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### Colonial waterbirds nesting in Canadian Lake Superior in 1978

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#### Abstract

In 1978 we made an inventory of waterbird colonies in the Canadian portion of Lake Superior. Total estimates obtained were: six colonies of Double-crested Cormorants (*Phalacrocorax auritus*) with a total of 35 nests, 34 colonies of Great Blue Herons (*Ardea herodias*) with 328 nests, 149 colonies of Herring Gulls (*Larus argentatus*) with 6410 nests, and four colonies of Ring-billed Gulls (*L. delawarensis*) with 4935 nests. We briefly discuss our results along with pertinent historical data.

#### Introduction

Colonial waterbirds in the Great Lakes are vulnerable during the breeding season. High lake levels, storm waves, ground and aerial predators, as well as people, can damage or disturb their colonies. In addition, changes in food availability and toxic chemicals present in their food may affect the birds' condition and reproductive success.

In 1976, the Canadian Wildlife Service (CWS) began a project entitled "Conservation of colonial waterbirds in the Great Lakes". As the name implies, the long-range goal of this project is to provide for the adequate protection of colonial waterbirds. The immediate objectives were to (1) obtain an understanding of the population dynamics to determine the need for protection and (2) study the ecological requirements of colonial waterbirds to enable development of proper management techniques. To understand fully the population dynamics of the Great Lakes colonial waterbirds, we first needed information on the distribution of their colonies. Hence, CWS carried out an inventory of waterbird colonies in Canadian Lake Ontario in 1976 (Blokpoel 1977) and, with the co-operation of the Ontario Ministry of Natural Resources (OMNR), made an inventory of Canadian Lake Erie in 1977 (Blokpoel and McKeating 1978). In 1978, CWS, OMNR, Lakehead University and Pukaskwa National Park jointly made an inventory of the Canadian shore of Lake Superior. We report the results of that inventory here.

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#### Methods

The inventory of Canadian Lake Superior consisted of (1) a survey of all colonies and (2) a count or estimate of nests (or birds) for each colony. As discussed by Buckley and Buckley (1980), a colony of waterbirds is hard to define. For the purposes of this paper, we define a colony as a site where colonial waterbirds nest. Although colonial waterbirds usually nest close to one another, single nesting pairs are occasionally found as well. The latter represent one-nest colonies according to our definition.

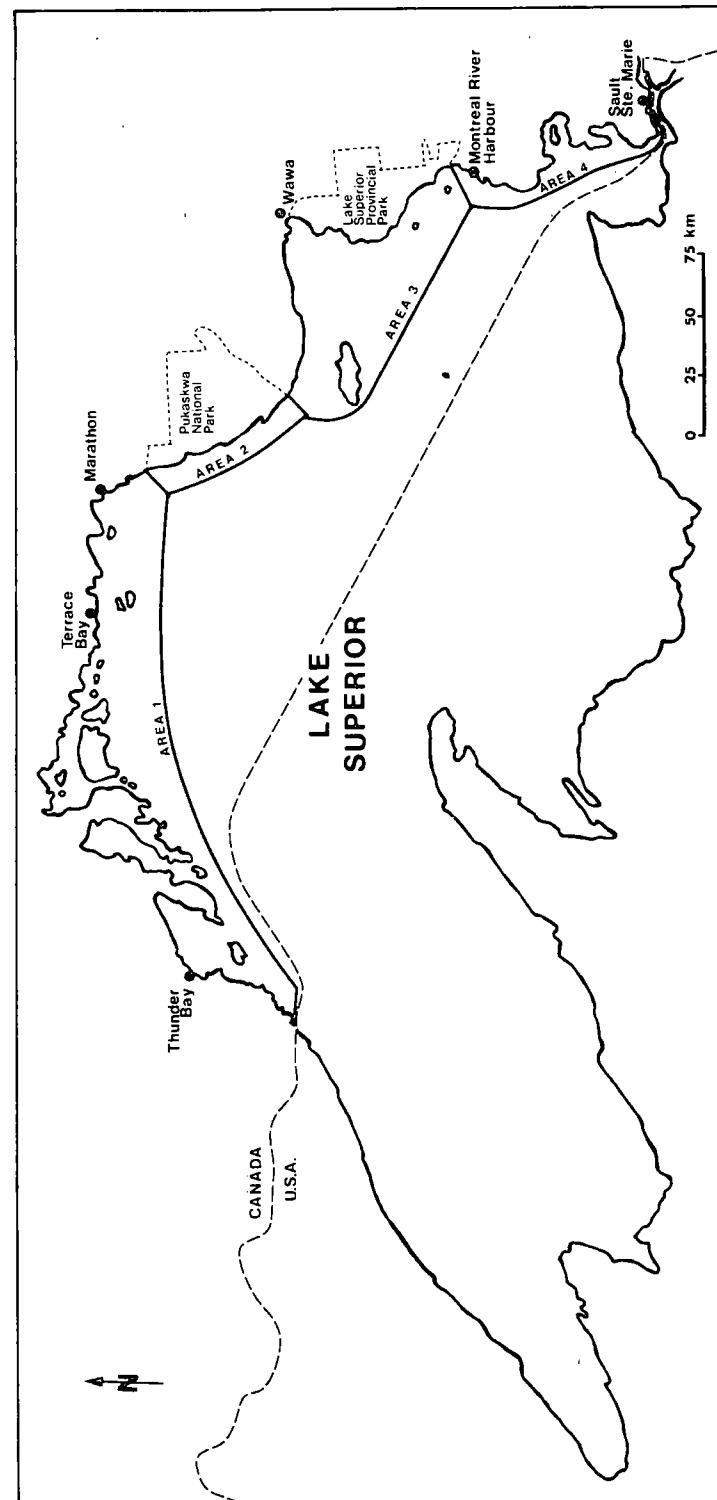
We divided Lake Superior into four areas, as shown in Figure 1. Area 1, from the US border near Pigeon River east to the Pic River near Marathon, was surveyed and censused by Lakehead University on 6-7 June 1978 using a Cessna-180 aircraft. They chose potential colony sites (islands) from the 1:50 000 topographic maps. Survey altitude and speed varied according to the numbers of birds seen on a particular island. Whenever they located a colony, they usually made two sweeps at low altitude and speed (about 50 m and 100-110 km/h respectively) to estimate the number of birds within the colony. Then they divided the number of birds by two to arrive at the number of nests.

Area 2, the coastline of Pukaskwa National Park, was surveyed and censused by park staff on 30 and 31 May, and 2 and 4 June using boats. When any island or portion of mainland had a gull or heron present, they checked it on foot for nests. They also inspected many islands which appeared ideal for nesting but had no birds present (Carswell 1978).

Area 3, from the southern border of Pukaskwa National Park to the southern border of Lake Superior Provincial Park (LSPP), including Michipicoten Island, was surveyed and censused by OMNR on 23 June using a Cessna-185 on floats, and on 23-24 June with a canoe. The aerial census consisted of an estimate of the number of nests for each colony. During the canoe trip they estimated the numbers of adult birds present on each colony and divided by two for the number of nests. OMNR made a ground census of the Vrooman Islands in the southern part of LSPP on 22 May, and CWS did the same at Barrett Island and the Agawa Islands (also located in the southern part of LSPP) on 24 May.

Area 4, from the southern border of LSPP to Sault Ste. Marie, was surveyed and censused by CWS on 23 May using a Cessna-180 on floats. For all colonies encountered, they estimated the number of nests from the air and took air photographs (35-mm colour slides) of most colonies. On 23, 24 and 25 May, they visited several colonies by boat and made ground counts of nests.

**Figure 1**  
Map of Lake Superior. Four different organizations each carried out an inventory of colonies of waterbirds in one of the areas shown



**Results and discussion**

We present all information for the four areas in Table 1, and the colony locations in Figures 2-5. Areas 1, 2, 3 and 4 contained colonies 1-76, 77-124, 125-148 and 149-167 respectively. Most colonies listed in Table 1 are on individual islands. Some, however, involve two or more associated islands or shoals and the numbers given are the total nests observed on those island groups.

**Double-crested Cormorant**

We found six colonies with an estimated total of 35 nests, their sizes ranging from 1 to 10 nests. All colonies were on small open islands with the birds nesting on the ground. Either Herring or Ring-billed Gulls were also nesting at all six of them. During surveys of the US portion of Lake Superior in 1977, no nesting cormorants were observed (Scharf *et al.* 1978).

In Ontario the Double-crested Cormorant is a locally common summer resident at Lake of the Woods, along shores of the Great Lakes, at Lake Abitibi, and, formerly, on James Bay (James *et al.* 1976). According to Postupalsky (1978), the history of the species in the Great Lakes "was initially one of absence as a breeding bird". The first cormorant colony in Lake Superior, and indeed in the Great Lakes, was on the Agawa Rocks (colony no. 147), where birds were observed nesting in 1913 (F. Novy pers. commun, to S. Postupalsky). The second colony, according to Baillie (1947), became established about 1920 on Carney Rocks, Black Bay, Lake Superior.

The subsequent history of cormorant colonies in Lake Superior and other Great Lakes is not well documented.

In the early 1940's the Great Lakes cormorant population increased rapidly, so much that in 1946 control measures, demanded by commercial fisheries interests, were launched in some areas. The major centers of breeding were in the North Channel and Georgian Bay area of Lake Huron, in eastern Lake Ontario, the Green Bay - Door Peninsula area of Lake Michigan, and the Thunder Bay area of Lake Superior. (Postupalsky 1978).

Even after persecution stopped, the cormorants continued to decline in number, as noted in Lake Superior by 1960 in the records of the Thunder Bay Field-Naturalists' Club.

Symptoms of this decline include widespread reproductive failures associated with moderate to severe thinning of eggshells and a high frequency of accidental egg breakage, all recognized as part of the DDE - contamination syndrome . . . By the early 1970's the total cormorant population nesting in the Great Lakes was reduced by more than 80 percent and eggshell thickness and reproduction were at their lowest point. (Postupalsky 1978).

In the following years (1973-76), "a partial recovery in breeding success and eggshell thickness was noted, possibly in response to declining DDE contamination in the birds' prey base, but populations continue at low levels." (Postupalsky 1978). In 1970, the one known colony on Granite Island in Lake Superior consisted of three nests. It produced no chicks. On 22 June 1973 and

19 July 1974 the colony on Cone Island consisted of 14-15 and 15 nests respectively (Postupalsky 1978). Cove Island had an estimated 10 nests (i.e., 20 birds) in 1978 (Table 1). The presence of six small colonies in 1978 indicates a recovery in the Lake Superior population, and the fact that all six colonies were found in western Lake Superior suggests that recolonization is taking place from the west. Lake Huron cormorants showed similar results: compared with the early 1970's, toxicant levels in 1979 had decreased while eggshell thickness and reproductive success had increased in cormorants nesting in the North Channel (Weseloh and McKeating in prep.).

**Great Blue Heron**

We counted 35 Great Blue Heron colonies with an estimated total of 328 nests. Colony sizes ranged from 1 to 32 nests, with an average of just under 10. All colonies were on islands with the nests built in trees. Fifteen of the heron colonies were on islands that held either Herring or Ring-billed Gull nests. Scharf *et al.* (1978) reported a total of seven heronries for US Lake Superior in 1977 (colony sizes ranged from 5 to 78 nests with a total of 272 nests).

The coastline of Lake Superior lies well within the breeding range of the Great Blue Heron (Godfrey 1966, Gray *et al.* 1980). We know of little historical information on the distribution and numbers of Great Blue Herons in Canadian Lake Superior. In 1932, eggs were collected from a colony at Port Arthur, now Thunder Bay (Baillie and Harrington 1936). In 1974, Ryder and Somppi (1974) surveyed the area between Thunder Bay and Terrace Bay and found three heron colonies: Hawk Island (17 birds), McKay Cove (five) and Cat Island (five). During the 1978 survey, we noted 17 heronries in the same area. The 1974 and 1978 surveys are not strictly comparable because the Beaver aircraft used in 1974 was not suitable for survey work. Nevertheless, the data do not suggest that the herons declined in number during the 1974-78 period. The heronries are most numerous in the western portion of Canadian Lake Superior, but we have no explanation for that distribution at present.

**Herring Gull**

We found 149 Herring Gull colonies with an estimated 6410 nests. Colony size ranged from 1 to 400 nests with an average of 43. The 743 nests in Area 2 contained 2077 eggs (mean clutch size = 2.8). In the US portion of Lake Superior, Scharf *et al.* (1978) counted 89 colonies in 1977 with a total of 7214 nests. Colony sizes ranged from 1 to 595 nests with an average of about 80.

The Herring Gull nests throughout Ontario (Godfrey 1966, James *et al.* 1976). An early record for Lake Ontario pertains to a colony on the Agawa Rocks, which were visited in 1926 (Fargo and Tyne 1927).

All colonies were on islands with the exception of a single one-nest colony near Campbell Point (no. 78,

Table 1). That nest was on the mainland located on the edge of a cliff facing Lake Superior. At all colonies the birds nested on the ground.

Most nesting islands were small with considerable amounts of open habitat (bare rock or depressions with grasses and sedges). On heavily vegetated islands, Herring Gulls typically nested at the periphery just above the boulders or bare rock, often near or under small bushes. However, on some of these islands, some gulls nested near the centre and their nests were completely surrounded by vegetation with well trodden paths from the nests to the island's rim.

The observers reported no one-nest colonies for Area 1, but 21 of them for Area 2. This difference is largely due to differences in survey techniques (aerial survey in Area 1 and visits by boat in Area 2).

#### Ring-billed Gull

We found four Ring-billed Gull colonies consisting of 17, 168, 2000 and 2750 nests (Table 1, nos. 165, 148, 32, and 29 respectively). All nests were on the ground and fairly closely packed. All colonies were on islands.

In Ontario the Ring-bill is a common nester in Lakes Huron, Erie and Ontario and the St. Lawrence River (Ludwig 1974, Blokpoel 1977, Blokpoel and McKeating 1978). The species also nests in James Bay (R.I.G. Morrison, pers. commun). Its history on Lake Superior is not well known. Two immature birds were observed near Agawa Rocks on 10 September 1926 (Fargo and Tyne 1927) but those young birds may well have wandered in from colonies in Lake Huron. In their review of the breeding distribution of Ontario birds, Baillie and Harrington (1936) did not report nesting of the species in Lake Superior.

The recent distribution and numbers of nesting Ring-bills in Lake Superior is interesting in view of the rapid increase in their numbers elsewhere in the Great Lakes (Ludwig 1974, Blokpoel 1977, Southern 1977, Scharf *et al.* 1978, Scharf 1979). The two large colonies in Lake Superior (Granite Island with about 2000 nests and Gravel Island with some 2750 nests in 1978) have grown rapidly during the last few years. Granite Island held approximately 800 pairs in 1973 (Ryder 1975) and again in 1975 (Ryder and Somppi 1976). In 1974, no Ring-bills nested on Granite Island because a red fox was present. In 1974, the gulls nested at Gravel Island, but waves destroyed about 50% of the nests during a storm in June (Ryder and Somppi 1976). We have no historical information for Gravel Island before 1974.

As to the two smaller colonies, we know that Ring-billed Gull were nesting on Vrooman Island in 1974, but no numbers of nests were reported (Ontario Nest Record Scheme). Since we have no historical information on the other colony, we believe that it is newly established. By monitoring such small colonies, we will see how they change in the presence of nearby nesting Herring Gulls, which are considerably larger and usually have larger nesting territories.

In the US portion of Lake Superior, Scharf *et al.* (1978) found six colonies in 1977 consisting of 67, 200, 234, 405, 550 and 1485 nests. Two of those colonies were established in 1977 (i.e., no nesting Ring-bills were seen there in 1976), while the total number of nests at the other four colonies had increased by 20% compared to 1976. Data obtained so far suggest increasing numbers of Ring-billed Gull throughout Lake Superior.

Of particular interest is the unusually high incidence of supernormal clutches on Vrooman Island on 22 May 1979 as reported by OMNR. The numbers of nests with 0, 1, 2, 3, 4, 5, 6 and 7 eggs were respectively 1, 15, 22, 61, 18, 30, 20 and 1. A total of 168 nests had 591 eggs or 3.52 eggs per nest on average. The normal clutch size is three eggs, although inexperienced birds often lay only two.

#### Reliability of inventory

For logistical reasons we did not collect data to determine the accuracy of the different methods used in the four areas. Hence the numbers presented in Table 1 may be biased in varying and unknown degrees. The only method which we "feel" to be accurate was used in Area 2. In that area, observers visited all known and potential nesting sites by boat to do ground counts of nests. That method produced minimum estimates, and we judge that the true nest numbers would not exceed those estimates by more than 10%.

#### Conclusions and recommendations

We consider our survey of colony sites to be virtually complete in that we have observed and reported all colonies except some very small ones (fewer than five nests) that may have been missed in areas 1, 3 and 4. Hence the information in Table 1 provides the first set of baseline data that can be used to monitor any changes in the distribution of colonial waterbirds nesting in Canadian Lake Superior.

We do not know how accurate the data on colony size are except for Area 2 (Pukaskwa National Park). To document any future changes in nest numbers it will be best to repeat the inventory for Area 2 using the 1978 census method.

We recommend that the entire coast of Canadian Lake Superior be inventoried every 4 to 6 years and that, where feasible, the method should be ground-counts of nests rather than aerial estimates of birds. If aerial estimates are made, helicopters are more suitable than fixed-wing aircraft.

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#### References

- Baillie, J.L. 1947. The Double-crested Cormorant nesting in Ontario. *Can. Field-Nat.* 61: 119-126.
- Baillie, J.L.; Harrington, P. 1936. The distribution of breeding birds in Ontario. Part 1. *Trans. R. Can. Inst.* 21:1-50.
- Blokpoel, H. 1977. Gulls and terns nesting in northern Lake Ontario and the upper St. Lawrence River. *Can. Wildl. Serv. Prog. Notes No. 75.* 12pp.
- Blokpoel, H.; McKeating, G.B. 1978. Fish-eating birds nesting in Canadian Lake Erie and adjacent waters. *Can. Wildl. Serv. Prog. Notes No. 87.* 12pp.
- Buckley, P.A.; Buckley, F.G. 1980. What constitutes a waterbird colony? Reflections from the northeastern US. Pages 1-15 in *Proc. Third Annu. Meet. Colonial Waterbird Group.* October 1979. Lafayette, La.
- Carswell, W.R. 1978. Shoreline avian nesting census 1978. Unpubl. Rep. Pukaskwa Natl. Park.
- Fargo, W.G.; Tyne, J. van. 1927. Fall bird notes from the eastern shore of Lake Superior. *Can. Field-Nat.* 41:7-9.
- Godfrey, W.E. 1966. *The birds of Canada.* Queen's Printer. Ottawa. 428 pp.
- Gray, P.A.; Grier, J.W.; Hamilton, G.D.; Edwards, D.P. 1980. Great Blue Heron colonies in northwestern Ontario. *Can. Field-Nat.* 94:182-184.

James, R.D.; McLaren, P.L.; Barlow, J.C. 1976. Annotated checklist of the birds of Ontario. *Life Sci. Misc. Publ. R. Ont. Mus.* 75pp.

Ludwig, J.P. 1974. Recent changes in the Ring-billed Gull population and biology in the Laurentian Great Lakes. *Auk* 91:575-594.

Postupalsky, S. 1978. Toxic chemicals and cormorant populations in the Great Lakes. *Can. Wildl. Serv. Wildl. Toxicol. Div. Manusc. Rep. No. 40.* Ottawa. 25pp.

Ryder, J.P. 1975. Egg-laying, egg size, and success in relation to immature-mature plumage of Ring-billed Gulls. *Wilson Bull.* 87:534-542.

Ryder, J.P.; Somppi, L. 1974. Aerial survey of colonial nesting birds along the northern Lake Superior shore. Unpubl. rep. Ont. Minist. Nat. Resour. 5pp.

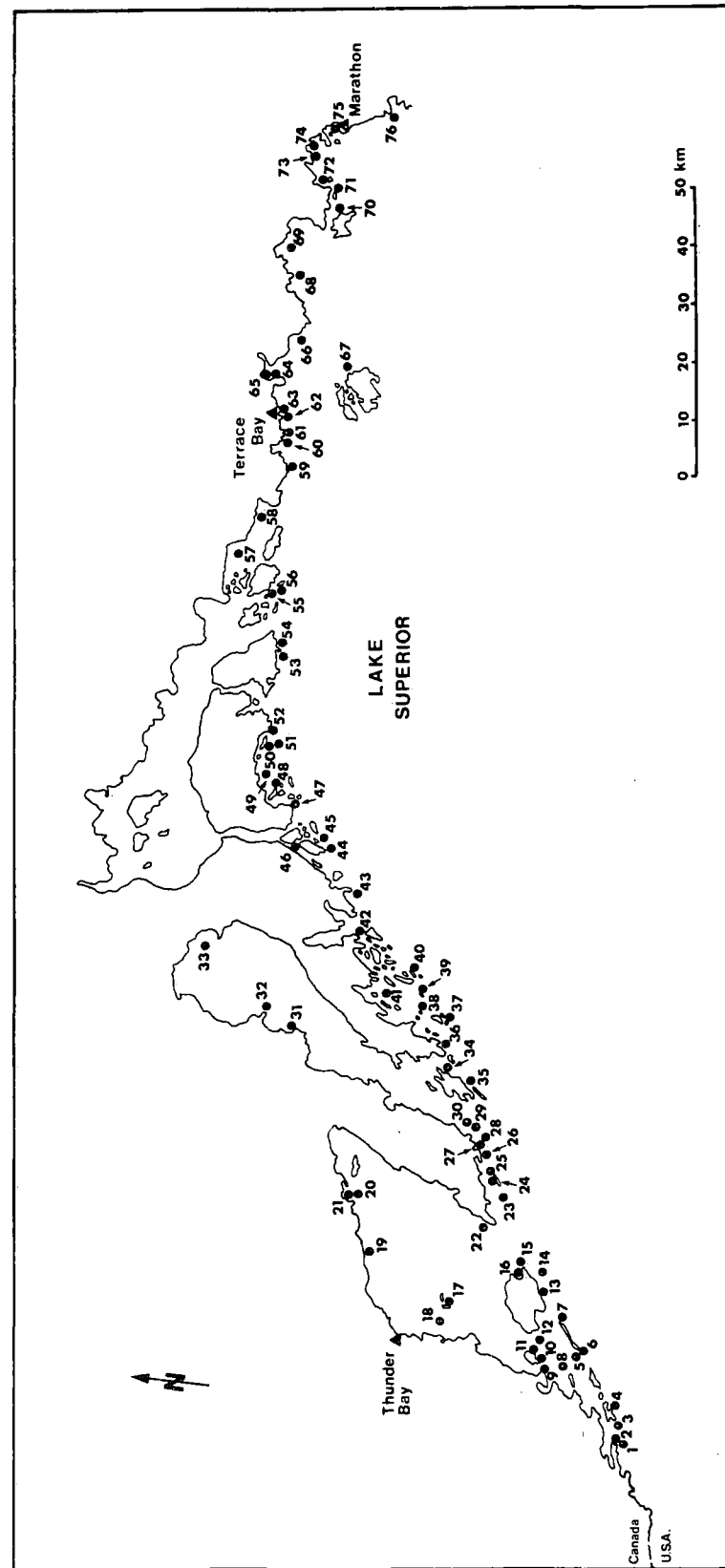
Ryder, J.P.; Somppi, L. 1976. Growth and development of known-age Ring-billed Gull embryos. *Wilson Bull.* 89:243-252.

Scharf, W.C. 1979. Nesting and migration areas of birds of the US Great Lakes (30 April to 25 August 1976). *US Fish Wildl. Serv. Off. Biol. Serv. FWS/OBS-77/2.* 113pp.

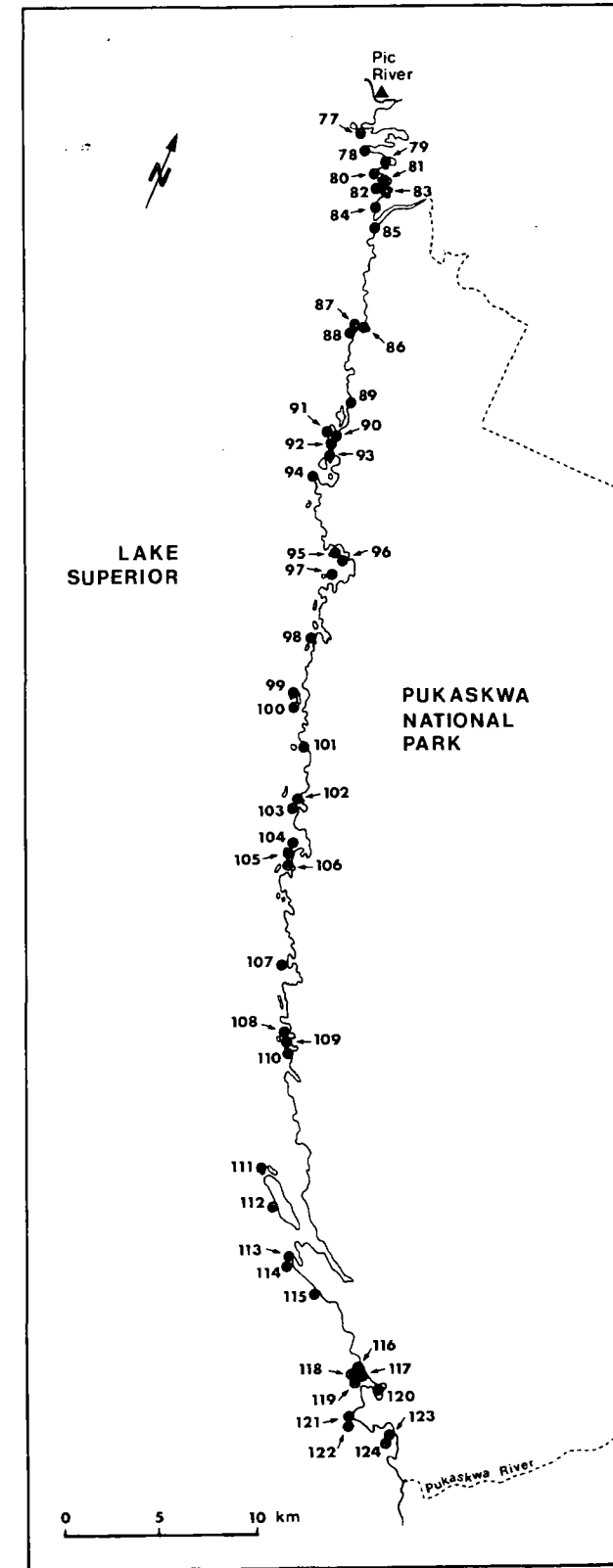
Scharf, W.C.; Shugart, G.W.; Chamberlin, M.L. 1978. Colonial birds nesting on man-made and natural sites in the US Great Lakes. Rep. WES-TR-D-78-10. US Army Eng. Waterw. Exp. Stn. Vicksburg, Miss. 140pp.

Southern, W.E. 1977. Colony selection and colony site tenacity in Ring-billed Gulls at a stable colony. *Auk* 94:469-478.

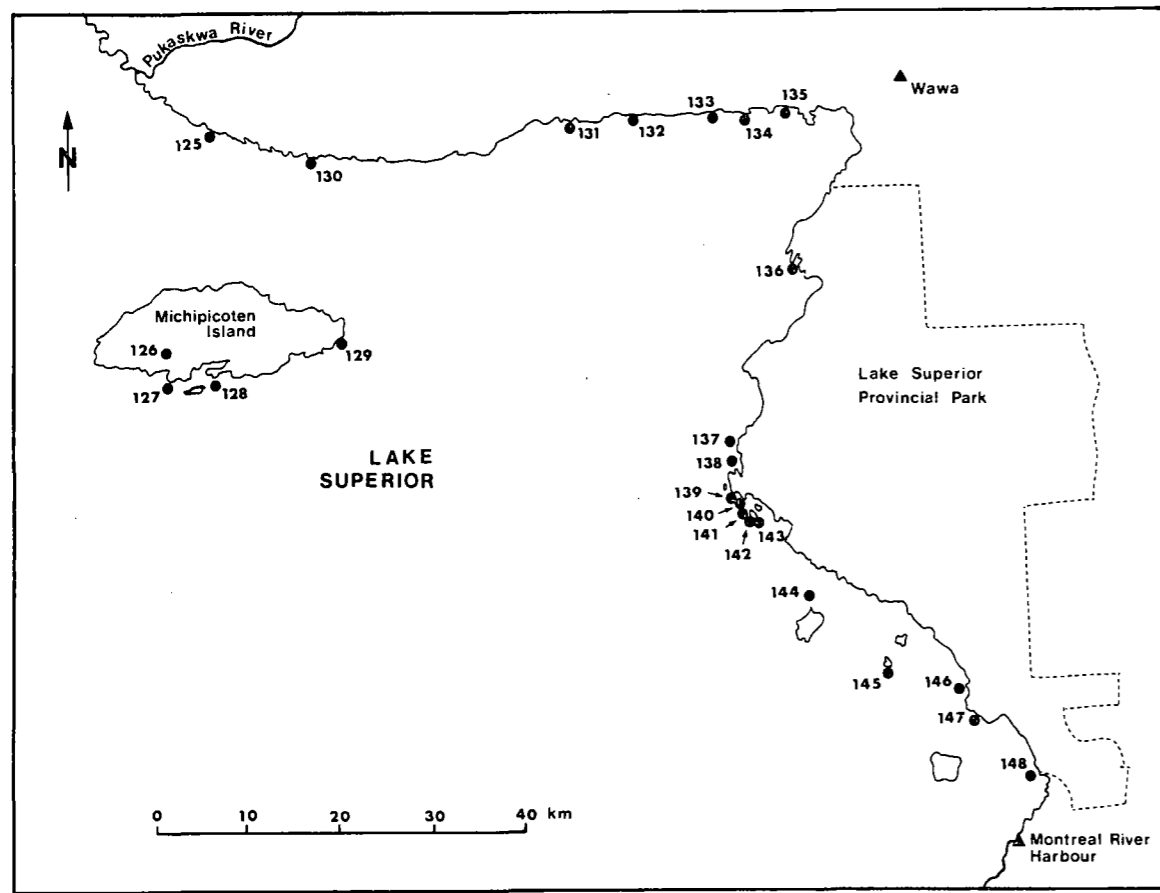
**Figure 2**  
Locations of colonies of waterbirds in 1978 in Area 1



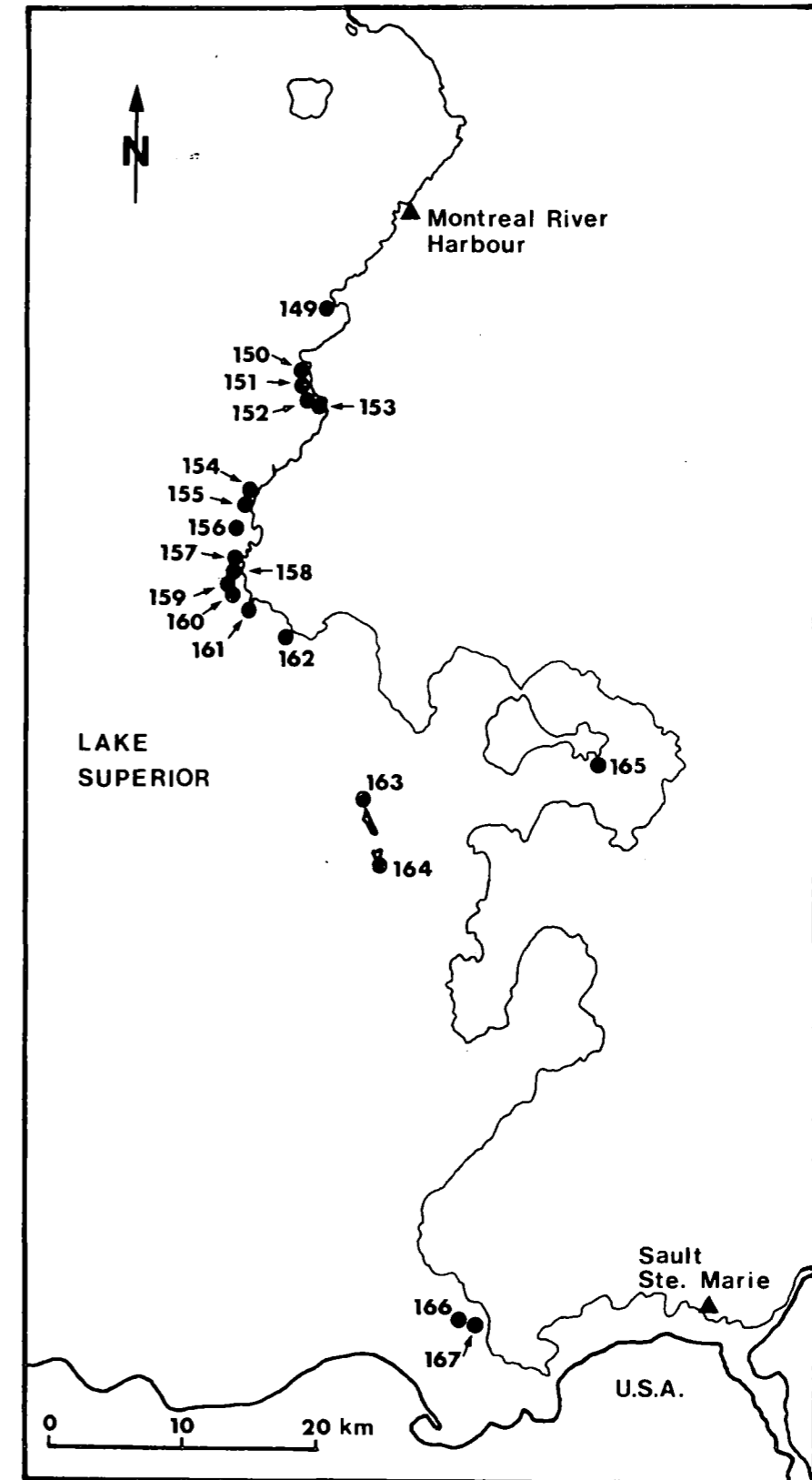
**Figure 3**  
Locations of colonies of waterbirds in 1978 in Area 2



**Figure 4**  
Locations of colonies of waterbirds in 1978 in Area 3



**Figure 5**  
Locations of colonies of waterbirds in 1978 in Area 4



**Table 1**  
Distribution and size of colonies of waterbirds in Canadian Lake Superior in 1978. See Figures 2-5 for colony numbers and locations. Note: I. = Island, Is. = Islands

Colony no.	Location	Method*	No. nests			
			Herring Gull	Ring-billed Gull	Great Blue Heron	Double-crested Cormorant
1	Clouds Is.	AE	25	0	0	0
2	Pinnacle Rock	AE	15	0	0	6
3	Tiger I. and Rock	AE	60	0	0	0
4	Rocks off Victoria Cove	AE	50	0	0	0
5	Slipper I.	AE	18	0	0	0
6	Is. at S end of Thomson I.	AE	150	0	0	0
7	Is. at N end of Thomson I.	AE	27	0	0	0
8	Sister Is.	AE	25	0	20	0
9	Singleton I.	AE	0	0	3	0
10	Flatland I.	AE	0	0	2	0
11	Is. on W side of Flathead I.	AE	4	0	0	0
12	Is. off Keefer Pt.	AE	46	0	0	0
13	SE side of Pie I.	AE	5	0	0	0
14	Cone I.	AE	75	0	0	10
15	I. off Turtle Hd.	AE	20	0	0	4
16	I. in cove of NE side of Pie I.	AE	50	0	0	6
17	Welcome Is.	AE	400	0	0	1
18	Mutton I.	AE	50	0	0	0
19	Papoose I.	AE	100	0	0	0
20	Buck Is.	AE	70	0	14	0
21	Kent I.	AE	50	0	0	0
22	Hare I.	AE	18	0	0	0
23	Is. at tip of Sibley Pen.	AE	50	0	0	0
24	Shangoia I.	AE	60	0	0	0
25	Silver Islet	AE	25	0	0	0
26	Sand Is.	AE	30	0	0	0
27	Skinaway I.	AE	10	0	0	0
28	Clark I.	AE	15	0	2	0
29	Gravel I.	AE	0	2750	0	8
30	Cranberry I.	AE	0	0	1	0
31	Nuttall I.	AE	0	0	22	0
32	Granite I.	AE	150	2000	0	0
33	Delaney I.	AE	0	0	8	0
34	Sybil I.	AE	14	0	0	0
35	Monk I.	AE	15	0	0	0
36	Tunnel I.	AE	0	0	8	0
37	St. Andrew I.	AE	25	0	0	0
38	Rocks on E side of Barclay I.	AE	5	0	0	0
39	Coates I.	AE	10	0	0	0
40	Rocks to E side of Sweetland I.	AE	48	0	0	0
41	Mood I.	AE	0	0	18	0
42	Lowrey I.	AE	35	0	0	0
43	Hawk I.	AE	50	0	16	0
44	Cedar I.	AE	15	0	1	0
45	Tremblay I.	AE	0	0	5	0
46	Rock on W side of Fluor I.	AE	0	0	1	0
47	Rocks on SW tip of St. Ignace I.	AE	95	0	0	0

(cont'd)

**Table 1 (cont'd)**

Colony no.	Location	Method*	No. nests			
			Herring Gull	Ring-billed Gull	Great Blue Heron	Double-crested Cormorant
48	Rocks on SE tip of Bowman I.	AE	4	0	0	0
49	Nest I. and associated rocks	AE	350	0	8	0
50	Burnet I.	AE	50	0	0	0
51	Reid I.	AE	20	0	0	0
52	Rocks on W side of McNab Hbr., St. Ignace I.	AE	35	0	0	0
53	Rocks off Beetle Pt., St. Ignace I.	AE	40	0	8	0
54	Legault I.	AE	40	0	0	0
55	Rocks on SW side of Wilson I.	AE	20	0	0	0
56	Cabinosh I.	AE	15	0	0	0
57	Cat Is.	AE	5	0	8	0
58	Rocks on W side of Collingwood Bay	AE	48	0	0	0
59	Les Petits Écrits	AE	40	0	0	0
60	Chase Rock	AE	37	0	0	0
61	Rocks to E of Chase Rock	AE	100	0	0	0
62	Rocks to W of Victoria Bay	AE	70	0	0	0
63	Is. in SW corner of Victoria Bay	AE	9	0	0	0
64	Cody I.	AE	5	0	0	0
65	Bare Rock	AE	10	0	0	0
66	Lawson I.	AE	30	0	0	0
67	Leadman Is.	AE	180	0	0	0
68	Fitzsimmons Rocks	AE	15	0	0	0
69	Barclay I.	AE	90	0	7	0
70	McDonald Is.	AE	200	0	0	0
71	Rocks to W of Sullivan Is.	AE	45	0	1	0
72	Rocks to N of Detention I.	AE	11	0	0	0
73	Glasgow I.	AE	11	0	0	0
74	Good Hope I.	AE	0	0	1	0
75	Skin I.	AE	15	0	0	0
76	Rocks off Randle Pt.	AE	25	0	0	0
77	I. NW of Campbell Pt.	GC	1	0	0	0
78	Campbell Pt.	GC	1	0	0	0
79	I. in SW part of Playter Hbr.	GC	22	0	0	0
80	I. N of Picture I.	GC	15	0	0	0
81	Picture I.	GC	1	0	0	0
82	I. SW of Picture I.	GC	1	0	0	0
83	I. S of Picture I.	GC	3	0	0	0
84	I. in Pitch Rock Hbr.	GC	1	0	0	0
85	I. S of mouth of White R.	GC	22	0	0	0
86	I. S of mouth of Willow R.	GC	42	0	0	0
87	I. S of mouth of Willow R.	GC	1	0	0	0
88	I. S of mouth of Willow R.	GC	1	0	0	0
89	Is. S of Shot Watch Cove	GC	26	0	0	0
90	Morrison Hbr. I.	GC	2	0	0	0
91	I. W of Morrison Hbr. I.	GC	16	0	1	0
92	Is. and rocks S of Morrison Hbr.	GC	75	0	0	0
93	I. in N part of Fish Hbr.	GC	1	0	0	0
94	I. off Sewell Pt.	GC	6	0	0	0
95	I. in N part of Oiseaux Bay	GC	11	0	0	0
96	I. in N part of Oiseaux Bay	GC	0	0	32	0

(cont'd)

Table 1 (cont'd)

Colony no.	Location	Method*	No. nests			
			Herring Gull	Ring-billed Gull	Great Blue Heron	Double-crested Cormorant
97	I. in S Part of Oiseaux Bay	GC	4	0	0	0
98	I. S of Fisherman's Cove	GC	1	0	0	0
99	I. NW of One Lake I.	GC	1	0	0	0
100	I. W of One Lake I.	GC	39	0	0	0
101	I. S of mouth of White Gravel R.	GC	1	0	2	0
102	Is. and rocks N of mouth of White Spruce R.	GC	110	0	0	0
103	I. W of mouth of White Spruce R.	GC	1	0	0	0
104	I. NW of Simons Hbr.	GC	29	0	24	0
105	I. S of Simons Hbr.	GC	6	0	0	0
106	I. S of Simons Hbr.	GC	1	0	0	0
107	I. NW of Newmans Bay	GC	22	0	0	0
108	I. W of Trapper Hbr.	GC	73	0	0	0
109	I. S of Trapper Hbr.	GC	1	0	0	0
110	I. off mouth of Swallow R.	GC	1	0	0	0
111	Is. off N tip of Otter I.	GC	126	0	0	0
112	Is. off W side of Otter I.	GC	61	0	0	0
113	I. NW of Deep Hbr.	GC	0	0	32	0
114	I. NW of Deep Hbr.	GC	3	0	0	0
115	Is. S of Otter Cove	GC	47	0	0	0
116	I. N of Richardson Hbr.	GC	2	0	0	0
117	I. N of Richardson Hbr.	GC	1	0	0	0
118	N tip of Cairn I.	GC	2	0	0	0
119	I. S of Cairn I.	GC	1	0	0	0
120	I. in Bonamie Cove	GC	1	0	0	0
121	I. N of Pointe la Canadienne	GC	1	0	0	0
122	I. W of Pointe la Canadienne	GC	1	0	0	0
123	I. E of Davis I.	GC	1	0	0	0
124	I. S of Davis I.	GC	1	0	0	0
125	Starr I.	AE	5	0	4	0
126	Michipicoten I.	AE	0	0	8	0
127	Ship I. S of Michipicoten I.	AE	6	0	0	0
128	Hope I. S of Michipicoten I.	AE	12	0	5	0
129	I. off SE side of Michipicoten I.	AE	5	0	0	0
130	I. E of Le Petit Mort Rocks	AE	2	0	0	0
131	I. W of False Dog Hbr.	AE	20	0	0	0
132	I. E of False Dog Hbr.	AE	20	0	0	0
133	I. E of mouth of Makwa R.	AE	5	0	0	0
134	I. W of Minnekona Pt.	AE	10	0	0	0
135	I. in Dore Bay	AE	20	0	0	0
136	Entrance I.	AE	0	0	14	0
137	Squaw I.	GE	75	0	0	0
138	I. N of Chalfant I.	AE,GE	0	0	9	0
139	Jordan I.	AE,GE	100	0	0	0
140	I. SE of Jordan I.	GE	40	0	0	0
141	I. NW of Devils Warehouse I.	GE	50	0	0	0
142	Devils Warehouse I.	GE	0	0	11	0
143	I. S of Devils Warehouse I.	GE	50	0	0	0

(cont'd)

Table 1 (cont'd)

Colony no.	Location	Method*	No. nests			
			Herring Gull	Ring-billed Gull	Great Blue Heron	Double-crested Cormorant
144	Ella Islet N of Leach I.	AE	60	0	0	0
145	I. S of South Lizzard I.	AE	0	0	14	0
146	Barrett I.	GC	128	0	0	0
147	Agawa Is.	GC	247	0	2	0
148	Vrooman I.	GC	175	168	0	0
149	Ossifrage I.	APH	41	0	0	0
150	I. S of Cozens Cove	AE	50	0	0	0
151	I. S of Cozens Cove	AE	25	0	0	0
152	I. S of Cozens Cove	AE	25	0	0	0
153	I. N end of Mica Bay	APH	1	0	0	0
154	I. N of Mamainse Hbr.	AE	30	0	0	0
155	Is. in Mamainse Hbr.	AE	25	0	0	0
156	Hibbard Rock	APH	1	0	0	0
157	Rousseau I.	APH	55	0	0	0
158	I. S of Rousseau I.	APH	2	0	0	0
159	I. N of Coppermine Rock	APH	105	0	0	0
160	Coppermine Rock	APH	2	0	0	0
161	I. off Whiskey Pt.	AE	2	0	0	0
162	I. W of Sawpit Bay	APH	40	0	0	0
163	I. N of North Sandy I.	GC	96	0	0	0
164	S tip of South Sandy I.	GC	61	0	0	0
165	Is. S of E end of Batchawana I.	GC	161	17	10 + 6†	0
166	I. W of Chêne I.	GC	253	0	0	0
167	Chêne I.	GC	189	0	0	0
			6410	4935	328	35

\*AE, aerial estimate; APH, airphoto; GC, ground count; GE, ground estimate.

†Of the islands visited, two had a heronry (one had six, the other 10 nests).

