BIRD-BANDING

A JOURNAL OF ORNITHOLOGICAL INVESTIGATION

VOL. V. JANUARY, 1934 No. 1

THE MIGRATORY MOVEMENTS OF CERTAIN COLONIES OF HERRING GULLS IN EASTERN NORTH AMERICA

By RICHARD JEFFERSON EATON

PART II[1]

THE MUSKEGET ISLAND (MASSACHUSETTS) COLONY

BANDING work on this colony has been done chiefly by Miss Grace C. Meleney, to whom I am particularly indebted for the use of her records. Mr. John A. Gillespie, Mr. L. B. Fletcher, and others have contributed to a greater or less degree. The number of recoveries is not sufficiently large to justify a detailed analysis by map and diagram. As a substitute the following table of recoveries has been arranged in the order of age as of the date when first reported. For convenience, all gulls are assumed to be hatched on July 1st, thus becoming a year old on the following June 30th. It is suggested that the reader refer to the map and diagram on pages 171 and 173 of this journal (Vol. IV, No. 4) and then attempt to visualize the migration curve of the Muskeget colony.

DETAILED RECORD OF RECOVERIES FROM THE MUSKEGET ISLAND COLONY

(Arranged in chronological order of age)

Date of Banding	*Band No. of Recovery*	*Place of Recovery*	*Date of Recovery*	*Reference*	*Age of Gull Recovered*
7/13/32	A703294	Bethany Beach, Del.	9/13/32	FD	1st year
"	B621854	Shippigan, Gloucester Co., N.B.	9/13/32	FD (Hurricane?)	" "
"	B621823	West Chop, Mass.	9/15/32	FD (Hurricane?)	" "
7/13/30	A703219	Rappahannock Spit, Chesapeake Bay	10/ 4/30	FD	" "

[1] The writer is greatly indebted to Mr. Richard M. Hinchman, of Harvard University, for his assistance in the accumulation of data and for the preparation of some of the figures in this and subsequent installments of this paper.

7/16/28	408596	Babylon, L. I.	10/ 7/28	FD	" "
7/13/30	303200	Gray, Jones Co., Ga.	10/ 8/30	Shot	" "
"	303180	Lutcher, La.	11/11/30	Shot	" "
"	A703214	Southampton, L. I.	11/13/30	K	" "
7/13/32	B621861	Eastchester, N. Y.	11/22/32	FD	" "
7/13/30	A600725	Jacksonville, Fla.	12/17/30	K	" "
"	A709743	Arroyo Colorado, Rio Grande Valley, Cameron Co., Tex.	1/ 1/31	FD	" "
7/13/32	B621877	Galveston, Tex.	1/16/33	C	" "
6/18/30	386813	Point au Fer, La.	1/26/31	Trap	" "
7/13/32	B621837	Coronado Beach, Fla.	1/27/33	Shot	" "
"	B621844	Vermillion Parish, La.	2/ 8/33	FD	" "
7/13/30	A709727	Vera Cruz, Mexico	3/ 1/31	FD(?)	" "
8/ 5/32	B621886	Aransas Pass, Tex.	4/21/33	C	" "
7/13/30	A600748	Sabine, Tex.	4/ 4/32	Shot	2d year
6/18/30	386716	Staten Island, N. Y.	5/15/32	C	" "
7/ 9/25	387020	Woods Hole, Mass.	8/ 7/26	C	" "
7/16/28	408658	East Dennis, Mass.	11/20/30	FD	3d year
7/ 9/25	387014	Nantucket Sound, Mass.	1/ 2/30	FD	5th year

References: C—Caught, FD—Found Dead, K—Killed.

An inspection of this table reveals an obvious similarity to the Essex County colony. Judging from twenty-two recoveries (and except for an elaboration of detail, this number must be considered significant), the young Muskeget gulls of the season are well on their way south by early October, reach the Gulf in November, and appear to concentrate along the coast of Texas in mid-winter. Except for an anomalous recovery of A600748 at Sabine, Texas, on April 4th of the second winter, there is no evidence of any important southward migration of gulls in their second winter. We must wait for further data before learning whether the Muskeget colony will display the second-year autumnal drift to the Carolinas which seems to be characteristic of the Essex County colony.

In referring to A600748 as an anomalous recovery, it is a striking fact that this is the first and only instance thus far noticed of a recovery from the Gulf Coast of a second-year Herring Gull hailing from any New England rookery. Correspondence with the man who reported the recovery has verified the fact that this bird was shot. Although it may have been prevented by an injury (later healed) from participating in first spring migration, we must consider it as a very unusual occurrence.

Another recovery, B621854, deserves comment. This bird was found dead at Shippigan, Gloucester County, N. B., on September 13th of the first year. Although a late-summer northward scattering of immature gulls occurs among some North Atlantic colonies, such a habit is not characteristic of the Essex County colony. Unless we discard the tentative hypothesis that the Muskeget colony is derived from the same population and is endowed with the same migratory traits, we are forced to conclude either that the Essex County record

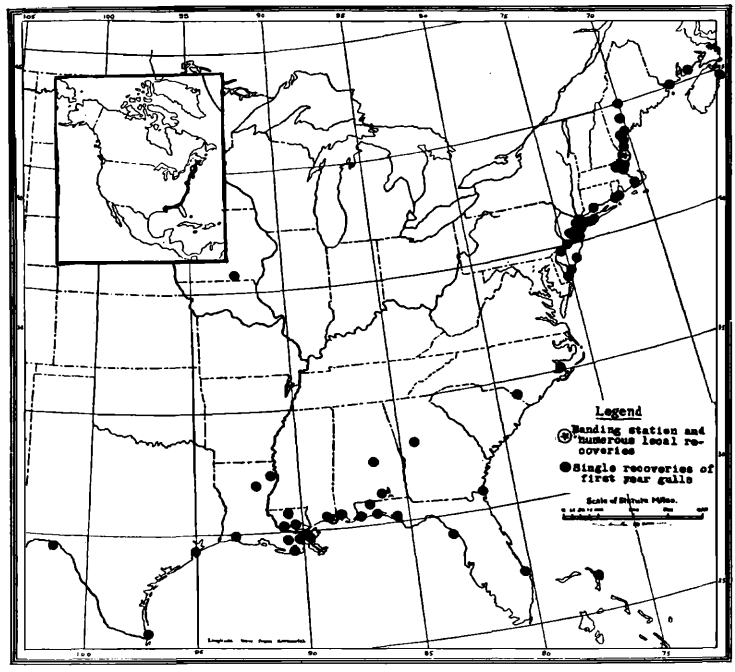

Figure 3. Map showing the distribution of recoveries from the Isles of Shoals colony. Insert: The "migration characteristic" of first-year birds from the same colony.

thus far is very misleading or else that the Shippigan recovery is a mere accident. Some color is lent to this latter alternative by the fact that Miss Meleney's report bore the notation, "Probably killed by the hurricane last week."

The recovery of A709727 at Vera Cruz on March 1st of the first year is noteworthy for holding the record of farthest south in so far as this particular investigation is concerned.

In general, the migratory traits of the Muskeget colony appear identical with those of the Essex County colony.

THE ISLES OF SHOALS COLONY

Through the courtesy of Mr. J. P. Melzer, of Milford, New Hampshire, and his friend, Mr. Lewis O. Shelley, of East Westmoreland, New Hampshire, the results of their extensive banding operations during the four-year period 1929–1932 at

Duck Island, Isles of Shoals, New Hampshire, have been placed at my disposal for publication. The accompanying list of recoveries contains all available data, excluding the records of local juveniles of the year found near the banding station prior to September 1st. Unfortunately the Bureau of Biological Survey on account of lack of funds is unable to furnish an up-to-date list of recoveries from this station, a circumstance which accounts for the relative paucity of data for second-, third-, and fourth-year birds. From a total of about two thousand banded Herring Gulls nearly one hundred recoveries have been reported up to July 1, 1933, of which eighty-four are considered here. The recoveries of local juveniles less than two months old have been disregarded.

Such a large accumulation of data is peculiarly adapted to the analytical treatment employed in Part I of this paper. On the map (Figure 3) is spotted the approximate location of each place of recovery. Apart from the general region of the banding station, two curious centers of concentration are evident: one on the Long Island-New Jersey coast, and a second, more widely dispersed, on the Gulf Coast from western Florida to the Mississippi delta. It is difficult to believe that these centers are purely fortuitous. Possibly they merely reflect a concentration of *human* activity in these particular areas. If this interpretation is correct, we should expect to find a similar effect indicated on page 171, Figure 1, in respect to recoveries from the Essex County colony. Such is not entirely the fact. The latter shows a grouping in the New Jersey region, to be sure, but only a mere scattering from Louisiana eastward. Instead, a marked concentration centers in the Galveston-San Antonio region. Apparently this rather bears out the theory that birds of a feather *do* flock together. In fact, it is not unreasonable to suppose that the same instinct which induces gulls to nest in colonies and to return year after year to the same small islands to breed might require first-year immatures to migrate in colonies and to select well-defined areas for their winter range. Under this supposition we should expect a thin and uniform distribution of recoveries along the migration route and a dense concentration in the winter range. How, then, may we account for the secondary concentration noted in northern New Jersey? If we attribute this to a winter hold-over of relatively weak or unambitious birds attracted by a presumed abundance of food near the middens of a huge city, we should expect (contrary to the fact) to find a midwinter concentration to appear on the graph (Figure 2) in respect to the Essex County colony. Perhaps a more

reasonable explanation is that the Duck Island colony is derived from two different strains and is endowed with a mixed migratory instinct. The force of this suggestion will become more apparent subsequently.

Another point of interest which this map brings out is the tendency of first-year birds from Duck Island to wander northward in the late summer before the fall migration sets in. There is one recovery from Nova Scotia, and there are two from New Brunswick, and four from Maine at places distant fifty miles or more from the banding station. It will be recalled that no such thing has yet been observed in the Essex County colony.

The final difference to be noticed is the relatively wider dispersal of the Duck Island gulls during their migration to places as widely separated as Ketch Harbor, Nova Scotia (A602497), Centerville, Iowa (A684309), Coahuila, Mexico (B610514), and Hopetown, Bahamas, B. W. I. (B676483). Such records may be entirely accidental and of no significance. On the other hand, they may represent extreme limits of range which are not characteristic of the Essex County colony.

The Centerville, Iowa, bird, A684309, killed on October 25th of the first year, well illustrates the significance of detailed analytical investigation of migratory traits of individual colonies. Herring Gulls in all plumages are of common occurrence in the Mississippi River Valley from Minnesota to the Gulf. Ordinarily, a recovery from eastern Iowa would be of no interest whatsoever. And yet we are in a position to say that this particular recovery is well-nigh accidental, for the simple reason that our map shows Iowa to be one thousand miles west of the normal summer range and migration route for the Isles of Shoals colony and five hundred miles north of its normal winter range. Possibly this bird was blown over the Alleghenies during an easterly gale and followed down the Ohio River and thence up the Mississippi; possibly it flew up the river from New Orleans, a most extraordinary feat to accomplish as early as October 25th; possibly the number on the band was misread (a source of error not to be overlooked).

Turning to the graph (page 7, Figure 4) we notice a general similarity between the Essex County and Isles of Shoals colonies, at least in respect to first-year birds. Because of the unfortunate lack of adequate data for second- and third-year birds from the latter colony, particularly during the winter months, we are still ignorant of the movements of its adolescents. A detailed examination reveals certain important differences between the two colonies, the most obvious of

which is the pronounced northward drift toward the end of the first summer. A hint of what the second-year birds may do is revealed by B610893 recovered on September 30, 1932, at West St. John Harbor, N. B., two hundred and twenty-five miles northeast of the banding station. It is one out of a total of six second-year recoveries here recorded. There is no evidence as yet of any such northward drift from the Essex County colony.

Two other important differences are noted: first, the concentration of recoveries in the neighborhood of two hundred and fifty miles south on both sides of the December 1st ordinate, and, second, the more scattered concentration in the region of New Orleans between November 15th and February 1st. These peculiarities have already been discussed. The graph, however, tends to confirm the suspicion that the Long Island-New Jersey region is a secondary *winter* range for the first-year birds from the Isles of Shoals colony. Coupled with the pronounced northward drift, this observation gives added force to the suggestion that we are now dealing with a mixed colony derived from "northern" and "southern" populations.

A detailed discussion of other features of the graph is omitted for lack of space. The reader by inspection may discover the significant dates of arrival and departure, and such other migration data as may reasonably be inferred, in a manner similar to that previously explained (see pages 165–176. 1933).

DETAILED RECORD OF RECOVERIES FROM THE ISLES OF SHOALS, NEW HAMPSHIRE, COLONY OF JUVENILE HERRING GULLS BANDED BY J. P. MELZER AT DUCK ISLAND

Date of Banding	*Band No. of Recovery*	*Place of Recovery*	*Date of Recovery*	*Reference*	*Age of Gull Recovered*
7/ 7/29	A635164	Newport, R. I.	9/ /29	FD	1st year
"	A635058	Huckleberry Island, New Rochelle, N. Y.	11/11/31	I	3d "
"	A635029	Casco Bay, Me.	3/ /32	FD	" "
7/11/30	A676091	Plum Island, Mass.	8/27/30	I	1st "
"	A676201	Hampton Beach, N. H.	8/30/30	FD	" "
"	A676108	Ram Island, Saco River, Me.	9/10/30	FD	" "
"	A676254	Montgomery, Ala.	11/15/30	...	" "
"	A676063	New Orleans, La.	11/16/30	I	" "
"	A676111	Hacoda, Ala. (Geneva Co.)	11/20/30	K	" "
"	A676256	LaSalle Parish, La.	11/20/30	C	" "
"	A676242	Ocean Springs, Miss.	11/22/30	K	" "
"	A676075	Bay Head, N. J.	12/14/30	FD	" "
7/12/30	A602497	Ketch Harbor, N. S.	10/ 1/30	F	" "
7/13/30	A676556	Scituate, Mass.	9/19/30	FD	" "
"	A676431	Lewes Beach, Del.	12/ 4/30	FD	" "
"	A676544	Corpus Christi, Texas	12/ 9/30	C	" "
"	A676597	Everett, Mass.	1/ 1/31	F	" "
"	A676492	Campobello, N. B.	8/31/31	FD	2d "
"	A676407	Port Washington, N. Y. (Nassau Co.)	9/ 3/32	S	3d "

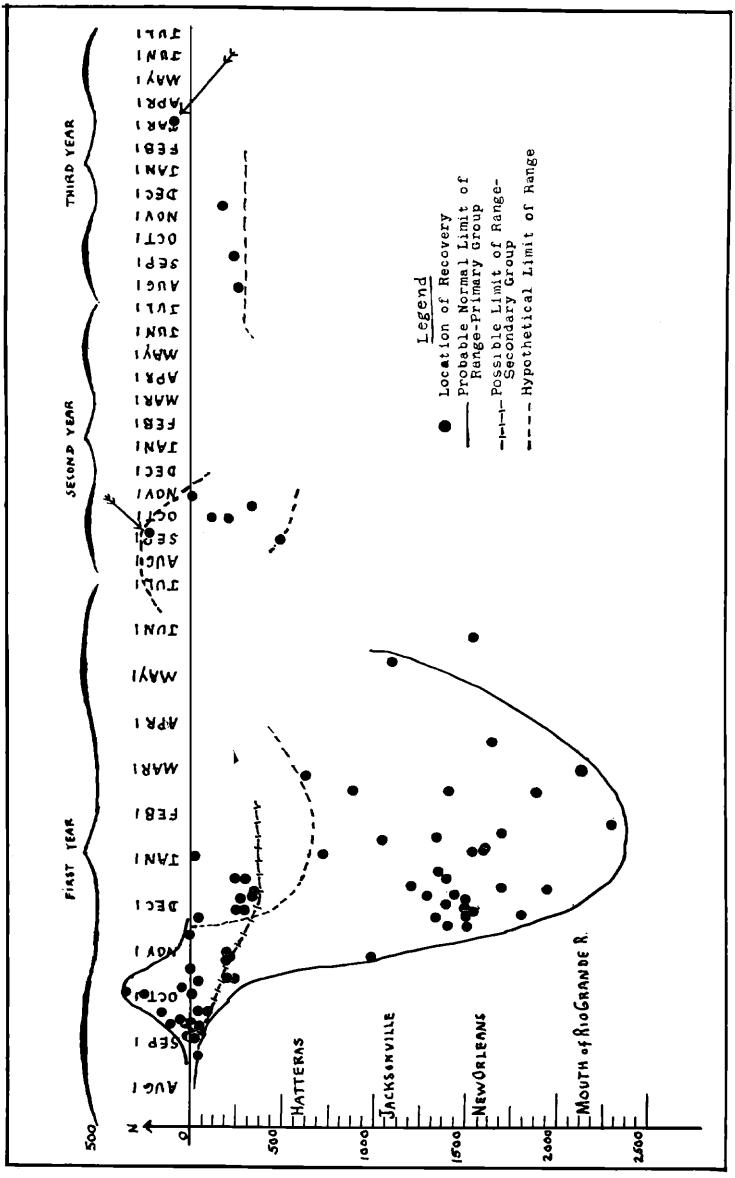

Figure 4. Graph of recoveries from the Isles of Shoals colony.

Date of Banding	*Band No. of Recovery*	*Place of Recovery*	*Date of Recovery*	*Reference*	*Age of Gull Recovered*
6/22/31	B618814	Rye Beach, N. H.	11/ 7/31	...	1st year
6/26/31	A680494	Choctawhatchee Bay, Fla. (Walton Co.)	11/30/31	...	" "
"	A680288	Stone Harbor, N. J. (Cape May Co.)	12/ 4/31	...	" "
"	A680486	Cameron Parish, La.	1/16/32	...	" "
7/10/31	A684347	Woburn, Mass.	8/19/31	K	" "
"	B610209	Androscoggin L., Leeds, Me.	9/10/31	FD	" "
"	B610240	Hampton, N. H.	9/30/31	FD	" "
"	B610054	Cape Elizabeth, Me.	10/ 3/31	FD	" "
"	B610252	Boston Harbor, Mass.	10/ 7/31	FD	" "
"	A684361	Rye Beach, N. H.	10/15/31	FD	" "
"	B610227	Barnstable, Mass.	10/21/31	FD	" "
"	A684343	Bridgeport, Conn.	10/22/31	I	" "
"	A684309	Centerville, Iowa	10/25/31	K	" "
"	A684364	St. Helena Parish, La.	11/25/31	K	" "
"	B610141	Fort Pierce, Fla.	12/ 5/31	FD	" "
"	B610358	Union Lake, Fla. (Walton Co.?)	12/ 5/31	K	" "
"	B610106	Crown Point, La. (Jefferson Co.)	12/10/31	C	" "
"	B610321	Sandy Hook, N. J.	12/15/31	FD	" "
"	B610006	Mobile, Ala., Dry Docks	12/19/31	C	" "
"	B610251	Purvis, N. C. (Robeson Co.)	1/ 1/32	K	" "
"	B610039	New Orleans, La.	1/ 4/32	FD	" "
"	B610154	St. Andrews, Fla.	1/12/32	FD	" "
"	B610234	Pontchartrain Bayou, La.	1/16/32	C	" "
"	B610342	Yonges Island, S. C.	2/12/32	K	" "
"	B610067	Lowland, N. C. (Pamlico Co.)	2/22/32	C	" "
"	B610346	Dulac, La.	3/16/32	FD	" "
"	B610377	Thomaston, Ga.	5/ 7/32	I	" "
"	B610273	Rodman's Neck, N. Y. (Jefferson Co.?)	5/29/32	FD	" "
"	B610171	Point Judith, R. I.	10/ 5/32	FD	2d "
"	B610177	Rockaway Beach, L. I., N. Y.	10/ 5/32	FD	" "
"	B610169	Brigantine, N. J.	10/16/32	...	" "
"	B610162	Rockport, Mass.	10/25/32	...	" "
"	B610058	Rye, N. Y.	7/24/33	FD	3d "
7/18/32	B610453	Plum Island, Mass.	8/30/32	FD	1st "
"	B610837	Kittery Point, Me.	9/ 1/32	FD	" "
"	B610645	Winthrop, Mass.	9/ /32	...	" "
"	B610856	Deer Island, Boston, Mass.	9/ 5/32	FD	" "
"	B610558	Salisbury, Mass.	9/ 8/32	FD	" "
"	B610541	Wallis Sands, N. H.	9/ 9/32	FD	" "
"	B610787	Lake Sebasticook, Me.	9/17/32	FD	" "
7/18/32	B610893	West St. (John?) Harbor, N. B.	9/30/32	...	1st year
"	B610940	Jones Beach, N. Y.	10/ 9/32	FD	" "
"	B610904	Wantagh, N. Y. (Nassau Co.)	10/23/32	...	" "
"	B610816	Lynn, Mass.	11/18/32	FD[2]	" "
"	B610862	Port Mammouth, N. J. (Monmouth?)	11/24/32	...	" "
"	B610894	Trenton, N. J.	11/24/32	...	" "
"	B610714	Pascagoula, Miss.	12/ 2/32	...	" "
"	B610844	Woodbury, N. J.	12/16/32	...	" "
"	B610550	Montegut, La. (Terrebonne Co.)	1/ 3/33	...	" "
"	B610514	Coahuila, Mexico	1/22/33	...	" "
"	B610905	Pensacola, Fla.	2/14/33	FD	" "
"	B610808	Fort Slocum, N. Y.	5/22/33	FD	" "
"	B610412	Gonzales, La. (Ascension Co.)	5/25/33	K	" "
"	B610781	City Island, New York City	6/17/33	C	" "
"	B610868	Seaford, Va.	8/23/33	I	2d "

[2] "Not shot or marked in any way—probably could not stand storm that we had about one week ago."

(THE FOLLOWING WERE BANDED BY MR. LEWIS O. SHELLEY)

7/18/32	B675994	Portland, Me.	9/12/32	I	1st year
"	B675928	Rye, N. Y.	9/26/32	S	" "
"	B676483	Hopetown, Abaco Island, Bahamas, B. W. I.	11/28/32	I	" "
"	B675965	New Brunswick, N. J.	12/ 4/32	FD	" "
"	B676454	Cedar Key, Fla.	12/10/32	K	" "
"	B675951	Ozark, Ala.	12/20/32	C	" "
"	B676436	Newellton, La.	12/26/32	K	" "
"	B676490	Cumberland Bar, near St. Mary's, Camden Co., Ga.	1/12/33	C	" "
"	B675996	Galveston, Texas	2/13/33	FD	" "
"	B676481	12 miles north of Port Isabel, Texas (Cameron Co.)	2/27/33	FD	" "

References: C—Caught; FD—Found dead; I—Injured; K—Killed; S—Sick.

BIDDEFORD POOL (MAINE), COLONY

The colony of Herring Gulls at Gooseberry Island, Biddeford Pool, is about ninety miles north of the Isles of Shoals. Excluding local juveniles, Mr. J. P. Melzer has supplied fifteen recovery records from this station, obtained from banding work done in 1928, 1929, and 1930. The geographical distribution of these recoveries is shown in Figure 5. The following list tabulates them in the order of age as determined by the recovery dates.

Date of Banding	*Band No. of Recovery*	*Place of Recovery*	*Date of Recovery*	*Reference*	*Age of Gull Recovered*	*Distance from Banding Station*
7/17/28	704519	Ocean City, N. J.	9/18/28	K	1st year	400-S
7/17/29	A608593	Erma, N. J.	9/24/29	K	" "	425-S
7/12/30	A676336	Tiverton, R. I.	12/12/30	FD	" "	150-S
7/17/29	A608537	Daughin Island, Ala.	1/13/30	K	" "	1550-S
"	A608520	Bay Harbor, Fla.	1/20/30	FD	" "	1400-S
"	A608501	Mayport, Fla.	1/27/30	FD	" "	1150-S
7/17/28	704520	Cedar Keys, Fla.	2/ 6/29	K	" "	1275-S
7/12/30	A676492	Campobello, N. B.	8/31/31	FD	2d "	200-N
7/17/28	704502	Long Beach, L. I.	10/ 9/29	FD	" "	250-S
7/17/29	A608589	Bronx, N. Y.	1/24/31	FD	" "	250-S
7/12/30	A676378	Barnegat Bay, N. J	1/24/32	FD	" "	300-S
7/17/29	A608595	Mouth, Savannah River, Ga.	3/29/31	FD	" "	1000-S
"	A608510	Reedy Pt. Bridge, Del.	11/18/31	FD	3d "	400-S
"	A608557	Baldwin Harbor, Long Island, N. Y.	3/20/32	FD	" "	250-S
7/17/28	704544	Beverly, Mass.	5/14/33	FD	5th "	75-S

Figures in miles. N—north, S—south.

It requires no great effort of the imagination to reconstruct the probable migration curve of this colony. By mid-September the first winter flight is under way, as shown by New Jersey recoveries on September 18th and 24th. A straggler was picked up in Rhode Island in mid-December, but we may assume that the majority have already reached the tidal flats of northern Florida and Alabama, where all four of the mid-winter records were obtained. Until evidence to the contrary

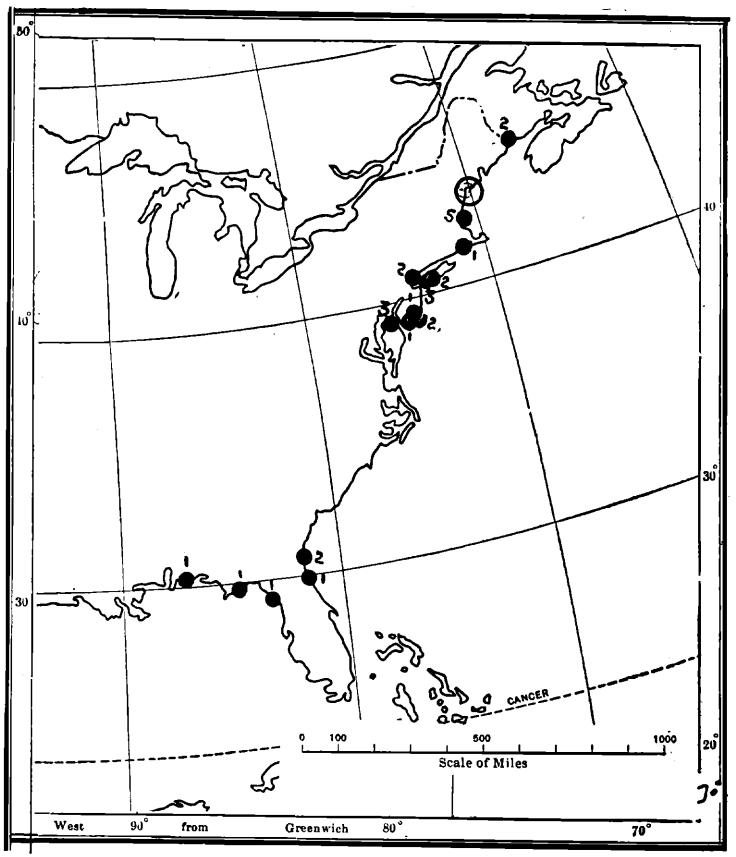

Figure 5. Map showing the distribution of recoveries from the Biddeford Pool colony. The numbers opposite the dots indicate the "year" of the recovery. The unshaded circle indicates the banding station.

is secured, it is reasonable to suppose that the center of distribution of gulls from the Biddeford Pool colony on their first winter feeding grounds lies somewhere along the northwest coast of Florida. Their migration "characteristic" is similar to that of the three colonies previously considered, but ends with the arrow-point at the most easterly location of any of them. We begin to suspect that there may be a progressive north-and-east shift of winter ranges as the breeding colonies

advance northeastward along the Atlantic Coast. More work and more data are needed for confirmation of this interesting hypothesis.

The Biddeford Pool colony has yielded an unusually high proportion of second-year recoveries. One third of the total number are in this category. In point of time, they are surprisingly well distributed. The first, at Campobello, New Brunswick, on August 31st, suggests a northward drift during the second summer. The remaining four, on October 9th, January 24th, January 24th, and March 29th, respectively, indicate a probable second-year winter range from New York to Georgia, coastwise. Considerable significance is attached to the fact that none occur on the Gulf Coast.

Of the two third-year and one fifth-year recoveries not much can be said except that the migratory instinct may still persist into the third winter. The fifth-year bird, 704544, at Beverly, Massachusetts, on May 14th, adds one more bit of evidence to the tentative hypothesis that North Atlantic Herring Gulls of breeding age normally do not occur very far south of their breeding colonies, and perhaps only accidentally south of New Jersey.

THE DUCK ISLAND (MAINE), COLONIES

Ten miles south of Northeast Harbor, Mount Desert, Maine, lie Great and Little Duck Islands exposed to the full rigors of the North Atlantic and supporting a very numerous Herring Gull population from time immemorial. Apparently, very little banding work has been done at these colonies, if we may judge from the insignificant number of recoveries obtainable from the Bureau of Biological Survey. It is particularly regrettable that we lack adequate data for constructing something more than a hypothetical migration curve. Because of the continuous history of these islands as gull rookeries, unbroken even during the ebb tide of the species at the turn of the nineteenth century, an exact knowledge of the migratory habits of these gulls might yield evidence concerning the recent ancestry of the very young colonies at Essex County and Muskeget Island.

As a matter of fact, the records of only ten recoveries have been obtained. Here is the list, arranged as previously in the order of ages:

DETAILED RECORD OF HERRING GULL RECOVERIES
FROM THE COLONIES AT GREAT AND LITTLE DUCK ISLANDS, MAINE
BANDED BY O. S. PETTINGILL AND OTHERS

Date of Banding	*Band No. of Recovery*	*Place of Recovery*	*Date of Recovery*	*Reference*	*Age of Gull Recovered*	*Distance from Banding Station*
7/16/29	A622864	Pork Island, Margate, N. J.	9/28/29	FD	1st year	450-S
7/27/29	A608043	Fairfield Beach, Conn.	9/28/29	FD	" "	325-S
"	A608060	Westport, Mass.	10/20/29	FD	" "	275-S
7/17/29	A622891	Beaufort, N. C.	11/ 1/29	FD	" "	850-S
7/19/30	A673592	Lake Gibson, Polk Co., Fla.	12/24/30	K	" "	1400-S
7/17/30	A515983	Port Jefferson, L. I., N. Y.	4/ 2/31	FD(Skel.)	" "	350-S
"	A673562	Galveston, Texas	4/25/31	FD	" "	2050-S
7/ 7/29	A622928	Fishers Island, N. Y.	6/ 8/30	K	" "	300-S
7/10/28	A622988	Bullocks Point, R. I.	12/14/29	FD	2d "	250-S
7/19/15	ABBA25386	Cape Porpoise, Conn.	8/ /20	...	5th "	300-S

Except for A673562, a first-year recovery at Galveston, Texas, on April 25th, the list, such as it is, strikingly resembles the Biddeford Pool tabulation. If we reject the Galveston record as an erratic without particular significance (and there is some justification on statistical grounds for doing so), we are led to wonder whence the young Essex County and Muskeget colonies derived their instinct to winter on the Gulf coast of Texas. Apparently no other known colonies on the New England coast or in the Maritime Provinces behave thus; and yet these two colonies are emigrants from an old fatherland somewhere. If we should take the hint offered by A673562 and interpolate a series of first-year Texas recoveries from December through March in the foregoing list, the migration curve would become indistinguishable from that of the Essex County colony. Immediately we should be tempted to conclude that the latter was an overflow from the Duck Islands. If, on the contrary, subsequent banding proves that the first-year winter range of the Duck Island gulls centers on the Carolina-Florida coast, it would seem likely that the hardy northern-bred gulls are less exacting in their choice of suitable winter resorts.

At this point the author files a plea that systematic banding work be done at this colony for at least five years, and that the Bureau at Washington be privately subsidized to carry out its necessary part in the program when called upon to do so.

THE GRAND MANAN COLONY

This colony embraces rookeries on several small islands off the large island of Grand Manan, New Brunswick, near the international boundary. Records of ten recoveries have been received from banding work done by Dr. C. W. Townsend and Mr. E. A. Joy a decade ago. For the sake of completeness the following tabulation is printed:

Date of Banding	*Band No. of Recovery*	*Place of Recovery*	*Date of Recovery*	*Reference*	*Age of Gull Recovered*	*Distance from Banding Station*
8/16/21	100646	Maces Bay, Charlotte Co., N. B.	10/18/21	I	1st year	30-N
"	100633	Jamaica Bay, L. I., N. Y.	1/ 4/22	I	" "	450-S
"	100700	Rockaway Pt., L. I., N. Y.	1/18/22	I	" "	450-S
"	100698	San Antonio Bay, Tex.	4/ 9/22	I	" "	2350-S
8/24/23	228976	Quogue, L. I., N. Y.	7/ 7/26	FD	4th "	425-S
7/14/24	312271	Cape Sable Island, N. S.	8/ /27	FD	" "	110-S
8/18/21	100696	Grand Manan, N. B.	9/10/24	FD	" "	Banding Sta.
"	100612	West Quoddy Head, Me.	Spring/26	FD	5th "	10-N
9/ 5/23	236619	Freeport, Digby Co., N. S.	9/22/30	C	8th "	40-SE
8/18/21	?	Lubec, Me.	10/—/28	?	" "	20-NW

At first sight it would appear that first-year gulls showed a tendency to remain throughout the winter along the northern coasts. The mid-October recovery at Maces Bay, New Brunswick, and the two January recoveries on Long Island, New York, are suggestive. It will be noticed that all three of these birds were found injured. Hence they may have been laggards that were forced to remain behind. Therefore the dates are without significance. The recovery of 100698 at San Antonio Bay, Texas, on April 9th proves that at least one bird reached the southwestern Gulf Coast. Much more data must be secured before we are in a position to discuss the migration curve of this colony. As a reasonable guess, we may assume that it will prove to be very similar to the Duck Island, Maine, colony, and that it is to be identified with the New England group of colonies to which belong all colonies thus far discussed.

It will be noticed that six out of the ten recoveries were adult birds in the fourth or later years, none of which were found farther south than Long Island. Five of the six adults were recovered within about one hundred miles of the rookery and one (100696) at the banding station itself on September 10th. It would be exceedingly interesting to know whether this gull had nested at its birthplace.

THE BONAVENTURE ISLAND COLONY

Mr. W. M. Duval has banded a few Herring Gulls at Bonaventure Island, Gaspé Co., Quebec, and has reported five recoveries:

Date of Banding	*Band No. of Recovery*	*Place of Recovery*	*Date of Recovery*	*Reference*	*Age of Gull Recovered*	*Distance from Banding Station*
7/25/24	313763	Economy, Colchester Co., N. S.	9/14/24	FD	1st year	200-SE
7/30/23	209571	Keansburg, N. J.	10/ 3/23	FD	" "	725-S
7/28/23	209565	Lavallette Beach, N. J.	11/22/23	F	" "	760-S
"	209563	Grand Manan Island, N. B.	1/15/25	Shot (?)	2d "	250-S
7/25/24	313770	Yarmouth Port, Mass.	2/18/30	FD (?)	6th "	525-S

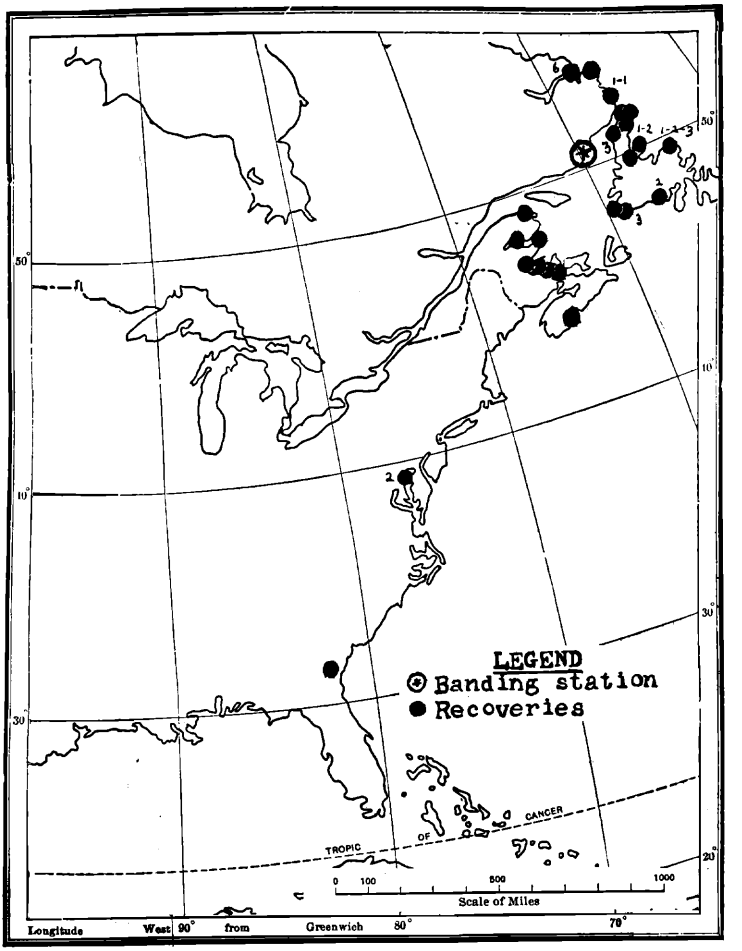

Figure 6. Map showing the distribution of recoveries from the Saginaw County, Quebec, Colonies. Numerals opposite the black dots represent the "year" or age of the recovery. Two or more numerals indicate separate recoveries from the same locality. Unnumbered black dots indicate first year gulls.

A definite southward migration of first-year immatures is indicated by the foregoing list, but the midwinter range is not yet evident. The recovery of 209565 on the coast of New Jersey in late November is inconclusive. This bird may have been a southbound straggler, ultimately destined for the Gulf Coast. The other New Jersey recovery, 209571, on October 3d, merely tends to strengthen the tentative supposition that the Bonaventure colony belongs to the same strain as the other colonies heretofore discussed.

THE SAGUENAY COUNTY, QUEBEC, COLONIES

Under this title are considered the data secured from banding work done by Dr. Harrison F. Lewis, Chief Federal Migratory Bird Officer, Ontario and Quebec, from 1923 to 1930, inclusive, at six island rookeries near the northerly shore of the Gulf of St. Lawrence about one hundred miles northeast of the easterly end of Anticosti Island. In addition, the results of banding operations in 1928 by Mr. Edmund H. Fletcher of Point Edward, Ontario, are included. Out of about 675 banded juveniles thirty-one recoveries have been reported from Washington, the latest being 657250 on October 2, 1930. The writer acknowledges with thanks the information received directly or indirectly from Dr. Lewis.

The distribution of the recoveries is shown on the accompanying map (page 14, Figure 6). With but two exceptions, every gull from this group has been recovered in the general region of the Gulf of St. Lawrence. This distribution is in striking contrast with that of the New England colonies, as for instance the Essex County colonies (see page 171, 1933, Figure 1) or the Isles of Shoals colony (see page 3, Figure 3). Judging from the map alone, we are led to infer that the Saguenay County colonies possess migratory traits conspicuously different from those heretofore discussed, despite the evidence of the two exceptions, one being a first-year bird, A701526, at Jesup, Georgia, on March 8th, and the other a second-year bird, 657201, at Fort Howard, Maryland, on May 10th. Apparently the general rule is that the gulls scatter in every direction except the west with an apparent normal limit of range bounded by southeastern Labrador, southern Nova Scotia, and the Gaspé Peninsula.

This conclusion must be accepted as probable but not final. Although the Georgia and Maryland records may reasonably be interpreted as unusual, nevertheless an analysis of the accompanying list of recoveries discloses the fact that there

are no first-winter records later than November 12th. From mid-November to March 8th there is a total blank. Thus it appears that the only evidence we possess concerning the whereabouts of first-year gulls after mid-November consists of the Georgia recovery of March 8th. The accompanying list of recoveries, arranged in the order of ages of the gulls, plainly shows the gap in the record.

In attempting to reconstruct the probable midwinter occurrence it is well to bear in mind that a continuous migration curve based on banding records is dependent on the following chain of circumstances: first, the banded gulls must die, be killed, or be caught; second, there must be satisfactory opportunity for persons to make recoveries at all seasons, wherever the gulls may happen to be; third, the finder must be sufficiently intelligent to report the recovery to Washington, and, in case he does not send the band, to read the number correctly; fourth, the number must not be garbled by the clerks, or by the mechanical tabulator, or by the author of this paper, or by the proof-reader. Even if it could be shown that the two freak (?) records resulted from error, we would still be confronted with a lack of positive evidence about the midwinter distribution of first-year birds. This very lack constitutes negative evidence of some weight when we consider the matter of opportunity. If we assume that the first-year gulls from the Saguenay colonies migrate to the Gulf States just as the New England colonies do, then we must concede that the opportunity for midwinter recoveries is identical with the latter. If so, it then becomes a matter of luck and chance whether recoveries are referable to any particular colony. Beyond a certain point the number of midwinter recoveries would be entirely dependent on the number of birds originally banded. Taking the Essex County colony for comparison, over one thousand birds were banded and the retake was fifty-five, or five per cent, eleven of which were first-year birds recovered between December 1st and February 15th, and a total of eighteen up to the following June. From the Isles of Shoals colony are listed eighty-four (4.2 per cent) retaken from about two thousand banded birds. Twenty-seven of the first-year recoveries occurred between December 1st and February 15th, and thirty-four between December 1st and June 1st. Thus the opportunity for making midwinter recoveries was sufficiently good to permit the high minimum ratios of 1 to 5 and 1 to 3. Hence, under our assumption, the Saguenay banding of 675 yielding a retake of 31 ought to

result in at least six to eight midwinter records and at least ten records from December 1st to June 1st.

As a matter of fact, the actual midwinter records of the Saguenay first-year birds are nil, and the December 1st–June 1st records consist of a single one only. It is unlikely that mere coincidence is responsible for this striking contrast. Is it not reasonable to suppose that our assumption is contrary to fact and that the midwinter range of its first-year birds is radically different from that of the other two colonies? Judging from the very numerous recoveries all along the Atlantic and Gulf seaboard, it is obvious that the opportunity factor in that region is not conspicuously low, except perhaps along the outer beaches of Virginia, North Carolina, and Florida. Hence, we are justified in believing that, by the law of chances, the normal midwinter range of the Saguenay first-years lies elsewhere. The writer considers it *probable* that their midwinter range is substantially as indicated by the actual recoveries, *viz.* the Maritime Provinces. If that is true, it is not very surprising that there are no midwinter dates, considering the severity of the long winter and the virtual cessation of shooting and fishing during that time of the year.

DETAILED RECORD OF RECOVERIES
FROM THE SAGUENAY COUNTY, QUEBEC, COLONIES

Banding Station	*Date of Banding*	*Band No. of Recovery*	*Place of Recovery*	*Date of Recovery*	*Reference*	*Age of Gule Recovered*
B	7/17/26	301357	Banding Station.....	8/ 4/26	FD	1st year
D	7/18/25	334256	Cook's Harbor, St. Barbe District, Nfd.....about	9/ 1/25	K	" "
D	7/26/27	422189	St. Mary's Island, Saguenay Co., Quebec.	9/ /27	FD	" "
B	7/20/28	657294	Spotted Islands, Lab.....	9/ 8/28	C	" "
B	"	657269	Griquet, Nfd.....	9/11/28	C	" "
B	8/ 1/29	A701619	Macatney Island, Grosse Isle, Lab.....	9/12/29	K	" "
B	7/17/25	309551	St. Anthony, No. Nfd...	9/16,25	K	" "
F	8/10/24	309437	Fogo, Nfd.....	9/20/24	K	" "
E	8/11/24	309475	8m. North Battle Harbor, Lab.....	9/21/24	C	" "
B	8/ 1/29	A701589	Near Battle Harbor, Lab.	9/23/29	K	" "
A	8/12/23	204762	Near Havre St. Pierre, Saguenay Co., Quebec.	10/ /23	Trap	" "
C	7/20/25	334326	Pearl Island, Lunenburg Co., N. S.....	10/ 6/25	C	" "
B	7/23/27	422129	Newcastle, N. B.....	10/ 6/27	K	" "
B	7/20/28	657238	Near Rose Blanche, Nfd.	10/14/28	K	" "
B	8/ 1/29	A701558	Chlorydorme, Gaspé Co., Quebec.....	10/21/29	K	" "
B	7/31/29	A701502	Kouchibouguac, Kent Co., N. B.....	10/28/29	F	" "
B	7/20/28	660463	Pigeon Hill, N. B...about	11/10/28	C	" "
B	8/ 1/29	A701559	Guegen, Kent Co., N. B..	11/12/29	C	" "
B	"	A701526	Jesup, Ga.....	3/ 8/30	K(?)	" "
B	"	A701583	Bay de Chaleur, No. N.B.	5/29/30	C	" "
B	7/23/27	422125	Shippigan Island, Gloucester Co., N. B...	6/ 2/28[4]	I	" "
B	8/ 2/26	418710	St. Bell Island, Raleigh, Nfd.....	8/24/27	K	2d "

A	8/12/23	204694	Aspen Cove, Fogo District, Nfd.	9/19/24	K	2d	year
B	7/27/27	302884	Westport, White Bay, Nfd.	9/20/28	K	"	"
B	7/17/25	309553	St. Barbe District, Nfd.	10/ 2/26	K	"	"
B	7/17/26	301546	Crole, Hermitage Bay, Nfd.	10/29/27	K	"	"
B	7/25/28	657201	Fort Howard, Md	5/10/30	FI	"	"
B	"	657250	Port aux Choix, Nfd.	10/ 2/30	K	3d	"
B	8/ 3/26	418711	Trout River, St. Barbe, W. Nfd.	1/ 1/29	K	"	"
B	7/17/25	309579	Codroy, Nfd.	4/27/28	K	"	"
E	8/11/24	309461	Georges Cove, Lab.	8/28/29	K	6th	"

Explanation of symbols designating banding station:

A—Cove Island, between Pointe au Maurier and Harrington Harbor	Lat. N. 50° 23′	Long. W. 59° 42′
B—St. Mary Islands	50° 18′	59° 38′
C—Seal Islet, near Pointe au Maurier	50° 22′	59° 48′
D—Boat Islands	50° 17′	59° 43′
E—Coacoacho	50° 12′	60° 20′
F—Fog Island	50° 10′	60° 30′

THE RED BAY, ONTARIO, COLONY

This colony is on the west side of the Bruce County peninsula between Lake Huron and Georgian Bay at about Lat. N45°45′, Long. W81° 15′. The following recoveries, all first-year birds, have been reported from banding work done by Mr. W. J. Lyon, Waukegan, Illinois, in 1929. It is regretted that further data from this interesting colony are at present unavailable.

Date of Banding	*Band No. of Recovery*	*Place of Recovery*	*Date of Recovery*	*Reference*	*Distance from Banding Station*
7/15/29	A637696	Pike Bay, Bruce Co., Ont.	8/20/29	FD	10-N
"	A637687	St. Clair Co., Mich.	9/22/29	K	150-S
"	A637560	St. Charles, Quebec (?)	9/23/29	K	430-E
"	A637682	Turkey Point, Lake Erie, Ont.	9/30/29	K	160-S
"	A637695	Montreal, Quebec	10/ 5/29	K(?)	400-E
"	A637679	New Baltimore, Mich.	10/ 5/29	FD	170-S
"	A637582	Mouth of Saginaw River, Mich.	10/19/29	K(?)	145-SW
"	A637580	Providence Bay, Ont.	11/30/29	K	70-NW
"	A637631	Stokes Bay, Ont.	12/ 1/29	C	15-N

The accompanying map on page 19, Figure 7, has been prepared to show the post-juvenile behavior of immature gulls from this colony. A definite scattering has occurred, but no southward migration is indicated. Judging by departure dates from colonies possessing the migratory trait, we may be justified in arguing that the October and November recoveries from the Red Bay colony would surely indicate any migratory tendency, should it exist. It is extremely probable that the midwinter range of first-year immatures from this colony is governed by the occurrence of open water in the lower Great Lakes' drainage system and the upper St. Lawrence River valley.

[4] Date of letter reporting the recovery.

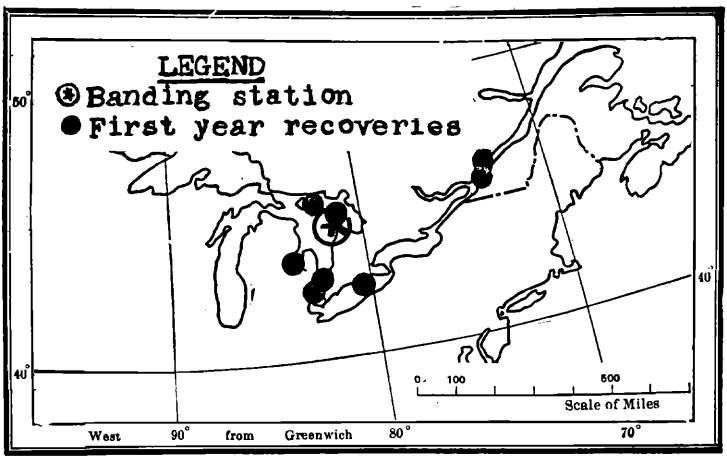

Figure 7. Map showing the distribution of recoveries from the Red Bay, Ontario, colony.

THE FOUR BROTHERS ISLAND COLONY ON LAKE CHAMPLAIN NEW YORK

Brief parenthetical mention is made of four recoveries of gulls banded at this rookery by Professor H. F. Perkins, Burlington, Vermont, on June 5, 1925.

Band No. of Recovery	*Place of Recovery*	*Date of Recovery*	*Reference*	*Distance from Banding Station*
223611	Banding Station	8/ 5/25	FD	...
223628	Gulf of St. Lawrence, 30 m. from C. Gaspé	9/19/25	K	550-NE
223616	Richelieu River, St. Hilaire, Quebec	11/ 9/25	FD	50-N
223629	Montreal Island, Quebec	11/22/25	FD	40-N

It seems quite possible that this colony ultimately will prove to belong to the same group as the Saguenay and Red Bay colonies, which for convenience is termed the Laurentian populations, thus roughly indicating the midwinter range of first-year immatures.

(*To be continued*)