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MOVEMENTS OF JUVENILE HERRING GULLS HATCHED AT JAMAICA BAY REFUGE, NEW YORK

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Herring Gulls (*Larus argentatus*) generally migrate along coasts (Gross 1940, Jorgensen 1973, Parsons and Duncan 1978) or inland waterways (Hofslund 1959, Moore 1976), although there is great variability in their migratory patterns. In some cases, the gulls seem to remain relatively close to their breeding colonies throughout the winter, while other populations seem to migrate hundreds of kilometers (Harris 1963, Threlfall 1978). Several investigators found an age-related difference in migration patterns (Smith 1959, Parsons and Duncan 1978, Spaans 1971). In a review of the distribution patterns of gulls based on 32,240 band recoveries from the United States, Southern (1980) noted these differences in migratory patterns, and suggested that such differences are related to food availability in the winter.

Since the turn of the century, Herring Gulls have increased in numbers and expanded their breeding ranges in both Europe (Davis and Dunn 1976) and the United States (Kadlec and Drury 1968, Drury and Kadlec 1974). As Herring Gulls expand their breeding range still farther south, they may become more sedentary. The present study was undertaken to determine the migratory behavior of young hatched at Jamaica Bay Refuge, Long Island, New York. I reasoned that the presence of abundant food (garbage dumps), and the warmer climate of the New York area (compared to Maine, the Great Lakes, or Finland), might result in a population that would remain within 100 km of the natal colony. I was interested in determining if young remain near the nesting colony during the winter, since they do not do so in nearby areas such as Massachusetts.

METHODS

In early July 1977, I leg-banded and wing-tagged 266 Herring Gull young that could fly short distances. No wing-tagged chicks were subsequently found dead on the colony area. Many researchers leg-band chicks when they are only a few days old; this results in recovery rates of 5% or lower (Gross 1940, Parsons and Duncan 1978). I banded only those chicks which fledged early since such chicks have higher post-fledging survival rates than later-fledged chicks (Burger 1972, Nisbet and Drury 1972). I wanted to maximize recovery rates rather than to determine survivorship.

From early July 1977 until 31 May 1978 (when chicks were 1 year old), the refuge was censused for 8 h per day, 4 days each week. Thereafter, the refuge was censused less regularly, and reports also came from bird watchers. To ascertain movements in the greater New York area, I censused one of the larger municipal garbage dumps located 75 km

from the nesting colony. The Edgeboro Sanitary Landfill (East Brunswick, New Jersey) was censused 3 to 4 times a week from September 1977 to March 1978, and from September 1978 to February 1979. Reports from other areas came from bird watchers or from the U.S. Fish and Wildlife Service band notifications. This paper reports on birds reported with the tags in place. Only 11 banded young (4%) have been reported as dead during the first 36 months.

RESULTS

In the 18 months following fledging, there were 151 sightings of wing-tagged Herring Gulls (Fig. 1). Over 80% of the reports were in the first 5 months after the chicks fledged. Over 50% of the sightings were from Jamaica Bay, 27% came from New Jersey, and the other 17% came from the coastal areas from New Jersey to Florida. Although most reports in September and October of the hatching year were within 75 km of the natal colony, two birds migrated 1700 km.

From 18 to 36 months following fledging there were 14 more sightings of the wing-tagged Herring Gulls: 8 from Jamaica Bay Refuge, 2 from elsewhere on Long Island, and 4 from New Jersey.

Wing-tagged gulls were sighted in New York and New Jersey throughout the winter. There was some dispersal from the natal colony as the number of sightings peaked at Jamaica Bay in August, and in New Jersey in October (Fig. 1). The lower number of sightings during the winter reflects a real decrease since the sites were sampled 4 days a week during that period. The Edgeboro dump was not sampled from March to the end of August because it was closed to observations.

The relative proportion of adult to young gulls is shown (Fig. 1) for the ponds at Jamaica Bay in the year following hatching. The numbers of immatures fluctuated, and decreased in January and February, but did not decrease as much as adults decreased. The number of adults was lowest in April and May when they were nesting on the colony.

DISCUSSION

This study, as any banding study, has certain problems. These problems involve the likelihood that a gull in any location will be reported. The reports for Jamaica Bay and New Jersey accurately reflect the number of sightings. The other sightings, however, can only be used to document where gulls were; they cannot be used to state where gulls were not. Harris (1963), and Parsons and Duncan (1978) noted that reports often reflect population concentrations of people for two reasons: (1) people are often present to observe the gulls, and (2) there are food sources such as garbage dumps.

In general, Herring Gull young rapidly disperse, and leave the vicinity of the natal colony (Southern 1980). In this study, young gulls remained within 100 km of the colony during the first winter, although a few dispersed as far south as Florida. Their use of nearby areas from October through December reflects a local dispersal to other food sources.

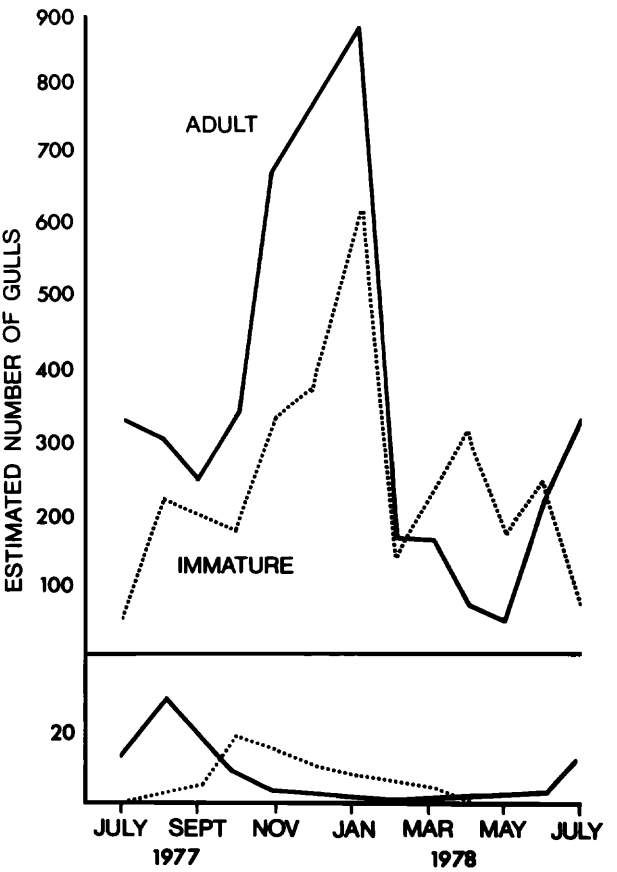

FIGURE 1. Top: Mean numbers of adult and immature Herring Gulls on the ponds at Jamaica Bay as a function of month. Bottom: numbers of sightings of wing-tagged Herring Gulls at Jamaica Bay Refuge, New York (solid lines) and the Edgeboro Dump, New Jersey (dotted line). Young left their natal colonies in mid-July.

New Jersey alone has over 240 active garbage dumps, and presumably, competition would be less if young were dispersed over several dumps.

A decrease in the number of wing-tag sightings in September is correlated with a 50% drop in the number of immatures at Jamaica Bay. The number of wing-tagged gulls continues to drop, whereas the number of immatures increases in November, decreases, and then increases again. I suggest that the increase in immatures in October reflects an influx of young fledged from more northern colonies. This hypothesis can be partially tested with data collected prior to the time when Herring Gulls nested in the New York area. Poor (1943) found that young did not arrive in the New York area from the Wicopesset Island colony (200

TABLE 1. Location of sightings of wing-tagged Herring Gulls as a function of age. Young were hatched in May 1978 at Canarsie Pol on Jamaica Bay. Given are number of sightings.

	Jamaica Bay	Edgeboro Dump NJ	CT[1]	NY	NJ	MD	VA	SC	GA	FL	Totals
1978											
Jul	14										14
Aug	25	1		1	3						30
Sep	17	2	2	2	2	2	3		1		31
Oct	8	12				1				2	23
Nov	6	10		1				1	1		19
Dec	2	6									8
1979											
Jan	2	6									8
Feb	1	—[2]									1
Mar	1									1	2
Apr	1					1	1				3
May	2[3]										2
Jun	1										1
Jul	2										2
Aug	1										1
Sep		1		1	1	1					4
Oct	1	2		1							4
Nov		1			1						2
Dec		1									1
1980											
Jan						1			1		2
Totals	84	42	2	6	7	6	4	1	3	3	158
%	53	26	1	4	4	4	3	1	2	2	100

[1] Abbreviations are for the following states, respectively: Connecticut, New York, New Jersey, Maryland, Virginia, South Carolina, Georgia, and Florida.

[2] Intensive observations on the Edgeboro dump were discontinued from February 1979 to September 1979.

[3] Intensive observations on the refuge were discontinued after the end of May 1979.

km from Jamaica Bay) until September, and numbers increased in November, then dropped in December when the birds apparently moved farther south. The influx of gulls from other areas suggests that control measures in the immediate vicinity would not eliminate the masses of gulls that congregate at the refuge, the garbage dump, and Kennedy International Airport.

One aim of the research was to compare the movement pattern of young hatched at Jamaica Bay with young from other such studies. The banding studies from continental Europe present a problem: gulls are hunted in many countries (Bianki 1967, Jorgensen 1973). In Denmark, some 66% of the young, and 48% of the adults recovered had been shot by hunters (Jorgensen 1973). Thus, the 12% recovery rate for Denmark,

TABLE 2. Movements of juvenile Herring Gulls in different geographical locations.

Colony location	Latitude	Location of young in January–February (from colony in km)	% young within 100 km in January–February	x̄ distance (km) of reports during first year	Source
Finland	66°	1700–2040	0	1700	Bianki 1967
Denmark	55°	up to 350	<30	180[1]	Jorgensen 1973
England	52–58°	up to 825[1]	<50[1]	~150[1]	Harris 1963
England	56°	up to 700[1]	7	165	Parsons and Duncan 1978
Newfoundland	47+°	1700–2890	0	1530	Threlfall 1978
Minnesota	47°	1870–2210	0	~850	Hofslund 1959
Maine	45°	204–3740	0	1463	Gross 1940
Great Lakes	46°	up to 3420	0	732	Gross 1940
Massachusetts	42°	~325	0	—[2]	Drury 1963
New York	41°	up to 1700	93	73	This study

[1] Calculated from the published range maps.
[2] Not given, and could not be computed from data available.

compared to the usual 5% for England and the United States, reflects hunting pressure. Nonetheless such banding data can be used to examine different migration patterns.

Two general dispersal patterns emerge: long distance and short distance (Table 2). The gulls which migrate long distances are from the Great Lakes, Newfoundland, Maine, and Finland. The gulls from Denmark, England, and Jamaica Bay are short distance migrants and usually remain within 200 km of the natal colony although a few gulls migrate great distances. The greatest proportion of young from the Jamaica Bay population remained within 100 km of the natal colony. Even allowing for sampling biases, the patterns are quite distinct. Latitude differences alone do not account for these differences, as gulls from England and Denmark were short distance migrants while those in the Great Lakes (at lower latitudes) were not. These differences may be accounted for by an increase in sanitary landfills in some areas, and differences in temperature during the critical winter months. The Gulf Stream passes up the Atlantic coast of North America, and then moves to England, bringing warmer air than might be expected at these latitudes. The gulls in Newfoundland, the interior Great Lakes, and Finland are subjected to cold oceanic and lake waters, and to cold air. The birds exposed to intermediate conditions (New England) migrate intermediate distances, and the majority of these young seem to move to the New York region as well (Poor 1943, Drury 1963).

SUMMARY

Herring Gull young hatched at Jamaica Bay Refuge, New York remain in the vicinity of the breeding colony in the early winter, and

disperse primarily into the surrounding areas. The winter influx of young gulls in the New York area appears to be accounted for by young from more northern colonies.

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