Massachusetts-banded Ring-billed Gulls breeding in Ontario and the Great Lakes

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In many traditional bird-banding studies, flightless young-of-the-year and/or adult birds are captured at their natal or breeding site, banded and released to determine where they go in winter. Among colonially-nesting waterbirds on the Great Lakes, this has been done with several species: Common Terns (Sterna hirundo) (Blokpoel et al. 1987), Ringbilled Gulls (Larus delawarensis) (Southern 1974 a, b), Herring Gulls (Larus argentatus) (Gabrey 1996), and Great Blackbacked Gulls (Larus marinus), Doublecrested Cormorants (Phalacrocorax auritus) and Great Egrets (Ardea alba) (CWS and USDA, unpubl. data). In the study by Blokpoel et al. (1987), over 1,700 adult and flightless Common Terns from Lake Ontario and the Niagara River were wing-tagged and found to spend most of the winter in the Caribbean, Central America and on the west coast of Peru.

A less often used approach with colonial waterbirds is to capture and band birds during migration or on their wintering grounds in hopes of determining where they go in the spring to breed. Using this method, King et al. (2007, pers. com.) found that Double-crested Cormorants (Phalacrocorax auritus) banded in Mississippi went to four main areas: Lake Champlain, western Lake Erie, south-eastern Georgian Bay, and the central Minnesota-North Dakota-Manitoba border area. Similarly, the same type of information can be obtained by analyzing accumulated data from banded birds found in a given area to see where they have come from. For example, this type of analysis was used for Herring Gulls on the Great Lakes, where more than 99% of the banded Herring Gulls encountered in the Great Lakes were also banded there, indicating a very "closed" population (Weseloh 1984).

The Ring-billed Gull is an abundant breeding bird on the Great Lakes - St. Lawrence River system (Gauthier and Aubry 1996, Cadman et al. 2007) and has been the subject of at least two largescale banding studies there. Bill Southern (1974 a, b) banded birds at Rogers City, Michigan (Lake Huron) and found that the major wintering area for Ring-billed Gulls from that site was on the Atlantic coast of Florida. Gabrey (1996), looking at all returns of Ring-billed Gulls banded throughout the Great Lakes, confirmed that U.S. states along the coast of the Gulf of Mexico, especially Florida, were the main wintering areas. Interestingly, he further noted that a maximum of only 3% of Ring-billed Gulls banded in the Great Lakes were recovered in winter in the New England states (Maine to New York). Thus, the reader can picture a winter distribution of Ring-billed Gulls, which breed on the Great Lakes, that is concentrated in Florida but with

diminishing numbers extending as far north as the state of Maine.

One of the limiting aspects of a traditional banding study using only metal bands is that each bird is usually only reported once, *i.e.* upon its death. However, studies which use field-readable (colour) bands or markers, or those using various kinds of transmitters, allow for repeated sightings of a given individual so that a bird's overall movements can be tracked. Such a study has been undertaken by the Massachusetts (MA) Department of Conservation and Recreation to assess the movements and breeding areas of Ring-billed Gulls which over-winter in central Massachusetts and which roost on the drinking water reservoirs that provide water to residents of the Greater Boston area (Clark 2009). Several of the Ring-billed Gulls colour-marked in that study have been observed repeatedly onthe Great Lakes and on the Atlantic coast. The purpose of this article is to

Figure 1. Local place names in Massachusetts and Rhode Island mentioned in the text. Banding sites in central Massachusetts are labelled in yellow and shown by squares; re-observation sites in this area are labelled in white and shown by circles. Some tagged Ring-billed Gulls were re-sighted at banding sites as well.





Figure 2. Gulls were baited into parking lots and within the range of a rocket net. Note the placement of the net between the front and rear tires of the truck. *Photo: Dan Clark.*

describe the movements of the birds from that study which were found, or assumed to be, breeding in or near to Ontario (ON), thus giving a slightly different perspective on the migration of Ring-billed Gulls to and from Ontario and further showing their fidelity to breeding, migratory and wintering sites.

Methods

During the non-breeding season from March 2008 to March 2010, Ring-billed Gulls were baited with bread, crackers and French fries into parking lots in central Massachusetts, near the communities of Brookfield, Shrewsbury, Marlborough and Worcester (Figure 1), where they were captured with rocket nets (Figure 2). Brightly coloured polyvinyl chloride (PVC) wing-tags were attached to the patagium of both wings. All wing-tags were individually marked, on both the upper surface and underside of the tag, with a unique combination of black numbers/letters (Figure 3). The project was widely advertised and the public was encouraged to report sightings of these birds. All bandings and re-sightings were maintained on a spreadsheet for easy sorting and when calculating the distance between subsequent re-sightings of the same bird, the straight line function in Google Earth was used. Only the results of birds re-sighted in Ontario or the adjacent U.S. waters of the Great Lakes/ St. Lawrence River are addressed in this paper.



Figure 3. Ring-billed Gull A42 (#7, see Table 1) with clearly visible wing-tag. Photo: Chip Weseloh.

Results

Of the 763 Ring-billed Gulls that have been wing-tagged to date in this study, 461 (60.4%) have been re-sighted at least once yielding 2,692 re-sightings (up to 15 October 2010) of these birds. The number of re-sightings per individual ranged from 1 to 77 with an average of 4.8 per bird. Thirteen of these re-sighted individuals (2.8%) were reported directly from, or near, breeding colonies in Lakes Ontario, Erie or Huron or the Ontario portion of the St. Lawrence River during April – June; they are assumed to have been breeding in those areas. There has been a total of 65 re-sightings (2.4% of the total) of these 13 birds to date. There were no re-sightings reported from west of Georgian Bay, Lake Huron.

For seven of the 13 re-sighted gulls (#s1-7, Table 1), most were observed in multiple seasons in both the Ontario/ Great Lakes/St. Lawrence River area and subsequently back in the Massachusetts/ Atlantic coast/southern U.S. area. One individual (#1) was not re-sighted back in the Massachusetts area but had a very noteworthy post-banding movement (see below). These seven gulls were re-sighted from 3 - 17 times each for a total of 65 re-sightings or 9.3 times per individual. Most of them provide interesting insight into the movements between these areas and their fidelity to specific sites. The chronology and details of their re-sightings are given in the narrative below. The general northward (spring) and southward (autumn) migratory movements of these tagged gulls are shown in Figures 4 and 5, respectively. The other six wing-tagged gulls (#s 8 – 13, Table 1) re-sighted in the Ontario/ Great Lakes/Upper St. Lawrence River area had very limited re-sightings. They were re-sighted in only one season and only in the Ontario/Great Lakes/St. Lawrence River area; they were not re-sighted anywhere outside the Great Lakes including anywhere near the banding location. They were seen only 1 - 4times each for a total of 10 re-sightings or 1.7 times per individual. However, there were two distinctions in this group of re-sighted gulls (#s 8–13, Table 1 and

Table 1. Details on banding, resighting and status of wing-tagged Ring-billed Gulls observed in Ontario and the Great Lakes

Gull	# Tag #	ng # Banding Date	No. Re- Sightings	1st Re- Sighting*	Location**	Status
1	A326	26 09-Nov-09	3	7-May-10	L.Galloo I.	On breeding colony
2	A198	98 06-Mar-09	4	5-Jun-09	Strachan I.	On breeding colony
3	A409	09 12-Jan-10	5	26-Apr-10	Port Colborne	On breeding colony
4	A421	21 12-Jan-10	6	9-Jun-10	Midland	Colony 25 km away
5	A186	36 20-Feb-09	8	28-Apr-09	Niagara Falls	Colony nearby
6	A196	96 06-Mar-09	12	28-Apr-10	Strachan I.	On breeding colony
7	A42	2 03-Oct-08	17	12-May-09	Collingwood	On breeding colony
8	A102	02 09-Feb-09	1	24-May-09	Long Sault	Colony nearby
9	A151	51 29-Dec-08	2	25-Mar-10	Toronto	On breeding colony
10	A443	43 12-Feb-10	4	19-Apr-10	Trenton	Colony nearby
11	Unk1	k1 N/A	1	13-Apr-10	Lancaster	Colony nearby
12	Unk2	k2 N/A	1	9-Jun-09	Belleville	Colony nearby
13	Unk3	k3 N/A	1	23-Jun-10	Russell	Colony 25 km away
7 8 9 10 11 12	A42 A102 A151 A443 Unk1 Unk2	2 03-Oct-08 02 09-Feb-09 51 29-Dec-08 43 12-Feb-10 k1 N/A k2 N/A	17 1 2 4 1 1	12-May-09 24-May-09 25-Mar-10 19-Apr-10 13-Apr-10 9-Jun-09	Collingwood Long Sault Toronto Trenton Lancaster Belleville	On breeding colony Colony nearby On breeding colony Colony nearby Colony nearby Colony nearby

* Along the Great Lakes/St. Lawrence River.

** All place names except Little Galloo I. and Niagara Falls (NY) are in Ontario.

Figure 4). Their dates of re-sighting in the Great Lakes area ranged from 25 March (#A151) to 23 June (Unknown #3), which are both the earliest and latest dates of re-sighting, respectively, in the Great Lakes. Unfortunately, none of these gulls were re-sighted subsequent to their arrival in the Great Lakes so nothing can be said of their autumn movements /migration or of their fidelity to their breeding, stopover or wintering sites.

Narratives of Individual Gulls

Bird A326 (#1, Figure 4) was re-sighted three times after banding on 9 November 2009 in Brookfield, MA. It was re-sighted on 10 November, the day after banding, at the banding site and then again on 9 March 2010 at a park in Cumming, Georgia (1,375 km from its banding site). It was next observed two months later, on 7 May, at Little Galloo Island (in New York, 38 km south of Kingston, ON), 1,265 km from its previous sighting and 395 km from its banding site. The sighting of this bird in Georgia in March suggests it was a migrant when initially captured in Massachusetts. After its capture, banding and release in Massachusetts, it apparently continued southward, at least to Georgia. Perhaps it continued to Florida, wintered there, and was re-observed in Georgia on its way back north. From the date of its re-sighting at Little Galloo, it apparently made the 1250+ km trip from Georgia to Little Galloo Island in less than two months. Unfortunately, the few re-sightings of this bird do not permit any assessment of its fidelity to either a breeding or wintering site.

Bird A198 (#2, Figures 4 and 5) was resighted four times after banding on 6 March 2009 at Shrewsbury, MA. It was re-sighted on 5 June 2009, three months after banding, at a nest on the breeding colony at Strachan Island, Cornwall, ON, 389 km away. Six weeks later (15 July) it was seen at a different breeding colony on Four Brothers Island in Lake Champlain near Willsboro, NY, 130 km away from Cornwall. Two and a half weeks later, on 3 August, it was seen at Woonsocket, Rhode Island (RI), 308 km away from the Lake Champlain site but only 53 km from its capture site. The gull was not reported during the winter of 2009/2010, so we do not know if it wintered in the Massachusetts-Rhode Island area or if it went much farther south, like the previous bird. However, on 17 June 2010, it was seen at a breeding colony on Bergin Island, in the St. Lawrence River, less than one km west of the Strachan Island colony where it was seen in June 2009. The banding and first re-sighting dates (6 March and 5 June 2009) are too far apart to show any stages of migration or to indicate where the bird may have spent the winter. The re-sighting at Lake Champlain six weeks after being seen on the breeding colony at Strachan Island suggests the bird may have failed at nesting at Strachan Island and left the island earlier than usual. Alternatively, it may have been an early nester, raised its young and left immediately, but stopped at Lake Champlain en route to its wintering area. The re-sighting at a colony on Lake Champlain also indicates that migrant birds from elsewhere use local breeding colonies as stopover sites during migration.



Figure 4. Suggested spring movements of 13 wing-tagged Ring-billed Gulls (as per Table 1) captured in central Massachusetts (see"Banding Locations"). All gulls except those represented by lines numbered 1, 3 and 8, were last seen in the Massachusetts-Rhode Island area before being re-observed in the Ontario-Great Lakes area during a breeding season. Gulls represented by lines 1, 3 and 8, while banded in Massachusetts, were last observed at the location where each of their lines begin (note the direction of the arrows). These three birds must have been migrants when captured in Massachusetts as they continued southward after capture. For example, line 1 represents a gull (A326, Table 1) which was banded in Brookfield, MA on 9 November 2009, re-sighted in Georgia on 9 March 2010 and observed on a breeding colony in eastern Lake Ontario on 7 May 2010.

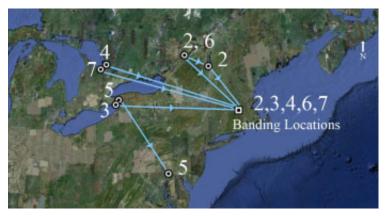


Figure 5. Suggested autumn movements of six wing-tagged Ring-billed Gulls captured in central Massachusetts, re-observed on or near a Great Lakes area breeding colony in summer and re-observed in the subsequent autumn-winter period. For example, line 4 represents a gull (A421, Table 1) that was seen in Midland, ON on 28 June 2010 and again in Shrewsbury, MA on 19 August 2010.

This is an important finding and one for which there has been very little opportunity for study among colonial waterbirds. The importance of breeding colonies to nesting birds is obvious but the importance of breeding colonies as stopover sites for migrating individuals seldom has been confirmed. The gull obviously did not stay long at Lake Champlain as it was seen in Rhode Island two and a half weeks later. It is interesting that the gull was not seen anywhere during the September 2009 to March 2010 period. However, it did return to its breeding area in 2010. Thus it showed good fidelity to both an autumn stop-over or wintering area and its breeding area.

Bird A409 (#3, Figures 4 and 5) was resighted six times after banding on 12 January 2010 in Worcester, MA. It was seen three weeks after banding, on 3 February, in Cranston, RI, 61 km away from its banding site. A month later, on 6 March, it was seen in Bethlehem, Pennsylvania, 350 km from the Rhode Island site. The next re-sighting came seven weeks later on 26 April at a nest on the breeding colony at Port Colborne, ON (597 km from the Pennsylvania site). The bird was then seen again on 29 September, and 5 and 22 October 2010 at a parking lot in Worcester, MA, less than one km of its capture site. It would appear that this bird wintered in the Worcester, MA area; it was captured there in January and was re-sighted there in September and October. It is very likely that it had begun its northward migration to Port Colborne when observed on 6 March in Bethlehem, even though that site is not in a direct line to the colony (see Figure 4). Ring-billed Gulls usually begin to arrive in the Hamilton area in spring, and presumably at Port Colborne, during the first week of February (Curry 2006). This bird also showed good fidelity to its apparent wintering area in Worcester, MA.

Bird A421 (#4, Figures 4 and 5) was resighted six times after banding on 12 January 2010 at Worcester, MA. It was re-sighted two months later (in March) near its banding location but not again during the spring migratory period of 2010. However, in June 2010 it was observed three times, on the 9th, 11th and 28th, at Little Lake Park in Midland, ON. There are several nesting colonies of Ring-billed Gulls in that vicinity, a notable one is at South Watcher Island, and it is presumed to have been nesting at one of them. The gull was then seen back in Massachusetts on 19 August at Shrewsbury and again in Worcester, MA on the 15 September. This bird also showed good fidelity to what appeared to be its wintering location, given it was seen there in January, March, August and September.

Bird A186 (#5, Figures 4 and 5) was resighted eight times after banding on 20 February 2009 at Marlborough, MA. It was observed in the Boston, MA, area (40 km away) five times between 26 February and 28 March. On 28 April, one month after last being sighted in the Boston area, it was reported in Niagara Falls, NY (661 km away). Many Ringbilled Gulls nest on islands and breakwalls in the Niagara River and it probably nested there. It was reported the following winter, on 2 January 2010, at the Conowingo Dam, MD (450 km away) from Niagara and 576 km from its banding site. On 15 June 2010, it was reported at the breeding colony on the Buckhorn Weir on Grand Island, Niagara Falls, NY, thus showing good fidelity to its probable breeding site/area. This bird may have been a migrant when captured given its January date in Maryland and February – March dates in Massachusetts.

Bird A196 (#6, Figures 4 and 5) was resighted twelve times after banding on 6 March 2009 also at Shrewsbury, MA. It was seen later the same day at a parking lot in Millbury, MA, 8.4 km away. It was not reported during the 2009 breeding season, April - July, but it was back, or still in Massachusetts, at Clinton, in August, September and October 2009, only 14 km from where it was banded. It was re-sighted four months later on 8 February 2010 at Newport News, Virginia (VA), 727 km to the south. On 27 April 2010, two and a half months later, it was observed on a nest on the breeding colony, again, at Strachan Island at Cornwall, ON, 901 km from Vermont. Just over two months later it was reported at Wachusett Reservoir in Boylston, MA, 381 km away from Cornwall on 2 July 2010. This site is only 9 km from where it had been banded. It was seen 5 times during August and September 2010 in the same area of Clinton, MA. From the re-sightings of this bird, we cannot tell if it wintered in the Shrewsbury-Clinton area of Massachusetts or if it passed through this area in the autumn and spring. The fact that it was seen in Virginia in February suggests that it wintered in that area. However, being observed in

central Massachusetts in July – September and March suggests it could have been migrating through that area but showing good fidelity to this area as a stopover site.

The last gull, bird A42 (#7, Figures 4 and 5), was re-sighted 17 times after banding on 3 October 2008 at Worcester, MA. It was reported six times between 7 October and 17 December 2008 in the area where it was banded. One of these re-sightings came from a reservoir where it roosted. Two months later, on 10 February 2009, it was reported from Coney Island beach in Brooklyn, NY (261 km away). But then on 16 and 20 March, five weeks later, it was back in Massachusetts where it had been captured. Approximately two months later, on 13 May, the bird was seen at a nest on the colony just south of Nottawasaga Island at Collingwood, ON (725 km from Massachusetts). Within three months, on 4 August, it was back at the parking lot at Worcester, MA where it was seen five more times up to 21 November 2009. The bird was not seen during the 2010 breeding season, although the authors searched for it on 24 June 2010 at the breeding colony near Collingwood. On 27 August 2010, the bird was re-sighted at the parking lot where it was originally captured, establishing that it did show fidelity to its wintering site in Massachusetts.

Discussion

This appears to be the first published study which has tracked individually tagged Ring-billed Gulls that breed in the eastern Great Lakes. Southern's (1974a, b) work was conducted at a colony in Rogers City, Michigan, on the west shores of Lake Huron in the 1960s – 1970s. He found that Florida was the main wintering area of most of the Ring-billed Gulls from that area of the Great Lakes.

One of the major findings of the current study, albeit with its small sample of birds that bred or presumably bred in the southern Ontario/eastern Great Lakes/ upper St. Lawrence River area, was that all six of the gulls that were observed at least twice during different breeding or non-breeding seasons, showed fidelity to breeding sites, wintering sites and/or migratory stopover sites between the Great Lakes and central Massachusetts. Five of six gulls showed fidelity to the capture area in central Massachusetts (and surrounding area, e.g. adjacent Rhode Island or nearby New York) either as a wintering area or as a stopover site; two birds (including one of the above) showed fidelity to breeding areas in the Great Lakes. Fidelity could not be assessed in the other six gulls (#s 8 - 13, Table 1) which were only observed in one breeding or non-breeding season.

Additionally, the average date of first detection of tagged Ring-billed Gulls on/near colonies in Ontario or the Great Lakes was 12 May. This date is heavily skewed, however, because most biologists/observers are not out on colonies until at least late April. The average date of first detection (arrival) in the banding area (Massachusetts) after the breeding season was 31 August (but four of six birds appeared between 2 July – 19 August). These dates should not be biased as observations in July – August would not be weather-dependent. Also,

these dates are early compared to findings of both Southern (1974b) and Gabrey (1996) who showed that dispersal from the colonies was just beginning in August and breeding Ring-billed Gulls were, on average, only about 320 km from their natal colonies then. However, the proportion of Great Lakes Ring-billed Gulls that goes to New England to winter or as a stopover spot in migration is small and probably does not count for much in the larger scheme of gull movements. However, a specific study on wintering areas of Ring-billed Gulls from the eastern Great Lakes, or the lower Great Lakes, has not been done. Part of the trouble in establishing fidelity was the fact that only in Massachusetts were sustained regular efforts made to re-sight the birds. On the Great Lakes and in areas south of Massachusetts, e.g. Georgia and Virginia, all sightings were accidental or opportunistic.

Southern (1974b) identified a major migration corridor for Ring-billed Gulls departing south-eastward from the lower Great Lakes, cutting across western and central New York and most of Pennsylvania ending up in the southern two-thirds of New Jersey, Delaware and Delaware Bay. Birds captured and/or observed in central Massachusetts are on the very northern edge of this corridor and may have a migration chronology that differs slightly from those gulls moving directly in the corridor.

One of the interesting features of this Massachusetts-based study is that none of the wing-tagged birds were reported from west of southern Georgian Bay in Lake Huron. Thus, although the wintering area for Great Lakes Ring-billed Gulls is given as from Maine to Texas (Ryder 1993, Gabrey 1996), there may be a propensity for gulls from the eastern Great Lakes to winter in the more northeastern section of that range. This is something which has not been shown previously.

Gabrey (1996) states that the northward migration of adult Ring-billed Gulls starts in March. This is slightly at odds with what is known about arrival times of Ring-billed Gulls at Hamilton, ON, where Curry (2006) says the first arriving birds are usually present in early February. Weir (2008) notes that the average arrival date in Kingston is 9 March. Perhaps the Ring-billed Gulls which can be seen massing at Eastport in Hamilton Harbour are birds which have over-wintered locally rather than recently arrived migrants. At least three of the Ring-billed Gulls observed at/near breeding colonies in the Great Lakes were still being reported in the Massachusetts area in early and late March. All three were observed on Great Lakes colonies during the last week of April. Three of the Ring-billed Gulls assumed to be breeding on Great Lakes colonies were back in Massachusetts by early July and early August.

Among Canadian provinces, the most Massachusetts-banded Ring-billed Gulls were re-sighted in Newfoundland (26), followed closely by Quebec (23), then Ontario and New Brunswick (14 each) and Nova Scotia (3). This distribution presents a very vivid image of where some of the Ring-billed Gulls, which are in Massachusetts during the non-breeding season, go to breed. It also points out the need for an analysis of the wintering areas of Ring-billed Gulls nesting east of the Great Lakes in eastern Canada.

Summary

In this study, the migration and local movements of adult Ring-billed Gulls captured in central Massachusetts during September to March were tracked through the re-sighting of birds marked with coloured patagial wing-tags. Thirteen of 461 re-sighted tagged birds (2.8%) were observed in Ontario or the Great Lakes: all were observed south and east of Georgian Bay, Lake Huron. Six of the 13 tagged gulls were observed during two or more years and all showed fidelity to a breeding, stopover or wintering site. One gull was noted using a breeding colony as a stopover location during its southward migration. At least two gulls were captured in Massachusetts en route to wintering locations where they were re-sighted farther south.

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