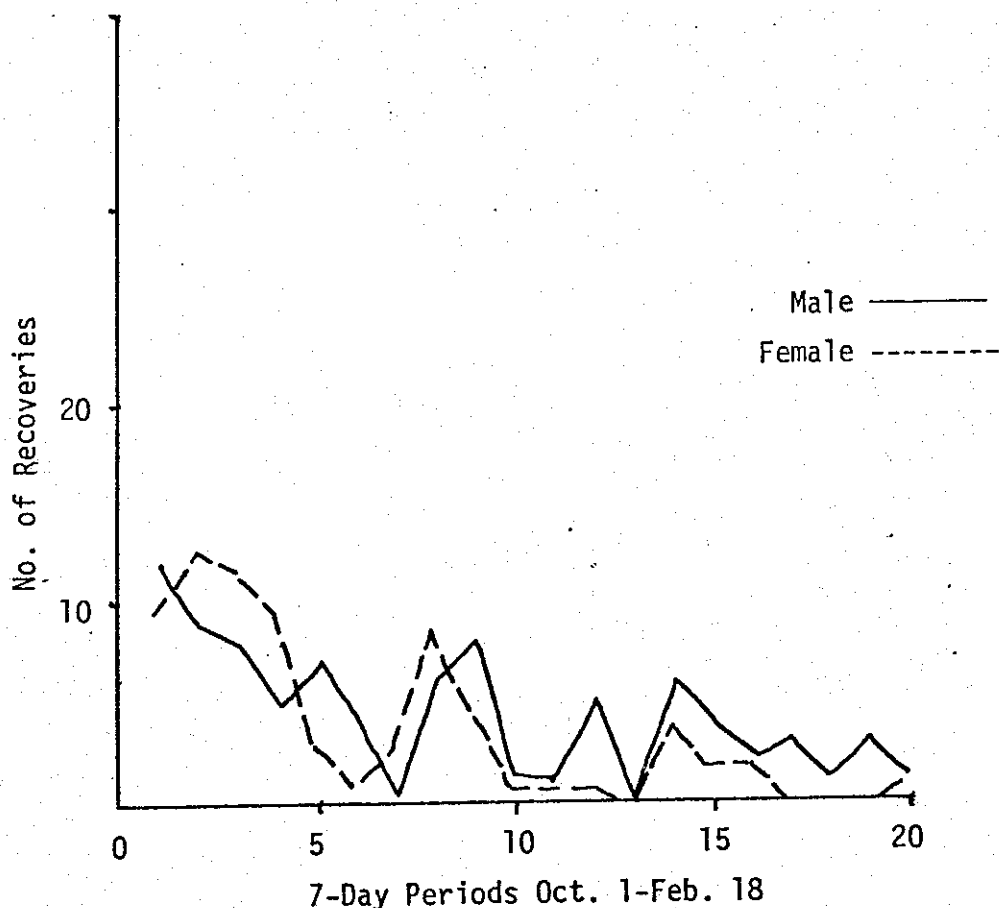


Figure 91. Temporal and Geographic Distribution of Recoveries of Male and Female Black Duck Banded in Cape Breton.

Recovery Location	Male			Female		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
✓ Canadian Total	73	84.88	13.95	72	92.31	12.82
✓ P.E.I.	5	5.81		4	5.13	
NB-NS Border						
Saint John River						
Other N.B.						
✓ Southern N.S.	15	17.44		7	8.97	
✓ N.E. Nova Scotia	53	61.63		58	74.36	
NW NS				3	3.85	
✓ USA Total	13	15.12		6	7.69	
✓ Maine	1	1.16		1	1.28	
✓ Massachusetts	5	5.81		1	1.28	
✓ Other New England	1	1.16		1	1.28	
✓ New Jersey	3	3.49		1	1.28	
✓ New York	1	1.16				
✓ North Carolina	1	1.16				
South Carolina						
Florida						
✓ Other USA	1	1.16		2		
✓ Grand Total	86			78		

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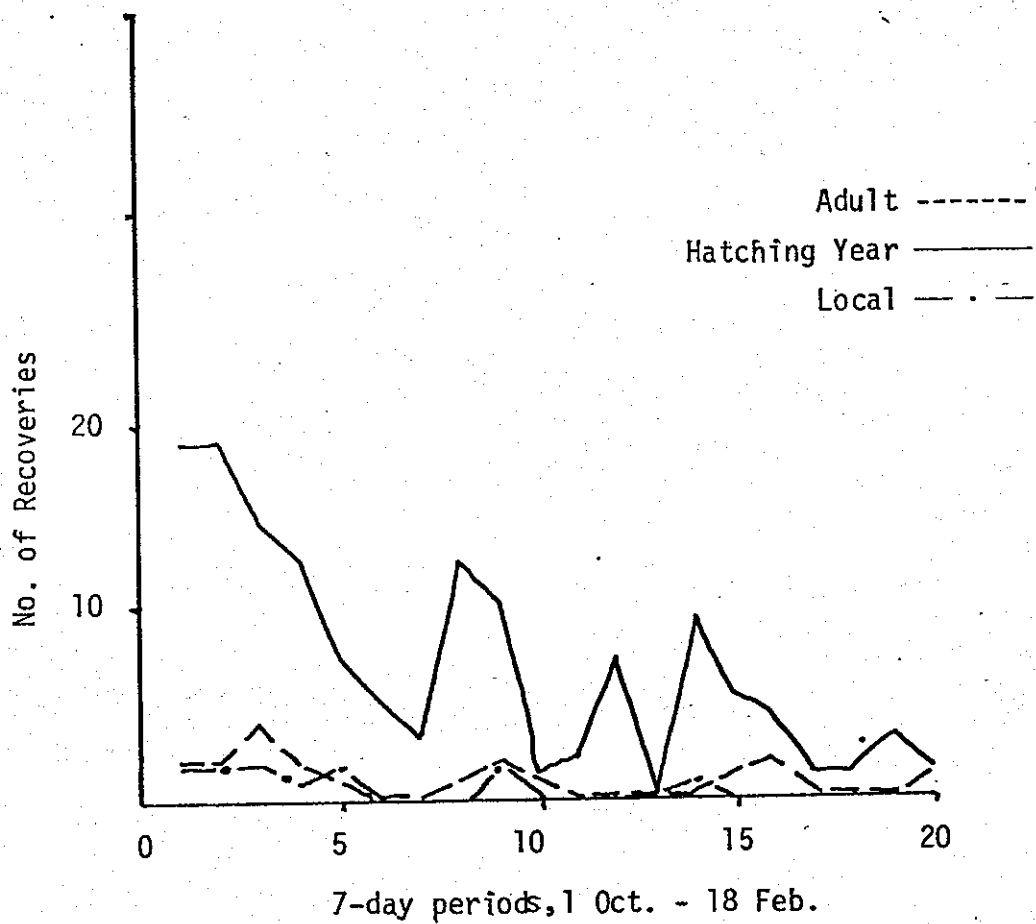


Figure 92. Temporal Distribution of Recoveries of Adult, Hatching Year and Local Black Duck Banded in Cape Breton.

Table 6

Geographic Distribution of Recoveries of Adult, Hatching Year and Local Black Duck Banded in Cape Breton

Recovery Location	Adult			Hatching Year			Local		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
✓ Canadian Total	18	94.74	10.53	116	87.22	13.53	11	91.67	16.67
✓ P.E.I.	3	15.79		5	3.76		1	8.33	
NB-NS Border									
Saint John River									
Other N.B.									
Southern N.S.	6	31.58		16	12.03		1	8.33	
N.E. Nova Scotia	8	42.10		94	70.68		8	66.67	
✓ N.W. Nova Scotia	1	5.26		1	0.75		1	8.33	
✓ USA Total	1	5.26		17	12.78		1	8.33	
✓ Maine				2	1.50				
✓ Massachusetts				6	4.51				
✓ Other New England				2	1.50				
✓ New Jersey	1	5.26		3	2.26				
✓ New York				1	0.75				
✓ North Carolina				1	0.75				
South Carolina									
Florida									
✓ Other USA				2	1.50		1	8.33	
✓ Grand Total	19			133			12		

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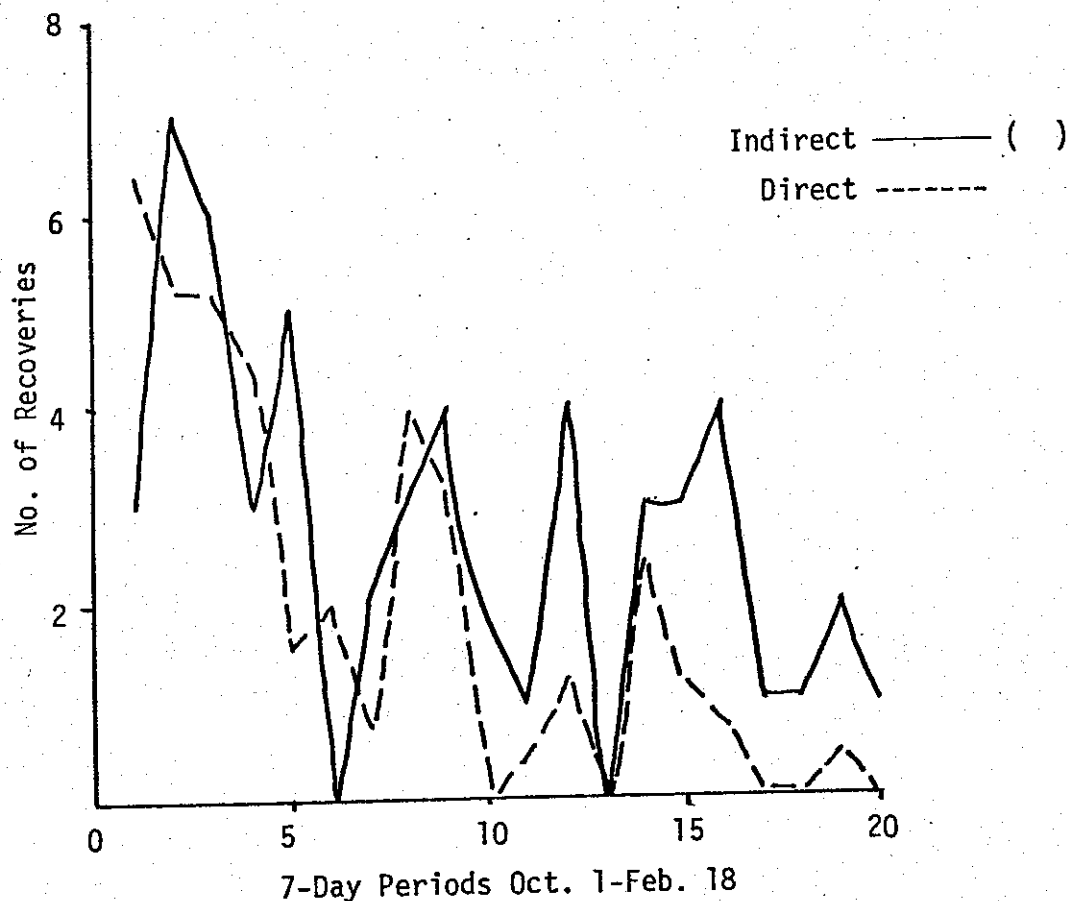


Figure 93. Temporal and Geographic Distribution of Direct and Indirect Recoveries of Black Duck Banded in Cape Breton.

Recovery Location	Direct			Indirect		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
✓ Canadian Total	100	91.7	17.4	45	81.8	5.5
✓ P.E.I.	5	4.6	0.0	4	7.3	0.0
N.E. Nova Scotia	80	73.4	17.4	32	58.2	5.5
N.W. Nova Scotia	2	1.8	0.0	0	0.0	0.0
✓ Southern Nova Scotia	13	11.9	0.0	9	16.3	0.0
✓ USA Total	9	8.3	0.0	10	18.2	0.0
✓ Maine	1	0.9	0.0	1	1.8	0.0
✓ Massachusetts	2	1.8	0.0	4	7.3	0.0
✓ Other New England	1	0.9	0.0	1	1.8	0.0
✓ New Jersey	2	1.8	0.0	2	3.7	0.0
✓ New York	0	0.0	0.0	1	1.8	0.0
✓ Pennsylvania	1	0.9	0.0	0	0.0	0.0
✓ Virginia	2	1.8	0.0	0	0.0	0.0
✓ North Carolina	0	0.0	0.0	1	1.8	0.0
✓ Grand Total	109	100	0.0	55	100	0.0

Newfoundland-Labrador

Black duck and green-winged teal banded in Newfoundland appear to contribute most heavily to harvests in Newfoundland and Nova Scotia. Over 70 per cent of all black duck recoveries ^{were} ~~are~~ from Canada as well as nearly 58% of the green-winged teal recoveries. In the U.S.A., the majority of black duck recoveries ^{were} ~~are~~ from the New England states, particularly Massachusetts, while green-winged teal recoveries ^{were} ~~are~~ distributed from Maine to ^{Louisiana} ~~Alabama~~ with the largest number (¹⁷ ~~9.8%~~) ~~coming~~ from New Jersey. Figures 94-95 and Table 7 show the geographic distribution of black duck and green-winged teal banded in Newfoundland, respectively.

Unlike Newfoundland birds, black duck and green-winged teal banded in Labrador ^{were} ~~are~~ more commonly recovered in the U.S.A., particularly Massachusetts and New Jersey. In Canada, Labrador accounted for most recoveries followed by Nova Scotia. The distribution of recoveries reached as far south as Georgia for black ducks and Alabama for green-winged teal. This ~~continues~~ ~~to demonstrate~~ that the further north that birds breed the further south they may be expected to winter. Figures 96-97 and Table 8 show the geographic distribution of black duck and green-winged teal banded in Labrador.

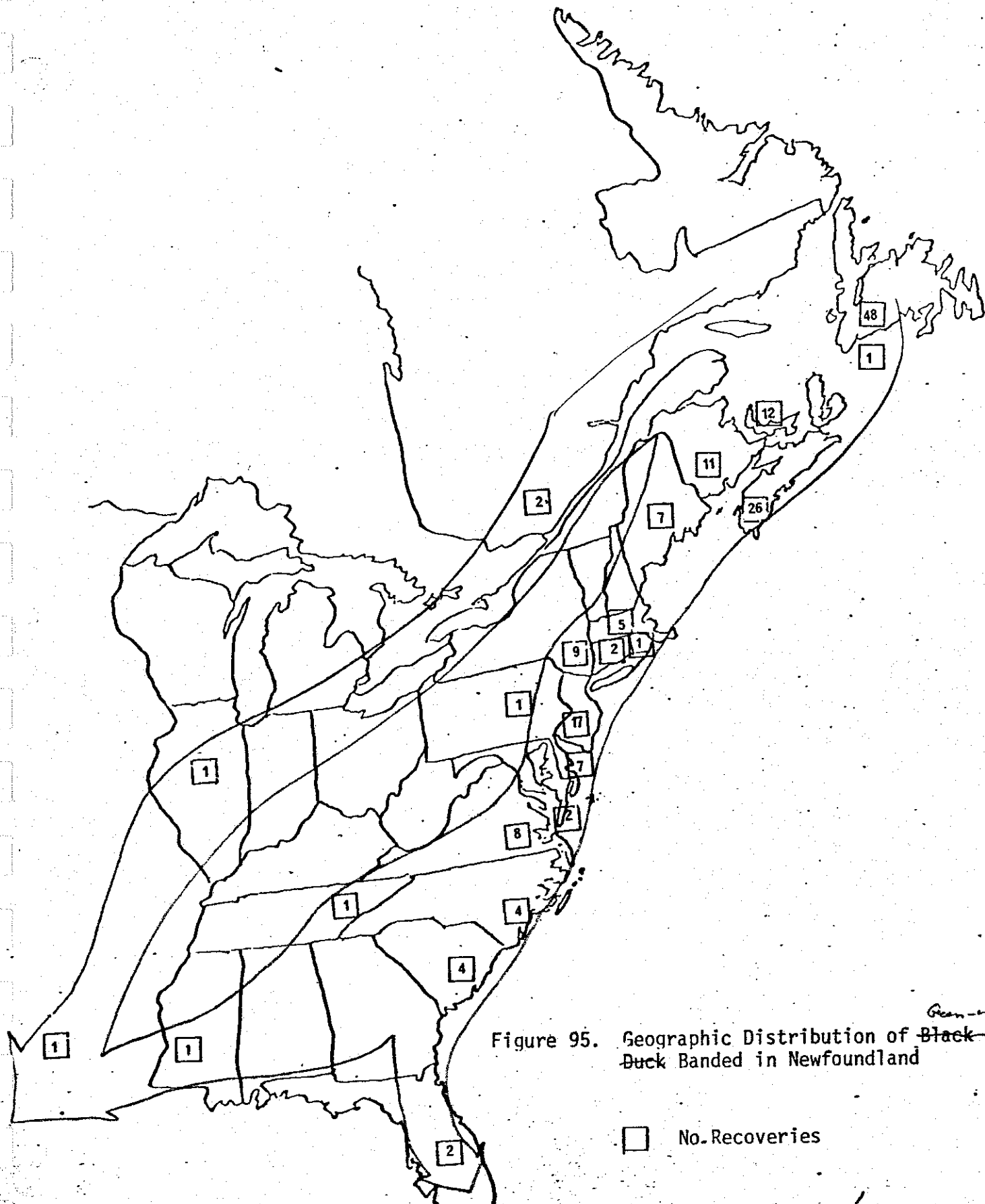


Figure 95. Geographic Distribution of Black Duck Banded in Newfoundland

Geographical

Table 7. Geographic Distribution of Recoveries of Black Duck and Green-winged Teal Banded in Newfoundland

Recovery Location	Number of Recoveries Black Duck	% Total Recoveries	No. Recoveries g. w. teal	% Total Recoveries
✓ Canada Total	157	70.4	✓ 100	57.8
✓ Newfoundland	70	31.7	✓ 48	27.7
✓ Labrador	1	0.4	✓ 0	0.0
✓ St. P/M.	1	0.4	✓ 1	0.6
✓ N.B.	4	1.8	✓ 11	6.4
✓ N.S.	69	30.8	✓ 26	15.0
✓ P.E.I.	9	4.0	✓ 12	6.9
✓ Quebec	2	0.9	✓ 2	1.2
✓ Ontario	1	0.4	✓ 0	0.0
✓ USA Total	66	29.6	✓ 73	42.2
✓ Maine	5	2.2	✓ 7	4.0
✓ Mass.	31	13.9	✓ 5	2.9
✓ New Hampshire	1	0.4	✓ 0	0.0
✓ Conn.	3	1.4	✓ 2	1.2
✓ R.I.	4	1.8	✓ 1	0.6
✓ N.Y.	5	2.2	✓ 9	5.2
✓ N.J.	9	4.0	✓ 17	9.8
✓ Del.	3	1.4	✓ 7	4.0
✓ Maryland	2	0.9	✓ 2	1.2
✓ Virginia	2	0.9	✓ 8	4.5
✓ N.C.	1	0.4	✓ 4	2.3
Penn.	0	0.0	✓ 1	0.6
Illinois	0	0.0	✓ 1	0.6
S.C.	0	0.0	✓ 4	2.3
Alabama	0	0.0	✓ 1	0.6
Tenn.	0	0.0	✓ 1	0.6
Florida	0	0.0	✓ 2	1.2
Louisiana	0	0.0	✓ 1	0.6
Grand Total	✓ 223	100	✓ 173	100

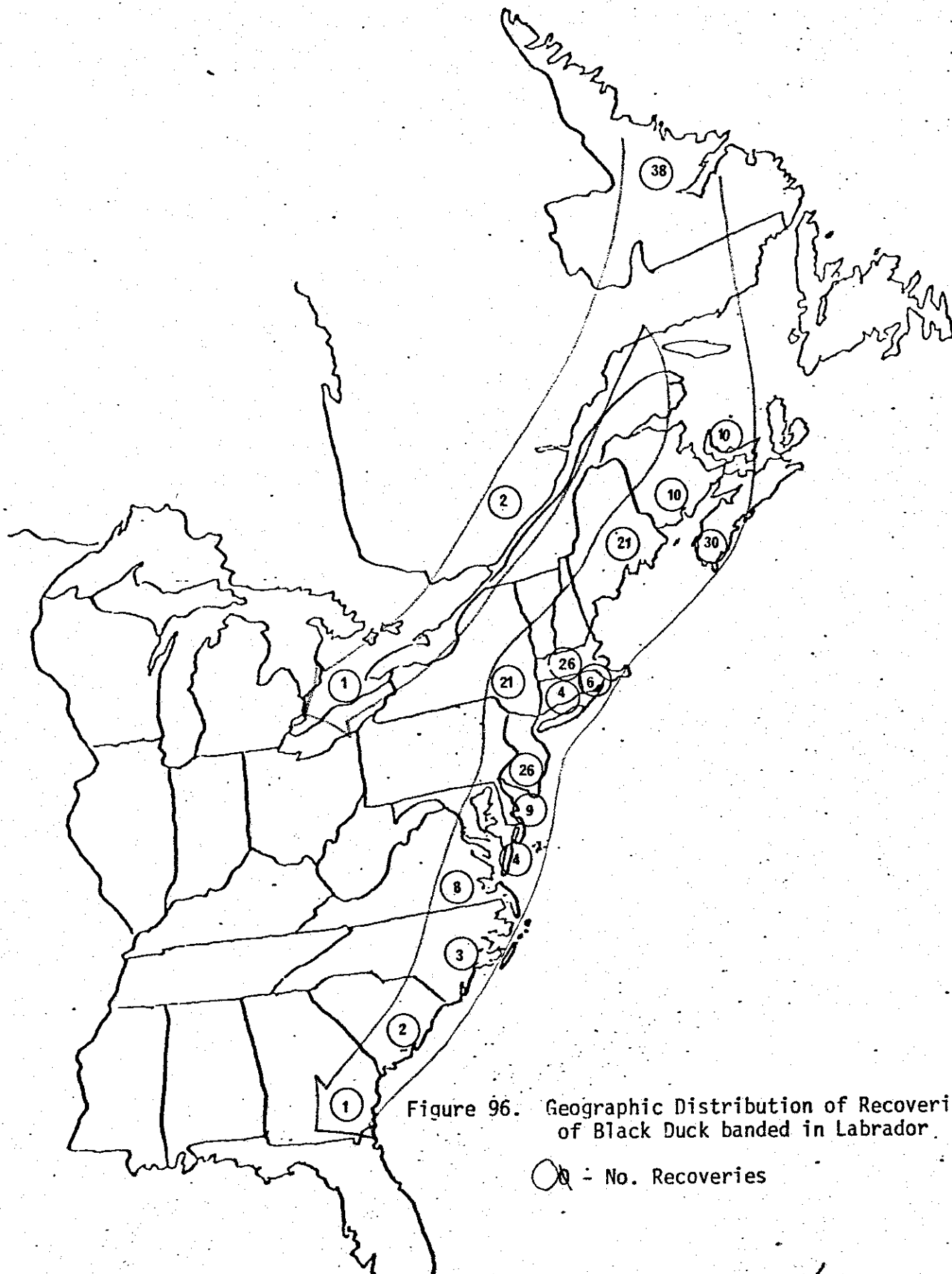


Figure 96. Geographic Distribution of Recoveries of Black Duck banded in Labrador.

○ - No. Recoveries

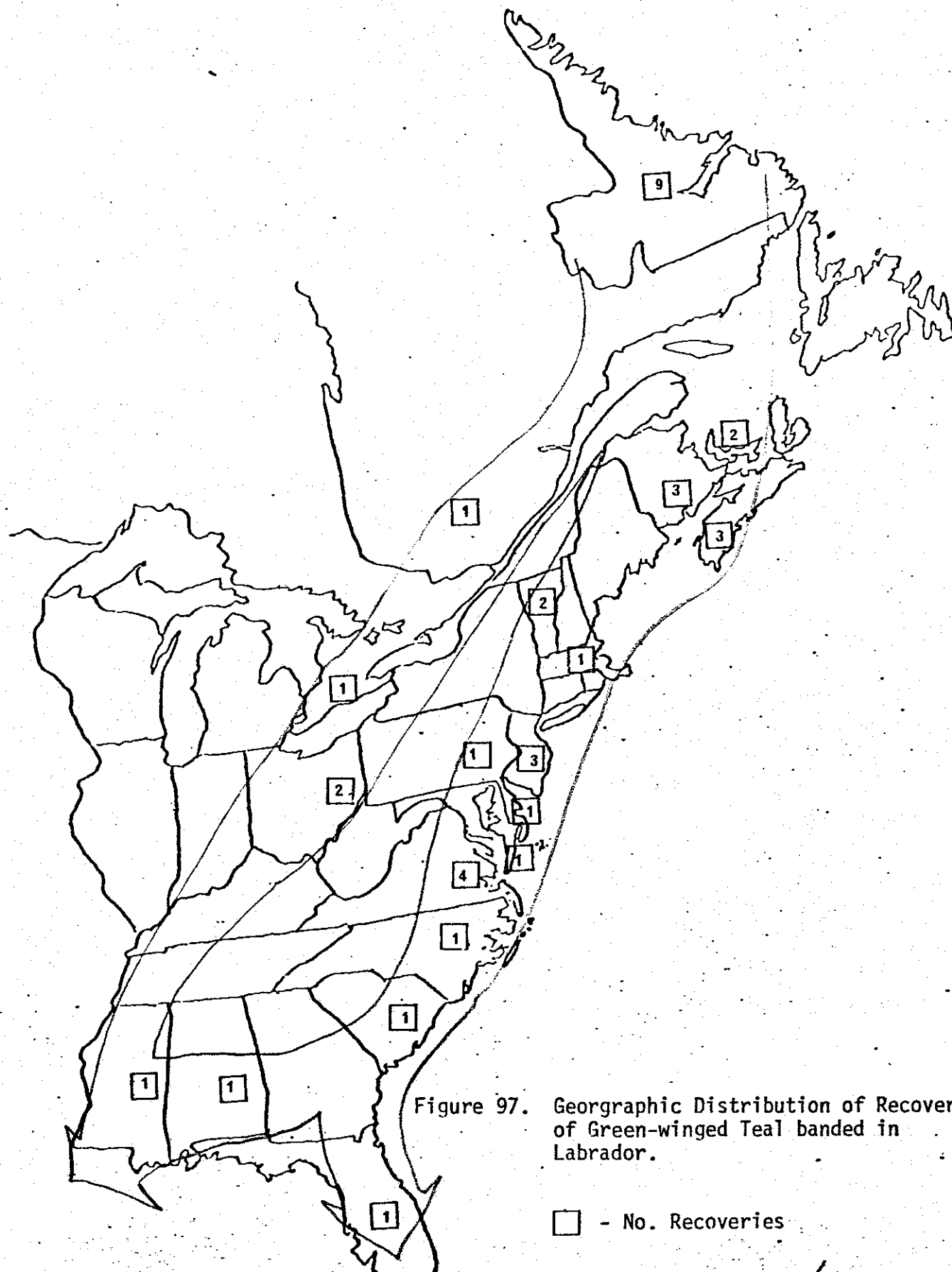


Figure 97. Geographic Distribution of Recoveries of Green-winged Teal banded in Labrador.

□ - No. Recoveries

Table 8. Geographic Distribution of Recoveries of Black Duck and Green-winged Teal Banded in Labrador

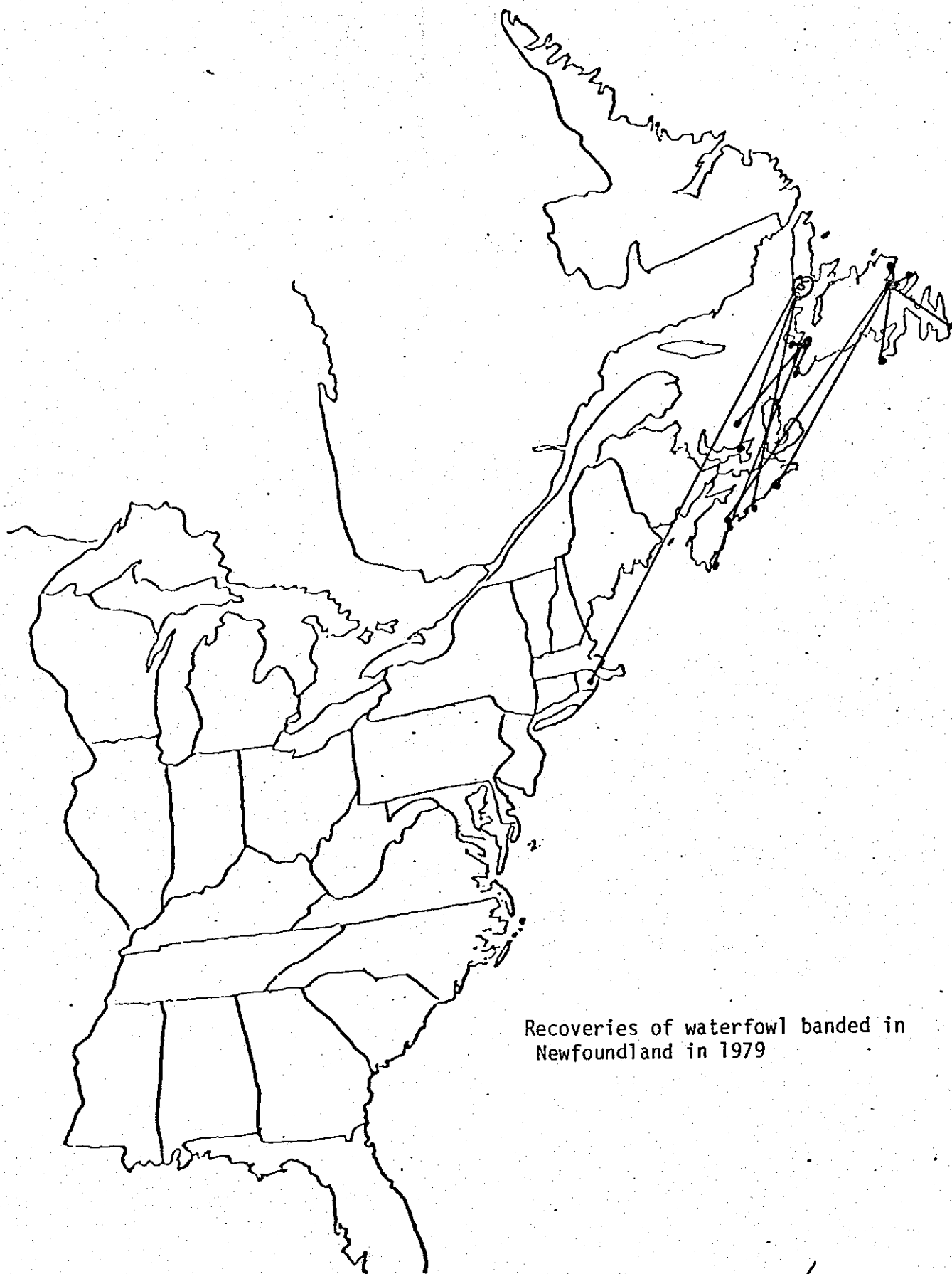
Recovery Location	Number of Recoveries Black Duck	% Total Recoveries	No. Recoveries g. w. teal	% Total Recoveries
Canada Total	✓ 91	41.0	✓ 19	48.7
Newfoundland	✓ 0	0.0	0	0.0
Labrador	✓ 38	17.2	✓ 9	23.1
St. P/M	✓ 0	0.0	0	0.0
N.B.	✓ 10	4.5	✓ 3	7.7
N.S.	✓ 30	13.5	✓ 3	7.7
P.E.I.	✓ 10	4.5	✓ 2	5.0
Quebec	✓ 2	0.9	✓ 1	2.6
Ontario	✓ 1	0.4	✓ 1	2.6
USA Total	✓ 131	59.0	✓ 20	51.3
Maine	✓ 21	9.5	0	0.0
Mass.	✓ 26	11.7	✓ 1	2.6
R.I.	✓ 6	2.7	0	0.0
Conn.	✓ 4	1.8	0	0.0
Vermont			✓ 2	5.0
N.Y.	✓ 21	9.5	0	0.0
N.J.	✓ 26	11.7	✓ 3	7.7
Del.	✓ 9	4.1	✓ 1	2.6
Maryland	✓ 4	1.8	✓ 1	2.6
Virginia	✓ 8	3.6	✓ 4	10.2
N.C.	✓ 3	1.3	✓ 1	2.6
S.C.	✓ 2	0.9	✓ 1	2.6
Georgia	✓ 1	0.4	0	0.0
Penn.			✓ 1	2.6
Ohio			✓ 2	5.0
Miss.			✓ 1	2.6
Alabama			✓ 1	2.6
Florida			✓ 1	2.6
Grand Total	✓ 222	100	✓ 39	100

Recoveries of Waterfowl Banded in Newfoundland in 1979

Species	Banding Location	Date	Recovery Location	Date
Black Duck	Birchy Basin	July 17	Marshfield, P.E.I.	Feb. 7/80
	" "	July 17	Warren, R.I.	Oct. 13/79
	" "	Aug. 22	Musquodoboit, N.S.	Nov. 17/79
	" "	Aug. 13	Upper Humber, Nfld.	/79
	" "	Aug. 14	Birchy Basin, Nfld.	Sept. 10/79
	" "	Aug. 14	Upper Humber, Nfld.	/79
	" "	Aug. 18	" " "	/79
	" "	Aug. 19	" " "	/79
	Terra Nova	Oct. 7	Halifax, N.S.	Jan. 14/80
	" "	Oct. 5	Sandringham, Nfld.	/79
	" "	Oct. 8	Bonavista Bay, Nfld.	Nov. 17/79
	" "	Oct. 18	Drum Head, N.S.	Dec. 10/79
	" "	Oct. 9	Lamaline, Nfld.	Feb. 7/79
	" "	Oct. 7	Aquaforce, Nfld.	Nov. 30/79
	Codroy Valley	July 20	Gull Island, N.S.	Nov. 12/79
	" "	July 20	Codroy, Nfld.	Sept. 12/79
Pintail	" "	July 20	Magdalene Island	/79
Green-winged Teal	Birchy Basin	July 17	Port au Port, Nfld.	Sept./79

Total Recoveries as of September 1980 = 18

8 local recs. - 2 Sept., 1 Nov., 5 ¹ unrelated
 2 also in Nfld. - 1 Nov., 1 Feb.
 4 in N.S. - 2 Nov., 1 Dec., 1 Jan.
 1 in P.E.I. - 1 Feb.
 1 in R.I. - 1 Oct.



Recoveries of waterfowl banded in
Newfoundland in 1979

Temporal and Geographic Distribution of Recoveries of Pintail
Banded in the Atlantic Region and Baie Johan Beetz, Quebec

Total

Recoveries of 349 pintail banded in the Atlantic Region and Baie Johan Beetz, Quebec, were examined. Geographically they were distributed almost equally between the USA (51.6%) and Canada (48.4%). Specific areas of high recovery were not apparent although small numbers were scattered over wide areas ~~of the USA and Canada~~. The New Brunswick-Nova Scotia border area reported the highest number of recoveries (10.9%) of any single area (Figure 1). Foreign recoveries amounted to less than one percent of the total and were reported from the Bahama Islands, Jamaica and Europe (Table 1 and Figure 2). Temporally, first week recoveries were much lower than other species examined with just over 26% of all recoveries being reported during that period (Figure 3).

Prince Edward Island

Only 38 recoveries of pintail banded on Prince Edward Island have been received of which 29 were local age and 9 were hatching year. No pintail banded as adults on Prince Edward Island have been recovered. Of the nine recoveries of birds banded as hatching year only one was from a Canadian location. All others were from the USA, notably North Carolina. Three ~~out~~ of the nine recoveries were females, ~~all of which were recovered in the USA.~~ Recoveries of local age birds showed that more females (50%) were recovered in Canada than males (45.5%). Table 2 shows the geographic distribution of recoveries of local age pintail banded on Prince Edward Island. Temporally, distribution of recoveries by sex and age ~~is~~ ^{was} closely similar, as shown by the total of all recoveries.

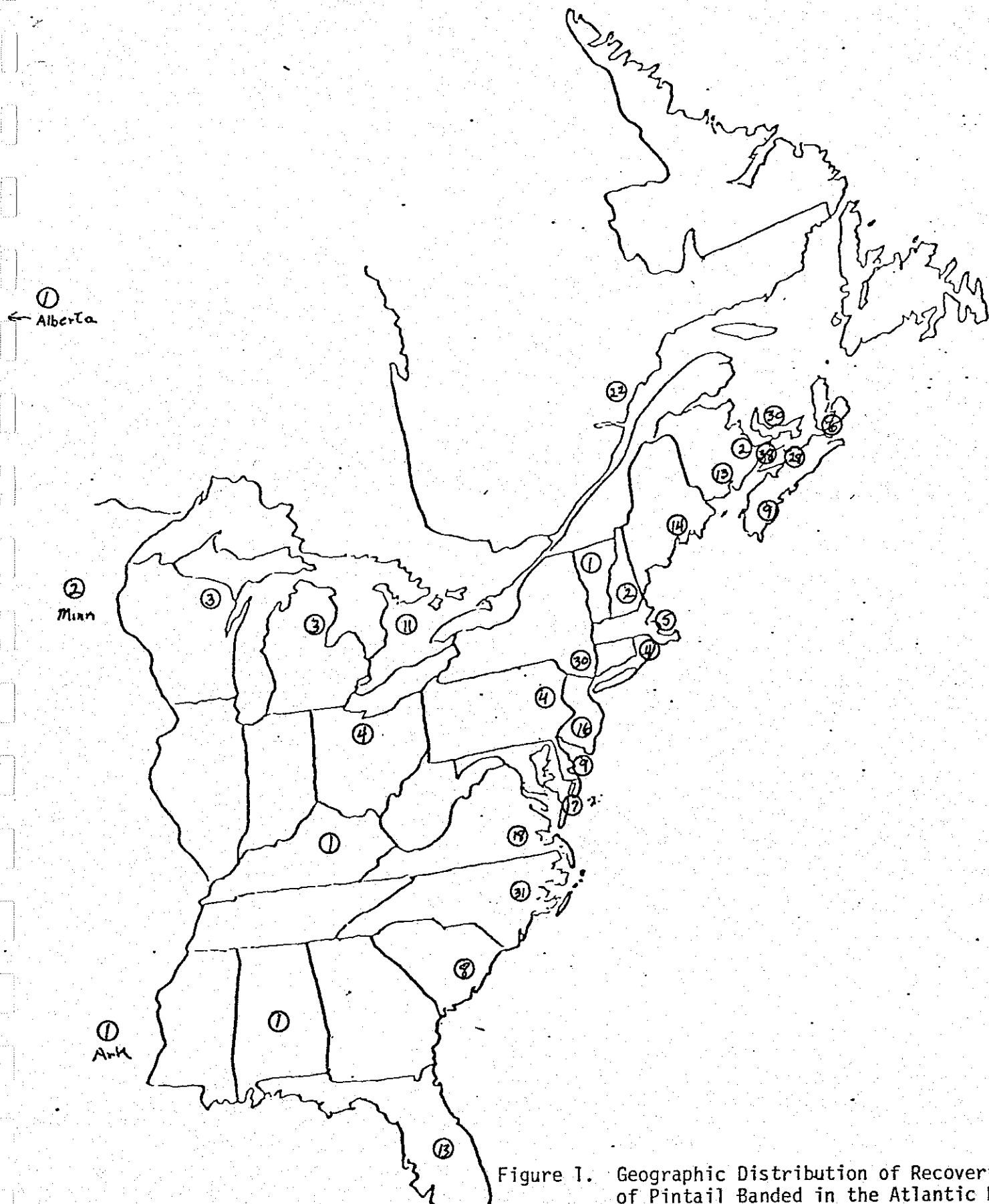
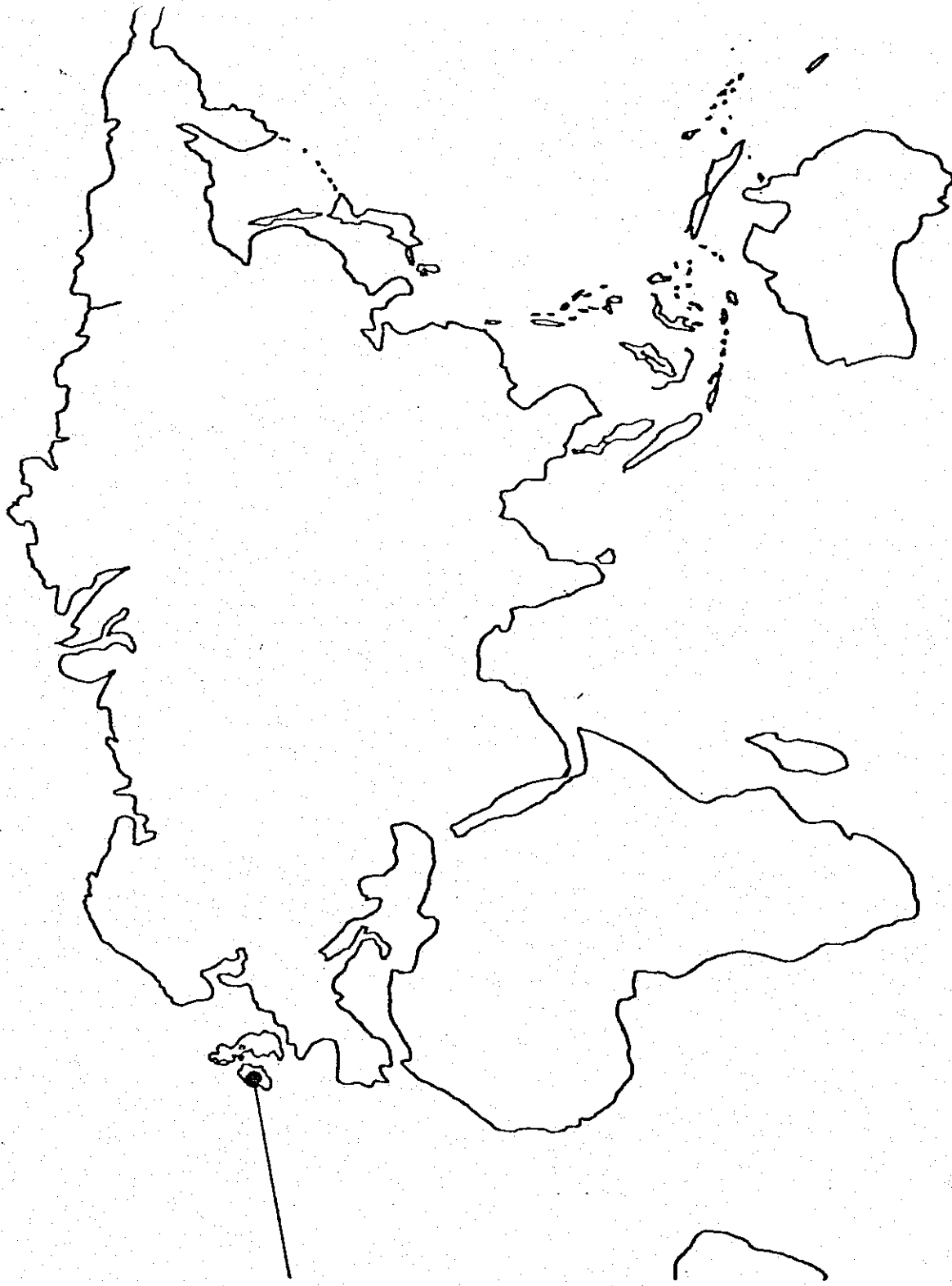


Figure 1. Geographic Distribution of Recoveries of Pintail Banded in the Atlantic Region and Baie Johan Beetz, Quebec.

Table 1. Geographic Distribution of Recoveries of Pintail Banded in the Atlantic Region and Baie Johan Beetz, Quebec.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	169	48.4	23.3
Prince Edward Island	30	8.6	3.4
NB-NS Border	38	10.9	8.3
St. John River	13	3.7	2.0
SE New Brunswick	2	0.6	0.3
NE New Brunswick	9	2.6	0.9
NW Nova Scotia	28	8.0	5.2
NE Nova Scotia	6	1.7	0.6
S. Nova Scotia	9	2.6	0.0
Ontario	11	3.2	0.0
Quebec	22	6.3	2.3
Alberta	1	0.3	0.3
USA Total	180	51.6	2.9
Maine	14	4.0	1.7
Massachusetts	5	1.4	0.0
New Hampshire	2	0.6	0.0
Vermont	1	0.3	0.0
Rhode Island	4	1.1	0.0
New York	30	8.6	0.3
New Jersey	16	4.6	0.0
Delaware	9	2.6	0.3
Maryland	7	2.0	0.0
Virginia	18	5.2	0.0
North Carolina	31	8.9	0.0
South Carolina	8	2.3	0.0
Florida	13	3.7	0.0
Pennsylvania	4	1.1	0.0
Minnesota	2	0.6	0.0
Michigan	3	0.9	0.0
Wisconsin	3	0.9	0.3
Ohio	4	1.1	0.0
Tennessee	1	0.3	0.3
Alabama	1	0.3	
Arkansas	1	0.3	
Foreign Total	3	0.9	
Bahama Islands	1	0.3	
Jamaica	1	0.3	
Europe	1	0.3	
Grand Total	349		



of Pintail Banded in the Atlantic Region and Baie Johan Beetz, Quebec.

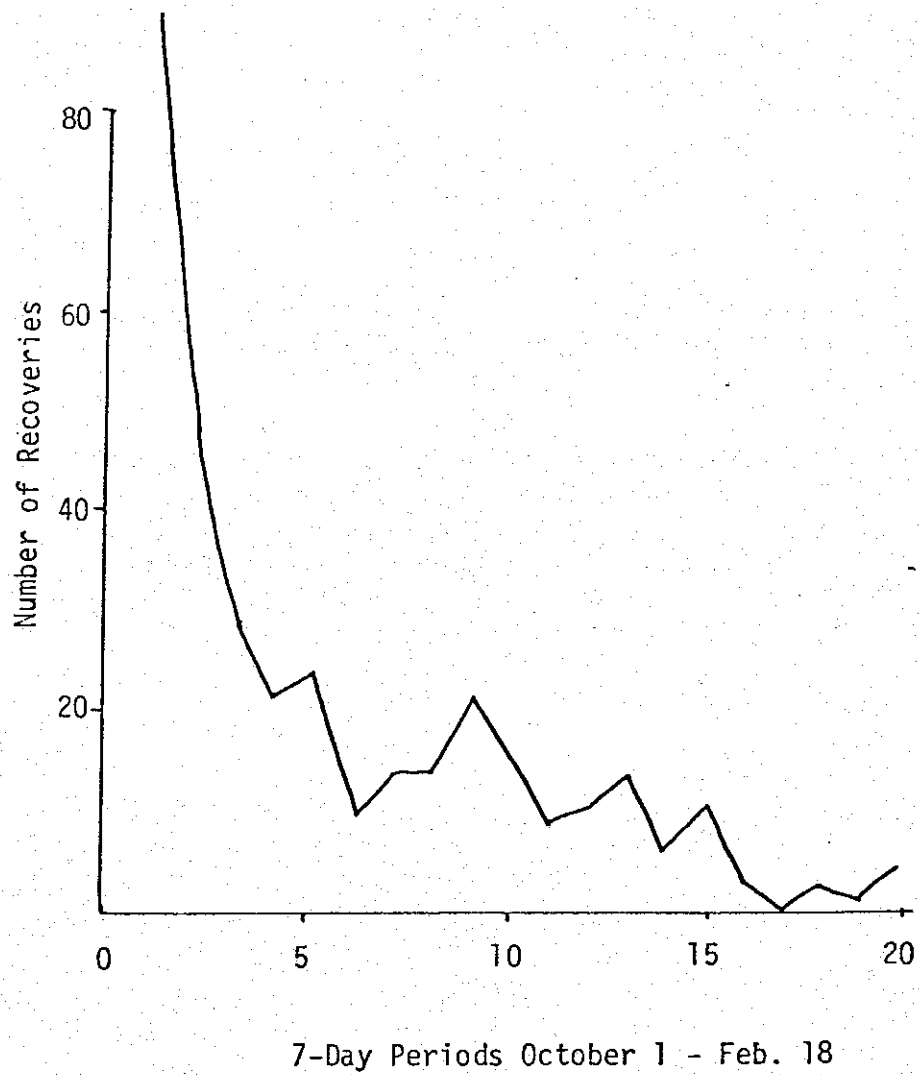


Figure 3. Temporal Distribution of Recoveries of Pintail Banded in the Atlantic Region and Baie Johan Beetz, Quebec.

Table 2. Geographic Recoveries of Local Male and Female Pintail Banded on Prince Edward Island.

Recovery Location	Number of Recoveries		% of Total Recoveries		% Recoveries 1st week	
	Male	Female	Male	Female	Male	Female
Canada Total	5	9	45.5	50.0		
P.E.I.	4	5	36.4	27.7	27.3	11.1
NW Nova Scotia	1		9.1			
S. Nova Scotia		1		5.6		
Ontario		1		5.6		
Quebec		2		11.1		5.6
USA Total	6	8	54.5	44.4		
Maine	0	1		5.6		
New York	1	2	9.1	11.1		
New Jersey	0	2		11.1		
Virginia	2		18.1			
North Carolina	3	2	27.3	11.1		
Florida		1		5.6		
Foreign Total	0	1		5.6		
Europe		1		5.6		
Grand Total	11	18				

New Brunswick-Nova Scotia Border

A total of 169 pintail banded in the New Brunswick-Nova Scotia border area have been recovered including seven adults, 121 hatching year and 41 locals. Adult recoveries were reported from the New Brunswick-Nova Scotia border region and northwestern Nova Scotia during the first week of October while in the USA recoveries were reported later in the season from Massachusetts, New Jersey and North Carolina. ~~Most~~ Most recoveries ~~(121)~~ were of birds banded as hatching year ~~and~~ were distributed as shown in Figures 4 and 5. ~~As shown,~~ a larger percentage of the female recoveries were from Canada than males although temporally the distribution was ~~closely~~ similar. Forty-one recoveries of birds banded as locals were examined. Again, Canadian

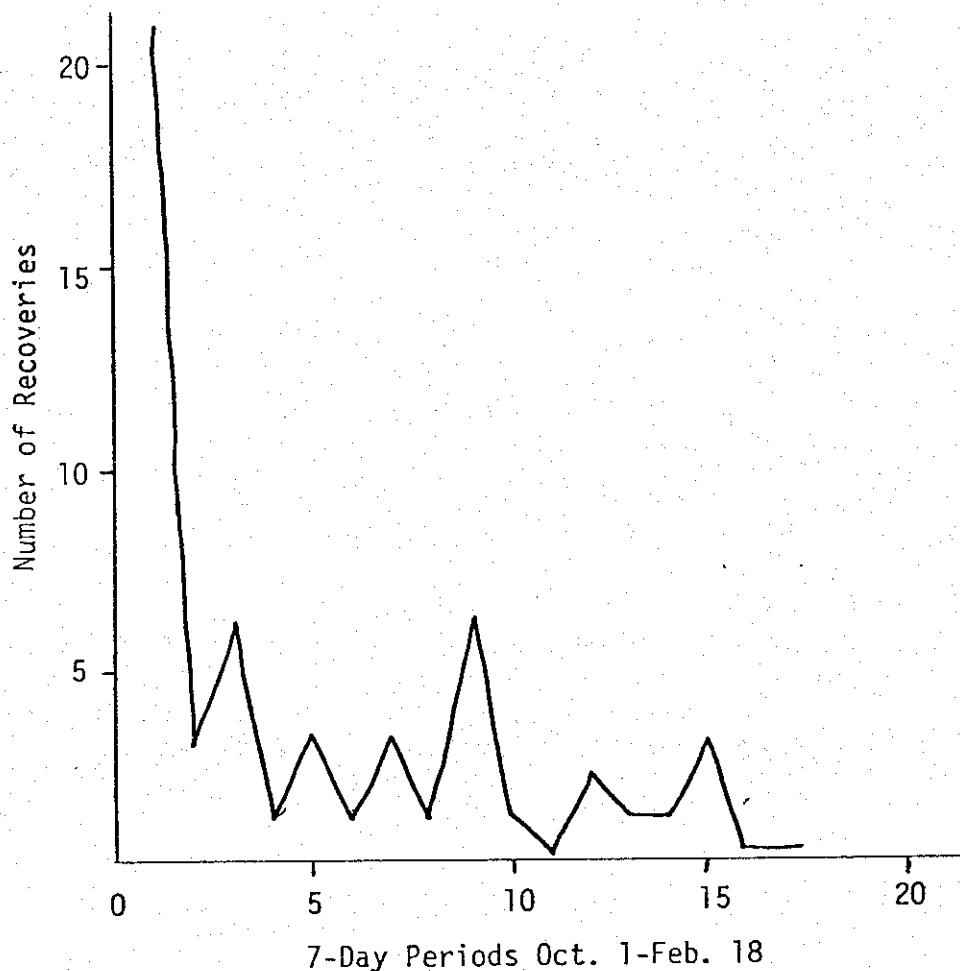


Figure 4 . Temporal and Geographic Distribution of Recoveries of Hatching Year Male Pintail Banded in the New Brunswick-Nova Scotia Border Area.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	26	49.06	37.74
P.E.I.	5	9.43	5.66
NB-NS Border	6	11.32	7.55
St. John River			
Other New Brunswick	2	3.77	3.77
Southern Nova Scotia	1	1.89	
Other Nova Scotia	9	16.98	15.09
Other Canadian	3	5.66	5.66
USA Total	27	50.94	1.89
Maine	3	5.66	1.89
Massachusetts	1	1.89	
Other New England			
New Jersey	5	9.43	
New York	4	7.55	
North Carolina	4	7.55	
South Carolina			
Florida			
Other USA	10	18.87	
Total	53		

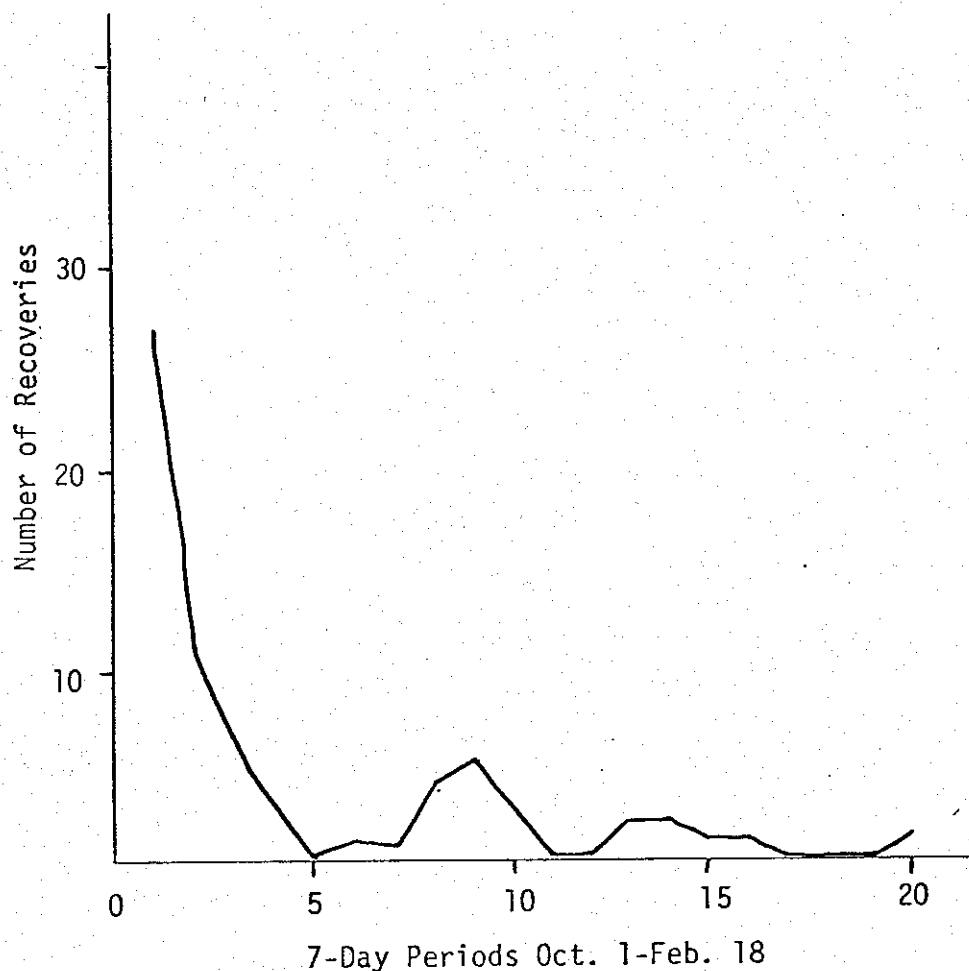


Figure 5. Temporal and Geographic Distribution of Recoveries of Hatching Year Female Pintail Banded in the New Brunswick-Nova Scotia Border Area

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	45	66.18	38.24
Prince Edward Island	9	13.24	2.94
NB-NS Border	18	26.47	22.06
St. John River			
Other New Brunswick			
Southern Nova Scotia	2	2.94	11.76
Other Nova Scotia	11	16.18	
Other Canadian	5	7.35	1.47
USA Total	23	33.82	1.47
Maine	2	2.94	1.47
Massachusetts			
Other New England	1	1.47	
New Jersey	3	4.41	
New York	2	2.94	
North Carolina	6	8.82	
South Carolina	1	1.47	
Florida	3	4.41	
Other USA	5	7.35	
Total	68		

recoveries ran heavy to females; however, unlike hatching year birds, female locals were also much more heavily harvested during the first week of October. Table 3 and Figure 6 show the temporal and geographic distribution of local age pintail recoveries.

Table 3. Geographic Distribution of Recoveries of Local Age Male and Female Pintail Banded in the New Brunswick-Nova Scotia Border Area.

Recovery Location	Number of Recoveries		% of Total Recoveries		% Recoveries 1st week	
	Male	Female	Male	Female	Male	Female
Canada Total	6	16	40.0	61.5	6.7	46.1
NB-NS Border	3	11	20.0	42.3	6.7	34.6
NW Nova Scotia		3		11.5		7.7
NE Nova Scotia	1		6.7			
S. Nova Scotia	1	1	6.7	3.8		
Ontario	1		6.6			
Quebec		1		3.8		3.8
USA Total	9	10	60.0	38.5	13.4	
New Hampshire		1		3.8		
Rhode Island		1		3.8		
New York	2	1	13.3	3.8	6.7	
New Jersey		2		7.7		
Delaware		1		3.8		
Virginia	2	1	13.3	3.8		
North Carolina	3		20.0			
South Carolina		1		3.8		
Florida	1		6.7			
Tennessee		1		3.8	6.7	
Michigan	1		6.7			
Arkansas		1		3.8		
Grand Total	15	26				

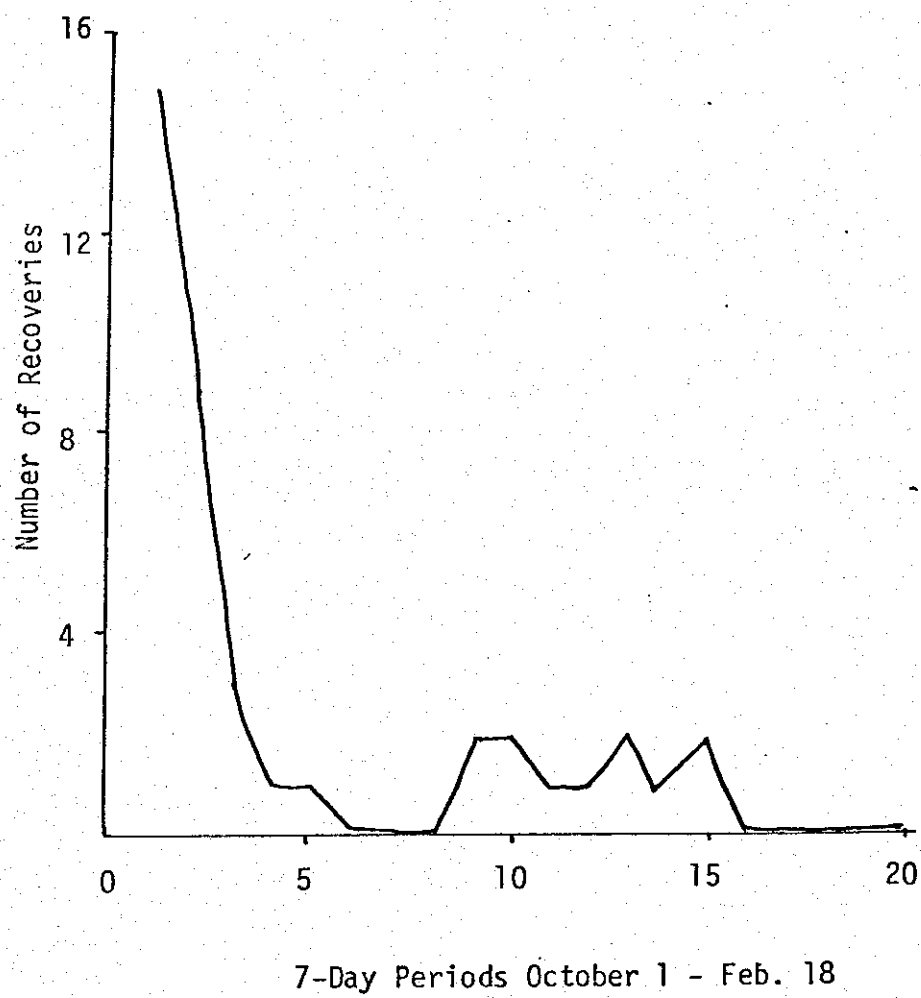


Figure 6. Temporal Distribution of Recoveries of Local Age Pintail Banded in the New Brunswick-Nova Scotia Border Area.

St. John River

In total only 23 recoveries of pintail banded in the St. John River have been reported. Those included ¹⁰one adult, 9 hatching year and ¹²13 locals. *see table*
The temporal distribution ^{was} is similar to recoveries from the border area and the geographical distribution is shown in Table 4.

Table 4. Geographic Distribution of Pintail Banded in the St. John River.

Recovery Location	Number of Recoveries			% of Total Recoveries			% Recoveries 1st week		
	Ad	Hy	L	Ad	Hy	L	Ad	Hy	L
Canada Total	1	4	6	100.0	40.0	50.0	100.0	50.0	16.7
St. John River	1	4	5	100.0	40.0	41.7	100.0	40.0	16.7
NW Nova Scotia			1			8.3		10.0	
USA Total		6	6	0.0	60.0	50.0			8.3
Maine		1			10.0				8.3
Massachusetts		1			10.0				
New Jersey		2			20.0				
New York			2			16.7			
Maryland		1			10.0				
Virginia		1			10.0				
North Carolina									
South Carolina			2			16.7			
Florida			1			8.3			
Wisconsin			1			8.3			
Grand Total	1	10	12						

Baie Johan Beetz

Two adults and 127 hatching year recoveries of pintail banded at Baie Johan Beetz, Quebec, were examined. Of the hatching year recoveries, 61 were males and 66 were females. Both the temporal and geographic distribution were closely similar between males and females. In both sexes, most recoveries were from the USA; ~~however, females were more heavily harvested in Canada than males.~~
Figures 7 and 8 show the temporal and geographic distribution of recoveries of hatching year male and female pintail banded at Baie Johan Beetz, Quebec.

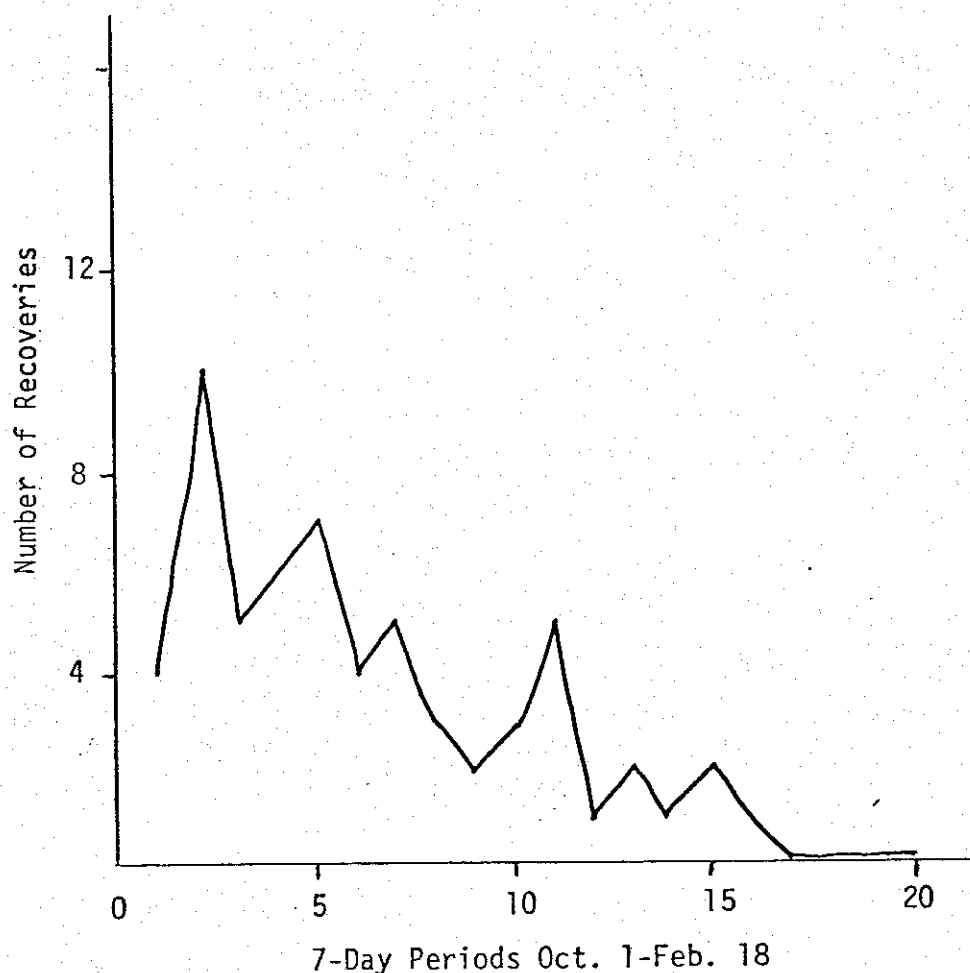


Figure 7. Temporal and Geographic Distribution of Hatching Year Male Pintail Banded at Baie Johan Beetz, Quebec.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	23	37.70	4.92
P.E.I.	3	4.92	1.64
NB-NS Border			
St. John River	1	1.64	
Other N.B.	3	4.92	1.64
Southern Nova Scotia	4	6.56	
Other Canadian = Quebec?	10	16.39	3.29
USA Total	38	62.30	1.64
Maine	4	6.56	1.64
Massachusetts	1	1.64	
Other New England	1	1.64	
New Jersey	1	1.64	
New York	8	13.11	
North Carolina	1	1.64	
South Carolina	3	4.92	
Florida	6	9.84	
Other USA	13	21.31	
Total	61		

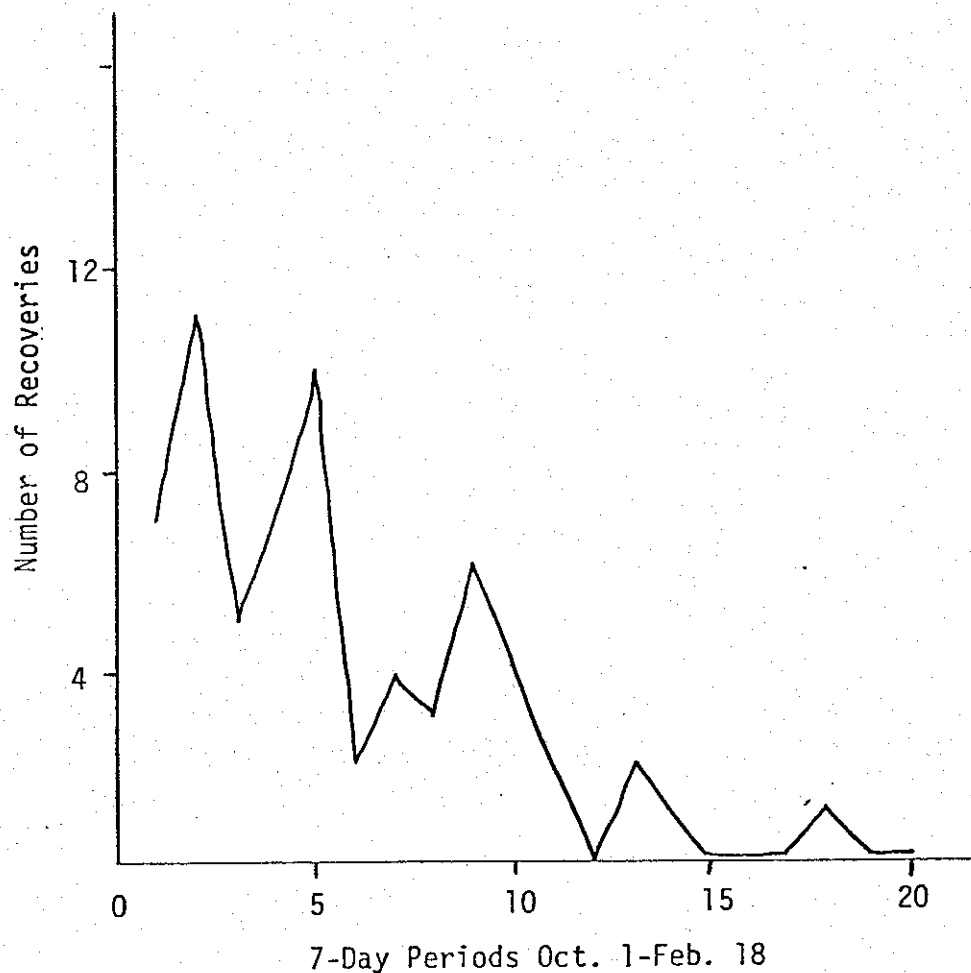


Figure 8. Temporal and Geographic Distribution of Recoveries of Hatching Year Female Pintail Banded at Baie Johan Beetz, Quebec.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	28	42.42	7.58
P.E.I.	4	6.06	3.03
NB-NS Border			
St. John River	3	4.54	1.52
Other New Brunswick	6	9.09	1.52
Southern Nova Scotia	1	1.52	
Other Nova Scotia	3	4.54	
Other Canadian = Quate?	11	16.67	1.52
USA Total	38	57.58	3.03
Maine	2	3.03	1.52
Massachusetts	2	3.03	
Other New England	2	3.03	
New Jersey	1	1.52	
New York	7	10.61	
North Carolina	7	10.61	
South Carolina	1	1.52	
Florida	1	1.52	
Other USA	15	22.73	1.52
Total	66		

Temporal and Geographic Distribution of Recoveries
of Ring-necked Duck Banded in the Atlantic Region
and Baie Johan Beetz, Quebec

Total

A total of 269 recoveries of ring-necked duck banded in the Atlantic Region and at Baie Johan Beetz, Quebec, were examined to determine the temporal and geographic distribution of the harvest. Of the total, 152 were recovered in Canada, 114 in the USA and three in foreign locations. In Canada, most recoveries came from the St. John River (68) followed by the NB-NS border area (24) and Prince Edward Island (15). Only 19 Canadian recoveries were from locations outside of the Atlantic Region. Virginia, North Carolina, South Carolina and Florida accounted for most of the USA recoveries. Foreign recoveries were reported from the Dominican Republic and Europe (Table 1). The major migration route from the Region ^{was} ~~is~~ southwest along the Atlantic Coast to Florida. Some westward movement of birds to Minnesota, Ontario and Quebec ^{was} ~~is attributed~~ primarily ^{of} ~~to~~ birds banded at Baie Johan Beetz (Figures 1 and 2). Temporally the period of highest kill occurs ^{red} ~~occurs~~ during the first two weeks of October in Canada. The Foreign and USA kill occurs ^{red} ~~occurs~~ at a lower level throughout November, December and January (Figure 3). On the basis of age, ~~it was found that~~ 50.8% of the hatching year; 60.6% of the adults and 61.2% of the locals ^{were} ~~are~~ harvested in Canada (Table 2). By sex, females appeared to be more heavily harvested in Canada than were males. The Border Area and the St. John River accounted for most of the greater kill of females (Table 3).

Table 1 Geographic Distribution of Recoveries of Ring-billed Duck Banded in the Atlantic Region and Baie d'An Beetz, Quebec.

Recovery Location	Total for All Stations			P.E.I.			NB-NS			St. John R.			Cape Breton			Baie Johan Beetz		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Canada Total	152	56.5	39.0	22	62.9	42.9	56	56.6	40.4	31	79.5	71.8	34	54.0	33.3	9	30.0	3.3
P.E.I.	15	5.6	4.8	12	34.3	28.6	1	1.0					2	3.2	3.0			
NB-NS border	24	8.9	12.3				22	22.2	19.2	1	2.6	2.6				1	3.3	
St. John R.	68	25.3	17.5	5	14.3	11.4	20	20.2	17.2	26	66.7	64.1	14	22.2	20.6	3	10.0	3.3
SE N.B.	1	0.4											1	1.6				
NE N.B.	1	0.4	0.4										1	1.6	1.6			
Other N.B.	4	1.5	1.5	1	2.9	2.9	2	2.0	2.0	2	5.1	5.1						
NW N.S.	6	2.2	0.7				1	1.0					4	6.3	3.2			
NE N.S.	8	3.0	0.7	1	2.9								6	9.5	3.2	1	3.3	
S. N.S.	5	1.8	0.4	1	2.9		2	2.0					2	3.2	1.6			
Ontario	7	2.6	0.4				6	6.1	1.0				1	1.6				
Quebec	12	4.5		2	5.7		2	2.0		2	5.1		3	4.8		3	10.0	
Nfld.	1	0.4																
USA Total	114	42.4	0.4	13	37.1		41	41.4	1.0	7	17.9		32	46.0	1.6	21	70.0	
Maine	8	3.0					3	3.0					2	4.8	1.6	2	6.7	
Massachusetts	3	1.1											1	1.6		1	3.3	
New Hampshire	2	0.7					1	1.0					1	1.6		1	3.3	
Vermont	5	1.8	0.4				3	3.0	1.0				1	1.6		1	3.3	
New York	3	1.1					2	2.0								5	16.7	
New Jersey	1	0.4																
Delaware	1	0.4																
Maryland	6	2.2																
Pennsylvania	1	0.4																
Virginia	17	6.3		3	8.6		6	2.0		2	5.1		1	1.6		1	3.3	
North Carolina	12	4.5		3	8.6		3	8.1		1	2.6		3	4.8		2	6.7	
South Carolina	15	5.6		1	2.9		7	2.0		3	7.7		4	6.3				
Georgia	3	1.1		2	5.7													
Florida	33	12.3		4	11.4		13	13.1		1	2.6		1	1.5		6	20.0	
Alabama	1	0.4					1	1.0										
Louisiana	2	0.7					1	1.0										
Minnesota	1	0.4					1	1.0										
Foreign Total	3	1.1		0			2	2.0		1	2.6							
Dom. Rep.	2	0.7					1	1.0		1	2.6							
Europe	1	0.4					1	1.0										
Grand Total	269			35			99			39						63		30

A = Total Recoveries B = % of Total Recoveries C = % Recovered 1st wk October

Total Differ from Fig. 1

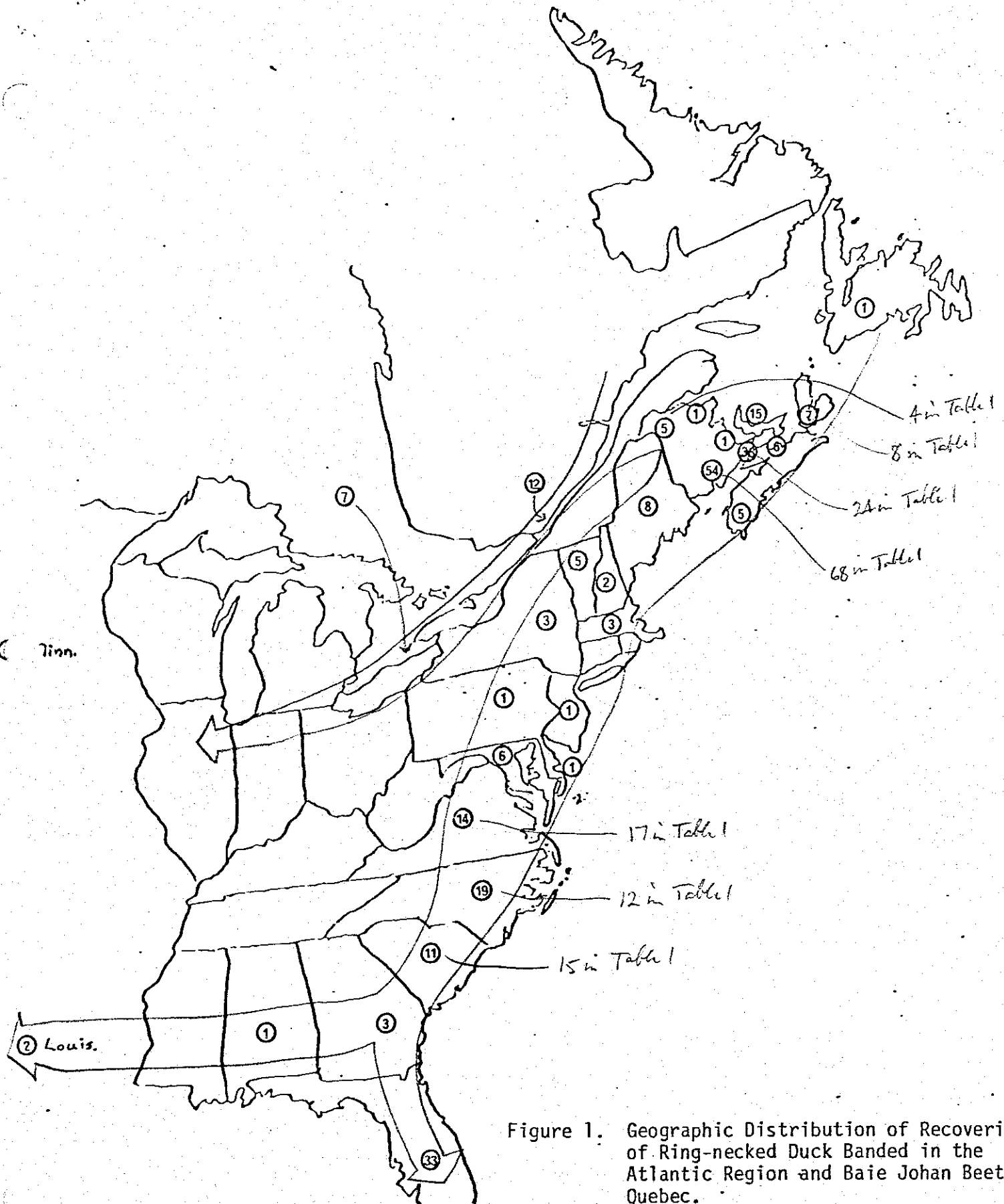


Figure 1. Geographic Distribution of Recoveries of Ring-necked Duck Banded in the Atlantic Region and Baie Johan Beetz, Quebec.

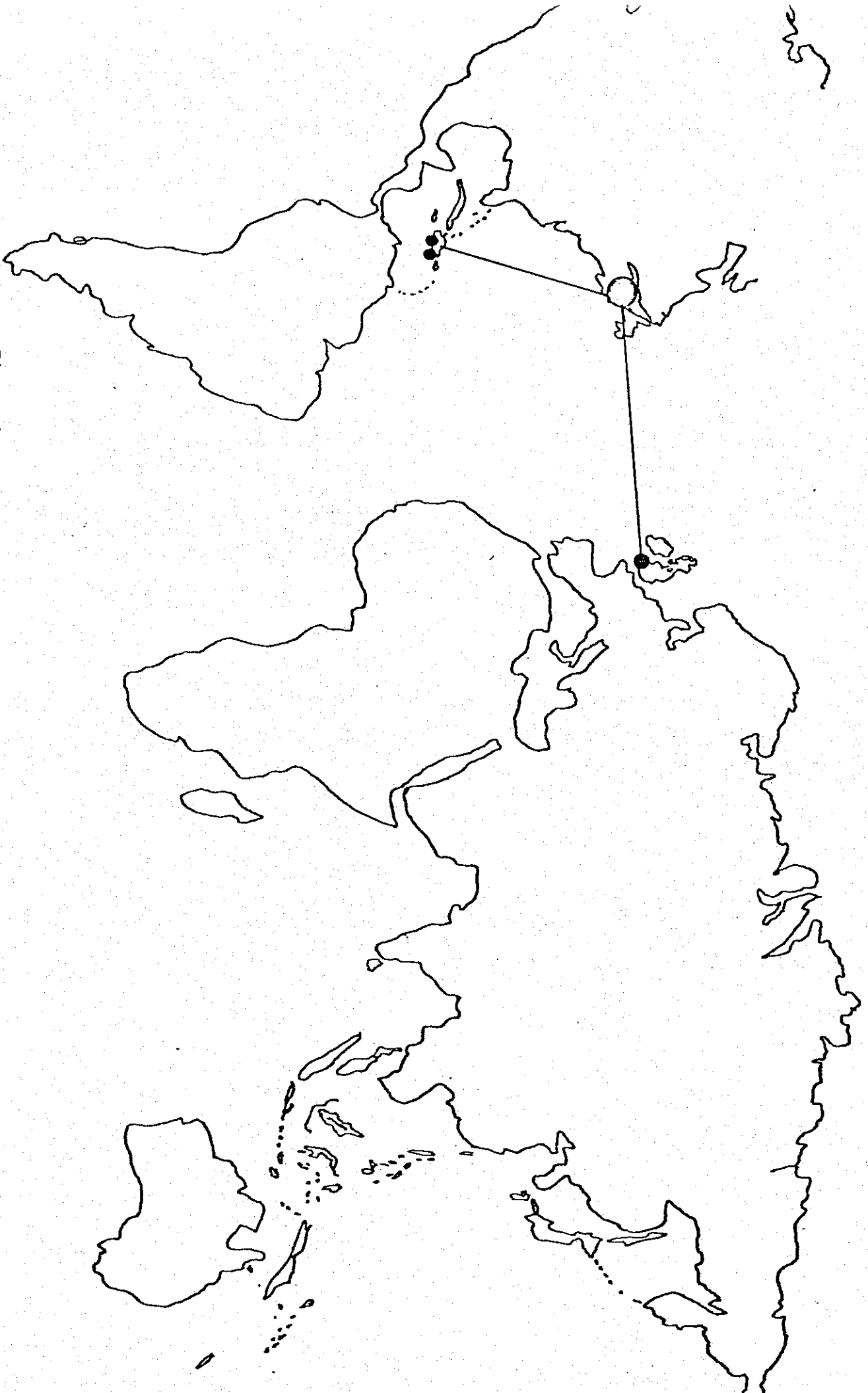
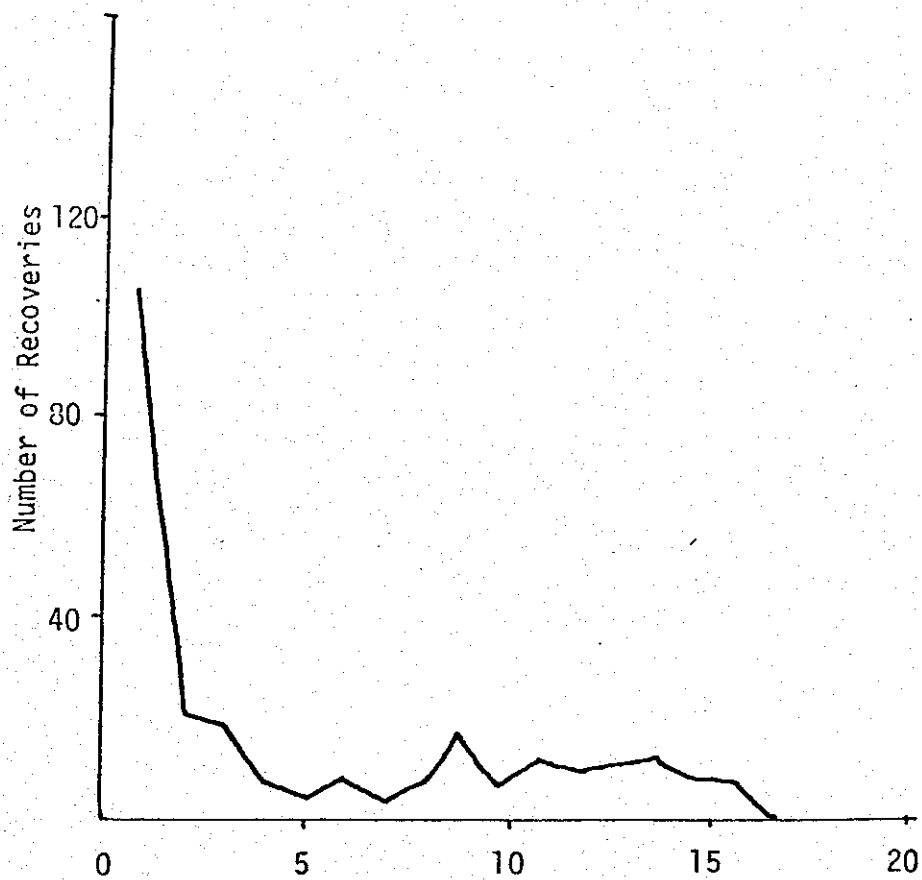


Figure 2. Foreign Recoveries of Ring-necked Duck Banded in the Atlantic Region and Baie Johan Beetz, Quebec.



7-Day Periods October 1 - Feb. 18

Figure 3. Temporal Distribution of Recoveries of Ring-necked Duck Banded in the Atlantic Region and Baie Johan Beetz, Quebec.

Table 2. Geographic Distribution of Recoveries of Ring-necked Duck Banded in the Atlantic Region and Baie Johan Beetz, Quebec by Age Class

Recovery Location	Total of All Recoveries						Prince Edward Island						NB-NS Border					
	Ad	Tot	%	HY	Tot	%	L	Tot	%	Ad	Tot	%	HY	Tot	%	L	Tot	%
Canada Total ✓	20	60.6		61	50.8		71	61.2		3	75.0		4	36.4		15	75.0	
P.E.I.	1	3.0		2	1.7		12	10.3		1	25.0		1	9.1		10	50.0	
NB-NS	1	3.0		12	10.0		11	9.5										
St. John River	8	24.3		30	25.0		30	25.9					2	18.2		3	15.0	
Other N.B.				3	2.5		3	2.6								1	5.0	
NE Nova Scotia	5	15.1		3	2.5					1	25.0							
NW Nova Scotia										1	25.0							
S. Nova Scotia	2	6.1					3	2.6		1	25.0							
Other Canadian	3	9.1		9	7.5		8	6.9					1	9.1		1	5.0	
USA Total ✓	13	39.4		57	47.5		44	37.9		1	25.0		7	63.6		5	25.0	
New England	1	3.0		9	7.5		8	6.9										
Maryland				5	4.2		1	0.9										
Virginia				7	5.8		10	8.6					2	18.2		1	5.0	
North Carolina	2	6.1		7	5.8		3	2.6					2	18.2		1	5.0	
South Carolina				6	5.0		9	7.7								1	5.0	
Florida	6	18.2		17	14.2		10	8.6					2	18.2		2	10.0	
Other USA	4	12.4		6	5.0		3	2.6		1	25.0		1	9.1				
Foreign Total ✓				2	1.7		1	0.9										
Grand Total ✓	33			120			116			✓ 4			11			20		
										6			45			48		

Table 2. (cont'd.)

Recovery Location	St. John River					Cape Breton					Baie Johan Beetz				
	Ad	Tot	HY	% Tot	L	Ad	Tot	HY	% Tot	L	Ad	Tot	HY	% Tot	L
Canada Total	4	80.0	7	100.0	20	8	57.1	16	48.5	10	2	50.0	6	25.0	1
P.E.I.															
NB-NS															
St. John River	4	80.0	5	71.4	17	2	14.3	9	27.3	3			1	4.2	
Other N.B.			1	14.3	1								3	12.5	
NW Nova Scotia						4	28.6	2	6.1	3			1	4.2	
NE Nova Scotia						1	7.1								
S. Nova Scotia			1	14.3	1	1	7.1	2	6.1	1			1	4.2	1
Other Canadian															
USA Total	1	20.0			6	6	42.8	17	51.5	9	2	50.0	18	75.0	1
New England						1	7.1	5	15.2	1			3	12.5	1
Maryland													5	20.8	
Virginia					2			2	6.1	3			1	4.2	
North Carolina					1			3	9.1				1	4.2	
South Carolina					3			1	3.0	3	1	25.0	1	4.2	
Florida								5	15.2				6	25.0	
Other USA	1	20.0				4	28.6	1	3.0	1	1	25.0	2	8.3	
Foreign Total					1	1	7.1								
Grand Total	5		7		27	14		33		19	4		24		2

Table 3. Geographic Distribution of Recoveries of Male and Female Ring-necked Duck Banded in the Atlantic Region and Baie Johan Beetz, Quebec.

Recovery Location	Total All Recoveries			Prince Edward Island			New Brunswick-Nova Scotia			
	Male	% Tot	Female	% Tot	Male	% Tot	Female	% Tot		
Canada Total	✓ 60	43.4	92	63.4	11	55.0	23	52.3	33	60.0
Prince Edward Island	5	4.0	10	6.9	4	20.0			1	1.8
NB-NS Border	7	5.6	18	12.4			7	15.9	16	29.1
St. John River	23	18.5	46	31.7	2	10.0	9	20.4	11	20.0
Other New Brunswick	4	3.2	2	1.4	1	5.0	1	2.3	1	1.8
NW Nova Scotia			1	0.7						
NE Nova Scotia	5	4.0	7	4.8	1	5.0				
S. Nova Scotia	4	3.2	1	0.7	1	5.0	1	2.3	1	1.8
Other Canadian	11	8.9	7	4.8	2	10.0	5	11.4	3	5.4
USA Total	✓ 63	50.8	51	35.2	9	45.0	20	45.5	21	38.2
New England	7	5.6	11	7.6			2	4.5	5	9.1
Maryland	4	3.2	1	0.7						
Virginia	11	8.9	6	4.1	2	10.0	5	11.4	1	1.8
North Carolina	7	5.6	6	4.1	3	15.0			3	5.4
South Carolina	9	7.2	5	3.4	1	5.0	4	9.1	3	5.4
Florida	17	13.7	16	11.0	2	10.0	7	15.9	6	10.9
Other USA	8	6.4	6	4.1	1	5.0	2	4.5	3	5.4
Foreign Total	✓ 1	0.8	2	1.4	0		1	2.3	1	1.8
Grand Total	✓ 124		145		✓ 20		✓ 44		55	

(continued)

Table 3. (cont'd.)

Recovery Location	St. John River			Cape Breton			Baie Johan Beetz			
	Male	% Tot	Female	% Tot	Male	% Tot	Male	% Tot	Female	% Tot
Canada Total	9	75.0	22	81.5	16	50.0	1	6.3	8	57.1
Prince Edward Island										
NB-NS			1	3.7	1	3.1			1	7.1
St. John River	7	58.3	19	70.4	4	12.5	1	6.3	2	14.3
Other New Brunswick	1	8.3	1	3.7	1	3.1				
NW Nova Scotia					5	15.6			1	7.1
NE Nova Scotia					2	6.2			1	7.1
S. Nova Scotia					3	9.4				
Other Canadian	1	8.3	1	3.7					3	21.4
USA Total	3	25.0	4	14.8	16	50.0	15	93.7	6	42.8
New England					3	9.4	2	12.5	2	14.3
Maryland							4	25.0	1	7.1
Virginia	1	8.3	1	3.7	2	6.2	1	6.3		
North Carolina			1	3.7	2	6.2	2	12.5		
South Carolina	2	16.7	1	3.7	2	6.2				
Florida			1	3.7	4	12.5	4	25.0	2	14.3
Other USA	0		0		3	9.4	2	12.5	1	7.1
Foreign Total	0		1	3.7	0		0		0	
Grand Total	✓ 12		27		✓ 32		✓ 16		14	

Prince Edward Island

Thirty-five recoveries from Prince Edward Island showed that 34.3% were taken on P.E.I. and 28.6% from other Canadian locations. All of the 13 USA recoveries were taken from Virginia south ~~with no foreign recoveries being reported~~ (Table 1 and Figure 4). Temporally, 42.9% of all recoveries were taken during the first week of October in Canada (Figure 5). One-half of the birds banded as locals were recovered on Prince Edward Island with an additional 25% coming from other Canadian locations. On the other hand most hatching year recoveries (63.6%) were from the USA particularly the Carolinas and Florida (Table 2). Female ringnecks were harvested much more heavily in Canada (73.3%) than the USA (5.5%). Prince Edward Island alone accounted for 53.3% of all female recoveries (Table 3).

New Brunswick-Nova Scotia Border

Banding in the border area ^{produced} ~~accounted for~~ more ringneck recoveries (99) than any other banding location. Slightly over half (56.6%) were from Canada; 41.4% from the USA and 2.0% from foreign locations. The St. John River and the border area were the largest Canadian recovery areas while North Carolina and Florida accounted for most USA recoveries. Foreign recoveries were from Great Britain and the Dominican Republic. Table 1 and Figure 6 show the geographic distribution of recoveries of ring-necked duck banded in the NB-NS border area. The temporal distribution ^{was} ~~is~~ closely similar to the overall harvest pattern (Figure 7). A larger percentage of birds banded as hatching year (62.2%) were recovered in Canada than either adults (50%) or locals (52.1%).

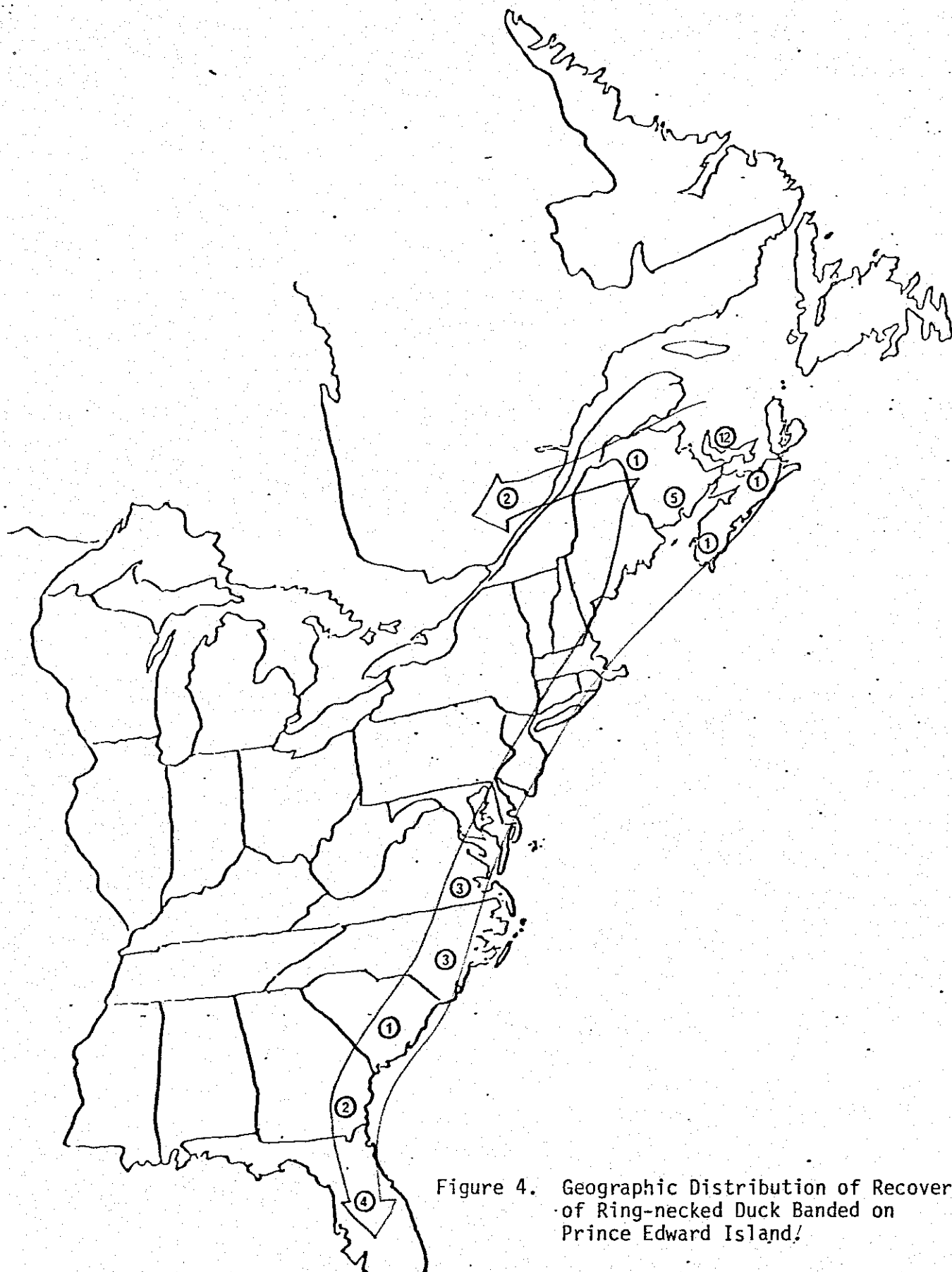


Figure 4. Geographic Distribution of Recoveries of Ring-necked Duck Banded on Prince Edward Island.

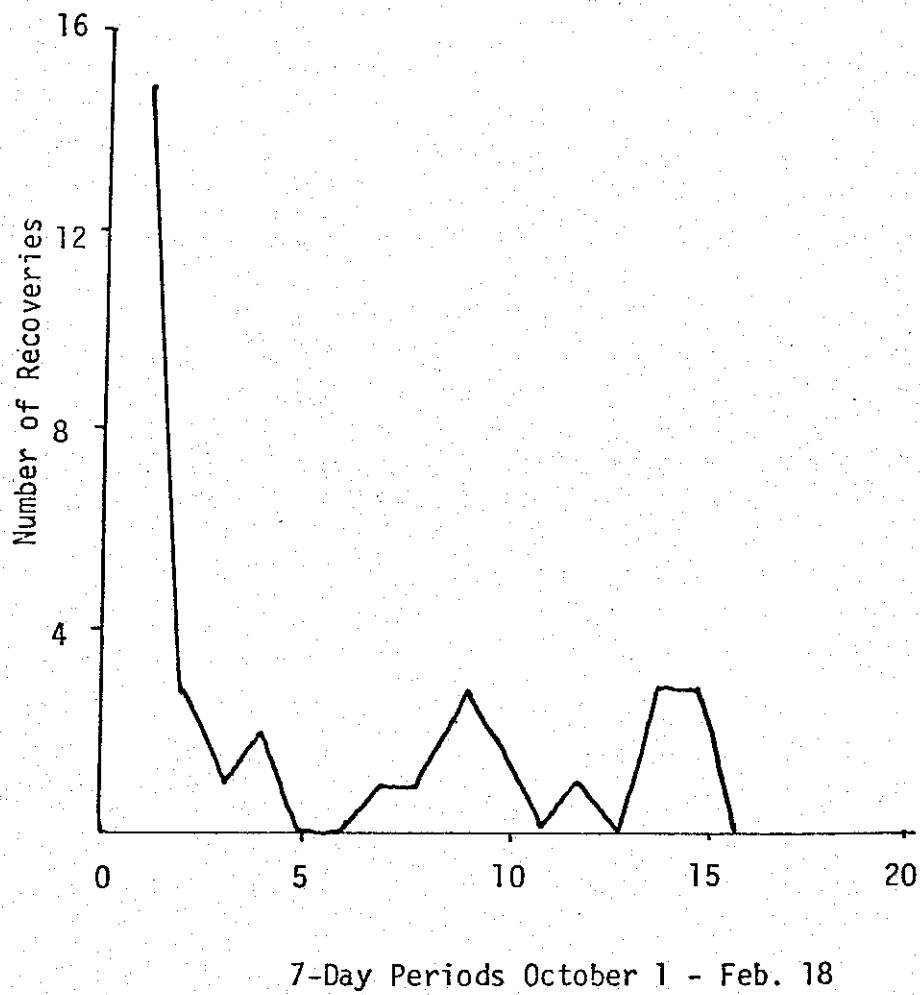


Figure 5. Temporal Distribution of Recoveries of Ring-necked Duck Banded on Prince Edward Island.

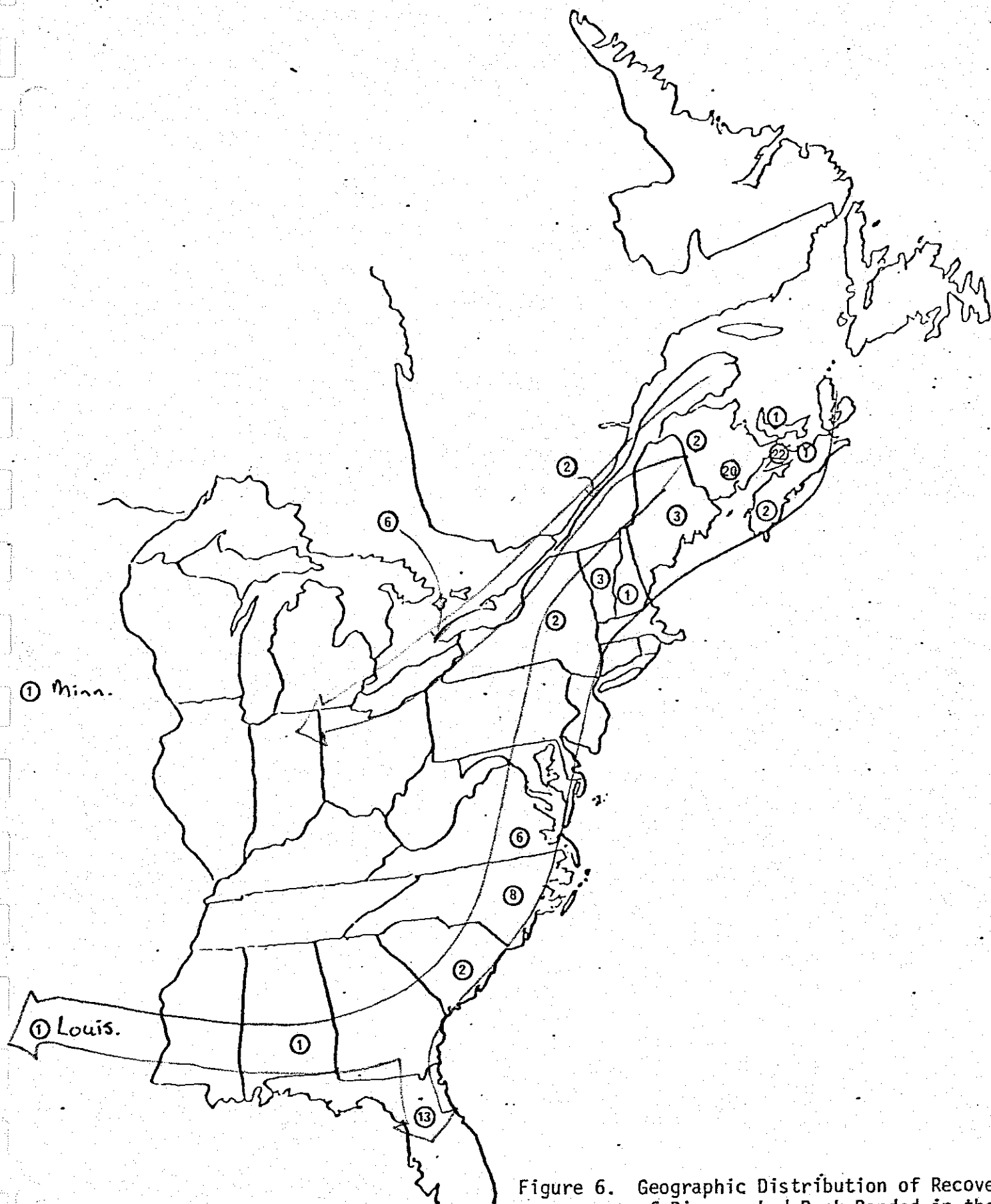


Figure 6. Geographic Distribution of Recoveries of Ring-necked Duck Banded in the New Brunswick-Nova Scotia Border Area.

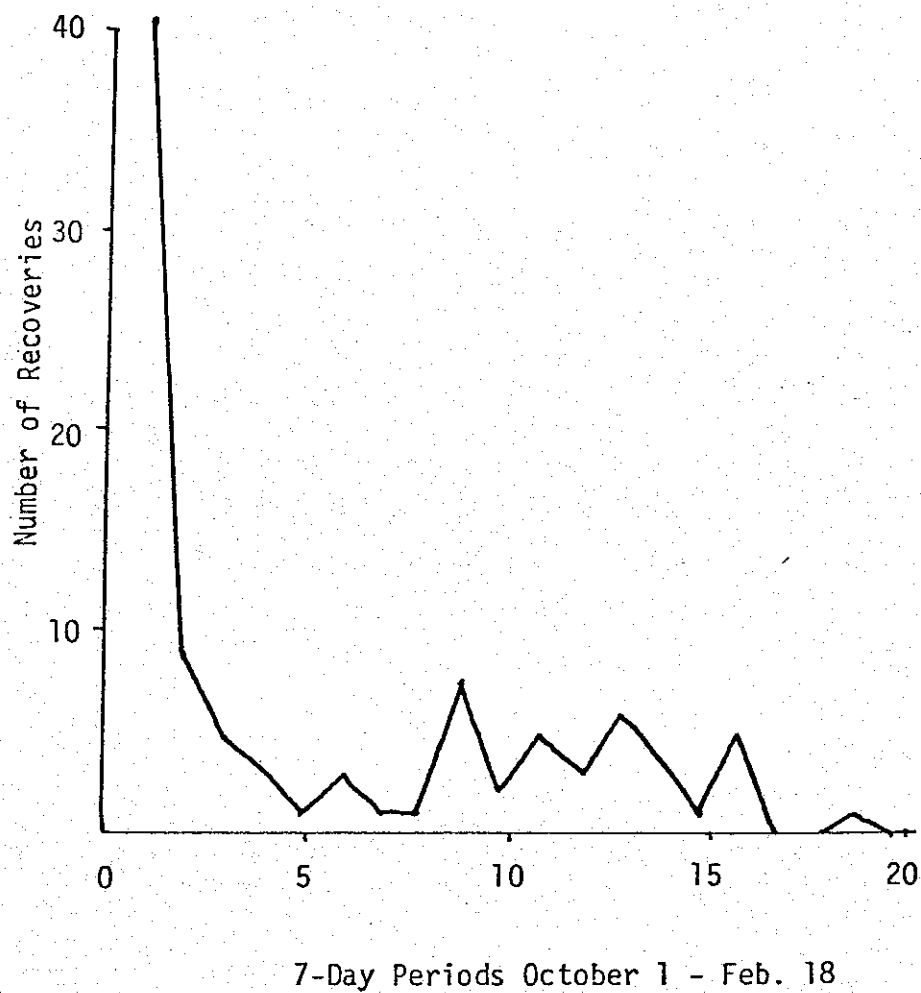


Figure 7. Temporal Distribution of Recoveries of Ring-necked Duck Banded in the New Brunswick-Nova Scotia Border Area.

By sex, the recovery rate of females greatly outnumbered males in Canada while an opposite relationship was found in the USA (Table 3).

St. John River

Ringnecks banded in the St. John River had a higher Canadian recovery rate ^(80%) than any other banding location. ~~Nearly 80% of the birds banded in the St. John River were recovered in Canada with 66.7% coming from the area of banding. Only seven USA and one foreign recovery had been reported from the St. John River~~ ^{bandings} (Table 1 and Figure 8). The kill of ringnecks during the first week of October was also ^{proportionately} higher (71.8%) than for any other banding location. All birds taken during the first week were from Canada (Figure 9). By age class (Table 2) 80% of the adults and all hatching year recoveries were from Canada as well as 74.1% of the locals. High percentages of all age groups were recovered in the St. John River. Females again composed a notably higher percentage of the recoveries than males in Canada while the reverse was true in the USA (Table 3).

Cape Breton

Sixty-six recoveries of ringnecks banded in Cape Breton were examined. The distribution was divided almost equally between the USA and Canada with the largest single recovery area ~~situated~~ in the St. John River. In the USA, Florida was the largest recovery area followed by ^{North} Virginia and South Carolina. A major movement of ringnecks from Cape Breton appears to occur just before or shortly after the opening of the hunting season, following a westerly course through the St. John River and south along the

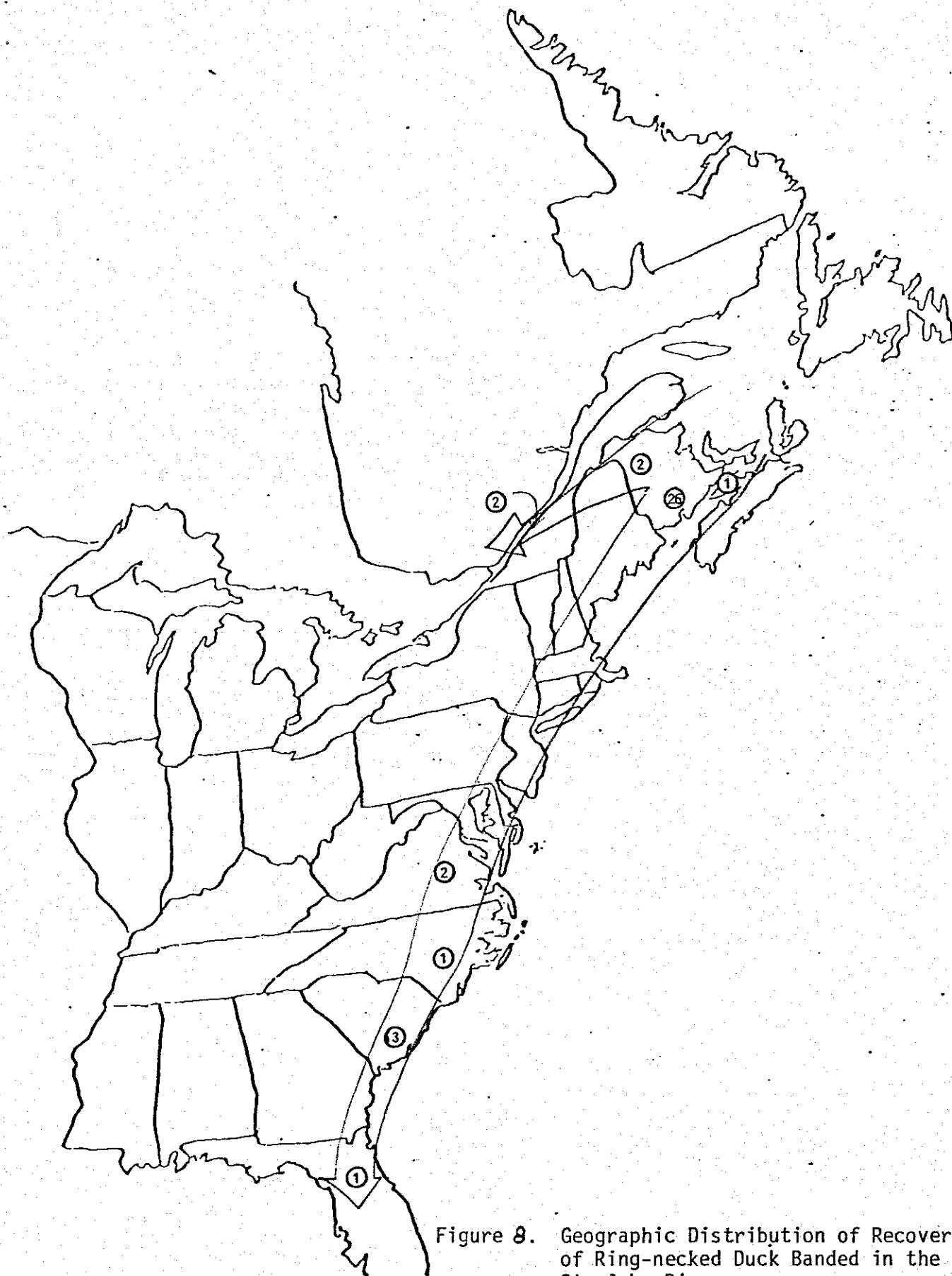
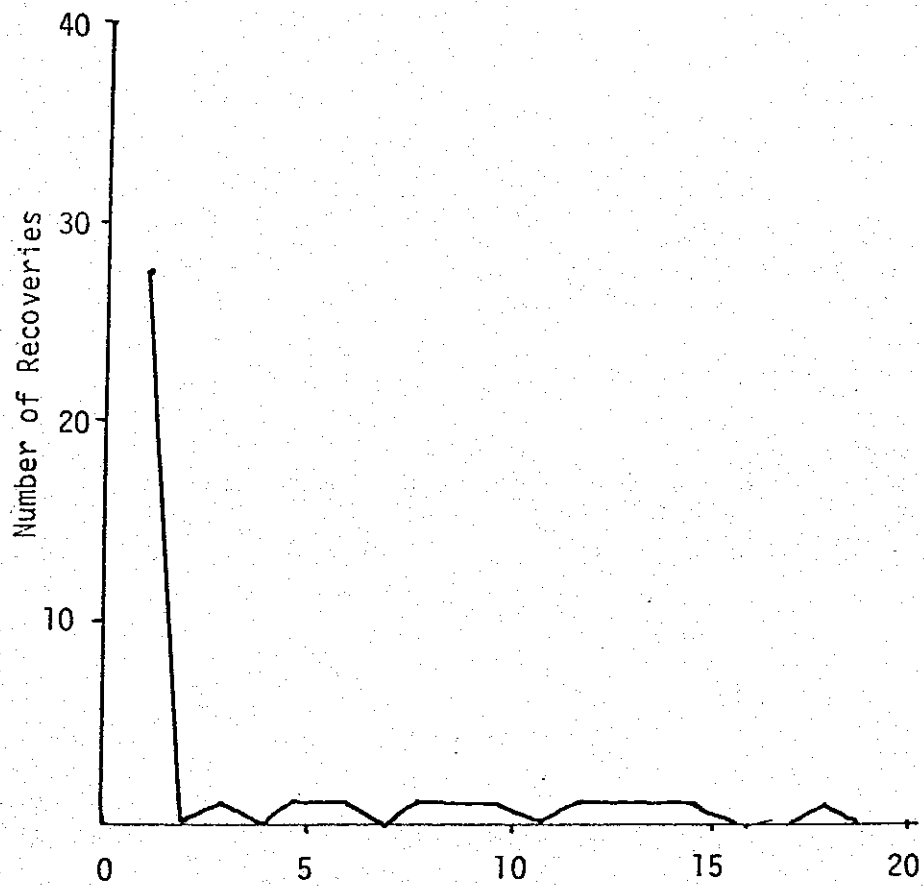


Figure 8. Geographic Distribution of Recoveries of Ring-necked Duck Banded in the St. John River.



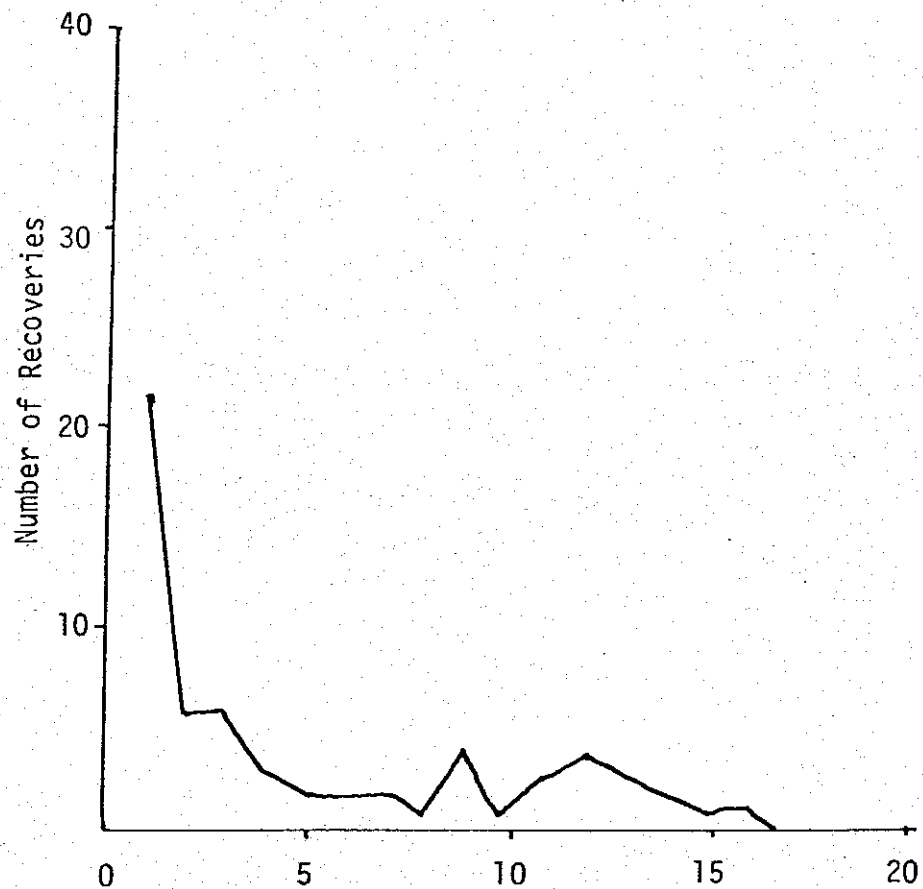
7-Day Periods October 1 - Feb. 18

Figure 9. Temporal Distribution of Recoveries of Ring-necked Duck Banded in the St. John River.

Atlantic Coast (Figure 10). Nearly 20% of recoveries of ringnecks banded in Cape Breton were taken during the first week of October in the St. John River (Table 1 and Figure 11). Distribution by age class followed closely the total distribution both temporally and geographically. Also no significant variation from the total distribution was noted on the basis of sex.

Baie Johan Beetz

Only 30 recoveries of ringnecks banded at Baie Johan Beetz were available for examination. Most recoveries (70%) were from the USA particularly Florida and Maryland. In Canada, Quebec and the St. John River accounted for most of the recoveries (Table 1). Migration as shown in Figure 12 ^{was} ~~is~~ directly south along the Atlantic Coast. Harvest of Baie Johan Beetz ringnecks ^{did} ~~does~~ not become significantly large until late October with equivalent peaks occurring in December and January (Figure 13). Twenty-four out of 30 recoveries were from birds banded as hatching year. Very few adults and even fewer locals have been banded in that area. The total recoveries were split nearly 50-50 between males and females; however, nearly 94% of the males were recovered in the USA while less than 50% of the females were recovered south of the border (Table 3). Florida was again the largest USA recovery area.



7-Day Periods October 1 - Feb. 18

Figure 11. Temporal Distribution of Recoveries of Ring-necked Duck Banded in Cape Breton.

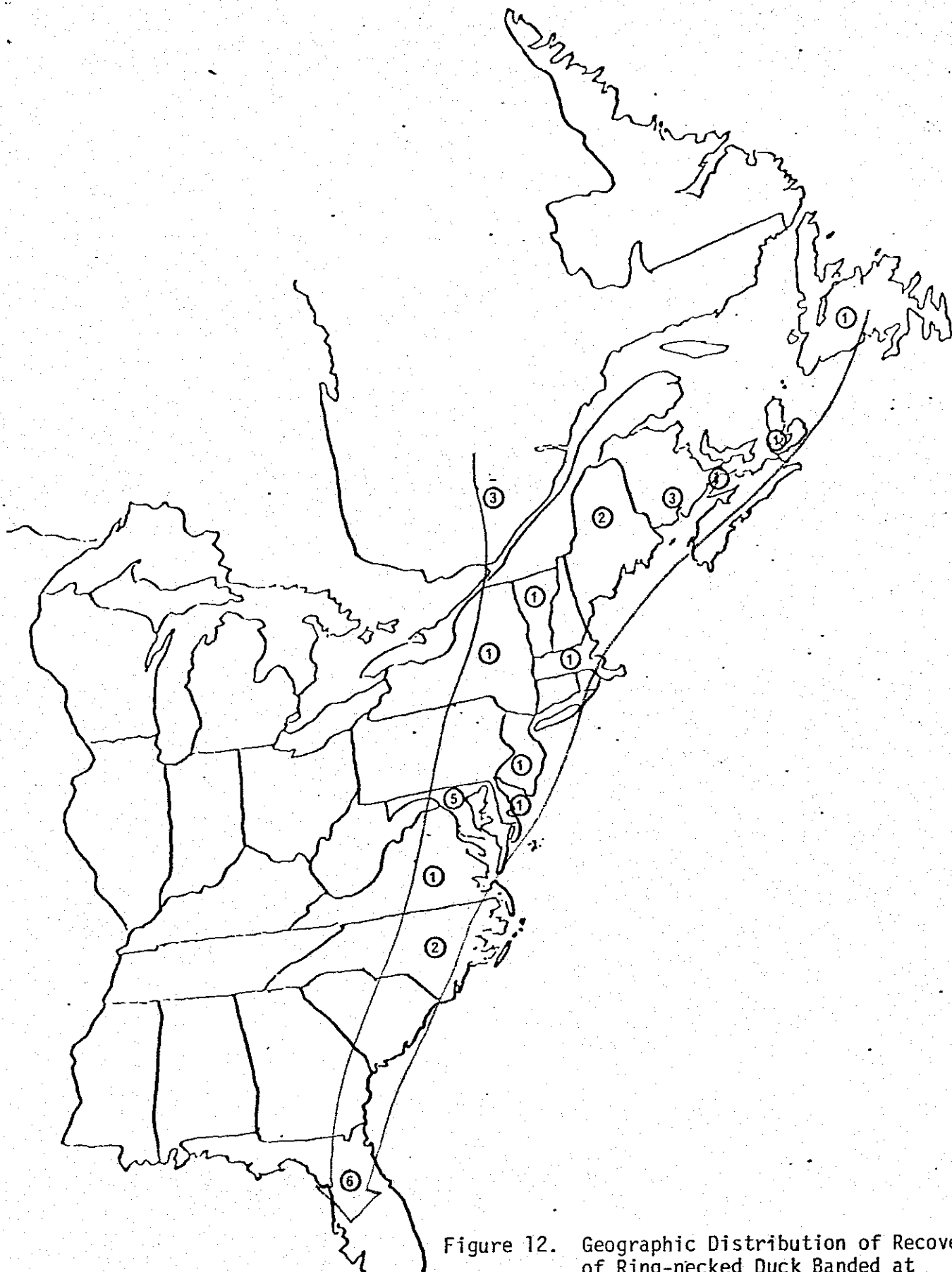
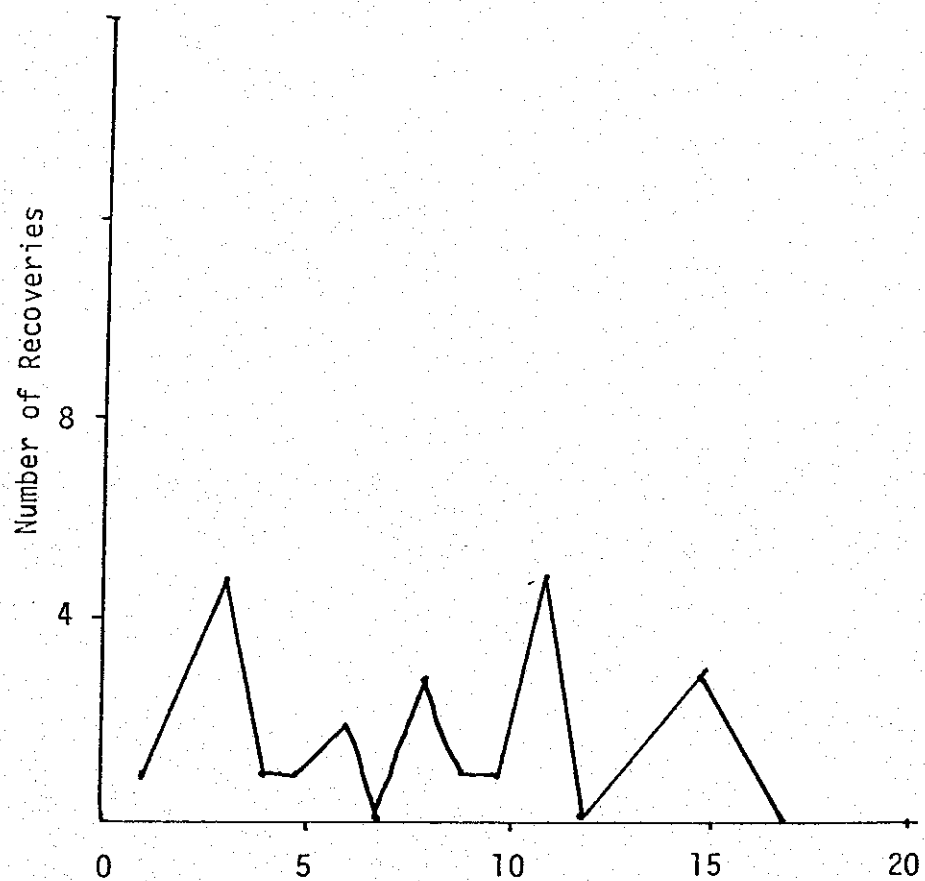


Figure 12. Geographic Distribution of Recoveries of Ring-necked Duck Banded at Baie Johan Beetz, Quebec.



7-Day Periods October 1 - Feb. 18

Figure 13. Temporal Distribution of Recoveries of Ring-necked Duck Banded at Baie Johan Beetz, Quebec.

*no mention of these?
were there any?* ←

Temporal and Geographic Distribution of Recoveries of Blue-winged
Teal Banded in the Atlantic Region and Baie Johan Beetz, Quebec

Total

^{In} A total of 962 recoveries of blue-winged teal banded in the Atlantic Region ~~and Baie Johan Beetz, Quebec~~ were examined to determine temporal and geographic distribution. Most recoveries were from Canada (78.5%) varying from ~~a low of~~ 50% for birds banded in Cape Breton to ~~a high of~~ 84% for birds banded in the St. John River. First week recoveries were highest in the St. John River where 75% of all recoveries were taken during that period. ~~A~~ low numbers of first week recoveries were taken at Louis Lake, ⁱⁿ Cape Breton and on Prince Edward Island. Most USA recoveries were reported from states south of Virginia but some were scattered from Maine to Florida with incidentals ~~being reported~~ from the Lake States ~~through the central USA~~ to Louisiana. USA recoveries accounted for 11.3% of the total. Foreign recoveries ~~were~~ ~~most common~~ from the Caribbean, ^b South America and Europe ^{made up} and ~~composed~~ 10.2% of ~~the total number of~~ blue-winged teal recoveries.

Prince Edward Island

Recoveries of blue-winged teal banded on Prince Edward Island totalled 189 including 18 adults, 124 hatching year and 47 locals. Except for foreign recoveries, both ~~the~~ temporal and geographic distribution of recoveries ^{were} ~~are~~ closely similar to those of other species, i.e. a high Canadian recovery rate, particularly during the first week of October (Tables 1 and 2; Figure 1). The distribution of blue-winged teal differs ^{ed} ~~is~~ from other species in that many more foreign recoveries ^{were} ~~are~~ reported. In fact, the number of foreign recoveries ^{ed} ~~exceeded~~ the number ~~reported~~ from

the USA. The West Indies ^{was} ~~are~~ by far the most common single recovery area outside of Canada with over 45% of all foreign recoveries ~~being reported from locations therein~~ (Figure 2).

New Brunswick-Nova Scotia Border

Recoveries of blue-winged teal banded in the New Brunswick-Nova Scotia border area number ³³¹ ~~331~~. Their distribution both temporally and geographically ^{was} ~~is~~ similar to ^{those} ~~that~~ of other species and ^{did} ~~does~~ not appear to vary significantly by sex or age (Table 3 and Figure 3). A high Canadian recovery rate particularly in the area of banding during early October ^{was} ~~continues to be~~ characteristic of all sex and age classes. Foreign recoveries (Figure 4) significantly outnumber ^{ed} ~~recoveries~~ from the USA and ^{were} ~~are~~ especially common from the West Indies and other Caribbean areas. New England, New York and New Jersey account ^{ed} ~~for~~ most of the USA returns in the North while equal numbers were recovered in Florida.

St. John River

More recoveries were available from the St. John River (399) than from any other banding location. Again the proportion of Canadian recoveries was exceptionally high (84.2%) with nearly 75% being recovered during the first week of October. The most significant recovery locations were the St. John River (69.4%) and southeastern New Brunswick (9.8%). Unlike ^{birds from} Prince Edward Island and New Brunswick-Nova Scotia border area, USA recoveries outnumbered foreign. Maine was the ^{most important} ~~largest~~ recovery area in the USA reporting 11 out of 37 recoveries. Florida was ~~the next largest~~ with five returns. The West Indies accounted for over ^{half} ~~50%~~ of the foreign recoveries (Table 4 and Figures 5-6).

Table / . Geographic Distribution of Recoveries of Adult and Local Age Blue-winged Teal Banded on Prince Edward Island

Recovery Location	Adult			Local		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	15	83.3	23.4	32	68.1	57.4
P.E.I.	14	77.8	23.4	25	53.2	42.5
St. John River	0			1	2.1	2.1
SE New Brunswick	0			1	2.1	2.1
NW Nova Scotia	0			2	4.3	4.3
NE Nova Scotia	0			2	4.3	4.3
Quebec	1	5.5		1	2.1	2.1
USA Total	1	5.5		5	10.6	4.3
Maine	0			1	2.2	2.2
New Jersey	0			1	2.1	
New York	0			1	2.1	2.1
North Carolina	1	5.5		1	2.1	
Florida	0			1	2.1	
Foreign Total	2	11.1		10	21.3	2.1
West Indies	0			4	8.5	2.1
French Guiana	2	11.1		2	4.3	
Puerto Rico	0			1	2.1	
Venezuela	0			2	4.3	
Bahama Islands	0			1	2.1	
Grand Total	18			47		

Table 2. Geographic Distribution of Recoveries of Hatching Year
Blue-winged Teal Banded on Prince Edward Island

Recovery Location	Hatching Year Male			Hatching Year Female		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	36	59.0	41.0	39	61.9	43.9
P.E.I.	32	52.5	37.7	33	52.3	36.5
SE New Brunswick	2	3.3	3.3	2	3.2	3.2
NE Nova Scotia	1	1.6		1	1.6	1.6
Ontario	0			1	1.6	
Quebec	1	1.6		1	1.6	1.6
Manitoba	0			1	1.6	
USA Total	7	11.5	3.2	10	15.9	3.2
Maine	3	4.9	1.6	1	1.6	1.6
Vermont	1	1.7	1.6	0		
New York	0			1	1.6	
New Jersey	0			1	1.6	
Florida	2	3.3		1	1.6	
Louisiana	0			2	3.1	
South Carolina	1	1.6		0		
Missouri	0			1	1.6	1.6
Wisconsin	0			1	1.6	
Minnesota	0			1	1.6	
Illinois	0			1	1.6	
Foreign Total	18	29.5	9.9	14	22.2	3.2
West Indies	11	18.0	6.6	5	7.8	3.2
French Guiana	2	3.3	3.3	3	4.8	
Puerto Rico	2	3.3		2	3.2	
Bahama Islands	0			1	1.6	
Dominican Republic	1	1.7		0		
Venezuela	1	1.6		0		
Africa	0			1	1.6	
Europe	1	1.6		0		
Cuba	0			1	1.6	
Brazil	0			1	1.6	
Grand Total	61			63		

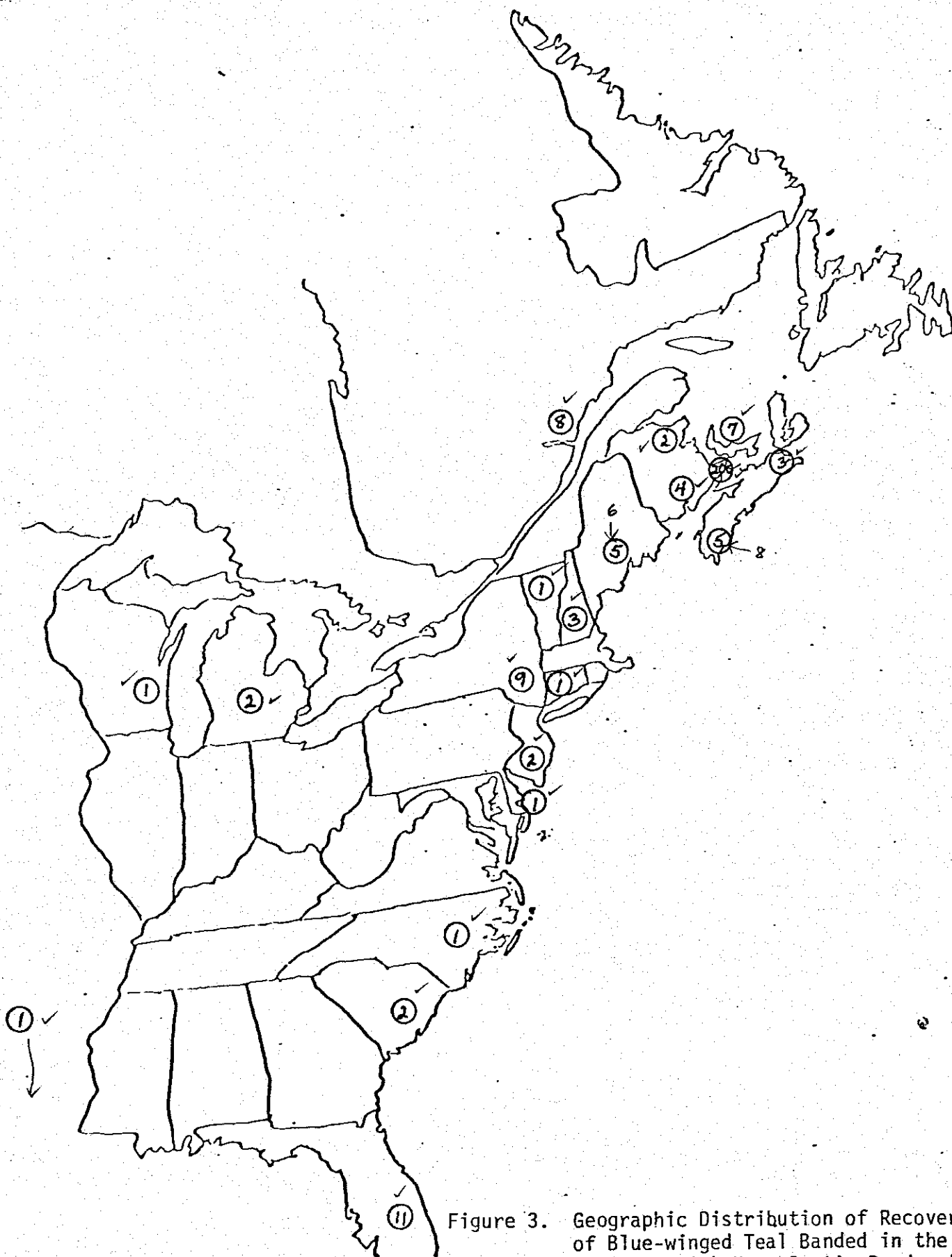


Figure 3. Geographic Distribution of Recoveries of Blue-winged Teal Banded in the New Brunswick-Nova Scotia Border Area.



Figure 4. Distribution of Foreign Recoveries of Blue-winged Teal Banded in the New Brunswick-Nova Scotia Border

Table 4. Geographic Distribution of Recoveries of All Blue-winged Teal Banded in the St. John River

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	336	84.2	74.9
P.E.I.	5	1.3	1.3
St. John River	277	69.4	61.7
SE New Brunswick	39	9.8	9.8
NE New Brunswick	2	0.5	0.5
NW Nova Scotia	3	0.7	0.5
NE Nova Scotia	1	0.2	0.2
Southern Nova Scotia	2	0.5	
Ontario	2	0.5	0.2
Quebec	5	1.3	0.7
USA Total	37	9.3	3.2
Maine	11	2.9	2.1
Massachusetts	1	0.3	
New Hampshire	1	0.2	
New York	4	1.0	0.5
New Jersey	4	1.0	
Delaware	1	0.2	
Virginia	1	0.2	0.2
North Carolina	2	0.5	
South Carolina	1	0.2	
Florida	5	1.3	
Pennsylvania	2	0.5	0.2
Wisconsin	2	0.5	0.2
Louisiana	2	0.5	
Foreign Total	26	6.5	1.3
West Indies	14	3.5	1.3
Dominican Republic	4	1.0	
Puerto Rico	4	1.0	
Spain	1	0.3	
Colombia, SA	1	0.2	
Bahama Islands	1	0.3	
Brazil	1	0.2	
Grand Total	399		

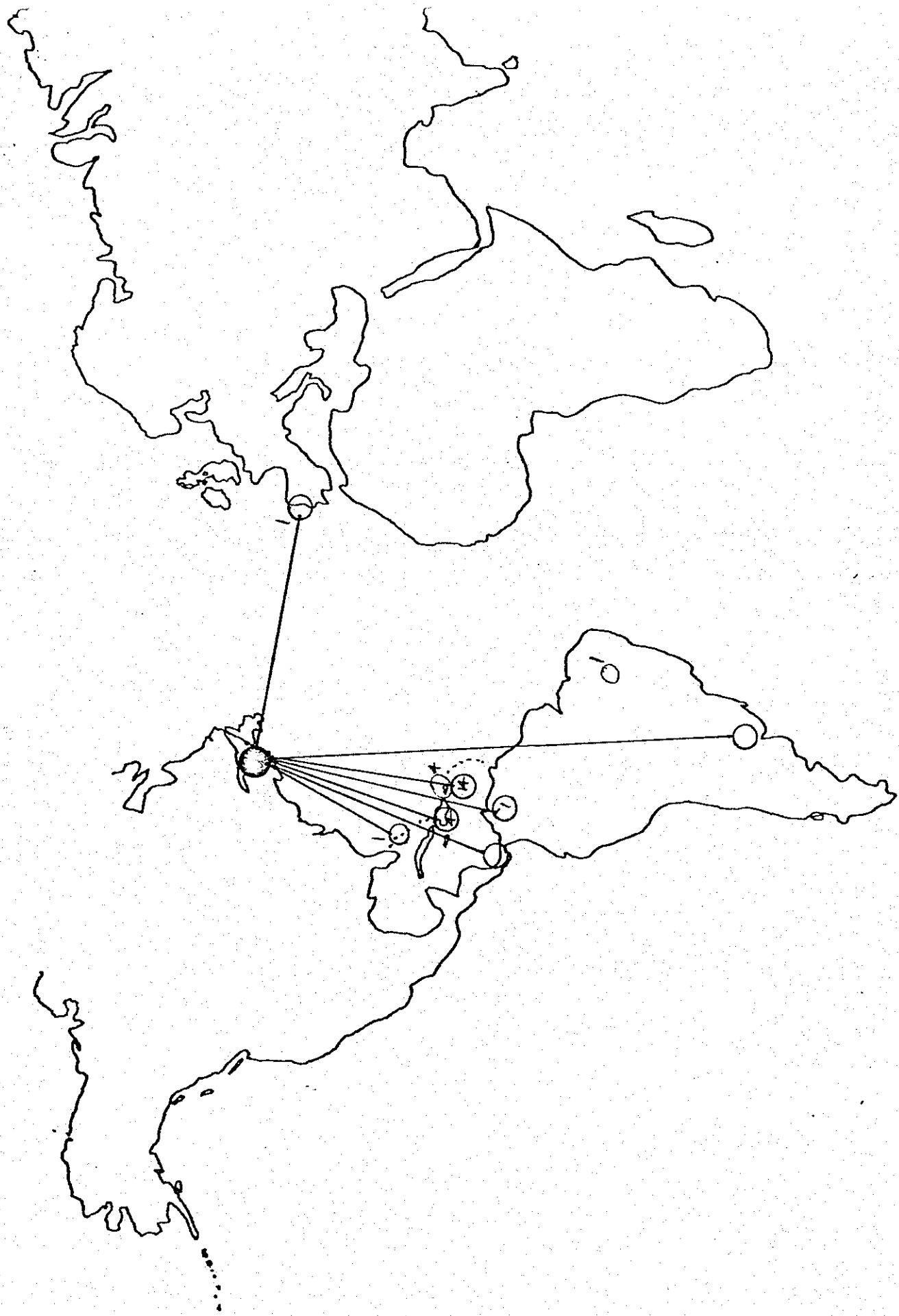


Figure 6. Distribution of Foreign Recoveries of Blue-winged Teal Banded in the St. John River.

Some variations by sex and age are suggested (Tables 5-7). In all age groups, females tend^{ed} to be harvested more heavily in Canada than males. This ^{was} ~~is~~ most evident in adults where 88.5% of all female recoveries were from Canadian locations as opposed to 72.7% for males. Similarly more females ^{were} ~~are~~ shot during the first week of October than males in adult and hatching year age classes. In locals the division ^{was} ~~is~~ nearly equal although males ^{were} ~~are~~ slightly higher. Also, birds banded as locals ^{had} ~~have~~ the highest Canadian recovery rate of all age classes. ~~It is interesting to note that~~ no adult females have been reported from the USA and only two adult males (Table 5).

Tabusintac

Only 62 recoveries of blue-winged teal banded at Tabusintac, New Brunswick, have been reported; thus, there ^{were} ~~are~~ too few returns in each ~~individual~~ sex and age class to provide a meaningful comparison. An examination of total recoveries shows ^{ed} ~~a~~ characteristically high Canadian recovery rate in the area of banding. Temporally, the first week of October accounts ^{ed} ~~for~~ over 72% of all returns (Table 8). USA recoveries were scattered equally over six states from Connecticut south to Florida and west to the Dakotas (Figure 7). Foreign recoveries are shown in Figure 8.

Louis Lake, Cape Breton and Debert

Very few recoveries of blue-winged teal banded at these stations have been reported. The temporal and geographic distribution of these recoveries are shown in Table 9. Generally a high Canadian recovery rate ^{was} ~~is~~ shown; however, only the Debert station shows ^{ed} ~~a~~ high recovery rate during ~~the first week of October.~~

not worth saying if only 5 recoveries.

Table 5. Geographic Distribution of Recoveries of Adult Blue-winged Teal Banded in the St. John River.

Recovery Location	Adult Male			Adult Female		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	8	72.7	54.5	23	88.5	80.8
P.E.I.	2	18.2	18.2	0		0.0
St. John River	4	36.4	36.6	21	80.9	73.1
SE New Brunswick	0	0.0		1	3.8	3.8
NE New Brunswick	1	9.1		0		
Quebec	1	9.1		1	3.8	3.8
USA Total	2	18.2				
Florida	1	9.1		0	0	
Louisiana	1	9.1		0	0	
Foreign Total	1	9.1		3	11.5	
Dominican Republic	1	9.1		1	3.8	
Puerto Rico	0			1	3.8	
Brazil	0			1	3.8	
Grand Total	11			26		

Table 1. Geographic Distribution of Hatching Year Blue-winged Teal Banded in the St. John River

Recovery Location	Hatching Year Male			Hatching Year Female		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	35	70.0	66.0	48	78.7	73.78
P.E.I.	1	2.0	2.0	1	1.64	1.64
St. John River	25	50.0	48.0	38	62.30	62.30
SE New Brunswick	7	14.0	14.0	6	9.84	9.84
NE New Brunswick	1	2.0	2.0	0		
NW Nova Scotia	0			1	1.64	
S. Nova Scotia	1	2.0		0		
Ontario	0			1	1.64	
Quebec	0			1	1.64	1.64
USA Total	6	12.0	8.0	9	14.8	4.94
Maine	1	2.0	2.0	3	4.90	3.30
New Hampshire	1	2.0		0		
New York	2	4.0	4.0	1	1.64	
New Jersey	0			1	1.64	
Pennsylvania	1	2.0		1	1.64	1.64
Virginia	1	2.0	2.0	0		
North Carolina	0			1	1.64	
Wisconsin	0			1	1.64	
Louisiana	0			1	1.64	
Foreign Total	9	18.0	2.0	4	6.5	1.64
West Indies	6	12.0	2.0	1	1.64	1.64
Puerto Rico	0			3	4.86	
Dominican Republic	1	2.0		0		
Colombia, SA	1	2.0		0		
Bahama Islands	1	2.0				
Grand Total	50			61		

Table 7. Geographic Distribution of Recoveries of Local Blue-winged Teal Banded in the St. John River

Recovery Location	Local Male			Local Female		
	No. Rec.	% of Total Rec.	% Rec. 1st week	No. Rec.	% of Total Rec.	% Rec. 1st week
Canada Total	99	86.1	82.6	123	90.4	80.1
P.E.I.	0			1	0.7	0.7
St. John River	82	71.3	68.7	107	78.8	69.2
SE New Brunswick	13	11.3	11.3	12	8.7	8.7
NW Nova Scotia	2	1.7	0.9	0		
NE Nova Scotia	1	0.9	0.9	0		
S. Nova Scotia	0			1	0.7	
Ontario	1	0.9	0.9	0		
Quebec	0			2	1.5	1.5
USA Total	10	8.7	0.9	10	7.4	3.8
Maine	2	1.7		5	3.8	3.8
Massachusetts	1	0.9		0		
New York	1	0.9		0		
New Jersey	3	2.5		0		
Delaware	1	0.9		0		
North Carolina	0			1	0.7	
South Carolina	0			1	0.7	
Florida	1	0.9		3	2.2	
Wisconsin	1	0.9	0.9	0		
Foreign Total	6	5.2	2.5	3	2.2	0.0
West Indies	6	5.2	2.5	1	0.7	
Dominican Republic	0			1	0.7	
Spain	0			1	0.7	
Grand Total	115			136		

Table 7 . Geographic Distribution of Recoveries of All Blue-winged Teal Banded at Tabusintac, New Brunswick.

Recovery Location	Number of Recoveries	% of Total Recoveries	% Recoveries 1st week
Canada Total	43	69.4	61.2
SE New Brunswick	3	4.8	4.8
NE New Brunswick	37	59.8	53.2
Southern Nova Scotia	1	1.6	
Ontario	1	1.6	1.6
Quebec	1	1.6	1.6
USA Total	6	9.6	3.2
Connecticut	1	1.6	
New Jersey	1	1.6	
Florida	1	1.6	
Pennsylvania	1	1.6	
South Dakota	1	1.6	1.6
North Dakota	1	1.6	1.6
Foreign Total	13	21.0	8.1
West Indies	7	11.4	8.1
French Guiana	4	6.4	
Venezuela	1	1.6	
Puerto Rico	1	1.6	
Grand Total	62		

Table 3. Temporal and Geographic Distribution of Recoveries of Blue-winged Teal Banded in the NB-NS Border Area (continued)

Recovery Location	Adult				Hatching Year				Local			
	No. Rec.	% of Tot. Rec.	No. 1st Wk. Rec.	% 1st Wk. Rec.	No. Rec.	% of Tot. Rec.	No. 1st Wk. Rec.	% 1st Wk. Rec.	No. Rec.	% of Tot. Rec.	No. 1st Wk. Rec.	% 1st Wk. Rec.
West Indies	1	3.1			18	7.5	8	3.3	3	5.0	2	3.3
French Guiana	3	9.4	1	3.1	9	3.8	1	0.4	3	5.0	1	1.7
Bahama Islands					3	1.2			1	1.7		
Venezuela					3	1.2			0			
Puerto Rico					4	1.8			2	3.3		
Dominican Republic					1	0.4			1	1.7		
Colombia, SA					3	1.2						
Jamaica					1	0.4						
Brazil									1	1.7		
Cuba	1	3.1										
Total Foreign	5	15.6			42	17.5			11	18.3		
Grand Total	32				239				60			

Total Recoveries = 331

Table 3. Temporal and Geographic Distribution of Recoveries of Blue-winged Teal Banded in the NB-NS Border Area

Recovery Location	Adult				Hatching Year				Local			
	No. Rec.	% of Tot. Rec.	No. 1st Wk. Rec.	% 1st Wk. Rec.	No. Rec.	% of Tot. Rec.	No. 1st Wk. Rec.	% 1st Wk. Rec.	No. Rec.	% of Tot. Rec.	No. 1st Wk. Rec.	% 1st Wk. Rec.
Canada Total	23	71.9			173	72.5			36	60.0		
P.E.I.					7	2.9	6	2.5				
NB-NS Border	21	65.7	18	56.2	151	63.3	131	54.8	28	46.6	24	40.00
St. John River	1	3.1	1		2	0.8	2	0.8	1	1.7	1	1.7
NE New Brunswick					1	0.4			1	1.7	1	1.7
Total New Brunswick	22	68.8			154	64.4			30	50.0		
NE Nova Scotia					3	1.2	1	0.4	0			
S. Nova Scotia					5	2.1	5	2.1	3	5.0		
Total Nova Scotia					8	3.3			3	5.0		
Quebec	1	3.1			4	1.8	1	0.4	3	5.0	1	1.7
USA Total	4	12.5			24	10.0			13	21.7		
Maine	1	3.1			3	1.2	1	0.4	2	3.3	2	3.3
New Hampshire					2	0.8	1	0.4	1	1.7	1	1.7
Vermont					1	0.4						
Connecticut					0				1	1.7		
Total New England	1	3.1			6	2.5			4	6.7		
New York	1	3.1			7	2.9	1	0.4	1	1.7	1	1.7
New Jersey					0				2	3.3		
Delaware					1	0.4						
North Carolina					0				1	1.7		
South Carolina					1	0.4			1	1.7		
Florida	2	6.2			7	2.9			2	3.3		
Louisiana					1	0.4						
Michigan	0				0	0.0			2	3.3	1	1.7
Wisconsin					1	0.4						
Total Other USA	3	9.4			18	7.5			9	15.0		

(continued)

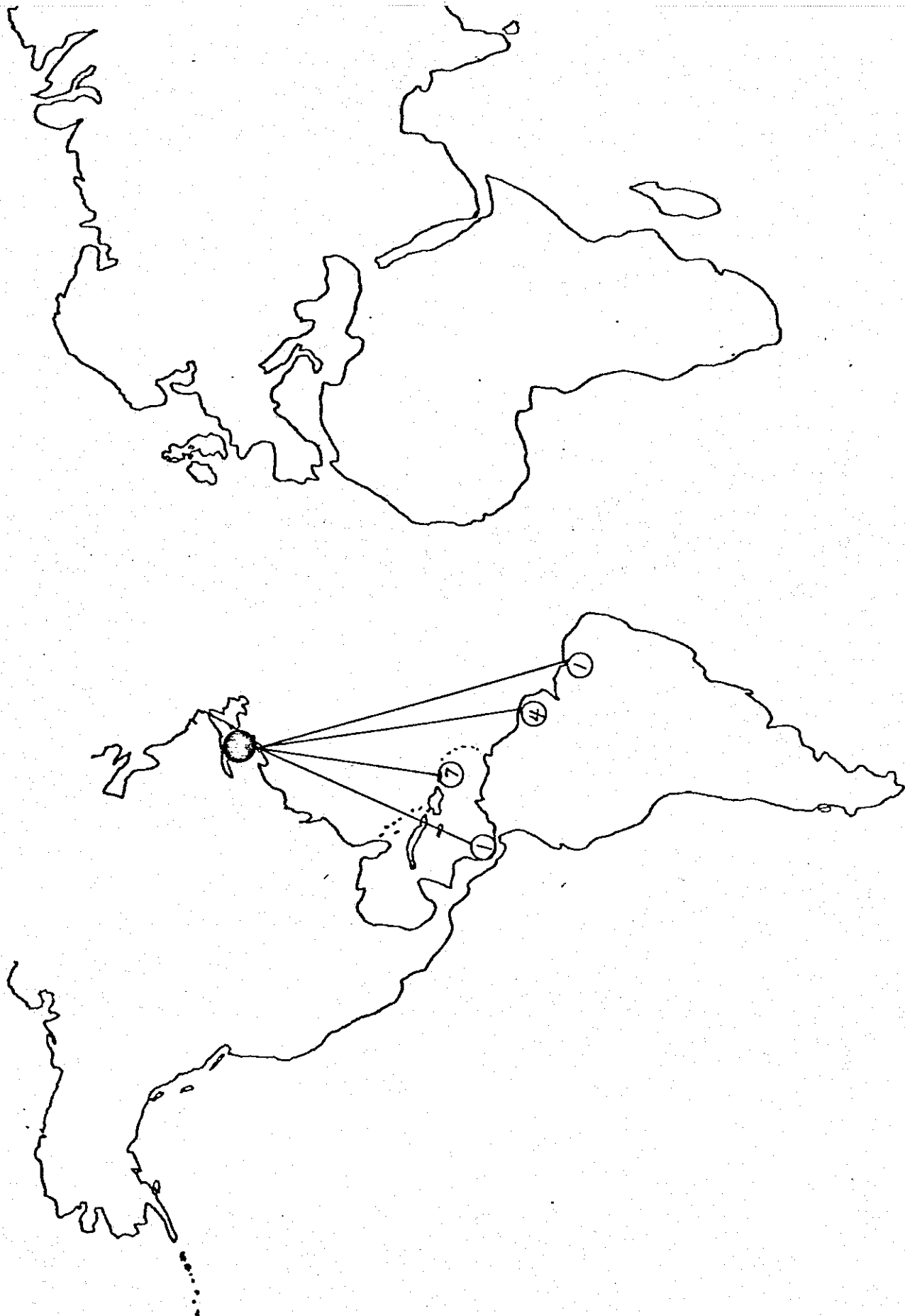


Figure 8. Distribution of Foreign Recoveries of Blue-winged Teal Banded at Tabusintac.

Table 9. Geographic Distribution of Recoveries of Blue-winged Teal Banded at Louis Lake, Cape Breton and Debert, Nova Scotia

Recovery Location	Louis Lake			Cape Breton			Debert		
	No. Rec.	% Tot.		1st week	% Tot.		1st week	% Tot.	
		Rec.			Rec.			Rec.	
Canada Total	16	64.0		12.0	2	50.0	25.0	4	80.00
NB-NS Border	0				0			2	40.00
St. John River	0				0			1	20.0
NW Nova Scotia	1	4.0			1	25.0		0	
NE Nova Scotia	0				1	25.0	25.0	1	20.0
S. Nova Scotia	13	52.0		12.0	0			0	
Quebec	2	8.0			0			0	
USA Total	2	8.0			0			0	
Michigan	1	4.0			0			0	
Minnesota	1	4.0		4.0	0			0	
Foreign Total	7	28.0			2	50.0		1	20.0
West Indies	3	12.0		4.0	0			1	20.0
Puerto Rico	1	4.0			1	25.0		0	
Cuba	0				1	25.0		0	
French Guiana	2	8.0			0			0	
Venezuela	1	4.0			0			0	
Grand Total	25				4			5	

Temporal and Geographic Distribution of Recoveries
of American Wigeon Banded in the Atlantic Region
and Baie Johan Beetz, Quebec

Total Recoveries

After excluding ^{those} ~~all~~ recoveries having insufficient information, ~~a total of~~ 326 were examined. These were primarily composed of birds banded as locals (78%) and were divided approximately equal between male and female. The largest percentage of the recoveries (60%) came from birds banded in the St. John River, followed by Prince Edward Island, Debert, Nova Scotia and the New Brunswick-Nova Scotia border area. Very few ~~recoveries~~ were from birds banded at Tabusintac and Baie Johan Beetz and no recoveries ~~were~~ from bandings in Cape Breton and Louis Lake. Of the 254 recoveries of birds banded as locals, most were reported as direct recoveries during the first week of October. This was particularly evident in the St. John River where the direct recovery of locals in the area of banding was notably high. Table 1 displays the geographic distribution of recoveries of wigeon banded in the Atlantic Region and at Baie Johan Beetz, Quebec. Temporal distribution is more meaningfully discussed in the following sections.

Thirteen recoveries were reported from locations outside of the USA and Canada. Those include Europe, West Indies, French Guiana, Venezuela, Puerto Rico and Dominican Republic. Figure 1 shows the location of recoveries of wigeon outside the USA and Canada.

Table 1. Geographic Distribution of All Recoveries of American Wigeon Banded in the Atlantic Region and Baie Johan Beetz, Quebec.

Recovery Location	Number of Recoveries	% of Total Recoveries
Canada Total	167	51.2
Prince Edward Island	25	7.8
New Brunswick-Nova Scotia	17	5.2
St. John River	61	18.8
NE New Brunswick	4	1.2
SE New Brunswick	17	5.2
NW Nova Scotia	7	2.1
NE Nova Scotia	4	1.2
S. Nova Scotia	12	3.7
Ontario	12	3.7
Quebec	7	2.1
Newfoundland	1	0.3
USA Total	146	44.8
Maine	12	3.7
Massachusetts	8	2.4
New Hampshire	1	0.3
Vermont	1	0.3
Connecticut	6	1.8
Rhode Island	3	0.9
New York	28	8.6
New Jersey	19	5.9
Delaware	3	0.9
Maryland	9	2.8
Virginia	19	5.9
North Carolina	19	5.9
South Carolina	8	2.4
Florida	2	0.6
Iowa	1	0.3
Pennsylvania	2	0.6
Tennessee	1	0.3
Ohio	2	0.6
California	1	0.3
Michigan	1	0.3
Outside USA and Canada	13	4.0
Europe	2✓	0.6
West Indies	2✓	0.6
Dominican Republic	4✓	1.2
French Guiana	1✓	0.3
Puerto Rico	2✓	0.6
Venezuela	1✓	0.3
Bahama Islands	1✓	0.3

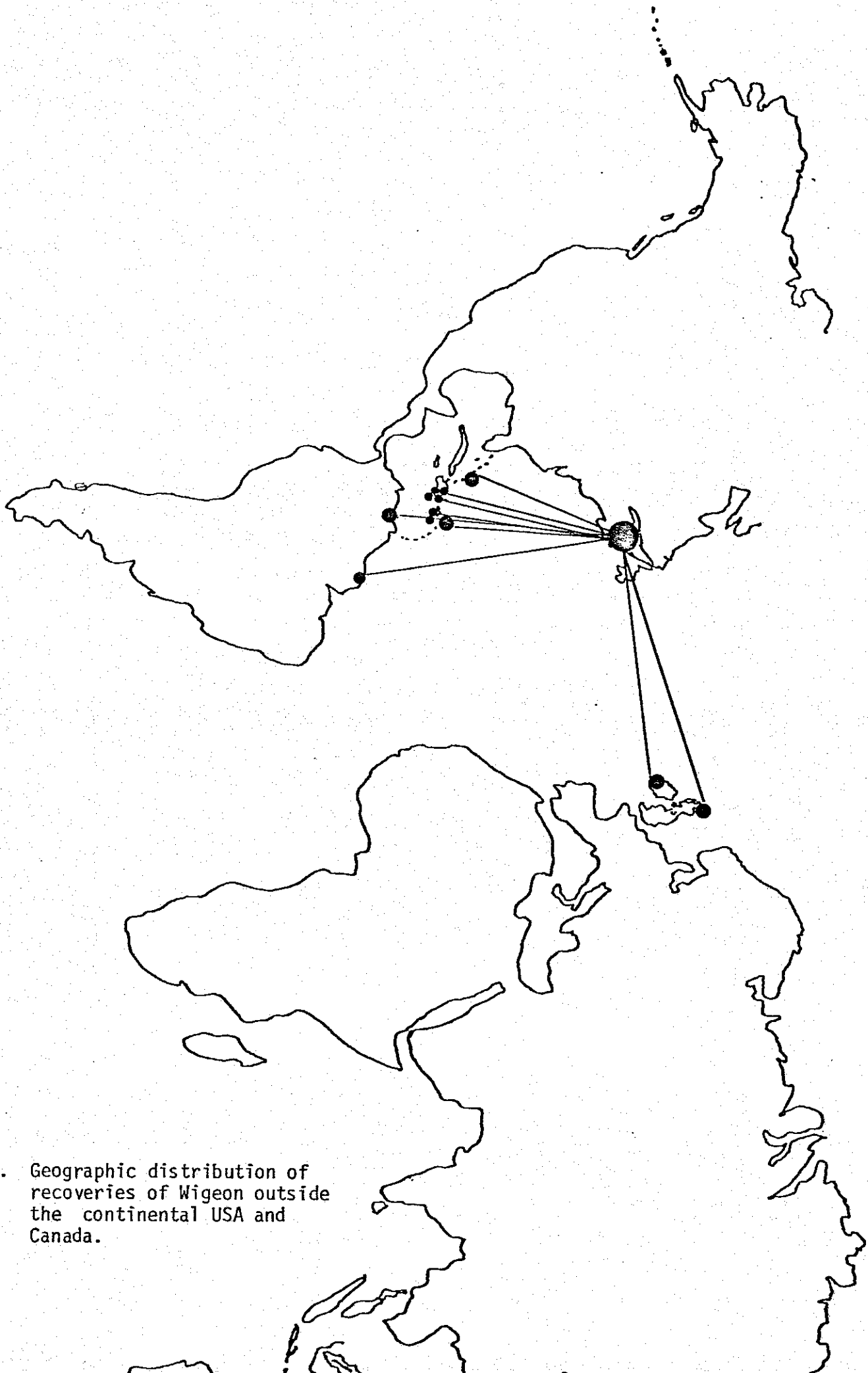


Figure 1. Geographic distribution of recoveries of Wigeon outside the continental USA and Canada.

Prince Edward Island

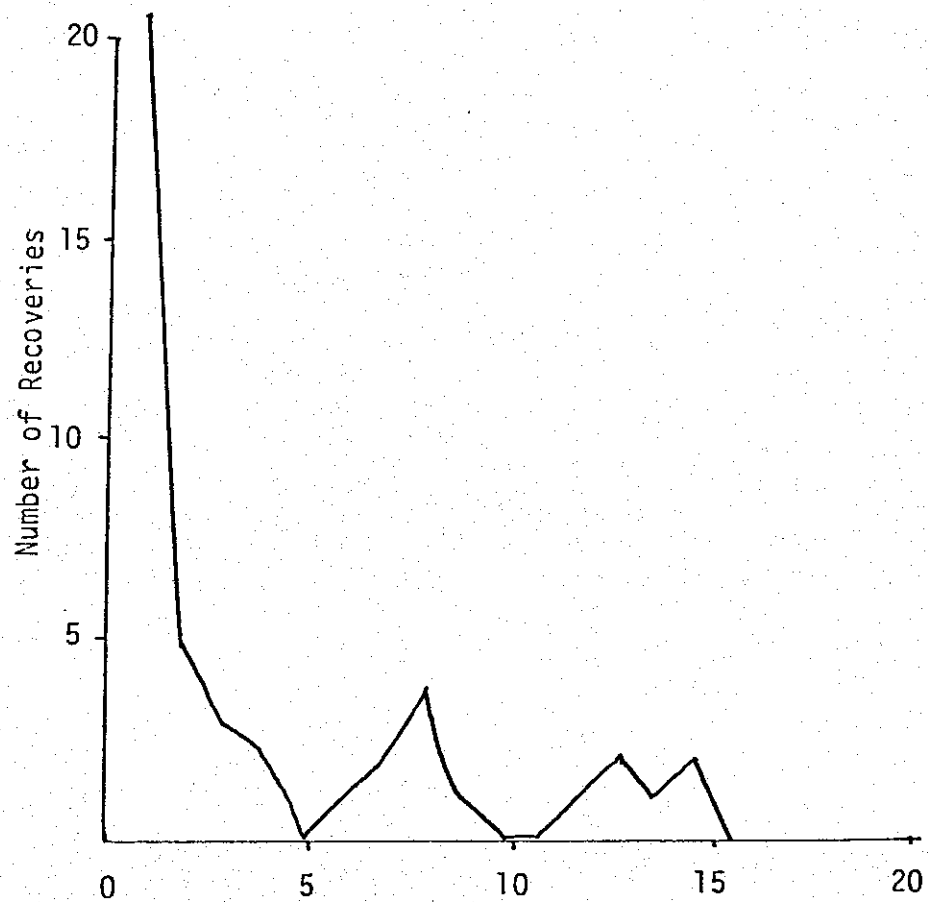
~~A total of 48~~ ^{Forty-eight} recoveries of American Wigeon banded on Prince Edward Island ~~were examined, after all recoveries having~~ ^{had} incomplete information, ~~were excluded.~~ Twenty-six ~~of the~~ recoveries were from Canadian locations, 18 from the Continental USA and 4 from ^{other} ~~locations outside~~ of Canada and the USA. The largest single recovery area was on Prince Edward Island ~~where (41.6%) of all recoveries were reported.~~ All other recovery locations reported four or less returns ~~as shown in~~ (Table 2). The migration route ^{was} ~~is directly~~ south and west through southern New Brunswick and Nova Scotia to the New England coast, New York, New Jersey, and south to South Carolina. A few recoveries occurred further west in Ontario, Quebec, and Pennsylvania (Figure 2).

Because of relatively few recoveries, direct and indirect types were not considered separately. Age appeared to be the only criteria ^{on} that varied significantly. Birds banded as locals accounted for 39 (81%) of the 48 recoveries and were divided approximately equal ^{ly} between sexes. ~~Of those recoveries~~ ^{and} ~~while~~ [≡] nearly 50% were taken during the first week of October, while only two recoveries during that period were from other age classes. Figure 3 shows the temporal distribution of recoveries of wigeon banded on Prince Edward Island.

Recoveries from outside the USA and Canada were reported in Puerto Rico, Bahama Islands and ~~the~~ Dominican Republic.

Table 2. Geographic Distribution of Recoveries of American Wigeon Banded on Prince Edward Island.

Recovery Location	Number of Recoveries	% of Total Recoveries
Canada Total	26 ✓	54.2
Prince Edward Island	20 ✓	41.6
St. John River	1 ✓	2.1
SE New Brunswick	1 ✓	2.1
Southern Nova Scotia	2 ✓	4.2
Quebec	1 ✓	2.1
Ontario	1 ✓	2.1
USA Total	18 ✓	37.5
Maine	2 ✓	4.2
New Hampshire	1 ✓	2.1
New York	4 ✓	8.3
New Jersey	3 ✓	6.2
Maryland	1 ✓	2.1
Virginia	3 ✓	6.2
North Carolina	2 ✓	4.2
South Carolina	1 ✓	2.1
Pennsylvania	1 ✓	2.1
Outside USA & Canada	4	8.3
Puerto Rico	1	2.1
Bahamas	1	2.1
Dominican Republic	2	4.2
Grand Total	48	



7-Day Periods October 1 - Feb. 18

Figure 3. Temporal Distribution of Recoveries of American Wigeon Banded on Prince Edward Island.

New Brunswick - Nova Scotia Border Area

A total of 33 recoveries of American Wigeon banded in the NB-NS border area were examined. Over 60% ~~of these~~ were from Canadian locations with 48.5% ~~coming~~ ^{Banding} from the ~~NB-NS border area~~. In the USA, southern New England and New Jersey accounted for the majority of the recoveries. ~~Again divisions by type of recovery were not made.~~ Birds banded as locals accounted for 26 out of the 33 ~~total~~ recoveries and were divided nearly equal^{ly} between male and females. Figure 3 shows the geographic distribution of Wigeon banded in the NB-NS border area.

Temporally, nearly 50% of all recoveries were taken during the first week of October in the NB-NS border area. Figure 4 shows the temporal distribution of recoveries of Wigeon banded in the NB-NS border area.

One recovery ~~from outside of Canada and the USA~~ was received from the Dominican Republic.

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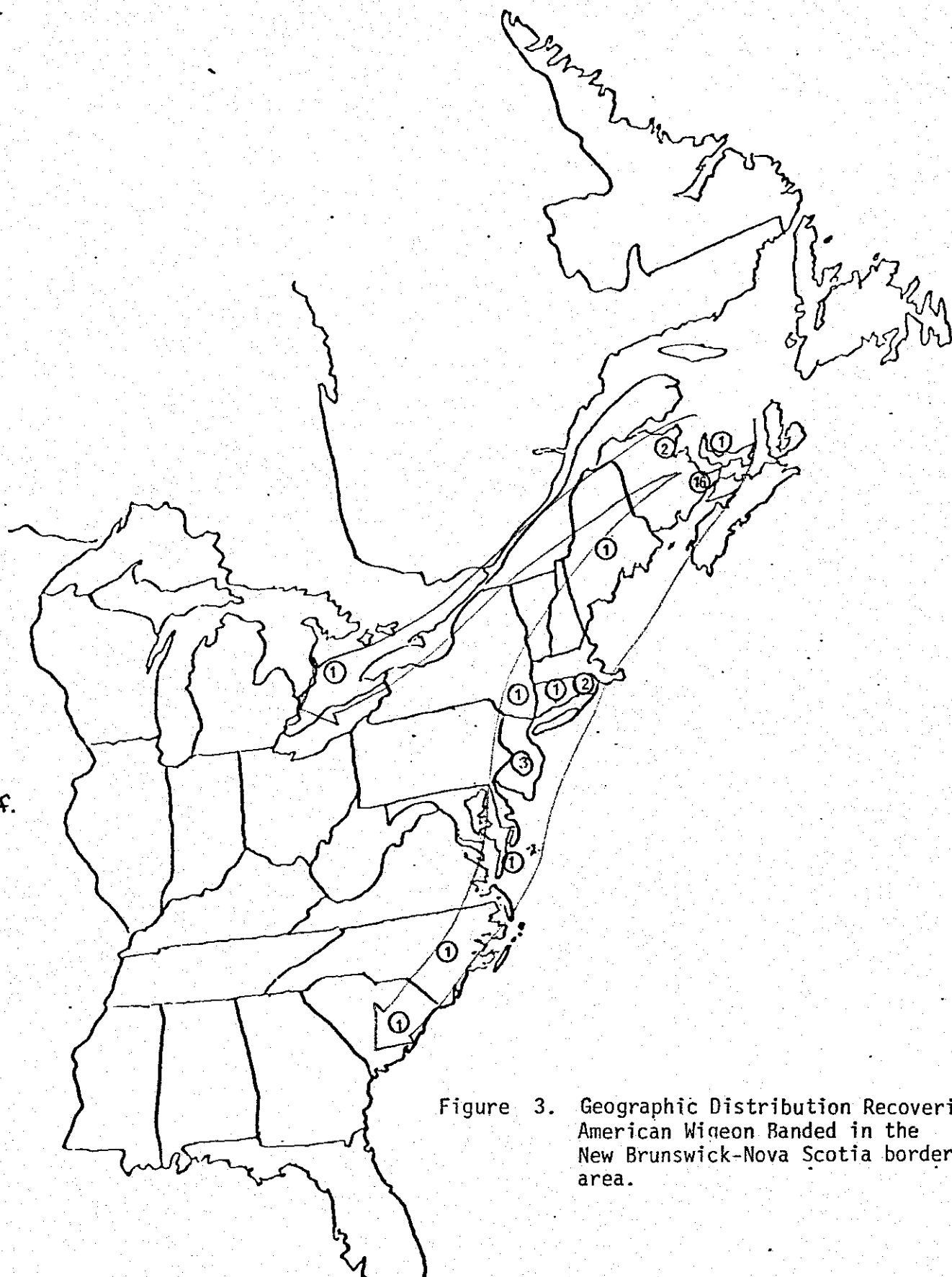


Figure 3. Geographic Distribution Recoveries of American Wigeon Banded in the New Brunswick-Nova Scotia border area.

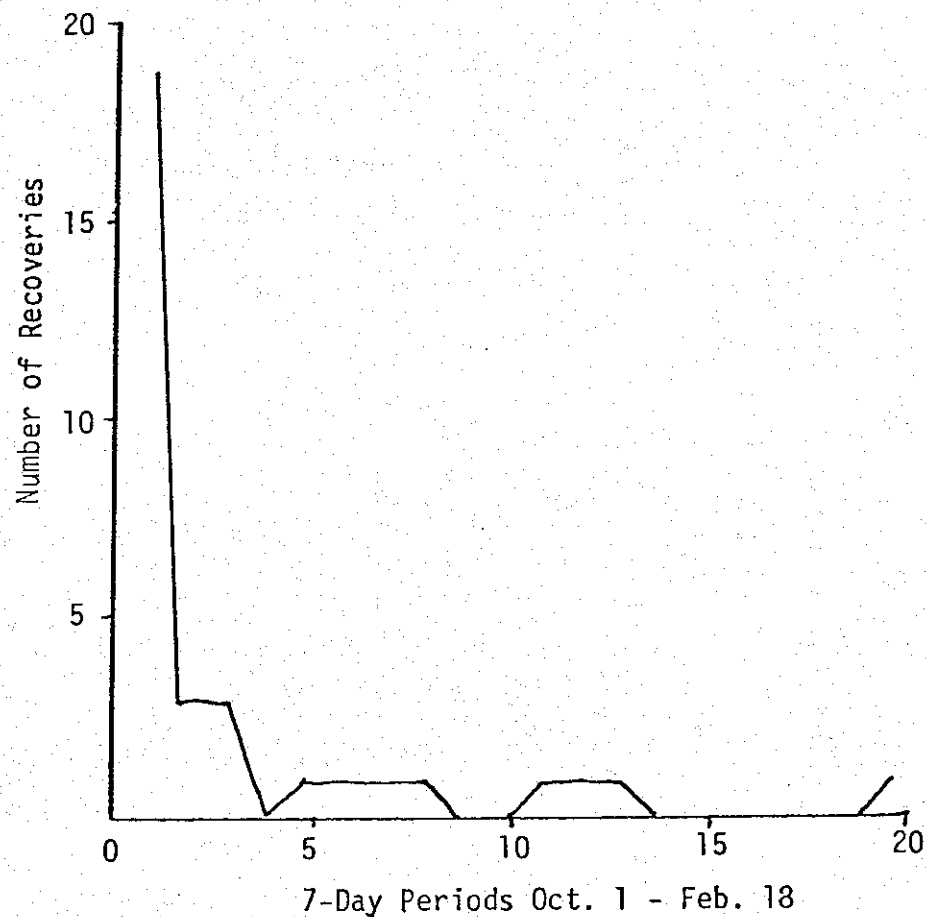


Figure 4. Temporal Distribution of Recoveries of American Wigeon Banded in the New Brunswick-Nova Scotia Border Area.

Recovery Location	Number of Recoveries	% of Total Recoveries
Canada Total	20 ✓	60.6
Prince Edward Island	1 ✓	3.0
NB-NS border	16 ✓	48.5
NE New Brunswick	2 ✓	6.1
Ontario	1 ✓	3.0
USA Total	12 ✓	36.4
Maine	1 ✓	3.0
Connecticut	1 ✓	3.0
Rhode Island	2 ✓	6.2
New York	1 ✓	3.0
New Jersey	3 ✓	9.2
Maryland	1 ✓	3.0
North Carolina	1 ✓	3.0
South Carolina	1 ✓	3.0
California	1 ✓	3.0
← Dominican Republic	1	3.0
Grand Total	33	

St. John River

Recoveries of wigeon banded in the St. John River totaled 197, ^{with} ~~which included~~ sufficient recoveries in most age classes to develop a meaningful analysis of distribution. ~~This was particularly true for direct recoveries of local males and females for which 58 and 63, recoveries were available, respectively.~~ ^{members of} Distribution did not vary significantly between sexes, age classes, or from the distribution of recoveries as a whole. Of most significance ^{was} ~~is~~ the high harvest ^{rate} of local birds during the first week of October. Out of 162 recoveries of local birds, 68 were recovered during the first week of October following banding including 44 which were recovered in the St. John River. Figures 5 and 6 and Table 3 show the temporal and geographic distribution of wigeon banded in the St. John River.

Recoveries from outside the USA and Canada (3) came from Europe, West Indies and the Dominican Republic.

Table 3. Temporal and Geographic Distribution of Recoveries of American Wigeon Banded in the St. John River, New Brunswick.

Recovery Location	Number of Recoveries	% of Total Recoveries
<u>Canada Total</u>	<u>105</u>	<u>53.3</u>
Prince Edward Island	2✓	1.0
St. John River	58✓	29.5
SE New Brunswick	15✓	7.6
Subtotal New Brunswick	<u>73</u>	<u>37.1</u>
NW Nova Scotia	5✓	2.5
NE Nova Scotia	1✓	0.5
Southern Nova Scotia	8✓	4.1
Subtotal Nova Scotia	<u>14</u>	<u>7.1</u>
Ontario	9✓	4.6
Quebec	6✓	3.0
Newfoundland	1✓	0.5
Subtotal Other Canadian	<u>16</u>	<u>8.1</u>
<u>Non-Canadian Total</u>	<u>92</u>	<u>46.7</u>
Maine	6✓	3.0
Massachusetts	7✓	3.5
Connecticut	3✓	1.5
Vermont	1✓	0.5
Rhode Island	1✓	0.5
Subtotal North Eastern	<u>18</u>	<u>9.1</u>
New York	18✓	9.1
New Jersey	9✓	4.6
Delaware	3✓	1.5
Maryland	3✓	1.5
Virginia	11✓	5.6
North Carolina	16✓	8.2
South Carolina	5✓	2.5
Pennsylvania	1✓	0.5
Ohio	2✓	1.0
Tennessee	1✓	0.5
Michigan	1✓	0.5
Subtotal Other USA	<u>70</u>	<u>35.5</u>
Europe	2	1.0
West Indies	1	0.5
Dominican Republic	1	0.5
Subtotal	<u>4</u>	<u>2.0</u>
<u>Grand Total</u>	<u>197</u>	

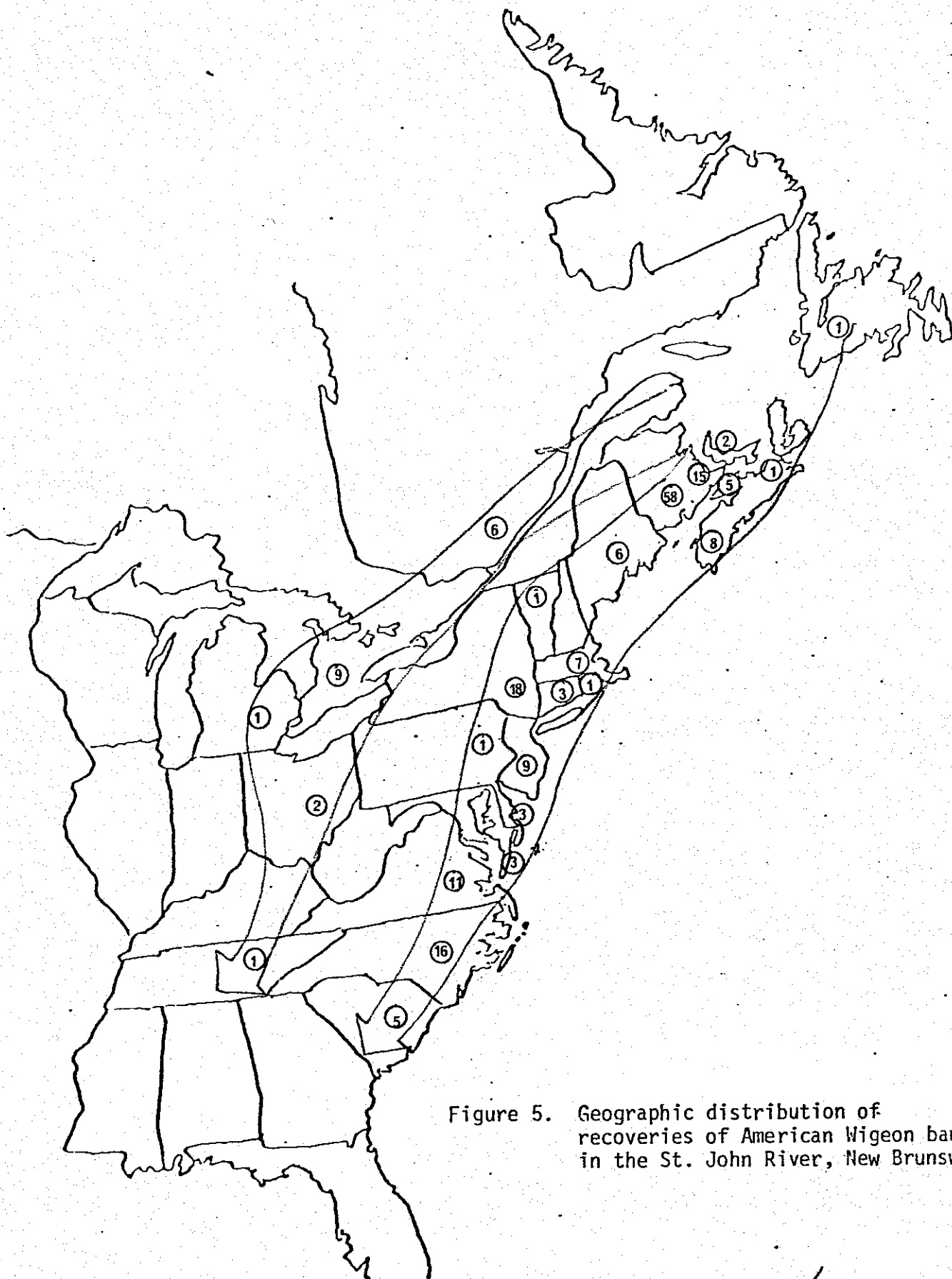


Figure 5. Geographic distribution of recoveries of American Wigeon banded in the St. John River, New Brunswick.

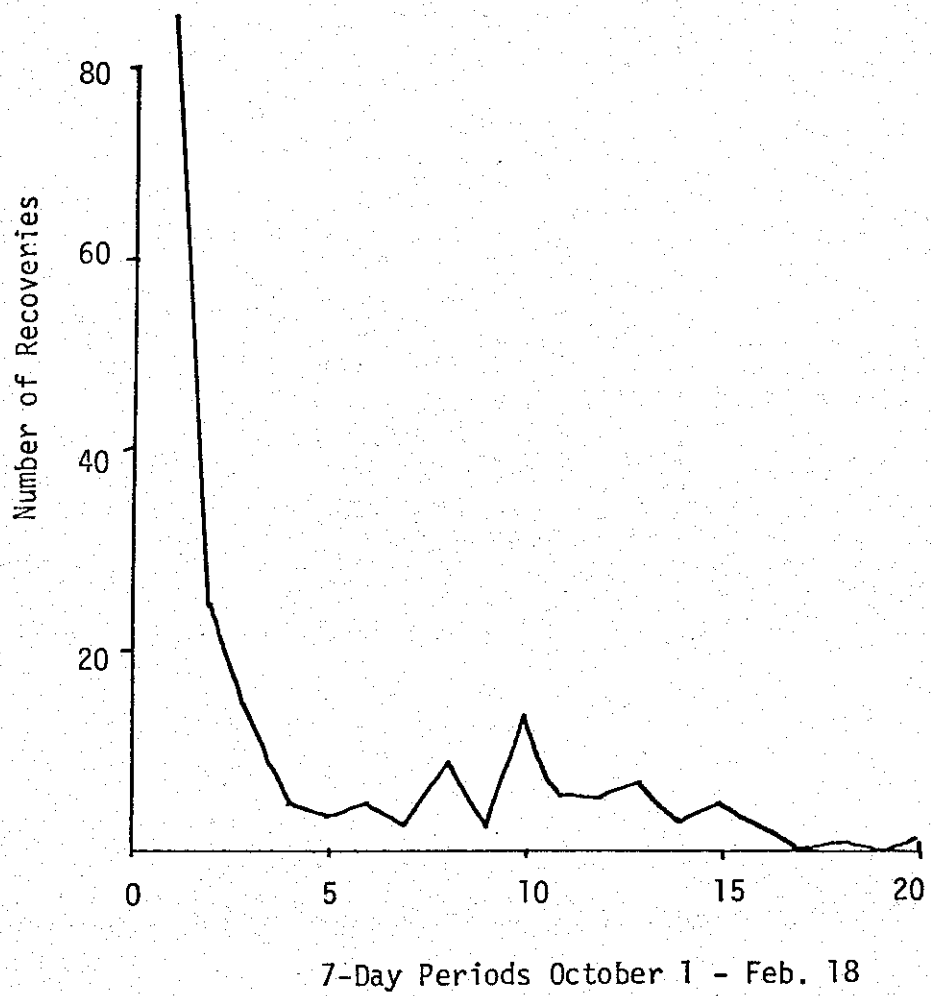


Figure 6. Temporal Distribution of Recoveries of American Wigeon Banded in the St. John River.

Debert, Nova Scotia

A total of 34 recoveries of American Wigeon banded at Debert, Nova Scotia, ~~have been examined~~ including 22 locals, 11 hatching year and 1 adult, ~~which were~~ divided almost equally between male and female. Only 24% were recovered in Canada unlike the nearly equal division with the USA found at other banding sites. Birds banded as locals again represented the majority of the recoveries (65%) although the number of recoveries taken during the first week of October was smaller. Figure 7-8 and Table 4 show the temporal and geographic distribution of recoveries of wigeon banded at Debert, Nova Scotia.

Recoveries from outside of the USA and Canada were from French Guiana, West Indies, Puerto Rico and Venezuela.

Tabusintac, New Brunswick and Baie Johan Beetz, Quebec

Only 14 recoveries of wigeon banded at Tabusintac and Baie Johan Beetz have been reported - 8 from Tabusintac and 6 from Baie Johan Beetz. Eight recoveries were from Canada and 6 from the USA. No recoveries were received from outside the USA and Canada. Most recoveries were banded as locals (5) at Tabusintac and as hatching year at Baie Johan Beetz. Table 5 shows the geographic distribution of wigeon banded at those two stations.

Table 5. Geographic Distribution of American Wigeon Banded at Tabusintac, New Brunswick and Baie Johan Beetz, Quebec

Recovery Location	Tabusintac		Baie Johan Beetz	
	Number of Recoveries	% of Total Recoveries	Number of Recoveries	% of Total Recoveries
Canada Total	3	37.5	5	83.3
Prince Edward Island	1	12.5	1	16.7
NB-NS border	0	0.0	1	16.7
St. John River	1	12.5	0	0.0
NE New Brunswick	1	12.5	1	16.7
NE Nova Scotia	0	0.0	1	16.7
Ontario	0	0.0	1	16.7
USA Total	5	62.5	1	16.7
New York	2	25.0	0	0.0
New Jersey	0	0.0	1	16.7
Virginia	2	25.0	0	0.0
Florida	1	12.5	0	0.0
Grand Total	8		6	

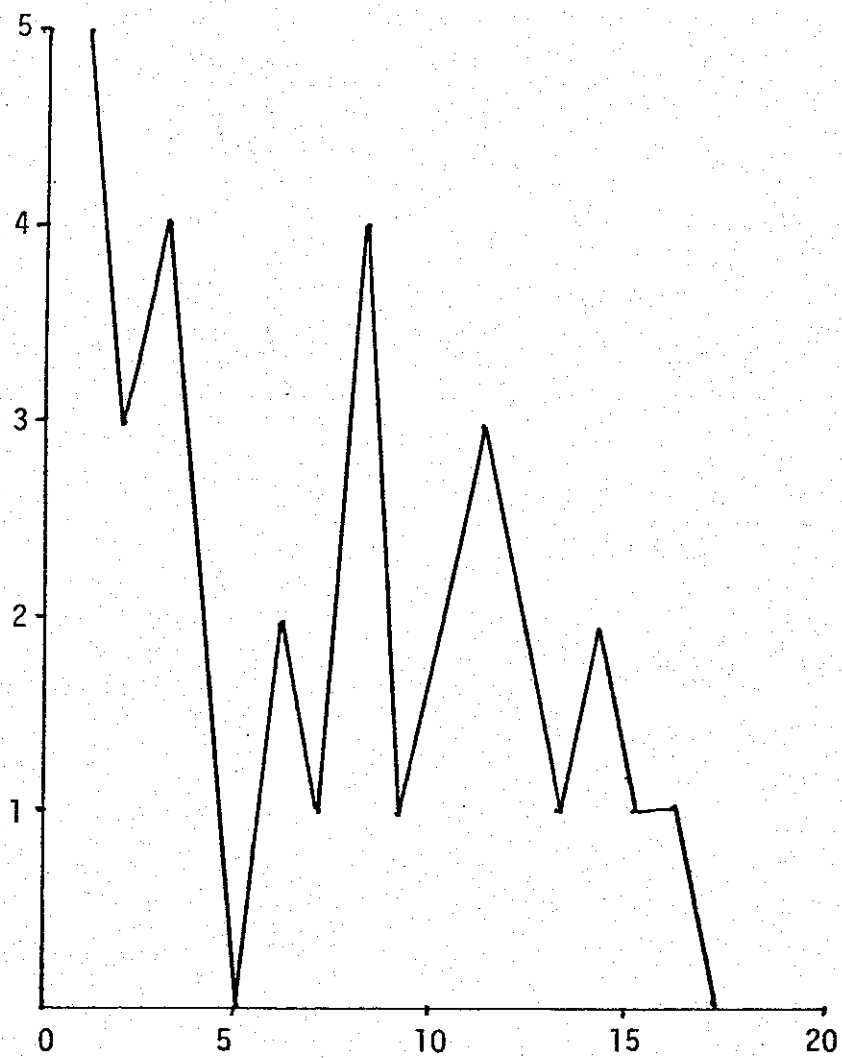


Figure 7. Temporal Distribution of Recoveries of Wigeon Banded at Debert, Nova Scotia.

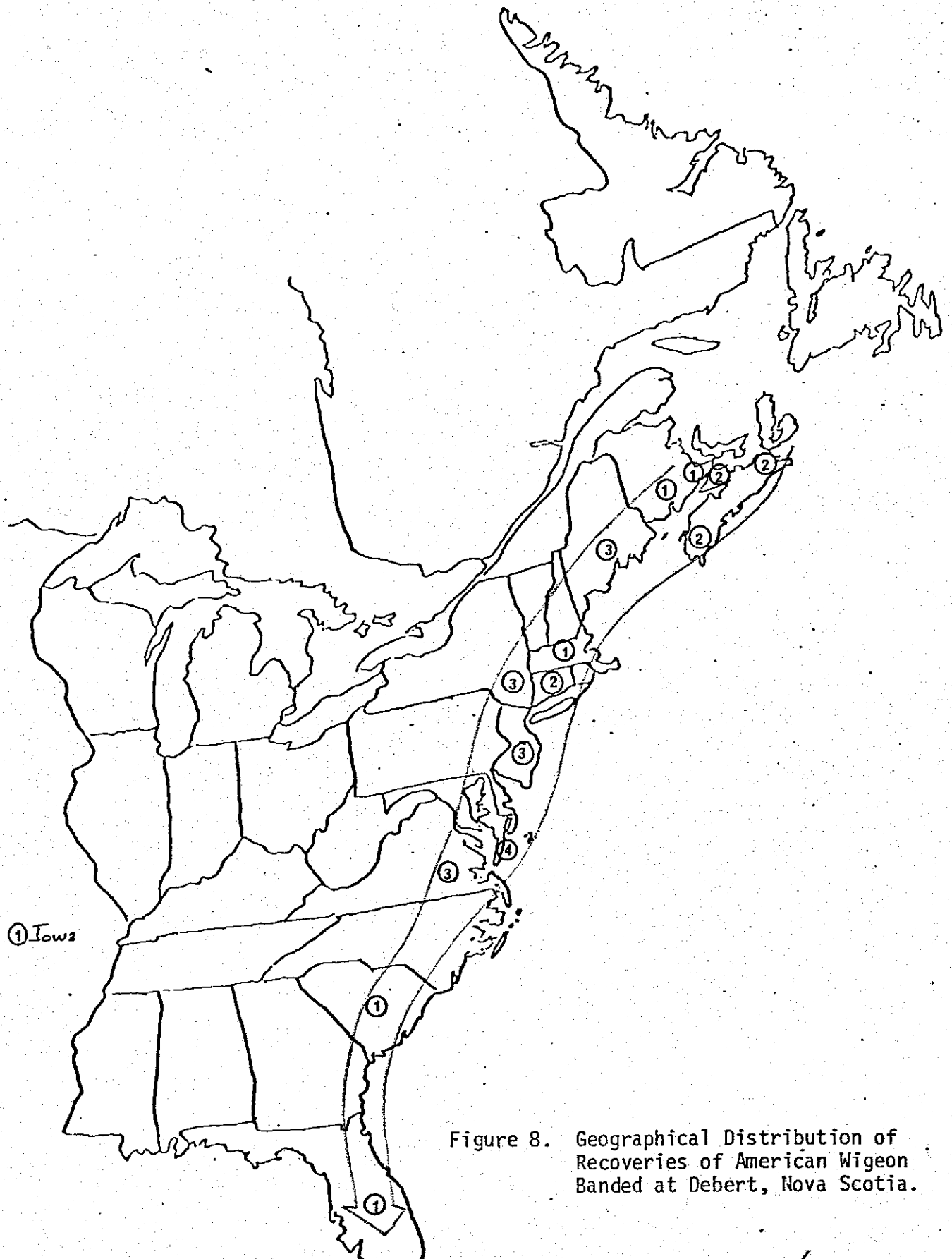


Figure 8. Geographical Distribution of Recoveries of American Wigeon Banded at Debert, Nova Scotia.

Table 4. Geographic Distribution of Recoveries of American Wigeon Banded at Debert, Nova Scotia

Recovery Location	Number of Recoveries	% of Total Recoveries
Canada Total	8	23.5
Prince Edward Island	0	0.0
New Brunswick-Nova Scotia	0	0.0
St. John River	1✓	2.9
SE New Brunswick	1✓	2.9
NE New Brunswick	0	0.0
NW Nova Scotia	2✓	5.9
NE Nova Scotia	2✓	5.9
Southern Nova Scotia	2✓	5.9
Ontario	0	0.0
USA Total	22	64.7
Maine	3✓	8.8
Massachusetts	1✓	2.9
Connecticut	2✓	5.9
New York	3✓	8.8
New Jersey	3✓	8.8
Maryland	4✓	11.8
Virginia	3✓	8.8
South Carolina	1✓	2.9
Florida	1✓	2.9
Iowa	1✓	2.9
Outside USA and Canada	4	11.8
French Guiana	1	2.9
Venezuela	1	2.9
West Indies	1	2.9
Puerto Rico	1	2.9
Grand Total	34	