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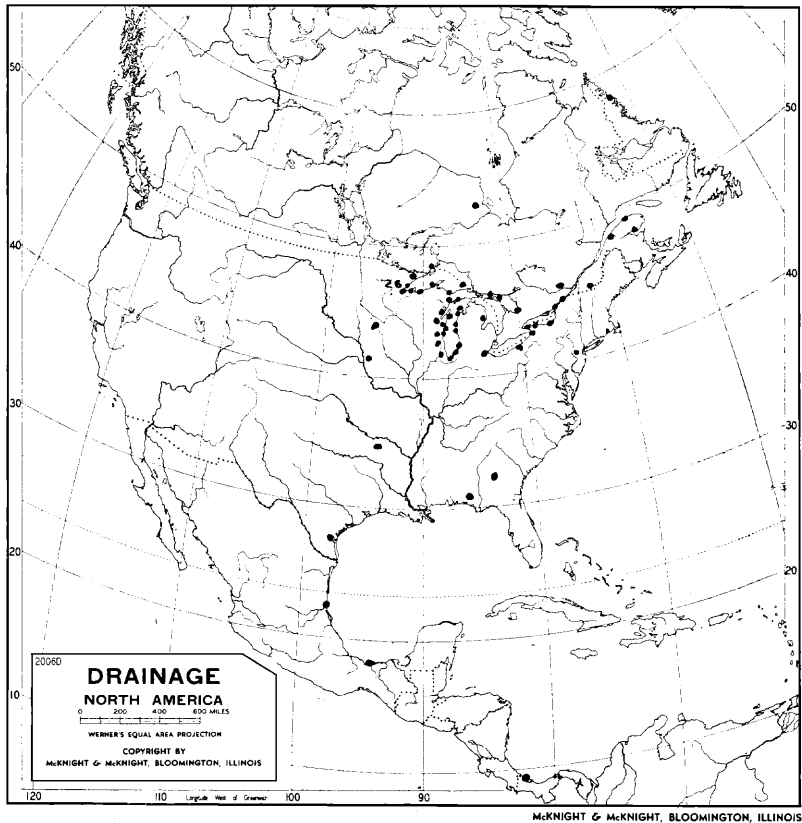
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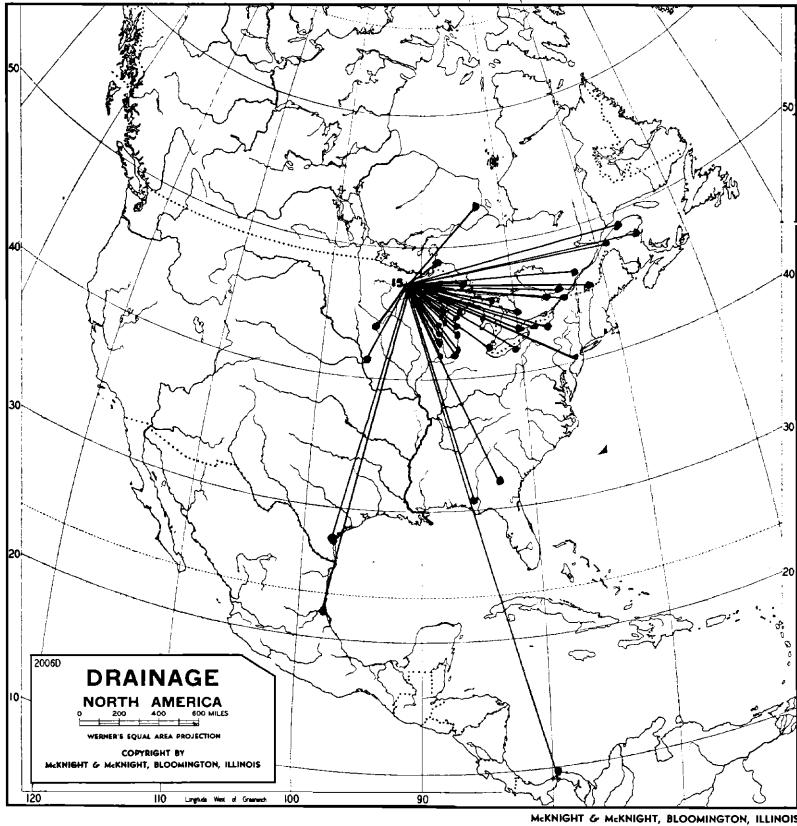
FALL MIGRATION OF HERRING GULLS FROM KNIFE ISLAND, MINNESOTA

By P. B. HOFSLUND

In June, 1950 the Duluth Bird Club began a banding study of a colony of Herring Gulls (*Larus argentatus*). This study has continued each summer since, the summer of 1957 marking the eighth year. The present paper deals with the recoveries of banded gulls up to May 15, 1958.



Map 1. Recoveries of Herring Gulls banded as nestlings on Knife Island, Minnesota.

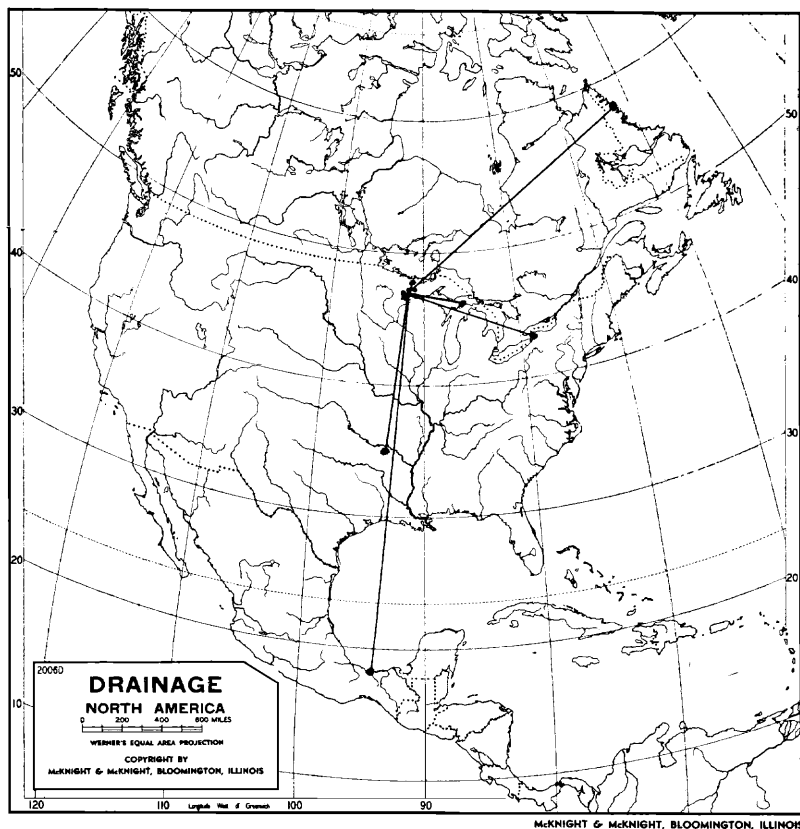


Map 2. Recoveries of first-year Herring Gulls.

The breeding site is a small island in Lake Superior, roughly 800 x 300 feet at its longest and widest spots. It lies less than a half mile from the mouth of Knife River in Lake County, Minnesota, and is known, at least locally, as Knife Island. Much of the island is covered with Mountain Ash (*Sorbus americana*) with a scattering of Balsam Fir (*Abies balsamea*), Balsam Poplar (*Populus balsamifera*), and a tangle of undergrowth. The periphery, however, is largely bare rock, and it is here that most of the nests are located. One notable exception was a nest placed approximately 18 feet up in a Balsam Fir.

Census reports (Hofslund, 1952:162) for the years 1948-'52 showed nest counts varying between 150 and 312. Though no actual counts have been made since 1952, it is likely that the island now supports in excess of 250 breeding pairs each year. In recent years the only other nesting birds found on the island have been a pair of Red-breasted Mergansers (*Mergus serrator*). Passerine birds are conspicuous by their absence.

Banding operations have been confined to an afternoon, usually on the second weekend in June. There has been an attempt to work



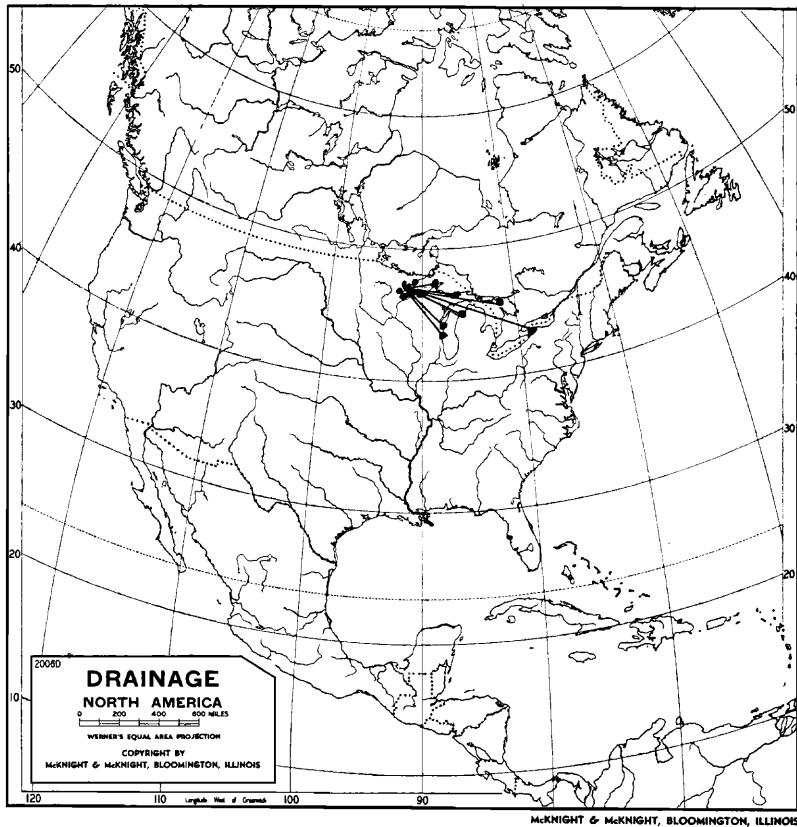
Map. 3. Recoveries of second-year Herring Gulls.

as swiftly and efficiently as possible with a general limit of 500 bands so as to minimize the disturbance of the colony. Despite this, some young birds have been killed by adults or have met death in other ways associated with the disturbance, and more than likely, most of the birds recovered in June of the year they were banded never survived the day of banding.

A total of 3,028 nestling gulls have been banded since the project started. We have received 81 reports of recoveries or 2.67% of the total banded. While not a large number, the recoveries reveal certain patterns in the movements of the gulls after they leave Knife Island.

Lincoln (1928:59) and Gross (1940:153) described the dispersal of gulls from their breeding grounds as "explosive," a conclusion well-founded on the basis of recoveries from banding sites in Lake Michigan and at Kent Island. The present study was started in part to determine whether this explosive nature of the dispersal was apparent only where ready access to large waterways was available.

The following points are pertinent to the discussion of the results of the study:



Map 4. Recoveries of adult Herring Gulls banded as nestlings on Knife Island.

1. The majority of the recoveries of Knife Island Gulls come from the Great Lakes. Of the 81 recoveries only 12 have not been from areas intimately associated with the Great Lakes-St. Lawrence Waterway.

2. Only two of the 12 records are from areas north of this waterway, the rest are south.

3. Of the 10 southerly records all but three are associated with the Atlantic, Gulf of Mexico, or Caribbean Sea coastlines.

4. The three records not associated with coastal waters are on or near major tributaries of the Mississippi River, and the dates of recovery (Table 1) suggest that these birds were continuing their wandering northward toward the breeding grounds rather than having reached these points through a southerly dispersal over land.

5. If we now turn our attention to the distribution maps (Maps 2, 3, and 4), it is apparent that the wandering tendency is lessened as the gulls reach breeding age, a conclusion previously brought out by others (Gross, 1940:136), and in the case of Knife Island gulls their travels seem to be confined largely to the Great Lakes.

6. There is a lack of uniformity in distances travelled by gulls of

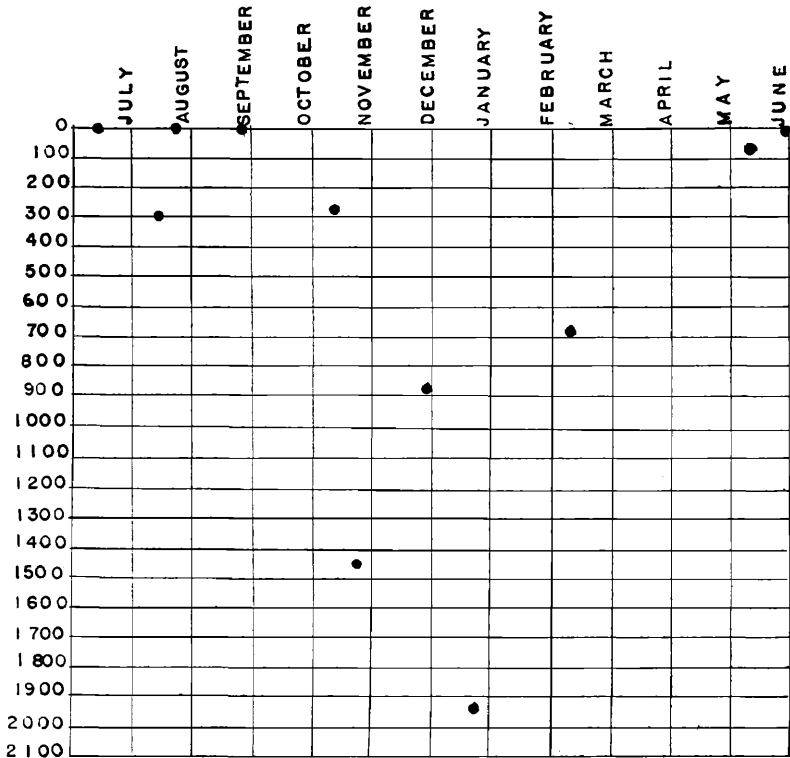


Figure 2. Scattergram showing distances from banding point to place of recovery of second-year birds.

9. The report of the Pacific gull-banding project (Woodbury and Knight, 1951) showed almost a strict adherence of Pacific gulls to coastal waters.

These points bring me to the conclusion that the term "explosive dispersal" is not suitable to describe the fall migration of Herring Gulls, but rather should be called a wandering whose directional tendencies are determined by the availability of large waterways. The explosive quality is effectively blocked by the lack of shore or coastlines.

The tendency to move southward after the first of the year as suggested by Lincoln (1928:56) and Gross (1940:153) also seems to me as not being an applicable general assumption. From the distribution of the records along the coastlines it appears that the only major southward movement comes from gulls that have reached the coastline. Once the coastline was reached the availability of food and the major water traffic would exert a positive force in a southerly direction. Major shipping lines might have some effect on this and also might determine to some extent the distances that individual gulls might travel. The concentration of records along the southern shores of the Great Lakes indicates that there are factors favoring such a distribution, one of which might be that the major ports of call of the

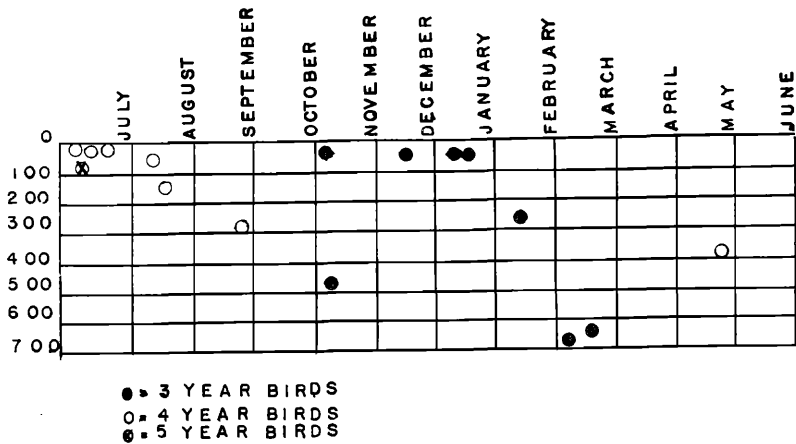


Figure 3. Scattergram showing distances from banding point to place of recovery of those birds that reached their third, fourth, or fifth year of age.

iron ore ships would be in these areas. An observer on Lake Superior can see concentrations of young gulls following some of these ships as they move away from and toward the shipping centers at Duluth and Two Harbors in late August.

Causes of death and the mortality rate are much as have been found in other gull studies. At least two-thirds of the mortality occurs before the Herring Gull has reached one year of age. The usual report is that the bird was "found dead," but several more detailed records, such as "brought home by the cat," "killed going over Niagara Falls," "landed in an oil pit," etc., are given in Table 1.

TABLE I
RECOVERIES OF GULLS BANDED ON KNIFE ISLAND

<i>Date Banded</i>	<i>Recovered At</i>	<i>How Found</i>	<i>Date Recovered</i>
June 17, 1950	Burlington, Ontario	Brought home by cat	Dec. 9, 1950
	½ mile from Duluth	Found dead on highway	April 23, 1951
June 16, 1951	Marinette, Wisconsin	Landed in oil pit	Aug. 28, 1951
	Big Muskego Lake, Wisc.	Brought to museum for identification	Nov. 23, 1951
	Tampico, Tamaulipas, Mexico	Captured alive	April 5, 1952
	Pneuforbee Creek, 8 miles N. Tuskegee, Ala.	Found dead	May 3, 1952
	Coatzacoalcos, Vera Cruz, Mexico	Found, probably dead	Dec. 15, 1952
	West River, shore of Beaver Island State Park, Grand Island, New York	Found dead in water	Feb. 8, 1953
	Lake Kagawong, Manitoulin Island, Lake Huron	Found dead, may have been shot	Oct. 5, 1953
Duluth, Minnesota	Found dead	June 7, 1954	

June 14, 1952	Lake Superior, Duluth	Found dead	June 14, 1952	
	Duluth, Minnesota	Drifted to shore	June 24, 1952	
	Duluth, Minnesota	Found dead, badly decomposed	July 13, 1952	
	Knife River, Minn.	Found dead	Aug. 24, 1952	
	Manitoulin Island, Meldrum Bay, Altoma, East County, Ontario	Found	Sept. 8, 1952	
	Massawippi Lake, Ayer's Cliff, Stanstead County, Quebec	Killed	Sept. 22, 1952	
	Elmvale, Simcoe, Ont.	White diarrhea	Oct. 9, 1952	
	Manistee, Michigan	Found dead	Oct. 18, 1952	
	West Twin River, Two Rivers, Wisc.	Found dead	Nov. 16, 1952	
	St. Maurice River, Laviolette County, Que.	Caught in fox trap	Nov. 20, 1952	
	June 14, 1952	Wilson, Niagara County, New York	Found dead	Mar. 31, 1953
		Jay Township, Dunnell, Martin County, Minn.	Found with a broken wing. Died	April 24, 1953
		Pentwater, Oceana County, Michigan	Found dead	July 10, 1953
Pungnivik, 10 miles So. of Nain, Labrador		Found	Oct. 1953	
Marble Lake, Lake County, Minnesota		Found dead with fishplug in mouth	May 15, 1954	
Mouth of Brule River, Douglas County, Wisc.		Found in fishermen's net	May 28, 1954	
4 miles West of Sand Island off Bayfield County, Wisconsin		Caught in float nets, released in good health	Nov. 18, 1954	
Niagara Falls, Welland County, Ont.		Killed going over Niagara Falls	Feb. 27, 1955	
Two Harbors, Minn.		Found dead	June 13, 1955	
Mouth of French River, St. Louis County, Minn.		Found dead	July 7, 1955	
Point Beach, Two Rivers, Wisconsin		Found dead	April 28, 1956	
Knife Island, Lake County, Minnesota		Found dead	June 8, 1957	
June 29, 1953		St. Joseph, Michigan	Found dead	(5 weeks from) Sept. 28, 1957
June 12, 1954	Oscoda, Iosca County, Michigan	Found dead	Sept. 19, 1954	
	Betsie Bay, Frankfort, Benzie County, Mich.	Found dead	Sept. 23, 1954	
	Lake Erie, Ashtabula, Ohio	Found dead	Sept. 25, 1954	
	Des Prairies, Bizard Island, Laval County, Quebec	Found	Sept. 27, 1954	
	1 mile S.E. Woodstock, McHenry County, Ill.	Found dead	Dec. 2, 1954	
	Beach at Michigan City, Indiana	Found dead	Feb. 9, 1955	

June 12, 1954	Oswego, N. Y.	Found dead	Mar. 14, 1955	
	Corpus Christi, Texas	Found sick, band removed	Mar. 22, 1955	
	Knife Island, Minn.	Leg found	June 11, 1955	
	Bad River, 10 m. E. of Ashland, Wisc.	Found dead	Oct. 1956	
	Superior, Wisc.	Found dead	Dec. 10, 1956	
	Superior, Wisc.	Found dead	Dec. 10, 1956	
	West Kewaunee, Kewaunee, Wisc.	Trapped and released	Jan. 17, 1957	
	Burlington Beach, Two Harbors, Minn.	Found dead	June 16, 1957	
	East Shore of Kewaunee Peninsula, Mich.	Found dead	July 8, 1957	
	Lake Superior between Munising and Marquette, Mich.	Found dead	Aug. 24, 1957	
	June 11, 1955	Between Two Harbors and Duluth, Minn.	Found dead	June 22, 1955
		½ mile east Knife River, Lake Cty., Minn.	Found dead	July 18, 1955
		Lester River, Duluth, Minn.	Found dead	July 19, 1955
5½ m. S. Two Harbors, Minn.		Found dead	Aug. 10, 1955	
Turkey Island, Detroit River, Ontario		Found dead	Oct. 20, 1955	
Black Cape, New Richmond, Bonaventure Cty., Gaspé Peninsula, Quebec		Caught in fox trap	Dec. 14, 1955	
Lake Manawa, Lewis Twp., Pottawattamie County, Iowa		Found dead	May 27, 1956	
12 m. E. Duluth, Minn.		Hit by a car	Aug. 21, 1956	
3 m. from Ford R., Mich.		Found dead	May 3, 1957	
East Beaver Bay, Silver Bay, Lake Cty., Minn.		Found dead	May 24, 1957	
June 9, 1956	17 m. N. Duluth, Minn.	Found dead	Aug. 8, 1956	
	Sleeping Bear Bay, Leelanau Cty., Mich.	Found dead	Sept. 12, 1956	
	Riviere du Loup, Quebec	Found dead	Oct. 5, 1956	
	Shore of Ottawa River, 4 m. W. Ottawa, Quebec	Found dead	Oct. 10, 1956	
	Grand Beach, Mich.	Found dead	Oct. 12, 1956	
	Ste. Flavie, ½ way between Grand Metis Bay and Mont Gali (Mt. Joli?) airport, Que.	Found dead	Oct. 18, 1956	
	Attawapiskat River, 50 m. N. of Ogoki, Ont.	Shot	Nov. 1956	
	Flood Bay, Two Harbors, Minn.	Found dying	Nov. 10, 1956	

	Duluth, Minn.	Found dead	July 16, 1957
	1 m. N. Camp Huan, 8 m. N. Sheboygan, Wisc.	Found dead	July 16, 1957
	Danville, Arkansas (2½ m. W.)	Found dead	Nov. 28, 1957
June 8, 1957	Duluth, Minnesota	Found dead	July 24, 1957
	Duluth, Minnesota	Found dead (shot)	July 25, 1957
	Big Caribou Island, Ontario	Found dead	Aug. 8, 1957
	Escanaba, Mich.	Found dead	Sept. 14, 1957
	Park Point, Duluth, Minn.	Found dead	Sept. 21, 1957
	S. Shore Lake Winne- bago, ¼ m. N. E. Fond du Lac, Wisc.	Found dead	Oct. 1957
	Black Bay, Lake Superior, Ontario	Noted	Oct. 25, 1957
	Lockport, Ill.	Found dead	Dec. 3, 1957
	Macon, Georgia	Found dead	Jan. 12, 1958
	Bay at Bocas del Toro, Panama	Caught on fish hook	Feb. 7, 1958
	State Fish Hatcheries, Hackettstown, N. J.	Shot	Mar. 23, 1958

Greatest wandering, as has been mentioned before, takes place during the first year, and there seems to be a tendency even among these first-year birds to turn toward their hatching place as the breeding season approaches. Very few apparently winter near the breeding grounds; we have only one recovery from less than 100 miles during the winter, and despite the fact that several thousand gulls winter along the North Shore and though we have examined flocks very carefully, we have yet to find more than one banded bird in the flocks. Whether this was a native bird we do not know.

SUMMARY

3028 nestling gulls have been banded on Knife Island, Lake County, Minnesota, from 1950 to 1957. 81 recoveries have been received.

The general tendency is for the gulls to move to the east at the end of the breeding season, following the shorelines of the Great Lakes-St. Lawrence Waterway. Explosive dispersal seems to be effectively stopped by the lack of suitable waterways.

The tendency to move south seems to be limited to those birds which reach the coast.

Wandering is greatest in non-breeding birds, but there is a tendency even among them to return to the breeding grounds at the beginning of the next breeding season.

Mortality is highest in first-year birds. Causes of death where detailed are listed.

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ANTARCTIC ORNITHOLOGICAL STUDIES DURING THE IGY

By CARL R. EKLUND

Exploration and research stimulated by the International Geophysical Year have been primarily concerned with the physical sciences. The United States National Committee for IGY and similar committees of other countries recognized, however, the unique opportunity for research in the life sciences in the remote polar regions. Because IGY personnel were encouraged to make such studies at Antarctica stations, it was my privilege to do ornithological work while serving as Scientific Leader at Wilkes Station during 1957-58.

None of the countries participating in the IGY employed ornithologists. Except for a zoologist and an ichthyologist assigned to the USSR Mirny Station, no full-time biologists of any type were at work in Antarctica. Fortunately, most stations had personnel with training in the biological sciences who were sufficiently interested to conduct studies incidental to their primary duties.

As we enter the post-IGY period, it is gratifying that the Polar Research Committee of the National Academy of Sciences has recognized a continuing need for Antarctic research in the life sciences. A Panel on Biology and Medical Science has been functioning as part of that Committee; on its recommendation, funds have been granted for ornithological work.

My purpose in this paper is to report ornithological studies conducted during the IGY at seven United States stations and, upon the basis of recent contact with foreign countries having Antarctica stations, to list their studies in this field.

In the fall of 1956, through the USNC-IGY, I initiated a study on the distribution and life history of the South Polar Skua (*Catharacta maccormicki*). Relatively little has been known of the habits and movements of this most southerly of all birds, which in January, 1953, was observed by Sir Edmund Hillary within 80 miles of the South Pole.

The main phase of the study required the banding of a representative number of skuas. Eight nations, including Argentina, Australia, Japan, New Zealand, Norway, USSR, the United Kingdom, and the United States, participated in making this one of the most internationally cooperative bird studies ever conducted. The normal numbered metal bands were used and, for the first time, a 1½-inch-wide colored thermoplastic band also was used. A different color denoted each of eighteen banding stations in Antarctica. This enabled ready field