Progress Note **llife Service**

ely data and conclusions
ice to other wildlife

Disponible également en fi

No. 165, December 1986

Colonial waterbirds nesting in Canadian Lake Huron in 1980

by D. V. Weseloh[1], P. Mineau[1,3], S. M. Teeple[1,4], H. Blokpoel[2] and B. Ratcliff[1,5]

Introduction

In recent years the need to systematically census colonies of waterbirds in North America has been recognized. Although there is not yet any comprehensive international plan for a continental census, several federal, provincial, state, and private agencies (and individuals) have undertaken regional censuses (e.g. Brown *et al.* 1975, Portnoy 1978, Blacklock *et al.* 1978, Erwin 1979, Korschgen 1979, Erwin and Korschgen 1979, DesGranges and Laporte 1983, and Dunn *et al.* 1985).

In 1976, one of us (HB) began a 4-year census of colonies of fish-eating birds in the Canadian waters of the Great Lakes. Lakes Ontario, Erie, and Superior were censused in 1976, 1977, and 1978, respectively, and these results were presented in earlier Progress Notes (Blokpoel 1977, Blokpoel and McKeating 1978, Blokpoel *et al.* 1980).

This report presents the numbers and locations of colonies of the Double-crested Cormorant (*Phalacrocorax auritus*), Great Blue Heron (*Ardea herodias*), Black-crowned Night-Heron (*Nycticorax nycticorax*), Herring Gull (*Larus argentatus*), Ring-billed Gull (*L. delawarensis*), Caspian Tern (*Sterna caspia*) and Common Tern (*S. hirundo*) that we found on Canadian Lake Huron in 1980. As such, this report concludes the first census of the Canadian portion of the Great Lakes. It and the papers of Blokpoel (1977), Blokpoel and McKeating (1978), and Blokpoel *et al.* (1980) complement the work of Scharf *et al.* (1978), who censused similar bird populations in the US portion of the Great Lakes in 1976 and 1977.

Methods

For the purposes of this paper, the term "Lake Huron" refers to the entire lake complex including Georgian Bay and the North Channel. The area of water exclusive of these two water bodies is referred to as "the main body" of Lake Huron.

The entire Canadian shoreline of Lake Huron was divided into four areas (see Fig. 1) and each was assigned to a census team as follows (initials are those of authors or of individuals listed in acknowledgements):

Area 1 — southern Lake Huron and southern Georgian Bay (HB, BL, and TH);
Area 2 — northern Georgian Bay (PM and JB);
Area 3 — Manitoulin Island (DVW and EW); and
Area 4 — North Channel and St. Mary's River (SMT and BR).

Each census team had its own boat (ranging in size from 5 to 7 m and constructed of glass fibre or heavy gauge aluminum), motor (70–180 hp, outboard or inboard/outboard), trailer, and towing vehicle. Teams 2 and 3 did their entire areas more or less continuously by boat with minimal trailering, camping en route. Teams 1 and 4, because of the discontinuous distribution of bird colonies, trailered to an area, censused the colonies, and trailered to the next area.

Ground counts, in which each individual nest was tallied, were made on over 97% of the colonies. Depending on the estimated size of the colony, the ground counts were conducted using one of three methods. On small colonies of less than 100 nests, one or both members of the team walked through the colony and recorded the number of nests of each species. On medium-sized colonies, up to about 500 nests, team members walked through the colony, marked each nest with a small spot of spray paint and counted (with a hand tally counter) as they went. On colonies of more than 500 nests, the colony was temporarily divided into strips using coloured plastic tapes laid on the ground and all nests within each strip were tallied. On very large colonies (>10 000 nests) it took up to 2 days to complete the census. In our experience the error rate associated with this type of census is less than 5%. Further details of this method are outlined in Blokpoel (1977) and Blokpoel and Weseloh (1982). In this report we use the terms "number of nests" and "number of pairs" interchangeably when referring to census figures.

On those few occasions when weather conditions were poor or time was limited, we estimated, rather than counted, the number of nests, especially in the southern portion of the study area. To estimate numbers we either landed on the island or circled the colony in the boat. We determined the sizes of many Great Blue Heron colonies from offshore because either the nests were easily visible from the water or the nesting trees were inaccessible owing to heavy vegetation.

We attempted to observe all islands in the study area. This was unrealistic only in eastern Georgian Bay. There we concentrated our effort on islands that were located away from cottages.

To minimize disturbance to the colonies, we conducted the census during the birds' incubation phase; this meant that more than one trip to mixed colonies might be necessary. During late April and early May, and in the course of other studies, we visited 12 widely separated colonies of Herring Gulls to assess the season's phenology. We visited all nesting islands, except those that supported Double-crested Cormorants, between 15 and 29 May. Because Common and Caspian Terns usually nest later than gulls and herons, we visited their colonies a second time between 1 and 10 June

[1] CWS, Canada Centre for Inland Waters, Ontario Region, P.O. Box 5050, Burlington, Ontario L7R 4A6
[2] CWS, Migratory Birds Division, Ontario Region, 1725 Woodward Drive, Ottawa, Ontario K1A 0E7
[3] Present address: CWS, National Wildlife Research Centre, Ottawa, Ontario K1A 0E7
[4] Present address: Inland Waters Directorate, Water Resources Branch, ion, 75 Farquhar Street, Guelph, Ontario N1H 3N4
[5] ess: R.R. #1, Vineland Station, Ontario L0R 2E0

Environment Canada Environnement Canada
Canadian Wildlife Service Service canadien de la faune

(7–14 days after the first visit). We consider the number of nests of Herring Gulls, Ring-billed Gulls, Great Blue Herons, Black-crowned Night-Herons, and Common and Caspian Terns to be a reliable assessment of the actual number of nesting pairs in 1980. Because of cormorants' sensitivity to human disturbance and the consequent risk of depredation by gulls on their eggs and young, we delayed that census until 23 June. At that time all cormorant nests and their contents were tallied, as were those of any other colonially nesting species present. As some gulls may have abandoned their nests by then, the numbers of gull nests recorded on islands that also supported nesting cormorants should be considered minimal. Some cormorants may also have abandoned or deserted their nests by this time.

We collected historical data from several sources. The largest single source was Ludwig (1962), who made detailed censuses of selected areas in Lake Huron during 1960–62. Additional data were obtained from various Canadian Wildife Service (CWS) censuses made during 1967–72 and, for the period 1960–72, from censuses reported in *Audubon Field Notes* and the Ontario Nest Record Scheme. These data are all on file at CWS, Ontario Region (% H. Blokpoel or D. V. Weseloh). As most of our historical data on numbers of gulls and Common Terns are from the period 1960–62, we have used 1962 (unless otherwise noted) as the date from which we calculate population changes.

What constitutes a "colony"?

An answer to the question of what constitutes a bird "colony" is not generally agreed on by ornithologists (Buckley and Buckley 1980). In this survey our prime objective was to document the locations and census the breeding sites of all colonial waterbirds nesting in Canadian Lake Huron so that past and future changes in their populations could be determined. There are several thousand islands in Lake Huron. We wanted to be sure that the breeding sites we visited could be relocated with ease and without confusion. In this report, "colony" does not imply or exclude any behavioural relationship among birds at given sites but refers to easily identifiable geographical locations (usually an island or group of closely associated islands) that contain usually one (e.g. Gray Island, location #A16 007) but sometimes more (e.g. the Blackbill Islands, location #H10 001) breeding sites. The breeding site(s) may harbour only one breeding species (Gray Island) or more than one (Blackbill Islands). We refer to the latter as a mixed species colony. Hence the sum of the number of individual species' colonies (573, see Table 1) is greater than the total number of colony names or location numbers (427) listed in Appendix 1.

Lastly, and primarily for ease in labelling tables and column headings, we have referred to the occurrence of a single nest of given species (usually Herring Gulls) at a given location as a "colony" (e.g. Felix Rock, Appendix 1, location #D13 015) even though the term is not generally considered to apply to single nestings (Buckley and Buckley 1980).

Results

Appendix 1 shows the results of our census on an individual colony basis and Table 1 summarizes them by topographical map sheet (1:50 000). Figure 2 provides the locations of the mapsheets. Appendix 1 also lists the locations of all nesting colonies, which are shown on Figures 3 and 4. Table 2 names the five islands with the most nests for each of seven species. We censused waterbirds at a total of 427 sites (App. 1).

Double-crested Cormorant

We found nine colonies of Double-crested Cormorants containing about 335 nests. Colonies ranged in size from 7 to 92 nests with a mean of 37 (median = 34). All colonies were in Georgian Bay and the North Channel with only one south of Parry Sound. All cormorant nests were on the ground and the nesting substrate was rock. In one colony, South Watcher Island (location #A16 003), nests were built among small boulders (15–30 cm diameter); in all other colonies, nests were found on large boulders (1–3 m diameter) or on exposed bedrock. All the islands on which cormorants nested had little or no vegetation except South Watcher Island, where there were large shrubs, and Southeast Rock (location #H15 025), which had an extensive growth of sedge (*Carex lenticularis*) and rough cinquefoil (*Potentilla norvegica*). However, from most colonies, uninhabited islands with mature trees were visible. We found no colonies that contained only cormorants (Table 3). Herring Gulls were nesting associates in all cormorant colonies, Common Terns on one and Ring-billed Gulls and Caspian Terns together on one (Tables 3 and 4).

Great Blue Heron

We censused 22 colonies of Great Blue Herons with an estimated total of 554 nests. Colonies ranged in size from 2 to 97 nests with a mean of 25 (median = 11.5). They occurred in all three portions of Lake Huron, but approximately half the nests were in the seven colonies (32%) south of a line from Parry Sound to the tip of the Bruce Peninsula. These southern colonies tended to be larger than colonies north of the line (means of 40 nests vs. 18 nests), though the difference was not significant (t-test, $P > 0.05$). All nests were located in trees. Great Blue Herons nested alone in 10 of their colonies. Herring Gulls were present in all the remaining colonies and Ring-billed Gulls were present in five, Black-crowned Night-Herons in three and Common Terns in one (Table 3).

Black-crowned Night-Heron

Black-crowned Night-Herons were the least common waterbird we censused. We located six colonies with an estimated total of 329 nests. Colony size ranged from 1 to 172 with a mean of 55 (median = 29). More than 98% of the nests were located in three colonies in the southern half of the study area: one (location #A9 001) in Nottawasaga Bay at the extreme south end of Georgian Bay and two (locations #A6 001 and A14 017) on the west side of the Bruce Peninsula. The three other nesting sites were not known previously. One, on James Island (location #H5 008) in the Main Channel between the Bruce Peninsula and Manitoulin Island, contained two nests on 21 May, both with eggs. The second (location #G9 004) contained at least one nest and was located on the largest of four islands immediately west of Walker Point on the south shore of Manitoulin Island. On 5 June this nest contained three young, and seven adults were observed flying overhead; so there may have been more nests than the one located. These two colonies are the first nesting records of the Black-crowned Night-Heron for Manitoulin District (Nicholson 1981). The third nesting site, with a single nest, was on Snake Island (location #H5 005) just off the tip of the Bruce Peninsula.

All known Black-crowned Night-Herons in Lake Huron nested in relatively low vegetation, such as cedar (*Thuja occidentalis*) and red osier dogwood (*Cornus stolonifera*). They shared all their colonies with Herring Gulls; Ring-billed Gulls nested on three and Great Blue Herons on three (Tables 3 and 4).

Herring Gull

The Herring Gull was the most widespread species encountered on our survey. We tallied approximately 33 800 nests on 376 colonies. Colony size ranged from 1 to 3714 nests with a mean of 90 (median = 32). Although colonies and numbers were well distributed throughout the study area, the Bruce Peninsula, Parry Sound, and the north end of Georgian Bay were the major nesting areas. In those areas the islands on six map sheets accounted for 40.3% of the colonies and 63.7% of the nests. The largest Herring Gull colony (3714 nests) was located at Chantry Island (location #A6 001), near Southampton, Ontario. There were two other colonies of over 1000 nests each: Barrier Island (2416 nests, location #A14 027) and Halfmoon Island (1242 nests, location H5 010). All three of these colonies are within 16 km of the shores of the Bruce Peninsula. We found at least 35 (9.3% of total) Herring Gull colonies containing only a single nest but have no way of knowing how many we may have missed. At 12 sites the single Herring Gull pair nested with one or more other species. At 23 sites they were truly solitary. More than half of these sites were in the northeast quarter of Georgian Bay. There was a noticeable gradient in colony size, decreasing from south to north: for example, the two largest Herring Gull colonies in Area 1 contained 3714 and 2416 nests, in Area 2, 592 and 565 nests, in Area 3, 357 and 289 nests, and in Area 4, 240 and 209 nests.

On Lake Huron, Herring Gulls appeared to nest only on uninhabited islands or on islands where cottages were considerably removed from nest sites. Most of their nesting islands were low-lying or slightly domed rocky outcroppings. Some nests, particularly on colonies in northern Georgian Bay, were located on cliff faces or atop high (50 m) rock outcroppings. All nests were on the ground. Herring Gulls nested in a variety of vegetation regimes, ranging from barren and unvegetated, through lush herbaceous growth to heavily wooded. On heavily wooded islands, Herring Gulls usually nested only on the perimeter or a few metres toward the interior.

Nesting associations between Herring Gulls and other colonial waterbirds are summarized in Tables 3 and 4. Of the 376 colonies in which Herring Gulls occurred (Tables 3 and 4), they were the only nesting species on 71.8% of the colonies and one of two or more species on 28.2%. Their most frequently recorded nesting associate was the Ring-billed Gull, occurring on 18.9% of the Herring Gull colonies (Table 4). Herring Gulls were present in all colonies that contained Double-crested Cormorants, Caspian Terns, and Black-crowned Night-Herons.

Ring-billed Gull

Ring-billed Gulls were the most numerous of the colonial birds we censused. We located 81 colonies and tallied an estimated 138 000 nests. Colonies ranged in size from 1 to 14 757 nests with a mean slightly over 1700 nests (median = 269). Colonies were not as widely distributed as were those of Herring Gulls. The major nesting areas were the Bruce Peninsula, Parry Sound, north-central Manitoulin Island, and northwestern and southeastern Georgian Bay. The two largest colonies were located on West Mary Island (14 757 nests, location #H13 010) in northwest Georgian Bay and Gertrude Island (13 866 nests, location #B15 003) north of Manitoulin Island in the North Channel.

Ring-billed Gull colonies, like those of Herring Gulls, were often situated on low lying, uninhabited islands. In contrast to Herring Gull colonies, there were few, if any, Ring-billed colonies on cliff faces or atop high rock outcroppings. All Ring-billed Gull nests were on the ground. The nesting substrate and vegetation regime of Ring-billed Gull colonies were similar to those of Herring Gulls, though Ring-bills were found somewhat more frequently on open and lower-lying areas of an island than Herring Gulls. Ring-billed Gulls occurred alone in only six colonies (Table 3), where populations ranged from 46 to 1946 pairs. Five of these six colonies were located in the western end of the North Channel (mapsheets 41J4 and 41J5). The most frequent nesting associates of Ring-billed Gulls were Herring Gulls and Common Terns (Tables 3 and 4).

Common Tern

Common Terns were the third most abundant species in our census. We recorded 71 colonies with a total of 5396 nests. Colony size ranged from 1 to 1082 nests with a mean of 76 (median = 31). Both colonies and pairs were most abundant in the northern part of the study area; 92.8% of the nests and 78.9% of the colonies were north of the line (latitude 45°20′) from Parry Sound to the tip of the Bruce Peninsula. Approximately 50% of the nests were located in the North Channel. The three largest colonies, on North Limestone Island (location #H8 044), the island northeast of the public wharf at Thessalon (location #J5 004), and West Mary Island (location #H13 010) had 1082, 661, and 302 nests, respectively. All other colonies had fewer than 250 Common Tern nests. Common Terns nested almost exclusively in low-lying areas with a rocky or grassy substrate and all nests were on the ground. Some nesting sites were very low lying and probably would be awash during periods of moderate to heavy winds. Common Terns nested most frequently in association with Herring Gulls (50.7% of colonies) (Table 4) or alone (43.7%

of colonies) (Table 3). They never shared an island solely with cormorants, herons, or Caspian Terns.

Caspian Tern

We recorded eight colonies of Caspian Terns with a total of 2138 nests. Colony size ranged from 134 to 523 nests with a mean of 267 (median = 231). The Caspian Tern was the only species censused that did not occur somewhere in the area in small colonies (<50 nests); all colonies contained more than 100 nests. Caspian Tern colonies were distributed throughout the study area with sites in northern and southern Georgian Bay, off the tip of the Bruce Peninsula, and in the North Channel. All colonies of Caspian Terns were located well offshore (mean = 12.0 km, range = 7.8–21.2 km).

All nests were on the ground. In all colonies the nesting substrate was gravel and sand or both, except for Papoose Island (location #H14 029), where eggs were laid on bedrock. There was little vegetation in most nesting areas. Caspian Terns never nested alone; Ring-billed and Herring Gulls were nesting associates on all eight colonies and one also included cormorants.

Discussion

Numbers and distribution of nests and colonies

There seem to be four major areas of nesting by colonial waterbirds in the Canadian waters of Lake Huron: 1) the west shore of the Bruce Peninsula, 2) central-eastern Georgian Bay in the area immediately north of Parry Sound, 3) the north end of Georgian Bay, and 4) the North Channel. There are three areas of much reduced nesting densities that together still harbour populations of all six of the species surveyed: 1) the east shore of the Bruce Peninsula; 2) the south, southeast, and northeast shores of Georgian Bay; and 3) the south shore of Manitoulin Island. Only the southern and southeastern shores of the main body of Lake Huron (south of Southampton) appear void of nesting waterbirds. There are many islands in the major nesting areas, fewer islands in the areas of reduced density, and no islands south of Southampton.

In terms of species diversity on islands within the Canadian waters of Lake Huron, there were four islands that supported four nesting species and 27 that supported three (Table 3). Of the former, Chantry (location #A6 001), Nottawasaga (location #A9 001), and the South Watcher Islands (location #A16 003), all located south of Parry Sound, had the most significant numbers of individuals. On the fourth, Bigsby Island (location #J3 021) in the North Channel, Herring and Ring-billed Gulls were each represented only by a single nest. There were no sites that had more than four species of nesting colonial waterbirds.

The Canadian waters of Lake Huron slightly exceeded those of the US in species diversity. At the time of this survey, there were no cormorants or Caspian Terns known to be nesting in the US waters of Lake Huron (see Table 9). In both areas, Ring-billed Gulls, Herring Gulls, and Common Terns, in that order, were the three most numerous species and numbers of Great Blue Herons exceeded those of Black-crowned Night-Herons (Scharf *et al.* 1978). In terms of absolute abundance, all species were more numerous in Canadian waters perhaps because the area is larger and there are more islands.

Population changes

In addition to providing the first complete census of breeding areas of selected species of colonial waterbirds in the Canadian waters of Lake Huron, our study also makes possible an analysis of population changes for some of those species in Canadian waters.

For cormorants and Caspian Terns a thorough analysis of population change is fairly easy because historical data covering all the known colonies are available. For the gulls and Common Terns, however, historical records are available from only a sample of our complete censuses given here (App. 1). We did not evaluate population changes of the Great Blue Heron as historical data are incomplete. The Ontario Heronry Inventory, a continuing province-wide survey of active heronries initiated by the Long Point Bird Observatory in 1978, will make evaluations possible in future (Dunn *et al.* 1985).

Double-crested Cormorant

Weseloh *et al.* (1983) compiled a census record of Lake Huron cormorant colonies for 1973 and in Table 5 the results are compared with 1980 figures. In 1973, 7 of the currently known 10 colonies were extant. The cormorants on one of these old established colonies, the Blackbill Islands, did not construct any nests in 1973. This failure to construct nests may have been due to the high levels of environmental contaminants the birds of this area were carrying at that time (see Weseloh *et al.* 1983). The colony on South Watcher Island is known to have started in 1980; it was not present in 1979 (Donald Fraser, pers. commun.). Cormorants were first noted nesting on Kalulah Rock (location #J5 008), in 1980, also; however, this may not have been their first nesting. They had been seen on the island in previous years but were assumed to be loafing birds from Africa Rock (location #J5 009) only 0.5 km to the south (DVW, pers. obs.).

There was a sixfold increase in the number of cormorant nests from 1973 to 1980. Two-thirds of this increase occurred on established colonies and one-third was attributable to the formation of new colonies (Table 5). Cormorants have shown a substantial increase on all colonies (new and old) except Wallis Rock (location #H8 040), which they have apparently abandoned. The pattern of increased numbers on old colonies probably reflects the cormorants' re-establishment on former (or reduced) colonies following their population decline during the DDT pesticide era of the 1960s and 1970s (Postupalsky 1971, 1978; Weseloh *et al.* 1983; Price and Weseloh, in press).

Caspian Tern

The numbers of Caspian Tern nests on Lake Huron in 1968–69 (Ludwig, pers. commun.; Martin 1978) are presented in Table 6. Six of the currently known eight colonies were then extant. Neither colony on the Watcher Islands was mentioned by Ludwig (1962) during his 1960–62 survey and persumably they did not exist then. Two nests were found on South Watcher Island by the Ontario Ministry of Natural Resources in 1973 (Donald Fraser, pers. commun.) and over 100 nests were present in 1974 (Ontario Nest Record Scheme). The first record of Caspian Tern nests on North Watcher Island (location #A16 002) is from 1972, when nine nests were reported (Ontario Nest Record Scheme).

From 1968–69 to 1980 the nesting population of the Caspian Tern in the Canadian waters of Lake Huron increased from approximately 1400 to 2100 nests (50%). Most of this increase (93% or 662 nests) comes from the establishment of the two new colonies at the Watcher Islands. Of the six established colonies known to be active in 1968–69, some showed gains and some losses, but total numbers were highly stable: a total increase of only 3.6% in 11 years.

This population growth occurring almost exclusively on new colonies is in direct contrast to the pattern shown by Double-crested Cormorants (see above). It may indicate that some density-dependent feature is limiting population growth on the established colonies and that these colonies have reached their carrying capacity for Caspian Terns. The mean nearest neighbour distance (±SD) for the five established colonies (or colony groups — taking Gull and Papoose Islands as a group) is 61.2 ± 11.4 km. The Watcher Islands, representing a new colony group, are located 60.7 km from the nearest Caspian Tern colony.

Herring Gull, Ring-billed Gull, and Common Tern

For these species, historical data is available for relatively few colonies (Tables 7 and 8). This restricts our knowledge of changes in population levels. Also, as we do not know which islands had colonies previously, we cannot compare growth on new and old colonies. The calculated growth rates (Tables 7 and 8) are for established colonies only and may not represent values for the entire population.

Herring Gulls were the most widespread colonial waterbird nesting in the Canadian waters of Lake Huron (376 colonies). We located historical data for 54 (14.4%) of these colonies representing 22.5% of the 1980 population. A comparison of these data (Table 7 and App. 2) indicates that between 1960–62 and 1980 the population on historical colonies grew by approximately one-third, from just under 5800 nests to just over 7600 nests. This represents an average annual growth rate of approximately 1.6%.

Ring-billed Gulls were the most numerous fish-eating bird nesting in the Canadian waters of Lake Huron (over 138 000 nests). For this species we found historical data for 17 (21.0%) of the 81 colonies, representing 39.7% of the 1980 population. On the colonies for which we have historical data, Ring-billed Gulls have increased nearly 350% since 1960–62, from 12 000 pairs to over 54 000 pairs (8.7% annually).

The Common Tern is the only colonial fish-eating bird that we find to be decreasing on its historical colonies in Canadian Lake Huron (Table 8). We have been able to locate historical data for 24 (33.8%) of the currently known or former colonies, representing 39.1% of the censused 1980 population. The population on those colonies declined a minimum of 42% from 1960–62 to 1980, an average decline of 3.8% per year.

Overall Great Lakes population

With the presentation of this report, there are now published figures (albeit gathered over a period of 5 years) for the breeding populations of several species of colonial waterbirds from each of the Great Lakes. From these figures it is possible to approximate the Great Lakes (US and Canadian) population of cormorants and some larids (Table 9).

We have shown that:

- the Ring-billed Gull is the most abundant of the five bird species by a factor of more than five;
- the largest Great Lakes populations of Herring Gulls and Caspian and Common Terns occur in Lake Huron. The largest populations of cormorants and Ring-billed Gulls are in Lake Ontario; and
- of the five species considered here, and at the time of this census, the Double-crested Cormorant, the Caspian Tern, and the Common Tern were restricted to specific lakes or portions of lakes in their distribution.

Acknowledgements

We should like to acknowledge the assistance and companionship of Earl Walker, Jim Brown, Bill Lee, and Tom Hince during the long hours of boat travel, camping, and census work. Ontario Hydro provided data for a portion of the Douglas Point colony. C.J. MacFayden provided the data for the Nottawasaga area. D.M. Fraser provided data for some islands in the vicinity of Go Home Bay. A. Harfenist and K.L. Maus provided the data for Chantry Island. The Technical Operations Division of the National Water Research Institute (NWRI) at the Canada Centre for Inland Waters provided staff and logistical support. Bill Finn and his staff at NWRI prepared the graphic illustrations and Val Morton, Inland Waters Directorate, typed the manuscript. H. Boyd, Iola M. Price, K. Marshall, D. M. Fraser, and D. A. Sutherland commented on an earlier version of the manuscript and provided valuable comments.

References

Blacklock, G.W.; Blankinship, D.R.; Kennedy, S.; King, K.A.; Paul, R.T.; Slack, R.D.; Smith, J.C.; Telfair, R.C., II. 1978. Texas colonial waterbird census, 1973–1976. Texas Parks Wildl. Dep. FA Rep. Serv. No. 15. PWD Rep. 7000-29. 715 Bronte, Rockport, 78382.

Blokpoel, H. 1977. Gulls and terns nesting in northern Lake Ontario and the upper St. Lawrence River. Can. Wildl. Serv. Prog. Note No. 75. 12 pp.

Blokpoel, H.; Harfenist, A. 1986. Comparison of 1980 and 1984 inventories of Common Tern, Caspian Tern, and

Double-crested Cormorant colonies in the eastern North Channel, Lake Huron, Ontario, Canada. Colonial Waterbirds 9: 61–67.

Blokpoel, H.; McKeating, G.M. 1978. Fish-eating birds nesting in Canadian Lake Erie and adjacent waters. Can. Wildl. Serv. Prog. Note No. 87. 12 pp.

Blokpoel, H.; Ryder, J.P.; Seddon, I.; Carswell, W.R. 1980. Colonial waterbirds nesting in Canadian Lake Superior in 1978. Can. Wildl. Serv. Prog. Note No. 118. 13 pp.

Blokpoel, H.; Tessier, G.D. 1986. The Ring-billed Gull in Ontario: a review of a new problem species. Occasional Paper No. 57, Can. Wildl. Serv. 34 pp.

Blokpoel, H.; Weseloh, D.V. 1982. Status of colonial waterbirds nesting on Little Galloo Island, Lake Ontario. Kingbird 32: 149–157.

Brown, R.G.B.; Nettleship, D.N.; Germain, P.; Tull, C.E.; Davis, T. 1975. Atlas of eastern Canadian seabirds. Can. Wildl. Serv. Spec. Publ. 220 pp.

Buckley, P.A.; Buckley, F.G. 1980. What constitutes a waterbird colony? Reflections from the northeastern US. 1979 Conf. Colon. Waterbird Group Proc. 3:1–15.

DesGranges, J.L.; Laporte, P. 1983. Fourth and fifth tours of inspection of Quebec heronries, 1980–81. Can. Wildl. Serv. Prog. Note 139. 11 pp.

Dunn, E.H.; Hussell, D.J.T.; Siderius, J. 1985. Status of the Great Blue Heron, *Ardea herodias*, in Ontario. Can. Field-Nat. 99:62–70.

Erwin, M. 1979. Coastal waterbird colonies: Cape Elizabeth, Maine to Virginia. US Fish and Wildl. Serv. Biol. Serv. Program FWS/OBS-79-10.

Erwin, R.M.; Korschgen, C.E. 1979. Coastal waterbird colonies: Maine to Virginia, 1977. An atlas showing colony locations and species composition. US Fish and Wildl. Serv. Biol. Serv. Program FWS/OBS-79-08. 647 pp.

Fetterolf, P.M.; Blokpoel, H. 1983. Reproductive performance of Caspian Terns at a new colony on Lake Ontario, 1979–1981. J. Field Ornithol. 54:170–186.

Korschgen, C.E. 1979. Coastal waterbird colonies: Maine. US Fish and Wildl. Serv. Biol. Serv. Program FWS/OBS-79-09. 87 pp.

Ludwig, J.P. 1962. A survey of the gull and tern population of Lakes Huron, Michigan and Superior. Jack-Pine Warbler 40:104–120.

Ludwig, J.P. 1984. Decline, resurgence and population dynamics of Michigan and Great Lakes Double-crested Cormorants. Jack-Pine Warbler 62: 92–102.

Martin, M. 1978. Status report on endangered wildlife in Canada: Caspian Tern. Committee on the Status of Endangered Wildlife in Canada (COSEWIC). National Mus. Can.

Nicholson, J.C. 1981. Birds of Manitoulin Island and adjacent islands within Manitoulin District. Acme Printers Ltd. Sudbury, Ont. 204 pp.

Portnoy, J.W. 1978. Colonial waterbird population status and management on the northern gulf of Mexico. Proc. 1977 Conf. Colon. Waterbird Group. 1:38–43.

Postupalsky, S. 1971. Toxic chemicals and declining Bald Eagles and cormorants in Ontario. Pestic. Sect. Can. Wildl. Serv. Manuscr. Rep. No. 20.

Postupalsky, S. 1978. Toxic chemicals and cormorant population in the Great Lakes. Wildl. Toxicol. Div. Can. Wildl. Serv. Manuscr. Rep. No. 40.

Price, I.M.; Weseloh, D.V. (In press). Increased numbers and productivity of Double-crested Cormorants on Lake Ontario. Can. Field-Nat.

Scharf, W.C.; Shugart, G.W. 1981. Recent increases in Double-crested Cormorants in the United States Great Lakes. Am. Birds 35: 910–911.

Scharf, W.C.; Shugart, G.W.; Chamberlin, M.L. 1978. Colonial birds nesting on man-made and natural sites in the US Great Lakes. US Army Engineer Waterways Experiment Station, Box 631, Vicksburg, MS. 39180. Tech. Rep. D-78-10. Rep. No. FWS/OBS 78/15. 136 pp.

Weseloh, D.V.; Mineau, P. 1982. Geographical distribution of contaminant and productivity measures of Herring Gulls in the Great Lakes, Lake Erie, 1978–79. Unpubl. Can. Wildl. Serv. Rep. 17 pp.

Weseloh, D.V.; Mineau, P.; Teeple, S.M.; McKeating, G.B.; Postupalsky, S. 1982. Double-crested Cormorants of the Great Lakes: Improvement in quality of life parameters 1972–73 vs. 1979–81. Unpubl. Can. Wildl. Serv. Rep.

Weseloh, D.V.; Teeple, S.M.; Gilbertson, M. 1983. Double-crested Cormorants of the Great Lakes: egg-laying parameters, reproductive failure, and contaminant residues in eggs, Lake Huron 1972–73. Can. J. Zool. 61:427–436.

Table 1
Summary of the numbers of nests and numbers of colonies (in brackets) of colonial waterbirds in Canadian Lake Huron in 1980, arranged by topographical mapsheet. See Figure 2 for location of mapsheets

	Total nests (total colonies)						
Mapsheet	HG*	RBG	CT	CAT	GBH	BCNH	DCC
Tiverton 41 A/5	285(1)	5 811(1)					
Chesley 41 A/6	3 714(1)	2 748(1)			24(1)	97(1)	
Wiarton 41 A/11	98(1)						
Cape Croker 41 A/14	7486(25)	24 698(8)	15(2)		140(3)	56(1)	
Dorcas Bay 41 H/4	9(3)	49(1)	28(3)				
Flowerpot Island 41 H/5	2 523(10)	3 473(3)		259(1)	12(1)	3(2)	
Nottawasaga Bay 41 A/9	696(2)	31(2)	8(1)				
Christian Island 41 A/16	713(10)	5 882(2)	48(1)	662(2)			20(1)
Penetanguishene 31 D/13	614(12)	7 955(2)	83(4)		53(1)	172(1)	
Sans Souci 41 H/1	2 794+(47)	471(3)	185(3)				
Parry Sound 41 H/8	1 673(43)	14 480(9)	1195(5)	334(1)	50(1)		
Naiscoot River 41 H/10	320(7)	296(1)	3(1)				92(1)
Key Harbour 41 H/15	1 219(34)	10 859(8)	290(7)				64(2)
Collins Inlet 41 H/14	3 344(27)	3 366(5)	475(9)	336(2)	40(1)		
Whitefish Falls 41 I/4	413(11)		347(4)				
Spanish 41 J/1	799(21)	7 872(2)	418(7)	152(1)			34(1)
Algoma 41 J/2	1 198(24)	3 566(4)	592(6)	395(1)			47(1)
Dean Lake 41 J/3	1 187(17)	3 086(4)	150(5)		63(3)		7(1)
St. Joseph Island 41 J/4	386(10)	315(2)	39(1)		61(4)		
Bruce Mines 41 J/5	470(13)	3 016(6)	731(3)				71(2)
Lake George 41 K/8E	97(2)		31(1)				
Meldrum Bay 41 G/14	482(4)	3 975(2)	83(1)		19(3)		
Great Duck Island 41 G/10	284(3)	4(2)					
Providence Bay 41 G/9	956(12)	43(2)	1(1)		12(2)	1(1)	
Manitowaning 41 H/11 & H/12	721(10)	4 067(6)	232(2)				
Little Current 41 H/13	707(14)	14 757(1)	302(1)		77(1)		
Kagawong 41 G/16	117(4)	3 198(2)	62(2)				
Silver Water 41 G/15	535(8)	13 868(2)	78(1)		3(1)		
Total	33 840(376)	137 886(81)	5396(71)	2138(8)	554(22)	329(6)	335(9)

* HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, CAT = Caspian Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, DCC = Double-crested Cormorant.

Table 2
Five islands with the most nests for seven species

Species	Island*	No. of nests	Mapsheet
Double-crested Cormorant	Blackbill Is.	92	41H/10
	Southeast Rk.	55	41H/15
	Africa Rk.	52	41J/5
	Doucet Rk.	47	41J/2
	Gull Rk.	34	41J/1
Great Blue Heron	I.S of Lyall I.	97	41A/14
	Loon I.	77	41H/13
	Nottawasaga I.	53	41A/9
	Birnie I.	50	41H/8
	Cedar I.	42	41J/4
Black-crowned Night-Heron	Nottawasaga I.	172	41A/9
	Chantry I.	97	41A/6
	Warren I.	56	41A/14
	James I.	2	41H/5
	Snake I.	1	41H/5
	I.W Walker's Pt.	1	41G/9
Herring Gull	Chantry I.	3 714	41A/6
	Barrier I.	2 416	41A/14
	Halfmoon I.	1 242	41H/5
	Chimney Rfs.	958	41A/14
	Snake I. and NW	633	41H/5
Ring-billed Gull	W Mary I.	14 757	41H/13
	Gertrude I.	13 866	41G/15
	S Limestone Is. (N and S)	13 382	41H/8
	Burke I.	8 305	41A/14
	McCallum I.	7 049	41A/14
Caspian Tern	S Watcher I.	5 234	1A/16
	Cousins I. (E)	395	41J/2
	S Limestone Is.	334	41H/8
	Halfmoon I.	259	41H/5
	Papoose I.	202	41H/14
Common Tern	N Limestone I.	1 082	41H/8
	I. NE of Thessalon dock	661	41J/5
	W Mary I.	302	41H/13
	Yg. Squaw I.	234	41H/14
	Louis I.	227	41J/2

* I. = island or isle.
Is. = islands.
Pt. = point.
Rk. = rock.
Rfs. = reefs.

Table 3
Distribution of waterbird colonies by species diversity and nesting association

Species in colony	No. colonies	% occurrence alone
1 species only		
HG*	270	71.8
CT	31	43.7
GBH	10	45.5
RBG	6	7.5
Subtotal	317	
2 species		
HG and RBG	41	
HG and CT	18	
HG and DCC	7	
HG and GBH	6	
HG and BCNH	2	
RBG and CT	4	
Subtotal	78	
3 species		
HG, RBG and CT	16	
HG, RBG and CAT	7	
HG, RBG and GBH	2	
HG, RBG and BCNH	1	
HG, CT and DCC	1	
HG, GBH and BCNH	1	
Subtotal	28	
4 species		
HG, RBG, GBH and BCNH	2	
HG, RBG, GBH and CT	1	
HG, RBG, DCC and CAT	1	
Subtotal	4	
Total no. of sites	427	

* HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, CAT = Caspian Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, DCC = Double-crested Cormorant.

Table 4
Nesting associations between Herring Gulls and other colonial waterbird species, Canadian Lake Huron, 1980

Species	No. of colonies	Colonies shared w/Herring Gull	% occurrence: Other species w/Herring Gull (*B*/372)	% occurrence: Herring Gull w/other species (*B*/*A*)
	(*A*)	(*B*)		
Herring Gull	376		—	—
Ring-billed Gull	81	71	18.9	87.7
Common Tern	71	36	9.6	50.7
Great Blue Heron	22	12	3.2	54.6
Double-crested Cormorant	9	9	2.4	100.0
Caspian Tern	8	8	2.2	100.0
Black-crowned Night-Heron	6	6	1.6	100.0

Table 5
Number of Double-crested Cormorant nests in Lake Huron, 1973 vs. 1980

Colony name	No. of nests 1973*	No. of nests 1980	Change, %	Av. annu. growth rate, %†
North Channel				
1. Africa Rock	16	52		
2. Kalulah Rock	0	19		
3. Talon Rock	1	7		
4. Doucet Rock	15	47		
5. Gull Rock	8	34		
Subtotal	40	159	+298	21.8
Georgian Bay				
6. Bustard Rocks	5	16		
7. Southeast Rock	0	55		
8. Blackbill Islands	0	92		
9. Wallis Rock	13	0		
10. S Watcher Island	0	20		
Subtotal	18	183	+917	39.3
Old colonies (#1,3–6, 8, 9)	58	248	328	23.1
New colonies (#2, 7, 10)	0	94	—	—
Total	58	342	490	28.9

* From Weseloh *et al.* (1983).
† Calculated from the formula: $GR = \sqrt[a]{RC/IC} \times 100$ where GR = growth rate, RC = recent count, IC = initial count and a = years between counts. For example, from 1973 to 1980 cormorants in the North Channel increased from 40 to 159; hence $GR = \sqrt[7]{159/40} \times 100 = 21.8\%$.

Table 6
Number of Caspian Tern nests in Lake Huron, 1968–69 vs. 1980

Colony	No. of nests 1968–69*	No. of nests 1980	Change, %	Av. Annu. growth rate, %
North Channel				
1. Cousins Island	270	395	+46.3	
2. Elm Island	180	152	−15.6	
Subtotal	450	547	+21.6	1.8
Georgian Bay				
3. Gull Island	155	134	−13.6	
4. Papoose Island	305	202	−33.8	
5. S Limestone Island	335	334	−0.3	
6. Halfmoon Island	180	259	+43.9	
7. S Watcher Island	0	523	—	
8. N Watcher Island	0	139	—	
Subtotal	975	1591	+63.2	4.6
Old colonies (#1–6)	1425	1476	+3.6	+0.3
New colonies (#7–8)	0	662	—	
Total	1425	2138	+50.0	+3.8

* Data from J. Ludwig (pers. commun.) and Martin (1978).

Table 7
Herring and Ring-billed Gull nests in Canadian Lake Huron, 1960–62 and 1980. See Appendix 2 for details regarding individual colonies

Area	No. of colonies	No. of nests 1960–62*	No. of nests 1980	Change, %	Av. annu. growth rate, %
Herring Gulls					
North Channel	26	1 698	2 380	+40	+1.9
Georgian Bay	21	2 437	4 586	+88	+3.6
Lake Huron (main body)	7	1 617	645	−60	−5.0
Totals	54	5 752	7 611	+32	+1.6
Ring-billed Gulls					
North Channel	4	1 875	12 937	+590	+11.3
Georgian Bay	10	9 190+	39 299	+328	+8.4
Lake Huron (main body)	3	1 125	2 473	+120	+4.5
Totals	17	12 190+	54 709	+349	+8.7

* All data for 1960–62 are from Ludwig (1962).

Table 8
Number of Common Tern nests in Canadian Lake Huron, 1960–72 and 1980. See Appendix 2 for details regarding individual colonies

Area	No. of colonies	No. of nests 1960–72*	No. of nests 1980	Change, %	Av. annu. growth rate, %†
North Channel	11	1121	619	−45	−4.2
Georgian Bay	12	2446	1405	−43	−3.9
Lake Huron (main body)	1	60	83	+38	+2.3
Totals	24	3627	2107	−42	−3.8

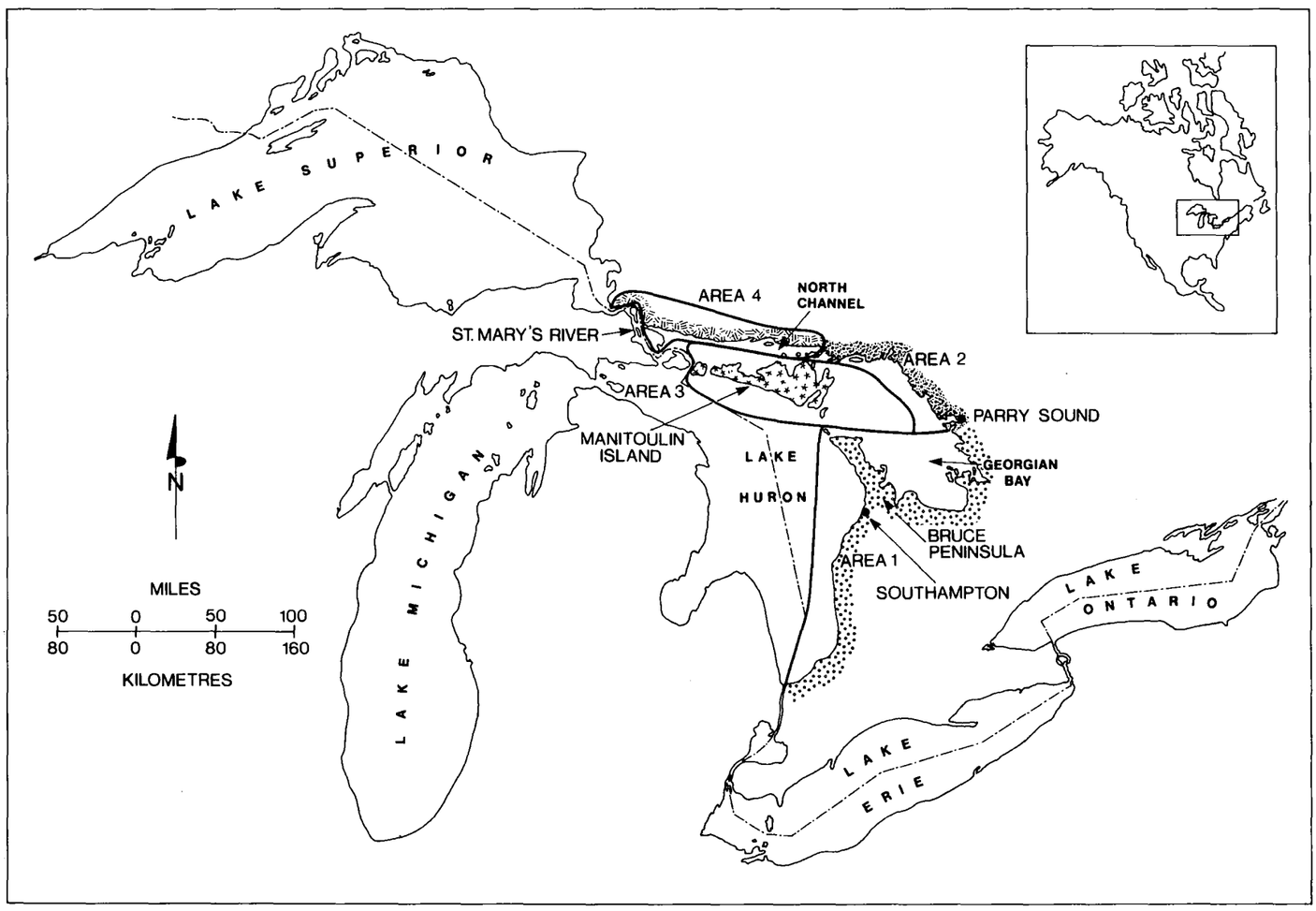
* Data from Ludwig (1962) and CWS (unpubl.).
† Approximately equal numbers of colonies were censused in 1960–62 and 1967–72; hence the year 1966, as the mid-point between 1960–1972, was used for growth rate calculation.

Table 9
Estimated numbers of nests of colonial waterbirds in the Canadian and US portions of the Great Lakes, 1976–80.* The figures for Double-crested Cormorants and Ring-billed Gulls are only rough approximations, because during the 5-year period their populations increased rapidly

Lake	Double-crested Cormorant†	Herring Gull	Ring-billed Gull‡	Caspian Tern	Common Tern
Lake Ontario§					
Canadian	99	482	100 000	183	1 299
US	276	213	73 817	0	5
Subtotal	375	695	173 817	183	1 304
Lake Erie‖					
Canadian	114	3 320	15 130	0	1 583
US	0	2 877	12 326	0	801
Subtotal	114	6 197	27 456	0	2 384
Lake Huron¶					
Canadian	335	33 840	137 886	2138	5 396
US	0	9 276	25 786	0	610
Subtotal	335	43 116	163 672	2138	6 006
Lake Michigan					
Canadian	—	—	—	—	—
US	61	11 978	34 141	1587	753
Subtotal	61	11 978	34 141	1587	753
Lake Superior					
Canadian	35	6 410	4 935	0	0
US	0	6 619	2 941	0	328
Subtotal	35	13 029	7 876	0	328
All lakes					
Canadian	583	44 052	257 951	2321	8 278
US	337	30 963	149 011	1587	2 497
Total	920	75 015	406 962	3908	10 775

* Population figures are taken from Blokpoel (1977), Scharf *et al.* (1978), Blokpoel and McKeating (1978), Blokpoel *et al.* (1980), Weseloh and Mineau (1982) and Blokpoel (unpubl.) unless otherwise noted.
† Population figures for Canadian cormorant colonies (except Lake Superior) and the only US colony in Lake Ontario have been updated to 1980 from Weseloh *et al.* (1982). More recent data are presented by Scharf and Shugart (1981), Ludwig (1984), Blokpoel and Harfenist (1986) and Price and Weseloh (in press).
‡ More recent data are presented by Blokpoel and Tessier (1986).
§ Lake Ontario population figures are from sources cited above except as follows:
Herring Gulls — Hamilton Harbour = 65, Mugg's Island = 25 and Eastern Headland = 56 (seen May 1980, Weseloh, unpubl.) and Pigeon Island = 54 (30 April 1979), Snake Island = 74, Scotch Bonnet Island = 116, Gull Island = 75 and West Brother Island = 17 (seen May 1980, G. A. Fox and A. P. Gilman, pers. commun.);
Ring-billed Gulls — Eastern Headland = 67 300 (Blokpoel, unpubl. data), Gull Island = 25 000 (Blokpoel, unpubl. data), High Bluff Island = 697 in 1979 (R. D. McRae, pers. commun.);
Caspian Terns — Eastern Headland = 72 (Fetterolf and Blokpoel 1983) and Pigeon Island = 111 (seen June 1977, R. Weir, pers. commun.).
‖ Includes Niagara, Detroit and St. Clair Rivers and Lake St. Clair.
¶ Includes St. Mary's River.

Figure 1
The study area showing the four census divisions



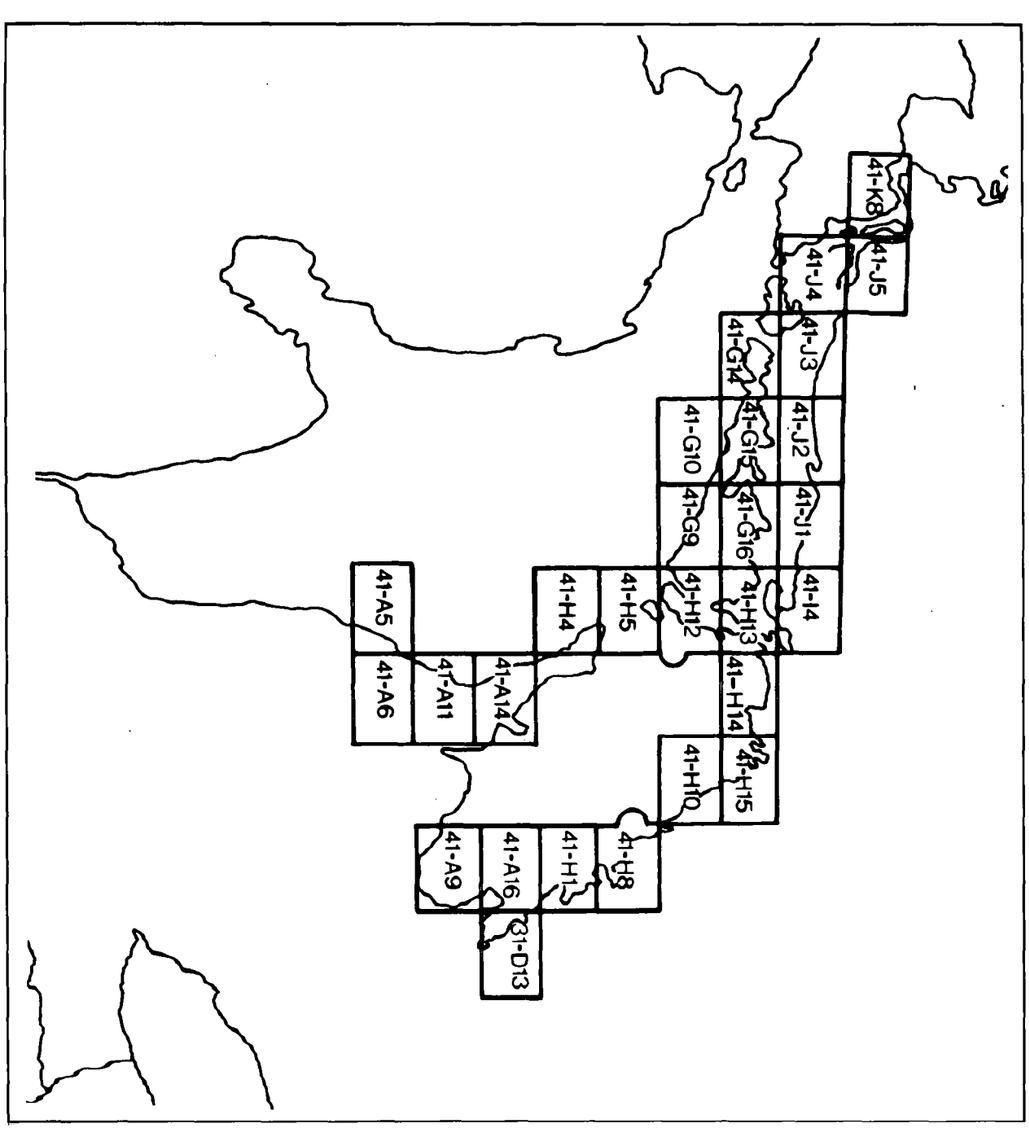


Figure 2
The 1:50 000 topographical mapsheets that show the study area

Figure 3
Location of colony sites and topographical mapsheets for Georgian Bay. The number of colony sites within each mapsheet area is given by *N*. The name, location number and latitude–longitude for each site are listed in Appendix 1

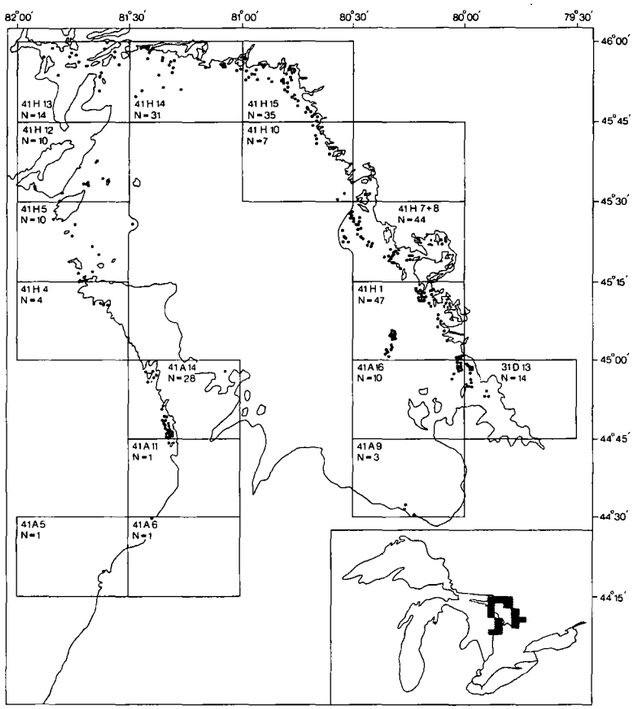
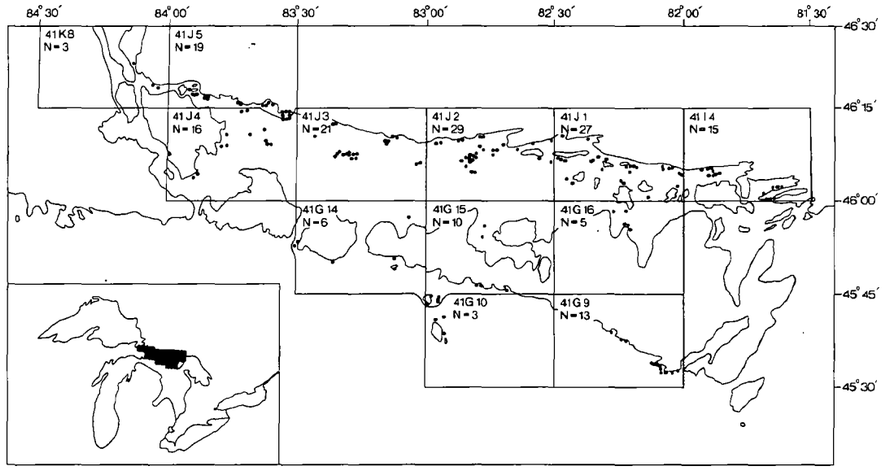


Figure 4
Location of colony sites and topographical mapsheets for the North Channel and Northern Lake Huron. The number of colony sites within each mapsheet area is given by *N*. The name, location number and latitude–longitude for each site are listed in Appendix 1



Appendix 1
Name, location and numbers of nests of colonial birds censused at colony sites in Canadian Lake Huron in 1980 (HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, CAT = Caspian Tern, DCC = Double-crested Cormorant)

TOPOGRAPHICAL MAP Colony name*	Location no.	Mainland or no. of islands	Lat.	Long.	No. of nests HG	RBG	CT	Other
TIVERTON 41 A/5								
Douglas Pt.	A5 001	Mainland	44°19.1′	81°36.4′	285	5811		
CHESLEY 41 A/6								
Chantry I.	A6 001	1	44°29.6′	81°24.2′	3714	2748		24 GBH 97 BCNH
WIARTON 41 A/11								
Is. SW of Jack I.	A11 001	2	44°44.3′	81°19.5′	98			
CAPE CROKER 41 A/14								
SE I. of Knife Is.	A14 001	1	44°57.9′	81°23.1′	1§			
Rf. S of Northstar I.	A14 002	1	44°57.2′	81°22.1′			14	
Dane I.	A14 003	1	44°57.0′	81°23.2′	396			
I. S of Lyal I. (omitted from 1979 ed. of topo.)	A14 004	1	44°56.2′	81°24.5′				97 GBH
Mad Rf.	A14 005	1	44°57.8′	81°25.5′	247	2473		
Kolfage I.	A14 006	1	44°51.2′	81°20.9′	57			
Chimney Rfs.	A14 007	6	44°50.5′	81°21.3′	958	398		
Ghegheto I.	A14 008	1	44°49.1′	81°20.7′	39			8 GBH
Rf. NE of Ghegheto I.	A14 009	1	44°49.2′	81°20.7′	80			
Cavalier I.	A14 010	1	44°48.5′	81°21.1′	460			
I. E of Cavalier I.	A14 011	1	44°48.5′	81°20.6′	173			
Beament I. and Rf. to NW	A14 012	2	44°47.8′	81°20.5′	184			
I. S of Beament I.	A14 013	1	44°47.6′	81°20.5′	108			
I. 0.5 km SE of Beament I.	A14 014	1	44°47.4′	81°20.2′	195			
McCallum I.	A14 015	1	44°47.6′	81°19.5′	512	7049		
Is. NW of McCallum I.	A14 016	2	44°47.7′	81°19.7′	65			
Warren I. and Rf. to NW	A14 017	2	44°47.2′	81°20.2′	90			56 BCNH
Large I. SE of Evelyn I.	A14 018	1	44°47.1′	81°19.6′	15	1909		
Argyle Is. E	A14 019	1	44°46.6′	81°19.4′		1946		
Is. N of Argyle Is.	A14 020	2	44°46.9′	81°19.5′	51		1	
Argyle Is. W	A14 021	1	44°46.6′	81°19.7′	369	1623		
Is. S of Argyle Is. W	A14 022	2	44°46.4′	81°19.7′	251			
I. E of Argyle Is.	A14 023	1	44°46.8′	81°18.6′	20			
I. NW of Burke I.	A14 024	1	44°46.3′	81°18.8′	489			
Burke I.	A14 025	1	44°46.0′	81°18.5′	19	8305		
Deadman's I. (= Basswood I.)	A14 026	1	44°45.7′	81°19.2′	288			
Scout Rf. (omitted from 1979 ed. of topo.)	A14 027	1	44°45.3′	81°20.2′	3§			
Barrier I.	A14 028	1	44°58.6′	81°04.7′	2416	995		35 GBH
DORCAS BAY 41 H/4								
I. in Dorcas Bay	H4 001	1	45°10.7′	81°35.1′	1		12	
I. S of Warner Pt.	H4 002	1	45°10.8′	81°38.2′	5	49	15	
Youell I.	H4 003	1	45°11.0′	81°39.2′			1	
Baptist I.	H4 004	1	45°11.9′	81°42.5′	3§			
FLOWERPOT ISLAND 41 H/5								
I. E of Devil I.	H5 001	1	45°15.3′	81°42.5′	1			
I. NE of Devil I.	H5 002	1	45°15.4′	81°42.9′	1	119		
White Rk.	H5 003	1	45°16.5′	81°43.8′	50			
Middle I.	H5 004	1	45°16.8′	81°38.7′	3§			
Snake I. and NW	H5 005	2	45°20.3′	81°37.5′	633	2		1 BCNH
White Shingle Is.	H5 006	2	45°21.3′	81°39.8′	35			
Lucas I.	H5 007	1	45°23.6′	81°45.8′	59			

(cont'd)

Appendix 1 *(cont'd)*
Name, location and numbers of nests of colonial birds censused at colony sites in Canadian Lake Huron in 1980 (HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, CAT = Caspian Tern, DCC = Double-crested Cormorant)

TOPOGRAPHICAL MAP Colony name*	Location no.	Mainland or no. of islands	Lat.	Long.	No. of nests HG	RBG	CT	Other
(FLOWERPOT ISLAND)								
James I.	H5 008	1	45°26.1′	81°44.4′	413			2 BCNH
Perseverance I.	H5 009	1	45°28.0′	81°50.6′	86			12 GBH
Halfmoon I.	H5 010	1	45°26.3′	81°28.1′	1242	3352		259 CAT
NOTTAWASAGA BAY 41 A/9								
Nottawasaga I.	A9 001	1	44°31.2′	80°15.4′	616	30		172 BCNH 53 GBH
I. S of Nottawasaga I.	A9 002	1	44°31.8′	80°15.8′	80	1		
Shoal off Collingwood	A9 003	1	44°30.0′	80°13.0′			8†	
CHRISTIAN ISLAND 41 A/16								
I. W of Table Rks.	A16 001	1	45°00.0′	80°01.8′	99			
North Watcher I.	A16 002	1	44°57.9′	80°03.8′	5	2447		139 CAT
South Watcher I.	A16 003	1	44°57.1′	80°04.1′	13	3435		523 CAT 20 DCC
S-most I. of Gray I.	A16 004	1	44°58.6′	80°00.9′	100			
First I. N of A16 004	A16 005	1	44°58.7′	80°01.0′	93			
First I. S of Gray I.	A16 006	1	44°58.7′	80°01.1′	98			
Gray I.	A16 007	1	44°58.9′	80°01.2′	150			
I. N of Gray I.	A16 008	1	44°59.1′	80°01.4′	73			
Southeast Wooded Pine I.	A16 009	1	44°59.3′	80°00.8′	53		48	
I. N of Southeast Wooded Pine I.	A16 010	1	44°59.5′	80°01.0′	29			
PENETANGUISHENE 31 D/13								
I. NE of Brebeuf I.	D13 001	1	44°52.9′	79°52.7′			26	
I. 0.3 km S of Minnicognashene I.	D13 002	1	44°53.7′	79°53.7′	1		26	
Hotchkiss Rk.	D13 003	1	44°54.5′	79°53.5′	26			
Eshpabekong I.	D13 004	1	44°56.0′	79°57.7′	56	2403		
I. 0.1 km SE of Eshpabekong I.	D13 005	1	44°55.9′	79°57.4′	150			
Is. 0.5 km SE of Eshpabekong I.	D13 006	3	44°55.6′	79°57.0′	133	5552		
Turtle Rk.	D13 007	1	44°55.7′	79°58.4′	98			
Mather Rk. and E	D13 008	2	44°57.6′	79°57.7′	93			
Smaller I. of Warwick Rks.	D13 009	1	44°57.9′	79°56.8′			26	
Large I. of Warwick Rks.	D13 010	1	44°57.9′	79°56.9′	42			
Rickord Rks.	D13 011	1	44°58.0′	79°57.2′	10		5	
S of Woore Rks.	D13 012	1	44°58.3′	79°57.3′	2			
Woore Rks.	D13 013	1	44°58.5′	79°57.2′	2			
Felix Rk.	D13 014	1	44°58.6′	79°57.9′	1			
SANS SOUCI 41 H/1								
Thumb Rk. and shoals	H1 001	4	45°02.1′	80°20.3′	15§			
Double Top I. and West Rk.	H1 002	2	45°02.4′	80°21.4′	14§			
I. SE of Pool Rks.	H1 003	1	45°02.6′	80°20.7′	21§			
Pool Rks.	H1 004	3	45°02.9′	80°18.5′	8§			
Block I.	H1 005	1	45°02.7′	80°19.9′	44§			
Gull I.	H1 006	1	45°02.8′	80°19.5′	50§			
Jagged I.	H1 007	1	45°03.1′	80°19.8′	88§			
Crescent I.	H1 008	1	45°04.6′	80°18.5′	296			
I. NW of Crescent I.	H1 009	1	45°04.7′	80°18.2′	56	2		
I. NE of Crescent I.	H1 010	1	45°04.8′	80°18.0′	81§			
Harbour I.	H1 011	1	45°04.9′	80°18.0′	38§			
I. W of Harbour I.	H1 012	1	45°04.9′	80°18.2′	57§			
Long I.	H1 013	1	45°05.1′	80°18.5′	258§			

(cont'd)

Appendix 1 *(cont'd)*
Name, location and numbers of nests of colonial birds censused at colony sites in Canadian Lake Huron in 1980 (HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, CAT = Caspian Tern, DCC = Double-crested Cormorant)

TOPOGRAPHICAL MAP Colony name*	Location no.	Mainland or no. of islands	Lat.	Long.	No. of nests HG	RBG	CT	Other
(SANS SOUCI)								
I. W of Long I.	H1 014	1	45°05.1′	80°18.8′	10§			
W One Tree I.	H1 015	1	45°05.3′	80°18.2′	195			
E One Tree I.	H1 016	1	45°05.3′	80°18.1′	224			
North Is.	H1 017	5	45°05.9′	80°18.3′	238§			
Gilead Rk.	H1 018	1	45°00.4′	80°02.5′	83			
North Wooded Pine I.	H1 019	1	45°00.5′	80°02.8′	65			
Northwest Pine Is.	H1 020	2	45°00.9′	80°03.5′	323			
Gibson Rf.	H1 021	1	45°00.6′	80°00.7′	10			
Allen Rks.	H1 022	2	45°00.9′	80°01.0′	41		1	
Clarke Rk.	H1 023	1	45°03.6′	80°04.8′	12			
Passage I.	H1 024	1	45°05.8′	80°07.2′	1			
Channel Rk.	H1 025	2	45°07.0′	80°08.5′	26			
I. N of Haight Rk. and SW of Smooth I.	H1 026	1	45°07.2′	80°07.2′	1		23	
I. SSE of Haystack Rk. and SW of Double I.	H1 027	1	45°08.0′	80°08.5′	26			
Matches Is.	H1 028	2	45°08.7′	80°08.4′	57			
Caleb Is.	H1 029	2	45°11.6′	80°11.8′	33	6	161	
Rigby Is.	H1 030	3	45°12.3′	80°12.3′	28			
Southeast Rk.	H1 031	2	45°12.0′	80°14.6′	10§			
I. W of Southeast Rk.	H1 032	1	45°12.0′	80°15.0′	12			
I. NW of H1 031	H1 033	1	45°12.1′	80°15.1′	20			
I. N of H1 032	H1 034	1	45°12.2′	80°15.2′	29			
I. S of largest Umbrella I. (two cottages)	H1 035	1	45°12.5′	80°15.3′	2†			
N Umbrella Is.	H1 036	3	45°12.8′	80°14.9′	28			
Tree I.	H1 037	1	45°12.5′	80°14.6′	13			
Is. S and SSE of Tree I.	H1 038	2	45°12.2′	80°14.5′	55			
I. W of H1 037	H1 039	1	45°12.3′	80°15.0′	42			
Remainder of Umbrella Is.	H1 040	—			few§			
Is. N of Umbrella Is.	H1 041	11	45°13.1′	80°14.6′	35§			
Loxton I.	H1 042	1	45°13.4′	80°13.9′	40			
I. SW of Loxton I. and W of Taylor I.	H1 043	1	45°13.2′	80°14.0′	18			
Chancellor Is.	H1 044	11	45°14.1′	80°14.5′	25§	463§		
I. NE of Tribune I.	H1 045	1	45°13.9′	80°15.6′	10§			
Tribune Is.	H1 046	3	45°13.8′	80°16.2′	36§			
Baker Group — S portion	H1 047	2	45°14.2′	80°16.3′	20§			
PARRY SOUND 41 H/8								
Gull I.	H8 001	1	45°22.2′	80°05.6′	109			
I. S of Partridge I.	H8 002	1	45°22.7′	80°05.6′	1†			
Is. N of Robertson I.	H8 003	2	45°22.6′	80°04.4′	2			
Carling Rk.	H8 004	1	45°20.0′	80°14.3′	16	1	69	
Rf. SW of Spruce I.	H8 005	1	45°20.0′	80°15.4′	1†			
Nias Rks.	H8 006	3	45°19.6′	80°14.8′	17			
Lyon Rks.	H8 007	3	45°18.8′	80°15.8′	102			
I. S of Bateau I.	H8 008	1	45°17.6′	80°17.7′	4			
Blizzard I.	H8 009	1	45°19.1′	80°18.8′	4			
Is. E of Blizzard I.	H8 010	2	45°19.1′	80°19.1′	26	4	21	
I. NW of The Pancakes	H8 011	1	45°20.4′	80°18.1′	1		22	
Gladman Rk.	H8 012	1	45°20.8′	80°18.8′	1			
Twin Rk. N	H8 013	1	45°20.4′	80°18.9′	32			
Twin Rk. S	H8 014	1	45°20.3′	80°18.9′	27			
Little Snake I.	H8 015	1	45°19.8′	80°20.3′	31			
Is. E of Little Snake I.	H8 016	4	45°20.0′	80°20.0′	137	2		
Is. S of Little Snake I.	H8 017	5	45°19.7′	80°20.2′	86			
Is. SE of Snake I.	H8 018	2	45°19.5′	80°20.3′	37			

(cont'd)

Appendix 1 *(cont'd)*
Name, location and numbers of nests of colonial birds censused at colony sites in Canadian Lake Huron in 1980 (HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, CAT = Caspian Tern, DCC = Double-crested Cormorant)

TOPOGRAPHICAL MAP Colony name*	Location no.	Mainland or no. of islands	Lat.	Long.	No. of nests HG	RBG	CT	Other
(PARRY SOUND)								
Is. N and W of Snake I.	H8 019	15	45°20.0′	80°21.0′	227			
Black Rk.	H8 020	1	45°21.6′	80°20.2′	60			
Old Tower Is.	H8 021	3	45°22.0′	80°25.0′	7			
Heron I.	H8 022	1	45°22.2′	80°25.1′	1†			
Is. SE of Searle I.	H8 023	3	45°22.3′	80°24.6′	34			
Is. between Stalker and Boucher Is.	H8 024	8	45°22.8′	80°25.7′	19†			
Green I. and Is. to SW	H8 025	5	45°23.6′	80°26.8′	15			
Raper, Wallbank, Goodkey complex	H8 026	11	45°24.3′	80°27.2′	62			
Elmtree I. and I. to S	H8 027	2	45°24.9′	80°28.0′	2†			
Large I. NW of Garland I.	H8 028	1	45°25.2′	80°28.3′	2	15	1	
Is. E of Garland and Elmtree Is.	H8 029	7	45°25.2′	80°27.1′	81			
Birnie I.	H8 030	1	45°26.1′	80°28.1′				50 GBH
Is. S and E of Birnie I.	H8 031	2	45°26.0′	80°28.0′	2†			
Is. between Champion and Big McCoy Is.	H8 032	6	45°26.7′	80°28.2′	7†			
I. W of Lawson I.	H8 033	1	45°27.5′	80°27.4′	1†			
I. N of Bassett Rk.	H8 034	1	45°26.8′	80°29.5′	57			
Southwest I.	H8 035	1	45°27.2′	80°30.3′	10	5+		
Is. NE of Southwest I.	H8 036	5	45°27.5′	80°30.1′	4	1053		
I. between Southwest and Chippewa Is.	H8 037	1	45°27.2′	80°29.3′	3†			
Colin Rk.	H8 038	1	45°28.0′	80°30.3′	79			
Large I. NE of Colin Rk.	H8 039	1	45°28.1′	80°30.1′	36			
Wallis Rks.	H8 040	2	45°23.0′	80°31.0′	40			
South Limestone Is. N	H8 041	3	45°23.5′	80°31.9′	48	7606		334 CAT
South Limestone Is. S	H8 042	1	45°23.3′	80°31.8′	22	5779		
I. S of South Limestone Is.	H8 043	1	45°23.1′	80°31.8′	103			
North Limestone I.	H8 044	1	45°25.0′	80°32.3′	117	15+	1082	
NAISCOOT RIVER 41 H/10								
Blackbill Is.	H10 001	17	45°30.8′	80°32.1′	111		3	92 DCC
O'Brien Is.	H10 002	2	45°32.4′	80°34.1′	116			
Black Rk.	H10 003	1	45°38.8′	80°35.5′	18			
Norgate Rks.	H10 004	5	45°42.3′	80°39.5′	15	296+		
Red Rk.	H10 005	1	45°42.5′	80°39.6′	28			
McHugh Rk.	H10 006	1	45°42.8′	80°40.0′	30			
Old Tower Rks.	H10 007	2	45°44.6′	80°40.1′	2			
KEY HARBOUR 41 H/15								
McNab Rks.	H15 001	10	45°45.6′	80°39.7′	10†			
Silent I.	H15 002	1	45°46.8′	80°41.3′	8	41	68	
I. E of Lombiere I.	H15 003	1	45°46.8′	80°40.2′	1†			
I. NE of Silent I.	H15 004	1	45°47.1′	80°39.9′	1†			
Is. between Potvin Pt. and Bessener Rk.	H15 005	7	45°47.7′	80°41.9′	31		50	
Bessener Rk. and W	H15 006	7	45°48.4′	80°43.2′	3	3542		
Flat Rk. and E	H15 007	2	45°47.7′	80°43.7′	72			
Large I. between Bessener Rk. and Champlain I.	H15 008	1	45°48.7′	80°43.6′	27			
Porcupine I. and S	H15 009	3	45°48.7′	80°44.8′	36	6+		
Is. between Salisbury I. and Champlain I.	H15 010	7	45°49.3′	80°44.9′	7†			
Salisbury I.	H15 011	1	45°49.5′	80°45.5′	4			
Is. N of Salisbury I.	H15 012	5	45°50.1′	80°45.9′	4		29	
Is. W of Salisbury I.	H15 013	14	45°49.7′	80°46.0′	93			
Is. SW of One Tree I.	H15 014	9	45°50.6′	80°47.4′	113	2+	89	
Solitary Rk. and E	H15 015	3	45°50.9′	80°47.9′	31			
Is. N of One Tree I.	H15 016	4	45°51.2′	80°47.1′	4†			
Elgin Rk.	H15 017	1	45°51.8′	80°47.4′	2	2370		

(cont'd)

Appendix 1 *(cont'd)*
Name, location and numbers of nests of colonial birds censused at colony sites in Canadian Lake Huron in 1980 (HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, CAT = Caspian Tern, DCC = Double-crested Cormorant)

TOPOGRAPHICAL MAP Colony name*	Location no.	Mainland or no. of islands	Lat.	Long.	No. of nests HG	RBG	CT	Other
(KEY HARBOUR)								
Is. E of Elgin Rk.	H15 018	4	45°51.8′	80°47.2′	4†			
Cherry I.	H15 019	2	45°51.9′	80°47.7′	8	2853		
I. W of Cherry I.	H15 020	1	45°51.9′	80°47.9′	27			
Murray Rks. N	H15 021	1	45°52.2′	80°48.0′	33			
Keefer Is.	H15 022	2	45°52.6′	80°46.6′	103			
Is. S of Keefer Is.	H15 023	4	45°52.2′	80°46.7′	5†			
Gull Rks.	H15 024	12	45°52.8′	80°51.8′	203	2043		
Southeast Rk.	H15 025	1	45°52.5′	80°51.3′	104			55 DCC
I. S of Graburn I.	H15 026	1	45°55.1′	80°54.5′	2		12	
Borron Rk.	H15 027	2	45°55.5′	80°54.7′			22	
Macoun Rk.	H15 028	1	45°55.7′	80°54.2′	1†			
Is. N of Gooseberry I.	H15 029	5	45°53.6′	80°56.2′	7		20	
Is. S of Gooseberry I.	H15 030	2	45°52.9′	80°55.9′	39			
Castle I. and NE	H15 031	4	45°53.8′	80°56.4′	95			
Bustard Rks.	H15 032	7	45°53.4′	80°57.1′	63	2		
Southwest Rk.	H15 033	1	45°53.1′	80°57.9′	40			9 DCC
Barclay Rk.	H15 034	1	45°55.0′	80°56.3′	36			
Is. E of Bad River Pt.	H15 035	2	45°54.7′	80°58.9′	2†			
COLLINS INLET 41 H/14								
Temple Rks.	H14 001	1	45°54.6′	81°00.4′	1		41	
Is. N of Temple Rks.	H14 002	5	45°55.0′	81°00.3′	4†		1§	
White Rk.	H14 003	5	45°55.4′	81°04.6′	14	8+	19	
I. W of White Rk.	H14 004	1	45°55.4′	81°04.8′	21			
I. NW of White Rk.	H14 005	1	45°55.7′	81°04.9′	22			
Is. in Voyageur Ch.	H14 006	2	45°56.0′	81°04.9′	2†			
I. S of Indian Bight	H14 007	1	45°55.9′	81°06.5′	1†			
Draper I.	H14 008	1	45°55.7′	81°08.8′	1†			
Is. around Fleming I.	H14 009	2	45°58.1′	81°10.6′	2†		1	
Is. around MacFarlane I.	H14 010	2	45°56.7′	81°11.9′	1§		1§	
Green I.	H14 011	1	45°54.6′	81°19.4′				40 GBH
Smooth Rk.	H14 012	1	45°55.1′	81°19.5′	31			
Southwest Hawk I. Group	H14 013	5	45°55.5′	81°20.1′	592			
'Middle' Hawk Is.	H14 014	2	45°55.9′	81°19.5′	193			
Hawk Is. N	H14 015	3	45°56.4′	81°19.0′	565			
Scarecrow I.	H14 016	1	45°54.4′	81°22.1′	253			
Fox Is.	H14 017	5	45°57.0′	81°21.7′	37			
I. N of Martins I.	H14 018	1	45°57.5′	81°21.4′			6	
Mocking Bird I.	H14 019	1	45°58.4′	81°24.7′	106			
I. NE of Mocking Bird I.	H14 020	1	45°58.6′	81°24.3′	1	2	132	
Celtic Rks.	H14 021	2	45°58.1′	81°24.9′	167			
Red Rk.	H14 022	1	45°57.3′	81°25.4′	48			
One Tree I.	H14 023	1	45°58.9′	81°25.3′	41			
Flat Rk.	H14 024	1	45°59.0′	81°25.7′	1†			
Pinch I.	H14 025	1	45°59.2′	81°25.5′	1†			
2nd I. W of Flat Rk.	H14 026	1	45°59.0′	81°26.3′	12			
I. ENE of Rannie Rks.	H14 027	1	45′59.1′	81°26.8′			40	
Gull I.	H14 028	1	45°51.3′	81°16.5′	537	19		134 CAT
Papoose I.	H14 029	1	45°51.5′	81°21.4′	469	3293		202 CAT
Young Squaw I.	H14 030	1	45°50.6′	81°27.2′			234	
I. W of Squaw I.	H14 031	1	45°49.9′	81°29.0′	221	44		
WHITEFISH FALLS 41 I/4								
Rf. S of Frazer Pt.	I4 001	1	46°00.1′	81°40.2′	19			

(cont'd)

Appendix 1 *(cont'd)*
Name, location and numbers of nests of colonial birds censused at colony sites in Canadian Lake Huron in 1980 (HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, CAT = Caspian Tern, DCC = Double-crested Cormorant)

TOPOGRAPHICAL MAP Colony name*	Location no.	Mainland or no. of islands	Lat.	Long.	No. of nests HG	RBG	CT	Other
(WHITEFISH FALLS)								
Westernmost I. of 4 Is. S of McGregor Pt.	I4 002	1	46°00.0′	81°41.6′	42			
2 Is. S of McGregor Pt.	I4 003	2	46°00.2′	81°43.0′	70			
E 2 Is. of 10 N of McGregor Pt.	I4 004	2	46°01.2′	81°42.5′	43			
I. 1.0 km S of Parksay Crag I.	I4 005	1	46°02.2′	81°38.0′			101	
Rf. 0.8 km SW of Jumbo I.	I4 006	1	46°02.4′	81°39.2′	7			
I. 1.6 km SW of Jumbo I.	I4 007	1	46°02.5′	81°40.1′	18			
Whitby Is.	I4 008	2	46°04.9′	81°53.4′	50			
Carpmael I.	I4 009	1	46°04.2′	81°53.8′	111			
Is. W of Carpmael I.	I4 010	2	46°04.2′	81°54.0′	17			
Is. E of Carpmael I.	I4 011	2	46°04.3′	81°53.1′			34	
Gordon Rks.	I4 012	2	46°04.3′	81°53.5′	6			
I. 0.6 km W of Flat Pt.	I4 013	1	46°05.6′	81°53.9′			175	
I. 1.4 km SW of Flat Pt.	I4 014	1	46°05.2′	81°54.4′	30			
Westernmost I. of group 1.5 km NE of Eastern I.	I4 015	1	46°05.4′	81°56.1′			37	
SPANISH 41 J/1								
MacPherson Ledge	J1 001	1	46°02.6′	82°01.7′	9			
Louisa Rks. E	J1 002	1	46°04.5′	82°00.0′	21			
Louisa Rks. W	J1 003	1	46°04.6′	82°00.1′			26	
Large I. N of Barren I.	J1 004	1	46°05.7′	82°01.7′	34			
Nisbet Rk.	J1 005	1	46°05.3′	82°03.0′	36			
Chatwin Rk.	J1 006	1	46°05.6′	82°04.8′	11			
Is. 0.4 km NE of Matheson I.	J1 007	3	46°06.0′	82°06.0′	11			
Elm I.	J1 008	1	46°00.9′	82°08.2′	77	2462		152 CAT
I. N of Gisborne Pt., Croker I.	J1 009	1	46°05.1′	82°12.1′			54	
East Rk.	J1 010	1	46°06.1′	82°10.6′	21			
I. W of East Rk.	J1 011	1	46°06.1′	82°11.0′	10			
West Rk.	J1 012	1	46°06.3′	82°11.6′			115	
Westernmost of Is. W of Ritchie Rk.	J1 013	1	46°06.1′	82°13.1′	7			
The Sow	J1 014	1	46°04.1′	82°14.7′	42			
Is. SE of The Sow	J1 015	2	46°04.1′	82°14.5′	48			
Gull Rk.	J1 016	1	46°05.7′	82°19.1′	44			34 DCC
3rd I. W of Hagarty I.	J1 017	1	46°07.5′	82°18.5′	27			
Hiesordt Rk. W	J1 018	3	46°07.9′	82°20.2′	75			
I. between Hoskin and Ferguson Is. NE	J1 019	1	46°07.8′	82°21.6′	18			
I. between Hoskin and Ferguson Is. SW	J1 020	1	46°07.7′	82°21.8′	13			
Howland Rks.	J1 021	2	46°02.9′	82°26.1′	114			
Egg I.	J1 022	1	46°03.6′	82°28.6′	146	5410		
Is. NE of Conmee I.	J1 023	2	46°07.6′	82°27.1′			72	
Fawcett I.	J1 024	1	46°07.5′	82°28.7′	24			
Dennis Is. W	J1 025	4	46°07.8′	82°29.4′	11		91	
I. E of Whiteaves I.	J1 026	1	46°10.5′	82°22.6′			37	
I. W of Rykert Pt.	J1 027	1	46°11.5′	82°27.6′			23	
ALGOMA 41 J/2								
Mouse I.	J2 001	1	46°07.3′	82°30.7′	240	10		
Tern I.	J2 002	1	46°07.6′	82°33.9′	45			
I. 1.2 km NE of Bartlett Pt.	J2 003	1	46°10.6′	82°30.4′			20	
Is. NE of Mulock I.	J2 004	3	46°09.9′	82°35.1′			52	
Turtle Rk.	J2 005	1	46°09.1′	82°39.0′	10			
Is. 0.8 km NE of Godfrey Is.	J2 006	4	46°09.9′	82°41.5′	8			
Robb Rks. Middle	J2 007	1	46°08.6′	82°43.5′	78			

(cont'd)

Appendix 1 *(cont'd)*
Name, location and numbers of nests of colonial birds censused at colony sites in Canadian Lake Huron in 1980 (HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, CAT = Caspian Tern, DCC = Double-crested Cormorant)

TOPOGRAPHICAL MAP Colony name*	Location no.	Mainland or no. of islands	Lat.	Long.	No. of nests HG	RBG	CT	Other
(ALGOMA)								
Robb Rks. W	J2 008	1	46°08.5′	82°43.7′	16			
Minstrel Rk.	J2 009	1	46°08.3′	82°43.9′	29			
Magazine Is. E	J2 010	1	46°10.7′	82°46.7′	18			
Magazine Is. W	J2 011	1	46°10.7′	82°46.8′	23	493		
I. NW of Vaux I.	J2 012	1	46°09.2′	82°47.5′			130	
Is. SW of Turnbull I.	J2 013	2	46°08.6′	82°46.0′			98	
N Fortin Rks.	J2 014	1	46°07.8′	82°48.2′	112			
Middle Fortin Rks. N	J2 015	1	46°07.7′	82°48.3′	14			
Middle Fortin Rks. S	J2 016	1	46°07.6′	82°48.4′	32			
N Chrysler Rks.	J2 017	1	46°07.3′	82°48.9′	53			
Middle Chrysler Rks.	J2 018	3	46°07.2′	82°49.1′	22			
S Chrysler Rks.	J2 019	2	46°07.1′	82°49.3′	21			
The Cousins E	J2 020	1	46°04.9′	82°48.5′	69	2035		395 CAT
The Cousins W	J2 021	1	46°05.0′	82°48.7′	30			
Black Rk.	J2 022	1	46°07.0′	82°50.1′	60			
Northernmost of two Is. S of Loughlin I.	J2 023	1	46°07.8′	82°49.6′	13			
Jane Rk.	J2 024	1	46°08.5′	82°50.5′	22			
Doucet Rk.	J2 025	1	46°08.4′	82°51.3′	26			47 DCC
Double Is. E	J2 026	1	46°10.4′	82°51.8′	128			
Double Is. W	J2 027	1	46°10.4′	82°51.9′	121			
Louis I.	J2 028	2	46°10.7′	82°56.2′			227	
Susanne I. W	J2 029	1	46°10.5′	82°57.6′	8	1028	65	
DEAN LAKE 41 J/3								
West I.	J3 001	1	46°06.7′	83°01.3′	109	3030		
I. W of West I.	J3 002	1	46°06.6′	83°01.4′	27			
De Caen Rk.	J3 003	1	46°10.2′	83°07.9′	24			
I. N of Sayers I.	J3 004	1	46°11.1′	83°08.1′			4	
Is. W of La Salle I.	J3 005	2	46°09.9′	83°09.2′	52			
Richelieu I.	J3 006	1	46°09.9′	83°09.5′	143			28 GBH
Talon Rk.	J3 007	1	46°09.9′	83°09.9′	3			7 DCC
Herbert I.	J3 008	1	46°08.1′	83°16.3′	177			
I. N of Herbert I.	J3 009	1	46°08.3′	83°16.1′		54	2	
E Grant I.	J3 010	1	46°08.4′	83°16.2′	1			
Fishery I.	J3 011	1	46°08.8′	83°17.1′	8			
SE Ivor Rk.	J3 012	1	46°08.4′	83°17.5′	65			
N Ivor Rk.	J3 013	1	46°08.5′	83°17.5′	4			
W Ivor Rk.	J3 014	1	46°08.7′	83°17.9′	115			
Middle Grant I.	J3 015	1	46°08.2′	83°19.4′	156			30 GBH
Bird I.	J3 016	2	46°08.4′	83°20.5′	209			
Anchor I.	J3 017	1	46°08.2′	83°20.7′	69			
Horne Rk.	J3 018	1	46°07.8′	83°21.5′		1	7	
W I. of 3 W of Dobie Pt.	J3 019	1	46°13.1′	83°19.4′			13	
I. 3.2 km W of Dobie Pt.	J3 020	1	46°13.3′	83°21.2′	24			
Bigsby I.	J3 021	1	46°10.3′	83°25.8′	1	1	124	5 GBH
ST. JOSEPH ISLAND 41 J/4								
Clinton I.	J4 001	1	46°14.9′	83°31.4′	20			
Large I. W of Clinton I.	J4 002	1	46°14.8′	83°31.6′		46		
Dyment Rk.	J4 003	1	46°14.7′	83°31.7′	9			
Sulphur I.	J4 004	1	46°08.9′	83°36.5′	70			
Maggs I.	J4 005	1	46°08.9′	83°36.8′	2			11 GBH
Gull I.	J4 006	1	46°09.8′	83°37.2′	75			
Kangaroo Rk.	J4 007	1	46°11.7′	83°38.4′	24			

(cont'd)

Appendix 1 *(cont'd)*
Name, location and numbers of nests of colonial birds censused at colony sites in Canadian Lake Huron in 1980 (HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, CAT = Caspian Tern, DCC = Double-crested Cormorant)

TOPOGRAPHICAL MAP Colony name*	Location no.	Mainland or no. of islands	Lat.	Long.	No. of nests HG	RBG	CT	Other
(ST. JOSEPH ISLAND)								
Serpent I.	J4 008	1	46°10.5′	83°41.3′	8			
I. SE of Birch I.	J4 009	1	46°14.7′	83°40.7′	44			
Cedar I.	J4 010	1	46°14.7′	83°43.5′				42 GBH
Ironsides Rf.	J4 011	1	46°11.1′	83°46.2′		269		
Perrique I.	J4 012	1	46°08.4′	83°45.7′	85			
Salt I.	J4 013	1	46°07.6′	83°47.8′	49			
Janden I.	J4 014	1	46°04.5′	83°53.8′				6 GBH
Pirate I.	J4 015	1	46°03.9′	83°54.5′				2 GBH
I. N of Hay Pt.	J4 016	1	46°08.0′‡	84°00.0′‡			39	
BRUCE MINES 41 J/5								
Thessalon Breakwater Middle	J5 001	1	46°15.2′	83°32.8′		108		
Thessalon Breakwater W	J5 002	1	46°15.1′	83°33.0′		158		
I. of W end of Thessalon Breakwater	J5 003	1	46°15.0′	83°33.0′		836		
I. NE of Thessalon Dock	J5 004	1	46°15.3′	83°33.0′		564	661	
I. SW of Thessalon Dock	J5 005	1	46°15.1′	83°33.2′			67	
I. NE of Gooseberry I.	J5 006	1	46°16.0′	83°35.3′	31			
Is. SE of Gooseberry I.	J5 007	2	46°15.8′	83°35.4′	24			
Kalulah Rk.	J5 008	1	46°15.7′	83°36.6′	36			19 DCC
Africa Rk.	J5 009	1	46°15.5′	83°38.2′	25			52 DCC
Small I. W of Long I.	J5 010	1	46°16.2′	83°43.8′	11			
I. W of Pallideau I.	J5 011	1	46°16.7′	83°44.2′	61			
I. NE of McPhail Rk.	J5 012	1	46°17.4′	83°50.5′	67			
One Tree I. E	J5 013	1	46°17.4′	83°50.7′	75	1338		
One Tree I. Middle	J5 014	1	46°17.5′	83°50.8′	10	12		
Duncan Rk.	J5 015	1	46°17.4′	83°50.9′	37			
Piercy Rks.	J5 016	5	46°17.8′	83°52.3′	69			
Easternmost of 2 Is. SE of Plummer I.	J5 017	1	46°17.9′	83°53.6′	12			
North Sister Rk.	J5 018	1	46°18.2′	83°54.7′			3	
Short Rk.	J5 019	1	46°18.8′	83°55.2′	12			
LAKE GEORGE 41 K/8E								
White Stone Rf.	K8E 001	1	45°18.8′	84°01.9′			31	
Almon I.	K8E 002	2	46°18.7′	84°03.7′	34			
Is. 1.2 km S of Pumpkin Pt.	K8E 003	2	46°23.2′	84°07.8′	63			
MELDRUM BAY 41 G/14								
Batture I.	G14 001	1	45°58.3′	83°04.2′	289	3967		5 GBH
Green I.	G14 002	1	45°50.3′	83°07.0′	3			
Middle I. of 4 Is. 1.3 km NW of Steevens I.	G14 003	1	45°51.8′	83°07.9′	5	8	83	
Boom Pt., Cockburn I.	G14 004	1	45°51.2′	83°21.0′				10 GBH
Wheeler Rf.	G14 005	1	45°53.9′	83°30.6′	185			
Kitchener I.	G14 006	1	45°54.2′	83°30.1′				4 GBH
GREAT DUCK ISLAND 41 G/10								
Middle Duck I.	G10 001	1	45°42.2′	82°55.5′	109	1		
I. E of Great Duck I.	G10 002	1	45°40.1′	82°56.1′	1			
Manitoba Rf.	G10 003	1	45°41.9′	82°57.9′	174	3		
PROVIDENCE BAY 41 G/9								
Scotchie Rk.	G9 001	1	45°33.3′	82°01.5′	22			
Southwesternmost of Birch Pt. Is.	G9 002	1	45°33.1′	82°03.2′	14			
Is. E of Walker Pt.	G9 003	4	45°33.1′	82°03.9′	150			
Is. W of Walker Pt.	G9 004	4	45°33.2′	82°05.1′	357			3 GBH 1 BCNH

(cont'd)

Appendix 1 *(cont'd)*
Name, location and numbers of nests of colonial birds censused at colony sites in Canadian Lake Huron in 1980 (HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, CAT = Caspian Tern, DCC = Double-crested Cormorant)

TOPOGRAPHICAL MAP Colony name*	Location no.	Mainland or no. of islands	Lat.	Long.	No. of nests HG	RBG	CT	Other
(PROVIDENCE BAY)								
I. N of Walker Pt.	G9 005	1	45°33.8′	83°05.0′	40	2		
Small I. in Big Bay	G9 006	1	45°34.1′	82°05.1′	1			
Maiden I.	G9 007	1	45°34.4′	82°06.1′				9 GBH
I. E of Maiden I.	G9 008	1	45°34.4′	82°06.0′	1			
I. W of Maiden I.	G9 009	1	45°34.4′	82°06.8′	41			
Is. at Michael Pt.	G9 010	6	45°34.6′	82°08.0′	219			
Is. S of Timber Bay	G9 011	2	45°37.9′	82°13.2′	66			
Everett Rfs.	G9 012	4	45°38.3′	82°14.6′	44			
Black Rk.	G9 013	1	45°39.6′	82°17.0′	1	41	1	
MANITOWANING 41 H/11 & H/12								
I. in Club Harbour, Club I. (North Rf.)	H12 001	1	45°34.1′	81°35.5′	5	153	33	
Erie Shingle	H12 002	1	45°34.5′	81°37.5′	171	5		
W Pt. Rabbit I.	H12 003	1	45°37.7′	81°38.9′	125			
Wall I.	H12 004	1	45°33.5′	81°41.2′	220	1		
I. E of Wall I.	H12 005	1	45°33.5′	81°41.2′	9	18		
I. W of Wall I. (West Flat)	H12 006	1	45°33.6′	81°41.6′	39			
I. NE of Owen I.	H12 007	1	45°31.4′	81°48.9′	1	26	199	
I. S of Owen I. (Channel Rock)	H12 008	1	45°30.1′	81°49.1′	23			
Mayflower I.	H12 009	1	45°32.2′	81°55.5′	126	3864		
Is. E of Mayflower I.	H12 010	4	45°32.3′	81°54.8′	2			
LITTLE CURRENT 41 H/13								
Is. at E end of Fraser Bay	H13 001	3	45°59.9′	81°35.6′	40			
Quartz Rk.	H13 002	1	45°58.7′	81°36.0′	39			
Is. NE of Maxwell Pt. (Badgeley Rks.)	H13 003	2	45°58.4′	81°33.8′	21			
Twin I. (Southernmost)	H13 004	1	45°57.5′	81°34.0′	38			
I. E of Kokanongwi I. (Kokanongwi Shingle)	H13 005	1	45°56.2′	81°33.3′	173			
I. NE of Northwest Burnt I.	H13 006	1	45°54.3′	81°37.4′	2			
I. E of Giwshkwebi I. (E Mound)	H13 007	1	45°51.0′	81°37.7′	54			
Heywood Rk.	H13 008	2	45°56.3′	81°44.2′	30			
East Mary I.	H13 009	1	45°57.9′	81°45.1′	4			
West Mary I.	H13 010	1	45°58.1′	81°46.1′	164	14 757	302	
I. SW of West Mary I.	H13 011	1	45°58.0′	81°46.4′	36			
Loon I.	H13 012	1	45°53.5′	81°49.8′	64			77 GBH
I. N of Thompson Pt.	H13 013	1	45°56.9′	81°53.1′	1			
Garden I.	H13 014	1	45°58.8′	81°51.5′	41			
KAGAWONG 41 G/16								
The Tooth	G16 001	1	45°55.6′	82°12.8′			33	
Seagull I.	G16 002	1	45°56.9′	82°13.5′	17	941		
Gooseberry I. (Trudeau I.)	G16 003	1	45°57.0′	82°14.1′	51	2257		
Meredith Rk.	G16 004	1	45°58.9′	82°14.4′	1		29	
Little I.	G16 005	1	45°58.9′	82°16.5′	48			
SILVER WATER 41 G/15								
I. in Murphy Harbour	G15 001	1	45°46.7′	82°40.5′	30			
I. SW of Henry I.	G15 002	1	45°54.2′	82°47.0′		2	78	
Gertrude I.	G15 003	1	45°55.4′	82°46.5′	273	13 866		
Buller Rf.	G15 004	1	45°47.2′	82°47.8′	9			
Is. N of Buller Rf.	G15 005	4	45°47.4′	82°48.0′	87			
Inner Duck I. (Thibault I.) N end	G15 006	1	45°46.3′	82°55.6′	89			
Inner Duck I. (Thibault I.) S end	G15 007	1	45°45.6′	82°55.8′	45			

(cont'd)

Appendix 1 *(cont'd)*
Name, location and numbers of nests of colonial birds censused at colony sites in Canadian Lake Huron in 1980 (HG = Herring Gull, RBG = Ring-billed Gull, CT = Common Tern, GBH = Great Blue Heron, BCNH = Black-crowned Night-Heron, CAT = Caspian Tern, DCC = Double-crested Cormorant)

TOPOGRAPHICAL MAP Colony name*	Location no.	Mainland or no. of islands	Lat.	Long.	No. of nests HG	RBG	CT	Other
(SILVER WATER)								
Western Duck I. NE Pt.	G15 008	1	45°45.9′	82°58.7′	1			
Western Duck I. SE Pt.	G15 009	1	45°44.3′	82°59.1′	1			
Inner Duck I. (Thibault I.)	G15 010	1	45°45.8′	82°55.7′				3 GBH

* Ch. = channel
I. = island or isle
Is. = islands
Rk. = rock
Rks. = rocks
Rf. = reef
Rfs. = reefs
† Ground estimate
‡ Approximation
§ Estimate from boat

Appendix 2
Colonies used to calculate the population changes for Herring and Ring-billed Gulls and Common Terns (see Tables 7 and 8). All data in 1960–62 column are from Ludwig (1962) unless otherwise noted. If more than one count was made during the census period, the earliest one was used. Although Ludwig does not list the dates of his surveys, he says that they were conducted during the nesting season and that he banded 60 000 young of four species; hence his survey was later than ours by up to one month. A survey at that time of the year would slightly underestimate the number of active nests on the site

Species	Area	Colony	No. of nests (pairs) 1960–62	1980
Herring Gull	Lake Huron (main body)	Everet Rf. Rks.	16	44
		Rks. N of Green I.	1	5
		Mad Rf. (Stokes Bay)	800*	247
		Manitoba Rf.	200	174
		Middle Duck I.	200	109
		Pike Bay	300*	0
		Timber Bay I.	100	66
		Subtotal	1617	645
	Georgian Bay	Badgeley Rks.	20	21
		Baie Finn Rks.	100	42
		Black Rks.	50	60
		East Mary I.	100	4
		English Pt. Rf.	20	0
		Erie Shingle	75	171
		Gull I.	200	537
		Gull Rks.	200	203
		Halfmoon I.	150	1 242
		McNab Rks.	50	10
		Nottawasaga I. and I.to S	432	696
		O'Brien Is.	170*	116
		Papoose I.	200	469
		Twin Sister I.	50	0
		Scarecrow I.	100	253
		South Limestone I.	200	173
		Southeast Rk.	75	108
		Southwest Hawk I.	100	281
		West Mary I.	100	164
		West Mary I. Rks.	20	36
		Young Squaw I.	25	0
		Subtotal	2 437	4 586
	North Channel	Anchor I.	40	69
		Bird I.	200	209
		Black Rk.	45†	60
		Chrysler Rks.	60	96
		Cousins I.	200	99
		De Caen Rk.	70	24
		Doucet Rk.	30†	26
		Egg I.	200	146
		Elm I.	25	77
		Fortin Rks.	30	158
		Gull I.	100	75
		Gull Rk.	50†	44
		Herbert I.	50	177
		Howland Rks.	50	114
		Ivor Rks.	75	184
		Kangaroo Rks.	4	24

(cont'd)

Appendix 2 *(cont'd)*
Colonies used to calculate the population changes for Herring and Ring-billed Gulls and Common Terns (see Tables 7 and 8). All data in 1960–62 column are from Ludwig (1962) unless otherwise noted. If more than one count was made during the census period, the earliest one was used. Although Ludwig does not list the dates of his surveys, he says that they were conducted during the nesting season and that he banded 60 000 young of four species; hence his survey was later than ours by up to one month. A survey at that time of the year would slightly underestimate the number of active nests on the site

Species	Area	Colony	No. of nests (pairs) 1960–62	1980
(Herring Gull)	(North Channel)	LaSalle I.	40	52
		Meredith Rk.	1	1
		Middle Grant I.	150	156
		Mouse I.	58†	240
		Richelieu I.	40	143
		Salisbury I.	10	4
		Sow and Pigs I.	20	90
		Talon Rk.	10	3
		Thessalon Hrbr.	15	0
		West I.	125	109
		Subtotal	1 698	2 380
		Total	5 752	7 611
Ring-billed Gull	Lake Huron (main body)	Ghegheto I.	375‡	0
		I. S of Ghegheto I.	350‡	0
		Mad Rf.	400*	2 473
		Subtotal	1 125	2 473
	Georgian Bay	Blackbill Is.	40	0
		East Mary I.	0	14 757
		Erie Shingle	100	5
		Gull I.	0	19
		Gull Rks.	1 000*	2 053
		Halfmoon I.	800	3 352
		McNab Rks.	50	0
		Papoose I.	1 700	3 293
		South Limestone I.	4 500	12 385
		South Watcher I.	1 000+*	3 435
		Subtotal	9 190+	39 299
	North Channel	Cousins I.	0	2 035
		Egg I.	0	5 410
		Elm I.	75	2 462
		West I.	1 800	3 030
		Subtotal	1 875	12 937
		Total	12 190+	54 709
Common Tern	Lake Huron (main body)	Rks. (Rf.) N of Green I.	60	83
		Subtotal	60	83
	Georgian Bay	Carling Rks.	150	69
		Cobblestone I.	149*	0
		Erie Shingle	120	0
		Gull (Tiny) I.	57*	0
		Halfmoon I.	10	0
		Is. N of Gooseberry I.	200*	20

(cont'd)

Appendix 2 *(cont'd)*
Colonies used to calculate the population changes for Herring and Ring-billed Gulls and Common Terns (see Tables 7 and 8). All data in 1960–62 column are from Ludwig (1962) unless otherwise noted. If more than one count was made during the census period, the earliest one was used. Although Ludwig does not list the dates of his surveys, he says that they were conducted during the nesting season and that he banded 60 000 young of four species; hence his survey was later than ours by up to one month. A survey at that time of the year would slightly underestimate the number of active nests on the site

			No. of nests (pairs)	
Species	Area	Colony	1960–62	1980
(Common Tern)	(Georgian Bay)	Southeast (Gull) Rks.	50	0
		Southeast Pine I.	270*	0
		South Limestone I.	200	1 082
		Tiny Bench	30*	0
		Wreck Bay	10*	0
		Young Squaw I.	1 200	234
		Subtotal	2 446	1 405
	North Channel	Cousins I.	30	0
		Dennis I.	208*	91
		Elm I.	200§	0
		Garrity (Turnbull) I.	165*	98
		Howland Rks.	10	0
		Land I.	175*	72
		Louis I.	150	227
		Meredith Rk.	150	29
		Susanne (Rks.) I.	10	65
		Thessalon I.	10	0
		I. E of Whiteaves I.	13*	37
		Subtotal	1 121	619
		Total	3 627	2 107

* Census data from 1967–72 period (CWS, unpubl. files)
† Mean of 1947 and 1971–72 censuses
‡ 1930 data
§ This figure dates from 1962. Ludwig found no Common Terns there in 1960