

THE EIGHTH ANNUAL REPORT OF THE BOWDOIN SCIENTIFIC STATION

Bulletin No. 10 Bowdoin College, Brunswick, Maine April 1, 1947

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KENT ISLAND COMMITTEE

Albert T. Gould
Edward N. Goding
Sumner T. Pike
Alfred O. Gross

DIRECTOR

Alfred O. Gross

FIELD DIRECTORS

William A. O. Gross	1935-1938
Charles S. Ruckstuhl	1939
James W. Blunt, Jr.	1940-1941
Station closed during war	1942-1945
Raymond A. Paynter, Jr.	1946

WARDEN

Ernest A. Joy 1935-1946

THE BOWDOIN SCIENTIFIC STATION

Kent Island, Bay of Fundy

New Brunswick, Canada

THE EIGHTH ANNUAL REPORT OF THE BOWDOIN SCIENTIFIC STATION

Bowdoin College,
Brunswick, Maine,
April 1, 1947

To the President and
Trustees of Bowdoin College

Sirs:

Following is the eighth report of the Bowdoin Scientific Station at Kent Island, Bay of Fundy, New Brunswick, Canada.

The Kent Island Committee, each year has recommended the usual appropriation of five hundred dollars (\$500.00) plus cost of insurance which was approved by the Governing Boards of the College. Of this amount three hundred dollars (\$300.00) was paid each year to Mr. Ernest Joy for his services as warden. The remainder, two hundred dollars (\$200.00) was used for painting, minor repairs of buildings, payment of taxes and cost or reprints of contributions and reports of the Station. A larger appropriation by the college would enable us to provide the much needed equipment mentioned in the Field Director's report.

The death of Mr. Albert T. Gould, chairman of the Kent Island Committee of the College Boards comes as a severe blow to the Bowdoin Scientific Station. Mr. Gould always maintained an active interest in the welfare of the station and was a source of great help and encouragement. Before the war he made frequent trips to Kent Island and thus had first hand information concerning the equipment and the work being conducted there. We also regret that Mr. Edward N. Goding is no longer able to serve as a member of the College Boards. Mr. Goding has a sincere interest in the progress of the Station and we shall miss his council and advice as a member of the Kent Island Committee.

The session of the summer of 1946, the first since the beginning of the war, was very successful. The following reports bear witness to the work that was accomplished by the Bowdoin undergraduates. The work done by the students at the station is intended primarily as a training in field observation and of conducting a project and solving a particular problem on their own initiative. In this work they have had the help and encouragement of visiting scientists who were invited to the station. Last summer Dr. Robert Cunningham, Meteorologist, and Professor Lawrence B. Chapman of M.I.T., Cambridge, Massachusetts, Dr. Harvey Lovell, Biologist, University of Louisville, Louisville, Kentucky and Mr. Howard Cleaves, Naturalist, Photographer and Lecturer, Staten Island, New York contributed much to the success of the session and to them we are truly grateful.

Mr. Ray Paynter, Jr., Bowdoin '47 served as student Field Director. His work was exacting and well done. Mr. Paynter, now a graduate student at the Osborn Zoological Laboratory, Yale University, New Haven, Conn., will again serve as Field Director for the 1947 session. He has succeeded in stimulating great interest in the station and has obtained the cooperation of many business concerns in giving supplies and materials for the use of the members who will attend.

Thus far fifteen contributions of the Station have been published. Several sets of these have been bound in permanent form as Volume I of the Bowdoin Scientific Station. Four additional contributions have been accepted for publication and will appear in various journals this year.

The warden, Mr. Ernest Joy, has served us well in taking care of the station, making daily observations of birds and in helping the members of the station in many ways. Also under the supervision of Dr. Robert Cunningham, Mr. Joy has continued the meteorological observations, the results of which are included in this report.

Alfred C. Cross
for the Committee

REPORT OF FIELD DIRECTOR - 1946
(by R. A. Paynter Jr., Bowdoin, '47)

The activities of the Bowdoin Scientific Station were resumed this year for the first time since the beginning of the war. Four Bowdoin students and a number of visiting scientists experienced a very successful season.

The buildings have been recently painted and are in excellent condition and only a few relatively minor additions are needed to make the equipment complete.

A small boat with a motor is needed. At present there are two boats; a dory and a punt which adequately serve our needs in the vicinity of the island. There is however, no means by which contact can be made with Grand Manan or the Life Saving Station at Wood Island in case of much needed supplies or in the event of an emergency. A large launch is not required but a small sea worthy boat with an outboard motor would serve well.

The danger of fire is a constant menace in such an isolated locality. At present there is but one fire extinguisher for the entire island. At least ten new extinguishers are needed. A small inexpensive water pump and storage tank would be welcome additions to the equipment of the Station. At present all water has to be carried a long distance from the spring. The use of the dark room for photography and certain laboratory experiments requiring running water have been impossible.

With a permanent warden on the island it is essential that some means be provided to carry the huge quantity of wood necessary for heating during the winter months. A used automobile or truck would serve this need.

Among other needs are at least eight cot mattresses, kitchen utensils, tools for the work shop and replacements of bird houses that are now beyond repair.

In regard to personnel, I wish to suggest the number of students and investigators not exceed ten at any one time and among these at least one graduate student or professor. The stimulating influences of Dr. Gross, Dr. Lovell, Prof. Chapman and Mr. Cleaves were among the highlights of the past summer and should be continued.

I suggest that a rate of \$200.00 be charged each student for the season of eight weeks which will be sufficient to include room, board and transportation to and from Lubec at the beginning and close of the season. Visitors and part time students should provide their own transportation and be charged board on a prorated basis.

A lack of biological reference books was particularly felt. Some arrangement should be made with the College Library to borrow a number of books for the season.

Among the scientists and visitors during the summer were Dr. and Mrs. Alfred O. Gross, Bowdoin College, Brunswick, Maine; Dean and Mrs. Otis N. Minot, Harvard University, Cambridge, Massachusetts; Dr. and Mrs. Robert Cunningham M.I.T., Cambridge, Massachusetts; Prof. Lawrence B. Chapman, M.I.T., Cambridge, Massachusetts; Dr. and Mrs. Robert Harrington, University of New Hampshire, Durham, New Hampshire; Mr. and Mrs. Howard Cleaves and Mr. Henderson Cleaves, Staten Island, New York and a large number of tourists from Grand Manan at various times during the summer.

The staff was Dr. Alfred O. Gross, Bowdoin College, Brunswick, Maine, Director; Mr. R. A. Paynter, Jr., Bowdoin 47, Osborn Zoological Laboratory, Yale University, New Haven, Connecticut, Field Director; Dr. Robert Cunningham, M.I.T., Cambridge, Massachusetts, Meteorologist; Dean Otis N. Minot, Harvard University, Cambridge, Massachusetts, Radio Engineer; Albert M. Barnes, Bowdoin '49, 1125 Park Avenue, New York City, New York; James Veghte, Bowdoin, '49, Johnstown, New York and H. Elliott Winn, Bowdoin, '48, West Bridgewater, Massachusetts.

KENT ISLAND ELECTRICAL, RADIO
AND MECHANICAL EQUIPMENT
(by Otis N. Minot)

Electrical Equipment. After several days work and much improvising, we put the A.C. electrical system back in its prewar condition as nearly as possible. The main building, warden's house, generator room, and radio shack have the wiring reconnected and lights operating. About 2000 watts at 110 volts are available from the gasoline motor-generator now in use. Lights in the dark room and shop can be easily connected with the addition of some new cables or wires. Storage batteries may be charged from the D.C. part of the generator now in use. (About 20 volts available).

It seems very doubtful that the large D.C. generator can be put back in working order economically. There is no need for it at present. (Since Mr. Minot's report was written we have disposed of the old generator).

Suggestions. 1. As soon as possible, immediately preferably, a good mechanic should look over the motor of the generator now in use and put it in really good working order. If advisable, it might be taken to Grand Manan or Lubec for overhaul.

2. It would be very desirable to have a small 1000 watt portable 110 V. A.C. generator for emergencies. This might be donated by interested persons. It would permit overhaul of the larger generator without loss of power. It would also be useful in night photography.

3. Certain parts on the following List I should be ordered for the present A.C. generator. (They have been ordered and received).

4. Only competent personnel should work on the generator, motor and wiring.

Radio Equipment. For war time security all radio equipment was made inoperative. Neither the warden's nor the large amateur station transmitter are in working order or complete. The warden's transmitter-receiver is quite old and needs a few days' work and several parts. The large transmitter power supply and radio frequency section appears to be in reasonably good condition of preservation; but the modulator and receiver for the amateur station will have to be installed for operation. There is an adequate supply of most small parts and a considerable amount of tubes, cable of all sorts, earphones, jacks, hardware, also a small volt-ohm meter. The radio shack is fully weathertight and in A-1 condition. Characteristics of the warden's equipment: Transmitter frequency about 3.7 megacycles- Receiver originally 170 to 1700 kilocycles and 6 to 15 megacycles. See previous reports for details of large station's equipment.

Suggestions. 1. Radio communication with the mainland is quite desirable for emergency, trip arrangements, and warden's communication. However, the large transmitter is not practical with its high power and expense of refitting, unless radio transmitting is again a specialty; and the warden's transmitter-receiver is in poor condition.

2. We should inquire whether the Biological Station or the warden may get a transmitting permit, and at what frequencies. (The warden has been granted a permit on the prewar frequencies).

3. After getting the permit, or before if better, we should: either (a) get a transmitter-receiver, possibly as a donation or reduced in price from some company or individual interested in the station. With war surpluses this would be a strategic time. (With Mr. Minot's assistance we have been given an excellent transmitter-receiver set from General Electric). (b) Have some student who is a good amateur radioman rebuild the warden's transmitter-receiver as necessary.

4. It would be even better to get two transmitter-receivers, one for the warden at the station, and the other for Lester Tate on Grand Manan, so that trips could be more easily arranged.

5. Whoever expects to do radio work here should bring a kit of radio tools. See List II for suggestions.

Mechanical Equipment. Mechanical equipment, shop machinery, tools, etc. have suffered from wartime disuse and inevitable loss. There are enough tools for one man's handyman work, no extras. Extras should be brought by the person interested in using them otherwise loss is probable. This refers to upkeep tools.

Suggestion. A couple of students interested in getting a nice vacation with a little work might well come up for a week or so and work each morning: getting shop tools, furniture, door fittings, lanterns, etc. cleaned, fixed, oiled and working. If their transportation were given free, it would be well worth their while and also a great benefit to the station. The warden can do only so much, and anyone coming in for just a day doesn't catch anywhere near all of the troubles.

List I. Parts needed for generator (Kato Light Generator, Model 30-A, Assy. No. R 523; Write Kato Engineering Co., Mankato, Minn.) Crank 1, Pins for crank, going through crank shaft 2, Spark plugs, Champion C 7 or equivalent 2, Belt for connecting mechanism 1. If the station personnel in summer increases to warrant the expense, three storage batteries to enable self starting would be handy.

List II. Radio Kit -- Items desirable, Side cutter, long nosed pliers, insulated screwdrivers, small wrenches, solder, friction tape, 6.0 volt miniature battery for Jackson volt-Ohm meter, leads, wire for chassis wiring. If it is planned to fix the warden's transmitter, 2 audio transformers, to operate into 6 N 7 tubes should be included. Plenty of replacements for large electrolytic condensers will probably be needed. A bias cell for 6 N 7 tune and an assortment of larger dry cells may come in handy for various bench purposes. One should count on having to get more parts after getting out here and should make previous arrangements to facilitate getting necessary parts from Lubec, Maine, or St. John's, New Brunswick.

Submitted July 21, 1946, Bowdoin Scientific Station.

BIRD-BANDING

As was done during pre-war sessions the members of the station, as a part of their field work, banded birds with U.S. Fish and Wildlife Service numbered aluminum bands. The following 1,426 birds were banded during the summer of 1946: Leach's Petrel 367, Black-backed Gull 33, Herring Gull 910, Tern 9, Black Guillemot 27, Atlantic Puffin 1, Tree Swallow 7, Barn Swallow 29, Cliff Swallow 42, and Eastern Savannah Sparrow 6.

Leach's Petrel. Since banding was started at Kent Island in 1934, 2,025 Leach's Petrels have been banded of which 916 were banded on Kent Island, 457 on Southern Green, 487 on Outer Wood Island and 165 on Machias Seal Island. From these we have obtained 55 recoveries. A detailed account of these 55 recoveries and of 61 others obtained of petrels banded on the Maine coast are included in a paper, "Recoveries of Banded Leach's Petrels" published as Contribution Number 16 of the Bowdoin Scientific Station in the journal, Bird Banding. Two of the petrels were recovered last summer 12 years after banding. The latter were adults when banded and hence are 13 or more years of age, a record of longevity for this species.

Black-backed Gull. Mr. Albert M. Barnes banded 33 Black-backed Gulls as a part of his work in connection with this species. (See Barnes' report in this bulletin). On July 22, 1946 he jacked an adult Black-backed Gull at night which carried a band number 59-646703 which was banded on Kent Island as a young on June 29, 1939 by William F. Carr. The old band was removed and replaced by band Number 35-601730.

Black Guillemots. H. H. Elliott Winn banded the 27 Black Guillemots in connection with his life history study of this species. Although 125 guillemots had been banded previous to 1946 no banded birds were recovered by Mr. Winn. Thus far we have had 5 recoveries of guillemots banded on Kent Island.

Swallows. Most of these birds were banded by Mr. Ray Paynter. The Cliff Swallows both adults and young were captured at their nests in the colony located under the eaves of the work shop. The Tree Swallows were taken from the bird houses. We expect to have a series of 50 new bird houses provided with trap doors to facilitate the banding of these birds. This would serve as an excellent project for some member of the station next season.

Herring Gull. The banding of Herring Gulls has been a major project at Kent Island since 1934 and was continued even during the war years by the warden and the director of the station. During the past 12 years the various cooperators and their assistants have banded 37,502 Herring Gulls of which 35,170 were young and 2,132 were adults. From these we have obtained 1,437 recoveries of which 1,252 have been reported in bulletins of the past and 185 are reported in the present issue. An analysis of 773 returns received up to the end of the year 1939 was presented in a paper, "The Migration of Kent Island Gulls" contribution number 7 of the Bowdoin Scientific Station published in *Bird Banding*, 11 (4): 129-155. Hustace H. Poor in a paper "Color-banded Adult Herring Gulls" contribution number 11 of the station has included all the sight records of adult Herring Gulls banded with colored bands at Kent Island. *Bird Banding*, 15 (3): 112-114. Mr. Ray Paynter, Jr. has prepared a paper, "The Fate of Banded Kent Island Gulls" based on the reports of 1,252 recoveries of gulls received up to December 31, 1945. This paper will be contribution number 17 of the Station to be published in *Bird Banding*. Mr. Paynter with the assistance of the other members of the station was responsible for the 910 Herring Gulls banded during the season of 1946. The 497 adults were captured by the method of jacking the birds with flash lights at night. This work also yielded 24 recoveries including some good longevity records. (See list of recoveries).

Herring Gulls Banded

1934 - 1946

<u>Bander in Charge</u>	<u>Year</u>	<u>Young</u>	<u>Number of Gulls Banded</u>	
			<u>Adults</u>	<u>Total</u>
F. B. Whitman, Jr.	1934-35	2,248	--	2,248
J. A. Crystal	1935	6,754	50	6,804
J. A. Crystal	1936	7,600	400	8,000
N. R. Pillsbury, Jr.	1937	4,651	200	4,851
C. S. Brand	1938	3,059	720	3,779
I. H. Spear	1939	3,000	110	3,110
E. A. Joy	1940	300	--	300
I. M. Spear	1941	1,300	155	1,455
E. A. Joy	1942	687	--	687
A. O. Gross	1943	2,258	--	2,258
A. O. Gross	1944	2,000	--	2,000
A. O. Gross	1945	400	--	400
R. A. Paynter	1946	413	497	910
Twelve-year Totals		<u>35,170</u>	<u>2,132</u>	<u>37,302</u>

RECOVERIES OF HERRING GULLS Banded AT KENT ISLAND
NOT PREVIOUSLY REPORTED

Number	Banded	Recovered	Place of Recovery	How Recovered
B-624891	7-25-34	Aug.-38	Westport, Nova Scotia	Found
34-629082	7-30-34	12-3-43	Hingham, Massachusetts	Found hurt
35-532025	8-9-35	7-21-46	<u>Kent Island, N.B.</u>	Jacked, released
35-532384	8-9-35	7-21-46	<u>Kent Island, N.B.</u>	Jacked, released
35-548040	8-1-35	12-2-43	Bronx, New York	Found dead
35-549936	7-22-35	2-11-45	Long Island, New York	Found dead
35-549162	7-22-35	7-12-46	<u>Kent Island, N.B.</u>	Shot, found dead
35-550867	8-10-35	3-27-46	Saint Andrews, N.B.	Killed
35-551485	8-1-35	6-20-46	<u>Kent Island, N.B.</u>	Found dead, Cause?
35-551926	8-1-35	11-1-43	Suffolk County, N.Y.	Found dead
35-552418	7-29-35	7-22-46	<u>Kent Island, N.B.</u>	Jacked, released
35-552641	7-29-35	12-12-46	Point Pleasant, N.J.	Found dead
35-553928	7-30-35	7-23-46	<u>Kent Island, N.B.</u>	Jacked, released
35-555865	8-25-35	7-20-46	<u>Kent Island, N.B.</u>	Jacked, released
35-556022	8-26-35	4-15-45	Powder Pt., Duxbury, Mass.	Found dead
35-556432	8-27-35	11-21-43	Wollaston, Mass.	Found dead
35-556504	7-16-38	10-5-46	Idelwild, Queens Co., N.Y.	Found dead
35-556639	8-27-35	2-27-46	Staten Island, N.Y.	Found dead
35-556953	8-29-35	6-26-46	<u>Kent Island, N.B.</u>	Found dead, Cause?
35-557249	8-2-38	9-13-44	Lubec, Maine	Found dead
35-557270	8-4-38	7-15-46	Brighton, Nova Scotia	Found dead
35-557299	8-2-38	8-31-43	Westport, Michigan	Band taken
35-557432	8-9-36	10-23-44	Brooklyn, New York	Found dead
35-557874	7-9-35	6-24-46	<u>Kent Island, N.B.</u>	Found dead, cause?
35-601933	7-23-41	1-15-44	North River, New York	Found dead
35-601938	7-23-41	4-26-44	Smith's Point, Virginia	Found in net
35-653392	7-11-37	7-31-44	Bay of Fundy, N.S.	Caught in fish net
36-641236	7-9-43	2-15-44	Berwick, Louisiana	Caught muskrat trap
36-641978	7-27-36	3-1-45	<u>Kent Island, N.B.</u>	Wing broken
36-642036	7-26-36	6-28-45	<u>Kent Island, N.B.</u>	Collected
36-642279	7-26-36	8-16-44	Victoria Beach, N.S.	Band removed
36-642576	7-26-36	7-22-46	<u>Kent Island, N.B.</u>	Jacked, released
36-643881	7-26-36	7-22-46	<u>Kent Island, N.B.</u>	Jacked, released
36-643925	7-26-36	12-19-43	Ocean City, N.J.	Found dead
36-644034	7-30-36	12-26-44	Poplar Branch, N. Carolina	Found dead
36-644607	7-30-36	7-22-46	<u>Kent Island, N.B.</u>	Jacked, released
36-645025	7-30-36	Fall-43	Hampton, N.H.	Found dead, shot
36-646180	8-6-36	5-30-46	Hart's Island, N.Y.	Killed
36-647099	8-11-36	12-8-45	Jamaica Bay, Queen's C. N.Y.	Shot
36-647156	8-11-36	7-21-46	<u>Kent Island, N.B.</u>	Jacked, released
36-647598	8-11-36	2-20-45	Winthrop, Mass.	Found dead
36-649009	7-9-43	11-20-46	<u>Kent Island, N.B.</u>	Alive, wing broken
36-649206	8-8-40	1-23-46	Tiverton, Digby Co., N.S.	No information
36-649238	8-8-40	12-21-44	Colombia Id., New York	Found dead
36-649266	8-8-40	7-22-46	<u>Kent Island, N.B.</u>	Jacked released
36-649351	8-9-40	11-2-45	Long Beach, New Jersey	Found dead
36-649415	8-9-40	4-16-46	Little Brook, Digby Co., N.S.	Found Dead
36-649432	8-9-40	7-21-46	<u>Kent Island, N.B.</u>	Jacked released
36-649828	8-13-36	2-6-44	Stamford, Conn.	Found dead
36-649886	8-12-40	7-21-46	<u>Kent Island, N.B.</u>	Jacked released
36-650216	7-9-43	10-10-43	Port au Port, Nfld.	Wing broken

Number	Banded	Recovered	Place of Recovery	How recovered
36-650309	8-20-42	10-15-44	Bronx, New York	Found dead
36-650401	7-31-43	11-23-43	Little Creek, Virginia	Found dead
36-650423	7-31-43	3-16-44	Carolina Beach, N.C.	Band found
36-650431	7-31-43	9-20-44	Dorchester, Mass.	Found dead
36-650437	7-31-43	10-1-44	Brooklin, Maine	Found dead
36-650473	7-31-43	9-21-45	Little Bay, Newfoundland	Caught
36-650518	7-26-41	7-21-46	Kent Island, N.B.	Jacked, released
36-650542	7-26-41	7-22-46	Kent Island, N.B.	Jacked, released
36-650588	7-26-41	7-22-46	Kent Island, N.B.	Jacked, released
36-650591	7-26-41	3-2-46	Rockaway Pt., L.I., N.Y.	Killed
36-650655	7-28-43	7-14-44	Jamestown, Rhode Island	Found dead
36-650733	7-31-43	Oct.-44	Squanton, Mass	Killed by airplane
36-650783	7-31-43	4-22-44	Long Island, New York	Found dead
36-650801	7-31-43	3-4-44	Port Arkansas, Texas	Found wounded
36-650859	7-31-43	March-44	Long Island, New York	Found injured
36-650878	7-31-43	Fall-43	Truro, Nova Scotia	Shot
36-650893	7-31-43	12-9-43	Milford, Conn.	Found dead
36-650921	7-31-43	8-26-46	Eastport, Maine	Injured
36-650924	7-31-43	7-21-44	Reversing Falls, N.S.	Found
36-650971	7-31-43	10-15-43	Staten Island, New York	Found dead
36-650981	7-31-43	6-27-45	Quincy, Mass.	Killed by storm
36-650988	7-31-43	8-14-44	Shelborne Co., N.S.	Found
37-653170	7-10-37	3-23-44	Cape Henry, Virginia	Found dead
37-646968	8-20-42	10-30-42	Harvey Cedars, N.J.	Killed by oil
37-655117	7-19-37	7-31-44	Bay of Fundy, N.S.	Caught, fishing gear
37-655272	7-19-37	10-8-44	Brooklyn, New York	Found exhausted
37-655304	7-19-37	7-27-46	Kent Island, N.B.	Found dead, cause?
37-655439	7-19-37	9-26-46	Eastport, Maine	Lead in scoot bin
37-656804	7-21-37	?	Allenwood, New Jersey	Found dead
37-657132	8-27-37	10-12-45	Gilbert's Cove, N.S.	Found dead
37-657134	8-27-37	5-20-46	St. Mary's Bay, N.S.	Found dead
37-657681	8-28-37	2-12-45	Woodstown, New Jersey	Found dead
37-664842	8-20-42	11-25-44	Pelham Bay, New York	Found dead
37-664874	8-20-42	9-13-44	Green Harbor, Mass.	Found dead
38-660465	7-21-41	8-12-44	Nantucket Id., Mass	Band on leg bone
38-666234	7-28-42	3-17-45	New Dorp Beach, Staten Id, N.Y.	Found dead
38-666469	7-28-42	9-1-43	Panama City, Florida	Caught
38-667935	7-21-41	Fall-45	Solomons, Maryland	Found
38-669696	7-28-38	7-25-44	Campobello Id., N.B.	No information
38-670005	8-1-38	6-2-44	Freeport, Nova Scotia	Found dead
38-670077	8-1-44	9-16-44	North Truro, Mass.	Found dead
38-670086	8-13-38	10-4-46	St. Andrews, N.B.	Found dead
38-670222	8-1-38	7-22-46	Kent Island, N.B.	Jacked, released
38-670487	8-2-38	6-23-46	Kent Island, N.B.	Found dead
38-670528	8-2-38	12-23-43	Manhattan College, N.Y.	Found dead
38-670799	8-3-38	7-9-45	Digby Gap, Bay of Fundy, N.S.	Found dead
38-670897	8-24-38	7-22-46	Kent Island, N.B.	Jacked, released
38-671731	7-24-38	1-29-44	Wading River, New York	Dead
38-672177	8-12-38	10-29-43	Yarmouth, Mass.	Shot
38-672386	8-27-38	11-9-46	Bluehill Bay, Blue Hill, Me.	Found
38-672519	8-14-36	3-17-44	Atlantic Beach, L.I., N.Y.	Found dead
38-672681	7-1-41	11-8-41	Bailey's Island, Maine	Shot
38-672893	8-11-41	2-1-46	Gamarcu Bay, N.Y.	Died
38-672977	7-11-43	10-9-43	Cape Henlopen, Delaware	Found dead
39-654605	7-21-41	6-17-46	Kent Island, N.B.	Found dead cause?
39-654670	7-21-41	2-26-44	Winthrop, Mass.	Found dead.

Number	Banded	Recovered	Place of Recovery	How Recovered
39-651922	7-15-41	1-20-44	Red Banks, New Jersey	Found dead
39-651929	7-15-41	Sept.-42	Brookline, Maine	Found
39-658536	7-17-39	?	Newport, Rhode Island	Found dead
39-658801	7-17-39	6-19-44	Campobello Id., N.B.	Broken wing
39-658978	7-17-39	8-14-44	Meteghan Centre, N.S.	Caught, fish net
39-658562	7-17-39	7-22-46	Kent Island, N.B.	Jacked, released
39-658979	7-17-39	7-21-46	Kent Island, N.B.	Jacked, released
39-658992	7-17-39	7-21-46	Kent Island, N.B.	Jacked, released
39-659072	7-18-39	7-21-46	Kent Island, N.B.	Jacked, released
39-659437	7-19-39	Dec.-44	Atlantic, New Jersey	Found dead
39-659561	7-1-39	12-28-45	Somers Point, New Jersey	Found dead
39-659844	7-23-39	8-26-46	Yarmouth, Nova Scotia	In Herring Net
39-659917	7-24-39	10-10-46	Wheehawken, New Jersey	Dead on pier 5
39-659931	7-24-39	10-2-43	Jones Beach, L.I., N.Y.	Injured
39-659986	7-24-38	7-22-46	Kent Island, N.B.	Jacked, released
39-630030	7-26-39	11-3-45	Key Port, New Jersey	Injured wing
39-660192	7-26-39	3-21-45	East Providence, R.I.	Found dead
39-660533	7-28-39	11-21-45	St. John County, N.B.	Killed
39-661253	7-30-39	8-13-43	Pelham Bay, New York City	Found dead
39-661266	7-30-39	12-19-43	Bayville, L.I., N.Y.	Found dead
39-661358	7-31-39	9-30-39	Yarmouth Co., N.S.	Shot
39-661548	8-9-39	7-22-46	Kent Island, N.B.	Jacked, released
39-661566	8-11-39	11-18-44	Bronx, New York	Found dead
39-661578	8-25-39	1-12-46	Port Washington, L.I., N.Y.	Found dead
39-661763	7-21-41	12-1-45	Eastville, Virginia	Broken wing
39-661766	7-121-41	7-22-46	Kent Island, N.B.	Jacked, released
39-661845	7-15-41	3-2-44	Savannah, Georgia	Shot
39-661855	7-15-41	12-27-45	Staten Island, New York	Found dead
39-661968	7-15-41	Sun.-44	Battcau, Labrador	Found
39-661898	7-15-41	Sun.-46	Hilsburn, Nova Scotia	Found dead
39-661993	7-21-41	7-22-46	Kent Island, N.B.	Jacked, released
39-662024	7-17-43	8-5-44	Friendship, Maine	Found dead
39-662153	7-12-43	3-26-44	Morehead City, N.C.	Found dead
39-662258	7-16-43	4-10-44	Norfolk, Virginia	Found dead
39-662316	7-17-43	8-7-44	Orient, L.I., N.Y.	Found dead
39-662369	7-17-43	12-29-45	Guyer Ave., Philadelphia, Pa.	Injured
39-662459	7-17-43	4-?-44	Galveston, Texas	Found dead
39-662465	7-17-43	10-20-43	Charleston, S.C.	Killed by airplane
39-662628	7-16-43	9-17-43	Brooklyn, New York	Died at S.P.C.A.
39-662669	7-16-43	2-22-45	Middle Marsh, N.C.	Found dead
39-662682	7-16-43	?	Rockaway Beach, N.Y.	Found dead
39-662720	7-28-43	7-8-44	Toledo, Ohio	Found dead
39-662956	7-12-43	Sept.-43	Blacks Harbor, N.B.	Found dead
39-662984	7-12-43	5-22-44	Atlantic City, N.J.	Band found
39-662994	7-12-43	11-15-43	Staten Island, N.Y.	Found dead
42-639058	7-14-44	11-8-44	Medford, Mass.	Found dead
42-649095	7-14-44	9-25-44	Phillips Harbor, N.S.	Caught on trawl
42-639112	7-30-44	7-30-45	Little Bay, Ft. Lotten, N.Y.	Found dead
42-639119	7-30-44	3-21-45	Daytona Beach, Florida	Found dead
42-639303	7-26-44	2-2-45	Key West, Florida	Found dead
42-639310	7-26-44	11-23-44	Cordele, Georgia	Shot
42-639314	7-26-44	2-6-45	Lake Pontchartrain, La.	Unable to fly
42-639437	7-30-44	9-15-44	Bruce, Nova Scotia	Found alive
42-639550	7-25-44	9-6-45	Jonesport, Maine	Injured
42-639633	7-25-44	7-9-45	Southwest Harbor, Maine	Found dead

Number	Banded	Recovered	Place of Recovery	How Recovered
42-653617	7-25-44	8-25-46	Chester, Nova Scotia	Found dead
42-659673	7-25-44	5-27-45	Coffee Springs, Alabama	Killed
42-659696	7-25-44	6-24-45	Mandia's pier, Staten Id., N.Y.	Found dead
42-659725	7-25-44	5-19-46	Milton, Mass.	Found dead
42-659739	7-25-44	1-2-46	Huntington, L.I., N.Y.	Killed by dog
42-659817	7-25-44	2-12-45	Pensacola, Florida	Found dead
42-659824	7-25-44	1-13-45	St. Petersburg, Florida	Found dead
42-659868	7-25-44	11-4-44	Bridgeport, Conn.	Found dead
42-659873	7-25-44	5-15-45	West Brentwood, L.I., N.Y.	Collected
42-67 929	7-25-44	8-15-46	Boston Harbor, Mass.	Found dead
42-640022	7-24-44	10-26-44	Cliff Island, Maine	Found dead
42-640024	7-24-44	7-20-45	Glen Cove, L.I., N.Y.	Found dead
42-640296	7-24-44	3-2-45	Morehead City, N.C.	Found dead
42-640308	7-24-44	9-28-44	Bath, Maine	Found dead
42-640400	7-24-44	5-11-45	Galveston Bay, Texas	Found dead
42-640472	7-24-44	3-29-45	Pensacola, Florida	Found dead
42-640656	7-30-44	8-30-44?	Lost Lake, Guy's Co., N.S.	Found dead
42-640748	7-29-44	12-31-44	Rock Hall, Maryland	Shot
42-640926	7-26-44	Mar.-46	Pleasant Bay, Orleans, Mass.	Killed by eagle
42-655315	8-24-45	9-21-46	Lowallette, New Jersey	Recovered
44-618015	?	7-19-46	Starboard, Maine	Found dead
44-618500	7-22-46	8-21-46	Salem, Mass.	Found dead
44-621974	7-15-46	12-23-46	Newport News, Virginia	Found dead

Mr. Ernest Joy recorded the following dates of the arrival and nesting activities of the Herring Gulls at Kent Island 1938-46.

Year	1938	1939	1940	1941	1942	1943	1944	1945	1946
First seen off island	2/17	2/28	2/27	2/23	2/28	2/12	2/22	2/11	2/12
First to alight on trees of Id.	3/20	3/18	3/18	3/8	3/13	3/2	3/8	3/8	3/4
Nesting started	4/19	4/7	4/10	3/25	4/6	3/29	3/11	3/31	3/27
Mating first observed	---	5/9	5/9	4/4	5/1	5/8	4/29	4/11	4/28
First egg found	5/15	5/17	5/14	5/7	5/11	5/17	5/9	5/13	5/14

Time required to complete laying of a clutch of 3 eggs, 1939-1940.

	First egg	Second egg	Third egg	Days required
1939				
Nest 1	May 17	May 19	May 21	5
Nest 2	May 17	May 19	May 22	6
Nest 3	May 25	May 27	May 29	5
1940				
Nest 1	May 14	May 16	May 18	5
Nest 2	May 15	May 17	May 20	6

PRELIMINARY REPORT ON THE EFFECTS OF EGGING ON THE
CLUTCH SIZE OF KENT ISLAND HERRING GULLS
(by Raymond A. Paynter, Jr., Bowdoin, '47)

One of the many objectives of my work this past summer was to study the effects of "egging" on the clutch size of Kent Island Herring Gulls (Larus argentatus smithsonianus). In a study of this kind the work of one season does not provide sufficient evidence on which to base definite conclusions. Seasonal, cyclic and other variations make it necessary to continue the investigation over a period of years. Therefore, this is merely a preliminary report and all conclusions are to be regarded as purely tentative. No attempt will be made to present a detailed analysis of the data at this time.

For many years the people of the Maritime Provinces have gathered Herring Gull eggs for food from the beginning of the nesting season until the end of June. The eggs are gathered daily, to insure freshness, and preserved in water-glass for winter use. Removing the eggs before the sets can be completed causes the gulls to continue laying well past their normal nesting season. Dr. Ivan M. Spear (1942) found that as many as 12 eggs were laid by a single gull when constantly robbed. When egging is terminated at the end of June, the gulls are able to raise a brood of young undisturbed and supposedly maintain their population.

With the establishment of Kent Island as a sanctuary in 1936 egging, of course was not permitted, but to cut off such a valuable food supply completely would cause the displeasure of the local people whose goodwill is very important to the station. Therefore, each year the northern end of the island is opened for egging until the end of June. This portion of the colony consists of about one thousand gulls while the southern end has a population of nearly thirty thousand. Even if a thousand gulls failed to rear a single young it would not seriously affect our gull population.

On July 15th, 15 days after egging ceased, a census was taken of the 65 most conspicuous nests at the northern section of the island. We may be reasonably certain these nests were egged regularly since seldom does a nest escape the thorough search of the egging parties.

Dr. J. W. Blunt (1942) and Dr. Ivan M. Spear (1942) have shown that the gonads of the males, whose nests are constantly robbed, cease functioning about July 15 and those of the females shortly thereafter. If this date is fairly constant it is safe to assume the census represents the total number of eggs laid from July first through the end of the nesting year. I found 12 nests with 3 eggs, 13 nests with 2 eggs, 7 nests with one egg and 28 nests with no eggs. This is a total of 65 nests with 85 eggs, or an average of 1.3 eggs per nest.

In discussing clutch size, Dr Townsend in A. C. Bent (1921) states: "Three eggs constitute a set, although the number is sometimes only two, and in very rare cases one or four." A. O. Gross (1940) gives an average of 1.93 eggs which is based on the work of a student at Kent Island. Information gathered since 1940 by Dr. Gross at Kent Island and along the Maine coast indicates the correct figure to be 2.5 eggs per nest. It is clearly seen that the figure of 1.3 eggs per nest is too low to maintain a stable population, which field evidence indicates is true at Kent Island.

It therefore may be concluded, if this past summer was normal in regard to weather, cyclic influences, etc., that eggging will reduce the Herring Gull population if carried on with equal intensity over an extended area.

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METEOROLOGY

(by Robert M. Cunningham, Massachusetts Institute of Technology.)

Mr. Ernest Joy has continued to take weather observations on Kent Island three times a day, except for a few weeks in the summer of 1944 and 1946 during visits by the author. Mr. R. A. Paynter Jr. took some of the July 1946 observations.

The basic weather equipment has not changed during the last four years. This equipment consists of standard U.S. Weather Bureau Max, and Min. thermometers and a sling psychrometer exposed in two small Stevenson screens, a Stewart wind vane and anemometer exposed about 25 feet above ground, and an eight inch rain gauge which is exposed in the center of the quadrangle of the station buildings (80 ft. from each building). A shield of the Mt. Washington type (built by the Stewart Instrument Company) was added to the rain gauge in June 1941.

For many years intermittent records have been obtained from a thermograph and hygrograph loaned to us by the Harvard Blue Hill Meteorological Observatory. The clocks in these instruments had to be repaired a number of times; apparently the hair springs in the clocks did not last in the salt laden air of the Island. The last records with these instruments were obtained in the spring of 1944.

A modern well sealed thermohygrograph would be a very valuable addition to the Island's meteorological instrumentation.

On Nov. 4, 1945, while Mr. Joy was oiling the Stewart anemometer, the guywires broke and Mr. Joy, pole, and wind instruments fell off the roof of the administration building. Although Mr. Joy did not recover completely from this bad fall for a good number of months, he continued to take weather records without any interruption.

The wind equipment was reinstalled in July 1946. A direct reading wind velocity instrument, running from the Stewart anemometer, was also installed; it was modeled after one described by Middleton in "Meteorological Instruments" 1943, p. 133, fig. 91. There are two scales, 0-50 mph, or 0-100 mph, which can be used on this instrument. By switching from one circuit with a long time constant to another with a shorter time constant either a one minute average wind velocity or a five second gust velocity can be obtained. Another added feature is an adjustment for the changing battery voltage.

Observations continued on a schedule similar to that given in the last bulletin (No. 9). This schedule was:

		A.S.T.	
March through April	8:10 A.M.	5:10 P.M.	8:10 P.M.
May through August	"	"	"
Sept. through October	"	5:10 P.M.	"
Nov. through Feb.	"	4:10 P.M.	"

The afternoon observation was kept as near to sunset as possible. The 8:10 P.M. observation did not include temperature or precipitation readings (except in summer).

The following Tables 1 and 2 include precipitation data only. Summaries of the other observed elements will be presented in the next bulletin.

Ten years of weather records from Kent Island have now been collected (1937-1946). Some data for 1935 and 1936 are available, but only for scattered months. A five year summary was given in bulletin No. 8 (April 1942), but the precipitation data were not averaged since five years is too short a period. Ten years of precipitation records, although still too short a time for accurate averages, is long enough to be useful. Table 1 gives monthly values of precipitation and related quantities for the years unreported in previous bulletins. Table 2 gives the average values for ten years of monthly and annual precipitation and days with precipitation. The table also gives the eight year averages for snowfall and the number of days of snow.

Note should be made of the seasonal variation of precipitation totals at Kent Island. The averages for the four seasons are: winter 9.66", spring 13.23", summer 11.35", autumn 14.86". The spring and autumn maxima are probably due to the increased number of strong coastal storms during these seasons and in the autumn also to the occasional hurricane that passes along the coast. The coastal storminess is just as active in the winter as in the spring and fall, but the storms (perhaps particularly in the last ten years) may pass further off shore, - Halifax's maximum monthly precipitation occurs in January. The summer minimum is undoubtedly due to the lack of severe local showers and thunderstorms which make this season the wettest inland.

Note should also be made of the high annual total precipitation in comparison with the neighboring stations. The total is close to Yarmouth's and Machias' 45.4"; Eastport, Maine, however, has a yearly average of only 35.5". This discrepancy is probably largely due to the poor location of the rain gauge at Eastport (on top of a tower like building), and not any real geographic variation of rainfall.

Some of the large monthly totals shown in the snowfall record of Kent Island are remarkable. These arise from a few storms which apparently deposit a great deal more snow than falls on inland points. This snow, however, does not last long

on the Island, it is usually blown off almost completely from the open parts of the Island. The storm of Feb. 25, 1946 illustrates the erratic nature of the snow depths observations on the Island. Some 45 inches of snow fell in 16 hours (3.85" melted snow recorded in rain gauge) with NE winds of 40 to 45 mph. 8 3/4 foot banks of snow were measured in the woods to the west of the station. During the night of the 25th to the 26th the wind was NW 30 mph and temperature 10° F. By 8 A.M. on the 26th only patches of snow remained on the open fields of the Island! The large number of inches of snowfall recorded in some months in Table 1 should therefore not be taken as an indication that the snowdepths on the Island are great. In fact the open stretches on the Island (most of the southern half of the Island is fairly open) are generally free of snow all winter. This fact has probably some influence on the plant life of these regions. The woods of the Island, on the other hand, have considerably more snowcover all winter. It might be of interest to establish a snow stake in the woods to the west of the meteorological station if the botanists thought it worth while.

The most important weather occurrence in the last four years was the passage within about 20 miles of the strong hurricane of Sept. 15, 1944. The marine section of the U.S. Weather Bureau asked for whatever Kent Island weather data the author had on this storm. The following is a quotation from the reply to the Weather Bureau: . . . "Besides the formal records taken on the Island, the observer, Mr. Ernest Joy, reports that the sea swell during the storm was the heaviest he can remember. A heavy swell began on the morning of the 12th. Reports from Seal Cove, Grand Manan Island, indicate that during the height of the storm the height of the swell increased suddenly and apparently most of the sea damage was caused by one single sea swell that was far higher than the rest. This was not noticed on Kent Island.

The air pressure was only observed at 8:10 A.M. so no minimum reading can be reported. Likewise, the wind velocity was not recorded at any other time but 8:10 A.M., but if the wind had been appreciably higher at some other time some remarks to that effect would have been made. Mr. Joy was much impressed by the lack of any strong N.W. winds after the wind had shifted. He stated that the wind was only gentle to moderate NW after 10:30 A.M. and that if there had been a strong NW wind considerably more damage would have occurred. No damage occurred on Kent Island, the sea only reaching to the edge of the grass land. However, considerable sea swell damage occurred on Gannet Rock light four miles south of Kent Island. The swell broke on the light house and washed away some of the buildings.

Mr. Joy reported many strange birds around the Island after the storm. He obtained specimens of some. When I visited the Island the last week in September, there were still a great number of Laughing Gulls slowly starving to death around the islands.

The temperature at the passage of the storm was remarkably high for Kent Island. In fact the maximum temperature recorded for the 15th, 76°F., is the highest temperature record (measurements began in 1937) for the month of September. The highest temperature on record for any month is 79° F. (1936-1944).

The wind shifted through the south both on Kent Island and on Grand Manan with dense, warm fog during the period of light winds". . . .

Some of the Kent Island observations for 8:10 A.M. and 5:10 P.M. on the 15th were

	8:10 A.M.	5:10 P.M.
Barometer	29.07	29.76
Temperature	60	66
Wind	SE 55	NW 9
Visibility (code)	4	8
Sea cond. (code)	3	7
Precipitation	.72	.08
Weather	Heavy rain	-
Sky	obscured	breaks
Clouds	-	Strato-cumulus

As stated previously summaries of the weather elements other than precipitation will be presented in the next bulletin.

It is hoped that Mr. Joy will continue to take the weather observations and that during the summer other members of the station will also learn to take the observations. Many subjects of interest could be investigated which involve the relationship of weather, climate, and microclimate of the Island to other fields such as botany, ornithology, etc.

Table 1

MONTHLY PRECIPITATION DATA FOR THE YEARS 1943 - 1946 Inclusive.

		JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY
Precipitation in inches	'43	1.95	5.24	5.14	3.92	6.12	7.11	7.28
	'44	1.39	3.23	4.00	3.75	0.55	6.87	2.40
	'45	4.85	3.64	4.00	5.27	11.75	7.66	8.43
	'46	3.75	8.67	2.63	5.82	5.97	1.78	1.89
Days with .01 or more	'43	15	12	13	16	14	17	20
	'44	8	12	11	10	4	14	10
	'45	16	9	14	12	13	14	9
	'46	15	12	7	14	14	10	12
Days with .25 or more	'43	1	9	6	8	8	10	3
	'44	1	4	7	5	1	3	3
	'45	10	6	4	8	10	8	4
	'46	5	8	3	8	9	2	2
Snowfall in inches	'43	12	19	13	5	0	0	0
	'44	10	46	2	T	0	0	0
	'45	10	6	6	0	T	0	0
	'46	12	58	1	26	0	0	0
Days with snow	'43	11	8	7	6	0	0	0
	'44	3	10	4	2	0	0	0
	'45	15	7	5	0	2	0	0
	'46	10	9	1	7	0	0	0
Precipitation in inches		Aug.	Sept.	Oct.	Nov.	Dec.	Annual Ave.	
	'43	8.73	4.54	8.25	8.30	1.78	68.36	
	'44	0.99	5.86	7.23	6.99	4.77	48.03	
	'45	1.72	(2.07)	(6.57)	4.88	3.73	64.37	
	'46	4.36	1.79	4.62	2.44	6.49	50.21	

Days with	'43	14	14	17	15	11	178
.01 or more	'44	5	15	11	12	13	125
	'45	9	(11)	(16)	15	12	150
	'46	11	7	8	8	17	135
Days with	'43	5	7	9	9	3	83
.25 or more	'44	2	9	7	8	5	60
	'45	3	(2)	(7)	7	6	75
	'46	5	2	3	3	8	58
Snowfall in	'43	0	0	0	T	3	52
inches	'44	0	0	0	1/4	3	63
	'45	0	(0)	(T)	4	22	48
	'46	0	0	0	T	12	110
Days with	'43	0	0	0	2	6	40
snow	'44	0	0	0	4	8	31
	'45	0	(0)	(1)	3	5	38
	'46	0	0	0	5	8	38

() means data taken from the Eastport Weather Bureau.

Table 2

MEAN PRECIPITATION DATA FOR TEN YEAR PERIOD 1937 - 1946

	Precip. in inches	Days with .01 or more	Days with .25 or more	Snowfall in inches	Days with snow
Jan.	2.80	12	4	12	9
Feb.	3.33	10	4	19	8
Mar.	4.40	11	4	9	5
April	4.19	12	6	5	3
May	4.64	12	6	T	*
June	4.55	13	5	0	0
July	3.62	12	4	0	0
August	3.17	9	3	0	0
Sept.	4.74	15	6	0	0
Oct.	4.74	13	5	*	1
Nov.	5.38	12	6	4	2
Dec.	3.53	13	4	8	7
Annual	49.10	142	57	57	35

*more than zero but less than 1/2 inch(day) average.

MUSKRATS

One of the interesting conditions of animal life of Kent Island was the total absence of all mammals when the station was established in 1935. In 1941 muskrats, the first mammals, made their appearance on Kent Island. These individuals probably came from nearby Hay Island (connected at low tide) where they arrived a few years before. Just how the muskrats reached Hay Island over the six miles of water, the shortest distance from Grand Manan, remains an unsolved question. Because of the excessive tides and strong currents this stretch of water is never frozen even during the most

severe winters, hence they could not have crossed on a bridge of ice. It is difficult to conceive that they were able to swim that distance against the hazards of strong tides, even if they took advantage of floating debris. We are reasonably certain they were not introduced by man. The fact remains the muskrats are there, they are prospering and rapidly increasing in numbers under the new environmental conditions. Evidence of their presence can be seen in all parts of each of the 3 islands, Kent, Hay and Sheep which comprise the group designated on charts as Three Islands. The muskrats are especially abundant in the iris marshes and alder swamps where one may see an intricate network of runways and tunnels. According to Mr. Joy, during the trapping season in April, the muskrats are concentrated in the brooks and swamps but with the coming of summer they disperse all over the island and in winter occupy burrows dug in the higher ground and even in the forested areas. One muskrat ventured to the porch of his house in January.

On Hay island there is a fresh water pond in which the muskrats build their characteristic mound houses which are occupied during the summer. They remain until the ice forms and for a time maintain open holes in the ice. But when the pond becomes solidly frozen in December they retreat to the high ground where they live in burrows until the pond is again freed of ice in early spring. No constructed mound homes are found on other parts of Hay Island or on Sheep and Kent Island.

There is no visual evidence that the muskrats are interfering in any way with the petrels which nest in excavated burrows or with the birds which construct their nests on the surface of the ground. This may be a possibility and the interrelation of the muskrats to our bird life should be fully investigated. In fact the invasion of the muskrats to "Three Islands" and the complete ecology of this mammal offers an inviting problem to some student or investigator interested in the project.

Mr. Joy was given permission to trap the muskrats during the trapping season in 1943 and during each year since that time. The results of his catches offers a rough index of the steady increase of these mammals. Mr. Joy examined each specimen and found that none of the females contained young up to the end of the trapping season the last day of April. The sexual ratio of the catches is of interest.

<u>Year</u>	<u>Males</u>	<u>Females</u>	<u>Total</u>
1943	13	0	13
1944	29	6	35
1945	60	15	75
1946	51	50	101
Totals	153	71	224

Mr. Joy received an average of slightly more than \$3.00 per skin. The prices received for the 101 muskrats trapped in 1946 are shown in the following table. The price varies according to size, character of the fur and general condition of the skin.

Number of skins	Price per skin	Total value
2	\$4.00	\$8.00
17	3.50	59.50
27	3.25	87.75
10	3.15	31.50
25	3.00	75.00
9	2.65	23.85
9	2.55	22.95
1 damaged	1.50	1.50
1 badly damaged	.50	.50
Total 101 skins	Total value	\$310.55

THE BLACK-BACKED GULL
(by Albert M. Barnes, Bowdoin '49)

During the summer of 1946 I made a study of the Black-backed Gull (Larus marinus) at Kent Island. In 1931 only one pair of these birds was to be found on the island but since that time it has steadily increased in numbers. In 1946 there were approximately twenty-six pairs nesting on the southern portion of the island in the midst of the Herring Gull colony. The nesting area comprises the entire southern one fourth of the island, which is devoid of trees except for a few dead scrags. The vegetation is a luxuriant growth of grass and weeds, chiefly ragweed.

The Black-backed Gull usually selects the higher elevations of ground for its nesting site, but some nests may be found on the lower levels. The nest which I had under observation was constructed on the edge of a piece of rock outcrop which protruded about six feet above the ground level. One pair chose the top of South Hill, the highest point on the island, a most characteristic place, for its nest.

Since 1938, Mr. Ernest Joy, warden of the island, has kept a record of the nesting of the gulls. According to these records, the Black-backed Gull arrives at the island about March 11th begins nesting about April 14th and the first eggs are to be found about April 25th. In 1944 these gulls started nesting April 11; on the 27th the first egg, April 29th the second and on May 1st the third egg was found. On May 25th the first egg hatched, on the 27th the second egg hatched. The third egg proved to be sterile.

Territory - The Black-backed Gull has a well defined nesting territory extending approximately twelve to fifteen feet on either side of the nest. This territory is zealously defended by the adult gulls not only during the nesting period but long after the young are hatched and until they have acquired the juvenile plumage and are able to fly. The Herring Gull is its chief competitor and it is against the encroachments of this bird that the territory is constantly defended. I quote from my notes of June 23, 1946 taken from my blind: "When the Herring Gull approaches the territory of the Black-backed Gull the latter violently pursues the Herring Gull and landing close to the intruder assumes an aggressive attitude with his wings half spread. The Herring Gull has made a hasty retreat as the Black-backed Gull follows him for some distance before returning to his territory. The indignant and persistent Herring Gull returns to tantalize his victim but at

a safe distance. Frequently he pauses, violently pulls up bits of vegetation with his bill, holds it a moment then drops it again - a behavior that is evidence of his irate condition. This performance with minor variations was repeated several times."

Nest. - The nest of the Black-backed Gull is somewhat similar in general appearance to that of the Herring Gull but is larger and the edges of the nesting bowl more elevated above the surface of the ground. The nests are constructed of bits of grass and pieces of weed stalks approximately three to six inches in length.

Eggs. - The number of eggs in all of the nests I examined at Kent Island was three but according to A.C. Bent (1921) there are sometimes only two in complete sets. The ground color of the eggs varies from pale olive buff to wood brown, or buffy brown. They are more or less heavily spotted and blotched with various shades of brown and are often more or less spotted or clouded with pale lilac, drab or lavender gray.

Incubation. - The incubation period of the Black-backed Gull as determined by H. B. Miller (1938) and others is twenty-eight days. In the nest I had under observation both sexes shared in the task of incubation confirming the observation by Miller. I observed the mate approach the nest and give a short cry similar to that uttered at the time of feeding the young. The incubating bird then left the nest while the other gull took its place on the nest to incubate the eggs. The eggs did not hatch simultaneously but hatching extended over a period of two days. Two eggs hatched on July 10th and the third on July 13th.

Young. - As soon as the natal down is dry the young leave the nest and crawl into the surrounding vegetation where they are well concealed from view. Although they never return to the nest they remain within the territory established by the adult gulls until they have acquired the juvenile plumage. For the first few days after hatching the young are unable to stand erect but rest on their tarsi and thus awkwardly move about until five or six days old. The young gulls cling closely together and remain motionless even when touched. However, if they are picked up they scream loudly and pick viciously at your fingers, causing no little pain when they are larger. When the adult arrives at the nest to feed the young it alights and walks about uttering a soft note not unlike that of the cry of a child. The adult extends its neck relatively close to the ground and utters a prolonged Waaaaaa - Waaaaaa. R. M. Strong (1914) describes this as the "mewing" cry. While uttering this call the bill is opened to its fullest extent. The young birds at this signal respond by running up to the adult bird from their well concealed positions among the dense vegetation. The young birds pick at the adult's bill which prompts her to disgorge food upon the ground where it is ravenously devoured by the youngsters. During the entire course of this feeding operation the young keep up a continuous peeping. At times the adult bird picks at the food apparently attempting to break it into smaller pieces more acceptable to the young. After all of the food is devoured the young often continue to pick at the adult's bill and if nothing is forth coming they eventually retreat to their hiding places among the weeds.

Food. - The food of the young consists chiefly of herring which are delivered in rather large amounts to satisfy their insatiable appetites. On one occasion when seizing a young for banding purposes it regurgitated a large piece of fish known as the Lump Fish (Cyclopterus lumpus). The integument of this fish contained large rough scales and is literally filled with bones, a rather coarse bit of food for a young gull.

Voice. - At the time of hatching the young utter a loud but plaintive peen though when begging for food it is a prolonged whistle-like sound. During the summer I had a captive young Black-backed Gull for growth and plumage studies. This gull when approached with food uttered, with the bill wide open, a bleating like cry. This call was accompanied with considerable hopping up and down and flapping of his yet down covered wings. The call of the adult is similar to that of the Herring Gull except that it is deeper in volume and more raucous in quality. This cry may be given either when perched on the ground or during its flight. When on the ground the performance begins by placing the head beneath the breast and then raising and thrusting it out during the first part and keeping it raised for the duration of the call. A similar technique is employed when the call is given during flight. When this bugle call is sounded in the midst of the colony it is apparently a signal for the other gulls to do likewise. This results in a wild pandemonium of voices as both Herring and Black-backed Gulls call loudly in concert. When the Black-backed Gull is disturbed it flies high over head uttering a perturbed nervous Kuk - Kuk - kuk. This call is invariably given when they sense that all is not well.

Habits. - One hardly thinks of a Black-backed Gull without associating it with acts of aggression but during the months that I studied the bird at Kent Island I failed to note them except when it was defending its territory. However there are many instances cited in the literature of its depredations on the eggs and young and even the adults of other birds. One of my associates, Mr. Ray Paynter, saw and photographed a Black-backed Gull in the act of destroying the eggs of a Herring Gull. On June 18th I saw a Herring Gull rob the nest of one of these gulls. I had been in the blind for a half hour, the Black-backed Gull was still circling over head uttering its characteristic Kuk-Kuk-Kuk warning calls. A Herring Gull swooped down broke and devoured one of the eggs so quickly that it appeared to be one motion. The Black-backed Gull immediately dove at the Herring Gull grabbing it by the wing in a desperate attempt to save its eggs but it was too late, the deed had been accomplished. When beginning to fly the young are constantly harassed in the air by the Herring Gulls which dive at them often grabbing them by their tail feathers. In spite of the aggressiveness shown by the Herring Gulls toward the Black-backed Gulls, especially the young, it will be of interest to note I found only two fatalities among the young. They appeared to have been killed by blows on the head, as much of the skin had been torn away. This method of killing is prevalent amongst gulls. Since the Black-backed Gull is extremely wary it was photographed with the greatest difficulty. Since my blind was located within five feet of the nest, it often took twenty minutes or more for the bird to return after I entered the blind. (The slightest noise within the blind, such as the clicking of my camera shutter was sufficient to cause the bird to leave immediately.) This was especially annoying when photographing the incubating bird. The birds have a keen sense of sight and quickly respond to the slightest movement near any aperture of the blind covering. The bird invariably faced the blind when incubating indicating its suspicions of danger from that source.

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BLACK GUILLEMOT

(by H. Elliott Winn, Bowdoin '48)

The shore of Kent Island with its masses of huge rocks and boulders provides ideal nesting sites for the Black Guillemot (Cephus grylle grylle).

When I arrived at the station on July fifth the nesting activities of these birds were already in progress and it was too late to observe the mating and courtship of the species at its best. I did observe one pair of which one bird, presumably the male, was seen swimming in pursuit of the female, jabbing her lightly and at times raising his head to emit a high pitched whistle. The female in attempting to get away would dive and swim under the water with the male also diving and swimming after her. Frequently during the chase the birds exhibited a peculiar side to side movement. Eventually after many hours of this ardent courtship the female submitted to copulation.

Nesting. - The nesting sites of the Black Guillemot are all located between the high tide mark and the edge of the vegetation. The nests are well concealed in crevices and spaces between and beneath the large rocks that form the sea wall. The nests are masses of small stones but sometimes consist of sea weed and debris such as sticks. Nineteen of the nests I had under observation were of small stones, three were of sea weed, one of sea weeds and stones and two were of sticks and rocks. These materials probably were already present and were not carried to the nesting place by the birds. It is noteworthy that the eggs laid on sea weed were sterile and the nest on sea weed and rocks was deserted. The nesting sites were located by watching the birds approach the nest, while I was well concealed at a good vantage point. White excrement leading to the nest entrance revealed the location of others. Because of the similarity of the rocks composing the sea wall it was necessary to paint large numbers on the rocks to enable me to readily find them on subsequent visits. The eggs are laid during the month of June. Both male and female share in the task of incubation. The birds exchange places about every three or four hours. The eggs have a white to a greenish blue ground color with splotches varying from brown to black. The markings often form a concentric ring around the larger end of the egg. Out of 32 nests 20 contained two eggs and twelve but one egg. No nests were found with three eggs although this number has been reported by other observers.

The average measurements of 28 eggs from Kent Island nests was 57.11 by 38.5 m.m. The four extremes were: 64 x 40, 60 x 40, 55 x 36 and 61 x 35 millimeters. The incubation period has been variously reported from 21 to 28 days and should be accurately determined. Several days before hatching a small crack appears followed by a pipped hole. At hatching the shell splits in half. (If two eggs are present in the nest the second egg usually hatches about a day later.) The shells are never removed from the nest by the adult birds but are merely pushed aside. Several shells were found in crevices occupied by nesting birds of the previous year. The weight of an egg just before hatching is 38 to 40 grams. The newly hatched chick weighs from 32 to 33 grams. As far as I could determine feeding begins within 48 hours after hatching. Both adults feed the chicks almost exclusively on rock eels (Gunnellus gunnellus). Feeding starts at dawn and is continued until darkness. During one night I spent in the blind the adults did not remain with the young.

Young. - The chick at the time of hatching is completely covered with a thin coat of black down. The lining of the mouth is pink, the legs are black but the webbing of the toes has a tinge of flesh color. The legs and feet as well as the lining of the mouth of the adults is a deep vermilion color. By the fifth day the feathers especially those of the wings show considerable development. From the 10th to the 15th day the greater wing coverts are longer than the primaries but by the 30th day they are of about equal length. The juvenile and adult plumages have been studied and described in detail but will not be included in this brief summary of my work.

Mortality. - The Guillemots apparently suffer from the depredations of other birds such as the crows and gulls which prey on their nests when discovered. The chief cause of destruction of nests, the eggs and young are through the excessive tides which often go well above the normal mark. Out of 40 eggs and chicks under daily observation 16 were thus destroyed.

Behavior. - A young taken for development and behavior studies, when placed in a pan of water dabbed its bill in the water, flapped its wings thrust its head under water and went through performances precisely as did the adults. This behavior was instinctive and required no training on the part of the adults. In swallowing rock eels these fish were invariably oriented so that the heads went down the gullet first. Because of the projecting spines of the fins it would be difficult for the guillemot to swallow an eel tail first. Sometimes an eel wriggled out after being swallowed whereupon the bird immediately picked it up and swallowed it a second time. The adults were often seen off shore in groups of 10 or 15 going through what seemed to be a play behavior. At times a group of adults lined up in single file for a moment then would resume their frolicking. During the day the adults frequently flew out to sea.

Territory. - The territory of the Black Guillemot is merely an area of a few feet about the entrance of the nest. In one instance the guillemot was seen to chase a larger more aggressive adult Herring Gull from its established territory. Last summer (1946) there were approximately 50 pairs of nesting guillemots at Kent Island and about 20 pairs at Southern Green Island.

Banding Returns. - We have had only 5 recoveries of the 125 Black Guillemots banded at Kent Island. Two were made on Kent Island the year following and one two years after banding at Kent Island. One banded July 20, 1934 was

recovered at Cutler, Maine on August 25, 1934. One bird banded on July 26, 1935 was shot October 30, 1935 at N. Cohasset, Massachusetts. This later record would indicate that at least some of our Kent Island birds winter on the southern New England coast.

THE BLACK-POLL WARBLER
(by James H. Veghte, Bowdoin, '49)

Kent Island represents the southern limits of the breeding range of the Black-poll Warbler (Dendroica striata) along the Atlantic coast. This warbler also nests in the higher altitudes of the mountains of New Hampshire and northern Maine. The range of this bird may be correlated with the mean average temperature which at Kent Island is about 50° F.

My study of the life history of the Black-poll Warbler at Kent Island was handicapped because of my inability to reach the station before June 15th. It is important to be at the island at least by the last week of May when the birds arrive in order to observe the courtship behavior, and the details of their territory selection and nest building. The average date of the arrival of the Black-poll Warbler at Kent Island based on five years of records by Ernest Joy is May 25th. The earliest date is May 23 and the latest May 27 which indicates there is but little variation in the time of their arrival.

Nesting. - Since the Black-poll Warbler arrives at a later date than most birds less time is spent in courtship and preparation for nest building. In 1944 the first bird was seen on May 23 and Mr. Joy found a nest with one egg on June 6th. According to Mr. Joy the first egg is usually laid about June 10 and an additional egg is laid until the set is complete. However, the sequence of laying the eggs varies, in one case reported by Dr. Cross the first egg was laid on June 16 and the final egg on June 22nd. Complete sets of eggs vary from 3 to 5, sets from 4 to 5 predominating. Nine nests of the Black-poll Warbler containing complete sets of eggs have been found at Kent Island on the following dates: June 12, 2, June 18, 1; June 20, 1; June 22, 1; June 25, 3; and June 27, 1 nest. With very few exceptions the nests found at Kent Island have been built in small white spruces (Picea canadensis). Ernest Joy has found two nests that were on the ground. During the summer of 1944 he found a nest on the ground beneath a fallen white spruce which contained four young. A nest was found in a similar situation a few years before. Such nesting sites are rare, for the bird usually builds from two to seven feet above the ground. The nest is generally built snugly against the trunk of the tree and supported by one or two horizontal branches. It is well concealed and because of the remarkable protective coloration are difficult to find. The average nest has an outside diameter of 5 1/2 inches and 3 inches depth. The nesting cavity has a width of 2 inches and 1 1/2 inches deep. These measurements were taken from a series of nests that have been found on Kent Island during previous years but those I had under observation corresponded very closely to the above. The female chooses the nest location and does most of the nest building, while the male sings nearby and defends the territory. The nest is usually completed over a period of four or five days but the time is somewhat dependent on the condition of the weather at the time. The structure of the nest varies and corresponds somewhat to the environment in which it is built. The nests that I had under observation were composed

of fine spruce twigs, bits of moss mixed with pieces of bark, dried grass and lichens. Occasionally a stray piece of paper was found. The inside of the nests were lined with plant fibers, white Herring Gull feathers from two to three inches long, fine rootlets, and some hair. It is interesting to note that small, white gull feathers seem to be typical of most nests found at Kent Island.

Eggs. - Typically the eggs have a white, or light creamy buff or sometimes a pale greenish tinted ground color marked with brown or reddish brown splotches and subdued marks in shades of lilac or lavender concentrated at the larger end of the egg. There is a slight variation in these markings. Dr. H. Sweet determined the following measurements of eggs found in nests at Kent Island. Average size 18.4 x 14.7 mm, average weight when first laid 1.8 grams. The incubation period is approximately eleven days. Incubation may start before the last egg is laid and hence as much as two days may elapse between the hatching time of the first and last egg. The female does most of the incubating.

Young. - At the time of hatching, the natal plumage of the young consists of delicate tufts of grayish down located on the head, humeral, crural, alar and caudal tracts. The female bird slips quietly off the nest as you approach and seldom any demonstrations are made. If, however, a young bird is picked up or disturbed so that it utters a call of distress, the parent appears and exhibits a great deal of anxiety. She may feign an injured bird fall out of a tree, tumble from limb to limb finally hitting the ground to attract the attention of the intruder and lure him away.

Measurements of Black-poll Warbler young
in millimeters and weights in grams.

Age of young (days)	1-2	3	5	7	8
Length	36.3	39.5	49.8	63.5	75.5
Tail	--	--	.8	4.0	7.0
Wing	8.5	9.5	21.4	32.5	36.0
Tarsus	6.3	10.0	16.8	20.0	20.0
Bill (Culmen)	5.0	5.1	5.3	6.0	7.0
Gape	6.3	7.3	9.2	11.0	12.5
Width of Bill (base)	8.6	9.5	10.0	11.5	11.5
First primary	--	--	4.2	13.5	19.0
First secondary	--	--	3.2	12.5	18.8
Right Foot					
Hind toe	4.8	5.0	7.2	8.0	8.0
Hind toe nail	1.0	1.3	2.2	3.3	4.0
Inner toe	3.5	4.5	6.0	7.0	7.0
inner toe nail	.8	.8	1.0	1.8	2.5
Middle toe	4.9	6.5	8.4	11.5	11.5
Middle toe nail	1.0	1.0	1.3	2.5	3.0
Outer toe	3.4	4.5	5.7	8.5	9.0
Outer toe nail	.5	.8	.9	1.5	2.0
Weight	2.91	3.18	6.87	10.10	11.90

The egg tooth persists for five or six days. The eyes remain closed until the fourth or fifth day. The down is about 7 to 8 mm. in length. The feather tracts are well outlined by developing papillae at the start.

The development of the feathers is uniform on all parts of the body. On the seventh day the young bird is capable of standing up in the nest. At this time the juvenile plumage has developed so that the body is completely covered. By the eighth day the sheathings are slowly breaking loose from the bases of the contour feathers. The young left the nest on the ninth day, probably prematurely since they were disturbed in making measurements. Generally the young do not leave the nest until eleven or twelve days old. Both adults take an active part in feeding the young. The food consists chiefly of larvae, adult insects and spiders. The young are fed by the adults for about two weeks after they have left the nest. The juvenile plumage consists of deep brown on the wings and tail, an olive-gray indistinctly mottled and streaked with black above with whitish or yellowish underparts, spotted or mottled with dull black dots. The wings have an olive-green edging with two white wing bars on tertials; the greater and middle wing coverts are blackish. The bill and feet are a pinkish-buff.

Voice. - The male Black-poll Warbler sings throughout the incubation and feeding periods and even after the young are able to fly he sings occasionally until about the last of July. The voice of the male warbler is very high pitched and has an insect quality. The high notes have a frequency of 10,225 vibrations per second and an approximate mean of about 8,900 vibrations, the highest pitched bird note recorded by Albert Brand.

This is merely a preliminary report and I hope to continue the work at some future time.

CONTRIBUTIONS

In addition to the Annual Reports and Bulletins of the Bowdoin Scientific Station the following contributions have been published.

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19. Winn, H. Elliott.
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