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Canadian Atlas of Bird Banding

Volume 2: Seabirds, 1921–1995



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Seabirds, 1921–1995

**Special Publication
Canadian Wildlife Service**

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Abstract

This volume is part of a series that summarizes, for the first time, bird-banding results for Canada, including data on birds banded in Canada and those banded elsewhere but encountered in Canada. Although limited in geographic scope, the data depict movement patterns that are typical for North America as a whole. The current volume deals with seabirds (albatrosses, petrels, gannets, cormorants, pelicans, jaegers, gulls, terns, and auks).

A full account is given for each species with at least one record of an individual moving more than 100 km; banding and encounter statistics for all species banded in Canada are summarized in an appendix. Species accounts consist of 1) one or more encounter maps showing lines joining points of banding and encounter; 2) a narrative discussing results and movement patterns and recapping any major analyses of band encounters already published for the species; 3) a list showing details of selected encounters; 4) a table giving summary statistics such as encounter rate and mean distance moved; and 5) an effort map showing frequency of banding by geographic location.

Many of the results for rarely encountered species have not been published before. Results for more frequently encountered species indicate geographic differences in movement patterns, which are often consistent across many species. The information presented here should be of interest not only to banders and students of migration, but also to managers and conservationists wanting to know more about the wintering destinations and migration routes of Canada's birds.

Acknowledgements

This atlas evolved over several decades and could not have been completed without the help of dozens of contributors. The original manuscript, which covered banding data up to 1976, benefited from the help of Suzanne Blain, Anne Lambert, Colleen Hyslop, Tony Salvadori, and Linda Prywezcki. Heather Trueman helped Eric Woodsworth significantly with the data thinning and mapping programs, while Glen Atkinson and Richard Aylesworth contributed to the development of base maps and projection methods. Major word-processing assistance was provided by Manon Vincent and Lorraine Tomkewich.

After a decision was made to extend coverage through 1995, additional people provided help. These included Lucie Métras, Louise Laurin, Ann Demers, Peter Blancher, and Christine Eberl. Mary Gustafson of the U.S. Bird Banding Laboratory kindly checked the original data to answer many queries. In tracing Canadian encounters of foreign-banded birds, the authors were greatly helped by officers of the banding schemes in Greenland (Denmark) (Kaj Kampp), Iceland (Aevar Petersen), the United Kingdom (the late Chris Mead), and Europe as a whole (R.D. Wassenaar of the European Union for Bird Ringing).

Other contributions to Volume 2 were as follows: Bev McBride edited many accounts and cross-checked maps and encounter details, and new accounts or revisions of old accounts were contributed by Gary Kaiser (Rhinoceros Auklet, Western Gull, Laysan Albatross) and Gilles Chapdelaine (Razorbill). Many thanks are extended to those who commented on parts of the document: John Chardine, Jean-François Rail, and Chip Weseloh. Finally, we want to acknowledge the uncountable hours of effort that hundreds of banders have put into amassing the database on which this summary is based. This atlas is for you.

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1. Introduction

This publication is part of an atlas series that presents, for the first time, a comprehensive overview of bird-banding results involving Canada. This volume covers seabirds (albatrosses, petrels, gannets, cormorants, pelicans, jaegers, gulls, terns, and auks).

Bird banding involves placing a metal band with a unique serial number on a bird's leg, so that the bird can be individually identified when it is found again. An "encounter" is any subsequent observation of the banded bird, dead or alive. (The term "recovery," sometimes used as synonymous with encounter, refers only to encounters of dead birds.)

Bird banding in Canada was begun by private individuals in the early years of the twentieth century. Following the 1916–1917 implementation of the Migratory Birds Convention between Great Britain (for Canada) and the United States, the public sector organized the administration of bird banding. The Canadian Bird Banding Office, established in 1923, was originally part of the Dominion government's Parks Branch but is now administered in Ottawa by the Canadian Wildlife Service (CWS) of Environment Canada. The Office works closely with the Bird Banding Laboratory of the U.S. Geological Survey's Biological Resources Division, which was established in 1920. These two agencies jointly administer the North American Bird Banding Program for migratory birds. Mexico joined the North American Bird Banding Program in 2006 and is developing a banding system in that country.

In Canada, as in most countries with vigorous banding programs, bird banding has included a great deal of volunteer activity. While many professional biologists use banding in their research and government biologists have done much of North America's banding of game birds, interest in the spectacular migrations of birds has led scores of unpaid enthusiasts to spend much of their spare time banding birds. Most published analyses of band encounters have involved species with numerous records, particularly species of economic importance. For other species, there is an enormous body of

encounter data that has never been compiled, covering many decades of effort. This atlas series is intended to fill that gap.

2. Overview of the series

The bulk of this atlas series consists of individual species accounts that depict movement patterns and summarize data to indicate what is available for further analysis. Although species accounts range from those reporting a single encounter to those summarizing 10000 or more, each is presented in a consistent format that is described in detail in the next section. Here we provide a brief overview of our treatment of the data and point out the limitations of our analyses.

Full accounts are included for species for which there was at least one encounter over 100 km from the banding site; banding statistics for other species banded or encountered in Canada are included in Appendix 1. Each species account provides one or more maps showing movement patterns, followed by a narrative and a listing of selected encounters reported in detail. Each account concludes with a summary table of standard information and a map showing the distribution of bandings for that species in Canada.

The survival or movements of species for which there are 100 or more encounters have often been analyzed in published works. In such cases, we provide a précis of the results in our narrative (including some important references from later than 1995, including Banding Office data on maximum longevity to 2007). When there is little or no literature, we have tried to highlight the most important patterns indicated by the encounters.

The list of selected encounter records in each account includes examples of typical movements, but also includes cases that will interest banders — for example, records showing unusually long-lived or far-travelled birds, movement outside the normal range of distribution, and cases of apparent "reverse" migration. We recognize from our own experience as banders that it is often the unusual or spectacular encounter that stimulates a bander's interest, and we hope that some of those listed will serve this purpose.

The database used in preparing this atlas series includes all records of birds banded under the North American scheme that were 1) banded in Canada and encountered anywhere or 2) banded elsewhere (usually in the United States but a few in Central America or on Pacific islands) and encountered in Canada. Encounters in Canada of birds banded under other banding schemes (chiefly in northwestern Europe and Greenland) are also included to the extent that we could find out about them, because these records add so much to our knowledge of the distribution and movements of Canadian birds (Tuck 1971; Dennis 1981). Encounters of this sort from the period prior to 1975 were extracted from European banding reports and other published sources. Those from 1975 to 1995 were obtained in part from literature but primarily from the European Union for Bird Ringing, or EURING, and we recognize that this atlas gives an incomplete picture of European-banded birds encountered in Canada. At some modest risk of creating a diplomatic incident, we have also included in this series a few records that did not involve Canadian territory — from the French islands of St. Pierre and Miquelon (located off the south coast of the island of Newfoundland).

The most obvious limitation of this atlas series is that it deals only with bandings or encounters occurring within Canadian boundaries and the seas immediately offshore. U.S. records that did not involve Canadian territory had to be excluded because the sheer volume of data for North America as a whole was simply beyond our means to handle. (The project was well under way before the dawn of the computer age.) Nevertheless, we felt that the Canadian database was sufficiently large and geographically representative to justify restricting our coverage. We hope that this atlas series will stimulate our American colleagues to collaborate in a more comprehensive continental assessment of banding and encounter data.

Banding data can be misleading if not interpreted carefully with a full understanding of biases and limitations. There is always uncertainty about specific records. The person reporting an encounter has to provide accurate information on the band number (which is usually the means of identifying the species); however, band numbers are easily misread, and only

rarely is the actual band returned with the report of finding. In addition, the finder must accurately report date, place, and other details, and investigation shows that reports may often be incomplete or incorrect (Houston and Francis 1993). Data entry is another common source of mistakes. Given the qualifications necessary to get a banding permit, bander error is a less likely source of problems. However, occasional odd encounters are most plausibly explained as mistaken species identification on the part of the bander. This can occur, for example, when chicks are banded in mixed colonies of gull or tern species.

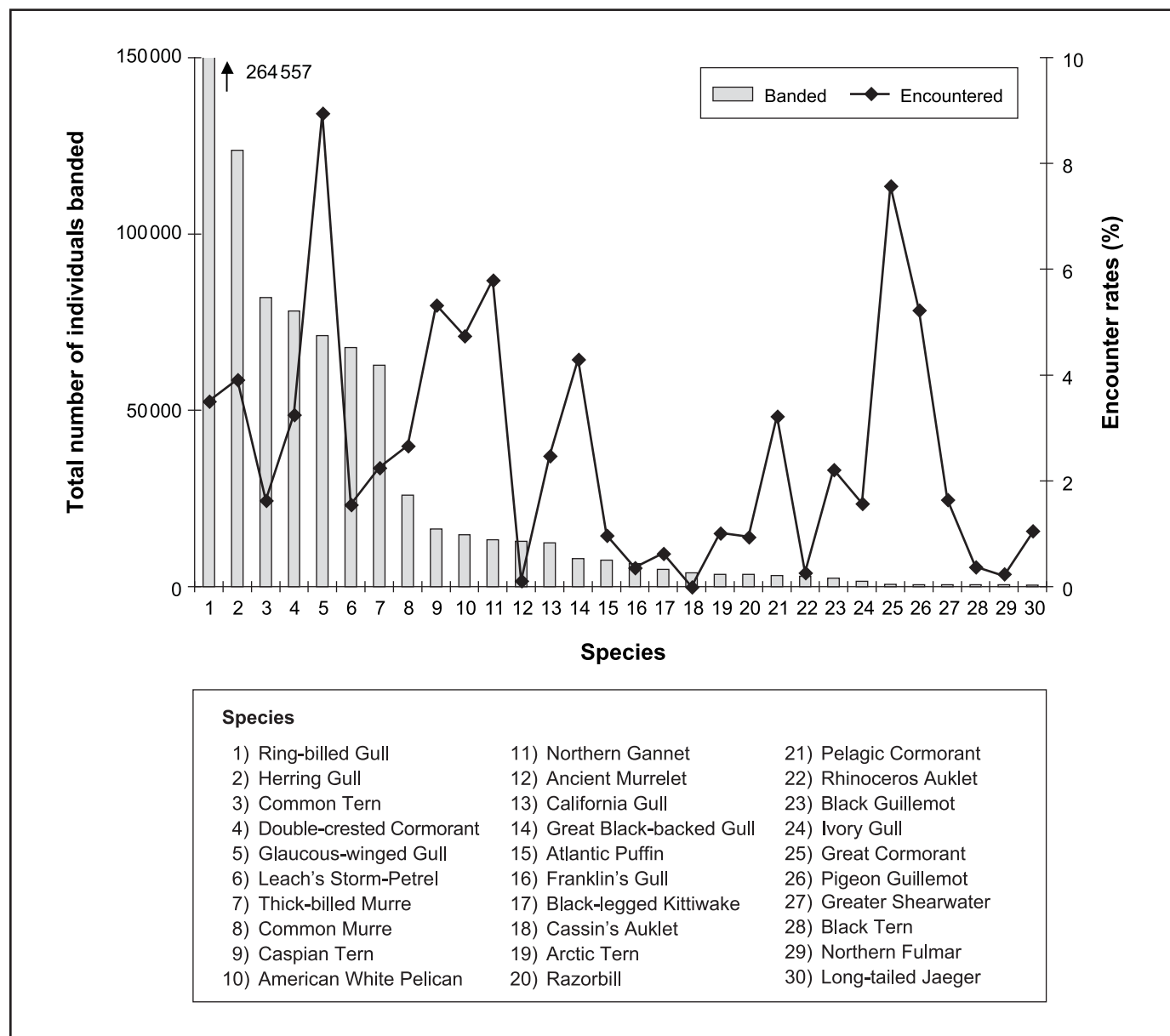
Although we could not check every record, we have checked the details of the most striking encounters. In most cases, there are no data entry errors and no clue as to whether the band number was read correctly. We therefore had to use our judgement as to whether to include certain odd records. When a record was clearly in error we excluded it, but when it was merely suspicious we retained it, usually calling attention to it in the species account. Readers should regard all individual records with a degree of caution, however, and give greatest credence to overall patterns of movement. Although it was sometimes discouraging (although hardly surprising) to see that errors had crept into this large database, we are convinced that the value of the data set as a whole justifies our summarizing all the available data for public scrutiny.

3. Overview of Volume 2

This volume covers the 58 species of seabirds that were banded or encountered in Canada from 1921 through 1995 (see full listing in Appendix 1). Of these, 50 species are treated with a full species account.

For the 58 species covered in this volume, 905 588 individuals were banded in Canada between 1955 and 1995. (Numbers of birds banded prior to 1955 have not been entered into the electronic database.) The species banded most frequently during 1955–1995, comprising more than a quarter of all seabirds banded, was the Ring-billed Gull (Fig. 1). All of the top four species (Ring-billed Gull, Herring Gull, Common Tern, Double-crested Cormorant) occur

Figure 1 Total number of seabirds banded in Canada and encounter rates for those species during 1955–1995^a



^aOnly species for which >300 were banded during 1955–1995 are shown.

inland around the Great Lakes, where there is a big concentration of banders. Altogether, more than 10 000 individuals were banded for 13 species, and more than 1 000 individuals for an additional 10 species.

Of the 905 588 seabirds banded during 1955–1995, 31 090 provided encounters up to 1995, for an overall encounter rate of 3.4%. The encounter rate for individual species varied from about 0.1%

(Ancient Murrelet) to above 5% (Great Cormorant, Caspian Tern, Pigeon Guillemot), reaching a maximum of 9% for Glaucous-winged Gull (Fig. 1). In addition to the 33 083 encounters of birds banded in Canada between 1955 and 1995, this volume covers an additional 7 525 encounters of birds banded between 1921 and 1954.

Being generally rather large and often conspicuous (white plumage) and sometimes being cast up on well-used beaches after death, banded seabirds tend to be encountered much more frequently than small songbirds. Species where encounter rates away from breeding colonies are especially low are mainly those frequenting unpopulated coasts throughout the year (Northern Fulmar, Glaucous Gull, Ancient Murrelet, Rhinoceros Auklet). Unlike landbird corpses, those of seabirds may travel substantial distances between where they died and where they are found, carried by winds and tides. As seabird carcasses are large and sometimes buried in sand and later reexposed, a long time may elapse between death and encounter. Consequently, neither the exact finding location nor the date of encounter should be treated as indicative of the species' precise range in time or space.

Seabird banding, to a much greater extent than landbird banding, has been carried out mainly by professionals, with CWS permits accounting for the vast majority of the marine seabirds banded. This is partly because seabirds are accessible for banding almost exclusively when they are breeding, an activity that takes place mainly on remote islands and headlands that are difficult and expensive to access. It also reflects the professional concerns of a small number of CWS biologists. Inland banding of gulls, terns, cormorants, and pelicans has been less concentrated, but has still depended on a small number of highly motivated individuals, some amateur, some professional. For 28 species, just two banding permits accounted for more than 50% of birds banded! The comments of one bander on the kind of effort involved typify the spirit required (Rowan 1927):

Words cannot describe the labour of our second visit. Every step in the sticky ooze...was an effort to begin with, but

towards the end it felt as though 50 lb weights were tied to our feet... Each band placed that day involved mental as well as physical effort and one bander after another dropped out from sheer exhaustion; by eleven o'clock the effort had automatically come to a conclusion. The last bander was played out.... Five of us, in spite of all handicaps and unexpected difficulties, placed over 500 bands each in five hours.

The amount of seabird banding in Canada has fluctuated greatly over the period between 1955 and 1995, the time period for which we have numbers (see Appendix 1). These fluctuations probably reflect the activities of particular individuals and the perceived management needs of CWS, rather than any changes in methods or equipment. Hence, the large numbers of Common Murres banded during 1955–1975 were mainly the responsibility of Leslie Tuck, whereas the peak of Thick-billed Murre bandings since 1985 reflects the ongoing CWS Coats Island project. Unlike the situation with landbirds (Brewer et al. 2000), there has been no increase in numbers banded since 1955. In fact, for many species, peak banding occurred in 1955–1975 and has fallen since, perhaps reflecting a belief that we have amassed sufficient information on the species involved. The absence of any encounters since 1972 for Canadian-banded Franklin's Gulls illustrates the relative slowdown in the amount of inland waterbird banding that has occurred in recent decades. It is worth noting that renewed banding for species that were heavily banded during the first half of the 20th century could provide interesting insights into changes in migratory patterns and wintering areas.

On top of the 40 608 encounters of Canadian-banded birds from 1921 to 1995, this volume also includes 9 173 cases of birds banded in other countries but encountered in Canada during the same period. These encounters of foreign-banded birds are much more numerous than those for landbirds (apart from those banded in the United States). This reflects the fact that seabirds inhabit oceans rather than continents. Most involve birds banded in Europe and encountered in eastern Canada, partly because there has been a great deal of banding carried out in Europe, and partly because the waters off eastern Canada are an important

feeding area for many populations breeding in Europe. Southern ocean species, such as Sooty Shearwater and Wilson's Storm-Petrel, are not represented at all among Canadian encounters, although they are very abundant visitors to Canadian waters. This reflects both the small amount of banding in the Southern Hemisphere breeding areas and the tendency for these species to remain offshore most of the time, making encounters less likely.

Foreign-banded birds encountered in British Columbia have mainly been birds banded on the coasts of California, Oregon, and Washington. Many Alaskan birds undoubtedly visit B.C. waters in winter, but little banding has been carried out in Alaska, so encounters are few. Likewise, the lack of encounters of Canadian-banded birds in Alaska should not be taken to indicate a lack of movement in that direction: the state has an enormous length of coasts that are rarely visited and are mostly very unsuitable for the accumulation of seabird carcasses.

An appreciable number of seabirds that breed in Canada make no clearly defined migration, in the sense that they exhibit no discrete and separate summer and winter ranges. This applies to most of the auks, many gulls, Northern Fulmar, and Great Cormorant. However, most disperse during the non-breeding period, especially the younger cohorts; in the case of Arctic breeders, this dispersal is mainly southwards, away from areas of winter ice cover. Band encounters for these species are useful, not so much in identifying routes of migration as in defining minimum limits of dispersal.

4. Detailed explanation of species accounts

4.1 Species name

The first items in each account are the species' common and scientific names, for which we follow the seventh edition of the Check-list of North American Birds (American Ornithologists' Union 1998 and updates through the 47th supplement), and the species number from *The North American Bird Banding Manual* (Gustafson et al. 1997).

4.2 Encounter map

The encounter map shows lines joining banding locations with encounter sites for birds encountered more than 100 km from the banding site. The symbol at the end of each line marks the encounter location.

Prior to mapping, data were screened to delete records showing encounters within 100 km of the banding site (the latter being relatively uninteresting for depiction on maps). Encounters with inexact location codes or coordinates were also excluded, except as follows. Records providing degrees of latitude and longitude but lacking the exact 10' block were assigned coordinates at the southeast corner of the 1° block. Some of the older encounters from Mexico report the state but do not give any coordinates; in such cases, we assigned coordinates for the centre of the state. To ensure that scarce long-distance encounters would be mapped, we also assigned coordinates for inexact locations within Central or South American countries, giving coordinates for the centre of the relevant country.

For species with few band encounters, every record of movement greater than 100 km could be mapped individually. However, this was not possible for species with high numbers of encounters, as even maps with as few as 50 lines can appear too cluttered. We therefore reduced the complexity of the maps using several methods. For example, for a few species (noted in the text), we omitted encounters within 200–400 km of the banding site, as opposed to the usual 100 km. A second approach was to produce several maps for a species to allow depiction of more cases.

Most commonly, we used a thinning process. First, groups of records were identified that shared the same banding and encounter coordinates (i.e., all the birds were banded within one 10' latitude-longitude block and encountered within another 10' block). Then a single line was plotted with a larger symbol to indicate the number of encounters represented by that line (see key on each map). If further thinning was required, coordinates were rounded to form larger degree blocks (instead of 10' blocks), and new (larger) groups of records were formed that shared the new banding and encounter coordinates. From each group, a single record was randomly chosen to represent the

group on the map, and these lines were plotted using their original coordinates. Again, the size of the symbol at the end of the selected line shows the number of records represented. If the map was still too crowded, the process was repeated with larger block sizes until the maps became clear. Block size in degrees (in decimal format) is shown with each map for which block size was enlarged above 10' of latitude and longitude for the purposes of thinning. Reference maps in Appendix 2 give the reader an idea of the area encompassed by large degree blocks.

The number of encounters represented by each symbol is consistent across all maps, with only two sets of frequency classes being used: one for large data sets (map symbols are triangles) and one for smaller data sets (map symbols are squares).

The result of the thinning process is a set of lines joining banding and encounter locations that summarizes geographic patterns of movement, rather than showing every encounter separately. The advantage of this system is that sparse or outlier records are not eliminated in the thinning process, whereas dense areas of repetitious records are rigorously weeded to reduce clutter. The disadvantage is that many individual records (sometimes hundreds) are not shown on the maps. When block size is large (over a few degrees), the text draws attention to that fact and notes any distortions of pattern that may result.

4.3 Narrative

Each narrative begins with a clarification of taxonomy if taxa traditionally recognized by banders do not coincide with those in current use by systematists. A short description of the North American breeding distribution and each species' wintering area follows, based mainly on Peterson (1980), the American Ornithologists' Union (1998 and subsequent supplements), Godfrey (1986), and individual species accounts in the Birds of North America series (Gill and Poole 1991–2001).

The main body of the text discusses movement patterns revealed by the encounters and refers to specific records (by number) that are listed below the text. If there are major published analyses of band

encounters for the species, relevant results are summarized briefly in the account, even if published later than the cut-off date for including band encounters (end of 1995). Cited longevity records (from the U.S. Banding Laboratory web site) were current as of 2006.

4.4 List of selected encounter records

The encounter records are listed in a standard format. Each one occupies two lines, the upper containing mostly the banding information, and the lower, the encounter details. The band number is given first. Below it, on the second line, appear either the initials of the bander or, if these cannot be traced, the bander's permit number or acronym of the permitting organization or the name of the country of banding. (This is the only banding information that appears on the second line rather than the first.) A key to banders' initials appears in Appendix 3.

All codes in the encounter listings are from The North American Bird Banding Manual (Gustafson et al. 1997; see Appendix 3 for keys). These codes are used in preference to the "international" symbols because they contain more information (Brewer and Salvadori 1978). Following the band number and the initials or permit number of the bander or country of banding are two sets of codes: on the upper line, the alphabetic versions of the codes for age (first) and sex (second) of the bird at banding; on the lower line, the numeric codes for "present status of bird and band" and "how obtained" from the encounter data. Together, the latter two codes give some indication of the completeness of information for the particular record.

Next are the dates of banding (above) and encounter (below). Note that these are in the order day/month/year (not month/day/year as they are in the computer files), to conform with common Canadian usage. Special codes indicate inexact dates of encounter (see details in Appendix 3).

Dates are followed by the names of the places of banding (above) and encounter (below). Most place names were obtained from the gazetteer of banding and encounter localities on file at the U.S. Bird Banding Laboratory. The location names in the gazetteer were assigned by Laboratory personnel and

frequently differ from the names that banders assign to their own sites. We have changed site names to those more recognizable by banders in the few cases where we knew which names were more appropriate, but in many cases we were not able to do so. When locations were not given in the gazetteer, we used atlases to find nearby place names. Maps of Canadian provinces and territories, U.S. and Mexican states, and Central and South American countries are shown in Appendix 2 for reader reference.

The next data in the encounter records are the latitude and longitude of banding (upper line) and encounter (lower line), expressed as the coordinates of the southeast corner of the appropriate 10' geographic block (Gustafson et al. 1997). Question marks indicate inexact locations. Where we assigned coordinates (see notes in section 4.2), the distance travelled (see below) is given as approximate. In a few specific cases for which revelation of the breeding locations might be deleterious to the bird, precise banding locations have been omitted. In these cases, we have identified only the province or state and rounded the geographic coordinates and the distances travelled.

The last data given are not extracted from the standard computer files but have been calculated separately. On the upper line is the time elapsed between banding and encounter (omitted when date of actual encounter was ambiguous or the bird was long dead at the time it was found), and on the lower is the calculated distance and direction between banding and encounter locations (see Appendix 4). The latter is blank when locations are inexact or where approximate locations were assigned (see section 4.2), in which case approximate distance and direction were calculated. Most encounters listed in detail are specifically cited in the text, but often the bird with the longest period between banding and encounter is listed at the end without any comment.

4.5 Summary of banding statistics

A summary of banding statistics is provided for each species with bandings in Canada. Data are arranged in three columns: birds banded in their first calendar year of life (Hatch Year), those banded in their second or subsequent calendar year of life (After Hatch Year),

and the total banded regardless of age (including birds of unknown age when banded). An explanation of each line in the summary table is given below.

No. of Canadian bandings (1955–1995):

Banding numbers were not handled by computer prior to 1955, so this item and the next (“No. encountered per 1 000 banded”) are restricted to the 1955–1995 period. These two lines are italicized in the table to emphasize that they are a restricted subset of the numbers appearing in the remainder of the table. See Appendix 3 for definitions of age at banding, and note that the total includes birds of unknown age.

No. encountered per 1 000 banded (1955–1995):

(No. of encounters of birds banded in Canada,
1955–1995) × 1 000

Total no. banded in Canada (1955–1995)

The number of encounters includes birds killed, found dead, or captured alive, as well as sight records (i.e., bands read from a distance). If a single bird was encountered multiple times, it was tallied only once.

The encounter rate is influenced by such factors as the size and conspicuousness of a species, density of human population, and whether the species is hunted, as well as by the geographic distribution of bird banders and the number of individuals of the species they handle. The encounter rate is also affected by the number of reports of birds encountered in the same 10' block in which they were banded. Prior to 1958, encounters within 90 days at the site of banding were incorporated into the database (although the numbers are not large); in 1958, however, this practice was discontinued. Encounters at the site of banding more than 90 days after banding can still be submitted to the banding office; however, some banders do not submit such encounters, and not all of those sent in are actually entered into the database (L. Métras, pers. commun.).

Total no. encountered (1921–1995):

No. of encounters of birds banded in Canada
(1921–1995) + no. of Canadian encounters of
birds banded elsewhere (1921–1995)

All further calculations in this table are based on this set of encounters. Duplicate encounters of the same bird were excluded.

No. encountered from foreign bandings:

No. of the above encounters (1921–1995) that involved birds banded in another country but encountered in Canada

Maximum period from banding to encounter (mo.):

Maximum period for any individual, rounded to the nearest month

This information is provided as an indicator of a bird's minimum age, so is not provided when date of encounter or actual date of death is highly uncertain. Note also that this figure does not represent longevity, except for birds banded as very young chicks, as no attempt was made to estimate the true age of the bird by guessing at its age when banded.

No. of Canadian-banded birds moving >0 km:

This number gives the sample size for the calculation below.

Mean movement >0 km of Canadian-banded birds (km):

Sum of km moved for all encounters of Canadian-banded birds that moved >0 km

No. of Canadian-banded birds moving >0 km

The distance between the banding and encounter locations of each record was computed using a great-circle distance — that is, the shortest distance that could be travelled between the two coordinates allowing for the curvature of the earth (Cowardin 1977; Appendix 4). Although the maps show straight lines connecting points of banding and encounter, no birds are likely to fly in an exact straight line, least of all seabirds, most of which will not overfly land and hence are constrained by the shape of coastlines. This is particularly important to bear in mind when considering birds banded in Hudson Bay or the Gulf of St. Lawrence and encountered on the U.S. east coast.

These individuals must have travelled much farther than the straight-line distances suggest. Hence, mean movement should be treated as the absolute minimum distance that individuals had travelled between banding and encounter. Distance travelled is shown as approximate in records for which we assigned encounter coordinates (see explanation in section 4.2).

Maximum movement from all encounters (km):

Maximum calculated distance moved for any individual

Unlike the calculation for mean movement of Canadian-banded birds (above), the maximum distance is given for any encounter in the database, regardless of banding location.

% recovered (encountered dead):

(Total no. encountered dead) × 100

Total no. encountered

Birds with “unknown” present condition codes (see Appendix 3) were treated as dead for this calculation and the next one (“% direct recoveries”), as were birds banded in their Hatch Year and encountered in the same 10' block within three months of banding.

Birds encountered before 1965 and birds banded outside the North American banding scheme (mainly in Europe and Greenland) did not have true “present condition” codes to indicate whether the encountered bird was alive or dead. We assigned codes to these records based on available information to enable their inclusion in this calculation (see Appendix 3).

% direct recoveries:

(Total no. of direct recoveries) × 100

Total no. of encounters

A direct recovery is an encounter with a bird “killed or found dead before, during, or immediately after the first period of migratory movement following banding and before return migration would be likely to have occurred” (Gustafson et al. 1997). Appendix 4 shows how this designation was assigned; see also notes above on “% recovered.”

The “% direct recoveries” is used chiefly as a measure of the hunting pressure on species in which most of the mortality is inflicted by hunters. In species that are not hunted, this figure is a rough guide to the magnitude of annual mortality. In the majority of species, this figure will be much higher for birds banded in their Hatch Year than for those banded in later years, reflecting the high mortality of juveniles typical of most birds.

% encountered during banding operations:

$$\frac{(\text{Total no. encountered in banding operations}) \times 100}{\text{Total no. of encounters}}$$

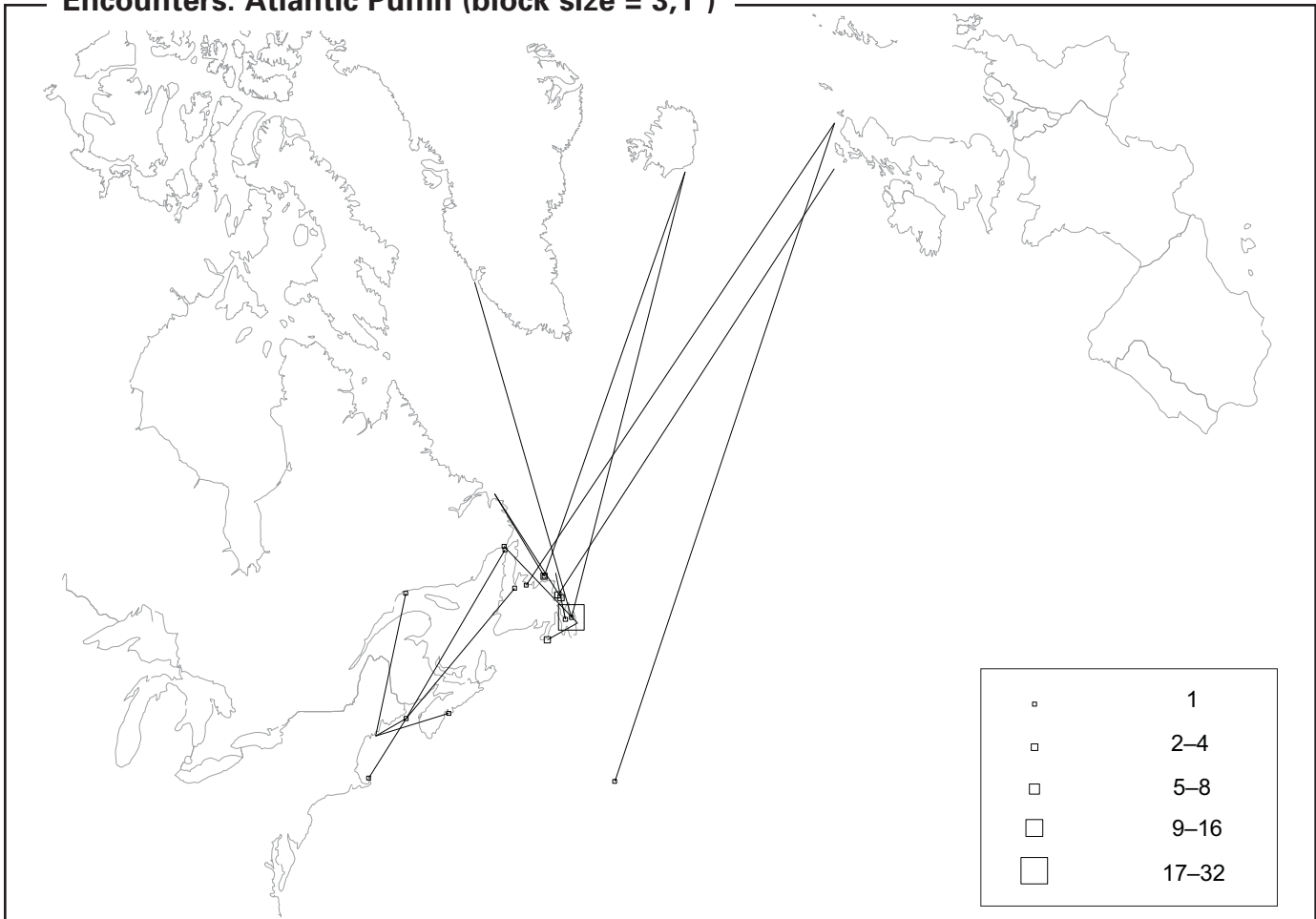
The number of birds encountered during banding operations was the sum of birds with “how obtained” codes of 89 or 99 (see Appendix 3).

4.6 Banding effort map

The banding effort map shows the numbers of individuals for each species that were banded in Canada from 1955 to 1995 in each location (compiled by 10' block, with blocks combined if too close to be shown separately on the map). This map helps the reader interpret the distribution of encounters, because it shows where banding effort has been concentrated. Under each map is a list of up to five of the master Canadian permit holders responsible for the most bandings of the species in Canada from 1955 to 1995 (listed in descending order). One to many individuals may band under a single master permit, so this listing does not necessarily identify the most prolific individual banders.

Atlantic Puffin (*Fratercula arctica*) 013.0

Encounters: Atlantic Puffin (block size = 3,1°)



Found throughout the temperate and arctic waters of the Atlantic and adjacent seas, from as far east as Novaya Zemlya, Russia, to the eastern Canadian High Arctic and south to New Brunswick and Maine, the Atlantic Puffin is an abundant species that feeds in inshore waters while breeding, but is otherwise scattered well offshore over and beyond the continental shelf (Gaston and Jones 1998). Winter distribution is poorly known (Harris 1984); the scarcity of band recoveries in winter suggests that puffins remain farther out in the North Atlantic (where banded birds are unlikely to be recovered) than murres and Razorbills, for which higher proportions of encounters are in winter.

Banding in Canada has been carried out mainly on Newfoundland, with smaller numbers banded in Labrador and New Brunswick. Some banding has also been carried out in Maine. The species has been extensively banded in Europe, with >100 000 banded in Britain alone.

Encounters of Canadian-banded birds have come almost exclusively from Canada and the northeastern United States, with the longest movement within North America (950 km, straight line) being of a bird banded as a nestling at Machias Seal Island, New Brunswick, and encountered in its second winter off White Bay, Newfoundland and Labrador (record 1). A bird banded in Maine and encountered near Moisie, Quebec, on the

North Shore of the Gulf of St. Lawrence (record 2), had travelled 749 km. Neither of these birds was of breeding age when encountered. There was one encounter from Greenland (record 3). An encounter involving a third-year bird banded in New Brunswick and reported from Massachusetts was the farthest south (record 4). Most other encounters involved birds banded and encountered on Newfoundland, many at the same locality where they were banded. Encounters were concentrated in summer, when adults are close to the breeding colonies, and many birds were taken incidentally in fishing nets; this cause of mortality accounts for two-thirds of all encounters, other than those of birds retrapped or resighted at the colony itself.

There have been many encounters of European-banded puffins in Newfoundland and Labrador, mainly originating from Iceland (22, all but 2 in their first winter: records 5 and 6). Newfoundland and Labrador recoveries of Icelandic-banded birds are very concentrated, both geographically and seasonally. All were banded as nestlings between 10 August and 2 September. Almost all were encountered in the first winter, from early October to early February, with one

in March. Most encounters came from the same area of northeastern Newfoundland between Notre Dame Bay and Bonavista Bay, and one encounter occurred near St. John's and another near St. Anthony. Movement of juvenile puffins from Iceland to Newfoundland and Labrador appears to be very rapid, with many encounters within 2 months of banding as nestlings (e.g., record 5).

Despite the very large numbers banded in Britain, there have been only four encounters in Canada: two banded at Sule Skerry, Orkney (records 7 and 8), and two from St. Kilda, in the Outer Hebrides (record 9). It may be significant that these two colonies are in the extreme northwest of Britain. None of the many birds banded in eastern Scotland and northeastern England has been encountered in Canada.

For a bird that is known to live a very long time, the age record of 17 years and 10 months (record 10) is not spectacular, but encounters of breeding-age birds are mainly dependent on trapping adults at breeding colonies, and such activities have been very intermittent in Canada.

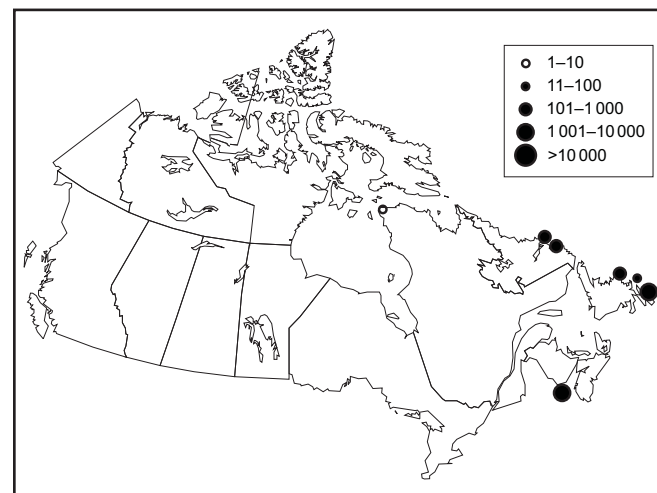
Encounter records: Atlantic Puffin

1	0815-16316	L	U	30/07/78	Machias Seal Island, NB	44°30'N 67°00'W	1 yr. 4 mo.
	ADS	05	23	99/11/79	White Bay, NL	49°30'N 56°50'W	950 km N51°E
2	0785-10205	L	U	04/08/81	Maine	43°50'N 69°20'W	2 yr. 1 mo
	SWK	05	00	??/09/83	near Moisie, Quebec	50°10'N 66°00'W	749 km N19°E
3	0005-73696	U	U	15/07/54	Greenland	64°10'N 52°00'W	5 mo.
	Denmark	00	97	03/12/54	Labrador, NL	47°30'N 53°00'W	1 856 km S2°W
4	0725-67140	L	U	26/08/72	Machias Seal Island, NB	44°30'N 67°00'W	2 yr. 2 mo.
	BC	05	00	21/10/74	Corn Hill Beach, MA	42°00'N 70°00'W	370 km S42°W
5	0004-55047	U	U	02/09/79	Vestmannaeyjar, Iceland	63°20'N 20°10'W	1 mo.
	Iceland	00	97	15/10/79	Labrador, NL	49°40'N 55°00'W	2 574 km S70°W
6	0004-77115	U	U	15/08/88	Vestmannaeyjar, Iceland	63°20'N 20°10'W	3 yr. 6 mo.
	Iceland	00	97	04/02/92	Labrador, NL	47°30'N 53°00'W	2 670 km S64°W
7	0000-32136	U	U	28/07/79	Sule Skerry, Scotland	59°00'N 04°20'W	5 mo.
	UK	00	97	04/12/79	at sea, south of Newfoundland	40°00'N 53°30'W	4 008 km S80°W
8	EB-57158	U	U	17/07/75	Sule Skerry, Scotland	59°00'N 04°20'W	6 mo.
	UK	00	97	01/01/76	Labrador, NL	49°30'N 55°50'W	3 415 km N85°W
9	R-W3439	U	U	04/08/39	St. Kilda, Scotland	57°40'N 08°30'W	4 mo.
	UK	00	97	21/12/39	at sea, Bonavista Bay, NL	48°40'N 53°50'W	3 119 km N89°W
10	0705-50905	AHY	U	11/08/68	Labrador, NL	47°10'N 52°40'W	17 yr. 10 mo.
	DNN	03	00	08/06/86	Labrador, NL	47°10'N 52°40'W	0 km

Summary of banding statistics: Atlantic Puffin

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			7505
<i>No. encountered per 1 000 banded (1955–1995)</i>			9
Total no. encountered (1921–1995)	21	63	111
No. encountered from foreign bandings	29	0	29
Maximum period from banding to encounter (mo.)	118	214	214
No. of Canadian-banded birds moving >0 km	13	47	60
Mean movement >0 km of Canadian-banded birds (km)	343	70	129
Maximum movement from all encounters (km)	1 072	768	4 008
% recovered (encountered dead)	95	79	87
% direct recoveries	14	4	26
% encountered during banding operations	0	17	9

Banding effort: Atlantic Puffin



Top banders: DNN, MUN, CWSAR, WT, BC

Rhinoceros Auklet (*Cerorhinca monocerata*) 015.0

Encounters: Rhinoceros Auklet



Rhinoceros Auklets breed on small offshore islands along the coast of the North Pacific Ocean from California to Alaska in North America and in Eurasia, from Kamchatka, Russia, to Japan (Gaston and Dechesne 1998). The North American population appears to be expanding. The colony on Triangle Island, British Columbia, may have been established in the 1950s. Other new colonies have been established on Mandarte Island near Sidney, B.C., and on Mittlenatch Island near Campbell River, B.C. (Campbell et al. 1990b). In North America, the

Rhinoceros Auklet winters from southern British Columbia to California. It is abundant in winter off California, especially the Monterey Peninsula (Briggs et al. 1987; Gaston and Dechesne 1998).

All of the Canadian banding has been carried out at breeding colonies along the coast of British Columbia. These colonies hold about 80% of the estimated North American population and about 57% of the world population of this species (Rodway 1991). Between 1983 and 1986, hundreds of nestlings and breeding adult Rhinoceros Auklets were banded with

stainless steel bands on Pine, Lucy, and Triangle islands (Bertram and Kaiser 1993). The first recorded encounter comes from those banding sessions (record 1, Kaiser et al. 1984).

All but one of the eight encounters were of birds banded as nestlings. The encounters indicate a fairly rapid movement into southern waters at the end of the breeding season, with nestlings banded in July being encountered in August of the same year in Washington (record 2) and Oregon (record 3) and by October in California (record 4). A bird banded at Lucy Islands, B.C., travelled to 35°N, the most distant movement so far (record 1). The single encounter in Alaska

(record 5) suggests that there is some irregularity in these movements. Most encounters were obtained from beached bird surveys.

Subsequent to the period considered in this volume, one bird banded as a nestling was encountered after 10 years and 11 months (G.W. Kaiser, unpubl. data). No other bands are known to have survived so long. However, on Triangle Island in 1986, four adults were captured with the eroded remains of aluminum bands on their legs. These had been placed on birds nesting in the same part of the colony during one of the breeding seasons between 1974 and 1978. Unfortunately, there was not sufficient material remaining in the bands to recover the numbers.

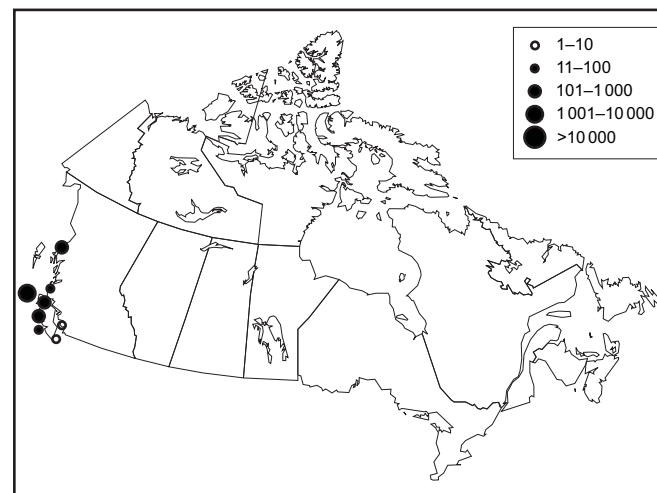
Encounter records: Rhinoceros Auklet

1	0785-50206	L	U	13/07/83	Lucy Islands, BC	54°10'N 130°20'W	5 mo.
	GK	03	00	08/12/83	near Lost Hills, CA	35°30'N 121°00'W	2 200 km S23°E
2	0785-57512	L	U	06/07/84	Pine Island, BC	50°50'N 127°40'W	1 mo.
	GK	03	00	14/08/84	Ilwaco, WA	46°20'N 124°00'W	569 km S30°E
3	0785-54029	L	U	17/07/89	Pine Island, BC	50°50'N 127°40'W	1 mo.
	GK	05	00	28/08/89	Yachats, OR	44°30'N 124°00'W	756 km S23°E
4	0785-57719	L	U	07/07/84	Triangle Island, BC	50°50'N 129°00'W	3 mo.
	GK	03	00	24/10/84	Atascadero, CA	35°30'N 120°50'W	1 828 km S24°E
5	0785-61060	L	U	31/07/87	Lucy Islands, BC	54°10'N 130°30'W	2 mo.
	GK	05	26	15/09/87	near Elfin Cove, AK	58°00'N 136°30'W	566 km N39°W

Summary of banding statistics: Rhinoceros Auklet

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			2 991
<i>No. encountered per 1 000 banded (1955–1995)</i>			2
Total no. encountered (1921–1995)	7	1	8
No. encountered from foreign bandings	0	0	0
Maximum period from banding to encounter (mo.)	41	84	84
No. of Canadian-banded birds moving >0 km	7	1	8
Mean movement >0 km of Canadian-banded birds (km)	1 066	37	938
Maximum movement from all encounters (km)	2 200	37	2 200
% recovered (encountered dead)	100	100	100
% direct recoveries	85	0	75
% encountered during banding operations	0	0	0

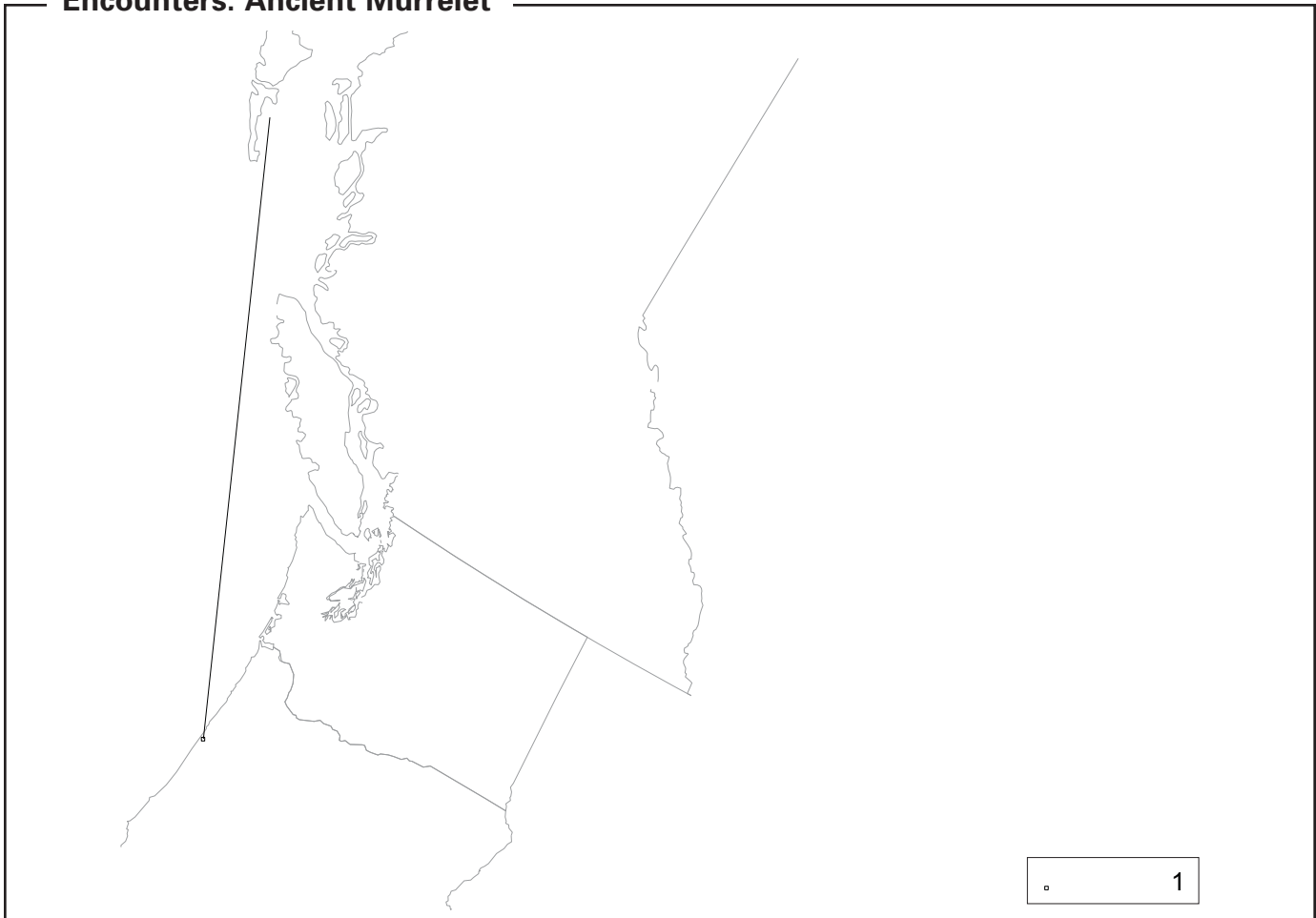
Banding effort: Rhinoceros Auklet



Top banders: CWSPYR, FC, SFU, RWC, UBC

Ancient Murrelet (*Synthliboramphus antiquus*) 021.0

Encounters: Ancient Murrelet



In Canada, Ancient Murrelets breed only in Haida Gwaii (the Queen Charlotte Islands), British Columbia (Campbell et al. 1990b). Banding has been conducted almost exclusively at two breeding colonies on the east side of the archipelago: Reef Island and East Limestone Island. All encounters but one were at one of these colonies, the exception (record 1) being a bird banded as a non-breeding adult prospector at Reef Island and found the following

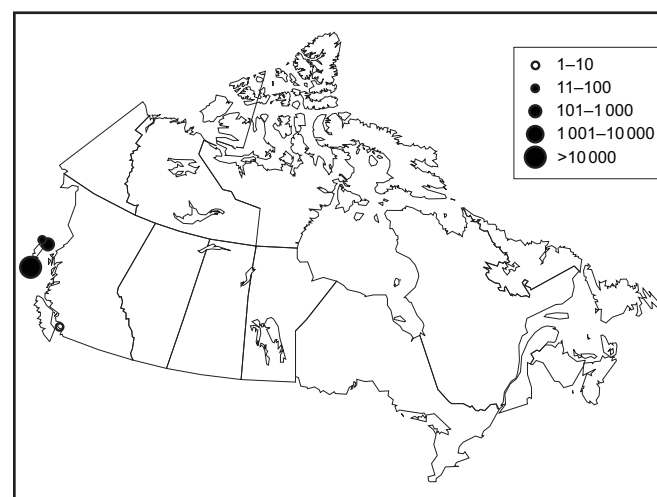
winter washed up dead on a beach near Waldport, Oregon. The rate of encounters ($<0.01\%$) is the lowest rate for any seabird species banded in Canada. In the eastern Pacific, Ancient Murrelets winter from Alaska to central California (Gaston 1992). They are found regularly on beached bird surveys in California and Oregon. The paucity of encounters of Canadian-banded birds suggests that not many Canadian birds winter south of British Columbia.

Encounter records: Ancient Murrelet

1	1103-56233	ASY	U	24/05/87	Reef Island, BC	52°50'N 131°30'W	8 mo.
	AJG	05	23	31/01/88	near Waldport, OR	44°30'N 124°00'W	1078 km S34°E

**Summary of banding statistics:
Ancient Murrelet**

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			12 877
<i>No. encountered per 1 000 banded (1955–1995)</i>			<0.1
Total no. encountered (1921–1995)	2	13	15
No. encountered from foreign bandings	0	0	0
Maximum period from banding to encounter (mo.)	24	26	26
No. of Canadian-banded birds moving >0 km	1	1	2
Mean movement >0 km of Canadian-banded birds (km)	37	1078	557
Maximum movement from all encounters (km)	37	1078	1078
% recovered (encountered dead)	100	92	93
% direct recoveries	50	38	40
% encountered during banding operations	0	7	6

Banding effort: Ancient Murrelet

Top banders: AJG, CWSPYR

Marbled Murrelet (*Brachyramphus marmoratus*) 023.0

The Marbled Murrelet is a resident of inshore waters from California to Alaska. It occurs throughout coastal British Columbia, feeding in bays and inlets and nesting on the branches of old-growth trees, deep in the interior of the coastal forests (Ralph et al. 1995). Because of the rapid destruction of its breeding habitat by logging, the Canadian population has been classified as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Banding in Canada was carried out only in the 1990s, following the introduction of floating mist net arrays for trapping adult birds (Burns et al. 1995). All of the encounters reported so far (records 1 and 2) have been of birds recaptured in Desolation Sound, B.C., the area in which they were banded, which is why there is no encounter map.

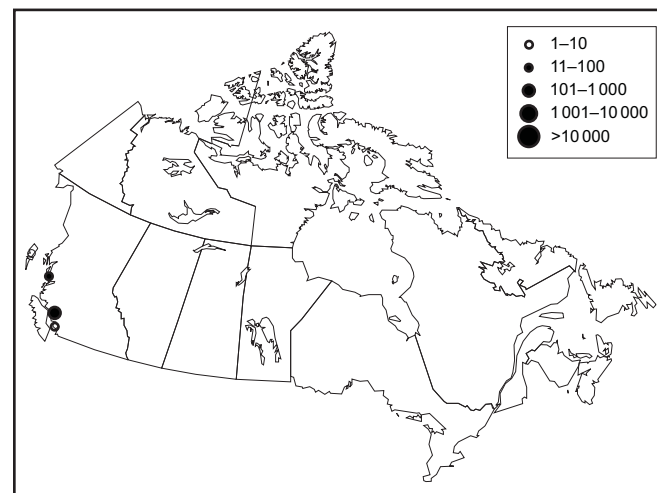
Encounter records: Marbled Murrelet

1	1313-50440	ASY	U	02/07/91	Desolation Sound, BC	50°00'N 124°40'W	4 yr. 0 mo.
	SFU	07	53	15/07/95	Desolation Sound, BC	50°00'N 124°40'W	0 km
2	1313-73052	AHY	U	19/07/94	Desolation Sound, BC	50°00'N 124°40'W	11 mo.
	SFU	07	53	14/06/95	Desolation Sound, BC	50°00'N 124°40'W	0 km

Summary of banding statistics: Marbled Murrelet

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			249
<i>No. encountered per 1000 banded (1955–1995)</i>			28
Total no. encountered (1921–1995)	0	7	7
No. encountered from foreign bandings	0	0	0
Maximum period from banding to encounter (mo.)	–	48	48
No. of Canadian-banded birds moving >0 km	0	0	0
Mean movement >0 km of Canadian-banded birds (km)	–	–	–
Maximum movement from all encounters (km)	–	0	0
% recovered (encountered dead)	–	0	0
% direct recoveries	–	0	0
% encountered during banding operations	–	0	0

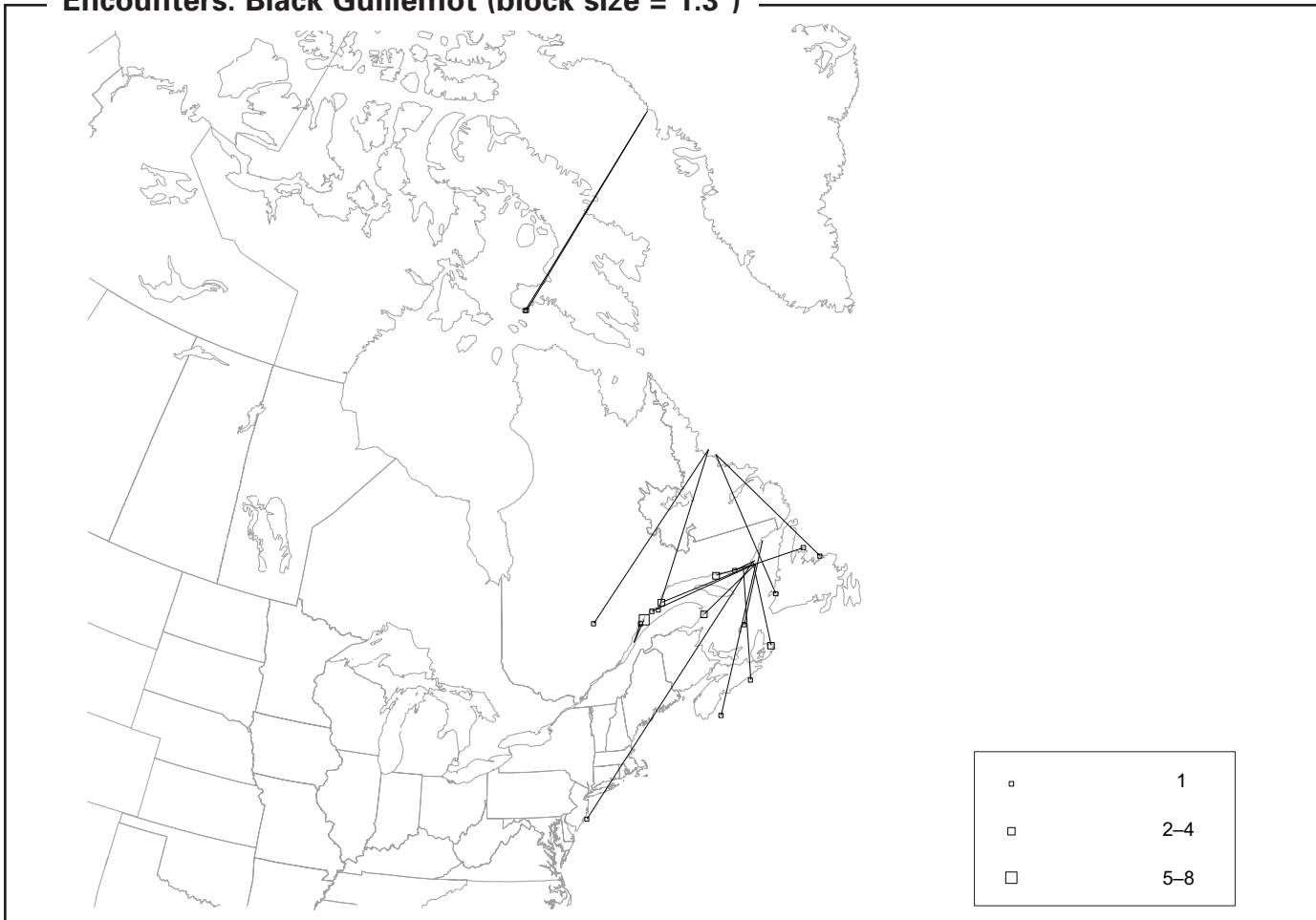
Banding effort: Marbled Murrelet



Top banders: CWSPYR

Black Guillemot (*Cepphus grylle*) 027.0

Encounters: Black Guillemot (block size = 1.3°)



The breeding range of the Black Guillemot is almost circumpolar and includes the Canadian Arctic and Atlantic coasts. The species occurs as far west as the Beaufort Sea, but in the northern Pacific it is replaced by the Pigeon Guillemot. Some Black Guillemots winter in open-water “polynyas” in the Arctic (Renaud and Bradstreet 1980; Gaston and McLaren 1990); banding of West Greenland birds shows that mainly first-year birds winter far north (Salomonsen 1967a), but whether this is true of Canadian birds is not known.

Most Canadian banding has been carried out at breeding colonies in New Brunswick, on the North Shore of the Gulf of St. Lawrence and on islands bordering Hudson Strait. Most encounters (42%) were of birds recaptured at the breeding colony where they were banded; a further 20% were shot. Only 29 Canadian-banded birds were more than 100 km from the place of banding, and only one encounter was reported from the United States, a second-year bird reported from New Jersey in May (record 1). This is well to the south of the usual wintering range;

the Black Guillemot is only “casual” in New Jersey (Peterson 1980). The most distant encounters are listed; all are from banding in Labrador or on the North Shore of the Gulf of St. Lawrence (records 2–5). Lack of encounters from the well-populated New England states suggests that the population in New Brunswick is very sedentary.

The encounters from Cape Dorset in March and May of birds banded as chicks in Greenland (records 6 and 7) suggest the possibility of interchange between

Canadian and Greenland colonies, especially as one of these birds was in its third year.

The recovery of a bird banded in Labrador in August and shot inland in Quebec the following November (record 8) is notable, but the encounter locality is questionable. A bird banded as an adult on Kent Island, New Brunswick (record 9), and recaptured at the same locality 11 years later holds the North American longevity record for this species (Clapp et al. 1982).

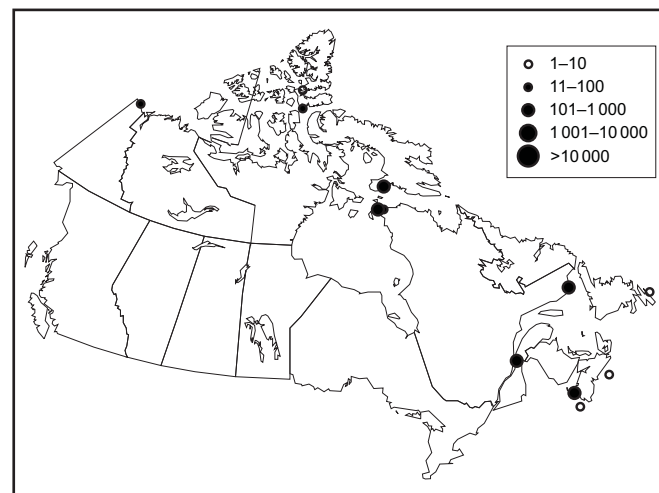
Encounter records: Black Guillemot

1	0002-93354	U	U	28/07/27	Yankee Harbour, QC	50°20'N 59°40'W	1 yr. 10 mo.
	HFL	00	00	15/05/29	Beach Haven, NJ	39°30'N 74°10'W	1 655 km S49°W
2	0005-60106	L	U	11/08/28	near Hopedale, NL	55°50'N 60°20'W	11 mo.
	OLA	00	01	99/07/29	Port au Port, NL	48°30'N 58°40'W	824 km S9°E
3	0005-60261	U	U	09/08/28	near Hopedale, NL	55°50'N 60°20'W	3 mo.
	OLA	00	01	15/11/28	Godbout, QC	49°10'N 67°30'W	896 km S43°W
4	0036-19202	U	U	01/08/34	Îles Sainte-Marie, QC	50°10'N 59°30'W	3 mo.
	RAJ	00	01	04/11/34	Baie Comeau, QC	49°10'N 68°00'W	620 km S83°W
5	0344-03553	U	U	25/07/34	Îles Sainte-Marie, QC	50°10'N 59°30'W	4 yr. 4 mo.
	HFL	00	01	25/11/38	near Bridgewater, NS	43°30'N 64°30'W	831 km S36°W
6	555441	HY	U	12/08/55	Augpilagtoq, Upernavik, Greenland	73°00'N 55°30'W	8 mo.
	Denmark	03	01	15/05/56	Cape Dorset, Baffin Island, NU	64°10'N 76°30'W	1 121 km S46°W
7	556226	HY	U	21/08/57	Tugssak, Upernavik, Greenland	72°50'N 56°10'W	2 yr. 6 mo.
	Denmark	05	01	10/03/60	Cape Dorset, Baffin Island, NU	64°10'N 76°40'W	1 264 km S51°W
8	0005-60258	U	U	09/08/28	near Tunungayualuk Island, NL	56°10'N 60°50'W	3 mo.
	OLA	00	01	12/11/28	Girardville, QC	49°00'N 72°30'W	1 116 km S56°W
9	0524-78845	AHY	U	17/06/60	Kent Island, NB	44°30'N 66°40'W	11 yr. 1 mo.
	CEH	11	01	05/07/71	Kent Island, NB	44°30'N 66°40'W	0 km

Summary of banding statistics: Black Guillemot

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			2 434
<i>No. encountered per 1 000 banded (1955–1995)</i>			22
Total no. encountered (1921–1995)	38	63	114
No. encountered from foreign bandings	0	0	2
Maximum period from banding to encounter (mo.)	99	133	133
No. of Canadian-banded birds moving >0 km	31	5	40
Mean movement >0 km of Canadian-banded birds (km)	376	66	361
Maximum movement from all encounters (km)	1 655	164	1 655
% recovered (encountered dead)	86	9	40
% direct recoveries	55	1	23
% encountered during banding operations	10	65	42

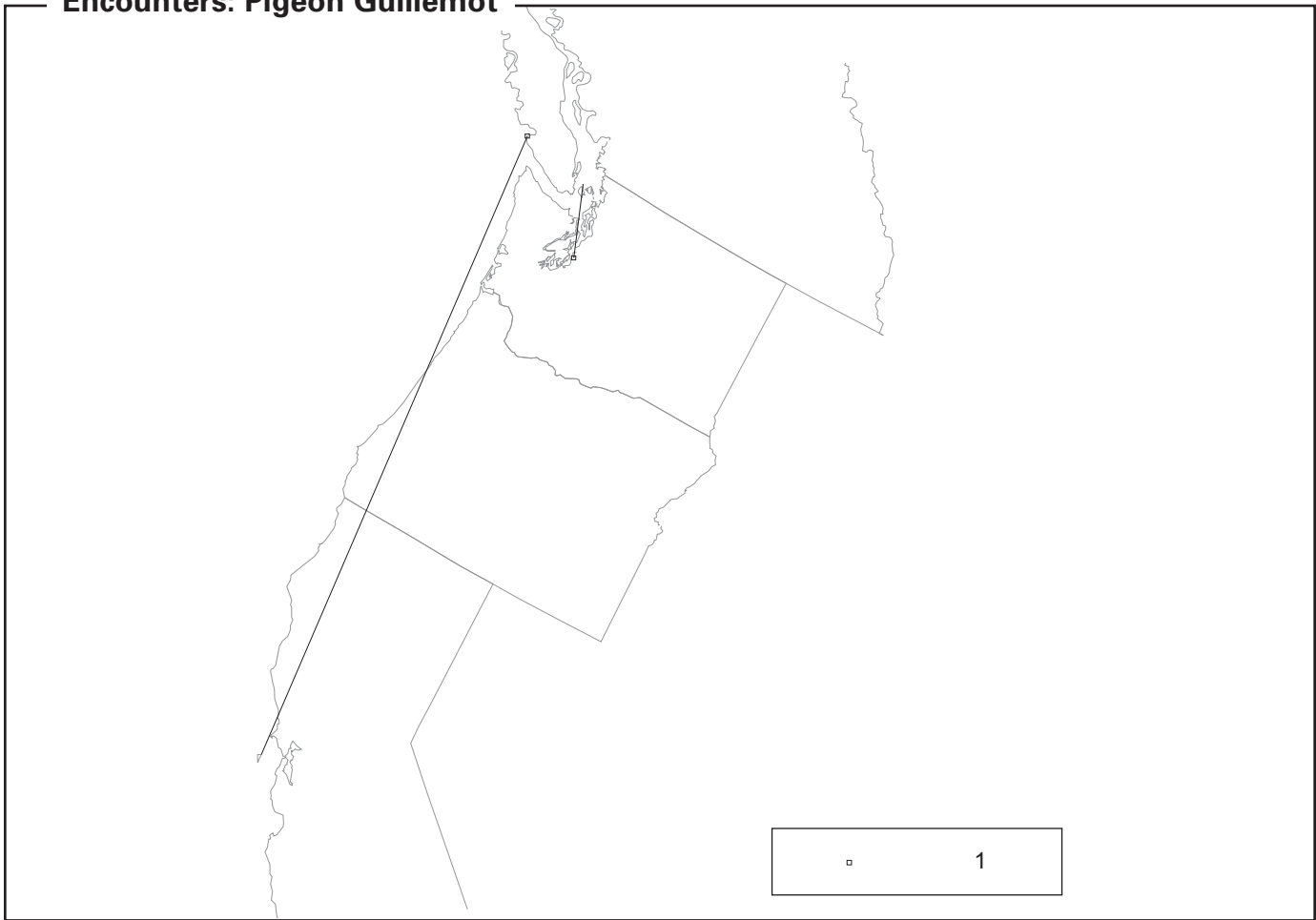
Banding effort: Black Guillemot



Top banders: AJG, BC, JB, FGC, YTG

Pigeon Guillemot (*Cepphus columba*) 029.0

Encounters: Pigeon Guillemot



The Pigeon Guillemot breeds and winters on the coast of British Columbia. Its distribution in North America extends from central California to the Bering Sea (Ewins 1993). Most Canadian banding has been carried out during the breeding season in the Gulf Islands, with smaller numbers banded as far north as Triangle Island.

Canadian-banded birds showed very little movement, the farthest encounters (records 1 and 2)

being 144 km and 83 km from the banding site on Imrie Island, British Columbia. However, the recovery of an adult banded at the Farallon Islands, California, and encountered 3 years later 1 255 km away at Cree Point, British Columbia, in the breeding season (record 3) suggests that some long-distance dispersal occurs within the species. The oldest Canadian bird reported so far was banded as a local at Imrie Island and encountered at Blanchard, Washington, at nearly 6 years of age (record 4).

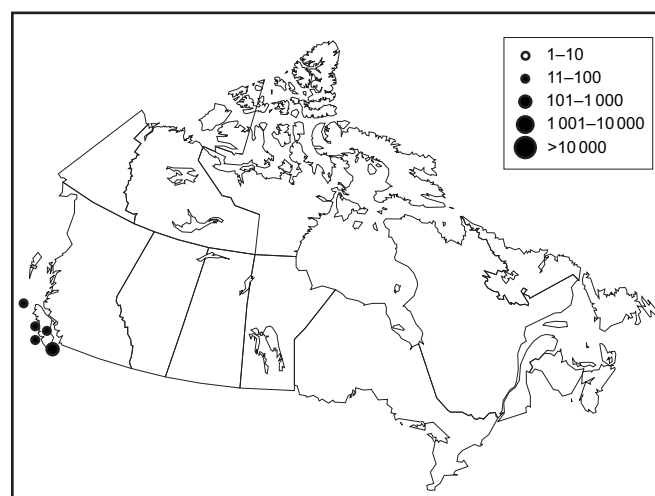
Encounter records: Pigeon Guillemot

1	0576-12960 GFV	L 00	U 00	01/08/57 08/06/58	Imrie Island, BC Alki Point, WA	48°40'N 123°10'W 47°30'N 122°20'W	10 mo. 144 km S26°E
2	0576-12954 GFV	L 00	U 00	29/07/57 04/07/58	Imrie Island, BC Nr. Bellingham, WA	48°40'N 123°10'W 48°00'N 122°40'W	1 yr. 0 mo. 83 km S27°E
3	0574-22693 PRBO	AHY 05	U 16	14/07/70 27/07/73	Farallon Islands, CA Cree Point, BC	37°40'N 123°00'W 48°50'N 125°10'W	3 yr. 0 mo. 1 255 km N7°W
4	0555-33805 GFV	L 05	U 11	07/08/59 22/07/65	Imrie Island, BC Blanchard, WA	48°40'N 123°10'W 48°30'N 122°20'W	5 yr. 11 mo. 64 km S73°E

Summary of banding statistics:
Pigeon Guillemot

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			554
<i>No. encountered per 1 000 banded (1955–1995)</i>			61
Total no. encountered (1921–1995)	11	24	35
No. encountered from foreign bandings	0	1	1
Maximum period from banding to encounter (mo.)	71	61	71
No. of Canadian-banded birds moving >0 km	10	2	12
Mean movement >0 km of Canadian-banded birds (km)	63	18	55
Maximum movement from all encounters (km)	144	1 255	1 255
% recovered (encountered dead)	81	16	37
% direct recoveries	27	0	8
% encountered during banding operations	0	54	37

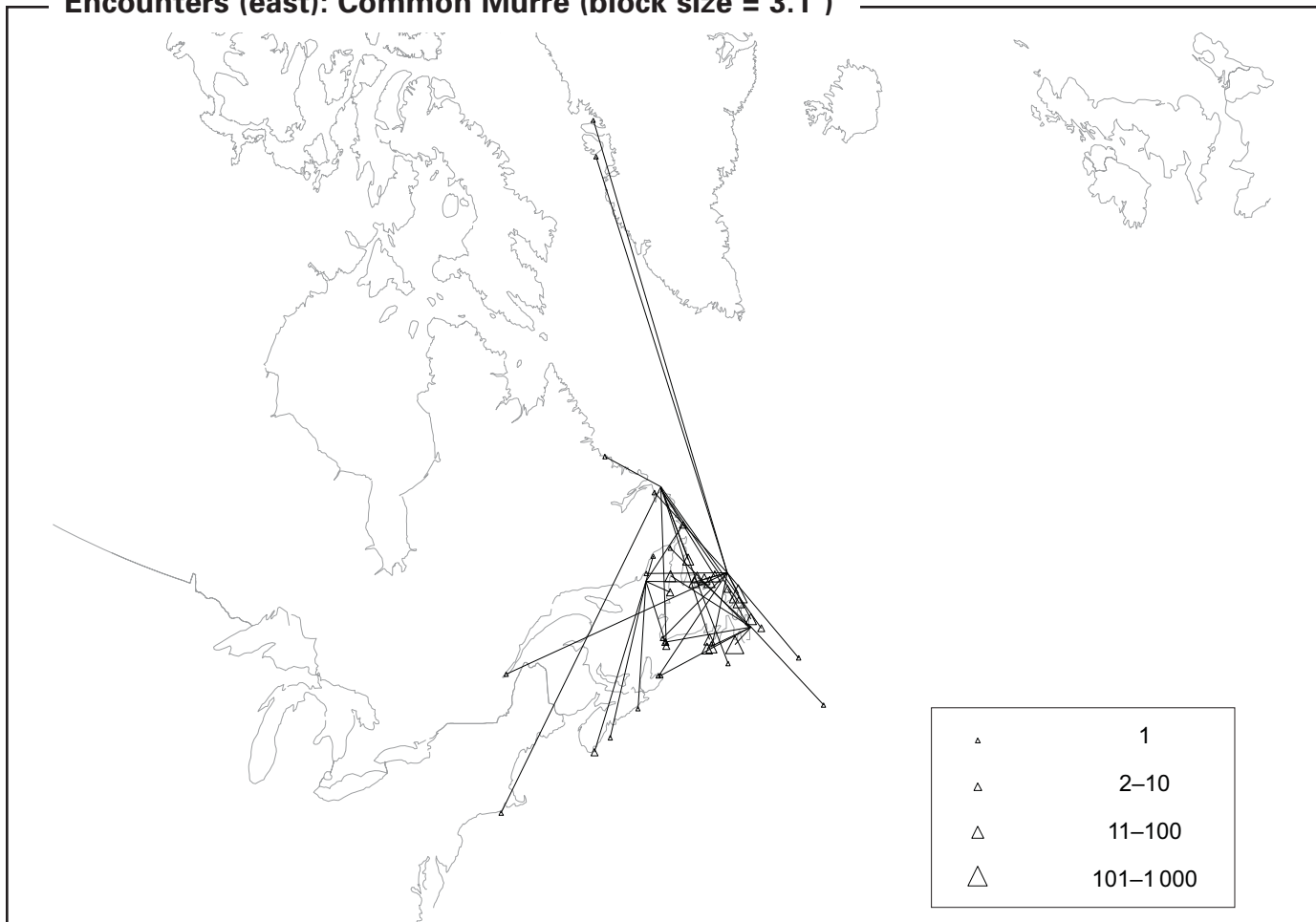
Banding effort: Pigeon Guillemot



Top banders: GFV, RHD, VM, FC, RWC

Common Murre (*Uria aalge*) 030.0

Encounters (east): Common Murre (block size = 3.1°)

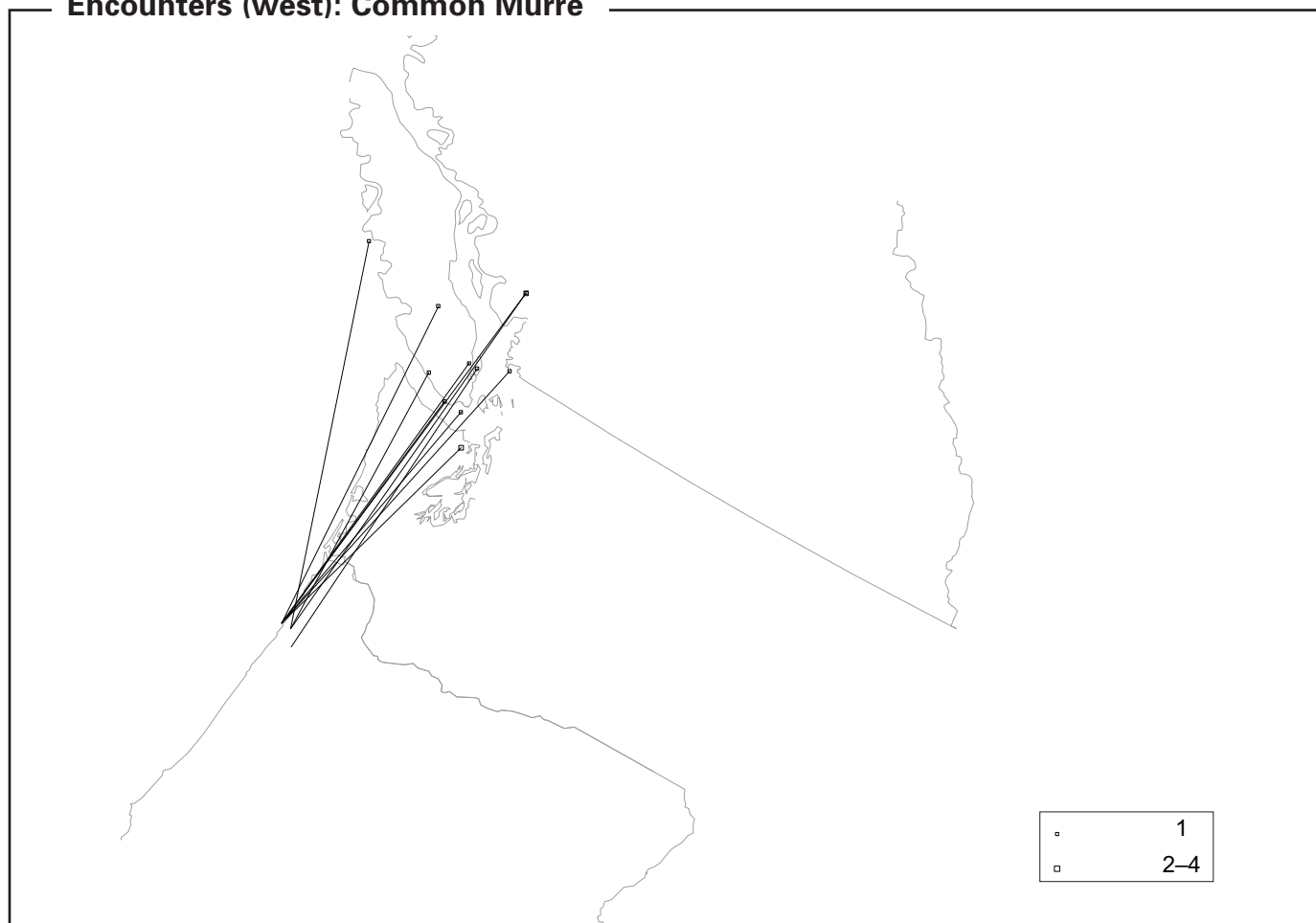


The Common Murre is an abundant breeding seabird throughout temperate waters of the northern hemisphere. In Canada, it breeds on the Atlantic coast from the Bay of Fundy to central Labrador. The largest colonies are in eastern Newfoundland, where a few sites hold nearly 90% of the population of eastern North America (Nettleship 1980): Funk Island alone supports more than 300 000 breeding pairs (Brown et al. 1975). Much smaller numbers breed along the coast of British Columbia, where the largest colony, on Triangle Island, supports fewer than 10 000 breeders (Campbell et al. 1990b).

Banding effort has been concentrated in two places: in Quebec, on the North Shore of the Gulf of St. Lawrence from the 1920s to the 1940s (therefore

not shown on the effort maps; records 1-3), when most birds were banded as adults and 83% of encounters were returns to the same breeding colony (Johnson 1940, 1941, 1944); and at colonies in Newfoundland and Labrador from the 1950s to 1960s (Tuck 1961, records 4, 5 and 7-12) and again from 1981 onwards, involving mainly chicks (Birkhead 1991). Most birds banded as adults appear to be faithful to their breeding sites, and summer encounters (May-August) of birds banded as chicks were also clustered within 100 km of the natal colonies (47%), demonstrating substantial philopatry. First- and second-summer birds tended to be farther away than older birds, but the difference was not great. One bird reared on Newfoundland was encountered in its second summer near Sarqaq, Greenland, in June (record 11). A 6-year-old bird from Newfoundland was encountered near Disko Island,

Encounters (west): Common Murre



Greenland, in September (record 8), but this bird may have moved there after breeding elsewhere.

Many young birds from Funk Island, Newfoundland, dispersed northwards after the breeding season, with more than two-thirds of encounters in October being from the northern peninsula of Newfoundland and southeast Labrador. However, by January, practically all encounters were to the south of the breeding site, along the south coast of Newfoundland and as far south as Nova Scotia (record 6), New York (record 9), and Rhode Island (record 5). The paucity of encounters in Nova Scotia, where Common Murres are abundant in winter and where people often walk the beaches, is puzzling. Only one bird made a significant westward movement, being encountered in the estuary of the St. Lawrence River (record 7).

Apart from recaptures at the colony, most birds (69%) were shot, mainly between October and February in the “turr” hunt off Newfoundland (Gaston et al. 1983; Elliot et al. 1991). A further 15% were caught in fishing nets in summer around the breeding colonies. Sixty-seven percent of shot birds were in their first year, but only 33% of netted birds, reflecting the tendency of Common Murres not to return to the colony until their second or third year (Johnson 1941; Tuck 1961).

There were 13 encounters of Common Murres in British Columbia; all were of birds banded in northern Oregon in July during the 1930s (records 13 and 14). Six encounters, all of hatching-year birds, were in the fall and winter of the same year in southwestern British Columbia. The other seven were also

encountered in southwestern British Columbia in the winter, up to 3.5 years later. All were encountered in the Straits of Georgia and Juan de Fuca, except for one bird encountered on the west coast of Vancouver Island (record 14). This distribution certainly reflects the distribution of potential finders. The distances moved were between 300 and 500 km. The lack of encounters of Common Murres from California, where many have been banded (W. Sydeman, pers. commun.), suggests that birds from that area rarely move to waters off British Columbia.

The longevity record for this species is at least 26 years and 5 months (Clapp et al. 1982), held by a Canadian bird encountered in 1976 (record 4; note that the age shown here is the time from banding to encounter). The bird was probably a breeder when banded, suggesting that it may have been more than 30 years old when encountered, as most Common Murres begin to breed only when more than 4 years old (Hudson 1985). The longer elapsed time shown by the bird in record 3 unfortunately has incomplete encounter details and so cannot be verified. Five birds were more than 20 years old when encountered.

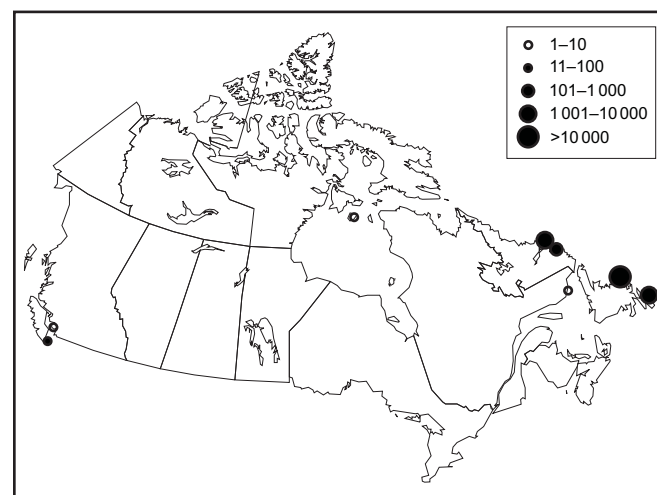
Encounter records: Common Murre

1	0003-34184 HFL	AHY 03	U 00	27/07/25 15/04/27	near Îles Sainte-Marie, QC near Cape Sable, NS	50°10'N 59°30'W 43°40'N 66°00'W	1 yr. 9 mo. 876 km S37°W
2	0355-26129 HFL	J 00	U 01	27/07/35 30/10/37	near Îles Sainte-Marie, QC near Bonavista, NL	50°10'N 59°30'W 49°00'N 53°50'W	2 yr. 3 mo. 429 km S75°E
3	0386-55511 HFL	AHY 01	U 01	30/06/38 99/08/70	near Îles Sainte-Marie, QC unknown location	50°10'N 59°30'W	32 yr. 2 mo.
4	0476-10882 LMT	AHY 05	U 01	11/07/51 15/11/76	Funk Island, NL Cape Fogo, NL	49°40'N 53°10'W 49°40'N 54°00'W	25 yr. 4 mo. 60 km N90°W
5	0476-11771 LMT	L 00	U 00	13/08/52 24/04/54	Outer Gannet Island, NL Card Ponds, RI	54°00'N 56°30'W 41°20'N 71°30'W	1 yr. 8 mo. 1 796 km S49°W
6	0003-34184 HFL	AHY 01	U 09	01/07/53 15/04/55	near Îles Sainte-Marie, QC near Cape Sable, NS	50°10'N 66°00'W 43°40'N 59°30'W	1 yr. 9 mo. 876 km S37°W
7	0566-74435 LMT	L 05	U 01	08/07/56 99/05/69	Funk Island, NL Saint François, QC	49°40'N 53°10'W 47°00'N 70°50'W	12 yr. 10 mo. 1 337 km S84°W
8	0586-15007 LMT	L 00	U 01	10/07/56 30/09/62	Funk Island, NL Disko Island, Greenland	49°40'N 53°10'W 69°10'N 53°30'W	6 yr. 2 mo. 2 171 km N
9	0586-19583 LMT	L 00	U 89	12/07/56 31/01/59	Funk Island, NL near Geneva, NY	49°40'N 53°10'W 42°40'N 76°50'W	2 yr. 6 mo. 1 973 km S76°W
10	0586-16364 LMT	L 00	U 01	12/07/56 99/05/57	Funk Island, NL at sea, Atlantic Ocean	49°40'N 53°10'W 45°20'N 50°10'W	10 mo. 532 km S26°E
11	0586-19405 LMT	L 00	U 01	12/07/56 12/06/58	Funk Island, NL near Sarqaq, Greenland	49°40'N 53°10'W 70°50'N 52°10'W	1 yr. 11 mo. 2 356 km N1°E
12	0586-24033 LMT	HY 02	U 98	18/07/66 26/01/67	Witless Bay, NL at sea, Atlantic Ocean	47°10'N 52°40'W 43°10'N 49°40'W	6 mo. 504 km S29°E
13	0396-49691 RWF	J 00	U 36	14/07/39 07/09/39	near Tillamook, OR near River Jordan, BC	45°20'N 123°50'W 48°30'N 124°10'W	2 mo. 353 km N4°W
14	0396-49826 RWF	J 00	U 01	14/07/39 16/12/39	near Tillamook, OR near Mate Islands, BC	45°20'N 123°50'W 49°20'N 126°20'W	5 mo. 484 km N22°W

Summary of banding statistics: Common Murre

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			25 982
<i>No. encountered per 1 000 banded (1955–1995)</i>			24
Total no. encountered (1921–1995)	822	288	1 137
No. encountered from foreign bandings	10	0	13
Maximum period from banding to encounter (mo.)	244	304	304
No. of Canadian-banded birds moving >0 km	768	41	817
Mean movement >0 km of Canadian-banded birds (km)	293	276	293
Maximum movement from all encounters (km)	2 356	875	2 356
% recovered (encountered dead)	99	18	77
% direct recoveries	50	4	38
% encountered during banding operations	0	81	22

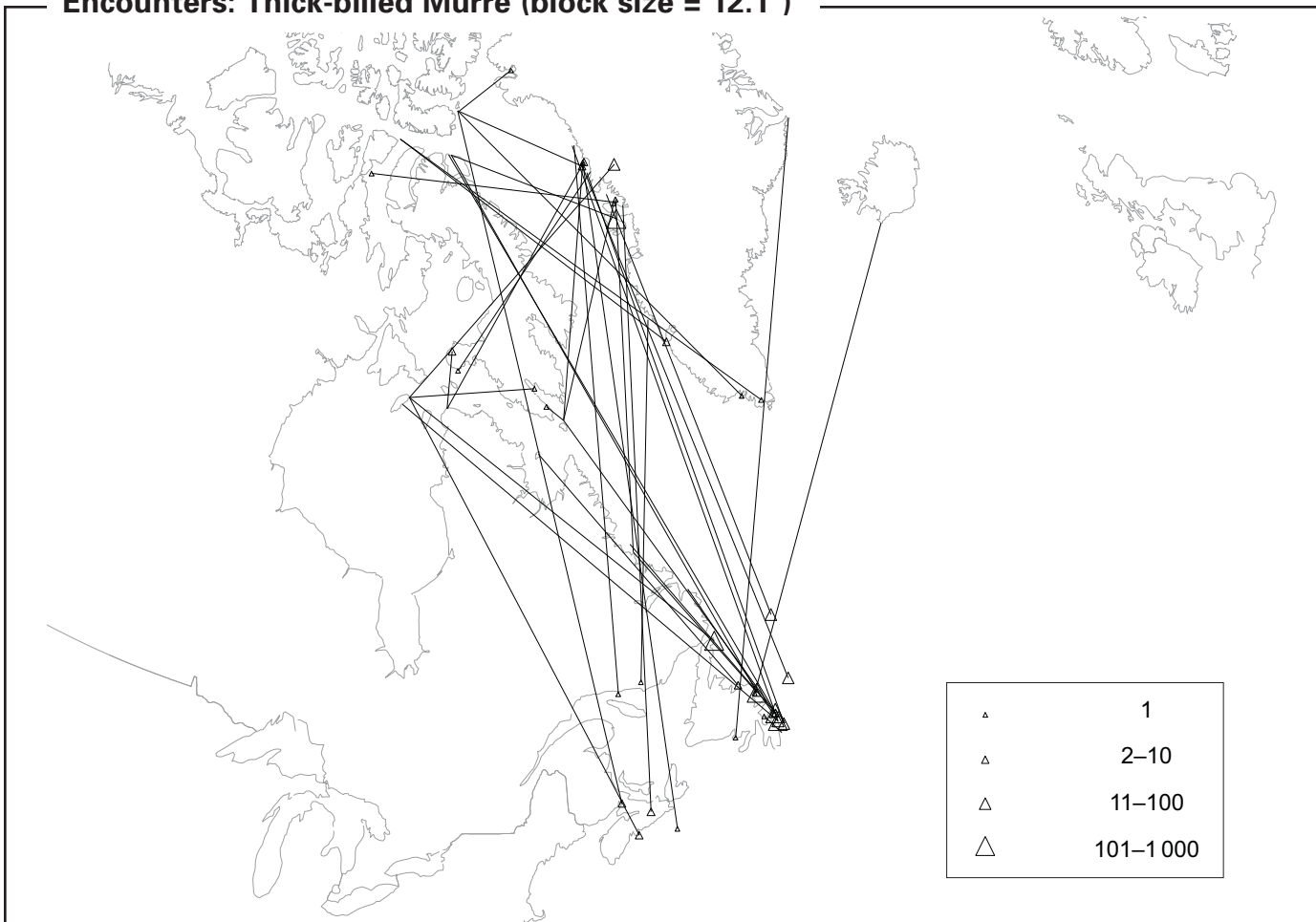
Banding effort: Common Murre



Top banders: LMT, DNN, CWSN, RDE

Thick-billed Murre (*Uria lomvia*) 031.0

Encounters: Thick-billed Murre (block size = 12.1°)



The Thick-billed Murre breeds chiefly in immense colonies in the eastern Arctic, where more than 95% of the Canadian population breeds at only 11 sites. There is one small colony in Mackenzie, N.W.T. (Cape Parry), and a few small colonies are scattered through Newfoundland and Labrador and the Gulf of St. Lawrence (Gaston and Hipfner 2000). In the Atlantic, the Thick-billed Murre winters mainly off Newfoundland and Labrador and in smaller numbers south to Massachusetts; Cape Parry breeders presumably winter in the Pacific (Brown 1985).

Most banding was carried out at a few eastern colonies, in Hudson Strait and Lancaster Sound in the 1950s, in the Lancaster Sound/Jones Sound region from 1975 to 1993, and in Hudson Strait from 1980

to 1995. An analysis of encounters to 1978 was given by Gaston (1980). A recent summary of encounters in Newfoundland and Labrador was made by Donaldson et al. (1997).

Long-distance encounters are the rule; 87% of encounters were 1000 km or more from the banding site. Moreover, straight-line encounter distances are misleading for this species, which rarely flies over land. Birds from Coats Island encountered off Newfoundland (great-circle distance approximately 2300 km) had probably travelled more than 2700 km.

The pattern of encounters probably reflects hunter distribution and the long-standing traditions of seabird hunting on Newfoundland. Encounters are concentrated during the hunting season (November–March), and there are few summer

encounters, because at that time most birds are within the breeding range, which has a very low density of human population. Over 90% of birds encountered were shot by “turr” hunters off Newfoundland and Labrador (records 1–4); the heavy losses inflicted by salmon fishing nets off West Greenland colonies (Tull et al. 1972) occurred during a period when little banding was being carried out in Canada (Gaston 1980). First-winter birds tend to arrive off Newfoundland earlier than adults and make up the bulk of hunter-killed birds up to December, with older birds predominating later in the winter. Very few encounters come from south of Newfoundland (<1%), but two birds from each of Digges and Coburg islands were encountered in Nova Scotia (records 5 and 6): one of these holds the record for rate of movement, covering a sea distance of about 3 700 km in 99 days, averaging >35 km/day (record 6). One bird banded at Cape Wolstenholme, Quebec (record 7), and one from Coats Island, Northwest Territories (record 8), were encountered in Massachusetts. Only one encounter came from the Gulf of St. Lawrence.

Many encounters of birds from the Lancaster Sound/Jones Sound colonies occurred off Greenland in September–November, with smaller numbers throughout the winter (record 9). All six encounters of birds banded at Prince Leopold Island were from Greenland, and a proportion of the Canadian High Arctic population may overwinter there, at least in some years, as well as a few birds from Hudson Strait (e.g. record 10, from Coats Island) (Tuck 1961; Kampp 1991). Over 150 birds banded in West Greenland (mainly as chicks) have been encountered in eastern Canada (records 11 and 12) (Salomonsen 1947–1979; Tuck 1971), suggesting that much of the West Greenland population also winters in Canadian waters, at least in their first year

(Donaldson et al. 1997). Small numbers of encounters of birds banded at the Norwegian Barents Sea colonies (Spitsbergen, Bear Island) and Iceland have also occurred on Newfoundland (V. Bakken, pers. commun.).

Although there are few summer encounters, Thick-billed Murres are known to return to the same colony each year to breed (Gaston et al. 1994). Eighteen encounters from Ivujivik, northern Ungava, in summer were all of birds banded at the nearby Digges Sound colonies. At Coats Island, Northwest Territories, up to 60% of birds banded as chicks were sighted at the colony as adults, suggesting strong philopatry. By 1992, more than 15 000 chicks had been banded at Coats Island, but observations of thousands of adult breeders and non-breeders at the nearest other colony (Digges Island) in the summers of 1992–1994 failed to reveal any birds banded at Coats Island (A.J. Gaston and G. Donaldson, unpubl. data). However, a single bird banded as a chick at Coats Island in 1989 was found breeding in Thule District of northwestern Greenland in 1997 (Kampp and Falk 1998), demonstrating that some long-distance dispersal does occur. A bird banded at Digges Island in 1994 was seen at Coats Island in 1997 (G. Donaldson, pers. commun.). Young birds do not visit their breeding colony in their first summer, but two encounters near Cape Dorset, Nunavut, of birds banded as chicks at Cape Wolstenholme and Digges Island, about 200 km away (record 13), show that some birds are not far from their natal colony during their first summer.

The longevity record for this species is held by a bird encountered in 1978, 23 years after banding (record 4) (Clapp et al. 1982). A bird recaptured at Digges Island in 1980 almost certainly had been banded at the same site in 1955, but the number was illegible.

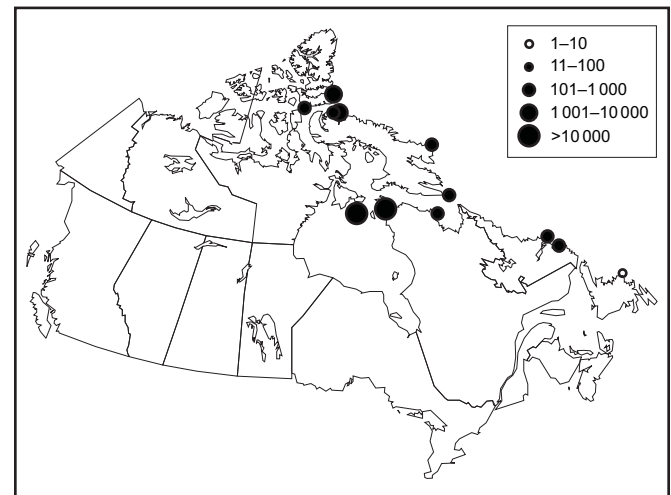
Encounter records: Thick-billed Murre

1	0526-76006 LMT	AHY 05	U 01	20/07/55 ??/??/67	Digges Island, NT near Blackhead Bay, NL	62°30'N 77°40'W 48°30'N 53°20'W	~12 yr. 2 162 km S55°E
2	0586-00212 LMT	AHY 00	U 01	08/07/57 09/03/62	Cape Hay, Bylot Island, NT Burin, NL	73°40'N 79°50'W 47°00'N 55°10'W	4 yr. 8 mo. 3 208 km S36°E
3	0586-01511 LMT	L 03	U 07	17/08/57 08/03/61	Cape Hay, Bylot Island, NT near Quidi Vidi Lake, NL	73°40'N 79°50'W 47°30'N 52°40'W	3 yr. 7 mo. 3 203 km S40°E
4	0526-76850 LMT	L 05	U 01	01/08/55 14/02/78	Digges Island, NT near South Dildo, NL	62°30'N 77°40'W 47°30'N 53°30'W	22 yr. 6 mo. 2 247 km S53°E
5	0785-56795 DNN	L 05	U 00	13/08/81 ??/02/82	Coburg Island, NT Beaver River, NS	75°40'N 79°20'W 44°00'N 66°10'W	6 mo. 3 582 km S18°E
6	0785-58843 AJG	L 07	U 45	15/08/87 22/11/87	Coburg Island, NT Sherwood Heights, NS	75°40'N 79°20'W 44°40'N 63°40'W	3 mo. 3 531 km S21°E
7	0546-94511 LMT	AHY 07	U 52	14/08/55 14/06/66	Cap Wolstenholme, QC Ballarach Cove, MA	62°30'N 77°30'W 42°30'N 70°40'W	10 yr. 10 mo. 2 271 km S15°E
8	0996-04502 AJG	L 03	U 00	04/08/86 24/12/86	Coats Island, NT Cape Cod, MA	62°50'N 82°00'W 41°40'N 70°00'W	4 mo. 2 485 km S24°E
9	0586-01535 LMT	L 05	U 01	17/08/57 ??/FA/72	Cape Hay, Bylot Island, NT near Godthaab, Greenland	73°40'N 79°50'W 69°20'N 53°30'W	25 yr. 1 036 km S76°E
10	0785-44759 AJG	L 03	U 01	16/08/81 03/12/92	Coats Island, NT south of Sukkertopen, Greenland	62°50'N 82°00'W 64°00'N 51°40'W	11 yr. 4 mo. 1 502 km N72°E
11	474033 Denmark	L 05	U 01	06/08/50 05/12/50	Jakobshavn, Greenland Mutton Bay, Saguenay County, QC	69°47'N 51°18'W 51°47'N 58°00'W	4 mo. 2 091 km S1°W
12	474030 Denmark	L 05	U 01	06/08/50 20/02/51	Jakobshavn, Greenland Trinity Bay, NL	69°47'N 51°18'W 47°57'N 53°19'W	7 mo. 2 440 km S7°E
13	0546-95069 LMT	L 00	U 01	15/08/55 99/07/56	Digges Island, NT west of Cape Dorset, NU	62°30'N 77°40'W 65°00'N 77°30'W	11 mo. 278 km N2°E

Summary of banding statistics: Thick-billed Murre

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			62 771
<i>No. encountered per 1 000 banded (1955–1995)</i>			22
Total no. encountered (1921–1995)	1 161	269	1 645
No. encountered from foreign bandings	0	0	214
Maximum period from banding to encounter (mo.)	270	257	270
No. of Canadian-banded birds moving >0 km	1 128	264	1 393
Mean movement >0 km of Canadian-banded birds (km)	2 303	1 710	2 189
Maximum movement from all encounters (km)	3 582	3 388	3 582
% recovered (encountered dead)	99	97	99
% direct recoveries	56	6	48
% encountered during banding operations	0	1	0

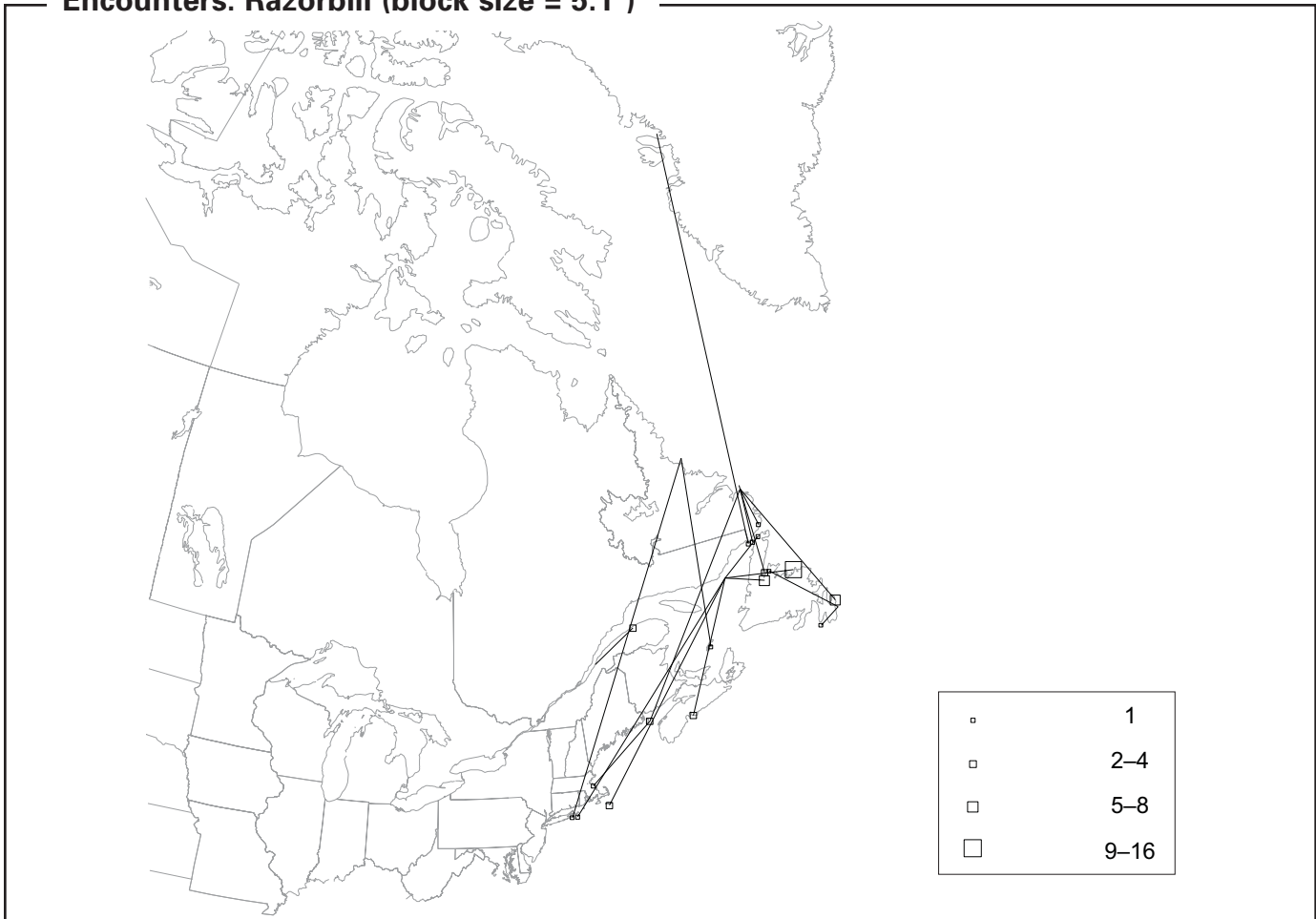
Banding effort: Thick-billed Murre



Top banders: AJG, LMT, DNN

Razorbill (*Alca torda*) 0.32.0

Encounters: Razorbill (block size = 5.1°)



The Razorbill breeds in small colonies along the northeastern coast of North America, including the northern coast of Maine, along the Bay of Fundy, the St. Lawrence River estuary and the Gulf of St. Lawrence, and along the east coast of Newfoundland and Labrador as far north as Hudson Strait; the bulk of the North American population is concentrated in southern Labrador and on the North Shore of the Gulf of St. Lawrence (Brown et al. 1975; Godfrey 1986; Chapdelaine et al. 2001). Most Canadian banding has been carried out at colonies on the North Shore of the Gulf of St. Lawrence and in central Labrador, with smaller numbers banded in New Brunswick and on Newfoundland. Most Canadian birds probably winter in the Gulf of Maine and Georges Bank, south to North Carolina (Brown 1986).

A description of encounters of Canadian-banded Razorbills is given by Chapdelaine (1997). Compared with murre, the encounter rate for Razorbills, at less than 1% of those banded, is extremely low. Nearly two-thirds of encounters were of adults recaptured at the colony; over half of the others were of shot birds. Only 17 encounters were in winter (November–February), of which 8 were on Newfoundland (including 6 of birds banded in Quebec, records 1 and 2), 4 in Nova Scotia (record 4), 2 in Massachusetts (records 5 and 6), and 1 each in Labrador, New Brunswick (record 7), and New York, the latter the longest distance travelled by a Canadian-banded bird (1901 km), from near Hopedale, Labrador, to Big Fresh Pond, New York (record 8). One bird banded in Greenland was encountered in its third

April, off Labrador (record 9; Salomonsen 1952), 2 172 km from the place of banding. According to Salomonsen (1944), the birds breeding in Greenland belong to the northern race *A. t. pica*, which has not definitely been recorded in Canada (Godfrey 1986).

Encounters of banded birds on the North Shore of the Gulf of St. Lawrence showed eastward movement after the breeding season through the Strait of Belle Isle (e.g., records 10 and 11), moving along the east coast of Newfoundland and then southward to the wintering areas. The preponderance of winter encounters on Newfoundland probably reflects birds killed incidentally in the annual murre hunt (Elliot et al. 1991); 21 of 24 encounters on Newfoundland between September and March were shot. The majority of these encounters were in September–December (19/24), and most (17/24) came from the northern peninsula and northeastern

coast (White Bay, Fogo Island); none was encountered on the south coast, where many Thick-billed Murres are shot in January–March (Donaldson et al. 1997). It seems likely that most Razorbills move farther south by midwinter; records from New Brunswick and the United States were all from December onwards.

Razorbills do not breed before 4 years of age (Lloyd and Perrins 1977). Most encounters outside the breeding season were of pre-breeding-age birds, including 20 of 24 of those encountered on Newfoundland. It appears that birds of breeding age are unlikely to be encountered away from their breeding colony. The oldest encounter, 15 years and 11 months (record 12), is a record for a North American-banded Razorbill. This encounter supersedes the longevity record of 6 years and 5 months reported by Klimkiewicz and Futcher (1989).

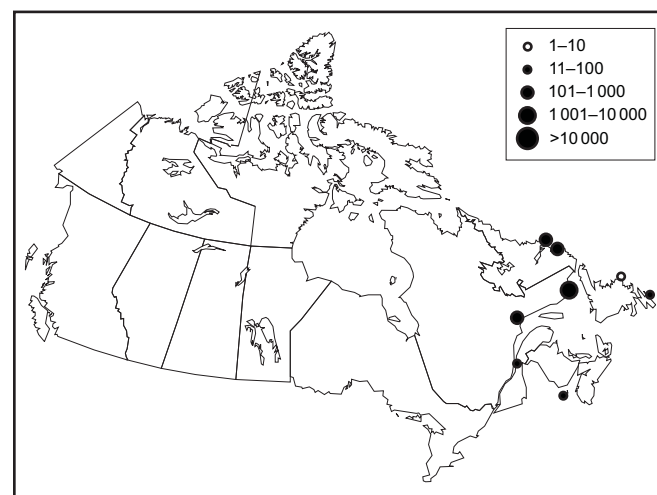
Encounter records: Razorbill

1	0004-05911 HFL	AHY 03	U 03	02/08/26 ??/11/29	Îles Sainte-Marie, QC near Doting Cove, NL	50°10'N 59°30'W 49°30'N 54°20'W	3 yr. 3 mo. 379 km S81°E
2	0996-52140 HFL	L 05	U 01	24/07/91 21/10/92	Îles Sainte-Marie, QC Greenspond, NL	50°10'N 59°30'W 49°00'N 53°30'W	1 yr. 3 mo. 452 km S76°E
3	0526-17199 LMT	L 00	U 01	26/08/52 11/11/52	Gannet Island, NL near St John's, NL	53°50'N 56°30'W 47°30'N 52°40'W	3 mo. 752 km S31°E
4	0004-05936 HFL	L 00	U 98	03/08/26 10/12/26	Îles Sainte-Marie, QC Seabright, NS	50°10'N 59°30'W 44°30'N 63°50'W	4 mo. 708 km S37°W
5	0026-06027 HFL	U 00	U 23	31/07/29 03/03/30	Îles Sainte-Marie, QC Coatue, MA	50°10'N 59°30'W 41°10'N 70°00'W	8 mo. 1286 km S49°W
6	0026-06147 HFL	U 00	U 23	02/08/29 16/01/31	Îles Sainte-Marie, QC Ellisville Beach, MA	50°10'N 59°30'W 41°50'N 70°30'W	1 yr. 5 mo. 1 257 km S47°W
7	0526-17185 LMT	L 00	U 23	26/08/52 04/01/56	Gannet Island, NL Grand Manan, NB	53°50'N 56°30'W 44°40'N 66°40'W	3 yr. 5 mo. 1253 km S47°N
8	0005-60069 OLA	U 00	M 23	11/08/28 03/03/30	Nunarsuk Island, NL Big Fresh Pond, NY	56°00'N 60°20'W 40°50'N 72°20'W	1 yr. 7 mo. 1901 km S32°W
9	47492 Denmark	AHY 00	U 01	01/08/48 20/04/51	Satut, Umanak, Greenland Long Point, NL	70°40'N 51°30'W 51°20'N 57°10'W	2 yr. 8 mo. 2 172 km S11°W
10	0895-00878 GC	L 05	U 01	01/08/90 29/09/90	Îles Sainte-Marie, QC near Englee, NL	50°10'N 59°30'W 50°40'N 55°30'W	1 mo. 289 km N77°E
11	0996-58539 GC	ATY 05	U 01	29/07/91 12/10/91	Îles Sainte-Marie, QC near Englee, NL	50°10'N 59°40'W 50°50'N 55°50'W	3 mo. 281 km N73°E
12	0666-39076 GC	L 02	U 98	26/07/62 16/06/78	Îles Sainte-Marie, QC Îles Sainte-Marie, QC	50°10'N 59°30'W 50°10'N 59°30'W	15 yr. 11 mo. 19 km S0°W

Summary of banding statistics: Razorbill

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			3 499
<i>No. encountered per 1 000 banded (1955–1995)</i>			9
Total no. encountered (1921–1995)	43	39	92
No. encountered from foreign bandings	0	0	0
Maximum period from banding to encounter (mo.)	75	61	75
No. of Canadian-banded birds moving >0 km	39	8	51
Mean movement >0 km of Canadian-banded birds (km)	484	473	514
Maximum movement from all encounters (km)	1 421	2 172	2 172
% recovered (encountered dead)	90	25	58
% direct recoveries	39	10	25
% encountered during banding operations	9	74	41

Banding effort: Razorbill



Top banders: CWSQR, DNN, JB, LMT

Dovekie (*Alle alle*) 034.0

Encounters: Dovekie



The Dovekie occurs throughout most of the Arctic, although only small numbers reach the Chukchi Sea. It breeds in colonies at high latitudes in Greenland, Spitsbergen, Iceland, and islands north of Siberia. It was not known to breed in Canada until 1983, when a small colony was discovered in Home Bay, Baffin Island (Finley and Evans 1984). Only a handful of Dovekies have been banded in Canada, none since 1955 (hence no banding effort map), but the species is often extremely abundant as a migrant (from huge colonies in Greenland), winter resident, or summer non-breeder

along the Canadian coasts of Baffin Bay and Davis Strait and in Jones and Lancaster sounds, Hudson Strait, and northern Hudson Bay (Brown 1986).

Dovekies winter offshore, from Hudson Bay and Hudson Strait south to the Gulf of St. Lawrence and the Bay of Fundy, straggling south to North Carolina. They occur inland occasionally, usually as a result of storms (Gaston and Jones 1998). There are three winter encounters on Newfoundland of birds banded as adults on the breeding grounds in northwest Greenland; all were shot within 3 years of banding (records 1–3).

Encounter records: Dovekie

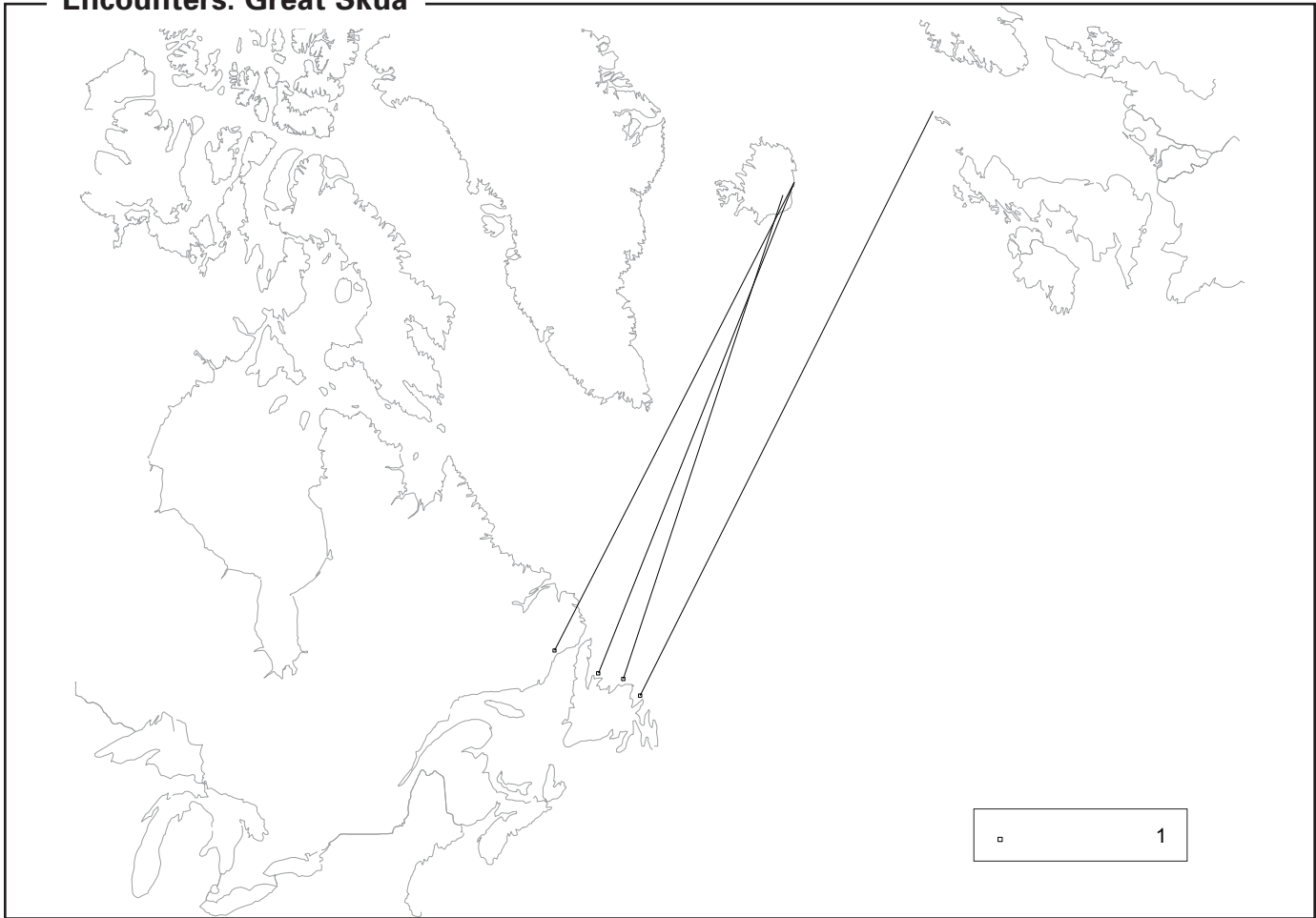
1	657118	AHY	U	08/06/69	Igdulvarssuit, Thule, Greenland	77°40'N 70°52'W	2 yr. 5 mo.
	Denmark	00	01	11/30/71	Exploits, NL	49°30'N 55°00'W	3 221 km S21°E
2	658560	AHY	U	??/08/69	Quanaq, Thule, Greenland	77°30'N 69°10'W	4 mo.
	Denmark	00	01	30/12/69	Happy Adventure, NL	48°30'N 53°40'W	3 278 km S21°E
3	672709	AHY	U	24/07/49	Savigssivik, Thule, Greenland	76°00'N 65°00'W	1 yr. 5 mo.
	Denmark	00 01		14/01/51	Twillingate, NL	49°30'N 54°50'W	2 985 km S15°E

Summary of banding statistics: Dovekie

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			0
<i>No. encountered per 1 000 banded (1955–1995)</i>	0	0	0
Total no. encountered (1921–1995)	0	0	3
No. encountered from foreign bandings	–	–	3
Maximum period from banding to encounter (mo.)	0	0	29
No. of Canadian-banded birds moving >0 km	–	–	0
Mean movement >0 km of Canadian-banded birds (km)	–	–	
Maximum movement from all encounters (km)	–	–	3 278
% recovered (encountered dead)	–	–	50
% direct recoveries	–	–	0
% encountered during banding operations			4

Great Skua (*Stercorarius skua*) 035.0

Encounters: Great Skua



Great Skuas breed in Iceland, the Faeroe Islands, and northern Scotland and recently in Norway (with allied forms in the Southern Hemisphere) and winter at sea from Spain to northwest Africa, venturing into North American waters in small numbers (Furness 1987). None has been banded in Canada, so no effort map is included. There have been nine encounters of Great Skuas in Canadian waters, eight of birds banded in Iceland (records 1–5) and one

from Scotland (record 6). The Icelandic birds were all banded as nestlings at breeding sites on the south coast of the island and were encountered mostly in northeastern Newfoundland, in the Notre Dame Bay and Bonavista Bay areas, with one bird in the Strait of Belle Isle. Most encounters occurred in October–December in the first or second year; one bird was in its third year (record 1). None of these birds would have begun to breed (Hamer and Furness 1991).

Encounter records: Great Skua

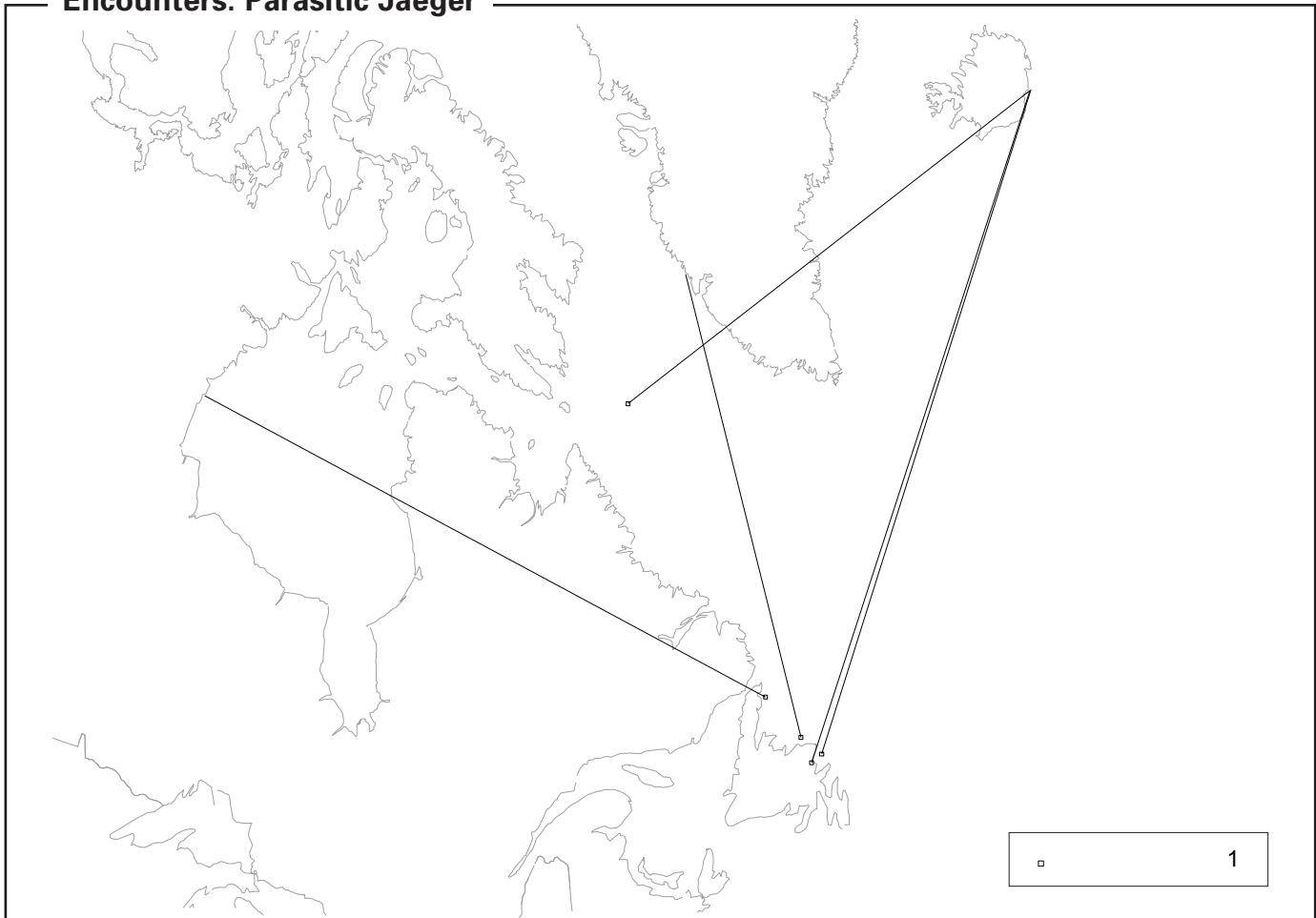
1	Rek-218148 Iceland	U 00	U 97	22/07/71 13/10/73	Fagurholmsmyri, A Skaft, Iceland Notre Dame Bay, NL	63°50'N 16°30'W 49°40'N 55°10'W	2 yr. 3 mo. 2772 km S74°W
2	Rek-212012 Iceland	U 00	U 97	08/08/66 05/11/66	Kvisker, A Skaft, Iceland Bonavista Bay, NL	63°50'N 16°20'W 49°00'N 53°20'W	3 mo. 2751 km S71°W
3	Rek-38023 Iceland	U 00	U 97	07/08/61 20/08/62	Breioamerkursandur, A Skaft, Iceland Fogo, NL	64°00'N 16°10'W 49°30'N 54°10'W	1 yr. 0 mo. 2760 km S72°W
4	Rek-34616 Iceland	U 00	U 97	11/07/52 25/10/52	Breioamerkursandur, A Skaft, Iceland Horse Islands, NL	64°00'N 16°10'W 50°10'N 55°40'W	3 mo. 2775 km S75°W
5	Skov-E1998 Iceland	U 00	U 97	28/07/30 22/07/31	Breioamerkursandur, A Skaft, Iceland Strait of Belle Isle, NL	64°00'N 16°10'W 51°30'N 58°30'W	1 yr. 0 mo. 2801 km S80°W
6	00AJ-73049 UK	U 00	U 97	16/07/62 07/11/63	Unst, Shetland Islands, Scotland near Spillars Cove, NL	60°50'N 00°50'W 48°50'N 53°10'W	1 yr. 4 mo. 3497 km N88°W

**Summary of banding statistics:
Great Skua**

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			0
<i>No. encountered per 1 000 banded (1955–1995)</i>			–
Total no. encountered (1921–1995)	0	0	9
No. encountered from foreign bandings	0	0	9
Maximum period from banding to encounter (mo.)	–	–	27
No. of Canadian-banded birds moving >0 km	0	0	0
Mean movement >0 km of Canadian-banded birds (km)	–	–	–
Maximum movement from all encounters (km)	–	–	3497
% recovered (encountered dead)	–	–	100
% direct recoveries	–	–	22
% encountered during banding operations	–	–	0

Parasitic Jaeger (*Stercorarius parasiticus*) 037.0

Encounters: Parasitic Jaeger



Parasitic Jaegers breed across the northern Holarctic, in Canada from northern Yukon and Mackenzie through northeastern Manitoba to the extreme north of Ontario, Quebec, and Labrador and north to Ellesmere Island (Godfrey 1986). They winter in the Southern Hemisphere from the equator off Peru south to about 55°S off Tierra del Fuego, being common around Australia and New Zealand, off the coast of Argentina, and off southwestern Africa. They usually migrate at sea, well offshore, but some overland movement has been noted (Furness 1987).

Very few Parasitic Jaegers have been banded in Canada, and only one (record 1) resulted in a long-distance encounter. Presumably, there is a migratory divide, probably somewhere in the Northwest Territories or Nunavut, between birds wintering in the Atlantic and Pacific basins. The encounter, on Newfoundland, of a

bird from McConnell River, Nunavut, suggests that the divide may be to the west of Hudson Bay. Three birds banded as locals at Bathurst Island, Nunavut, were encountered near the banding site an average of 15 months later. However, two of these encounters were from owl pellets, and one was taken from a carcass that was very old when found (D. Grey, pers. commun.). Hence, they provide no evidence for natal philopatry and probably all perished before, or soon after, fledging.

The Greenland-banded bird encountered on Newfoundland (record 2) was also noted by Tuck (1971). Encounter records 3–5 represent the only encounters of Icelandic-banded birds outside Iceland. Large numbers have been banded in Scotland (Furness 1987), and the lack of encounters in the western Atlantic suggests that those birds migrate directly south from there, rather than moving westwards, after breeding.

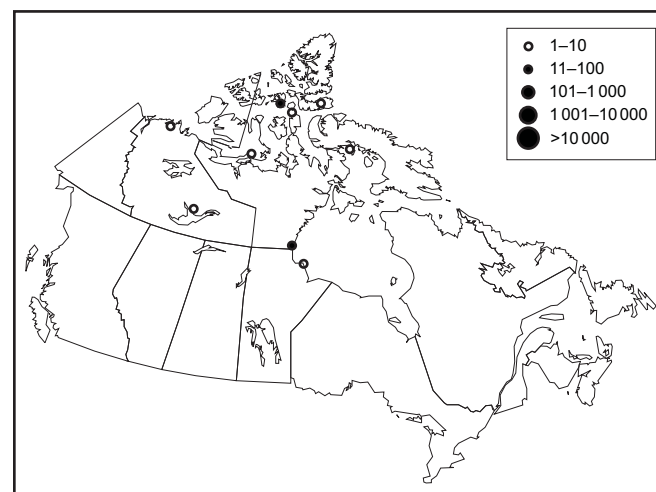
Encounter records: Parasitic Jaeger

1	0633-46006 JMH	U 05	U 01	24/06/65 15/09/65	McConnell River, NU near Grey Island, NL	60°50'N 94°20'W 51°10'N 55°30'W	3 mo. 2 597 km S83°E
2	579103 Denmark	U 00	U 97	19/07/58 15/08/58	Sukkertoppen District, Greenland 8 km off Fogo Island, NL	65°00'N 52°20'W 49°40'N 54°10'W	28 dy. 1 710 km S4°W
3	X6508 Iceland	L 00	U 00	10/07/32 25/08/33	Vatnagarour, southwest Iceland east of Fogo Island, NL	64°00'N 20°00'W 49°40'N 53°50'W	1 yr. 1 mo. 2 555 km S68°W
4	26103 Iceland	U 00	U 97	27/07/77 09/07/89	near Fagurholsmyri, Iceland at sea, east of Frobisher Bay	63°50'N 16°30'W 61°20'N 60°00'W	12 yr. 0 mo. 2 203 km N77°W
5	22951 Iceland	U 00	U 97	29/07/74 31/01/78	near Fagurholsmyri, Iceland Bonavista Bay, NL	63°50'N 16°30'W 48°50'N 54°00'W	3 yr. 6 mo. 2 788 km S71°W

Summary of banding statistics:
Parasitic Jaeger

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			140
<i>No. encountered per 1 000 banded (1955–1995)</i>			35
Total no. encountered (1921–1995)	3	1	9
No. encountered from foreign bandings	0	0	4
Maximum period from banding to encounter (mo.)	22	11	144
No. of Canadian-banded birds moving >0 km	2	0	3
Mean movement >0 km of Canadian-banded birds (km)	4	–	868
Maximum movement from all encounters (km)	4	0	2 788
% recovered (encountered dead)	100	0	88
% direct recoveries	0	0	33
% encountered during banding operations	0	100	11

Banding effort: Parasitic Jaeger



Top banders: JMH, NMNH, TWB, DLP, RIGM

Long-tailed Jaeger (*Stercorarius longicaudus*) 038.0

The Long-tailed Jaeger breeds across the northern Arctic, from Alaska to Baffin Island, Greenland, and northern Eurasia; it winters at sea in the Atlantic and Pacific oceans, migrating mainly at sea (Wiley and Lee 1998).

All encounters involved birds banded as adults on Ellesmere Island, Nunavut, and resighted or encountered in the breeding season within 20 km of

the place of banding (records 1 and 2), which is why there is no encounter map. With 488 birds banded between 1955 and 1995, the encounter rate away from the breeding site is among the lowest for any seabird, presumably because both breeding and wintering grounds are very remote. Ages at encounter ranged from 1 to 7 years, showing that an individual may return to the same area for many years.

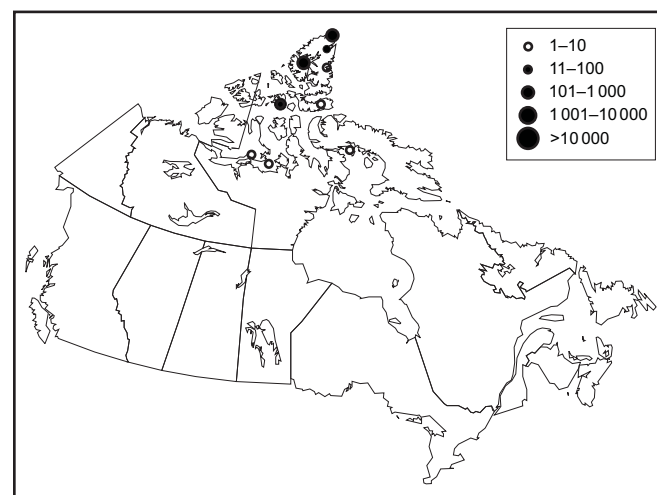
Encounter records: Long-tailed Jaeger

1	0523-50242	AHY	U	16/06/55	Eureka, Ellesmere Island, NU	80°00'N 86°00'W	7 yr. 1 mo.
	DFP	00	00	30/07/62	Eureka, Ellesmere Island, NU	80°00'N 86°00'W	0 km
2	0593-69203	AHY	U	25/07/63	Lake Hazen, Ellesmere Island, NU	81°50'N 71°10'W	4 yr.
	REL	04	00	23/07/67	west of St. John Island, NU	81°40'N 71°10'W	18 km S

Summary of banding statistics: Long-tailed Jaeger

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			488
<i>No. encountered per 1000 banded (1955–1995)</i>			12
Total no. encountered (1921–1995)	0	5	6
No. encountered from foreign bandings	0	0	0
Maximum period from banding to encounter (mo.)	–	85	85
No. of Canadian-banded birds moving >0 km	0	3	3
Mean movement >0 km of Canadian-banded birds (km)	–	18	18
Maximum movement from all encounters (km)	–	18	18
% recovered (encountered dead)	–	60	50
% direct recoveries	–	0	0
% encountered during banding operations	–	40	50

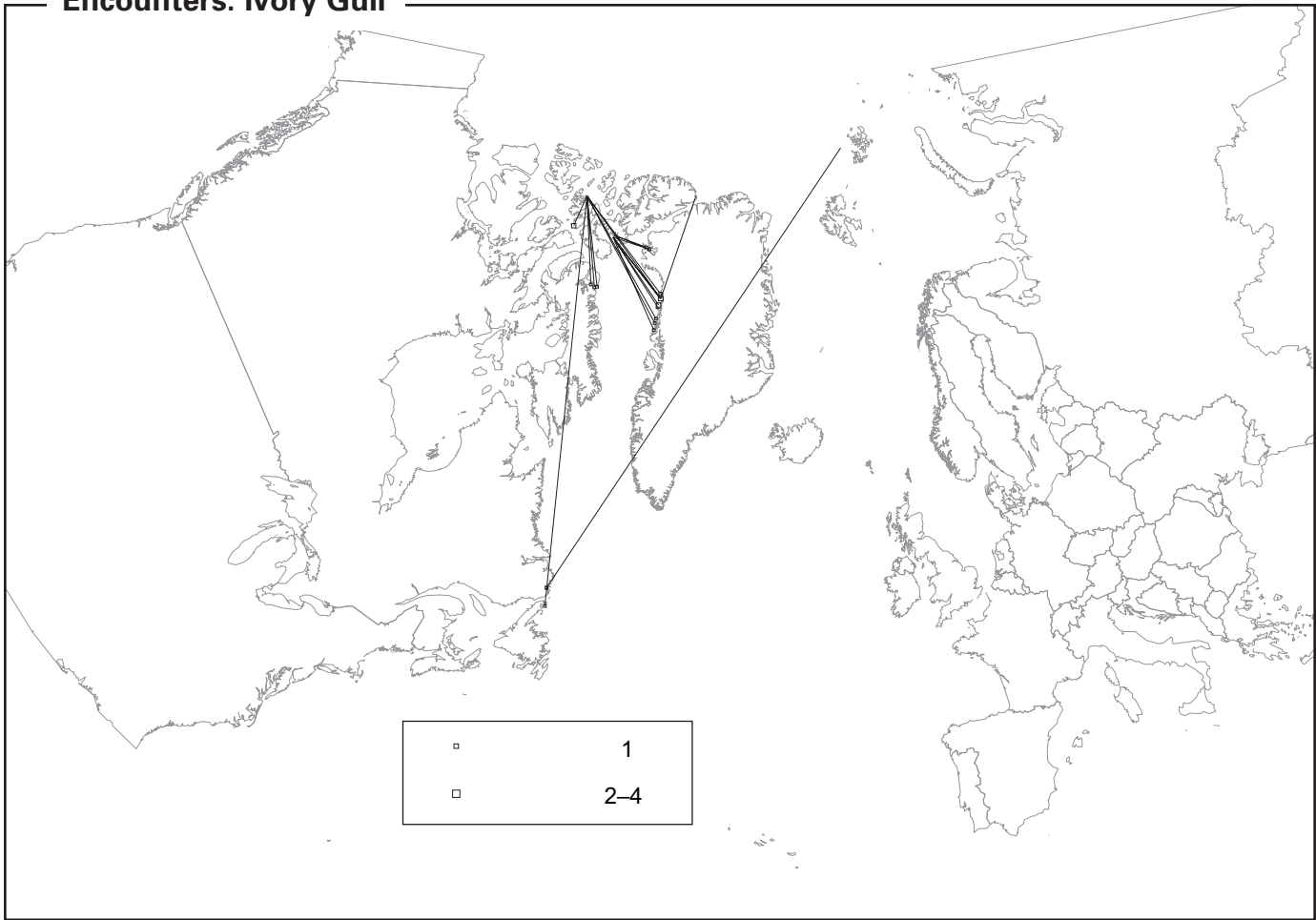
Banding effort: Long-tailed Jaeger



Top banders: NMNH, DFP, RIGM, CWSER, WJM

Ivory Gull (*Pagophila eburnea*) 039.0

Encounters: Ivory Gull



The Ivory Gull is an exclusively High Arctic breeder found from the islands off northern Siberia, through Spitsbergen and Greenland, and as far west as Seymour Island in the Canadian Central Arctic; it was previously also found in the Beaufort Sea. Ivory Gulls winter at the edge of Arctic pack ice in Davis Strait and the Greenland, Labrador, and Bering seas (Haney and MacDonald 1995).

Banding in Canada has been carried out on Seymour, Bathurst, and Ellesmere islands and on the Brodeur Peninsula of Baffin Island (Thomas and MacDonald 1987). Considering the remote location of its breeding colonies, the encounter rate of 15 per 1 000 banded is relatively high, especially as all the encounters were more than 100 km from the banding location. Most encounters (17) were from northwest

Greenland, as far south as 72°N (records 1–7); all but two of these were shot, presumably for food. Two encounters were from Newfoundland (record 8) and the remainder from northern Nunavut (record 9), where, again, the birds were shot, this time with the exception of one of them. Overall, the pattern of encounters suggests an eastward and southward movement of the population outside the breeding season. There is one encounter of a foreign-banded Ivory Gull, banded in Franz Joseph Land, Russia, during the breeding season and encountered 6 years later in Labrador (record 10).

Encounters in Greenland were mainly reported in May–July (12), the rest in September–November. Those on Newfoundland were reported in November and February. Large numbers winter in southern Davis Strait (Orr and Parsons 1982), where they are hardly likely to yield encounters; on Newfoundland, the species is an uncommon winter visitor. The oldest encounter was just under 12 years old (record 3), but Thomas and MacDonald (1987) mention two others, not available in the current CWS database, at 12 and 17 years. Only 25% of encounters were of birds less than 1 year old: an unusually low proportion, for a gull.

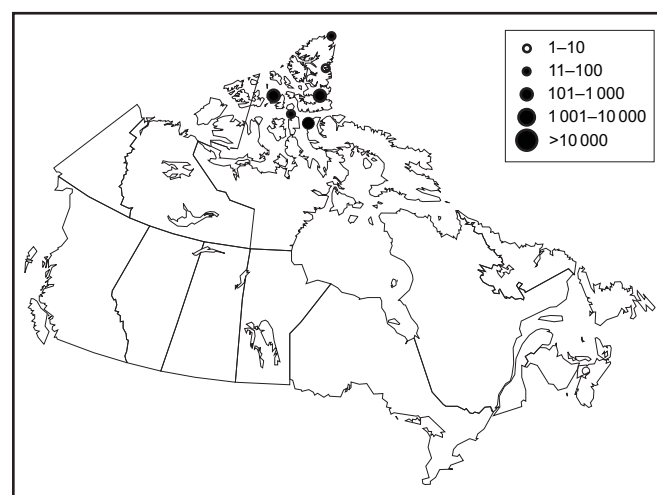
Encounter records: Ivory Gull

1	0614-28603	ASY	U	28/06/83	Grise Fiord, NU	76°20'N 82°50'W	10 yr. 0 mo.
	NMNH	03	01	18/06/93	Upernavik District, Greenland	74°30'N 57°10'W	741 km S87°E
2	0614-28589	ASY	U	28/06/83	Grise Fiord, NU	76°20'N 82°50'W	5 yr. 1 mo.
	NMNH	03	01	06/07/88	Upernavik District, Greenland	74°30'N 57°20'W	737 km S87°E
3	0564-06435	L	U	06/08/76	Seymour Island, NU	76°40'N 101°10'W	11 yr. 10 mo.
	NMNH	05	26	14/06/88	Upernavik District, Greenland	74°50'N 58°00'W	1 172 km N78°E
4	0614-28780	L	U	03/08/83	Seymour Island, NU	76°40'N 101°10'W	4 yr. 9 mo.
	NMNH	03	01	25/05/88	Upernavik District, Greenland	74°30'N 57°10'W	1 212 km N79°E
5	0614-28758	L	U	03/08/83	Seymour Island, NU	76°40'N 101°10'W	11 mo.
	NMNH	03	01	21/07/84	near Upernavik, Greenland	72°40'N 56°00'W	1 361 km N86°E
6	0614-28508	AHY	U	13/07/82	Grise Fiord, NU	76°20'N 82°50'W	2 mo.
	NMNH	03	01	29/09/82	near Upernavik, Greenland	72°10'N 55°30'W	935 km S74°E
7	0594-21531	AHY	U	04/06/86	Alert, NU	82°30'N 62°20'W	7 yr. 0 mo.
	RIGM	03	01	18/06/93	Upernavik District, Greenland	74°30'N 57°10'W	897 km S10°E
8	0554-09951	ASY	U	14/06/76	Seymour Island, NU	76°40'N 101°10'W	1 yr. 8 mo.
	NMNH	05	01	25/02/78	near St. Anthony, NL	51°20'N 55°30'W	3 410 km S61°E
9	0594-66653	L	U	24/07/75	Seymour Island, NU	76°40'N 101°10'W	1 yr. 0 mo.
	NMNH	05	01	17/07/76	near Pond Inlet, NU	72°40'N 76°30'W	842 km S71°E
10	510K29034E	?	?	17/08/34	Franz Joseph Land, Russia	82°00'N 50°00'E	5 yr. 7 mo.
	Russia	?	?	04/03/40	Port Hope Simpson, NL	52°30'N 56°10'W	3 296 km S8°W

Summary of banding statistics: Ivory Gull

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			1 522
<i>No. encountered per 1 000 banded (1955–1995)</i>			15
Total no. encountered (1921–1995)	10	12	24
No. encountered from foreign bandings	0	0	1
Maximum period from banding to encounter (mo.)	142	120	142
No. of Canadian-banded birds moving >0 km	9	12	23
Mean movement >0 km of Canadian-banded birds (km)	945	990	916
Maximum movement from all encounters (km)	1 361	3 410	3 410
% recovered (encountered dead)	100	100	100
% direct recoveries	10	16	12
% encountered during banding operations	0	0	0

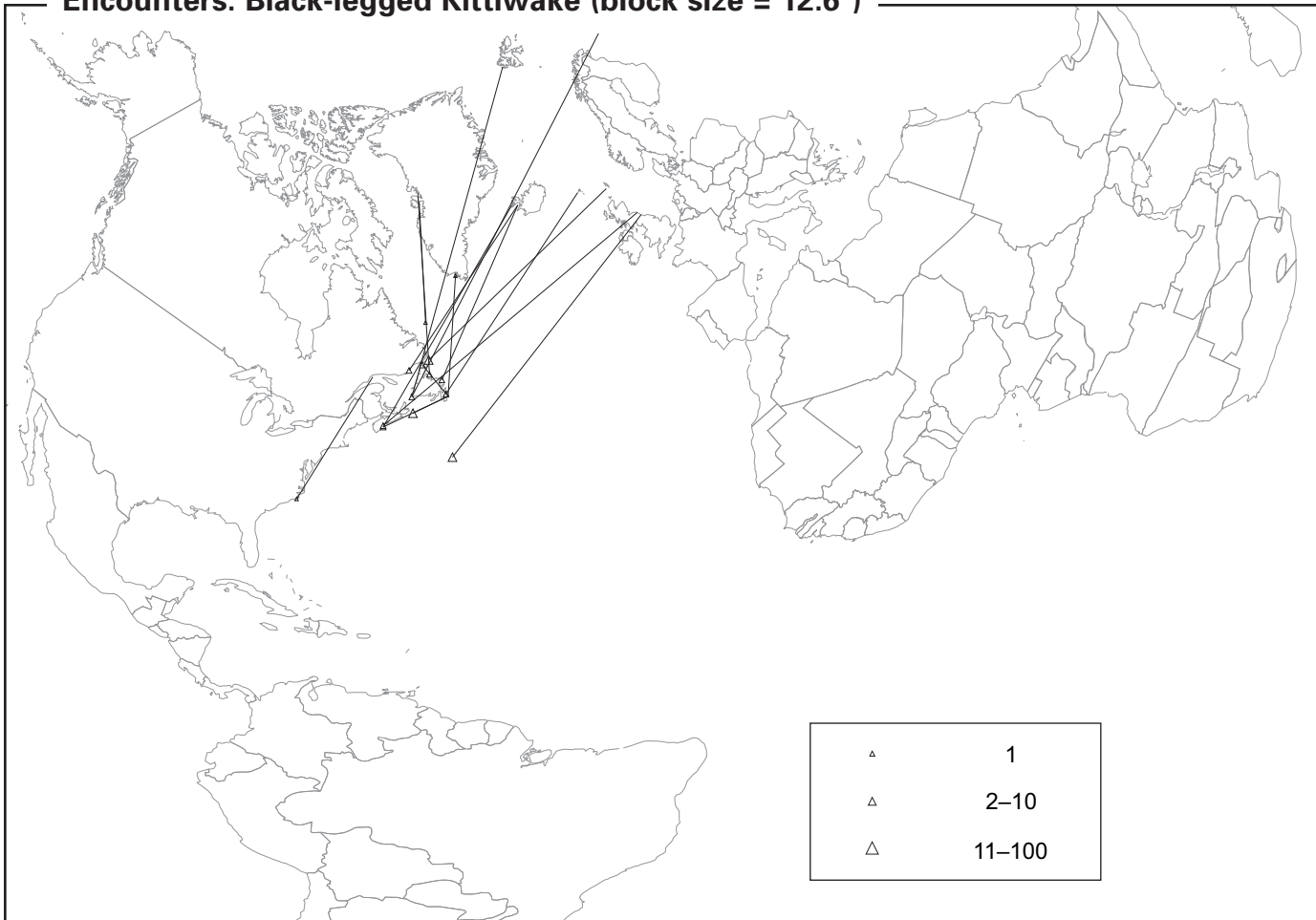
Banding effort: Ivory Gull



Top banders: NMNH, RIGM

Black-legged Kittiwake (*Rissa tridactyla*) 040.0

Encounters: Black-legged Kittiwake (block size = 12.6°)



In Canada, this species breeds in colonies in the Bay of Fundy, the Gulf of St. Lawrence, Newfoundland and Labrador, and east Baffin Island and at major colonies around Lancaster Sound and Barrow Strait in the High Arctic (Brown et al. 1975; Kehoe and Diamond 2001). The species also breeds in abundance in Greenland, Iceland, and western Europe from Brittany, France, to Spitsbergen, Norway, and east to Novaya Zemlya, Russia (Cramp and Simmons 1983), as well as across the northern Pacific from the Sea of Okhotsk to Alaska (Baird 1994).

Virtually all banding, and all encounters in the time period we consider, have come from work on Newfoundland. Movements were generally relatively short distance (records 1–4), with only six exceeding 500 km, although one bird banded near Sept-Îles, Quebec, moved 1 900 km to be encountered in North

Carolina in January (record 5), one reached the west coast of Greenland at 3 months of age (record 6), and one adventurous bird arrived aboard a fishing boat off Valencia, Spain, in February of its first year (record 7). The letter reporting this encounter concluded “May God keep you for many years.” It is not clear if this referred to the bird or the bander.

The relatively short-range movements of most Canadian kittiwakes contrast markedly with the numerous very long distance Canadian encounters of kittiwakes banded in Greenland, northwestern Europe, and Russia. Tuck (1971) reported encounters on Newfoundland of no fewer than 101 kittiwakes banded abroad: 10 were from Greenland (record 8), 39 from Britain (records 9 and 10), 30 from Russia (records 11 and 12), 18 from Norway, and one each from Spitsbergen (record 13), Iceland (record 14), the

Faeroe Islands (record 15), and Jutland (record 16). Among encounters of European-banded birds, only two were in Nova Scotia and two on the Quebec shore of the Gulf of St. Lawrence. Clearly, many kittiwakes from North Atlantic and Arctic colonies migrate to waters off Newfoundland for the winter.

Among European-banded encounters used in the current analysis (87; we were unable to find all of the records used by Tuck [1971]), 33 birds were in their first year, 23 were in their second year, and 31 were older. All but three encounters (91%) of older birds were in September–February, but 18 encounters (32%) of first- and second-year birds were outside that period. Birds banded in Britain and encountered in the western Atlantic are encountered predominantly in Greenland during June–September, but mainly from Canada in November–January, suggesting a southward shift in winter (Wernham et al. 2002). Prior to 1980, birds less than 2 years old made up 73% ($n = 64$) of European-banded encounters, but from 1980 onwards, they have constituted only 39% ($n = 23$). This suggests a greater tendency in recent years for breeding-age European Black-legged Kittiwakes to visit Canadian waters. However, rapid band loss during the early period, when aluminum bands were used, is another possible explanation (J.C. Coulson, pers. commun.).

Banding effort in West Greenland (Salomonsen 1967a), Britain (Coulson 1966), and Norway (Holgersen 1961) has been sufficient to produce detailed accounts of movement and mortality of these populations; this is not yet true of Canadian populations, especially those breeding in the Arctic, which might be expected to be much more mobile than birds from the Atlantic provinces. In this sense, the banding encounters of Canadian birds to date may prove unrepresentative.

The greatest length of time between banding and encounter of a Canadian Black-legged Kittiwake was 8 years and 6 months (record 4); this is less than the mean life expectancy of 13 years estimated for adults in Alaska (Hatch et al. 1993). The oldest bird encountered in Canada was one banded in Britain, which was 24 years and 6 months old when taken at sea off Newfoundland in 1990 (record 10). The average life expectancy of a British kittiwake is 4.5 years (Aebischer and Coulson 1990). The difference between regions, although probably not as large as the numbers suggest, reflects very large differences in typical reproductive performance — British Black-legged Kittiwakes rear, on average, twice as many young per year as their Alaskan conspecifics.

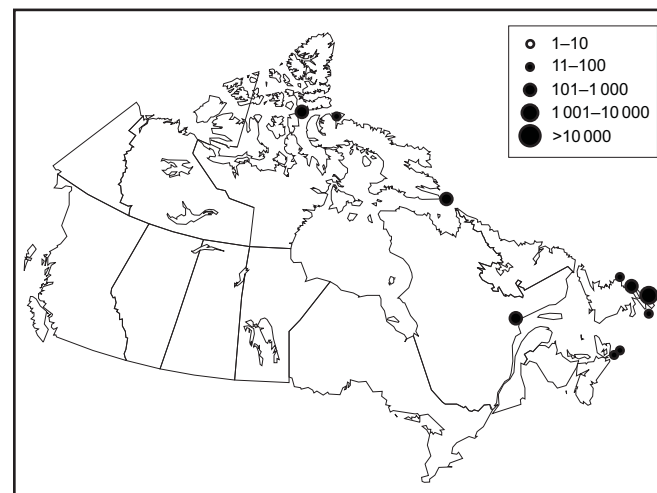
Encounter records: Black-legged Kittiwake

1	0494-68753 LMT	L 00	U 98	01/08/54 06/09/55	Witless Bay, NL Venison Tickle, NL	47°10'N 52°40'W 52°50'N 55°40'W	1 yr. 1 mo. 666 km N18°W
2	0685-11072 WT	L 05	U 01	22/07/70 14/02/74	Witless Bay, NL Broad Cove, NS	47°10'N 52°40'W 44°10'N 64°20'W	3 yr. 7 mo. 966 km S74°W
3	0585-88468 WT	L ?	U ?	16/07/70 11/07/77	Witless Bay, NL Salmon Cove, NL	47°10'N 52°40'W 47°40'N 53°10'W	7 yr. 0 mo. 67 km N34°W
4	0514-55067 LMT	L 03	U 01	09/07/57 08/01/66	Witless Bay, NL Stopperside, NL	47°10'N 52°40'W 47°30'N 52°30'W	8 yr. 6 mo. 39 km N19°E
5	0624-24102 CWSQR	L 05	U 00	05/06/85 18/01/86	La Prairie, QC Atlantic Beach, NC	50°00'N 66°20'W 34°40'N 76°40'W	7 mo. 1 903 km S30°W
6	0564-38736 WT	U 02	U 98	20/07/71 02/10/71	Witless Bay, NL near Julianehaab, Greenland	47°10'N 52°40'W 60°40'N 46°00'W	3 mo. 1 563 km N14°E
7	0704-48577 MUN	L 07	U 28	17/06/83 28/02/84	Witless Bay, NL at sea off Puerto de Gandia, Valencia, Spain	47°10'N 52°40'W 04°00'N 00°10'E	8 mo. 6 964 km S64°E
8	0005-26727 Denmark	U 00	U 97	28/07/68 15/01/69	near Sarqaq, Greenland near Rose Blanche, NL	70°40'N 51°40'W 47°30'N 58°40'W	6 mo. 2 606 km S12°W
9	314378 UK	U 00	U 97	01/07/46 29/11/48	Farne Islands, Northumberland, UK Port aux Basques, NL	55°30'N 01°30'W 47°30'N 59°10'W	2 yr. 3 mo. 3 972 km N78°W
10	30352 UK	U 00	U 97	24/06/66 16/12/90	Northumberland, UK near Sweet Bay, NL	55°30'N 01°30'W 48°30'N 53°40'W	24 yr. 6 mo. 3 570 km N80°W
11	0008-63056 Russia	U 00	U 97	17/07/76 04/12/85	near Murmansk, Russia near Hatchet Harbour, NL	68°40'N 37°20'E 49°40'N 54°40'W	9 yr. 5 mo. 5 057 km N65°W
12	E498196 Russia	L 00	U 01	13/07/59 23/01/62	Kharlov Island, Murmansk coast, Russia Port aux Basques, NL	68°49'N 37°20'E 47°35'N 59°10'W	2 yr. 6 mo. 5 414 km S117°W
13	536445 Norway	L 00	U 01	30/07/60 14/01/65	Kings Bay, Spitsbergen Port aux Basques, NL	78°50'N 11°00'E 47°35'N 59°10'W	4 yr. 5 mo. 4 427 km S83°W
14	5/1695 Iceland	ATY 00	U 56	27/05/38 13/01/43	Kollsuik, Iceland Lahave Bank, NS	65°40'N 24°20'W 44°10'N 64°20'W	4 yr. 7 mo. 3 400 km S65°W
15	502724 Denmark	L 00	U 00	31/08/70 27/10/70	Mykinesholm, Faeroe Islands Foxtrap Beach, NL	62°06'N 07°40'W 47°29'N 52°58'W	2 mo. 3 230 km S81°W
16	0059-2544 Denmark	L 03	U 01	02/07/46 26/05/47	Jutland, Denmark Fogo Island, NL	57°30'N 10°40'E 49°40'N 54°50'W	11 mo. 4 239 km N73°W

Summary of banding statistics: Black-legged Kittiwake

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			4 926
<i>No. encountered per 1 000 banded (1955–1995)</i>			6
Total no. encountered (1921–1995)	35	1	127
No. encountered from foreign bandings	0	0	91
Maximum period from banding to encounter (mo.)	102	84	294
No. of Canadian-banded birds moving >0 km	32	0	32
Mean movement >0 km of Canadian-banded birds (km)	591	–	591
Maximum movement from all encounters (km)	6 963	–	6 963
% recovered (encountered dead)	85	0	95
% direct recoveries	45	0	34
% encountered during banding operations	2	0	0

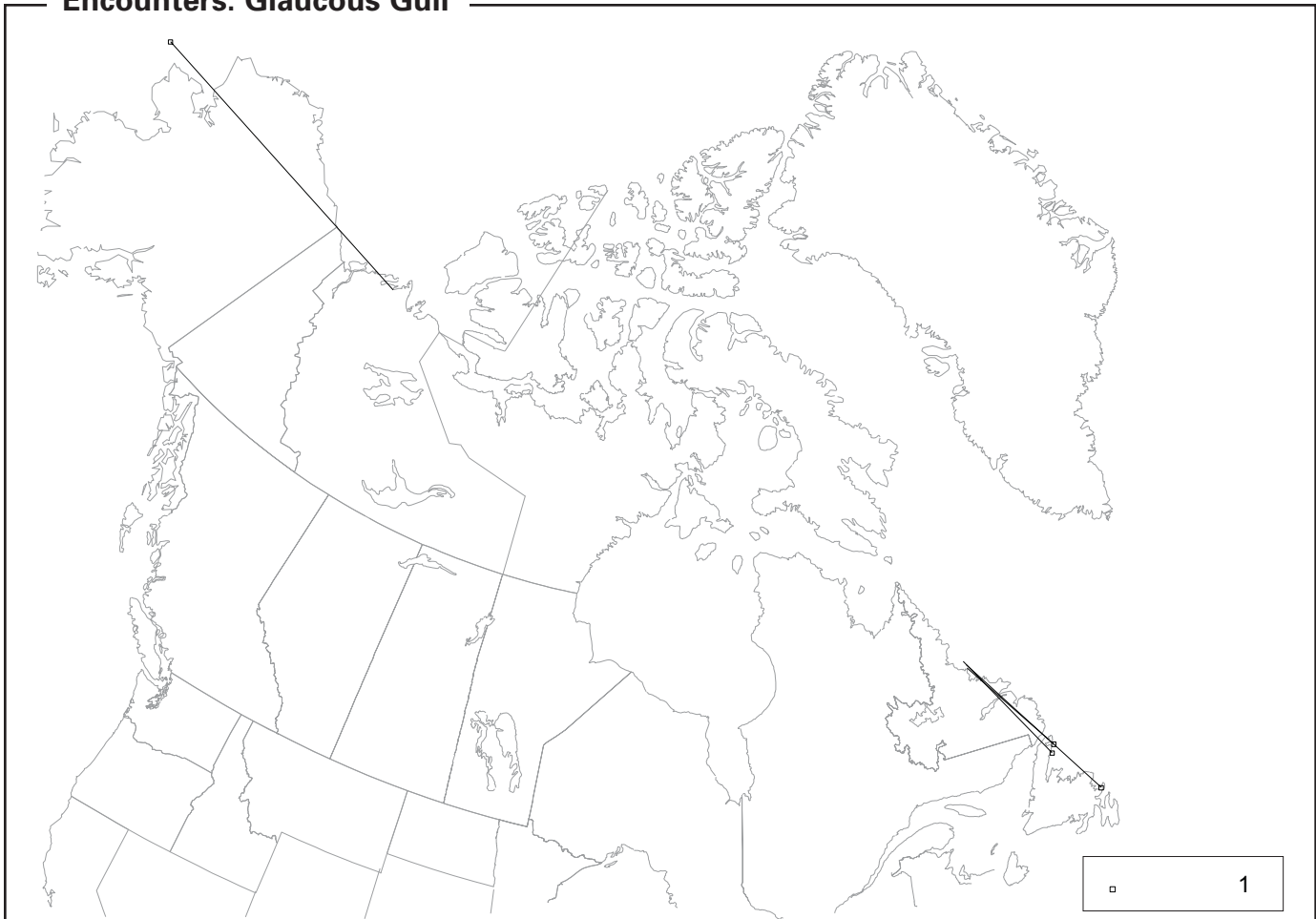
Banding effort: Black-legged Kittiwake



Top banders: WT, LMT, RKH, JMPo, DNN

Glaucous Gull (*Larus hyperboreus*) 042.0

Encounters: Glaucous Gull



A circumpolar Arctic species, the Glaucous Gull breeds on sea cliffs, offshore islands, and tundra lakes and ponds up to 100 km inland. In Canada, the species breeds in the Mackenzie Delta, through the Arctic islands, around Hudson Bay, and as far south as central Labrador. It winters south to the Great Lakes, the Gulf of St. Lawrence, and the Maritime provinces; it is an occasional visitor in British Columbia (Godfrey 1986; Campbell et al. 1990b).

Few Glaucous Gulls have been banded in Canada, and the encounter rate of 2 per 1000 banded is one of the lowest for Canadian seabirds, presumably because the species spends most of the year in very

remote areas. Of the four encounters available, one involves a bird banded as a nestling in the Anderson River delta and reported in September of its fourth year in the Chukchi Sea, off Alaska (record 1). The remaining encounters all resulted from banding in central Labrador: two birds were encountered on the northern peninsula of Newfoundland (records 2 and 3), and the third in Bonavista Bay (record 4). The Newfoundland encounters may indicate that Newfoundland is the normal wintering area for the Labrador population. A bird colour-banded at Coats Island, Nunavut, was reported from the mouth of the Saguenay River, Quebec, in two successive winters: the band number was unknown (A.J. Gaston and H.G. Gilchrist, unpubl. data).

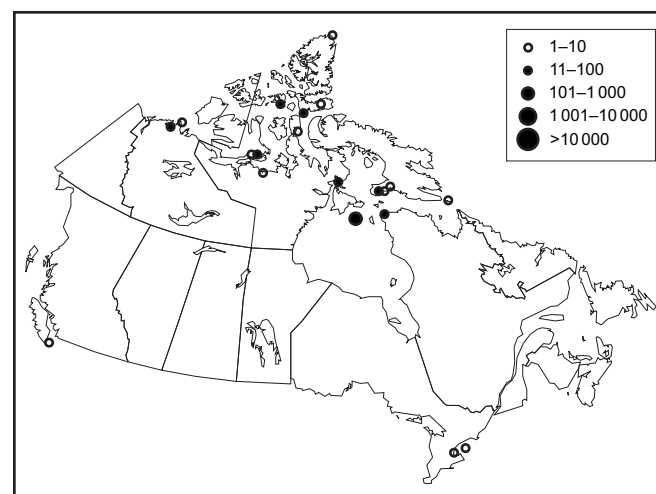
Encounter records: Glaucous Gull

1	0897-09903 TWB	L 05	U 00	16/07/73 23/09/76	Anderson River, NT Chukotsk Peninsula, Russia	69°40'N 129°00'W 65°40'N 170°50'W	3 yr. 2 mo. 786 km N84°W
2	0005-60560 DMC	U 03	U 01	06/08/28 15/01/32	Nunakslak Island, NL Hare Bay, NL	55°50'N 60°20'W 51°10'N 55°30'W	3 yr. 5 mo. 610 km S34°E
3	0005-60293 OLA	L 03	U 01	10/08/28 25/04/29	Nunakslak Island, NL near Englee, NL	56°10'N 60°30'W 50°50'N 55°50'W	8 mo. 669 km S29°E
4	0005-60544 DMC	U 03	U 01	06/08/28 11/04/32	Nunakslak Island, NL near Bonavista, NL	56°00'N 60°20'W 48°30'N 53°20'W	3 yr. 8 mo. 960 km S33°E

Summary of banding statistics: Glaucous Gull

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			466
<i>No. encountered per 1 000 banded (1955–1995)</i>			2
Total no. encountered (1921–1995)	2	0	4
No. encountered from foreign bandings	0	0	0
Maximum period from banding to encounter (mo.)	38	–	44
No. Canadian-banded birds moving >0 km	2	0	4
Mean movement >0 km of Canadian-banded birds (km)	1 227	–	1 006
Maximum movement from all encounters (km)	1 785	–	1 785
% recovered (encountered dead)	100	–	100
% direct recoveries	0	–	0
% encountered during banding operations	0	–	0

Banding effort: Glaucous Gull



Top banders: AJG, TWB, NMNH, AHM, DNN

Iceland Gull (*Larus glaucoides*) 043.0

Encounters: Iceland Gull



The Iceland Gull is a highly variable species for which taxonomic limits are not well defined.

The American Ornithologists' Union (1998) checklist (and supplements through 2006) allows two races within North America: *L. g. glaucoides*, breeding in Greenland and wintering as far south as the northeastern United States, and *L. g. kumlieni*, breeding from Baffin Island north to Ellesmere Island and as far west as Coats Island in northern Hudson Bay (Gaston et al. 1986). The species intergrades with Thayer's Gull on northern Baffin Island and Southampton Island (Snell 1989; Gaston and Elliot

1990) and was considered conspecific with it by Godfrey (1986).

Only a small number of Iceland Gulls have been banded in Canada, and only one encounter of a Canadian-banded bird has been reported: a bird banded at Digges Sound, at the northern tip of the Ungava Peninsula, and found dead in its first winter near Burin, Newfoundland (record 1). There is one encounter of a bird banded in Greenland and encountered near Cartwright, Labrador, in November (record 2). If this bird was reared in Greenland, it presumably belonged to the nominate race.

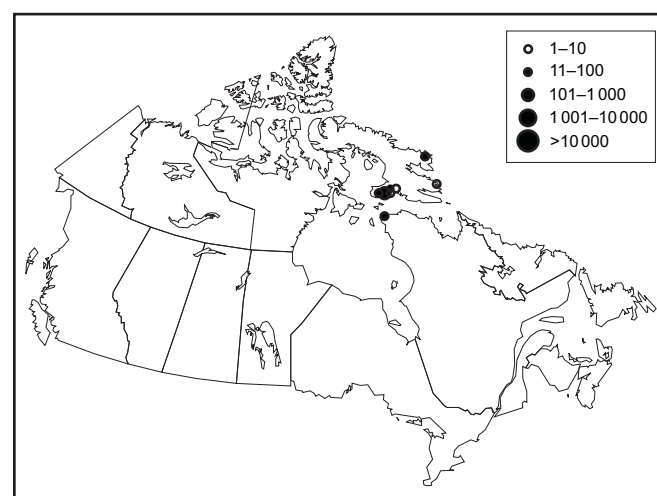
Encounter records: Iceland Gull

1	0846-55524 AJG	L 05	U 00	08/08/82 15/01/83	Digges Sound, NU Burin Bay, NL	62°20'N 77°40'W 47°00'N 55°00'W	5 mo. 2 221 km S50°E
2	0003-71045 Denmark	U 00	U 97	23/07/50 05/11/54	Upernavik, Greenland near Cartwright, NL	72°20'N 55°30'W 53°20'N 55°40'W	4 yr. 4 mo. 2 115 km W

Summary of banding statistics:
Iceland Gull

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>	252	16	268
<i>No. encountered per 1 000 banded (1955–1995)</i>			3
Total no. encountered (1921–1995)	1	0	2
No. encountered from foreign bandings	0	0	1
Maximum period from banding to encounter (mo.)	5	–	52
No. Canadian-banded birds moving >0 km	1	0	1
Mean movement >0 km of Canadian-banded birds (km)	2 221	–	2 221
Maximum movement from all encounters (km)	2 221	–	2 221
% recovered (encountered dead)	100	–	100
% direct recoveries	100	–	50
% encountered during banding operations	0	–	0

Banding effort: Iceland Gull



Top banders: AHM, AJG, SLW

Thayer's Gull (*Larus [glaucoides] thayeri*) 043.1

Encounters: Thayer's Gull



Thayer's Gull breeds on coastal sea cliffs from Ellesmere and eastern Baffin islands, west to Banks Island, and south to Vansittart Island and the north coast of Southampton Island (Gaston et al. 1986; Godfrey 1986). It winters along the Pacific coast from British Columbia to California (American Ornithologists's Union 1998 and supplements through 2006). The status of Thayer's Gull as a separate species is under some dispute. While Godfrey (1986) regarded it as a subspecies of the Iceland Gull (*Larus glaucoideus thayeri*), the latest American Ornithologists' Union checklist (American Ornithologists' Union 1998) still maintains it as a separate species. However, until the 1960s, it was regarded as a subspecies of the Herring Gull (*Larus argentatus*). Consequently, earlier banding of *thayeri* was recorded as being of that species, and it is impossible to compile accurate banding statistics (hence,

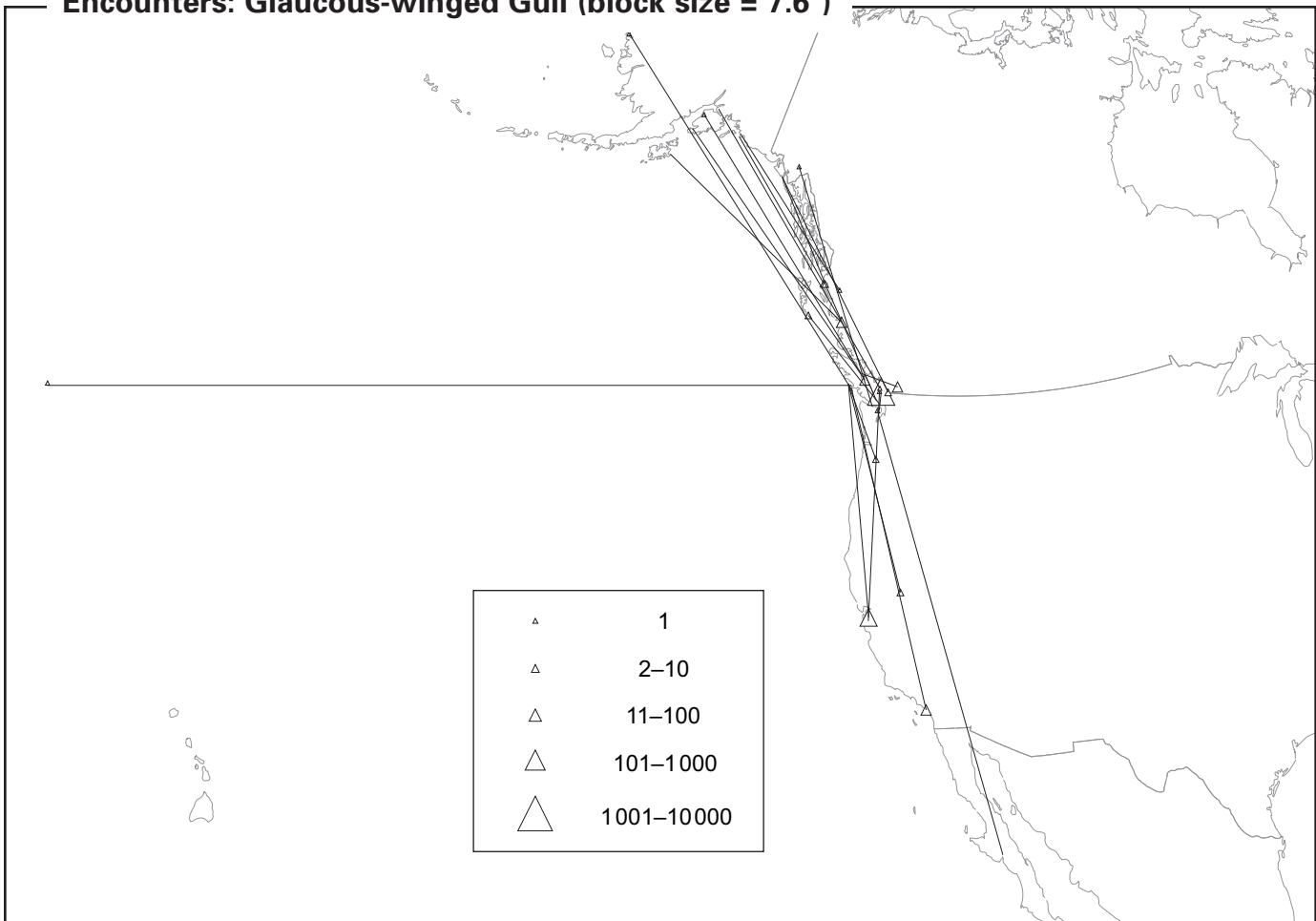
we have not included a summary table or banding effort map). Based on considerations of range, at least 59 *thayeri* have been banded in Canada. Thayer's Gull is included here on the basis of one encounter near Vancouver of a bird banded near Cambridge Bay, Nunavut, where *thayeri* is known to occur, but *argentatus* does not (Parmelee et al. 1967). This encounter illustrates the typical wintering behaviour of the species and is noteworthy mainly for the speed of travel, which suggests that the bird may have travelled over land, rather than taking the very long sea route via the Bering Strait. Another bird banded as a Herring Gull at "Coppermine River," Northern Territories, and encountered in California in winter could have been a Thayer's Gull, but the banding locality does not match the coordinates given, which place it well inland; this encounter remains enigmatic.

Encounters: Thayer's Gull

1	0667-81908	L	U	27/08/62	near Cambridge Bay, NU	69°00'N 105°00'W	2 mo.
	DFP	00	00	24/10/62	Vancouver, BC	49°10'N 123°00'W	2414 km S33°W

Glaucous-winged Gull (*Larus glaucescens*) 044.0

Encounters: Glaucous-winged Gull (block size = 7.6°)



Glaucous-winged Gulls breed along the coast of British Columbia, through the Gulf of Alaska, the Aleutians, and the southern Bering Sea, and west to Kamchatka, Russia. They winter throughout most of the breeding range and along the Pacific coast south to Baja California. Vagrants have straggled as far east as Churchill, Manitoba (Verbeek 1993).

Substantial banding effort, concentrating on nestlings, in a number of colonies in British Columbia for many years has produced enough encounters for several analyses (Woodbury and Knight 1951; Pearse 1963; Butler et al. 1980), which are the basis for this account. Butler et al. (1980) excluded sight records (band numbers read through binoculars or telescope), which account for over half the encounters of this species, due to the activities of several

dedicated individuals (see, for example, Houston 1963). Banding effort on this species decreased sharply after 1975. The species has the highest encounter rate of any Canadian seabird (9% of those banded have been reported).

Butler et al. (1980) found that first-year birds were encountered mainly between September and November, substantially earlier than the peak of December–February reported in an earlier study (Woodbury and Knight 1951), based on birds banded from 1938 to 1940. Butler et al. (1980) suggested that this shift in the timing of mortality may have been due to increased competition with adults because of the rapid increase in numbers that took place subsequent to the earlier study (estimated at 3.5-fold between 1928 and 1974). Older immatures were encountered more

evenly through the year, but adults (4 years and older) were encountered most frequently in July and August. The mortality of first-year birds was estimated from band returns as 58–59%.

Most encounters showed a southerly dispersal away from the breeding colonies in autumn (records 1 and 2). Butler et al. (1980) felt this trend was real, in spite of the bias introduced by the distribution of human populations, being predominantly to the south of most colonies. However, there are several hundred sight records in British Columbia of birds banded in colonies in Washington State, all of which show northward movement (many of 100 km or more, although, of course, only northward movements are possible for U.S.-banded birds encountered in Canada!), suggesting a much more random pattern of post-fledging dispersal. One encounter of a second-year bird at Prince Rupert involved a northward movement of 800 km (record 3).

The rate of autumn dispersal was estimated from band returns as about 350 km per month — to wintering grounds in Washington, Oregon, and central California (mainly in December–March); this pattern is strongly biased by the distribution of major cities. Not only are banded Glaucous-winged Gulls more likely to be encountered in cities, but the gulls also concentrate there to feed on refuse dumps (Cogswell 1977). Butler et al. (1980) found no difference in the distances moved by different age groups, although Woodbury and Knight (1951) had found that first-year birds moved farther away than older individuals. Even in December, nearly 40% of encounters were within 100 km of the banding site, suggesting that a substantial part of the population is resident. Vermeer (1963) found that individuals tended to return to traditional sites in successive winters.

Among a small sample of birds banded in Alaska and encountered (mainly as sight records) in British Columbia (records 4 and 5), encounters were chiefly in winter (73% between December and February), with only one in summer.

Glaucous-winged Gulls are coastal birds, and the pattern of encounters reflects this. The recovery files include several encounters showing movement far inland and to the east of the normal range; unfortunately, Glaucous-winged Gulls take the same band size as Mallards *Anas platyrhynchos* and these encounters may have arisen from band numbers being misread. We have excluded all records east of 110°W. However, the Glaucous-winged Gull is a “fairly frequent visitor to the N.W. Hawaiian Islands” (Pratt et al. 1987) and to Japan (Brazil 1991), so there seems no reason to doubt the authenticity of records 6 and 7, the first of which was of a bird recaptured by a bander.

The encounter in Yukon (record 8) would, if genuine, constitute only the second record for the Yukon (Godfrey 1986). However, the encounter code (98) indicates that only the band or band number was reported, without any supporting details; consequently, this recovery has to be regarded as incompletely authenticated.

Like other large gulls, Glaucous-winged Gulls can live a long time. The North American record of 22 years and 1 month reported by Clapp et al. (1982) is now exceeded by a bird banded as a nestling at Mitlenatch Island, B.C., and encountered in California at 23 years and 5 months (record 9). However, Campbell et al. (1990b) reported several individuals, identified by plumage characteristics and habits, that lived more than 25 years.

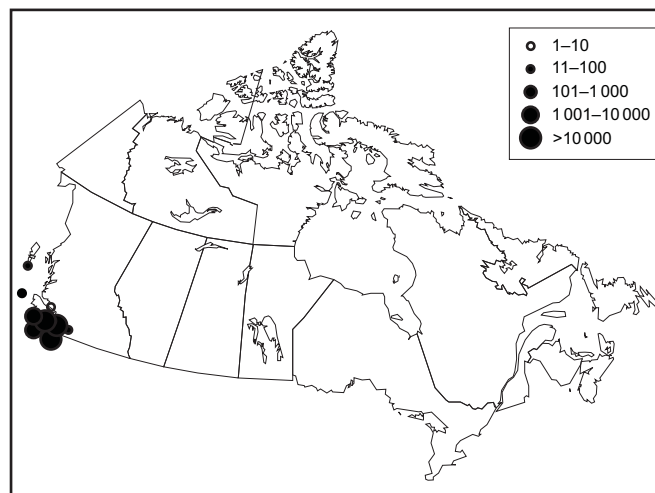
Encounter records: Glaucous-winged Gull

1	0396-52467 DAH	U 00	U 97	03/08/39 22/01/40	Imrie Island, BC Alcatraz Island, CA	48°40'N 123°10'W 37°40'N 122°20'W	5 mo. 1 222 km S4°E
2	0857-69437 RWC	L 03	U 00	05/08/70 18/08/71	Cleland Island, BC Lompoc, CA	49°10'N 126°00'W 34°30'N 120°20'W	1 yr. 0 mo. 1 692 km S21°E
3	0867-84563 BCPM	L 07	U 52	19/07/73 16/06/75	Cadboro Bay, BC near Prince Rupert, BC	48°20'N 123°10'W 54°10'N 130°10'W	1 yr. 11 mo. 808 km N50°W
4	0586-88077 FSW	L 05	U 00	20/07/64 02/05/65	Homer, AK Lasqueti Island, BC	59°30'N 151°30'W 49°30'N 124°30'W	10 mo. 2042 km S69°E
5	0646-89489 LJP	AHY 00	U 87	06/05/61 30/09/63	Anchorage, AK Vancouver, BC	61°10'N 149°50'W 49°10'N 123°00'W	2 yr. 4 mo. 2 141 km N64°E
6	0587-37304 RWC	L 07	U 89	22/07/67 04/12/71	Tofino Inlet, BC Midway Island, HI	49°00'N 125°40'W 28°10'N 177°20'W	4 yr. 4 mo. 4938 km S82°W
7	0587-02707 DAH	L 00	U 26	29/07/56 81/10/58	Gulf Islands, British Columbia at sea off Hokkaido, Japan	48°20'N 123°10'W 42°00'N 144°00'E	2 yr. 3 mo. 6 859 km S88°W
8	0527-27190 EDW	L 00	U 98	27/08/54 99/93/62	near Seagull Island, BC near Rancheria, YT	48°10'N 123°30'W 60°00'N 130°50'W	8 yr. 1 568 km N48°W
9	0807-33407 RWC	L 05	U 00	02/08/69 20/01/93	Mitlenatch Island, BC near San Francisco, CA	49°50'N 125°00'W 38°00'N 122°50'W	23 yr. 5 mo. 1 329 km S8°E

Summary of banding statistics: Glaucous-winged Gull

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			71 162
<i>No. encountered per 1 000 banded (1955–1995)</i>			87
Total no. encountered (1921–1995)	8 727	140	8 867
No. encountered from foreign bandings	2 139	13	2 159
Maximum period from banding to encounter (mo.)	281	238	281
No. Canadian-banded birds moving >0 km	6 031	119	6 192
Mean movement >0 km of Canadian-banded birds (km)	158	56	156
Maximum movement from all encounters (km)	6 859	2 140	6 859
% recovered (encountered dead)	41	19	41
% direct recoveries	35	25	35
% encountered during banding operations	0	0	0

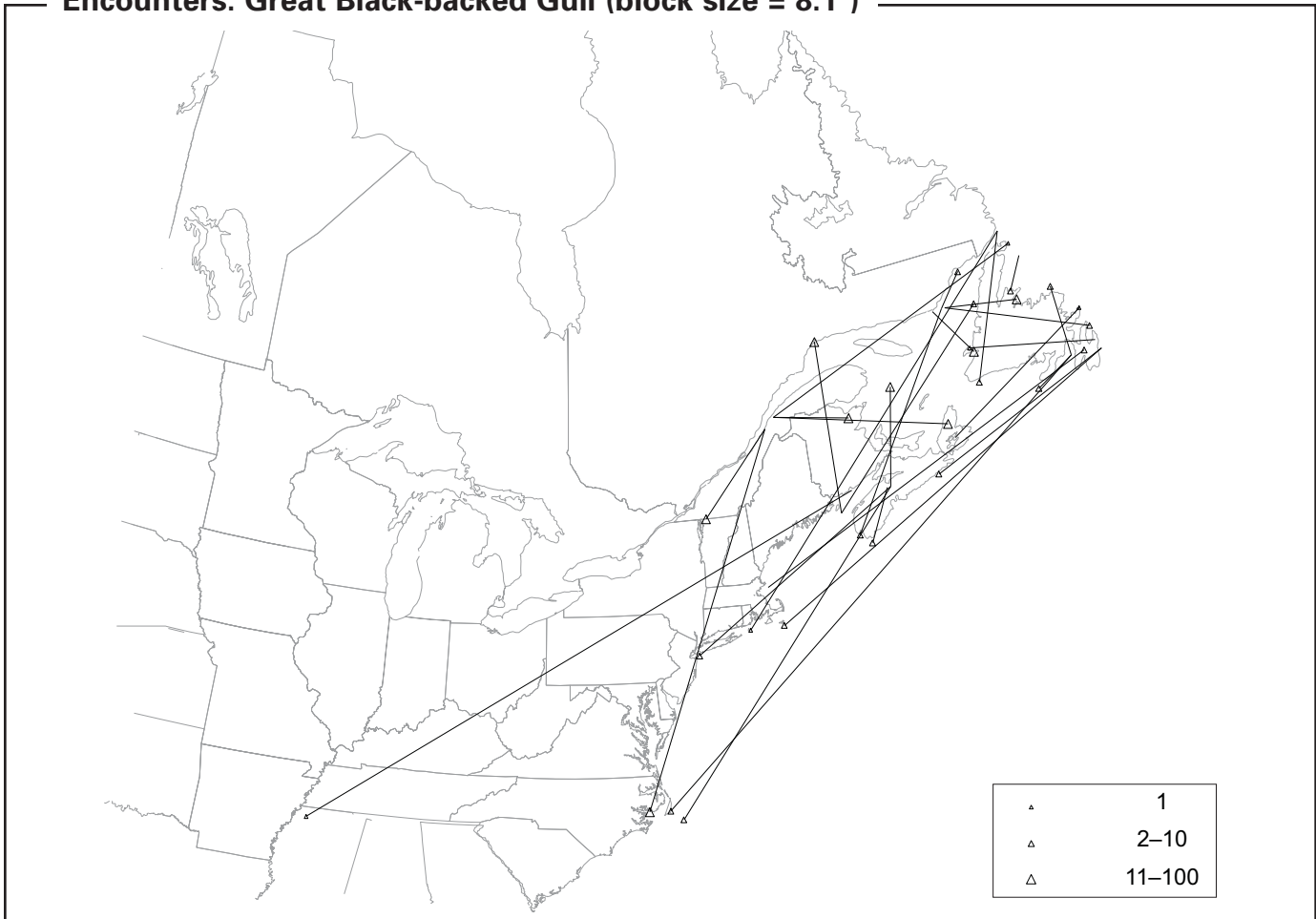
Banding effort: Glaucous-winged Gull



Top banders: RWC, RBCM, VM, GFV, EDW

Great Black-backed Gull (*Larus marinus*) 047.0

Encounters: Great Black-backed Gull (block size = 8.1°)



Great Black-backed Gulls breed along the Atlantic coast from northern Labrador south to New York and uncommonly on the Great Lakes. They winter mainly on the east coast from the Strait of Belle Isle southward and in small numbers on the St. Lawrence River and the Great Lakes (Good 1998).

Banding effort has been concentrated at colonies in the Gulf of St. Lawrence; almost all the gulls banded have been chicks. Most encounters reported involved dead birds (95%); of these, 74 were shot. Some recovery information on birds banded at Manawagonish Island, New Brunswick, was given by Astle and McAlpine (1985).

Movements were generally along the eastern seaboard, from Newfoundland south to the Carolinas

(records 1–6). There have been nine encounters of Quebec-banded birds in Ontario (records 7 and 8) and one from New Brunswick (record 9). In addition, there have been 28 encounters in Canada of birds banded in Maine (New Brunswick 6, Nova Scotia 14, Quebec 4, Newfoundland and Labrador 2, and Ontario 2 [record 10]) and 7 from Massachusetts (Newfoundland and Labrador 1 [record 11], Nova Scotia 4, Prince Edward Island 1, and Quebec 1). Patterns of encounters did not differ greatly between the first and subsequent years after banding, although the sample of older birds was small. Mean encounter distances were greatest in winter (January–March, approximately 750 km) and least in summer (July–September, 198 km). The most distant encounter of a Canadian-banded bird (2411 km) was of a bird banded on Newfoundland and found in North Carolina (record 2).

The distribution of encounters suggests that movements follow the coastline, although a gull banded as a local near Cape Cod, Massachusetts, was recovered at the western end of Lake Ontario less than 1 month later, suggesting an overland route (record 10). The recovery of one bird inland in northern Mississippi (record 12) would constitute an interesting record if authentic. The species has not been recorded away from the coast in Mississippi, although there are a number of records in Tennessee (T. Schiefer and G.D. Jackson, pers. commun.). Unfortunately, the circumstances of this recovery do not preclude the possibility of a misread band number. The same

applies to the apparent trapping of a bird banded in Massachusetts in 1970 and retrapped at Churchill, Manitoba, in 1977: the species is only an accidental vagrant at Churchill, where many geese, carrying a band of the same size, are trapped.

Great Black-backed Gulls appear to be among the longest-lived of North American birds. Twenty-six encounters were of birds more than 10 years old at death. The longevity record for this species in North America was 23 years (record 8, Clapp et al. 1982), but has since been surpassed by a Quebec bird, encountered only 133 km from where it was banded, at 27 years and 4 months (record 13).

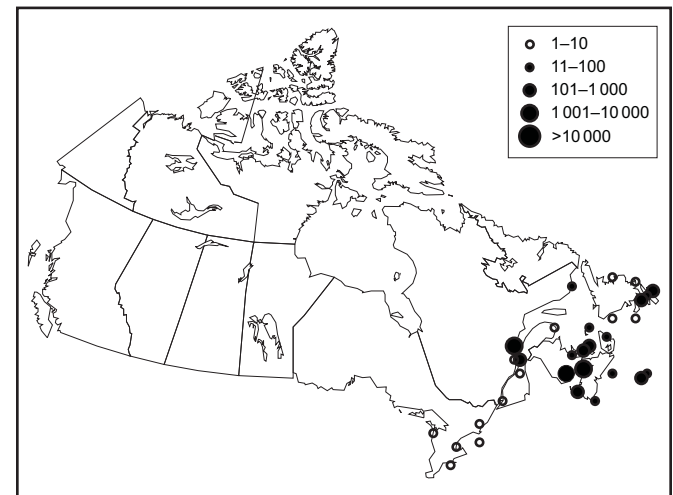
Encounter records: Great Black-backed Gull

1	0867-90150 WOA	L 03	U 26	16/07/73 14/10/74	Lancaster, NB Duck Island, NC	45°10'N 66°00'W 35°40'N 75°30'W	1 yr. 3 mo. 1 323 km S44°W
2	0587-69411 MUN	ASY 03	M 26	19/07/84 ??/03/87	near St. John's, NL near C. Hatteras, NC	47°10'N 52°40'W 35°00'N 76°40'W	2 yr. 8 mo. 2 411 km S65°W
3	0937-00796 WT	L 05	U 00	19/07/74 22/06/75	Red Island, Placentia Bay, NL Arundel, ME	47°20'N 54°10'W 43°20'N 70°20'W	11 mo. 1 334 km S75°W
4	0036-21547 BC	L 32	U 09	24/07/31 ??/04/64	Yarmouth, NS Franklin, ME	43°50'N 66°00'W 44°00'N 68°10'W	33 yr. 9 mo. 187 km N72°W
5	0517-38331 LGL	L 00	U 14	06/07/52 31/12/52	Big Pilgrim Island, QC Charleston Heights, SC	47°40'N 69°40'W 32°50'N 79°50'W	5 mo. 1 854 km S34°W
6	0577-23208 LGL	L 00	U 26	01/07/59 28/12/59	Big Pilgrim Island, QC Swan Quarter, NC	47°40'N 69°40'W 35°20'N 76°20'W	5 mo. 1 457 km S28°W
7	0517-38205 AB	L 00	U 00	06/07/52 22/12/52	Strawberry Island, QC Cootes Paradise Marsh, ON	47°40'N 69°40'W 43°10'N 79°50'W	5 mo. 945 km S66°W
8	0517-38331 LGL	L 05	U 14	06/07/52 26/09/75	Gull Rock Island, QC Don Mills, ON	47°40'N 69°40'W 43°40'N 79°20'W	23 yr. 2 mo. 870 km S67°W
9	0697-43540 WOA	L 03	U 00	12/07/74 14/04/75	Manawagonish Island, NB Presqu'île, ON	45°10'N 66°00'W 43°50'N 77°30'W	9 mo. 924 km S85°W
10	0757-98850 WHD	L 03	U 00	22/06/65 11/07/65	near Portsmouth, ME near Oakville, ON	42°50'N 70°30'W 43°20'N 79°40'W	19 dy. 747 km N83°W
11	0907-00187 WHD	AHY 01	U 01	13/07/68 ??/08/69	near Cape Cod, MA Markland, NL	42°30'N 70°30'W 47°20'N 53°30'W	1 yr. 1 mo. 1 440 km N62°E
12	0867-90125 WOA	L 09	U 03	16/07/73 01/01/74	Manawagonish Island, NB Arkabutla Dam, MS	45°10'N 66°00'W 34°00'N 90°00'W	6 mo. 2 346 km S69°W
13	0547-14420 LGL	L 05	U 00	03/07/55 07/11/82	near St. Simon, QC Matane, QC	48°10'N 69°00'W 48°50'N 67°30'W	27 yr. 4 mo. 133 km N56°E

Summary of banding statistics: Great Black-backed Gull

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			8 001
<i>No. encountered per 1 000 banded (1955–1995)</i>			41
Total no. encountered (1921–1995)	478	4	531
No. encountered from foreign bandings	36	2	39
Maximum period from banding to encounter (mo.)	328	32	328
No. Canadian-banded birds moving >0 km	359	2	384
Mean movement >0 km of Canadian-banded birds (km)	365	1 211	365
Maximum movement from all encounters (km)	2 346	2 411	2 411
% recovered (encountered dead)	94	100	95
% direct recoveries	46	0	46
% encountered during banding operations	1	0	1

Banding effort: Great Black-backed Gull



Top banders: WOA, CKC, LGL, MUN, AB

Western Gull (*Larus occidentalis*) 049.0

Encounters: Western Gull



Western Gulls breed on the Pacific coast of the United States and hybridize with Glaucous-winged Gulls in northern Washington and extreme southwestern British Columbia (Campbell et al. 1990b). They winter from southern coastal British Columbia to southern Baja California.

None has been banded in Canada (hence no banding effort map). All but one encounter in Canada

involved birds banded in Oregon and Washington: the most southerly was a bird banded on the Farallon Islands, California (record 1). Most encounters occurred in the populated Vancouver–Victoria area; the two most northerly are listed (records 2 and 3). Encounters in Canada occurred mainly between October and February. Twelve of the 14 encounters in Canada involved birds less than 1 year old: the oldest recovery (record 4) was less than 2 years old.

Encounter records: Western Gull

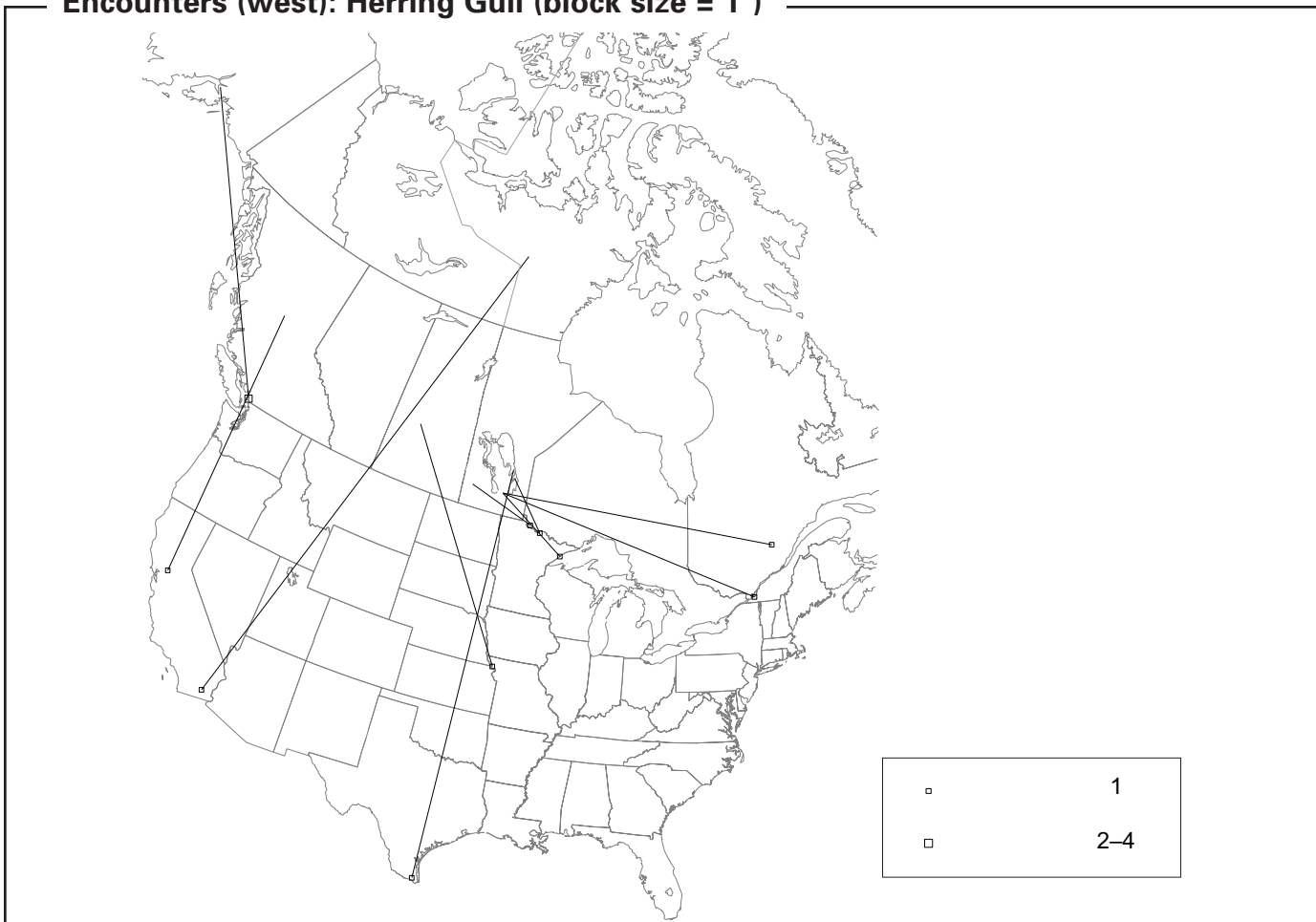
1	0846-63906 PRBO	L 05	U 00	27/06/83 04/09/83	Farallon Islands, CA Vancouver Island, BC	37°40'N 123°00'W 48°40'N 123°30'W	3 mo. 1 225 km N2°W
2	0026-28491 RWF	U 00	U 00	10/07/35 LT/01/36	Cloverdale, OR near Kingcome Inlet, BC	45°10'N 123°50'W 51°??'N 126°??'W	6 mo. 835 km N26°W
3	0346-57487 RWF	U 00	U 89	10/07/35 20/01/36	Cloverdale, OR near Port McNeil, BC	45°10'N 123°50'W 50°30'N 127°30'W	6 mo. 654 km N23°W
4	0346-57729 RWF	U 00	U 26	17/07/36 22/02/38	Cloverdale, OR Cleland Island, BC	45°10'N 123°50'W 49°10'N 126°00'W	1 yr. 7 mo. 474 km N79°W

**Summary of banding statistics:
Western Gull**

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			0
<i>No. encountered per 1 000 banded (1955–1995)</i>			
Total no. encountered (1921–1995)	13	2	15
No. encountered from foreign bandings	13	2	15
Maximum period from banding to encounter (mo.)	19	–	19
No. Canadian-banded birds moving >0 km			
Mean movement >0 km of Canadian-banded birds (km)			
Maximum movement from all encounters (km)	1 225	–	1 225
% recovered (encountered dead)	85	–	86
% direct recoveries	76	–	80
% encountered during banding operations	7	–	6

Herring Gull (*Larus argentatus*) 051.0

Encounters (west): Herring Gull (block size = 1°)



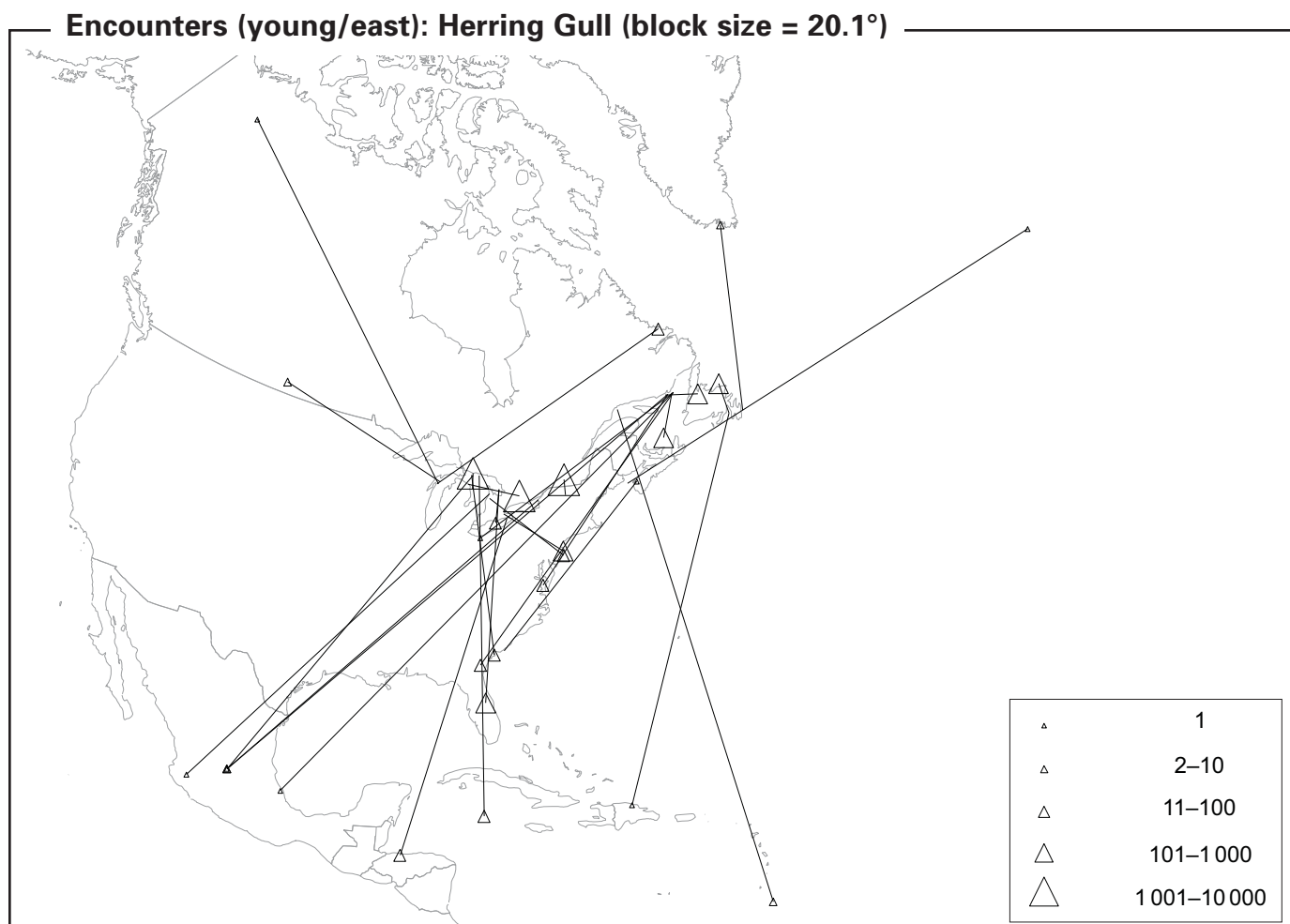
The Herring Gull is a circumpolar superspecies with many closely related forms distributed throughout northern North America, Europe, and central and northern Asia (Perrins and Snow 1998). The subspecies represented in North America, *L. a. smithsonianus*, breeds around the Great Lakes, along the eastern seaboard from North Carolina to Labrador, beside lakes and rivers throughout the boreal zone, and on Low Arctic tundra from Alaska to Labrador. It is the commonest large gull of eastern Canada, but is scarcer on the Pacific coast (nesting in coastal and northern British Columbia) and in the interior, where it breeds widely in Manitoba, but only in the north of Saskatchewan and Alberta (Salt and Salt 1976).

Herring Gulls winter on the Pacific coast from southeast Alaska to Mexico, in the Great Lakes region,

and on the east coast from the Gulf of St. Lawrence and Newfoundland to the southern United States and throughout the Caribbean. Breeding-age birds of the Great Lakes and east coast populations winter within the breeding range (Pierotti and Good 1994).

Banding effort has concentrated on chicks, chiefly in colonies in Atlantic Canada and the Great Lakes. With over 100 000 banded and more than 10 000 encounters, this species dwarfs all others except the Ring-billed Gull in the richness of data available. These data have been the subject of a greater number of, and of more detailed, publications than are available for any other North American seabird. Hence, this account is mainly a précis of previous work.

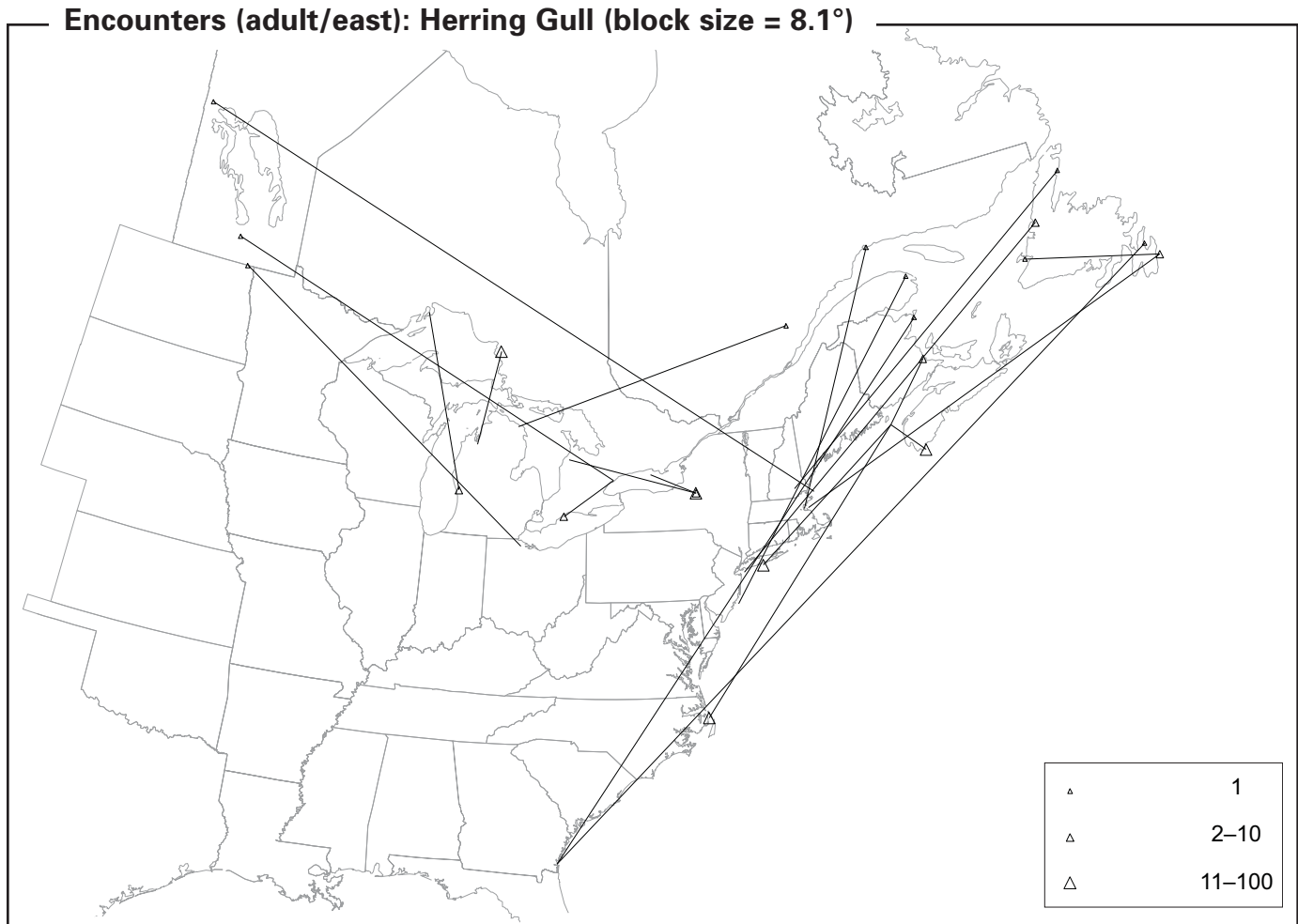
The earliest treatment of North American Herring Gull banding was provided by Eaton (1933, 1934a,



1934b), who dealt with encounters from banding at Grand Manan, New Brunswick, and Bonaventure Island and the North Shore of the Gulf of St. Lawrence, Quebec, as well as several sites in the United States. Threlfall (1978) and Gross (1940) analyzed recoveries of birds banded in Atlantic Canada (Newfoundland and New Brunswick, respectively); Gross (1940) also compared New Brunswick recoveries with those of birds banded in the Great Lakes. Kadlec and Drury's (1968) analysis included the population of Atlantic Canada. Southern (1968), Moore (1976), Gilman et al. (1977), and Weseloh (1984) analyzed recoveries of birds banded in the Great Lakes region.

Throughout their distribution, encounters are concentrated along waterways and coasts and in cities; like Glaucous-winged Gulls, Herring Gulls are great

garbage eaters and concentrate where people do. Most encounters were in the region of banding. Among long-distance encounters, the majority were in Florida, Louisiana, and Texas. Young birds from both the Great Lakes and the East Coast were encountered more or less throughout the winter range. However, those from Atlantic Canada predominated in Florida (61%, $n = 203$, record 1) and were less important in Texas (30%, $n = 107$, record 2) and Mexico (5%, $n = 41$); one bird each reached Honduras (record 3) and Cuba; those from Ontario made up 66% of encounters in Mexico (record 4), 50% in Honduras (plus one in El Salvador, record 5, and four in Cuba, record 6), 24% of those in Texas, but only 18% of those in Florida. Birds from Quebec, mainly the North Shore of the Gulf of St. Lawrence, were intermediate, comprising 21% of encounters in Florida,



19% of those in Texas, and 10% of those in Mexico (records 7 and 8); one came from Honduras (record 9). The vast majority of these southern encounters were of birds in their first year.

In November, the main southward movement of young birds in eastern North America begins abruptly; over the next month, the mean distance of encounter of first-year birds doubles (from 366 to 727 km). First-year and subadult gulls move south on a broad front from the Mississippi valley to the Atlantic coast, reaching the Gulf coast, Mexico, and Central America by January and February. A higher proportion of subadults winters on the eastern Great Lakes than on the western lakes. There is a steady decline in recovery distances with age, so that adult Herring Gulls (3 years and older) are virtually resident year-round within the Great Lakes region; only in March are 10% or more of

adult encounters outside the breeding range. The spring return of young birds begins in March; by May, 68% of juvenile recoveries are within the breeding range.

Threlfall (1978) analyzed encounters of eastern Herring Gulls banded in several rapidly growing colonies in Witless Bay, Newfoundland, from 1966 through 1972. Fifty-eight percent of recoveries were on Newfoundland, and 75% of those encountered in their first year were encountered within 6 months of banding. They showed a wide general dispersal after fledging, including a substantial northward movement (one as far as Greenland, record 10). By winter (December–March), most first-year birds had moved to the eastern seaboard of the United States, especially the New York region; the average movement in winter was about 1 450 km, with one bird reaching the

Encounters (transatlantic): Herring Gull

Dominican Republic (record 11). Second- and third-year birds moved shorter distances, and adults least of all (about 56% of the distance moved by 2-year-olds). Adults also showed a different seasonal pattern of recovery, with a peak between March and September within 65 km of the colony and another from November to May in New England. Many adults were recaptured or resighted at the colony where they had been banded.

Threlfall (1978) also found that most of the encounters on Newfoundland of birds banded in the Great Lakes region occurred from August to October, supporting Moore's (1976) finding that some Great Lakes young move east and north, rather than south, after fledging, at the same time that many Newfoundland young move south and west to New England. The lack of encounters of locally banded

Herring Gulls in winter on Newfoundland shows that most of the large numbers wintering there originate from elsewhere. Many may be from farther north, where there has been little banding; few can be from the Great Lakes, as birds banded there winter much farther south.

Eaton (1933, 1934a, 1934b), dealing with colonies in New Brunswick and the Gulf of St. Lawrence, was the first to determine that first-year birds often migrate substantial distances, to the southern United States and Mexico, in winter, while breeding-age birds remain mostly in the vicinity of their breeding areas. Similar results were reported by Astle and McAlpine (1985) for birds breeding in New Brunswick. Gross (1940) compared recoveries of birds banded on Kent Island, New Brunswick (Bay of Fundy), with those banded in the Great Lakes

region. In all age groups, Kent Island birds appeared to move a little farther, probably partly because more Great Lakes birds than Kent Island birds wintered locally. The substantial wintering population of Herring Gulls in the Bay of Fundy, like that on Newfoundland, is evidently not of local origin. Kent Island birds often dispersed north after fledging, before moving south, as Newfoundland ones did; recoveries north of the banding site were between August and December, with none from January to March. Most adults wintered on the eastern U.S. coast between Maine and the Carolinas; the heavy concentration of recoveries along the coast differs from that of Great Lakes birds, which are centred along inland waterways, especially the St. Louis, Mississippi, and Ohio rivers and their tributaries. Birds from Kent Island were encountered as far apart as Honduras (record 3) and the northeast Atlantic off Spain (record 12).

Moore (1976) analyzed recoveries of birds banded in the Great Lakes region and recovered through 1971. He found some differences between birds originating west and east of longitude 85°W, i.e.,

the junctions of Lake Huron with lakes Michigan and Superior. First-year birds were recovered mainly between August and October and showed some northward dispersal like other populations, despite the scarcity of people to report the bands north of the Great Lakes. During fall and early winter — and only then — many “western”-banded birds moved into the eastern lakes. Eastern birds did not move west, but many were encountered northeast in Ontario and Quebec, some as far as the Gulf of St. Lawrence and Newfoundland.

Herring Gulls are very important indicators of environmental pollution in the Great Lakes (see, for example, Mineau et al. 1984), so it has been necessary to establish whether adult Herring Gulls are confined to the Great Lakes basin. The vast majority (>99%) of the more than 12000 encounters of Great Lakes Herring Gulls reviewed by Weseloh (1984) came from within that region. Moreover, birds more than 3 years old were rarely encountered away from the Great Lakes basin, and there were very few encounters in the Great Lakes basin of birds banded elsewhere. Weseloh (1984) concluded that the Great Lakes population is

more or less isolated from other North American Herring Gull populations. Gilman et al. (1977) used recoveries to examine movement within the Great Lakes system and found that most recoveries were on the same lake where they were banded, although there was some movement from Lake Superior to Lake Michigan and some emigration of colonizers from lakes Superior and Huron to Lake Michigan and from Lake Erie to Lake Superior. Herring Gulls breeding in western Canada (west of 95°W) remain mainly west of the Mississippi River, except those from southern Manitoba, which move to the Great Lakes and farther east.

Survival has been estimated from band recoveries in several studies, reviewed by Kadlec and Drury (1968) and Kadlec (1975), who found that previous estimates of band loss (which confounds the calculating of survival rates) were much too high, and that only 3% of bands are lost within 7 years. The rapid growth of Herring Gull populations during the period of most banding effort, combined with the species' long lifespan (up to 40 years or more in captivity) and the likelihood that gulls may outlive

their bands, has made it very difficult to construct reliable life-tables from band recovery data. However, the very large number of encounters suggests that the observed longevity record for North American Herring Gulls of at least 27 years and 3 months, estimated by Clapp et al. (1982) (record 13), may be close to the true maximum life expectancy of the species. Although seven encounters were of birds 20 or more years of age, less than 5% of birds encountered were more than 10 years old: the vast majority were in their first 2 years of life.

One encounter of an Iceland-banded gull (record 14) presumably refers to the race *L. a. argentatus* that has not previously been identified in Canada (Godfrey 1986). Correspondingly, the recovery off Spain (record 12) constitutes the first record of the North American race *L. a. smithsonianus* in European waters; in recent years, there have been a number of sight records of this subspecies in Ireland, all in first-winter plumage (P. Smiddy, pers. commun.). Not a single encounter has been reported in Canada of the nearly 300 000 Herring Gulls banded in Britain.

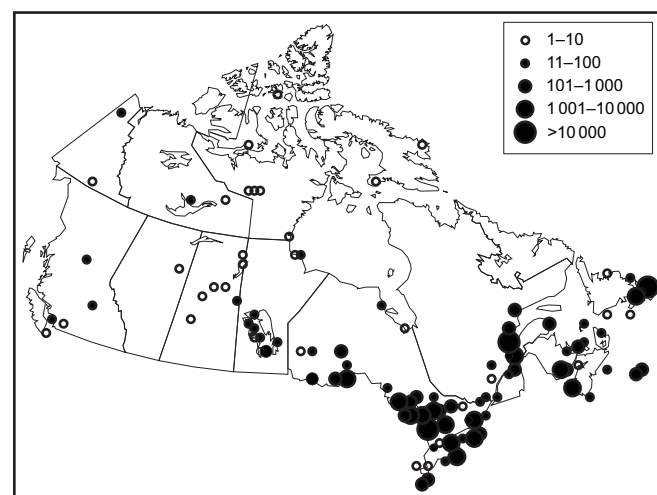
Encounter records: Herring Gull

1	0366-49155	HY	U	08/08/40	Kent Island, NB	44°30'N 66°40'W	6 mo.
	BC	00	00	27/02/41	Palm Beach, FL	26°40'N 80°00'W	2 316 km S35°W
2	0516-46175	HY	U	22/07/51	Lancaster, NB	45°10'N 66°00'W	6 mo.
	WOA	00	00	??/01/52	Bryan Beach State Park, TX	28°50'N 95°20'W	3 151 km S65°W
3	0376-53151	U	U	10/07/37	Kent Island, NB	44°30'N 66°40'W	5 mo.
	BC	00	89	24/12/37	near Tela, Honduras	15°40'N 87°20'W	3 752 km S38°W
4	0526-83015	L	U	29/06/54	Huyck Point, ON	43°50'N 77°30'W	1 yr. 0 mo.
	HHS	00	01	24/06/55	Veracruz State, Mexico	20°00'N 96°40'W	3 195 km S40°W
5	0626-66058	L	U	08/06/63	near Southampton, ON	44°20'N 81°20'W	6 mo.
	HHK	00	01	11/01/64	east of La Libertad, El Salvador	13°40'N 89°00'W	3 491 km S14°W
6	0616-03876	L	U	18/06/66	Gravenhurst, ON	44°50'N 79°20'W	10 mo.
	CHR	05	03	??/04/67	near Havana, Cuba	23°00'N 82°20'W	2 438 km S8°W
7	0406-56624	U	?	01/08/42	near Wolf Bay, QC	50°10'N 60°10'W	6 mo.
	TSH	00	06	01/02/43	Guanajuato State, Mexico	21°00'N 101°00'W	4 821 km S63°W
8	00097-64449	HY	U	20/07/37	Barachois, QC	48°30'N 64°10'W	6 mo.
	?	03	01	99/01/38	Guanajuato State, Mexico	21°00'N 101°00'W	4 478 km S60°W
9	0556-61317	L	U	02/07/60	Île aux Pommes, QC	48°00'N 69°10'W	3 mo.
	LGL	00	98	11/10/60	Utila, Bay Islands, Honduras	16°00'N 86°50'W	3 912 km S30°W
10	0686-17183	L	U	04/08/66	Witless Bay, NL	47°10'N 52°40'W	9 yr. 11 mo.
	WT	05	01	08/07/76	near Upernavik, Greenland	72°20'N 55°30'W	2 797 km N6°W
11	0826-25713	L	U	23/07/74	Placentia Bay, NL	47°20'N 54°10'W	2 mo.
	MUN	05	00	24/09/74	Gaspar Hernández, Dominican Republic	19°40'N 70°20'W	3 410 km S31°W
12	0366-48130	U	U	13/08/36	Kent Island, NB	44°30'N 66°40'W	1 yr. 3 mo.
	BC	01	03	99/11/37	at sea, 480 km northwest of Cape Finisterre, Spain	46°30'N 14°00'W	4 039 km S68°E
13	0496-31926	AHY	U	19/07/49	Kent Island, NB	44°30'N 66°40'W	26 yr. 2 mo.
	CWSAR	05	03	07/09/75	Annapolis, MD	38°50'N 76°30'W	1 028 km S59°W
14	216727	L	U	10/07/74	Skrudhar Island, east Iceland	64°54'N 13°38'W	9 mo.
	Iceland	00	00	02/04/75	Twillingate, NL	49°39'N 54°40'W	2 918 km S75°W

Summary of banding statistics: Herring Gull

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			123 680
<i>No. encountered per 1 000 banded (1955–1995)</i>			37
Total no. encountered (1921–1995)	9 735	477	10 707
No. encountered from foreign bandings	2 410	43	2 602
Maximum period from banding to encounter (mo.)	301	314	314
No. Canadian-banded birds moving >0 km	6 098	287	6 701
Mean movement >0 km of Canadian-banded birds (km)	611	239	614
Maximum movement from all encounters (km)	4 821	3 035	4 821
% recovered (encountered dead)	94	74	93
% direct recoveries	54	17	52
% encountered during banding operations	1	12	2

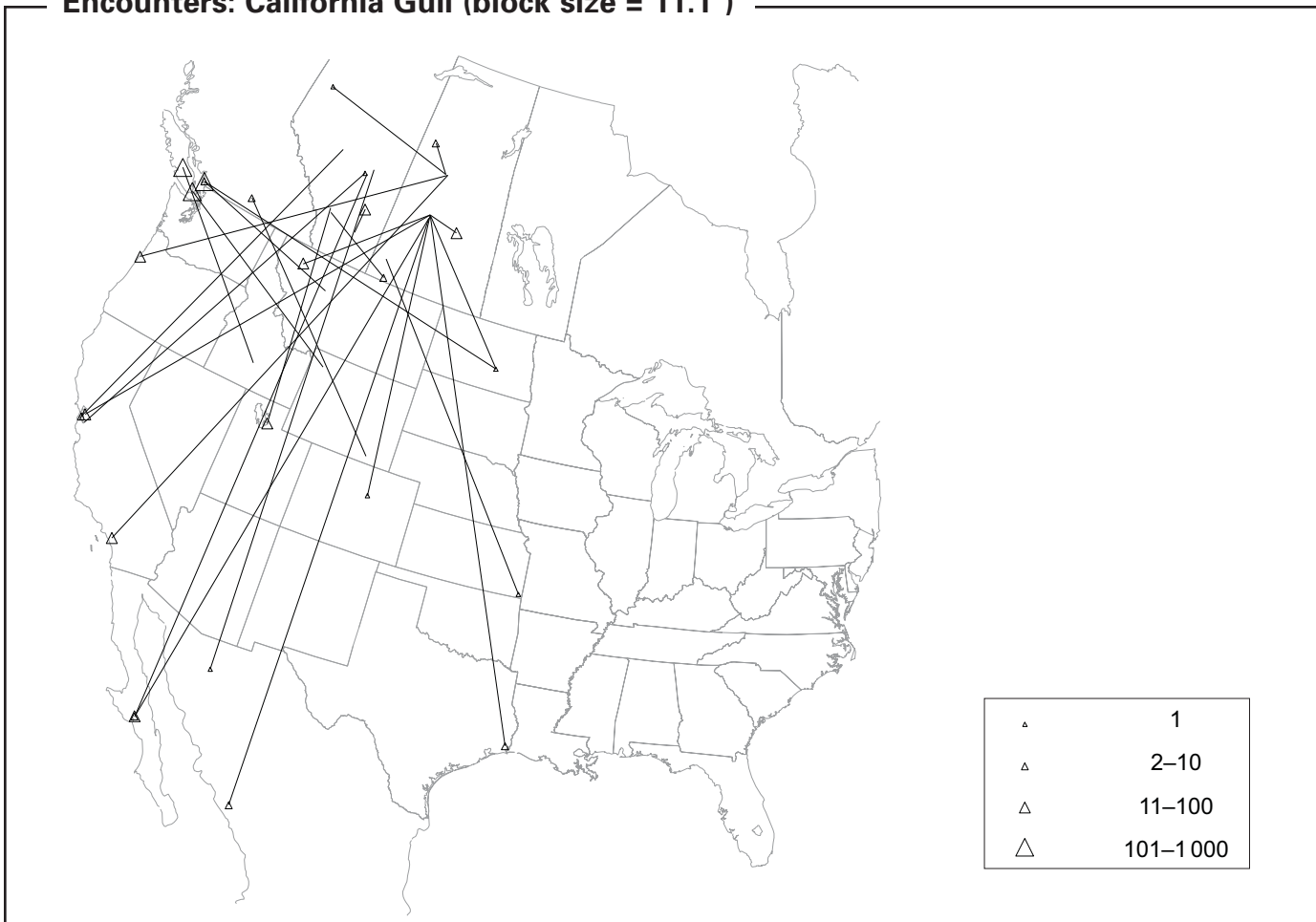
Banding effort: Herring Gull



Top banders: HHK, LGL, WT, AB, WOA

California Gull (*Larus californicus*) 053.0

Encounters: California Gull (block size = 11.1°)



California Gulls are birds of inland plains while breeding and are found on sea coasts in winter. In Canada, they breed from southern Mackenzie District south through eastern Alberta and Saskatchewan to southwestern Manitoba and in interior southern British Columbia. The winter distribution extends along the Pacific coast of North America from southern British Columbia south to Mexico (Winkler 1996). Small numbers winter inland in the lower Colorado River area, in Texas, and in the Salton Sea of southern California. This gull is common in southern British Columbia coastal waters in fall and spring, occurring as far north as the Queen Charlotte Islands (Campbell et al. 1990b).

Encounters (including sight records) of chicks banded in Saskatchewan were analyzed by Houston (1977), and encounters of birds banded in Alberta were analyzed by Vermeer (1970a); their results are treated here as representative of the Canadian population. Both studies found a striking pattern of westward movement to the Pacific coast in the fall; in some cases, birds reached the coast within 6 weeks of banding (record 1). In September and October, birds from the Canadian Prairies share the refuse dumps and shores of southern British Columbia with others that have moved north and west from breeding grounds in the United States; most birds then move south for the winter. Virtually all Canadian-banded first-year birds,

and about half the second-year birds, remain on the coast for the following summer, when older birds return to their prairie breeding grounds.

Canadian-banded birds have been encountered in Mexico (19: Baja California, 12 [record 2]; Sonora, 5 [record 3]; Sinaloa, 2 [record 4]), California (51 [record 5]), North Dakota (2), Texas (2), Kansas (1), Oregon (8), and Washington (13). The farthest movement was from Alberta to the Gulf coast of Louisiana (record 11). One bird banded in Alberta was encountered as an adult 8 years later, in Minnesota in June (record 6), demonstrating that not all young birds return close to their natal area.

Large-scale banding at colonies in the northwestern United States has resulted in numerous encounters in British Columbia, mostly in the Vancouver area. These birds originated from California, Oregon, North Dakota, Wyoming, Utah, Montana, and Idaho. The great majority of these encounters involved birds whose band numbers had been read by telescope. This technique, while very welcome, introduces a further bias into the recovery pattern; the chance of encounters is influenced, as always, not only by the density of human population, but also by the presence of people willing to sit down with a telescope observing gulls' legs. There are, for example, no fewer than 56 encounters in Burrard Inlet and adjacent Beach Grove, British Columbia, of birds banded as locals at Freezeout Lake, Montana (record 7). A substantial number of encounters are multiple — i.e., several observations of the same bird, frequently in subsequent years (record 8).

Origins of birds banded as locals and encountered (excluding multiple encounters) in the Lower Mainland of British Columbia were as follows:

Colorado, 1; Nevada, 1; North Dakota, 9 (record 9); Montana, 169; Utah, 15 (record 10); Idaho, 46; Wyoming, 93; California, 18; Oregon, 11; Washington, 55. Banding locations in the last three states were inland. In agreement with the Canadian experience, the great majority of encounters were in the first and second years of the birds' lives. Inland encounters were as follows: Montana to Saskatchewan, 4; Montana to Alberta, 2; and Wyoming to Saskatchewan, 4. As with Canadian records, several of these encounters involved birds of breeding age.

Two encounters in Louisiana (record 11) occurred before the species had been recorded in that state; their occurrence was not confirmed until fall of 1985 (J.V. Remsen, pers. commun.). Unfortunately, these band recoveries, and perhaps the one in Minnesota, must be treated with the greatest reservation because California Gulls are very similar to Ring-billed Gulls (which are abundant in Louisiana in winter) and breed in mixed colonies on the prairies; their chicks are virtually indistinguishable in the field (Salt and Salt 1976). Ring-billed Gulls had been banded at the same locality as these "California" Gulls, although not in the same year. There must, therefore, always be some doubt that birds banded as chicks were identified correctly.

The oldest encounter of a bird banded in Canada was of a nestling banded at Great Slave Lake, Northwest Territories, and encountered in the same area nearly 13 years later (record 12). The oldest bird banded in the United States and encountered in Canada was 11 years old when reported (record 13). Only one other encounter exceeded 10 years — a remarkably low apparent survival for a gull (cf. Ring-billed Gull, Herring Gull).

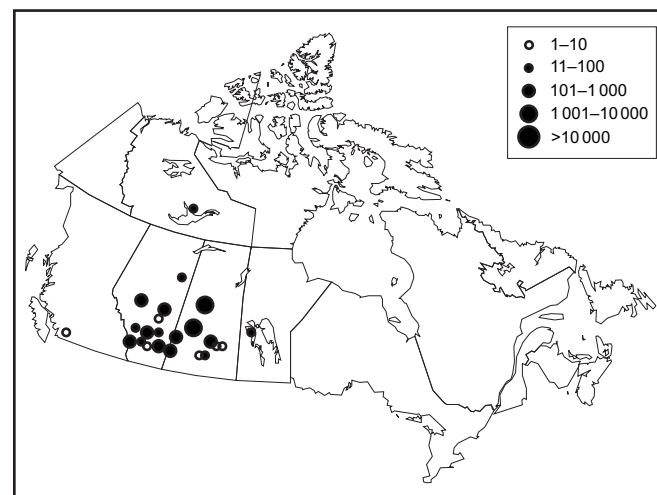
Encounter records: California Gull

1	0695-53725	L	U	01/07/69	near Saskatoon, SK	52°40'N 107°10'W	1 mo.
	CSH	07	52	17/08/69	near Vancouver, BC	49°00'N 123°00'W	1183 km S76°W
2	0007-00216	U	U	26/06/28	Bittern Lake, AB	53°00'N 113°00'W	1 yr. 10 mo.
	FLF	00	00	07/04/30	Baja California, Mexico	~28°00'N 114°00'W	2784 km S2°W
3	005-44378	L	U	22/06/27	Bittern Lake, AB	53°00'N 113°00'W	7 yr. 1 mo.
	FLF	00	01	??/07/34	Sonora State, Mexico	~29°00'N 111°00'W	2677 km S4°E
4	0545-93522	L	U	27/06/63	east of Hafford, SK	52°40'N 107°10'W	1 yr. 6 mo.
	CSH	00	47	??/12/64	Sinaloa State, Mexico	~24°00'N 108°00'W	3136 km
5	0585-88958	L	U	19/06/65	near Medicine Hat, AB	50°20'N 111°50'W	4 yr. 10 mo.
	CSH	03	01	15/04/70	near Big Pine, CA	36°40'N 118°10'W	1604 km S21°W
6	006-99889	L	U	28/06/28	Bittern Lake, AB	53°00'N 113°00'W	8 yr.
	FLF	00	00	FT/06/36	Como Lake, MN	44°50'N 93°00'W	1708 km S67°E
7	0725-99617	L	U	27/06/70	Freezeout Lake, MT	47°40'N 112°00'W	1 yr. 2 mo.
	LMM	07	52	01/08/71	Beach Grove, BC	49°00'N 123°00'W	824 km N83°W
8	0555-43529 KLD	L	U	04/07/59	Bamforth Lakes, WY	41°20'N 105°40'N	1603 km N65°W
		00	87	19/08/60	Burrard Inlet, BC	49°10'N 123°00'W	1 yr. 1 mo.
		00	87	01/11/61	Burrard Inlet, BC	49°10'N 123°00'W	2 yr. 4 mo.
		00	87	17/09/62	Burrard Inlet, BC	49°10'N 123°00'W	3 yr. 2 mo.
		00	87	18/09/63	Burrard Inlet, BC	49°10'N 123°00'W	4 yr. 2 mo.
9	0545-64859 RTG	L	U	20/06/59	Chase Lake National Wildlife Refuge, ND	47°00'N 99°20'W	2 mo.
		00	87	28/09/59	Burrard Inlet, BC	49°10'N 123°00'W	1763 km N84°W
10	0416-50437 AMW	L	U	14/06/41	near Ogden Bay Refuge, UT	41°00'N 112°10'W	4 yr. 2 mo.
		00	00	20/08/45	near Stuart Island, BC	50°20'N 125°00'W	1432 km N53°W
11	0007-00399 FLF	U	U	26/06/28	Bittern Lake, AB	53°00'N 113°00'W	3 yr. 7 mo.
		00	04	ST/01/32	Delacroix Island, LA	29°00'N 89°40'W	3217 km S45°E
12	0685-01582 NPWRC	L	U	29/06/69	Mackenzie, NT	62°10'N 114°10'W	12 yr. 11 mo.
		05	45	16/05/82	Mackenzie, NT	62°20'N 114°20'W	20 km N25°W
13	0615-95967 KLD	L	U	04/07/65	near Laramie, WY	41°20'N 105°40'W	11 yr. 1 mo.
		0	00	22/08/76	near Vancouver, BC	49°10'N 123°00'W	1608 km N51°W

Summary of banding statistics: California Gull

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			12 390
<i>No. encountered per 1 000 banded (1955–1995)</i>			24
Total no. encountered (1921–1995)	731	17	770
No. encountered from foreign bandings	421	6	435
Maximum period from banding to encounter (mo.)	155	51	155
No. Canadian-banded birds moving >0 km	284	11	304
Mean movement >0 km of Canadian-banded birds (km)	1 038	532	1 019
Maximum movement from all encounters (km)	3 217	1 877	3 217
% recovered (encountered dead)	36	58	37
% direct recoveries	32	47	32
% encountered during banding operations	0	0	0

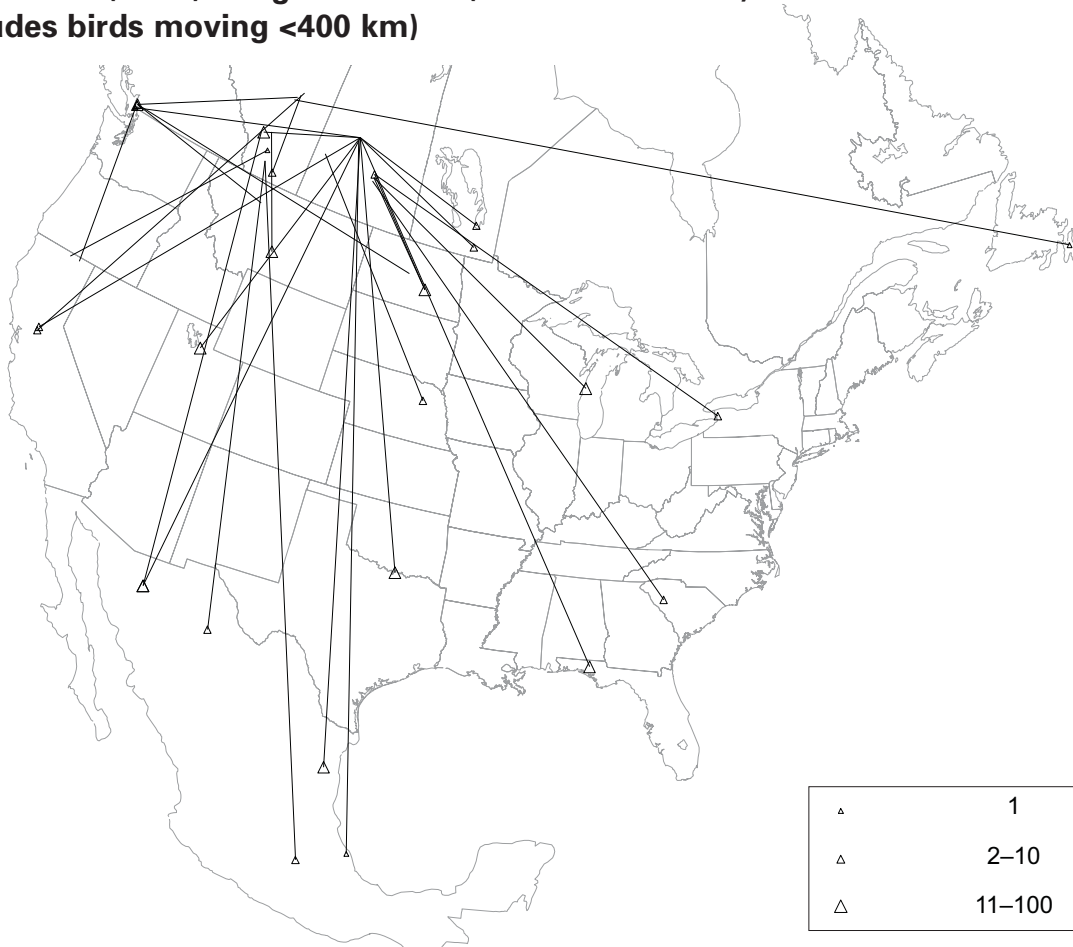
Banding effort: California Gull



Top banders: CSH, KV, WEM, MTM, AEP

Ring-billed Gull (*Larus delawarensis*) 054.0

Encounters (west): Ring-billed Gull (block size = 12.1°; excludes birds moving <400 km)



Ring-billed Gulls breed in two more or less distinct populations: a western group centred on the prairies and breeding south to Colorado and Wyoming, and an eastern one concentrated in the Great Lakes but extending down the St. Lawrence River to the Gulf of St. Lawrence, with outliers in James Bay, northeastern Newfoundland, and southern Labrador (Blokpoel and Tessier 1986). The western population shares some of the Pacific coast wintering range of California Gulls, but also winters inland in the Mississippi valley and northern Mexico. Eastern breeders winter on the Atlantic coast, especially in Florida and on the coast of the Gulf of Mexico,

straggling to the West Indies. Until recently, these two populations were separated by a clear “migratory divide” west of Lake Superior, but new colonies have been discovered at Lake of the Woods in the centre of this divide (Blokpoel and Tessier 1986).

Most banding operations have concentrated on chicks. In the eastern population, 70% of all bands have been put on in Ontario. Encounters have been analyzed by Southern (1974), Blokpoel and Haymes (1979), and Blokpoel and Tessier (1986), who also documented the dramatic increase in this species since the late 1940s. Encounters of western birds were analyzed by Vermeer (1970a). Blokpoel and Haymes

Encounters (young/east/north): Ring-billed Gull (block size = 13.1°; excludes birds moving <400 km)



(1979; see also Blokpoel and Courtney 1982) used band encounters to determine the origins of birds establishing a new colony near Toronto and developed a “contribution index,” which showed that the largest and closest colonies contributed most recruits to the new colony.

From May to September, most encounters reported for eastern birds were from the Great Lakes themselves. Dispersal begins in July and is widespread through September, with a number of encounters along the St. Lawrence seaway to the Gulf of St. Lawrence and a few on the U.S. Atlantic coast. There are a few exceptional encounters in Florida in July and August,

but the main movement south is from October to December, chiefly along a corridor from lakes Erie and Ontario southeast to the Atlantic coast around Chesapeake Bay. In January and February, over half the encounters are in Florida (record 1), where many birds evidently winter. Northward migration begins in late February, retracing the southward route; by May, very few remain in Florida, and three-quarters of encounters are within the Great Lakes region. A decline in the proportion of encounters from Florida in November–February since the 1960s suggests that the centre of gravity of the wintering area may have shifted northwards. The distribution of 1-year-old birds

**Encounters (young/east/south): Ring-billed Gull (block size = 2.1°;
excludes birds moving <400 km)**



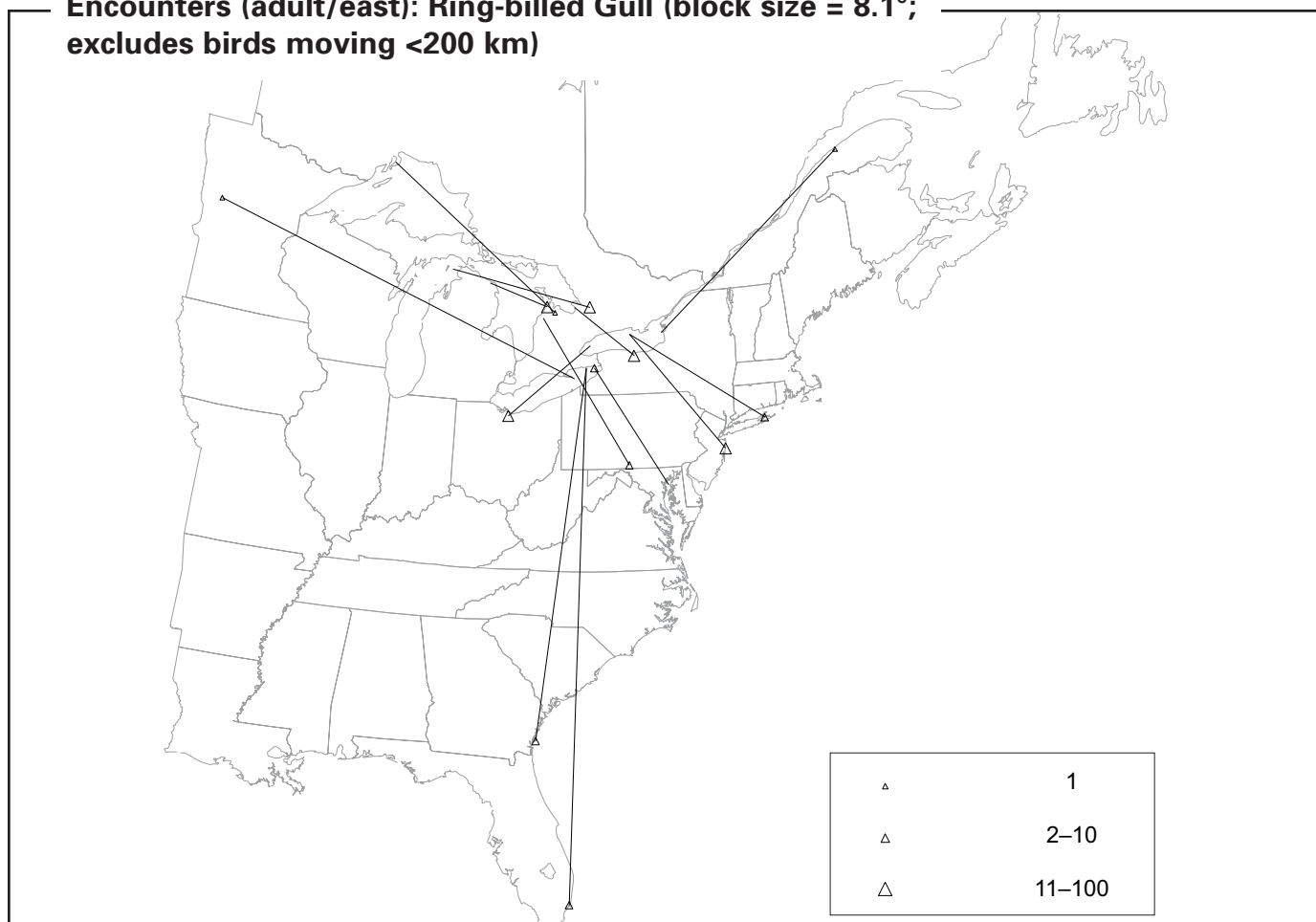
during the breeding season is unclear; they are encountered within the Great Lakes region then, but are rarely seen at the breeding colonies.

Although most of the population breeding in eastern Canada winters no farther south than Florida, there are significant numbers of encounters in the Caribbean, as well as one in Brazil (record 2). The latter is by far the most southerly record of the species (Brewer and Salvadori 1978); at that time, Ring-billed Gulls had not been recorded anywhere in continental South America (Meyer de Schauensee 1970). Thirty-two birds banded as nestlings in Ontario (mainly) and Quebec were encountered as follows: Bahamas, 11; Cuba, 7; Hispaniola, 6 (record 3); Jamaica, 3; Puerto Rico, 1; Guadeloupe, 2 (record 4);

Antigua, 1; St. Lucia, 1 (record 5). The species is considered a “vagrant” in the Lesser Antilles (Bond 1985). Small numbers of eastern birds were encountered in Mexico, mostly on the Caribbean coast and in Yucatán (record 6); however, there are single encounters on the Pacific coast of Mexico (record 7) and in El Salvador (record 8).

The western population of Ring-billed Gulls winters especially in California (record 9). In contrast to the eastern population, birds banded in the Prairie provinces showed no encounters in the Caribbean basin; although many were encountered in Mexico, they were all north of 18°N and were predominantly from Pacific coast states, with about 30 encounters inland (records 10–12), including one in the Federal

Encounters (adult/east): Ring-billed Gull (block size = 8.1°; excludes birds moving <200 km)

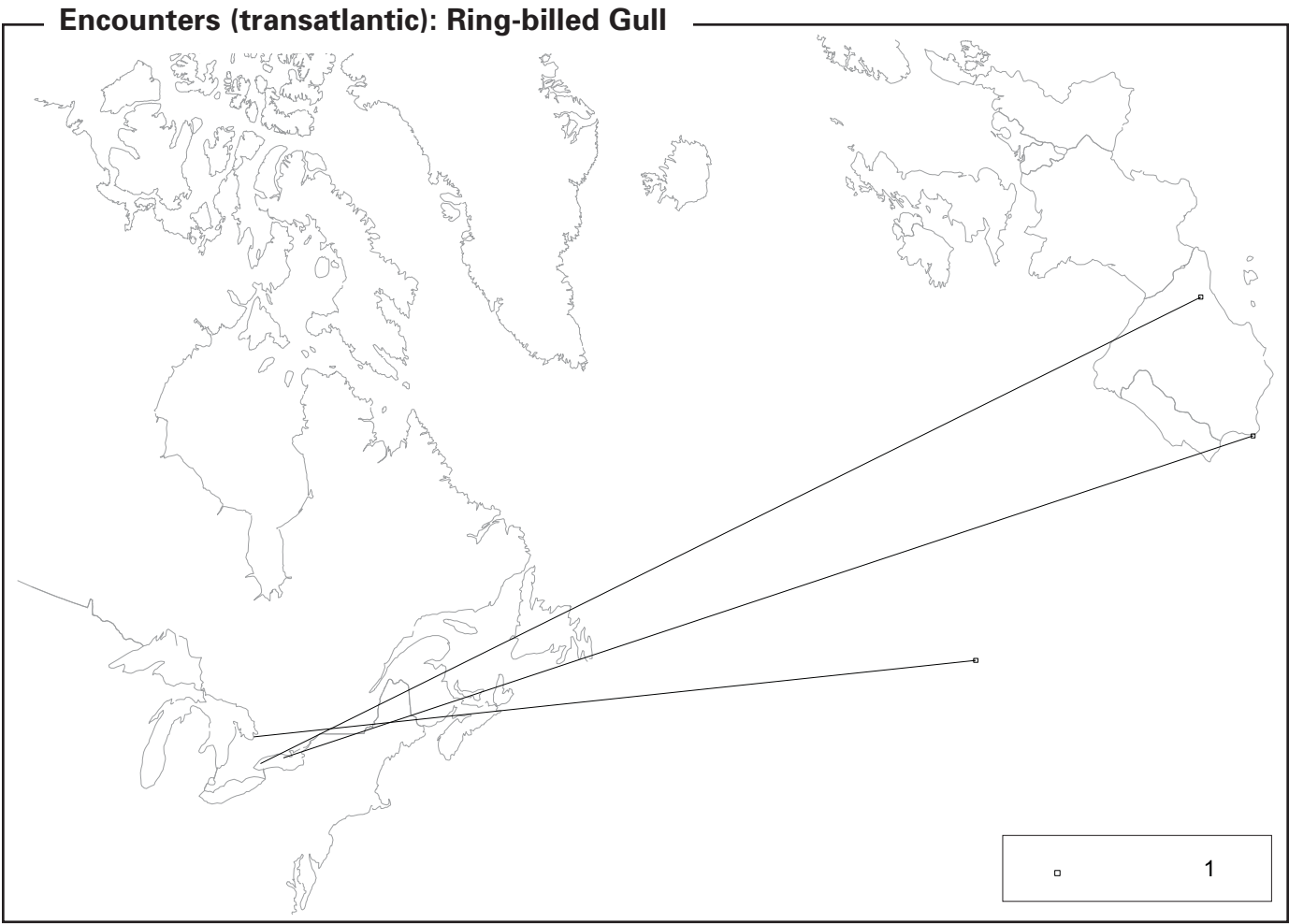


District. In spring, some birds take a direct, inland route to the breeding grounds, rather than retracing the fall migration, as California Gulls do (Vermeer 1970a). There is apparently very little interchange between western and eastern populations (Ryder et al. 1983), although a few encounters suggest dispersal between them (records 13–15).

Ring-billed Gulls occur regularly in Europe, with records from Spitsbergen, Norway, to Morocco and the Canary Islands; they occur annually in Britain (Perrins and Snow 1998). These records have become much more numerous in recent decades, perhaps because of the enormous increase in the North American population (Blokpoel and Tessier 1986); however, record 16 predates this increase and suggests

that transatlantic stragglers may not be a new phenomenon. Record 17, which was fully authenticated, was at the time only the second record of the Ring-billed Gull in Spain and in mainland Europe. There has now been a second encounter in Iberia (record 18).

An Ontario-banded bird (record 19) encountered in 1981 at Presqu'île Provincial Park in Ontario holds the longevity record for this species of 25 years and 1 month (Clapp et al. 1982). The encounter code of record 20, encountered 29 years after banding, does not preclude the bird having been long dead and so does not supersede this record. There are several other >25-year-old encounters, but none was recently dead when found.



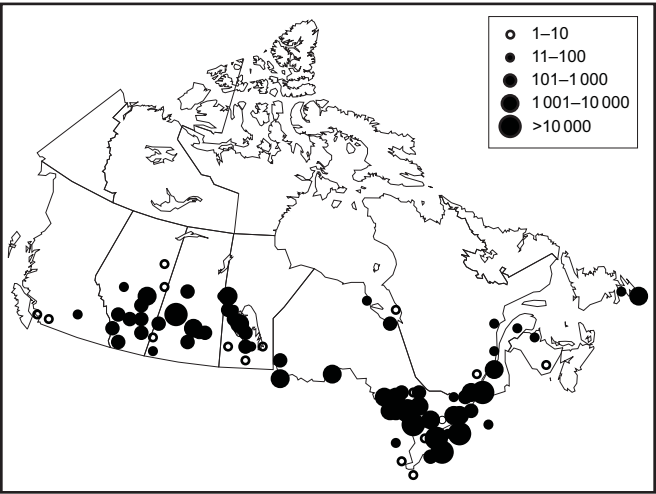
Encounter records: Ring-billed Gull

1	0725-77544 HHK	L 01	U 03	24/06/78 19/02/82	near Saugeen Shores, ON near Winter Garden, FL	44°20'N 81°20'W 28°20'N 81°20'W	3 yr. 8 mo. 1 781 km S
2	0675-69481 AB	L 02	U 28	22/06/68 23/11/68	near Presqu'île Point, ON near Tefe, Amazonas, Brazil	43°50'N 77°40'W 03°20'S 64°40'W	5 mo. 5 409 km S17°E
3	0554-86641 JPL	L 05	U 28	08/06/69 15/01/71	East Mary Island, ON near Cabrera, Dominican Republic	45°50'N 81°40'W 19°30'N 70°00'W	1 yr. 6 mo. 3 112 km S24°E
4	0545-45100 HHS	L 00	U 21	22/06/58 ??/11/58	near Presqu'île Point, ON near Pointe à Pitre, Guadeloupe	43°50'N 77°40'W 16°10'N 61°30'W	5 mo. 3 437 km S31°E
5	0725-63541 AB	L 01	U 21	21/06/70 28/08/71	near Presqu'île Point, ON St. Lucia, British West Indies	45°50'N 77°40'W 13°50'N 60°50'W	1 yr. 1 mo. 3 705 km S31°E
6	0675-67908 LGL	L 03	U 03	03/07/67 22/01/68	near Presqu'île Point, ON Yucatán State, Mexico	43°50'N 77°40'W 21°00'N 89°20'W	7 mo. 2 762 km S27°W
7	0675-66889 LGL	L L	U U	01/07/68 ??/02/69	near Presqu'île Point, ON Michoacán State, Mexico	43°50'N 77°40'W 19°00'N 102°00'W	7 mo. 3 576 km S47°W
8	0725-74373 JPR	L 00	U 28	14/07/71 99/04/74	near Black Bay, ON near Acajutla, El Salvador	48°40'N 88°20'W 13°40'N 89°50'W	2 yr. 9 mo. 3 899 km S3°W
9	0025-72235 FLF	U 00	? 53	18/06/33 LT/10/34	15 km east of Alliance, AB Boardwalk Beach, CA	52°20'N 112°40'W 36°50'N 122°00'W	1 yr. 4 mo. 1 874 km S27°W
10	0003-67874 FLF	HY 00	U 01	08/06/49 05/03/50	11 km south of Venn, SK Sonora State, Mexico	51°20'N 105°10'W 30°00'N 110°00'W	9 mo. 2 408 km S11°W
11	0525-03250 CSH	L 01	U 20	01/07/56 31/03/57	near Redberry Lake, SK Michoacán State, Mexico	52°40'N 107°10'W 19°00'N 99°00'W	9 mo. 3 774 km S9°E
12	0535-87392 MTM	L 04	U 21	17/06/72 10/02/74	near Kemp Lake, AB Federal District, Mexico	49°50'N 113°00'W 19°20'N 102°00'W	1 yr. 8 mo. 3 616 km S25°E
13	0555-24856 AB	L 05	U 01	01/07/58 03/05/73	near Presqu'île Point, ON Stanley Mission, SK	43°50'N 77°40'W 55°20'N 104°30'W	14 yr. 10 mo. 2 292 km N47°W
14	0006-99706 FLF	L 00	U 31	28/06/28 LT/04/33	Bittern Lake, AB Kelligrews, NL	53°00'N 113°00'W 47°30'N 53°30'W	4 yr. 10 mo. 4 155 km N74°E
15	0715-55359 DRH	L 05	U 00	17/07/70 99/07/71	near Pebble Beach, MB Harrisville, MI	51°00'N 98°30'W 44°30'N 83°10'W	1 yr. 0 mo. 1 353 km S64°E
16	0416-69469 HHS	L 00	U 01	10/06/45 04/11/45	near Midland, ON Pico, Azores	44°40'N 80°00'W 38°30'N 28°30'W	5 mo. 4 270 km N81°E
17	0575-00956 AB	L 00	U 98	27/06/64 20/01/65	near Presqu'île Point, ON Barbate de Franco, Spain	43°50'N 77°40'W 36°10'N 05°50'W	7 mo. 5 992 km S72°E
18	0704-33203 TBO	L 03	U 00	08/07/80 21/01/81	Toronto, ON near Barcelona, Spain	43°30'N 79°20'W 41°10'N 00°20'E	6 mo. 6 296 km N63°E
19	0525-00717 LGL	L 00	U 03	24/06/56 28/07/81	near Presqu'île Point, ON near Presqu'île Point, ON	43°50'N 77°40'W 43°50'N 77°40'W	25 yr. 1 mo. —
20	0386-67422 JHB	L 02	U 98	23/06/38 04/09/67	Collins Bay, ON Collins Bay, ON	44°10'N 76°30'W 44°10'N 76°30'W	29 yr. 3 mo. 0 km

Summary of banding statistics:
Ring-billed Gull

	Age at banding		
	Hatch year	After hatch year	All ages
No. of Canadian bandings (1955–1995)			264 557
No. encountered per 1 000 banded (1955–1995)			35
Total no. encountered (1921–1995)	11 927	444	12 336
No. encountered from foreign bandings	1 793	131	1 998
Maximum period from banding to encounter (mo.)	301	182	301
No. Canadian-banded birds moving >0 km	8 719	190	9 053
Mean movement >0 km of Canadian-banded birds (km)	530	339	528
Maximum movement from all encounters (km)	6 296	2 589	6 296
% recovered (encountered dead)	86	70	86
% direct recoveries	56	26	55
% encountered during banding operations	2	11	3

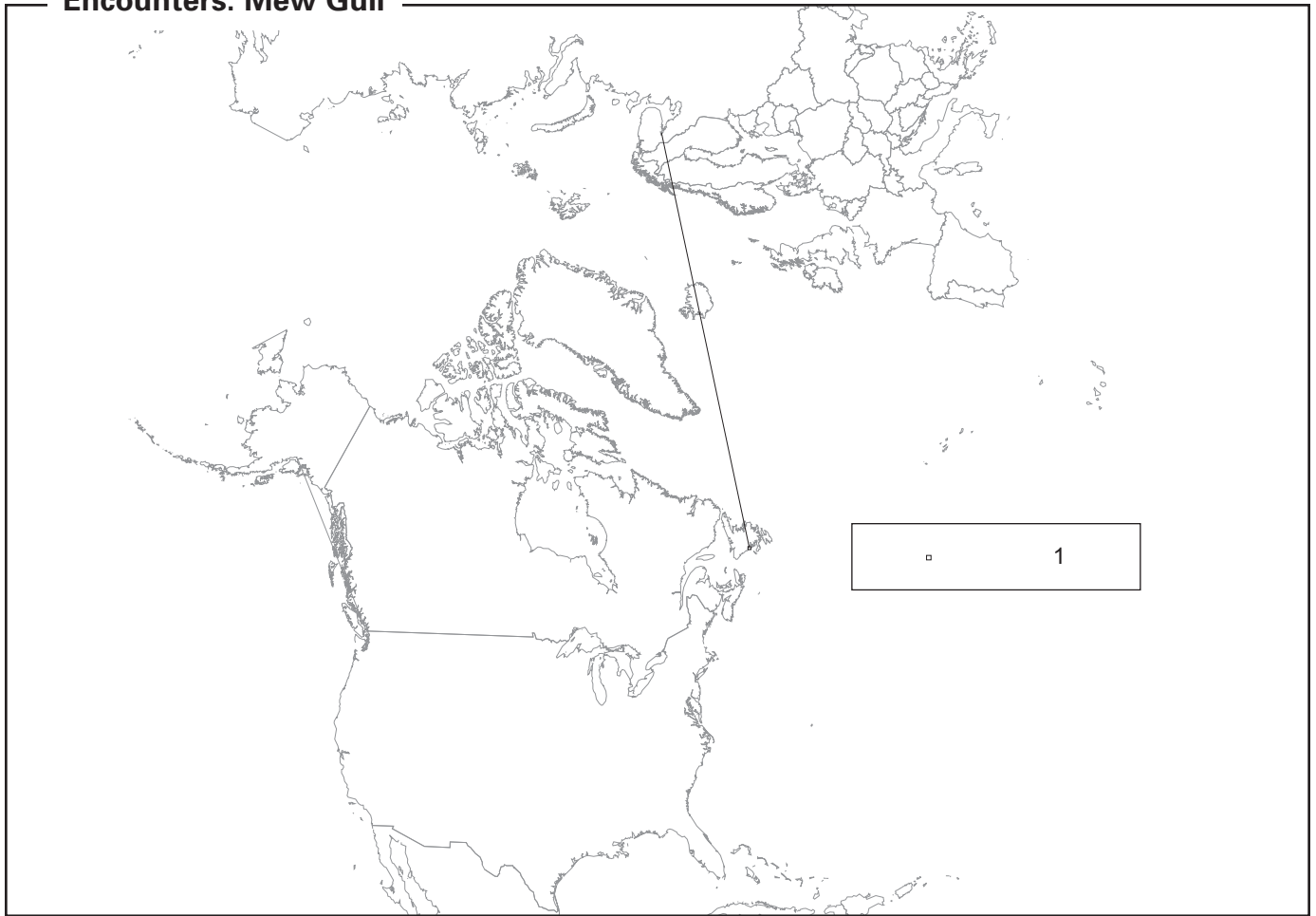
Banding effort: Ring-billed Gull



Top banders: HHK, LGL, AB, CSH, FEL

Mew Gull (*Larus canus*) 055.0

Encounters: Mew Gull



In Canada, the Mew Gull breeds in central and southern Yukon, the southern Mackenzie Valley, central Saskatchewan, northeastern Manitoba (Churchill), and coastal British Columbia (Godfrey 1986). It winters from southern Alaska to northern Baja California and is common on the coast of British Columbia (Campbell et al. 1990b).

Only 35 Mew Gulls were banded in Canada between 1955 and 1995, all in British Columbia and the Northwest Territories. There have been only two

encounters in Canada of North American-banded birds: one, banded near Fort Smith, Northwest Territories (record 1), was found dead there 2 weeks later; the second moved from Alaska to southern British Columbia (record 2). These recoveries refer to the race *L. c. brachyrhynchus*. A third encounter (record 3), a bird banded as a nestling on the White Sea coast of Russia and shot on Newfoundland 3 years later, involved the nominate race or “Common Gull” of Eurasia. This was the first record of this subspecies in the New World (Tuck 1971).

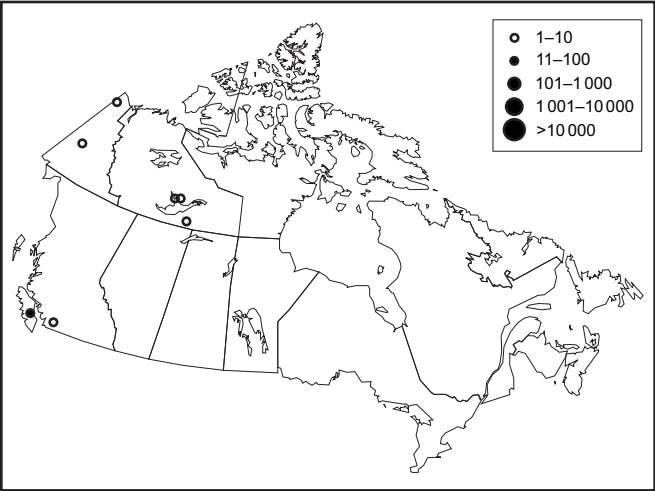
Encounter records: Mew Gull

1	0516-45704	AHY	U	13/06/64	near Fort Smith, Mackenzie, NT	60°00'N 111°50'W	16 d
	EK	00	00	29/06/64	near Fort Smith, Mackenzie, NT	60°00'N 111°50'W	0 km
2	0534-42051	AHY	U	04/05/62	Anchorage, AK	61°10'N 149°50'W	4 yr. 9 mo.
	LJP	05	00	25/02/67	Fraser River mouth, BC	49°00'N 123°10'W	2 146 km S63°E
3	E319142	L	U	07/07/54	Devich ya Luda, White Sea, Russia	67°02'N 32°35'E	2 yr. 9 mo.
	Russia	00	01	19/04/57	Lock's Cove, NL	47°36'N 56°30'W	5 213 km S112°W

Summary of banding statistics:
Mew Gull

	Age at banding		
	Hatch year	After hatch year	All ages
No. of Canadian bandings (1955–1995)			35
No. encountered per 1 000 banded (1955–1995)			28
Total no. encountered (1921–1995)	0	2	2
No. encountered from foreign bandings	0	1	1
Maximum period from banding to encounter (mo.)	–	57	57
No. Canadian-banded birds moving>0 km	0	0	0
Mean movement >0 km of Canadian-banded birds (km)	–	–	–
Maximum movement from all encounters (km)	5 213		5 213
% recovered (encountered dead)	–	100	100
% direct recoveries	–	50	50
% encountered during banding operations	–	0	0

Banding effort: Mew Gull



Top banders: KV, NPWRC, EK, YTG, CWSPYR

Black-headed Gull (*Larus ridibundus*) 055.1

Encounters: Black-headed Gull



In recent decades, the Black-headed Gull, formerly exclusively a Palaearctic species, has been recorded in increasing numbers in North America. Breeding locations were predicted as early as 1963 (Erskine 1963), but was first proven in 1977, on western Newfoundland (Montevecchi and Tuck 1987). Since then, breeding has occurred, or has been suspected, at several locations from Labrador to Massachusetts (Montevecchi and Tuck 1987). However, the numbers of Black-headed Gulls seen are too great to be accounted for from the production of known New World colonies, suggesting either regular immigration from Europe or the existence of substantial undetected New World colonies, possibly in Greenland.

There have been seven encounters of European-banded Black-headed Gulls in Canada, five on the island of Newfoundland and two in Labrador. One of the latter involved a bird banded as a local in the Netherlands (record 1); all other encounters were of birds originating from breeding colonies in Iceland (record 2). The colonization of Iceland itself occurred only in 1910, from birds presumed to have originated in the British Isles (Cramp and Simmons 1983). Encounters of British-banded birds in Iceland are numerous (Wernham et al. 2002). Because no birds were banded in Canada, no banding effort map appears in this account.

Encounter records: Black-headed Gull

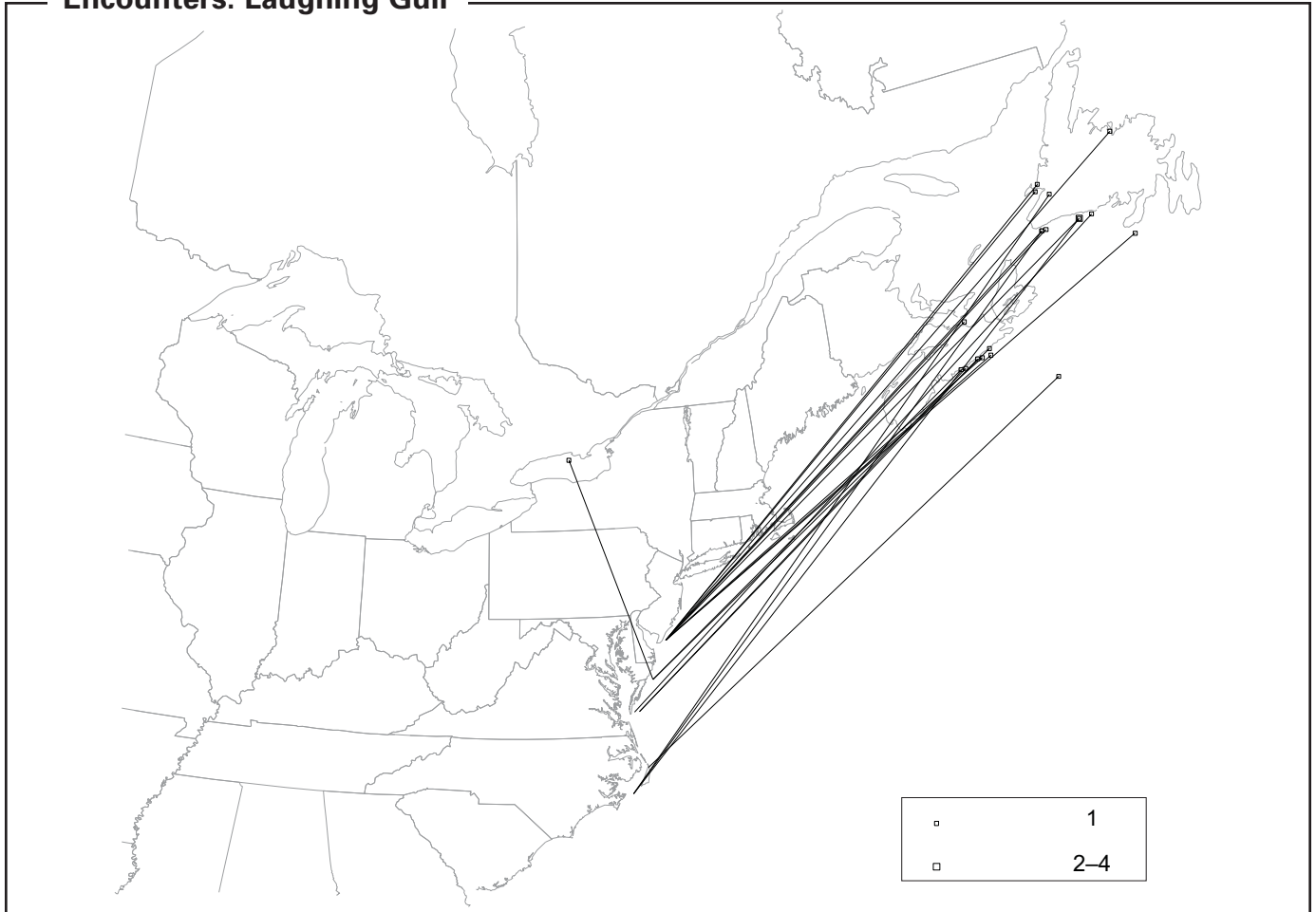
1	851 Netherlands	L ?	U ?	21/06/32 99/09/33	Groote Meer, the Netherlands at sea off Labrador	~53°00'N 06°00'E 56°06'N 55°46'W	1 yr. 2 mo. 3 877 km W
2	52278 Iceland	L ?	U ?	16/06/43 26/10/43	Lake Myvatn, Iceland Badger, NL	65°30'N 16°50'W 49°00'N 56°00'W	4 mo. 2 925 km S70°W

Summary of banding statistics: Black-headed Gull

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			0
<i>No. encountered per 1 000 banded (1955–1995)</i>			–
Total no. encountered (1921–1995)	0	0	7
No. encountered from foreign bandings	0	0	7
Maximum period from banding to encounter (mo.)	–	–	51
No. Canadian-banded birds moving >0 km	0	0	0
Mean movement >0 km of Canadian-banded birds (km)	–	–	–
Maximum movement from all encounters (km)	3 877	–	3 877
% recovered (encountered dead)	–	–	100
% direct recoveries	–	–	66
% encountered during banding operations	–	–	0

Laughing Gull (*Larus atricilla*) 058.0

Encounters: Laughing Gull



The Laughing Gull breeds along the U.S. eastern seaboard from Maine south to the Gulf of Mexico and the Caribbean. Formerly, the species bred very locally in Nova Scotia (Tufts 1973; Godfrey 1986). It winters from North Carolina southwards (Burger 1996). The species does not normally occur in Canadian waters; however, on rare occasions, tropical storms in the western Atlantic result in large influxes of Laughing Gulls to the Atlantic provinces. Encounters of U.S.-banded birds reflect these events.

Twelve banded birds reported in the fall of 1958 were the result of Hurricane Helene (see Tuck 1968 for a fuller account). Eleven of these encounters were reported in Newfoundland and Labrador (record 1) and

one in Prince Edward Island (record 2), most of them between 30 September and 15 October. All of the birds had been banded as locals at breeding colonies from New Jersey to Virginia and were in their first or second year; no adult birds were encountered. Until 1958, the Laughing Gull had not been recorded in Newfoundland and Labrador; however, in the aftermath of the storm, at least 1 000 were present in the Burgeo area alone, mostly in an exhausted condition. The encounter in Prince Edward Island was also the first occurrence of this species in that province (Godfrey 1986).

A similar invasion of Laughing Gulls into the Atlantic provinces occurred following Hurricane Gladys in October 1968. Flocks of several hundred

were seen in a number of locations, including Sable Island (Mills 1969). Seven encounters of birds banded in the eastern United States were made in Nova Scotia as a result of that storm (records 3 and 4) and one in Newfoundland and Labrador (record 5). All but one had been banded as locals in nesting colonies from New Jersey to North Carolina; four birds were in

their first year, and the rest were adult (encountered 3–8 years after banding). Since then, there has been only one further encounter — a Maryland-reared bird encountered in Ontario in its third summer (record 6). Because no birds were banded in Canada, no banding effort map appears in this account.

Encounter records: Laughing Gull

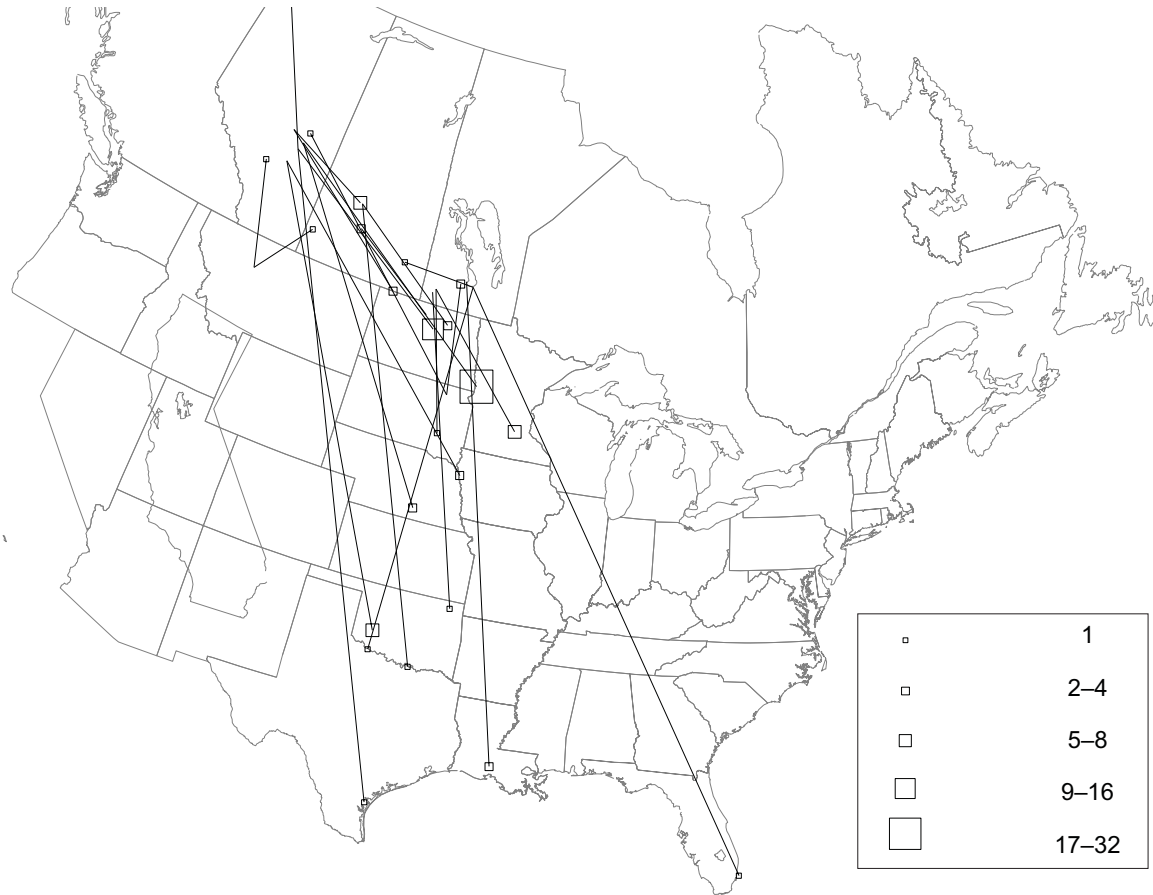
1	0495-26341	L	U	05/10/53	Portsmouth Island, NC	35°00'N 76°00'W	5 yr. 3 mo.
	?	00	03	10/10/58	near King George IV Lake, NL	48°20'N 58°20'W	2078 km N39°E
2	0545-62954	L	U	27/07/57	Avalon, NJ	39°00'N 74°40'W	1 yr. 3 mo.
	BKM	00	45	19/10/58	Wood Island, PE	45°50'N 62°40'W	1 243 km N48°E
3	0535-27857	L	U	09/07/60	Stone Harbor, NJ	39°00'N 74°40'W	8 yr. 4 mo.
	BKM	08	04	01/11/68	Beaver Harbour, NS	44°50'N 62°20'W	1209 km N54°E
4	0544-00170	AHY	U	04/05/68	south of Wanchese, NC	35°40'N 75°30'W	5 mo.
	HDH	00	05	25/10/68	Sable Island, NS	43°40'N 59°50'W	1 616 km N51°E
5	0605-26411	L	U	21/07/63	Villas, NJ	39°00'N 74°40'W	5 yr. 3 mo.
	JCM	05	03	31/10/68	near Captain Ball Rock, NL	46°50'N 55°40'W	1 764 km N55°E
6	0755-90717	L	U	09/07/73	Chincoteague, MD	38°00'N 75°10'W	3 yr. 2 mo.
	JHB	07	89	08/09/76	near Presqu'île Point, ON	43°50'N 77°40'W	682 km N17°W

**Summary of banding statistics:
Laughing Gull**

	Age at banding		
	Hatch Year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			0
<i>No. encountered per 1 000 banded (1955–1995)</i>			–
Total no. encountered (1921–1995)	21	1	22
No. encountered from foreign bandings	21	1	22
Maximum period from banding to encounter (mo.)	100	5	100
No. Canadian-banded birds moving >0 km	0	0	0
Mean movement >0 km of Canadian-banded birds (km)	–	–	–
Maximum movement from all encounters (km)	2 078	1 615	2 078
% recovered (encountered dead)	85	0	81
% direct recoveries	52	100	54
% encountered during banding operations	4	0	4

Franklin's Gull (*Larus pipixcan*) 059.0

Encounters (north): Franklin's Gull (block size = 6.1°; excludes birds moving <300 km)



Franklin's Gull nests in colonies on prairie lakes and marshes, from Alberta (east of the mountains) through Saskatchewan to southwestern Manitoba. Birds may be found wintering in the Gulf of Mexico from the coast of Louisiana to Panama on the west coast of Mexico and Guatemala, but are mainly found along the west coast of South America from northern Peru to southern Chile and on freshwater lakes in the High Andes of Peru and Bolivia (Murphy 1936; Burger and Gochfeld 1994).

Most encounters with Canadian-banded birds date from the 1960s or before, with 68 (55%) resulting from banding in Alberta in the 1920s and 1930s. Most encounters occurred in July and August (soon after banding). There have been no encounters of Canadian-banded birds reported since 1972, likely because little banding has been carried out since the 1960s. Encounters were recorded in Saskatchewan (14 cases), North Dakota (13, record 1), South Dakota (13), Minnesota (11, record 2), Iowa (1), Nebraska (1),

**Encounters (south): Franklin's Gull (block size = 1°;
excludes birds moving <300 km)**



Kansas (4), Oklahoma (2, record 3), Texas (6, record 4), Louisiana (1, record 5), and Florida (1, record 6). The encounters in Louisiana and, especially, Florida are unexpected, because Franklin's Gull is of only casual occurrence on the Atlantic coast. Encounters reported in the Prairie provinces included birds banded as nestlings in South Dakota (5, record 7), North Dakota (1), Montana (5), and Minnesota (2). Several birds returned to breed hundreds of kilometres from their natal colonies in the prairies (records 7 and 8).

Franklin's Gull is by far the most migratory of all Canadian gulls, with five encounters in continental South America (Ecuador, 2 [records 9 and 10]; Peru, 2 [records 11 and 12]; Chile, 1 [the southernmost at 27°S, record 13]) and five in Central America (El Salvador, 2 [record 14]; Guatemala, 2 [record 15]; Mexico, 1).

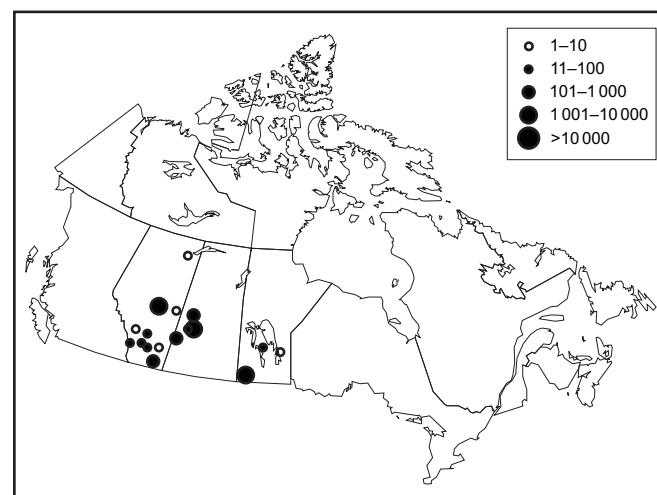
Encounter records: Franklin's Gull

1	0594-65210 CSH	L 05	U 00	06/07/72 ??/10/79	west of Vanscoy, SK near Leeds, ND	52°00'N 107°00'W 48°20'N 99°10'W	7 yr. 3 mo. 691 km S57°E
2	0004-46862 WR	U 00	U 01	24/06/26 ??/FA/29	Beaverhill Lake, AB Winnebago, MN	53°20'N 112°30'W 43°40'N 94°10'W	~3 yr. 1 720 km S59°E
3	0544-80973 CSH	L 05	U 01	08/07/70 05/11/70	west of Grandora, SK Lebanon, OK	52°00'N 107°00'W 33°50'N 96°50'W	4 mo. 2 181 km S26°E
4	0365-11624 WIL	U 00	U 89	28/06/36 11/12/36	southwest of Morden, MB Lozano, TX	50°10'N 98°10'W 26°10'N 97°30'W	5 mo. 2 672 km S1°E
5	0354-03539 NOF	U 00	U 00	01/07/39 ??/11/39	Langruth, MB Lafayette, LA	50°20'N 98°40'W 30°10'N 92°00'W	4 mo. 2 313 km S16°E
6	0375-16471 FEL	U 00	U 00	01/07/37 FT/12/38	Delta, MB southeastern Florida	50°10'N 98°10'W 26°80'N 80°80'W	1 yr. 5 mo. ~2 900 km ~S36°E
7	0365-17954 JKP	AHY 00	U 01	25/06/37 01/06/39	Tacoma Park, SD Amaranth, MB	45°30'N 98°10'W 50°30'N 98°40'W	2 yr. 0 mo. 558 km N4°W
8	0574-36493 LMM	L 05	U 45	15/06/68 01/07/74	Freezeout Lake, MT Raven, AB	47°40'N 112°00'W 52°00'N 114°20'W	6 yr. 1 mo. 511 km N18°W
9	0514-57832 JG	L 01	U 00	18/08/64 25/11/64	west of Hay Lakes, AB central San Lorenzo, Ecuador	53°01'N 113°01'W 00°50'S 80°04'W	5 mo. 6 724 km S38°E
10	0505-62069 JBG	AHY 00	U 03	26/07/55 06/11/55	west of Kindersley, SK near Manta, Ecuador	51°02'N 109°01'W 00°05'S 80°00'W	4 mo. 6 424 km S35°E
11	0375-20183 FGB	L 03	U 00	08/07/38 15/12/38	east of Tuxford, SK near Corongo, Peru	50°30'N 105°20'W 08°30'S 77°50'W	5 mo. 7 085 km S31°E
12	0384-23653 AH	J 00	U 01	01/07/39 LT/11/41	west of Langruth, MB near Chiclaço, Peru	50°20'N 98°40'W 06°40'S 79°39'W	2 yr. 4 mo. 6 600 km S22°E
13	0564-38468 CSH	L 05	U 00	06/07/72 03/02/73	west of Vanscoy, SK near Coldera, Chile	52°00'N 107°00'W 27°00'S 70°50'W	7 mo. 9 475 km S32°E
14	0554-03042 DRH	L 03	U 56	11/07/65 19/11/65	northwest of Souris, MB near La Union, El Salvador	49°40'N 100°30'W 13°20'N 87°50'W	4 mo. 4 207 km S20°E
15	0524-75990 DRH	L 05	U 56	28/06/64 ??/05/66	northwest of Souris, MB near Playa Grande, Guatemala	49°40'N 100°30'W 14°30'N 91°40'W	1 yr. 11 mo. 3 996 km S15°E

Summary of banding statistics: Franklin's Gull

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>	6083	459	6543
<i>No. encountered per 1000 banded (1955–1995)</i>			3
Total no. encountered (1921–1995)	66	8	124
No. encountered from foreign bandings	11	2	13
Maximum period from banding to encounter (mo.)	87	24	87
No. Canadian-banded birds moving >0 km	53	6	108
Mean movement >0 km of Canadian-banded birds (km)	1424	1346	1352
Maximum movement from all encounters (km)	9475	6424	9475
% recovered (encountered dead)	96	100	96
% direct recoveries	59	62	62
% encountered during banding operations	1	0	2

Banding effort: Franklin's Gull



Top banders: DRH, JG, CSH, DBS, JBG

Sabine's Gull (*Xema sabini*) 062.0

Sabine's Gull breeds on coastal marshes and ponds from the Mackenzie Delta eastwards to Bylot Island and eastern Hudson Bay. The species winters in the Benguela Current region off the west coast of southern Africa and off the west coast of South America (Cramp and Simmons 1983). The migration routes and wintering areas of Canadian breeders are unknown; they may occur in both Atlantic and Pacific oceans. A lack of records of migrating Sabine's Gulls off Atlantic Canada suggests that

much of the Canadian population may move westwards in fall (Brown 1986); the species is a common migrant in spring and fall off British Columbia (Campbell et al. 1990b).

The only encounter of a Canadian-banded bird was close to where it was banded as an adult and hence tells us nothing about the possible migration route of Canadian birds. This is also the reason there is no encounter map for this species.

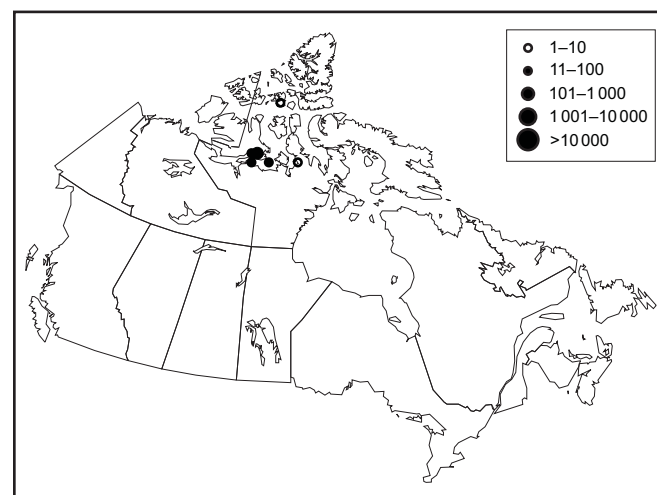
Encounter records: Sabine's Gull

1	1313-60388	ASY	U	15/07/84	near Long Lake, NU	69°00'N 104°40'W	2 yr. 10 mo.
	TK	05	01	??/05/87	near Greiner Lake, NU	69°10'N 104°50'W	19 km N19°W

Summary of banding statistics: Sabine's Gull

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			180
<i>No. encountered per 1 000 banded (1955–1995)</i>			5
Total no. encountered (1921–1995)	0	1	1
No. encountered from foreign bandings	0	0	0
Maximum period from banding to encounter (mo.)	–	34	34
No. Canadian-banded birds moving >0 km	0	1	1
Mean movement >0 km of Canadian-banded birds (km)	–	19	19
Maximum movement from all encounters (km)	–	19	19
% recovered (encountered dead)	–	100	100
% direct recoveries	–	0	0
% encountered during banding operations	–	0	0

Banding effort: Sabine's Gull



Top banders: TK, DFP, RPY, NMNH

Caspian Tern (*Hydroprogne caspia*) 064.0

Encounters (north): Caspian Tern (block size = 6.1°; excludes birds moving <300 km)

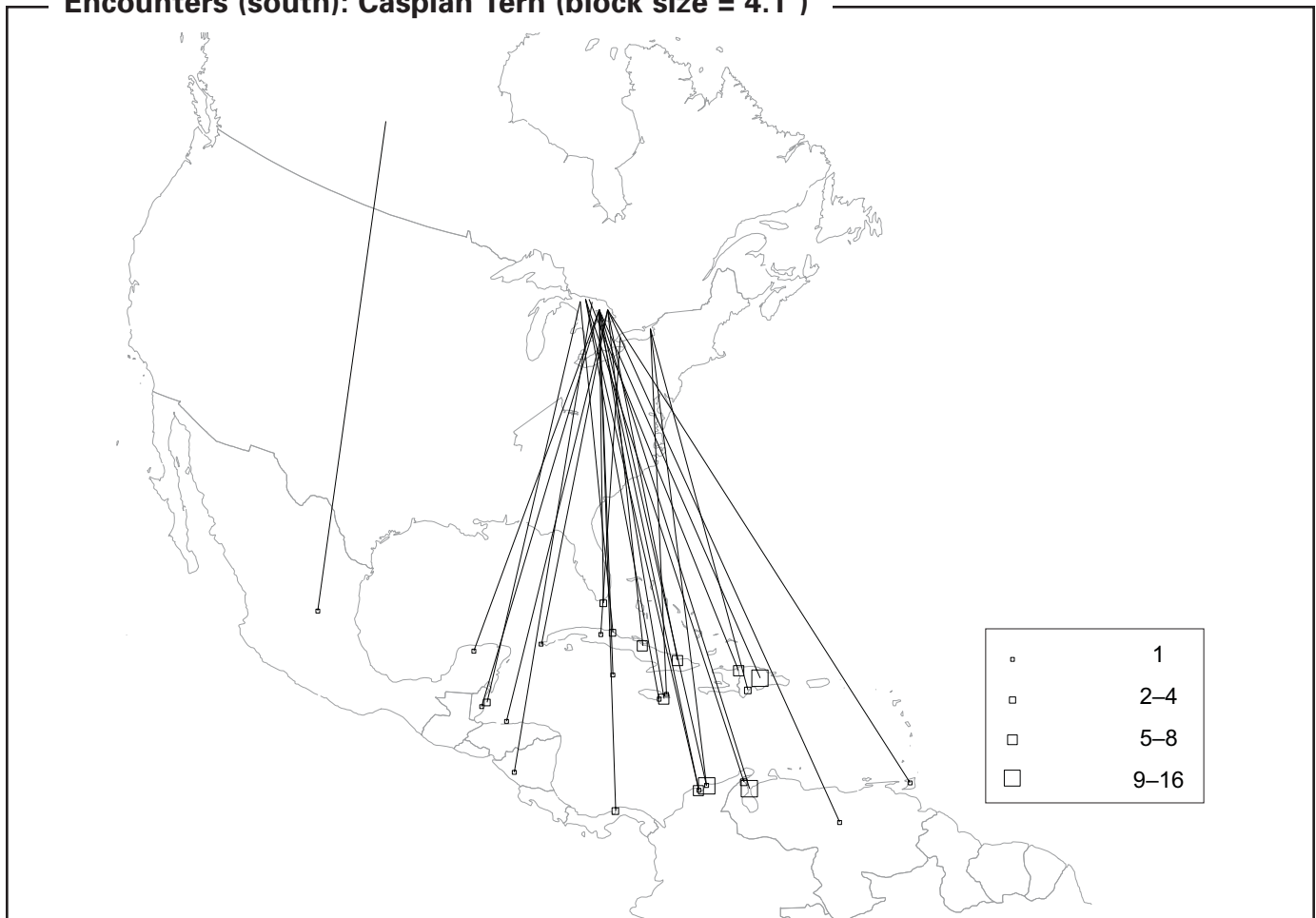


The Caspian Tern is a cosmopolitan species, breeding locally throughout its range, which in Canada includes the Great Slave Lake area, northeastern Alberta, central Saskatchewan, south and central Manitoba, southern Ontario and Quebec, the Gulf of St. Lawrence, and the island of Newfoundland. In the New World, Caspian Terns winter along the Pacific coast from central California south through Baja California to Colombia, in the Gulf of Mexico, and in the Caribbean south to the Lesser Antilles.

Most encounters reported were of birds banded in Ontario, around the Great Lakes. Caspian Terns banded as nestlings returned in later years to the same general area where they were banded, but tended not to breed on their natal islands. Those banded as adults, however, tended to return to the same islands to breed.

Encounters during December–February were mainly from Florida (18, record 1), Colombia (9, records 2 and 3), and the Caribbean (14, records 4–11), with smaller numbers from the southern United States (5). Encounters in Virginia and the Carolinas were mainly in October–November (24 and 34, respectively), suggesting that birds from the Great Lakes travel down the Atlantic coast of the United States on fall migration. In March–May, there were only six in Virginia and the Carolinas, and proportionately more were from the U.S. Gulf coast (6, compared with the same number in fall), suggesting a more inland route in spring. Surprisingly, there were almost as many encounters from the Caribbean in June–August (8) as there were in winter, and these included some birds more than 5 years old, suggesting

Encounters (south): Caspian Tern (block size = 4.1°)



that some adults, as well as pre-breeders, remain in the wintering area throughout the breeding season (Cuthbert and Wires 1999).

Caspian Terns are uncommon on the Canadian east coast, although small numbers breed there. Out of seven encounters reported from the Maritime provinces and the island of Newfoundland (record 12), only one was more than 2 years old; some of these encounters may have involved birds that were storm-driven (see Laughing Gull, Black Skimmer). However, the encounter of an Ontario-banded bird in Saskatchewan within 2 months of being banded as a nestling (record 13) suggests that juveniles may disperse very rapidly after independence.

The fact that none of the five Caspian Terns banded in Saskatchewan were encountered east of

Louisiana (record 14) suggests the possibility of a “migratory divide” between populations breeding on the prairies and the Great Lakes, similar to that found in Ring-billed Gulls. This is supported by the fact that most encounters of California-banded Caspian Terns were from the Pacific coast of Central and South America (Gill and Mewaldt 1983). One bird banded in California was encountered in Alberta (record 15).

Caspian Terns are potentially very long lived, with four records of encounters of birds more than 26 years old in North America (Clapp et al. 1983). Four Ontario-banded birds were more than 20 years old when encountered (records 16 and 17), the oldest, at 25 years, being 1 year short of the current record for the species.

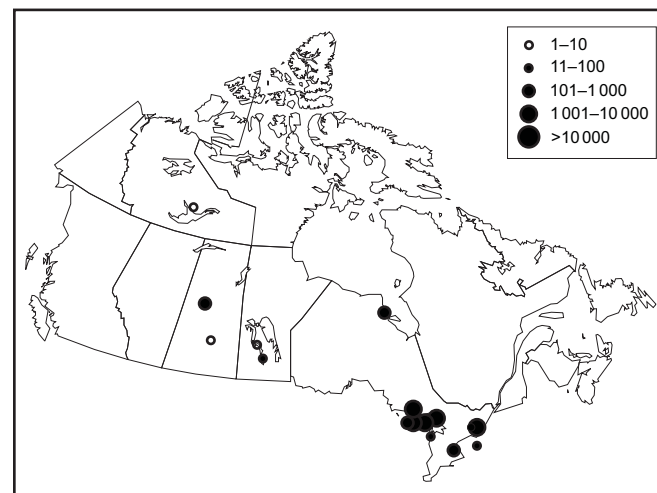
Encounter records: Caspian Tern

1	0604-21126 JPL	L 05	U 00	18/06/63 10/01/82	near Courtney Island, ON Cocoa Beach, FL	46°00'N 82°20'W 28°20'N 80°40'W	18 yr. 7 mo. 1 972 km S5°E
2	0565-15793 JPL	L 00	U 01	21/06/62 03/12/62	Freer Point, ON near Santa Marta, Colombia	45°50'N 82°00'W 11°30'N 72°50'W	6 mo. 3 908 km S15°E
3	0665-35483 FEL	AHY 00	U 08	30/05/67 ??/01/68	Clara Island, ON Soledad, Colombia	46°00'N 82°40'W 10°50'N 74°40'W	8 mo. 3 976 km S13°E
4	0564-53638 FEL	AHY 05	U 01	01/06/67 12/10/67	east of Killarney, Georgian Bay, ON near Rocky Point, Jamaica	45°50'N 81°10'W 17°40'N 77°10'W	4 mo. 3 150 km S8°E
5	0665-37900 JPL	HY 05	U 03	23/06/68 20/10/68	Half Moon Island, ON near Maggotty, Jamaica	45°20'N 81°20'W 18°20'N 77°50'W	4 mo. 3 014 km S7°E
6	0564-67493 FEL	AHY 04	U 00	15/06/67 ??/??/71	7°W of Bustard Island, ON near Portland Point, Jamaica	45°50'N 81°00'W 17°40'N 77°10'W	~4 yr. 3 146 km S8°E
7	0495-98245 LT	L 02	U 05	22/06/51 15/11/53	Limestone Island, ON near Cocos Bay, Trinidad	45°20'N 80°30'W 10°30'N 61°20'W	2 yr. 5 mo. 4 286 km S29°E
8	0635-74654 FEL	L 00	U 03	16/06/65 04/12/65	Freer Point, ON Maracaibo, Venezuela	45°50'N 82°00'W 10°40'N 71°30'W	6 mo. 4 028 km S17°E
9	0635-74675 FEL	L 03	U 97	16/06/65 04/11/66	Freer Point, ON near Managua, Nicaragua	45°50'N 82°00'W 12°10'N 86°10'W	1 yr. 5 mo. 3 750 km S7°W
10	0754-19844 JPL	L 03	U 01	15/06/91 ??/01/92	Clara Island, ON Cuba	46°00'N 82°40'W 22°30'N 80°00'W	7 mo 2 627 km S6°E
11	0665-34930 FEL	L 03	U 14	25/06/66 08/11/66	Freer Point, ON near Enriquillo, Dominican Republic	45°50'N 82°00'W 17°50'N 71°30'W	5 mo. 3 250 km S21°E
12	0566-32953 OSP	L 03	U 00	10/07/58 09/10/58	Rogers City, MI Boxey Harbour, NL	45°20'N 83°40'W 47°20'N 55°30'W	3 mo. 2 158 km N85°E
13	0665-35560 FEL	L 07	U 89	13/06/67 09/08/67	Freer Point, ON Kelvington, SK	45°50'N 82°00'W 52°10'N 103°30'W	2 mo. 1 708 km N73°W
14	0645-60553 CSH	L 00	U 56	08/07/65 12/10/66	Mooswu Lake, SK near Pastora, San Luis Potosi, Mexico	54°40'N 107°00'W 22°20'N 100°20'W	15 mo 3 642 km S11°E
15	0505-96341 ?	L 00	U 00	29/05/54 18/11/54	near San Jose, CA near Calgary, AB	37°30'N 122°00'W 50°50'N 112°50'W	6 mo. 1 771 km S13°W
16	0575-42870 JPL	L 07	U 89	19/06/62 04/06/86	Half Moon Island, ON near Pellston, MI	45°20'N 81°20'W 45°40'N 85°10'W	24 yr. 0 mo. 301 km N82°W
17	0665-35977 FEL	L 08	U 99	12/06/67 11/06/92	Clara Island, ON Clara Island, ON	46°00'N 82°40'W 46°00'N 82°40'W	25 yr. 0 mo. 0 km

Summary of banding statistics: Caspian Tern

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			16 363
<i>No. encountered per 1 000 banded (1955–1995)</i>			54
Total no. encountered (1921–1995)	819	160	986
No. encountered from foreign bandings	38	12	51
Maximum period from banding to encounter (mo.)	300	204	300
No. Canadian-banded birds moving >0 km	608	55	668
Mean movement >0 km of Canadian-banded birds (km)	859	741	854
Maximum movement from all encounters (km)	4 286	4 170	4 286
% recovered (encountered dead)	40	21	38
% direct recoveries	17	2	15
% encountered during banding operations	55	76	58

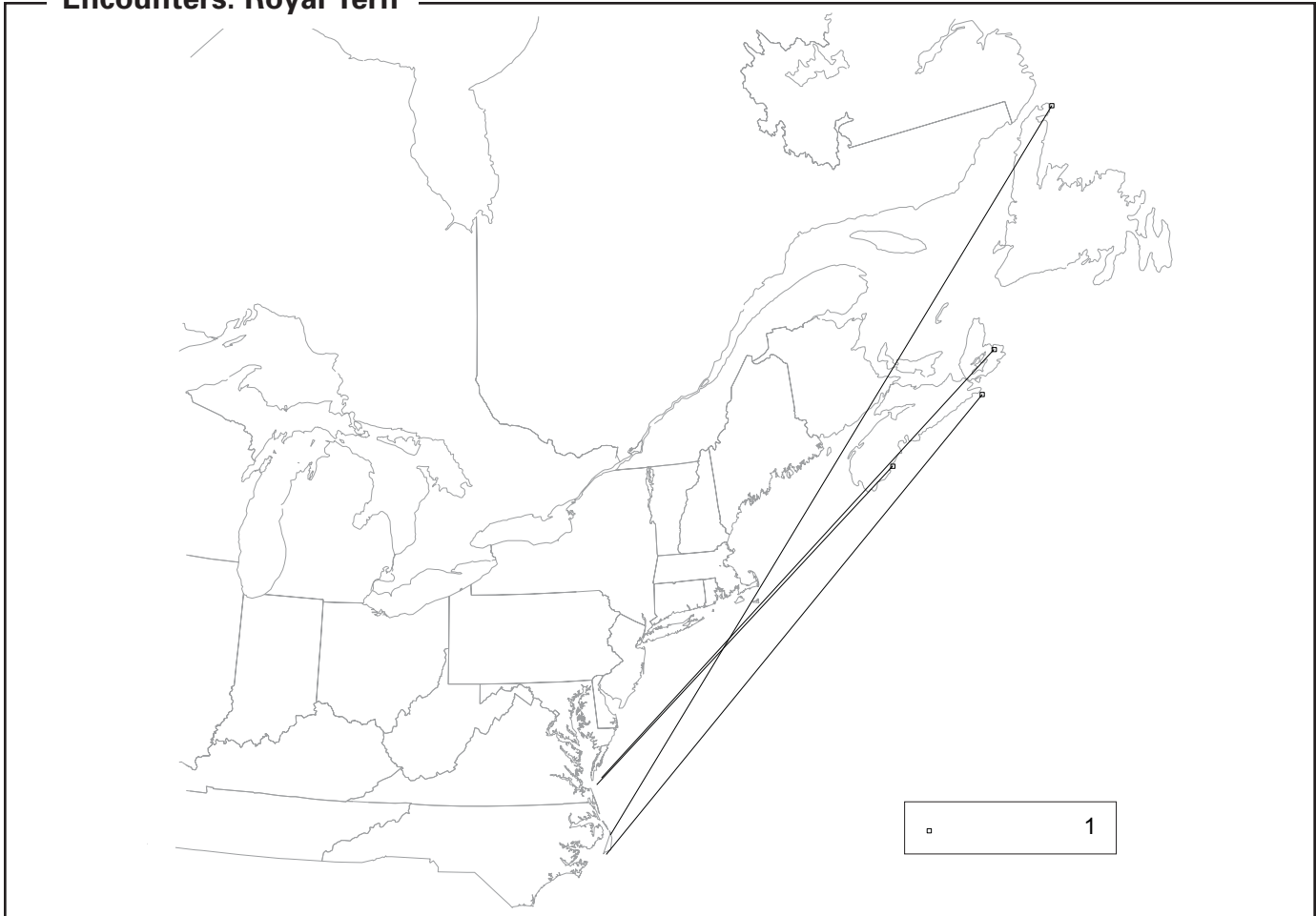
Banding effort: Caspian Tern



Top banders: JPL, FEL, HHK, LT, PEPO

Royal Tern (*Thalasseus maximus*) 065.0

Encounters: Royal Tern



The Royal Tern breeds in the Caribbean and on the U.S. east coast as far north as Massachusetts (Olsen and Larsson 1995). None has been banded in Canada (hence no banding effort map), but there have been four encounters in Canada of birds banded as locals in the United States (Virginia, 2;

North Carolina, 2), three in Nova Scotia (records 1–3), and one in Newfoundland and Labrador (record 4), the latter holding the distance record (2382 km). The bird encountered in December in Nova Scotia (record 1) was well off course; the species winters mainly in the Caribbean.

Encounter records: Royal Tern

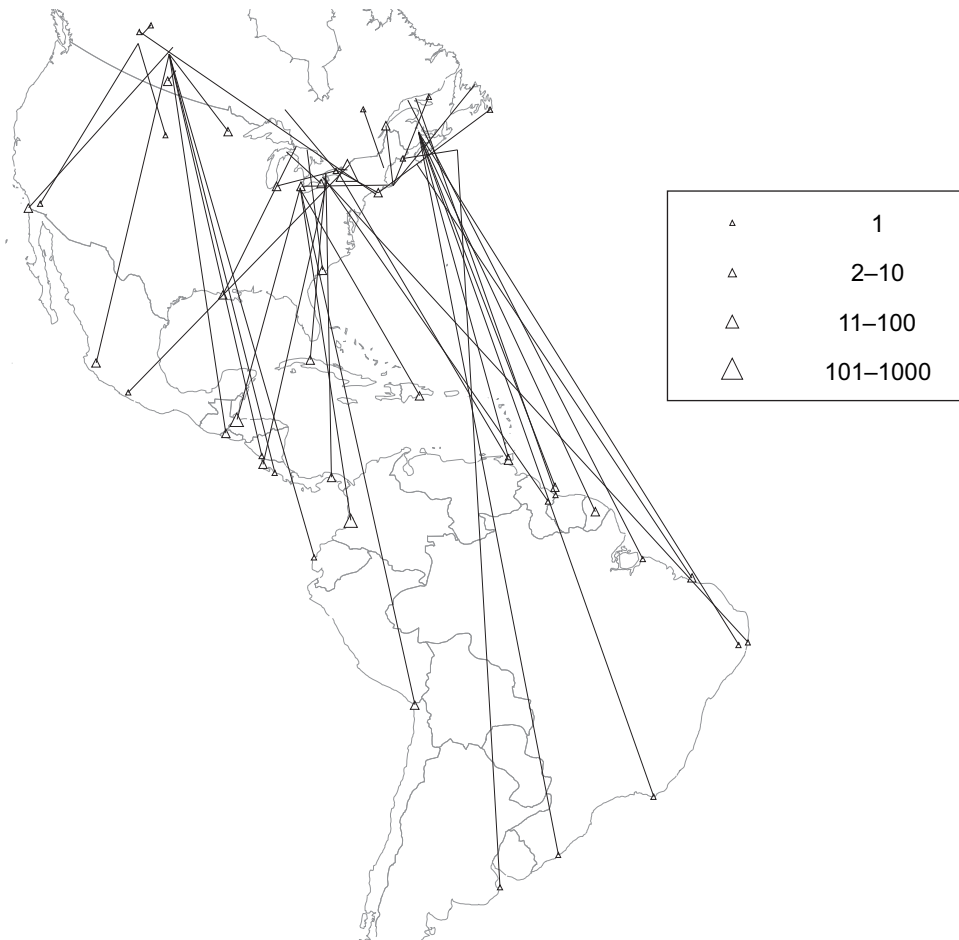
1	1704-26067 JSW	L 05	U 00	08/07/93 06/12/93	near Newport News, VA near Liverpool, NS	37°00'N 75°50'W 44°00'N 64°40'W	5 mo. 1 223 km N47°E
2	0784-54009 JSW	L 03	U 03	28/06/90 05/09/93	Cape Hatteras, NC Little Dover, NS	35°10'N 75°40'W 45°10'N 61°00'W	3 yr. 3 mo. 1 667 km N44°E
3	0684-19838 JSW	L 07	U 28	01/07/83 04/04/84	near Newport News, VA Sydney, NS	37°10'N 75°40'W 46°10'N 60°10'W	9 mo. 1 628 km N47°E
4	0674-22677 JHB	L 04	U 00	20/06/81 10/07/84	Cape Hatteras, NC St. Lunaire, NL	35°40'N 75°30'W 51°30'N 55°20'W	3 yr. 1 mo. 2 382 km N36°E

**Summary of banding statistics:
Royal Tern**

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			0
<i>No. encountered per 1 000 banded (1955–1995)</i>			–
Total no. encountered (1921–1995)	4	0	4
No. encountered from foreign bandings	4	0	4
Maximum period from banding to encounter (mo.)	39	–	39
No. Canadian-banded birds moving >0 km	0	0	0
Mean movement >0 km of Canadian-banded birds (km)	–	–	–
Maximum movement from all encounters (km)	2 382	–	2 382
% recovered (encountered dead)	75	–	75
% direct recoveries	25	–	25
% encountered during banding operations	0	–	0

Common Tern (*Sterna hirundo*) 070.0

Encounters (adults and unknown/>1 yr.): Common Tern (block size = 12.1°)



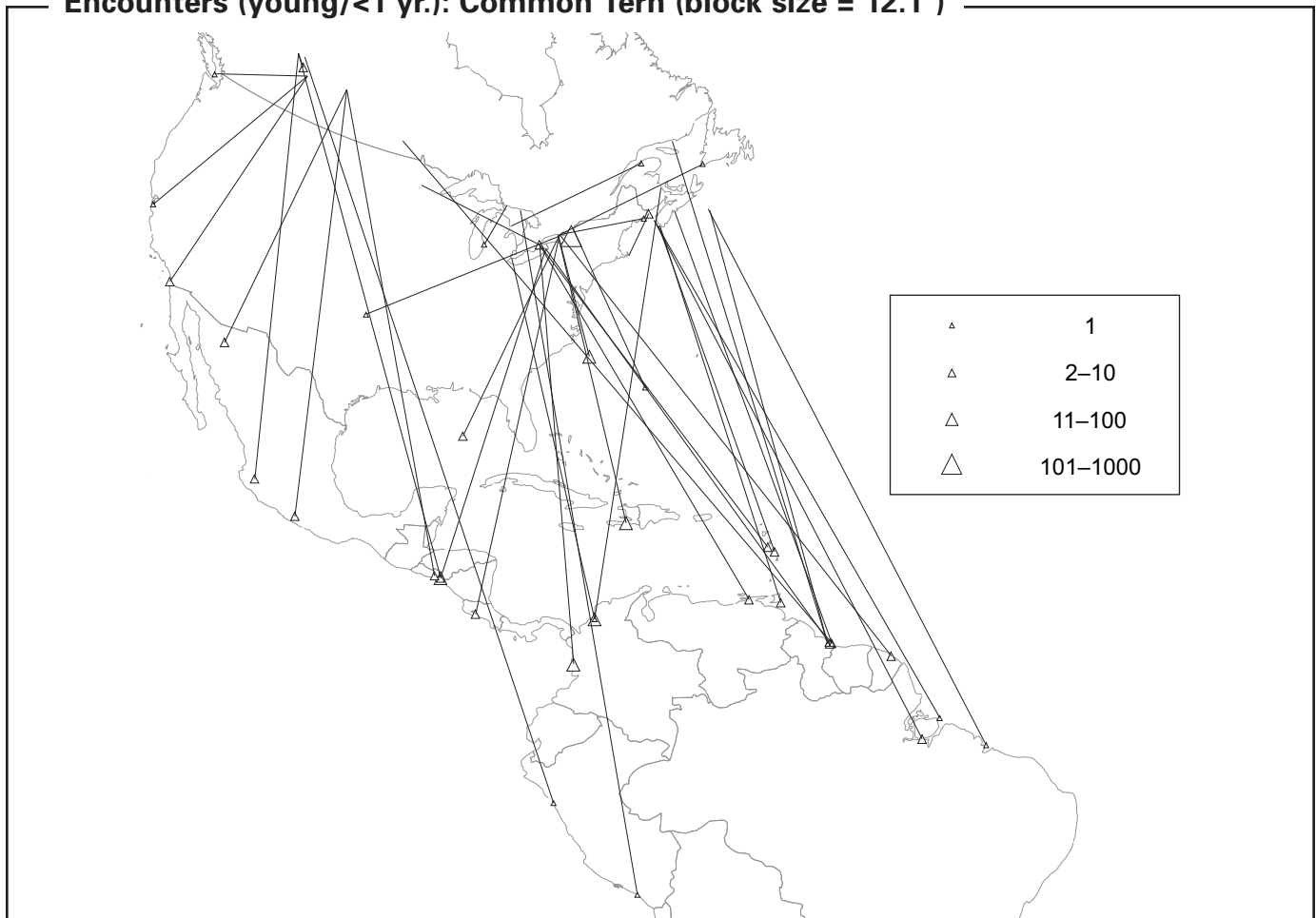
The Common Tern breeds widely in the Northern Hemisphere of both the New and Old Worlds.

It is a locally common breeder and transient in Canada, breeding from the southern Mackenzie Valley south and east from Alberta (east of the Rocky Mountains) to Newfoundland and Labrador. North American populations winter from southern California and South Carolina south to Chile and Argentina (American Ornithologists' Union 1998). Common Terns appear as transients in British Columbia (Godfrey 1986).

Large numbers of Common Terns have been banded throughout their Canadian range, mainly as chicks. Most encounters (85%) were of birds that died in areas within their presumed wintering range.

Encounters of Canadian-banded birds have been reported from all Central and South American countries except Uruguay and Paraguay, with the largest number of records from Panama (33, record 1), Colombia (31, record 2), Guyana and Suriname (31, record 3), Mexico (21), El Salvador (16, record 4), Ecuador (15, records 5 and 6), and Hispaniola (14). These records were spread throughout the year, but the majority were in October–March. Encounters in winter (December–February) were reported from Florida (6), the U.S. Gulf coast (4), Mexico (14), the Caribbean (48, records 7–10), the Pacific coast of South America (24, records 11 and 12), and the Atlantic coast of South America (21, mainly in Guyana to French Guiana, record 13).

Encounters (young/<1 yr.): Common Tern (block size = 12.1°)



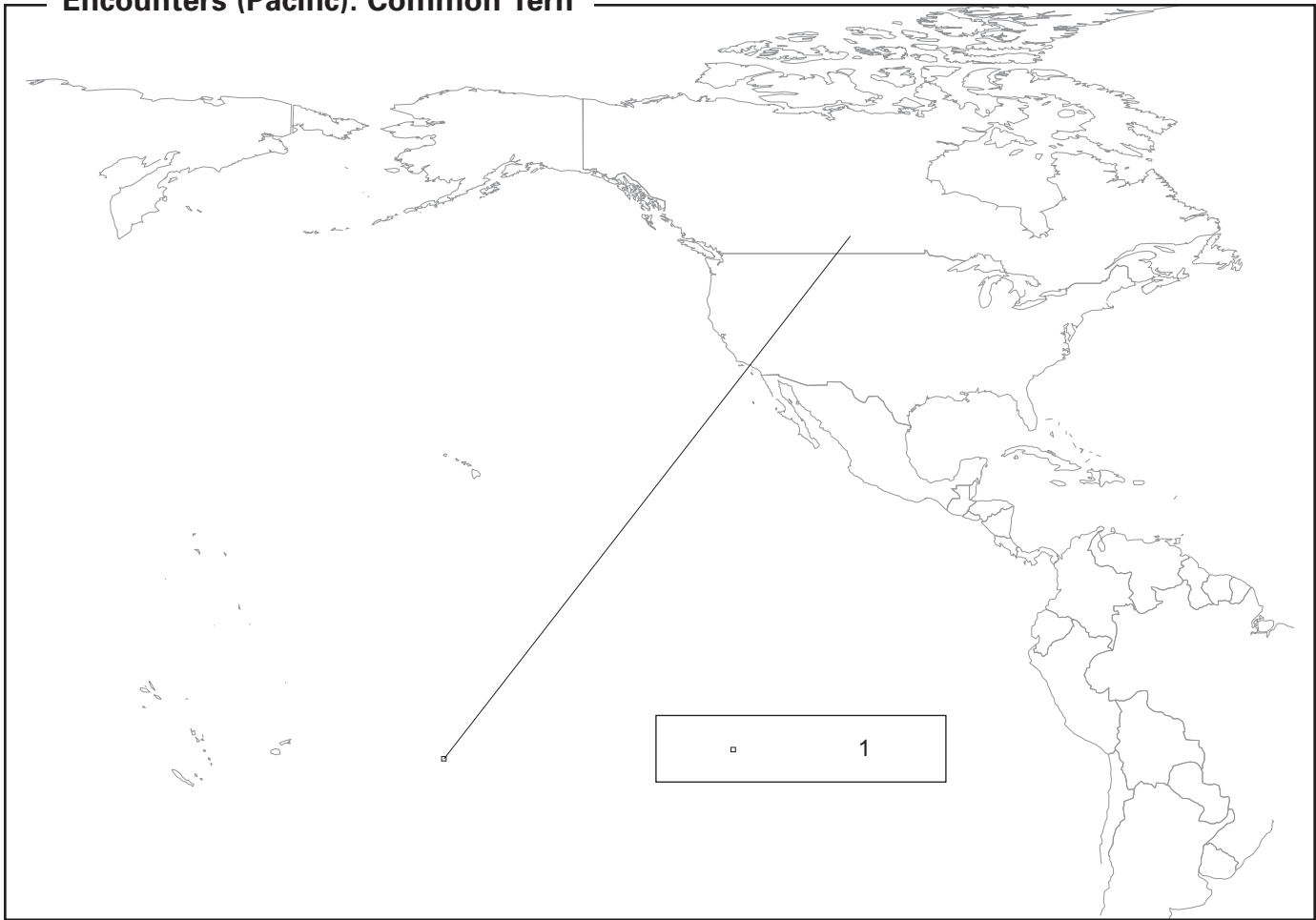
An encounter reported from Bolivia (record 11) constituted the first record of Common Tern from that country, although there have been several since (R.S. Ridgely, pers. commun.). DiCostanzo (1978) described several encounters of Common Terns from colonies in the northeastern United States in interior locations in South America, in Brazil and Bolivia. He speculated that the routes taken originated in the Atlantic, ascending the river systems. Although the encounter location of record 11 was in the Andes, it was much closer to the Amazon River system than to the Pacific, and the same argument may apply. Record 12 was the first authenticated record of Common Tern for Chile (previous sight records having been discounted because of confusion with the South American Tern

Sterna hirundinacea; DiCostanzo 1978). A second bird banded in southern Ontario in 1963 was encountered at 18°S in Chile in November 1964.

Other than the birds encountered in wintering areas and at colony sites, several were found at sea during October and November, at southern locations: north of the Bahama Islands (2), in the Gulf of Mexico (2), in the Caribbean (1), and in the Pacific off the coast of Ecuador (1). Disease, injury, and a storm accounted for their deaths.

One bird presumably overshot its wintering area, to be encountered in the Cook Islands, central South Pacific (record 14; Houston 1962). The population of Common Terns wintering in the western Pacific

Encounters (Pacific): Common Tern



belongs to the black-billed race *S. h. longipennis*, breeding in northeastern Asia; the race breeding in Canada, *S. h. hirundo*, is a “straggler to Aiututaki” (Cook Islands) (Pratt et al. 1987). This bird holds the distance record for a Canadian-banded Common Tern, beating the single encounter in Argentina, which covered 8911 km (record 15). As befits one of the most mobile birds in the world, some Common Terns travelled extremely rapidly. One banded as a local in Ontario (record 3) covered 4619 km in 43 days, maintaining an average of >100 km/day for more than 5 weeks.

Haymes and Blokpoel (1978) analyzed 1957 encounters of Common Terns banded in the Great Lakes up to 1976; 61% of these were banded in

Ontario. They found that adults wintered mainly on the mainland of Central and South America, whereas juveniles and subadults (i.e., less than 2 years old) wintered chiefly in Florida and the West Indies. Terns banded as adults returned to the same colony in later years, whereas those banded as chicks usually bred in a different colony. There was little exchange of breeding birds between the Atlantic and Great Lakes regions, but there was frequent interchange between colonies in the same or neighbouring lakes. The age of first breeding was normally 2 years.

Houston (1962, 1972a) pointed out that Common Terns breeding in Saskatchewan evidently winter entirely on the Pacific coast of Central and South America. There has subsequently been one encounter

of an Alberta-banded Common Tern on the Caribbean coast of Mexico. All of the 10 encounters in California originated from either Alberta or Saskatchewan (record 16). The majority of encounters of Ontario-banded Common Terns in Mexico (six of seven) came from the Caribbean side. However, six of seven encounters from Peru originated in Ontario, suggesting that eastern Canadian birds cross to the Pacific south of Mexico.

Common Terns lose their bands rather quickly, probably because of abrasion by sand grains between the band and the leg; their bands have a half-life of about 9 years (Hatch and Nisbet 1983a), which is very short for a species that can live 2–3 times as long (Austin 1953; Clapp et al. 1982). The oldest encounter for a Canadian-banded Common Tern is 16 years and 9 months: a bird encountered in Brazil (record 17).

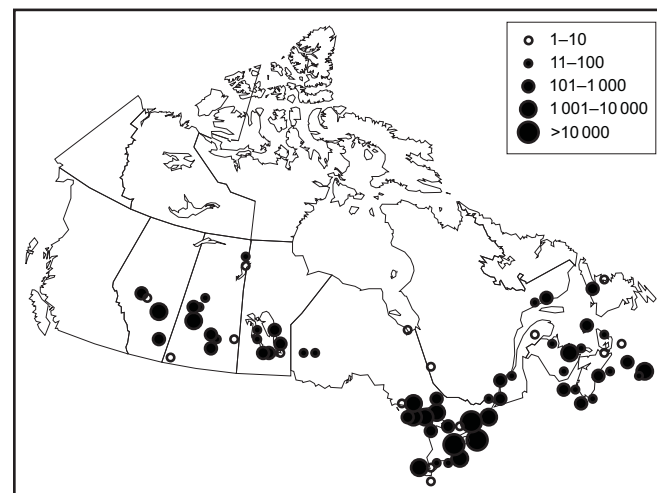
Encounter records: Common Tern

1	0663-57052 WPN	L 00	U 36	16/07/63 07/10/63	near Amherstberg, ON Isla de Coiba, Panama	42°00'N 83°00'W 08°10'N 82°20'W	3 mo. 3 767 km S1°E
2	0503-89478 LGL	L 00	U 97	01/07/52 05/10/52	near Consecon, ON Isla de Baru, Colombia	44°00'N 77°30'W 10°20'N 75°30'W	3 mo. 3 741 km S3°E
3	0743-20706 ARC	L 07	U 04	20/06/70 02/08/70	Port Colborne, ON near Rosehall, Guyana	42°50'N 79°10'W 06°10'N 57°10'W	2 mo. 4 619 km S34°E
4	0963-85505 UAB	L 07	U 26	23/06/70 16/03/71	Pelican Island, Chip Lake, AB Golfo de Fonseca, El Salvador	53°40'N 115°20'W 13°10'N 87°40'W	9 mo. 5 107 km S35°E
5	0543-13561 LGL	L 00	U 01	28/06/58 28/11/58	Presqu'île Provincial Park, ON near Esmeraldas, Ecuador	43°50'N 77°40'W 00°50'N 79°40'W	5 mo. 4 777 km S2°W
6	0983-45256 JPL	02 08	00 28	23/06/68 ??/11/72	North Channel, Lake Huron, ON Bahia de Manta, Ecuador	46°00'N 82°00'W 00°50'S 80°40'W	4 yr. 5 mo. 5 215 km S2°E
7	0502-23814 HO	L 00	U 05	14/07/68 ??/12/68	Baie des Chaleurs, NB near Maracaibo, Venezuela	48°00'N 66°00'W 10°30'N 71°30'W	5 mo. 4 194 km S8°W
8	0523-55504 AB	L 00	U 21	26/06/55 18/11/55	Astra, ON near Gajeota Point, Trinidad	44°00'N 77°30'W 10°00'N 61°00'W	5 mo. 4 093 km S26°E
9	0623-98448 CSH	L 05	U 24	11/07/70 FT/05/72	east of Hafford, SK near Tola, Nicaragua	52°40'N 107°10'W 11°30'N 85°50'W	1 yr. 10 mo. 4 950 km S31°E
10	0023-71330 WIL	U 00	U 09	23/07/30 13/10/30	northwest Lake Erie, ON near Santo Domingo, Dominican Republic	41°50'N 83°00'W 18°20'N 69°50'W	3 mo. 2 890 km S29°E
11	0523-57568 LGL	L 01	U 00	20/06/53 14/11/54	Ameliasburg, ON near Cochabamba, Bolivia	44°00'N 77°03'W 17°S 66°W	1 yr. 5 mo. 6 891 km S12°E
12	0503-71144 CTW	01 56	00 00	31/05/51 03/01/55	Lowbanks, Lake Erie, ON Caleta Pabellon de Pica, Chile	42°50'N 79°30'W 21°00'S 70°00'W	3 yr. 8 mo. 7 172 km S10°E
13	0523-65688 LGL	L 00	U 20	06/07/55 ??/12/55	Gananoque, ON near Macouria, French Guiana	44°20'N 76°10'W 04°50'N 52°20'W	5 mo. 4 961 km S32°E
14	0523-60398 CSH	L 00	U 00	08/07/56 26/11/60	Last Mountain Lake, SK Ureia, Aitutaki, Cook Islands	51°20'N 105°10'W 18°50'S 159°40'W	4 yr. 4 mo. 11 997 km S82°E
15	0872-12595 ARL	L 07	U 89	09/07/85 23/03/94	Sable Island, NS Bahia Samborombon, Argentina	43°50'N 59°50'W 36°10'S 56°40'W	8 yr. 8 mo. 8 911 km S3°E
16	0963-07731 LDK	L 07	U 28	16/07/67 17/09/67	near Buffalo Lake, AB Delmar, CA	52°20'N 112°50'W 32°50'N 117°10'W	2 mo. 2 192 km S12°E
17	1103-24150 ADS	L 07	U 89	19/07/76 24/04/93	Kouchiboujouac, NB Lagoa dos Patos, Brazil	46°40'N 64°50'W 31°10'S 51°00'W	16 yr. 9 mo. 8 775 km S12°E

Summary of banding statistics: Common Tern

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			82 004
<i>No. encountered per 1 000 banded (1955–1995)</i>			15
Total no. encountered (1921–1995)	1 445	164	1 620
No. encountered from foreign bandings	118	11	136
Maximum period from banding to encounter (mo.)	201	121	201
No. Canadian-banded birds moving >0 km	1 095	54	1 163
Mean movement >0 km of Canadian-banded birds (km)	1 207	1 031	1 201
Maximum movement from all encounters (km)	11 997	7 172	11 997
% recovered (encountered dead)	80	34	76
% direct recoveries	62	9	57
% encountered during banding operations	5	55	10

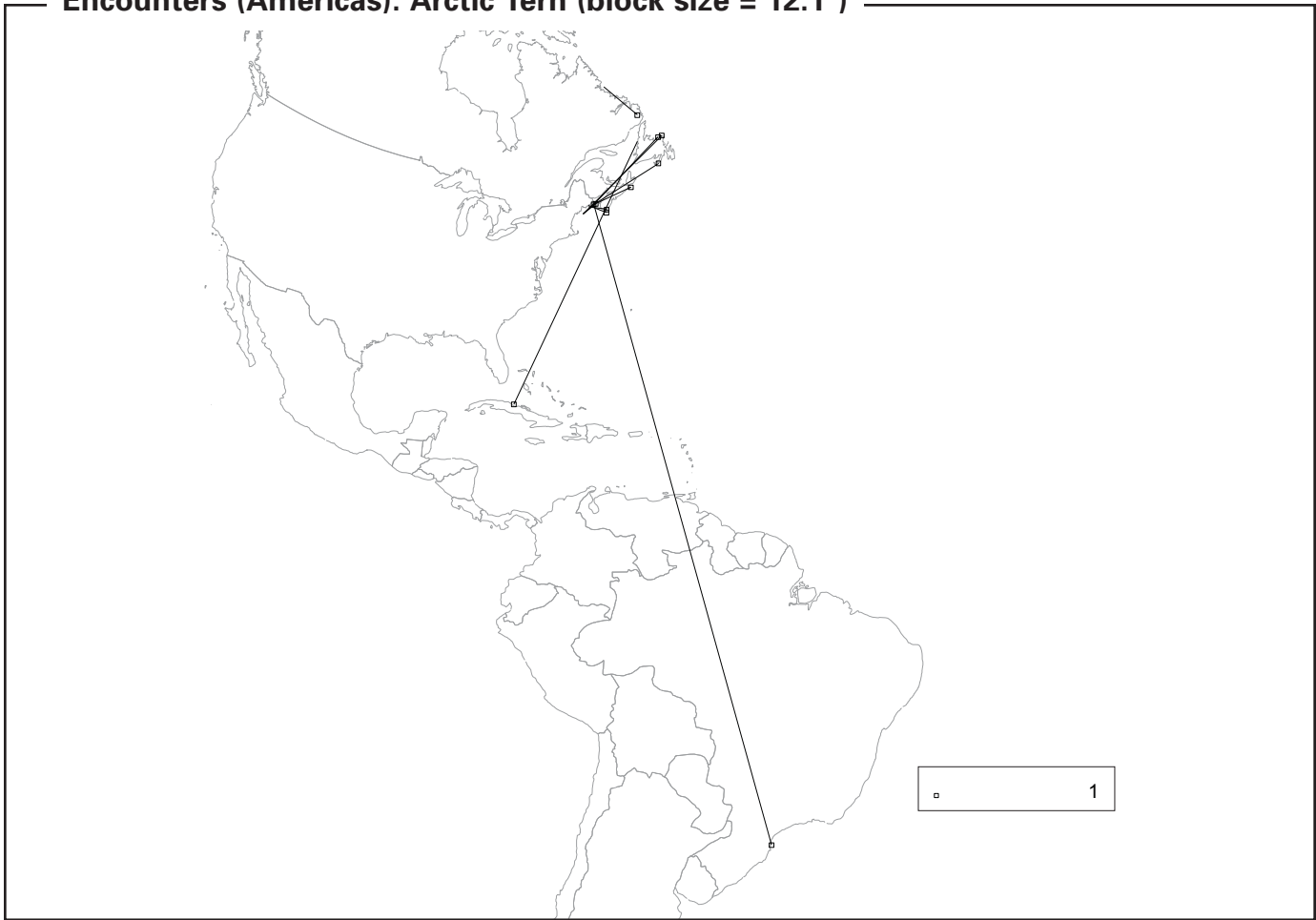
Banding effort: Common Tern



Top banders: LGL, WPN, AB, JPL, CWSOR

Arctic Tern (*Sterna paradisaea*) 071.0

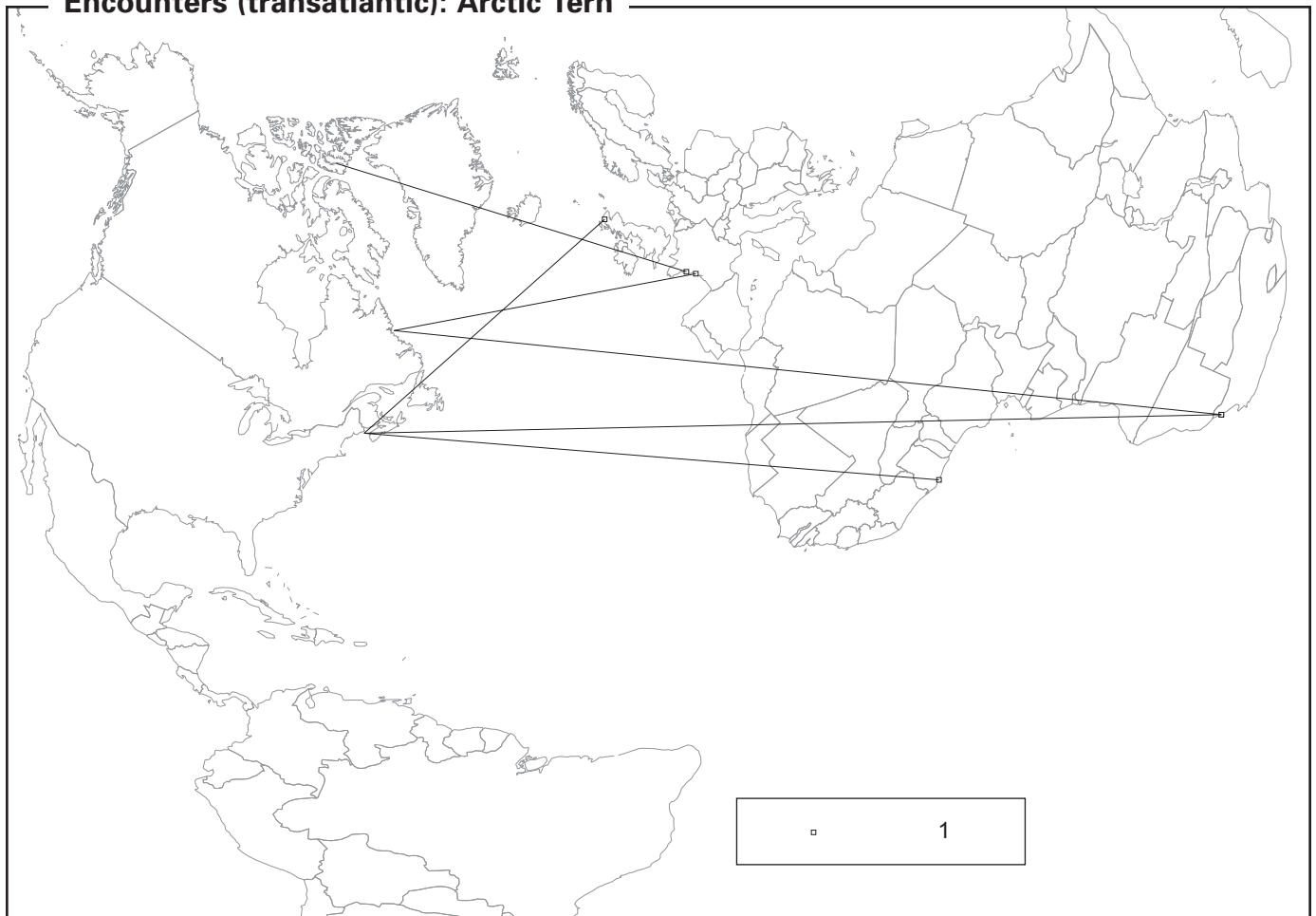
Encounters (Americas): Arctic Tern (block size = 12.1°)



The Arctic Tern breeds in the circumpolar Arctic and winters in the Antarctic; in Canada, it breeds on coasts throughout the eastern seaboard and Arctic as far north as Ellesmere Island. Southernmost breeding in North America occurs in the Gulf of Maine. The species has among the longest migrations of any bird (Salomonsen 1967b) and appears to be exceptionally long-lived. This species is much more pelagic outside the breeding season than the Common Tern; perhaps as a result, its bands wear out at one-sixth the rate (Hatch and Nisbet 1983b).

Two-thirds of Canadian encounters (64) showed no movement; 61 of these were indirect, showing a return to the banding area in later seasons.

The transatlantic encounters of Canadian-banded Arctic terns (records 1–6) show that a substantial fraction of Canadian breeders cross the Atlantic and join European breeders to move south down the west coasts of Europe and Africa, en route to the Antarctic, as do birds from Greenland and the eastern United States (Salomonsen 1967b). However, Canadian birds also use the western Atlantic while moving south, with

Encounters (transatlantic): Arctic Tern

encounters in Cuba and Brazil (record 7). Note that birds from Canada's largest colony (Machias Seal Island, New Brunswick) have been reported in places as diverse as South Africa, West Africa, Scotland, and Brazil (records 1, 3, 4, and 7).

Salomonsen (1967b) described the encounter of a bird banded as a chick in West Greenland and shot the following summer in a breeding colony in James Bay, Ontario. This encounter (not mapped because encounter details lacking) and those of three birds banded in New Brunswick and Maine and encountered

in summer in Newfoundland and Labrador (records 8–10) suggest that Arctic Terns, like Common Terns, may prospect colonies far distant from those where they were hatched.

Half of the encounters occurred 8 or more years after banding, and no fewer than 12 were 20 years or older; most were recaptured at or near the colony of banding. One banded in its hatching year (record 11) was shot at the banding location 28 years later; the longevity record for this species is 34 years (Clapp et al. 1982).

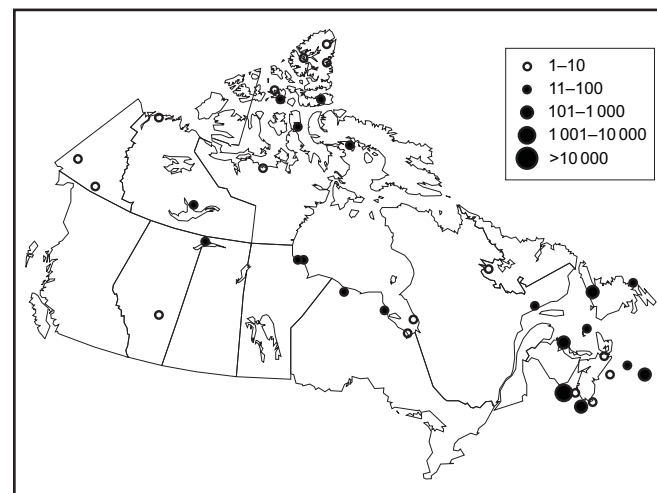
Encounter records: Arctic Tern

1	0373-06032	L	U	05/07/47	Machias Seal Island, NB	44°30'N 67°00'W	1 yr. 4 mo.
	OH	00	00	10/11/48	unknown location, South Africa	30°??'S 17°??'E	12 450 km S69°E
2	0005-48138	L	U	23/07/28	Nain, NL	56°30'N 61°10'W	4 mo.
	OLA	00	00	14/11/28	unknown location, South Africa	30°??'S 17°??'E	~13 000 km S74°E
3	0922-77561	L	U	08/07/94	Machias Seal Island, NB	44°30'N 67°00'W	10 mo.
	OH	07	28	FT/05/95	Cape Coast, Ghana	05°00'N 01°10'W	7 725 km S76°E
4	0483-27338	U	U	18/07/48	Machias Seal Island, NB	44°30'N 67°00'W	2 mo.
	OH	00	00	LT/09/48	Kylestrome, Scotland	58°10'N 05°00'W	4 392 km N47°E
5	0813-10873	L	U	07/08/67	17°W of Cape Sparbo, NU	75°40'N 84°30'W	2 mo.
	GLH	05	00	04/10/67	near Machecout, France	47°00'N 01°50'W	4 798 km S82°E
6	005-48656	L	U	22/06/27	Nain, NL	56°30'N 61°10'W	4 mo.
	OLA	00	00	01/10/27	Vendée region, France	46°??'N 01°??'W	~4 000 km
7	0503-20677	L	U	14/07/50	Machias Seal Island, NB	44°30'N 57°00'W	16 yr. 4 mo.
	OH	05	00	02/11/66	near Penha, Brazil	26°40'S 48°30'W	8 142 km S17°E
8	0473-36827	U	U	12/07/48	Machias Seal Island, NB	44°30'N 67°00'W	5 yr. 11 mo.
	OH	00	01	23/06/54	Lamaline, NL	46°50'N 55°40'W	918 km N70°E
9	0483-27189	U	U	16/07/48	Machias Seal Island, NB	44°30'N 67°00'W	1 yr. 1 mo.
	OH	00	01	06/08/49	Shambler's Cove, NL	49°30'N 54°20'W	1 109 km N55°E
10	0713-46404	L	U	07/07/63	Matinicus Island, ME	43°40'N 68°50'W	7 yr. 1 mo.
	FRW	05	04	16/08/70	near Fogo Island, NL	49°30'N 53°40'W	1 326 km N55°E
11	0363-39145	HY	U	10/07/37	Churchill, MB	58°40'N 94°10'W	28 yr. 0 mo.
	FJW	05	01	16/07/65	Churchill, MB	58°40'N 94°10'W	0 km

Summary of banding statistics: Arctic Tern

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			3 529
<i>No. encountered per 1 000 banded (1955–1995)</i>			2
Total no. encountered (1921–1995)	86	10	96
No. encountered from foreign bandings	7	0	7
Maximum period from banding to encounter (mo.)	336	60	336
No. Canadian-banded birds moving >0 km	23	3	27
Mean movement >0 km of Canadian-banded birds (km)	2 656	7	2 297
Maximum movement from all encounters (km)	12 450	13	12 450
% recovered (encountered dead)	53	9	48
% direct recoveries	19	0	17
% encountered during banding operations	38	81	42

Banding effort: Arctic Tern



Top banders: CWSAR, ARL, AWD, JH, MCH

Roseate Tern (*Sterna dougalli*) 072.0

Encounters: RoseateTern



The Roseate Tern is a nearly cosmopolitan marine species, scattered thinly throughout tropical and temperate oceans except the central and eastern Pacific (Gochfeld et al. 1998). It breeds locally in Nova Scotia and on the Atlantic coast of the United States, south to New Jersey (Nisbet 1984). The species is listed as “endangered” in the United States and “threatened” in Canada (COSEWIC 1993).

All North American band recoveries from 1922 through 1978 were analyzed by Nisbet (1984), and those in South America by Hays et al. (1997). The major wintering area is more restricted than for other North American terns, being found between 11°N and 18°S along the north and east coasts of South America from western Colombia to eastern Brazil. This pattern is consistent with the sole long-distance encounter of a

Canadian bird, banded as a local in Nova Scotia in August and found more than 4000 km away in Guyana the following January (record 1).

Band encounters have helped to identify trapping in the winter quarters as a major cause of the sudden recent decline of this species, in Europe as well as in North America (Langham 1971; Nisbet 1984); the pattern of recoveries has even enabled particular beaches to be pinpointed as major mortality sites and individual trappers as major causes of mortality.

Three encounters of U.S.-banded birds have been reported in Canada: one in New Brunswick (record 2) and two in Newfoundland and Labrador (records 3 and 4). The two recoveries in Newfoundland and Labrador would, if authenticated, constitute the first records of this species for the province (Montevecchi and Tuck

1987). However, Nisbet (1984) expressed concern about the reliability of the banding data, especially for record 4; birds were banded in mixed colonies of Common and Roseate terns; although the chicks of each are distinguishable, there is the possibility of

recording error. The coincidence of encounter locations, within a few kilometres, also seems strange. However, none of nearly 300 000 Common Tern chicks banded in New England has been recovered in Newfoundland and Labrador either.

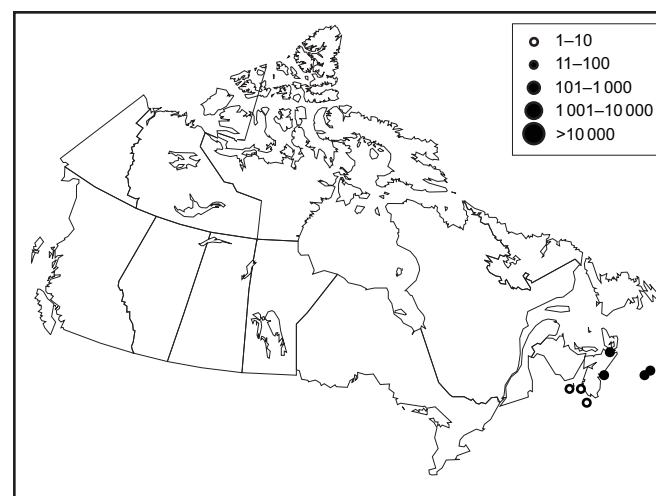
Encounter records: Roseate Tern

1	0872-11874 ARL	L 03	U 00	01/08/84 11/01/85	Sable Island, NS near Georgetown, Guyana	43°50'N 59°50'W 06°40'N 58°00'W	5 mo. 4 141 km S3°E
2	0383-25382 OLA	J 00	U 00	03/07/38 12/09/38	Cape Cod, MA near Saint John, NB	41°40'N 69°50'W 45°10'N 66°00'W	2 mo. 498 km N37°E
3	0353-14924 OLA	U 00	U 00	06/07/35 FT/10/35	Cape Cod, MA Lord's Cove, NL	41°40'N 69°50'W 46°50'N 55°30'W	3 mo. 1 277 km N58°E
4	0023-43200 ?	HY 00	U 01	04/07/29 28/07/31	near Cape Cod, MA near Lamaline, NL	41°30'N 70°40'W 46°50'N 55°40'W	2 yr. 0 mo. 1 334 km N59°E

Summary of banding statistics: Roseate Tern

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			135
<i>No. encountered per 1 000 banded (1955–1995)</i>			7
Total no. encountered (1921–1995)	3	0	4
No. encountered from foreign bandings	2	0	3
Maximum period from banding to encounter (mo.)	24	–	24
No. Canadian-banded birds moving >0 km	1	0	1
Mean movement >0 km of Canadian-banded birds (km)	4 141	–	4 141
Maximum movement from all encounters (km)	4 141	–	4 141
% recovered (encountered dead)	100	–	100
% direct recoveries	66	–	75
% encountered during banding operations	0	–	0

Banding effort: Roseate Tern



Top banders: IAM, ARL, MCH

Black Tern (*Chlidonias niger*) 077.0

Encounters: Black Tern



Black Terns breed on inland marshes across Canada from central British Columbia and southern Mackenzie Valley eastwards to southern parts of Quebec, New Brunswick, and Nova Scotia and south to Colorado and Kansas. They winter mainly in Pacific coastal waters up to 100 km offshore, from central Mexico south to Peru, and along the north coast of South America east to Suriname (Dunn and Agro 1995).

Few have been banded in Canada, and only two encounters have resulted: a bird banded as a local in British Columbia and reported from the Pacific coast of Mexico in its second winter (record 1), and one banded in Quebec in August and encountered in Florida in September of the same year (record 2). The rate of movement of the latter was noteworthy, as the bird covered 2 144 km in only 10 days, an average of >200 km/day.

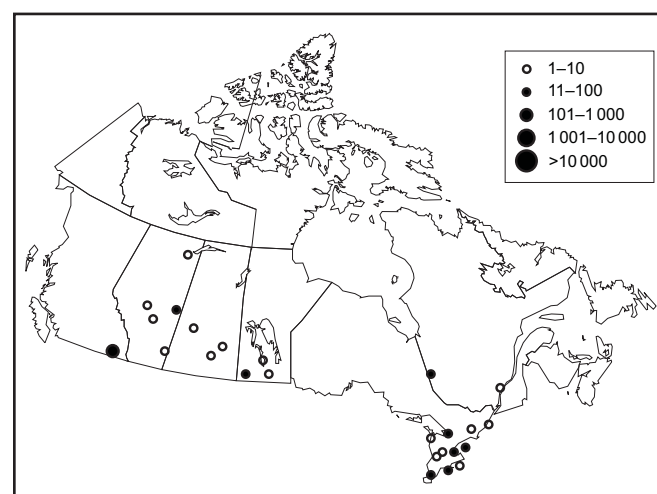
Encounter records: Black Tern

1	0862-90927	L	U	13/07/84	Creston, BC	49°10'N 116°30'W	1 yr. 8 mo.
	SFU	05	01	18/03/86	Sinaloa, Mexico	24°30'N 107°00'W	2 868 km S20°E
2	0692-12066	HY	U	26/08/65	Lake Abitibi, QC	48°40'N 79°20'W	10 dy.
	WED	06	03	05/09/65	near Hawthorn, FL	29°30'N 81°50'W	2 144 km S7°W

Summary of banding statistics:
Black Tern

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			519
<i>No. encountered per 1 000 banded (1955–1995)</i>			259
Total no. encountered (1921–1995)	2	0	2
No. encountered from foreign bandings	2	0	2
Maximum period from banding to encounter (mo.)	20	–	20
No. Canadian-banded birds moving >0 km	2	–	2
Mean movement >0 km of Canadian-banded birds (km)	2 506	–	2 506
Maximum movement from all encounters (km)	2 868	–	2 868
% recovered (encountered dead)	50	–	50
% direct recoveries	50	–	50
% encountered during banding operations	0	–	0

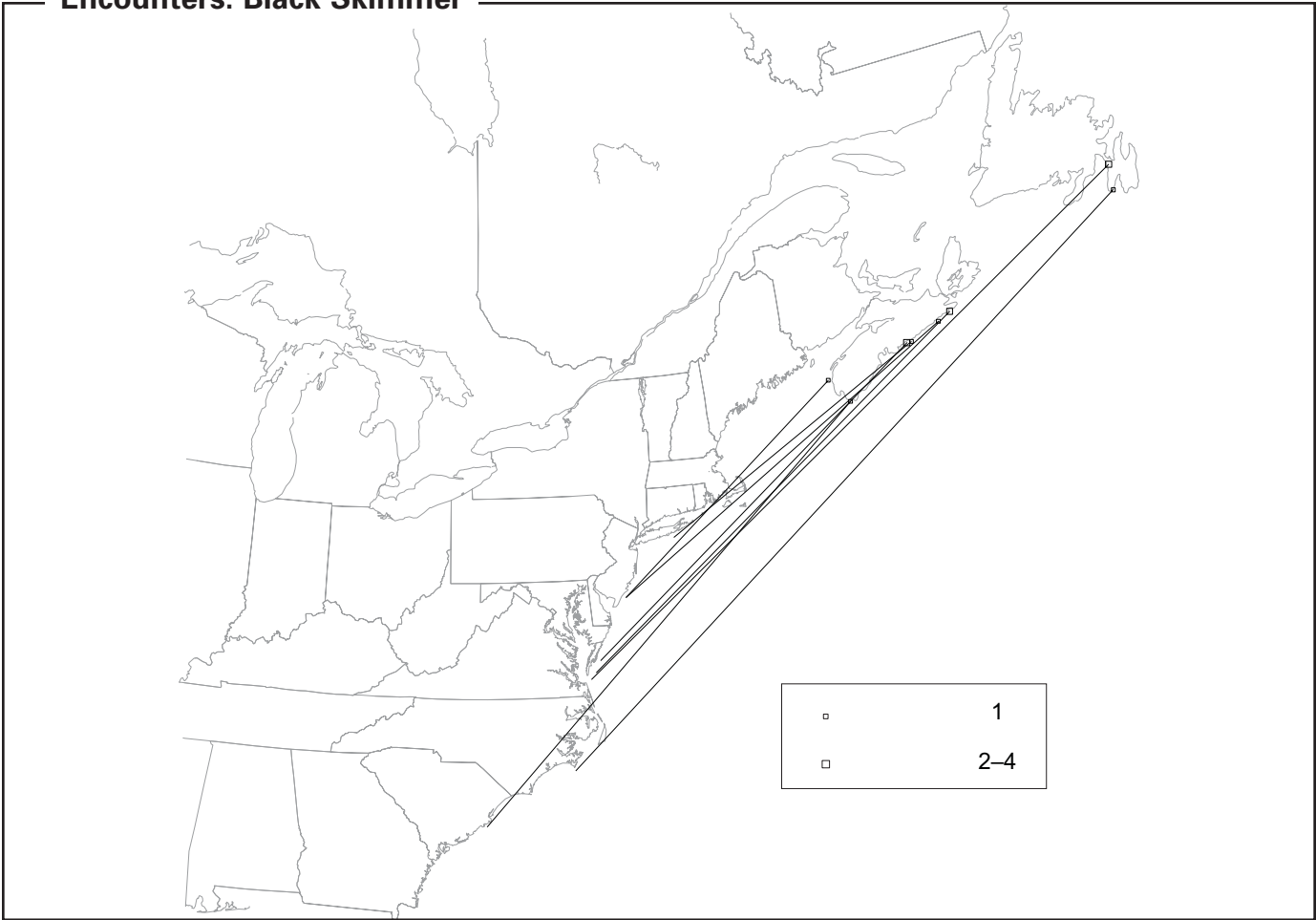
Banding effort: Black Tern



Top banders: SFU, LPBO, JKL, WED, HKBS

Black Skimmer (*Rynchops niger*) 080.0

Encounters: Black Skimmer



Black Skimmers do not breed in Canada and occur only casually in Nova Scotia and New Brunswick; they are vagrants to Newfoundland and Labrador and southwestern Quebec, usually as a result of hurricanes. Because no Black Skimmers have been banded in Canada, no banding effort map is included in this species account.

The Canadian encounters of U.S.-banded birds mirror very closely those of Laughing Gulls and result

from the same two hurricanes, Helene in September 1958 and Gladys in October 1968 (Tuck 1968). The 1958 encounters (5) were all in Newfoundland and Labrador, the 1968 ones (8) in Nova Scotia. All the birds had been banded as chicks at breeding colonies on the eastern seaboard of the United States from South Carolina to New York (mostly New Jersey [5] and Virginia [5]). Four were in their first year, and the rest ranged up to 6 years and 3 months (record 1) and came from as far as 2330 km away (record 2).

Encounter records: Black Skimmer

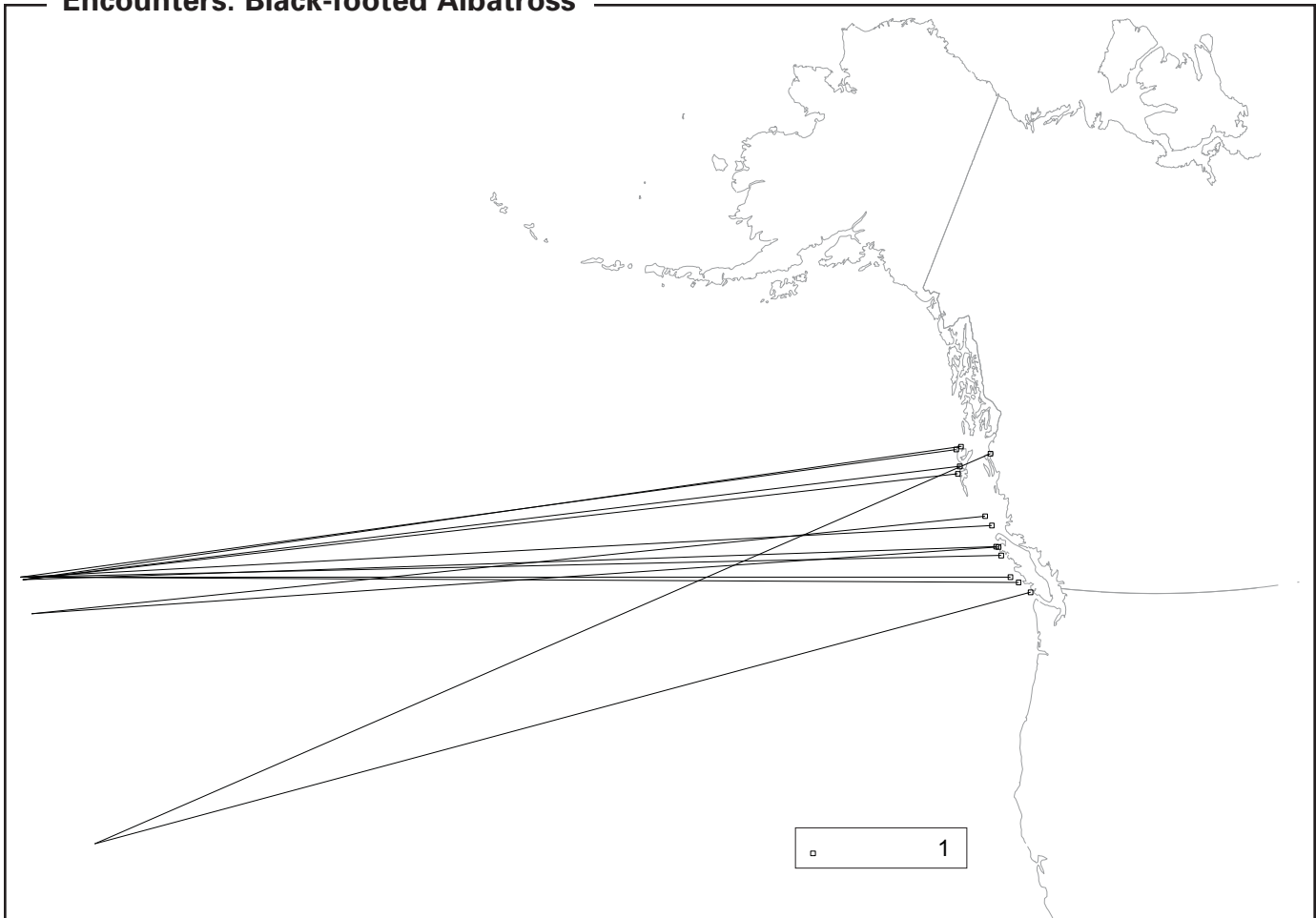
1	0673-77421 FGS	L 05	U 45	30/07/62 ??/10/68	near Accomac, VA near Dartmouth, NS	37°30'N 75°30'W 44°40'N 63°10'W	6 yr. 3 mo. 1 304 km N48°E
2	0514-98151 ?	L 00	U 01	02/07/57 30/09/58	Cape Lookout, NC near Branch, NL	34°30'N 76°30'W 46°50'N 54°00'W	1 yr. 2 mo. 2 330 km N47°E

**Summary of banding statistics:
Black Skimmer**

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			0
<i>No. encountered per 1 000 banded (1955–1995)</i>			–
Total no. encountered (1921–1995)	13	0	13
No. encountered from foreign bandings	13	0	13
Maximum period from banding to encounter (mo.)	75	–	75
No. Canadian-banded birds moving >0 km	0	0	0
Mean movement >0 km of Canadian-banded birds (km)	–	–	–
Maximum movement from all encounters (km)	2 330	–	2 330
% recovered (encountered dead)	100	–	100
% direct recoveries	30	–	30
% encountered during banding operations	0	–	0

Black-footed Albatross (*Phoebastria nigripes*) 081.0

Encounters: Black-footed Albatross



The Black-footed Albatross breeds mostly on the Leeward chain of the Hawaiian Islands and is a common visitor to the offshore waters of British Columbia from March to September. It ranges over the north Pacific to the southern Bering Sea and is seen regularly off Canada's Pacific coast (Campbell et al. 1990a).

All 13 encounters in Canada were of birds banded on or near the breeding grounds in the Hawaiian chain that were encountered off the coast of

British Columbia, from southern Vancouver Island north to Graham Island in the Queen Charlotte Islands (records 1–3).

Encounters occurred in April (1), June (3), July (2), August (2), September (2), October (2), and November (1). Most observations of this species in British Columbia have been made during the same period (Campbell et al. 1990a). No banding effort map appears in this account, as no Black-footed Albatrosses were banded in Canada from 1955 to 1995.

Encounter records: Black-footed Albatross

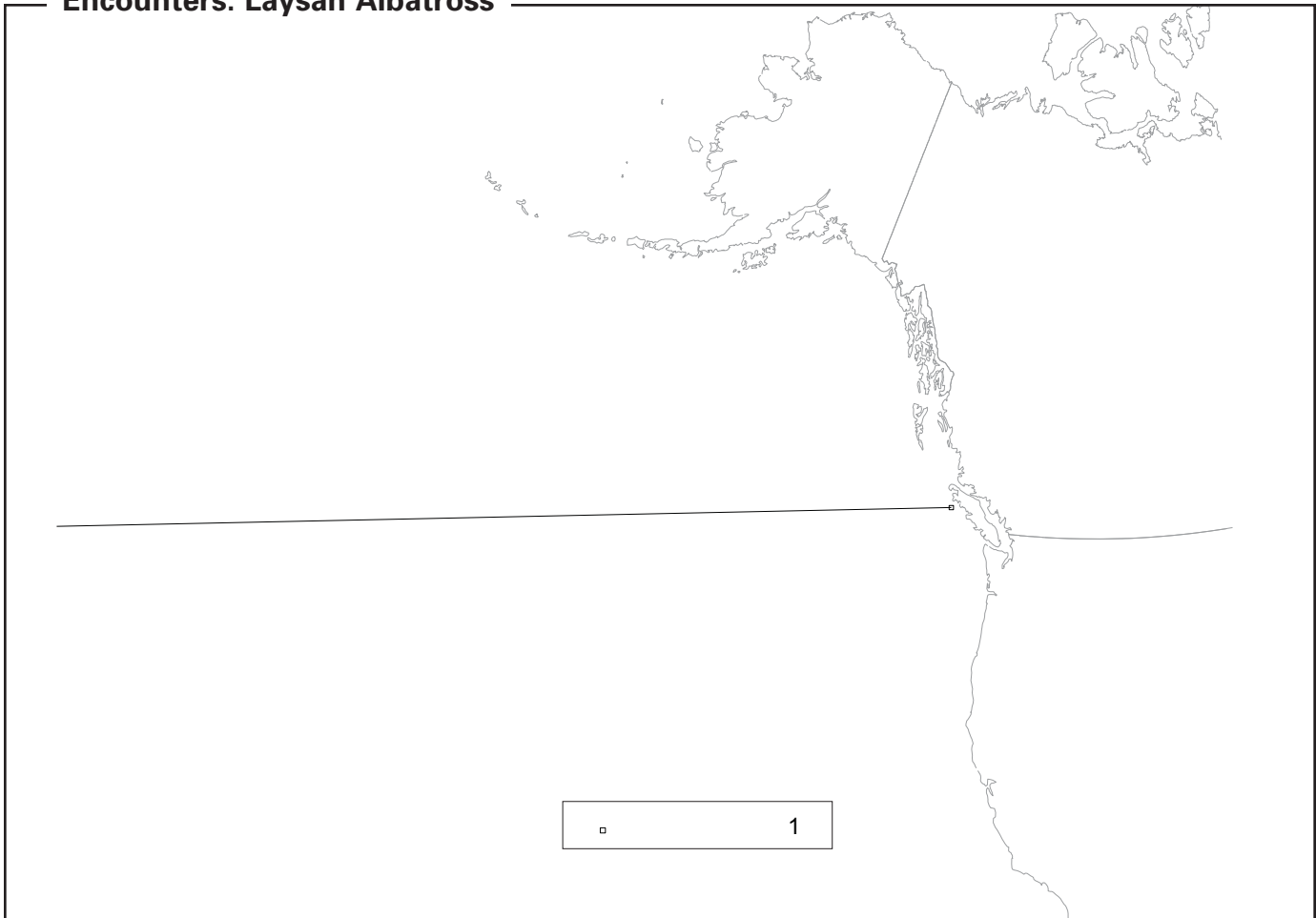
1	0498-85585 RRS	AHY 07	U 26	19/02/52 ST/10/61	Midway Island, HI near Cleland Island, BC	28°10'N 177°20'W 49°10'N 126°40'W	9 yr. 8 mo. 4 868 km N47°E
2	0757-77216 CSR	L 02	U 56	06/03/64 10/04/65	Midway Island, HI Strait of Georgia, BC	28°10'N 177°20'W 48°80'N 123°00'W	1 yr. 1 mo. 5 120 km N49°E
3	0757-36565 RBC	L 04	U 05	19/06/67 14/11/71	Whale-Skate Islands, HI Whyac, BC	23°50'N 166°10'W 48°40'N 125°00'W	4 yr. 5 mo. 4 530 km N42°E

**Summary of banding statistics:
Black-footed Albatross**

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			0
<i>No. encountered per 1 000 banded (1955–1995)</i>			–
Total no. encountered (1921–1995)	9	4	13
No. encountered from foreign bandings	9	4	13
Maximum period from banding to encounter (mo.)	53	116	116
No. Canadian-banded birds moving >0 km	0	0	0
Mean movement >0 km of Canadian-banded birds (km)	–	–	–
Maximum movement from all encounters (km)	5 058	4 868	5 058
% recovered (encountered dead)	88	75	84
% direct recoveries	0	0	0
% encountered during banding operations	11	0	7

Laysan Albatross (*Phoebastria immutabilis*) 082.1

Encounters: Laysan Albatross



Laysan Albatrosses nest on mid-Pacific islands and, when not breeding, range from the Gulf of Alaska south to the coasts of California and Baja California. Although the species was known to occur far offshore in the waters west of British Columbia (Godfrey 1986), it was only in the late 1960s that inshore records were obtained, with the first occurrences in actual Canadian territorial waters

reported in 1971 (Campbell and Shepherd 1973). Campbell et al. (1990a) list a total of 15 observations by 1988. The encounter near Esperanza Inlet (record 1) constitutes the first and only encounter for this species in Canada. Since no Laysan Albatrosses have been banded in Canada, this account does not include a banding effort map.

Encounter records: Laysan Albatross

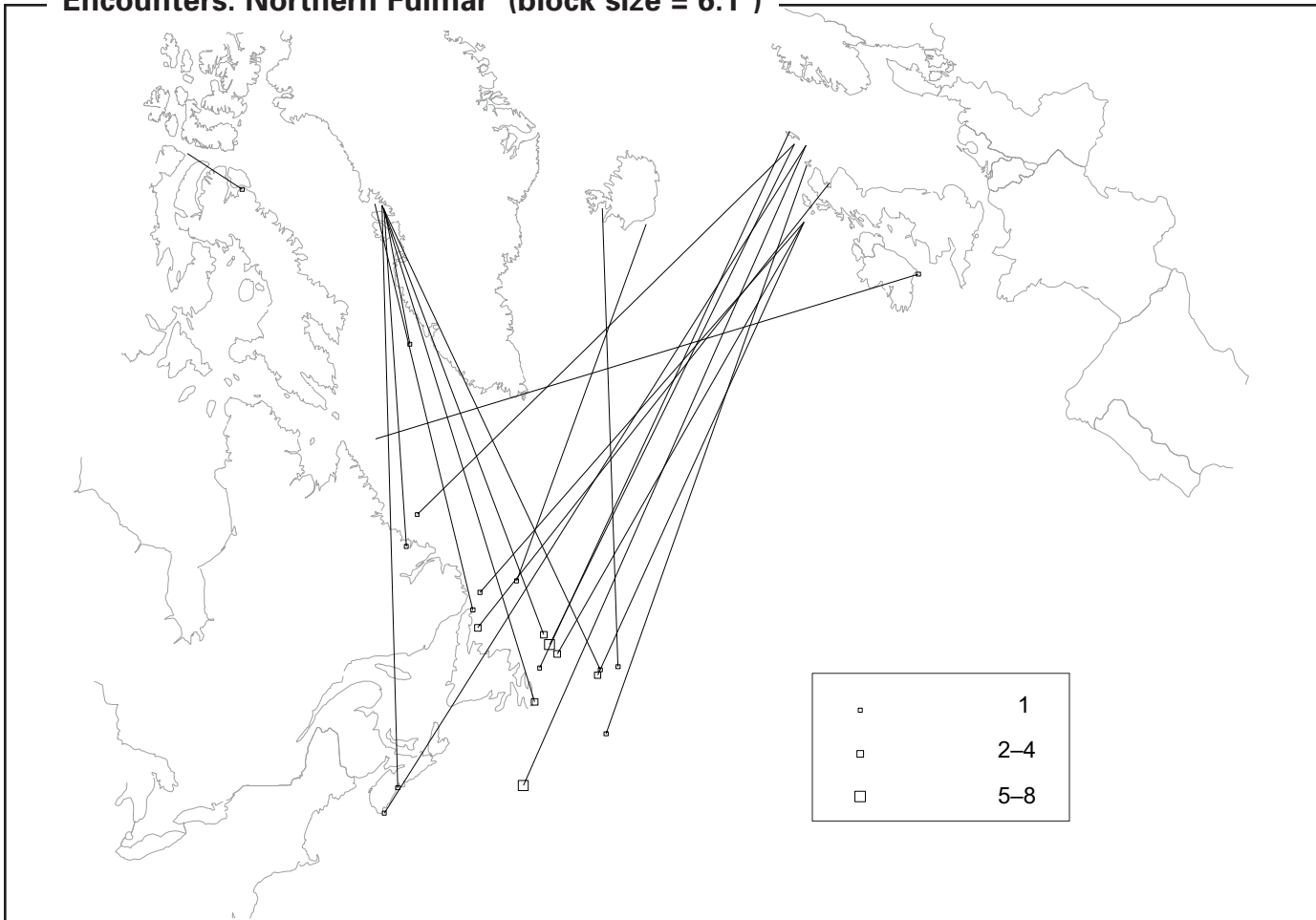
1	0697-83671 HIF	L 00	U 26	26/06/63 01/10/63	eastern Midway, HI near Esperanza Inlet, BC	28°10'N 177°10'W 49°50'N 127°50'W	4 mo. 4 787 km N46°E
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**Summary of banding statistics:
Laysan Albatross**

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			0
<i>No. encountered per 1 000 banded (1955–1995)</i>			–
Total no. encountered (1921–1995)	1	0	1
No. encountered from foreign bandings	1	–	1
Maximum period from banding to encounter (mo.)	4	0	4
No. Canadian-banded birds moving >0 km	–	–	–
Mean movement >0 km of Canadian-banded birds (km)	–	–	–
Maximum movement from all encounters (km)	4 787		4 787
% recovered (encountered dead)	100	–	100
% direct recoveries	100	–	100
% encountered during banding operations	0	–	0

Northern Fulmar (*Fulmarus glacialis*) 086.0

Encounters: Northern Fulmar (block size = 6.1°)



The Northern Fulmar has a circumpolar breeding distribution in the Northern Hemisphere, from Norway and the Arctic Archipelagos to Iceland and Greenland, and in parts of the northern Pacific. In Canada, it nests in large and widely dispersed colonies on the east coast of Baffin Island and through the Jones Sound/Lancaster Sound region, as far west as Cape Liddon, Devon Island; recently, small numbers have also colonized Newfoundland and Labrador (Hatch and Nettleship 1998; Stenhouse and Montevecchi 1999).

Only one encounter of a Northern Fulmar banded at a breeding colony in Canada has been reported: a bird banded as an adult at Prince Leopold Island, Nunavut, and reported 18 years later near Pond Inlet, northern Baffin Island (record 1). Three encounters of

birds banded at sea, from fishing boats in Canadian waters, in March (record 2) and May (records 3 and 4) all showed substantial northerly movement, to Greenland and Iceland. One other at-sea banding resulted in an encounter in southern Ireland (record 5).

There are many encounters in Canada, or in Canadian waters, involving birds banded in Greenland, Iceland, and Scotland. The Greenland birds all originated at or near colonies located in the region north of Disko Island, 70°N or 71°N, and were banded as juveniles or nestlings. Of the 11 encounters of birds from this area, two were in Labrador at about 55°N (record 6 and 7), and seven were on insular Newfoundland, as far south as the Avalon Peninsula, one was in Nova Scotia, and one was at sea off the island of Newfoundland. Eight encounters were at the

end of September or early October, seven of these in the year of banding, and three encounters were in April, May, and September of the following year. As Northern Fulmars breeding in Greenland do not fledge until September, southward post-fledging dispersal is clearly very rapid. One bird travelled 2 173 km in, at most, 17 days, an average of 128 km/day (record 6).

There are 25 encounters involving birds banded as locals in Britain, mainly from the northern or western coasts of Scotland or from various offshore islands, including Orkney (5), Shetland (7), and St. Kilda (5). Most encounters were in Newfoundland waters (record 8), the farthest south being at sea off Cape Sable, Nova Scotia (record 9), and the farthest north, a single bird off the Labrador coast at 56°25'N.

Two birds banded in Iceland, both from the west coast north of Reykjavik, were encountered in Canadian waters, one in the Gulf of St. Lawrence (record 10) and the second in Notre Dame Bay,

Newfoundland and Labrador; one bird banded at sea off Labrador made the reverse journey (record 4).

The concentration of foreign-banded encounters around Newfoundland and Labrador presumably reflects the distribution of fishing vessels, as most encounters came from birds caught accidentally or deliberately from boats. Encounters of birds banded in Britain were most common in the 1950s and 1960s (16) and lower in the 1970s (5) and 1980s (4), and only one was reported in the 1990s. This decline in encounters probably reflects a decrease in the type of fishing activity that would result in encounters, because banding of fulmars in Britain peaked in the 1980s (Wernham et al. 2002). Elapsed time between banding and encounter for European-banded birds ranged from 4 months to 4 years. However, even the latter bird was probably still too young to breed. Probably most European birds in Canadian waters are pre-breeders (Brown et al. 1975).

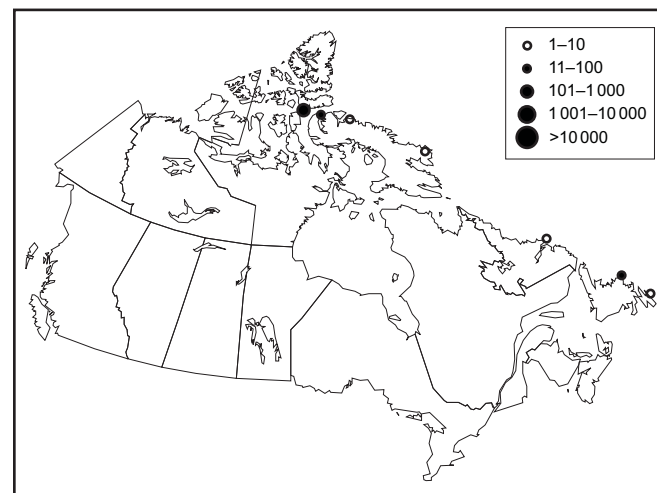
Encounter records: Northern Fulmar

1	0756-16013 DNN	AHY 05	U 00	05/07/75 21/07/93	Prince Leopold Island, NU near Pond Inlet, NU	74°00'N 90°00'W 72°40'N 77°50'W	18 yr. 0 mo. 415 km S75°E
2	0526-17256 LMT	U 00	U 26	00/03/53 08/10/59	at sea, Newfoundland Banks Godthaab, Greenland	44°30'N 53°20'W 64°00'N 52°50'W	6 yr. 7 mo. 2 170 km N1°E
3	0726-57016 RGB	AHY 05	U 01	17/05/69 22/04/72	at sea off Labrador, NL Disko Island, Greenland	53°30'N 52°40'W 71°00'N 52°10'W	2 yr. 11 mo. 1 948 km N1°E
4	0726-57048 RGB	AHY 08	U 89	07/05/70 15/03/72	at sea off Labrador, NL Heimaey, Westmann Islands, Iceland	53°30'N 52°30'W 63°20'N 20°10'W	1 yr. 10 mo. 2 146 km N47°E
5	408578 ?	U ?	U ?	02/07/71 31/05/75	at sea off Labrador, NL Great Saltee, Wexford, Ireland	60°15'N 61°04'W 52°07'N 06°35'W	3 yr. 9 mo. 3 387 km S79°E
6	424650 Denmark	HY 00	U 00	13/09/65 30/09/65	Igdlorssuit, Greenland Noddy Bay, NL	71°05'N 53°25'W 51°35'N 55°30'W	17 dy. 2 173 km S4°W
7	452609 Denmark	HY 00	U 05	09/09/55 99/09/55	Sagdleq, Greenland Kaipokok Bay, NL	70°55'N 52°08'W 55°00'N 60°00'W	~21 dy. 1 812 km S16°W
8	371622 UK	L 00	U 26	19/08/55 15/03/57	Gairsay, Orkney, Scotland St. Pierre Bank, NL	59°05'N 02°57'W 45°54'N 55°17'W	1 yr. 7 mo. 3 799 km S67°W
9	14575 UK	L 00	U 26	19/07/71 15/11/71	Fair Island, Shetland, Scotland at sea, south of Cape Sable, NS	59°30'N 01°36'W 43°36'N 65°18'W	4 mo. 4 868 km S68°W
10	511634 Iceland	AHY 02	U 28	04/09/69 12/09/70	Laugagerdissskoli, Iceland Ramea, NL	64°49'N 22°26'W 47°33'N 57°23'W	1 yr. 0 mo. 2 827 km S64°W

Summary of banding statistics: Northern Fulmar

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			495
<i>No. encountered per 1 000 banded (1955–1995)</i>			1
Total no. encountered (1921–1995)	0	1	47
No. encountered from foreign bandings	0	0	38
Maximum period from banding to encounter (mo.)	–	216	216
No. Canadian-banded birds moving >0 km	0	1	1
Mean movement >0 km of Canadian-banded birds (km)	–	414	414
Maximum movement from all encounters (km)	4 868	2 827	4 868
% recovered (encountered dead)	–	100	100
% direct recoveries	–	0	33
% encountered during banding operations	–	0	0

Banding effort: Northern Fulmar



Top banders: DNN, MUN

Greater Shearwater (*Puffinus gravis*) 089.0

Encounters: Greater Shearwater



The Greater Shearwater is known to nest only in the Gough Islands and Tristan da Cunha in the South Atlantic. At the end of the southern summer in April, birds leave the breeding grounds and head northwest, reaching Canadian waters by May or June. They are abundant from the Gulf of Maine to the Newfoundland Banks from late May to September (Brown 1986). Later in the summer, they move to the Labrador Sea and southern Greenland, then eastwards across the North Atlantic, before heading south again to be present on the breeding grounds between late August and October (Palmer 1976; Brown 1986).

All banding of Greater Shearwaters in Canada has been carried out by catching adult birds at sea, from boats in July or August off the New Brunswick coast. Not surprisingly, considering the remoteness of their breeding grounds and the enormous numbers of birds involved, no Canadian-banded birds have been reported from their breeding colonies. However, one bird was caught in fishing gear in the South Atlantic to the south of the breeding grounds, although probably within the foraging range of the breeding population (record 1, not mapped). At just over 12000 km, this is one of the most distant encounters of any Canadian seabird.

Four encounters involved birds caught at sea off Newfoundland (records 2 and 3). Three encounters in the year of banding were well to the east of the banding location, in the central Atlantic, and three, all from later years, were at sea off southwestern Britain in October–November (records 4 and 5), reflecting the eastward movement that occurs in late summer. An encounter at Cape Hatteras, North Carolina, in June, of a bird banded in New Brunswick in July 3 years before (record 6), is consistent with the known pattern of movement deduced from observations of birds at

sea; they approach the east coast of the United States before moving north to Newfoundland waters (Brown 1986). Hagen (1952, in Palmer 1976) reported two encounters in June and August 1938 off eastern Newfoundland of birds banded on the breeding grounds the previous breeding season. These records are not in our database. Considering the very pelagic habits of this species, the encounter rate of 1.6% for Canadian-banded birds is surprisingly high and may reflect their tendency to be caught in fishing gear.

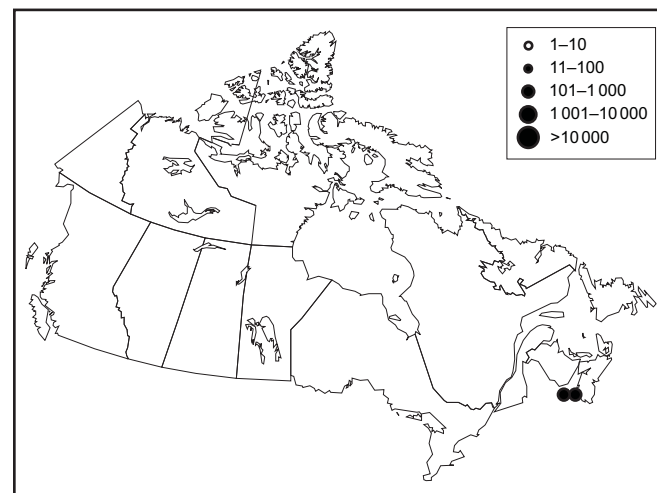
Encounter records: Greater Shearwater

1	0756-12207 CEH	U 05	U 26	18/07/72 99/10/73	southeast of Whitehead, NB at sea, South Atlantic Ocean	44°30'N 66°30'W 49°50'S 06°20'W	1 yr. 3 mo. 12007 km S36°E
2	0626-32634 CEH	AHY 05	U 13	22/07/65 05/08/69	south-southwest of Seal Cove, NB at sea, southeast Shoal Banks, NL	44°10'N 67°00'W 40°30'N 50°00'W	4 yr. 1 mo. 1450 km S77°E
3	0666-81887 CEH	AHY 03	U 26	28/07/69 07/09/70	off Kent Island, NB at sea, Newfoundland Banks	44°30'N 66°40'W 46°30'N 52°00'W	1 yr. 2 mo. 1160 km N82°E
4	0626-32638 CEH	AHY 02	U 28	22/07/65 14/11/67	south-southwest of Seal Cove, NB at sea, off southern Ireland	44°10'N 67°00'W 50°20'N 08°30'W	2 yr. 4 mo. 4357 km N60°E
5	0075-61220 CEH	U 00	U 97	18/07/72 15/10/73	off Kent Island, NB at sea, off Isles of Scilly, Britain	44°30'N 66°30'W 49°40'N 06°30'W	1 yr. 3 mo. 4462 km N61°E
6	0756-12244 CEH	U 05	U 00	18/07/72 27/06/75	near White Head, NB at sea, off Cape Hatteras, NC	44°30'N 66°30'W 35°10'N 75°40'W	2 yr. 11 mo. 1295 km S44°W

Summary of banding statistics: Greater Shearwater

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			544
<i>No. encountered per 1 000 banded (1955–1995)</i>			16
Total no. encountered (1921–1995)	0	4	9
No. encountered from foreign bandings	0	0	0
Maximum period from banding to encounter (mo.)	–	49	84
No. Canadian-banded birds moving >0 km	0	4	9
Mean movement >0 km of Canadian-banded birds (km)	–	2054	3491
Maximum movement from all encounters (km)	–	4357	12007
% recovered (encountered dead)	–	75	88
% direct recoveries	–	0	0
% encountered during banding operations	–	0	0

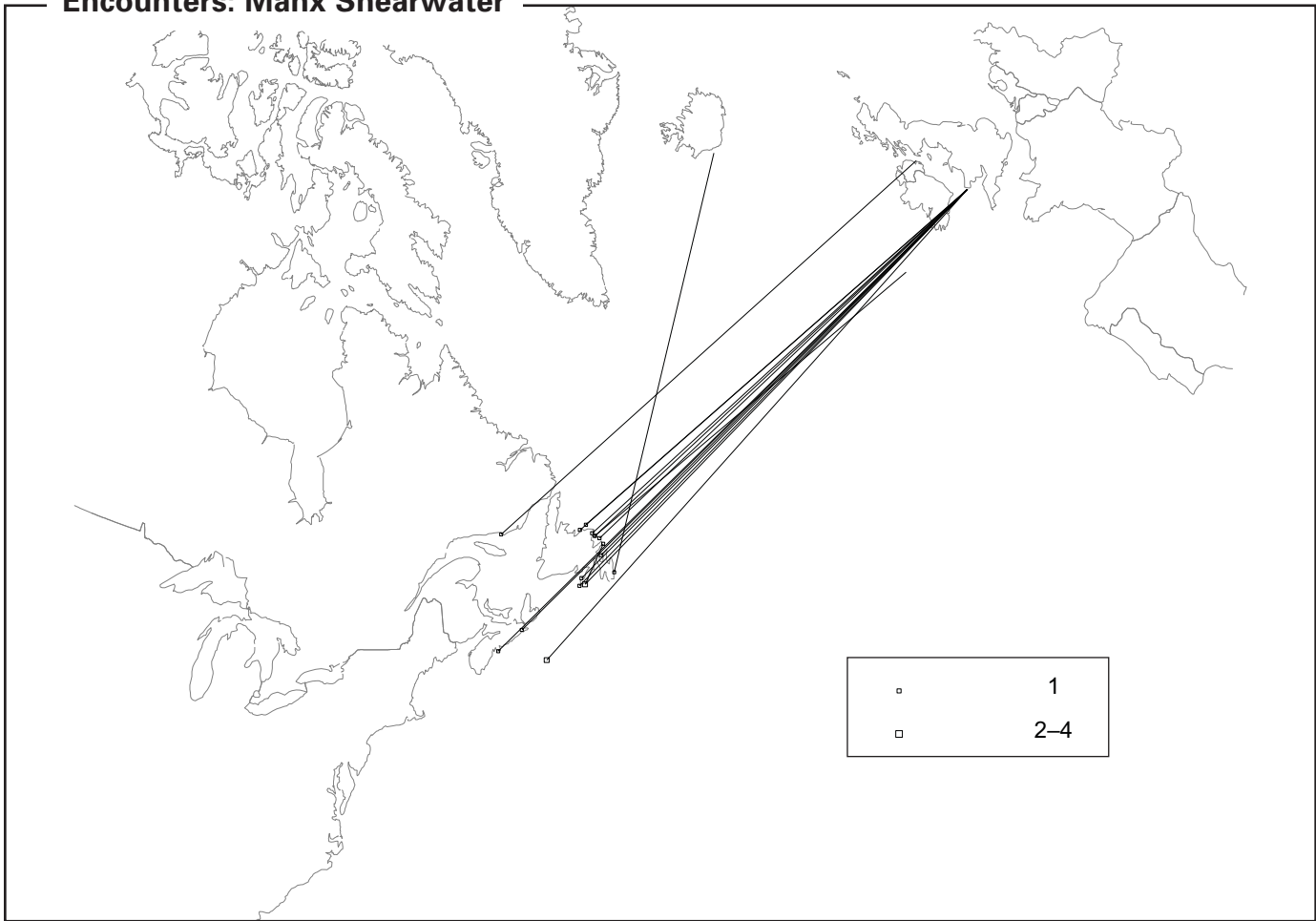
Banding effort: Greater Shearwater



Top banders: BC

Manx Shearwater (*Puffinus puffinus*) 090.0

Encounters: Manx Shearwater



The nominate race of the Manx Shearwater nests in the eastern North Atlantic, from Iceland through the British Isles to the Azores and Madeira. Recently, breeding has been proven in Massachusetts and Newfoundland and Labrador (Storey and Lien 1985). After the breeding season, birds from European colonies perform a rapid migration to the wintering area, in the southwestern Atlantic off the South American coast between 10°S and 50°S (Harrison 1983). Relatively few birds return to the natal area in the first 2 years of life (they do not breed until the age of 5; Brooke 1990). It would appear that after the first winter, the birds are more dispersed, occurring in the northwestern Atlantic in the summer.

There have been few Manx Shearwaters banded in Canada: all at Middle Lawn Island, off the Burin Peninsula, Newfoundland and Labrador. Three encounters have been reported: two at the same locality and one, the next summer, at the north end of Trinity Bay (record 1). All were banded as adults.

There have been 16 encounters of British-banded Manx Shearwaters in Canada or in Canadian waters (records 2-5). All except one were banded as nestlings, on the well-studied colonies of Skokholm and Skomer islands off the coast of Dyfed, Wales: all were banded between 26 August and 22 September, when young birds emerge from their burrows and can be caught on the surface. Encounter dates were from late June to

August, with three in September and one each in April and November; 9 encounters were in the summer following the year of banding, 2 in the subsequent year, and 2 more than 5 years later. None was

encountered in the same year they were banded, indicating that they move directly south after leaving the breeding colony. One encounter, in July, was banded in the Westman Islands, Iceland (record 6).

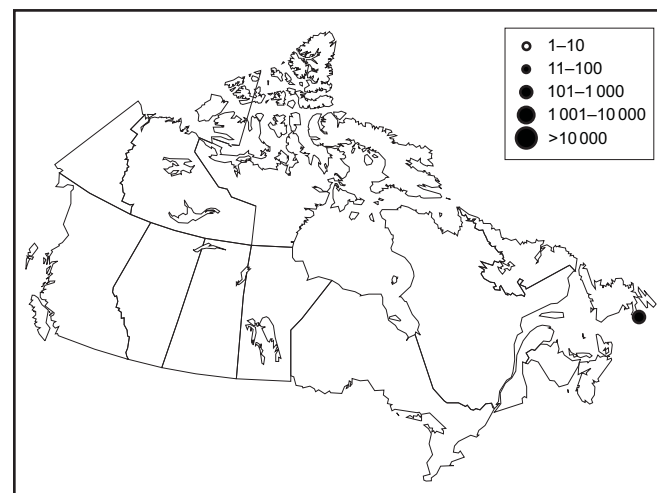
Encounter records: Manx Shearwater

1	0564-39242 MUN	AHY 05	U 01	15/07/77 10/07/78	Middle Lawn Island, NL near Catalina, NL	46°50'N 55°30'W 48°30'N 53°00'W	1 yr. 0 mo. 263 km N44°E
2	FS 56623 UK	L 00	U 01	31/08/72 12/04/81	Skomer Island, Dyfed, Wales Lawn Harbour, NL	51°44'N 05°19'W 46°56'N 55°32'W	8 yr. 8 mo. 3 671 km S82°W
3	EC 69450 UK	L 00	U 01	30/08/65 10/08/66	Skokholm Island, Dyfed, Wales Bonavista Bay, NL	51°42'N 05°16'W 49°00'N 53°30'W	11 mo. 3 431 km S85°W
4	ED 65710 UK	L 00	U 00	29/08/68 23/06/69	Skokholm Island, Wales south of Sable Island, NS	51°42'N 05°18'W 43°48'N 60°00'W	9 mo. 4 168 km S78°W
5	ED 73608 UK	L 00	U 97	31/08/69 20/07/70	Skokholm Island, Wales near Halifax, NS	51°42'N 05°16'W 44°30'N 63°40'W	11 mo. 4 303 km N77°W
6	40727 Iceland	U 00	U 97	14/09/72 30/07/76	Westman Islands, Iceland at sea, east of St. John's, NL	63°20'N 20°10'W 47°00'N 52°50'W	3 yr. 10 mo. 2 708 km S63°W

Summary of banding statistics: Manx Shearwater

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			167
<i>No. encountered per 1 000 banded (1955–1995)</i>			17
Total no. encountered (1921–1995)	0	3	21
No. encountered from foreign bandings	0	0	18
Maximum period from banding to encounter (mo.)	–	46	104
No. Canadian-banded birds moving >0 km	0	1	1
Mean movement >0 km of Canadian-banded birds (km)	–	263	263
Maximum movement from all encounters (km)	–	263	4 302
% recovered (encountered dead)	–	100	100
% direct recoveries	–	0	0
% encountered during banding operations	–	0	0

Banding effort: Manx Shearwater



Top banders: MUN

Fork-tailed Storm-Petrel (*Oceanodroma furcata*) 105.0

Fork-tailed Storm-Petrels breed widely on islands in the North Pacific from northern California through British Columbia and the Gulf of Alaska to the Kuril Islands of Russia. In Canada, the species breeds on islands off the west coast of Vancouver Island, in Queen Charlotte Sound, and around the southeast and west coasts of Haida Gwaii (Queen Charlotte Islands) (Campbell et al. 1990a). In winter, they disperse over the entire northern Pacific (Ainley 1984).

Only small numbers have been banded in Canada, mainly adults trapped by mist-netting on breeding colonies, and there have been no encounters of Canadian-banded birds. The sole encounter is of a bird banded as an adult in Washington State and trapped and released 5 years later on Vancouver Island, only 61 km from the point of banding. Because the bird had travelled less than 100 km when it was encountered, there is no encounter map for this species.

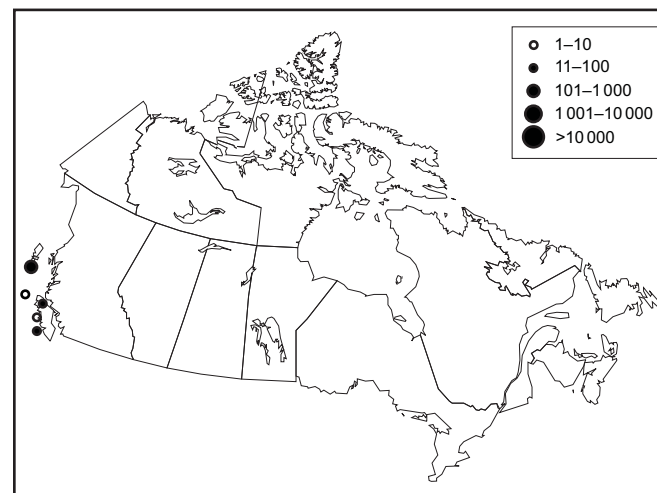
Encounter records: Fork-tailed Storm-Petrel

1	1151-26190	ASY	U	09/05/82	near Cape Flattery, WA	48°20'N 124°40'W	5 yr. 2 mo.
	PDB	07	89	29/07/87	near Tofino, BC	48°50'N 125°00'W	60 km N24°W

Summary of banding statistics: Fork-tailed Storm-Petrel

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			457
<i>No. encountered per 1 000 banded (1955–1995)</i>			0
Total no. encountered (1921–1995)	0	1	1
No. encountered from foreign bandings	0	1	1
Maximum period from banding to encounter (mo.)	–	62	62
No. Canadian-banded birds moving >0 km	0	0	0
Mean movement >0 km of Canadian-banded birds (km)	–	–	–
Maximum movement from all encounters (km)	–	60	60
% recovered (encountered dead)	–	0	0
% direct recoveries	–	0	0
% encountered during banding operations	–	100	100

Banding effort: Fork-tailed Storm-Petrel



Top banders: AJG, UBC, CWSPYR

Leach's Storm-Petrel (*Oceanodroma leucorhoa*) 106.0

Encounters (North America): Leach's Storm-Petrel



Leach's Storm-Petrel breeds on both Pacific and Atlantic coasts — in the west, locally on the coastal islands of British Columbia, and in the east, in similar situations from southern Labrador and the island of Newfoundland to New Brunswick and Nova Scotia, with a few colonies in the Gulf of St. Lawrence (Huntington et al. 1996). The colony at Baccalieu Island, Newfoundland and Labrador, has been estimated at 3 million breeding pairs — probably the largest colony in the world (Sklepkovitch and Montevecchi 1989). The species winters mainly in the tropical zone of the Atlantic and Pacific. Many birds from the northwestern Atlantic probably move to European waters in fall, as numbers there in early winter far exceed local breeding populations (Huntington et al. 1996).

Most banding has been carried out at breeding colonies on Kent Island, New Brunswick, and on the Witless Bay islands, Newfoundland and Labrador. Most encounters were of birds banded and recaptured at their breeding colonies. The Kent Island birds (the majority) were part of a long-term study that is still in progress (Huntington et al. 1996); similar work, over a shorter period, on the same population in Maine was described by Morse and Buchheister (1977).

Many birds banded at Kent Island and encountered elsewhere were subjected to special treatment, including being transported before release, some as far away as Scotland. Encounters of birds artificially displaced for homing and translocation experiments were omitted from this account.

Encounters (non-North America): Leach's Storm-Petrel



Nevertheless, some encounters in summer might indicate movement between colonies (records 1 and 2). Two birds were reported from Europe in winter, one from Spain (record 3) and one from western France (record 4). These occurrences support the idea of an eastward movement in fall. However, an April encounter of a first-year bird in Trinidad suggests that some birds disperse south (record 5). Several birds were encountered at sea in the Atlantic (records 6 and 7), attesting to the tendency for storm-petrels to come aboard fishing boats; the bird in record 7 travelled especially far, being reported from the South Atlantic, about 1 300 km west of St. Helena.

Many encounters were of birds returning to the same nest site over many years, including a number

recaptured more than 10 years after banding, suggesting a remarkable lifespan for a sparrow-sized seabird. The current age record for an encounter is of a bird banded as an adult at Kent Island and recaptured at the same place almost 26 years later (record 8), but this is a relative youngster; Huntington et al. (1996) reported a bird more than 36 years old at the same place.

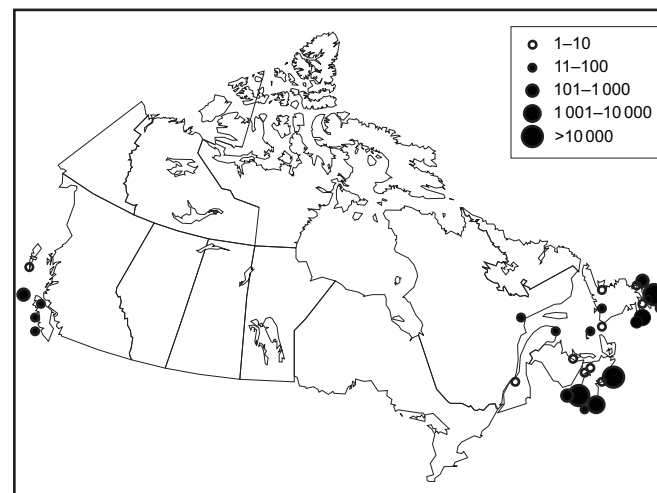
Encounter records: Leach's Storm-Petrel

1	0311-09098 BC	AHY 03	U 00	17/07/65 02/07/68	Kent Island, NB Sable Island, NS	44°30'N 66°40'W 43°50'N 59°50'W	3 yr. 0 mo. 551 km S85°E
2	1251-51359 RRA	ASY 07	U 09	10/07/81 17/06/83	Cape Sable Island, NS at sea, Gulf of Maine	43°20'N 65°40'W 43°50'N 68°00'W	1 yr. 11 mo. 196 km N73°W
3	0311-03136 BC	L 00	U 00	15/08/62 09/01/63	Witless Bay, NL near Huelva, Spain	47°10'N 52°40'W 37°10'N 06°50'W	5 mo. 4910 km S81°E
4	1111-26037 BC	ATY 05	U 00	13/07/86 12/01/88	Kent Island, NB Loire Atlantique, France	44°30'N 66°40'W 47°10'N 01°30'W	1 yr. 6 mo. 4913 km N62°E
5	1251-68406 RRA	HY 05	U 00	29/10/81 22/04/82	near Clark's Harbour, NS Trinidad, Lesser Antilles	43°20'N 65°40'W 10°20'N 61°00'W	6 mo. 3701 km S8°E
6	0311-02991 BC	L 05	U 00	14/08/62 31/08/65	Witless Bay, NL at sea, east of the Grand Banks	47°10'N 52°40'W 45°20'N 47°30'W	3 yr. 0 mo. 447 km S65°E
7	1111-04195 BC	L 06	U 03	14/10/70 02/03/71	Kent Island, NB at sea, South Atlantic	44°30'N 66°40'W 14°20'S 17°40'W	5 mo. 5697 km S70°E
8	0261-80407 BC	AHY 08	M 99	20/07/57 25/06/83	Kent Island, NB Kent Island, NB	44°30'N 66°40'W 44°30'N 66°40'W	25 yr. 11 mo. 0 km

Summary of banding statistics: Leach's Storm-Petrel

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			67 831
<i>No. encountered per 1 000 banded (1955–1995)</i>			16
Total no. encountered (1921–1995)	41	1 236	1 279
No. encountered from foreign bandings	0	4	4
Maximum period from banding to encounter (mo.)	190	311	311
No. Canadian-banded birds moving >0 km	13	55	68
Mean movement >0 km of Canadian-banded birds (km)	1 153	982	1 014
Maximum movement from all encounters (km)	5 697	4 913	5 697
% recovered (encountered dead)	24	1	2
% direct recoveries	19	2	2
% encountered during banding operations	41	46	46

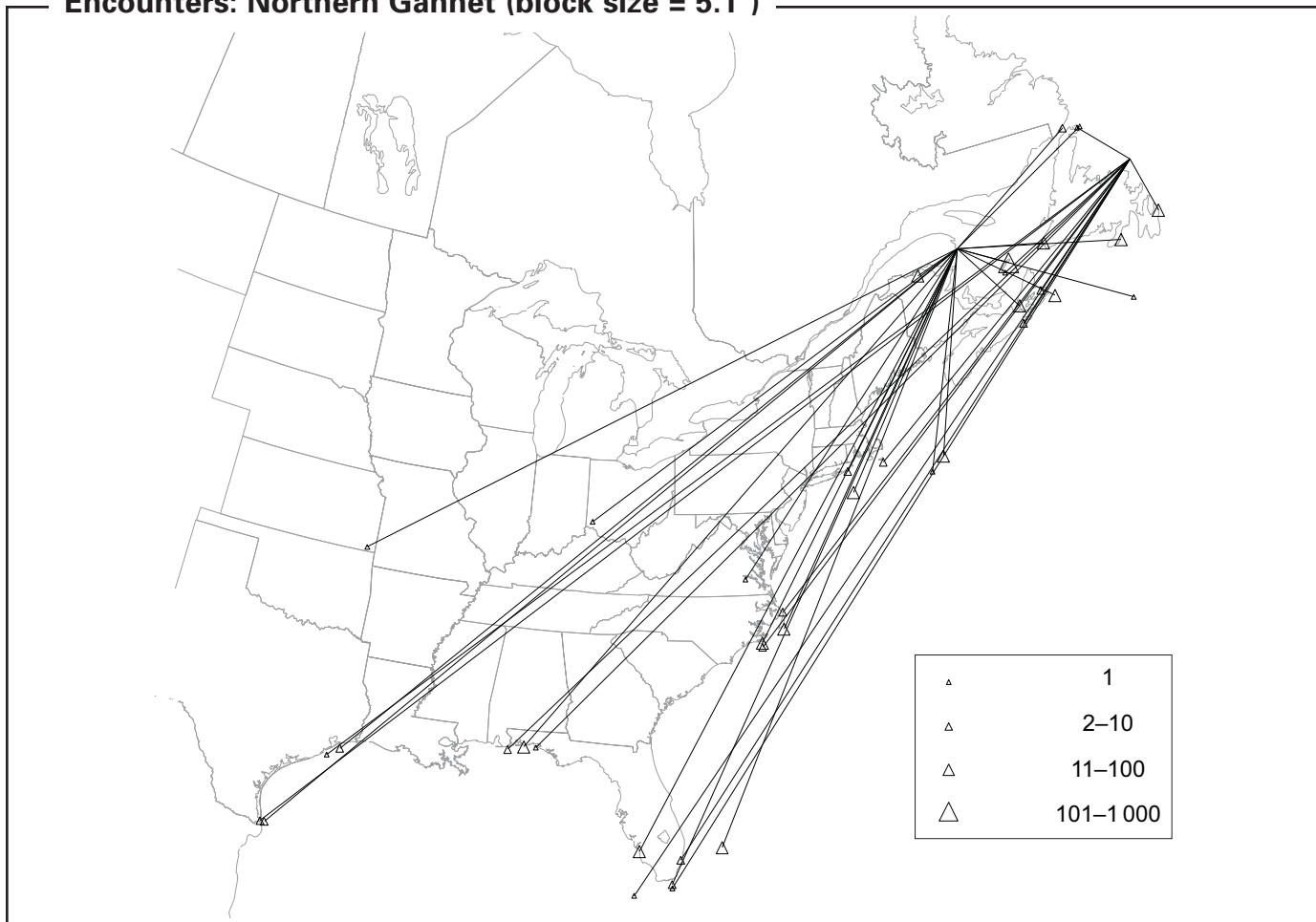
Banding effort: Leach's Storm-Petrel



Top banders: BC, NSDNR, CKC, LMT, MUN

Northern Gannet (*Morus bassanus*) 117.0

Encounters: Northern Gannet (block size = 5.1°)



Northern Gannets have historically bred at only six colonies in North America, all in the Gulf of St. Lawrence or off the island of Newfoundland, although one pair bred in New Brunswick recently (Corrigan and Diamond 2001); over 50% of the continent's population breeds at Bonaventure Island, Quebec (Chapdelaine and Brousseau 1992). All colonies have experienced substantial growth since the 1930s, except for a period in the 1960s when the Bonaventure Island population declined in response to pesticide pollution (Chapdelaine et al. 1987). Gannets winter mainly off the coasts of Florida and the northern Gulf of Mexico, west to Texas.

Almost all the banding of Northern Gannets up to the 1970s was of nestlings on Bonaventure Island; since then, there has been less banding in Quebec, but substantial numbers have been banded in Newfoundland and Labrador. The 417 recoveries from over 11 000 birds banded at Bonaventure Island from 1922 through 1971, and recovered through October 1971, were analyzed by Moisan and Scherrer (1973), whose work is the basis of this account.

In autumn, all age classes move southward along the Atlantic coast, at about 24–32 km/day. Juveniles (up to 1 year old) and subadults (1–4 years) reach the Gulf of Mexico by January, but most encounters (69%) from Texas (17, record 1), Mississippi (6, record 2),

Encounters (transatlantic): Northern Gannet



Louisiana (5, record 3), and Alabama (4, record 4) were reported from March to May. Adults (5 years and older) do not usually pass beyond the east coast of Florida. Spring migration begins for adults in February, but not until early March for subadults and April for juveniles. Adults arrive at the breeding grounds in mid-April, before good weather and plentiful fish supplies have arrived, the younger age classes arriving correspondingly later. The spring return — at 56–112 km/day — is somewhat swifter than the fall migration.

The majority of encounters reported from the northeastern United States (52%: Massachusetts, 17; New Jersey, 21; New York, 10) were during fall

(September–November), whereas the peak of encounters in the Carolinas (56) and Virginia (12, record 5) occurred in March–May (49%). This suggests that staging areas or migration routes may differ somewhat between spring and fall. Most winter encounters (December–February, $n = 83$) were reported from Florida (71%, record 6) and the Carolinas (20%).

Although Northern Gannets obviously pass in great numbers through the Straits of Florida (which, at their narrowest, are only 60 km wide), the first record for the West Indies, including the Bahamas (on the Berry Islands, south of Grand Bahama), occurred only in 1984 (Bond 1985). Hence, a bird encountered on

Grand Bahama Island in 1969 (record 7) constituted the first record of the species for the region. Given the large number of recoveries in Florida and farther west in the Gulf of Mexico, the lack of encounters from the Bahamas suggests that Northern Gannets hug the Florida coast quite tightly on their southward movement.

There have been six encounters in the eastern Atlantic. A third-year bird encountered near Cabo de Penas, Spain (record 8), is notable for being in an area that yields many recoveries of birds banded in colonies

in Scotland (Wernham et al. 2002); it was the first evidence of contact between the New World and Old World populations. Subsequently, there has been one additional recovery from Spain, of a third-year bird in November, as well as two encounters of first-year birds in Portugal (record 9), one of a first-year bird in Morocco in November (record 10), and one first-year bird at sea off Morocco in October (record 11). As young birds do not fledge from Canadian colonies until September, the latter made a very rapid transatlantic crossing. These records off northwestern Africa are

Encounter records: Northern Gannet

1	0518-10590 JEP	L 00	U 00	12/09/60 14/01/61	Île Bonaventure, QC Bayview Gun Club, TX	48°30'N 64°10'W 26°00'N 97°10'W	4 mo. 3 799 km S61°W
2	0518-10511 JEP	L 00	U 00	10/09/60 MT/03/61	Île Bonaventure, QC Mississippi	48°30'N 64°10'W 30°20'N 89°00'W	6 mo. 2 916 km S55°W
3	0768-15602 WAM	L 05	U 28	25/08/87 24/07/88	Funk Island, NL Louisiana	49°40'N 53°10'W 29°10'N 90°10'W	11 mo. 3 855 km S68°W
4	0588-75862 WAM	L 05	U 00	10/08/82 19/12/82	Funk Island, NL Alabama	49°40'N 53°10'W 30°10'N 87°30'W	4 mo. 3 597 km S66°W
5	0498-86563 JEP	L 00	U 00	14/08/52 08/04/61	Île Bonaventure, QC Virginia	48°30'N 64°10'W 36°50'N 75°50'W	8 yr. 8 mo. 1 608 km S40°W
6	0528-82908 JEP	L 00	U 00	19/09/62 31/03/63	Île Bonaventure, QC Florida	48°30'N 64°10'W 30°20'N 87°10'W	6 mo. 2 807 km S52°W
7	0509-47396 AR	L 00	U 07	07/09/68 27/04/69	Île Bonaventure, QC Grand Bahama Island, West Indies	48°30'N 64°10'W 26°30'N 78°30'W	7 mo. 2 738 km S33°W
8	0508-00379 JMP	L 05	U 26	09/09/67 30/11/70	Île Bonaventure, QC Cabo de Penas, Spain	48°30'N 64°10'W 43°30'N 05°40'W	3 yr. 2 mo. 446 km N74°E
9	0638-73693 WAM	L 05	U 00	19/08/84 15/11/84	Funk Island, NL near Lisbon, Portugal	49°40'N 53°10'W 38°40'N 09°20'W	3 mo. 3 648 km S87°E
10	0748-54848 WAM	ATY 05	U 28	20/08/88 19/11/88	Funk Island, NL south of Casablanca, Morocco	49°40'N 53°10'W 33°10'N 08°30'W	3 mo. 4 079 km S80°E
11	0678-27313 WAM	L 07	U 28	06/08/79 25/10/79	Funk Island, NL at sea, off Morocco	49°40'N 53°10'W 32°40'N 16°50'W	2 mo. 3 534 km S71°E
12	0638-73634 WAM	L 03	U 23	19/08/84 LT/03/88	Funk Island, NL near Westport, Ireland	49°40'N 53°10'W 53°50'N 09°30'W	3 yr. 7 mo. 2 996 km N64°E
13	0638-73740 WAM	L 03	U 26	19/08/84 15/05/91	Funk Island, NL Flatey Island, Iceland	49°40'N 53°10'W 66°10'N 17°50'W	6 yr. 9 mo. 2 717 km N34°E
14	0006-62368 WMD	L 00	U 00	06/08/29 ??/??/49	Île Bonaventure, QC near Gaborouse, NS	48°30'N 64°10'W 45°40'N 60°10'W	~20 yr. 436 km S54°E
15	0578-67373 WMD	L 05	U 00	11/09/66 25/07/92	Île Bonaventure, QC Île Bonaventure, QC	48°30'N 64°10'W 48°30'N 64°10'W	25 yr. 10 mo. 0 km

within the normal wintering range of the European gannet population (Perrins and Snow 1998).

A bird in its fourth year was encountered in western Ireland in March (record 12), and a breeding-age (seventh year) bird was encountered in May in Iceland (record 13). These two records suggest that some birds from the western Atlantic may settle at eastern Atlantic breeding colonies.

There are a number of recoveries in the Great Lakes basin; although the Northern Gannet does occur

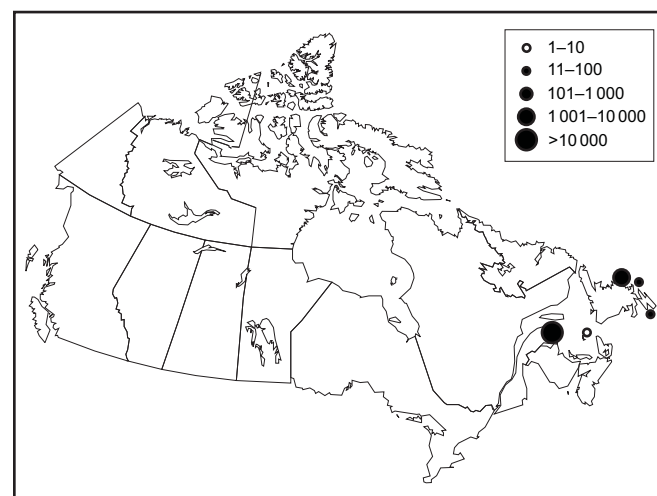
as a vagrant in lakes Ontario and Erie, most of the recoveries were insufficiently authenticated by the finder to preclude the possibility of an error in reporting bands used on Canada Geese *Branta canadensis*. These encounters have therefore been excluded from the encounter maps.

The longevity record for North America was held by a bird banded at Bonaventure Island and encountered in Nova Scotia at age 20 (record 14) (Clapp et al. 1982), but another bird banded at Bonaventure Island has exceeded that by 5 years 10 months (record 15).

Summary of banding statistics: Northern Gannet

	Age at banding		
	Hatch year	After hatch year	All ages
No. of Canadian bandings (1955–1995)			13 312
No. encountered per 1 000 banded (1955–1995)			57
Total no. encountered (1921–1995)	703	124	837
No. encountered from foreign bandings	0	0	0
Maximum period from banding to encounter (mo.)	310	195	310
No. Canadian-banded birds moving >0 km	624	99	732
Mean movement >0 km of Canadian-banded birds (km)	1 232	681	1 154
Maximum movement from all encounters (km)	4 584	4 463	4 584
% recovered (encountered dead)	91	87	90
% direct recoveries	22	2	19
% encountered during banding operations	3	11	5

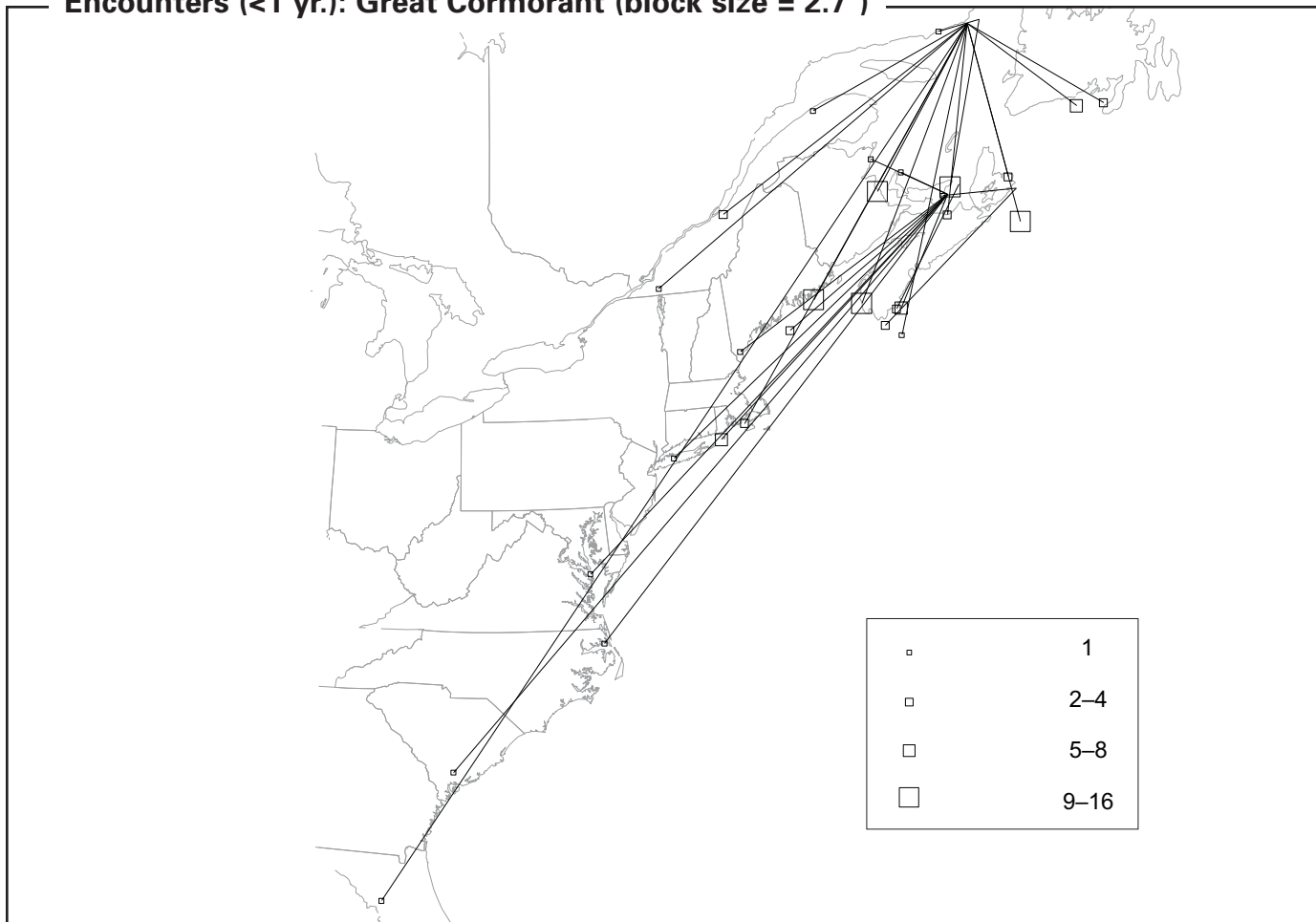
Banding effort: Northern Gannet



Top banders: JMP, MUN, JB, JEP, AR

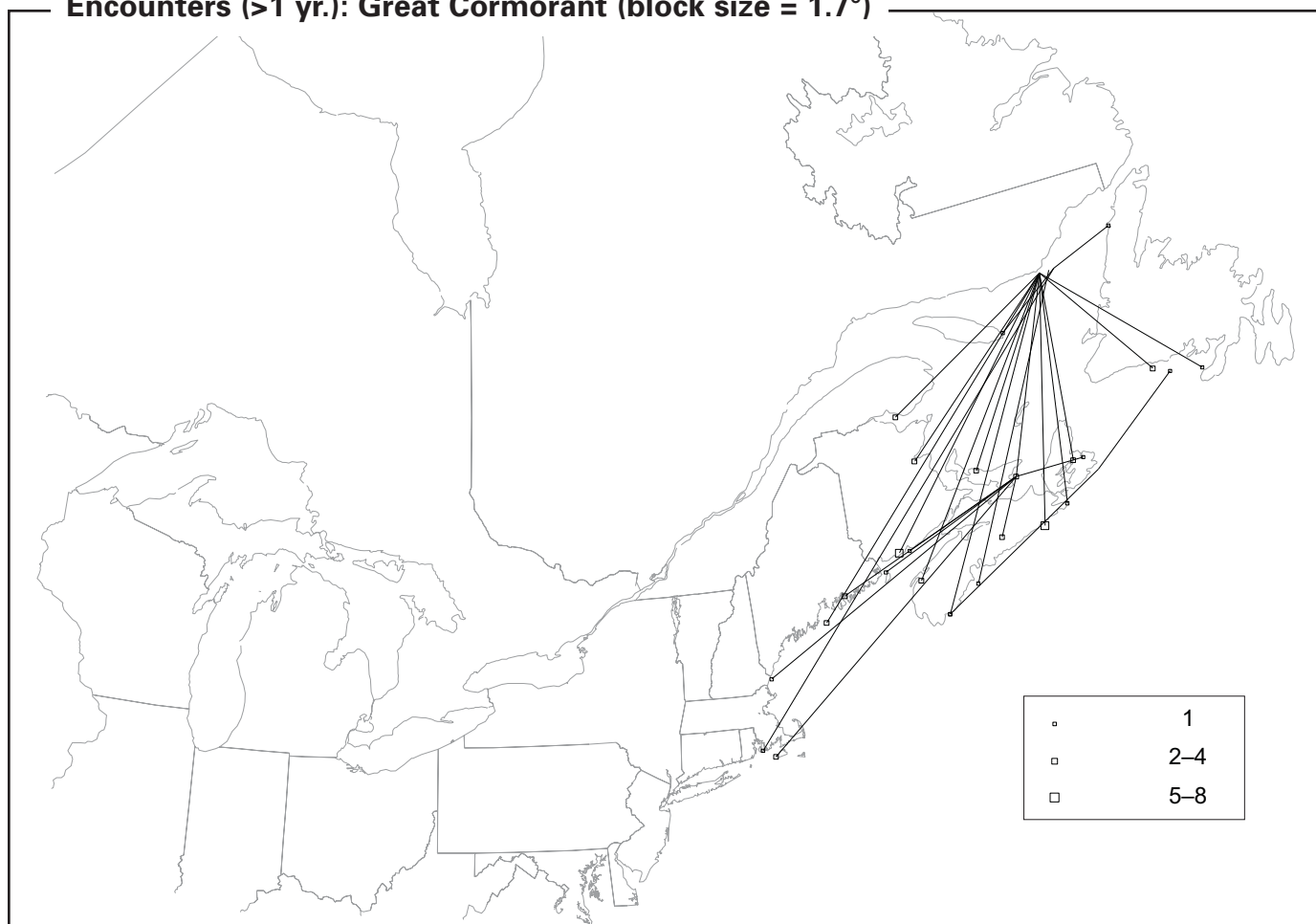
Great Cormorant (*Phalacrocorax carbo*) 119.0

Encounters (<1 yr.): Great Cormorant (block size = 2.7°)



Great Cormorants breed locally in the Atlantic provinces and southern Quebec (Gulf of St. Lawrence) and winter south to North Carolina, straggling to southern Florida, Louisiana, and inland to Lake Ontario and West Virginia (Hatch et al. 2000). Most banding has been in two areas in the Gulf of St. Lawrence, on the North Shore in 1931–1940 and on Prince Edward Island after 1971; all but 12 of the recoveries before 1975 refer to the former area, and over half are within the Maritimes.

There have been 44 encounters in the United States, mostly in Maine (27, records 1 and 2), Massachusetts (10, records 3 and 4), and Rhode Island (4, record 5). Single encounters in Florida (record 6), South Carolina (record 7), and Virginia (record 8) are of unusual interest because the species is only occasional in these states. Another encounter, far up the St. Lawrence (record 9), may illustrate the route taken by vagrant birds that have appeared increasingly frequently in Lake Ontario in recent years. Movements

Encounters (>1 yr.): Great Cormorant (block size = 1.7°)


are apparently rather longer in the first year than in older birds.

The most commonly identified cause of mortality was shooting (45% of first-years, 33% of older birds), although entanglement in fishing nets has accounted for a greater proportion of encounters more recently. Most recoveries occurred in October and November, mainly of first-year birds. No first-year birds were found within 100 km of the natal colony in their first

summer, although two encounters of birds at that age were of birds from non-natal colonies, suggesting the possibility of some interchange. A bird encountered in Maine in July at 5 years of age could have been breeding there (record 2).

A bird banded at Cape Whittle, Quebec, in 1937 and encountered at Cape Breton in the fall of its 15th year (record 10) holds the North American longevity record for this species (Clapp et al. 1982).

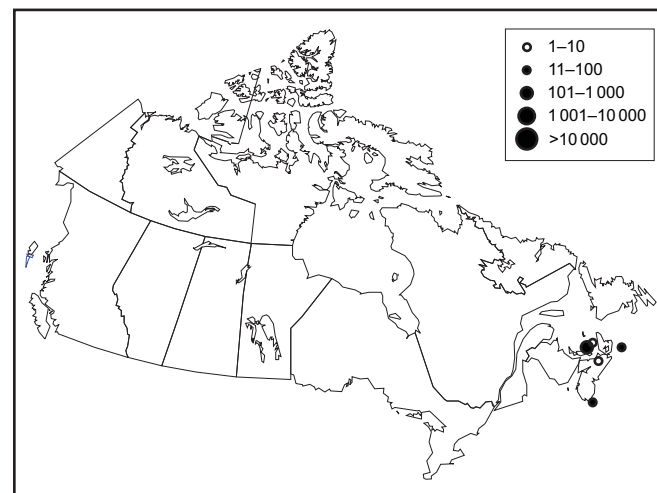
Encounter records: Great Cormorant

1	0027-20543	U	U	07/07/32	Cap Whittle, QC	50°10'N 60°00'W	4 mo.
	HFL	00	00	??/11/32	Brigham's Cove, ME	43°50'N 69°50'W	1 022 km S57°W
2	0628-79057	L	U	21/06/74	eastern Prince Edward Island	46°10'N 62°20'W	5 yr. 1 mo.
	PEIFW	02	98	23/07/79	near Bangor, ME	44°40'N 68°40'W	522 km S74°W
3	0027-20484	U	U	13/07/33	Cap Whittle, QC	50°10'N 60°00'W	4 mo.
	HFL	00	00	07/11/33	Barney's Joy Beach, MA	41°30'N 70°50'W	1 273 km S45°W
4	0678-28370	L	U	12/06/78	eastern Prince Edward Island	46°10'N 62°20'W	10 yr. 9 mo.
	PEIFW	05	00	02/03/89	near Quincy, MA	42°10'N 70°50'W	811 km S60°W
5	0378-01981	U	U	30/06/38	Îles Sainte-Marie, QC	50°10'N 59°30'W	8 yr. 10 mo.
	HFL	00	00	06/04/47	Common Fence Point, RI	41°30'N 71°10'W	1 315 km S53°W
6	0027-08212	U	U	25/07/30	Cap Whittle, QC	50°10'N 60°00'W	5 mo.
	HFL	00	01	05/12/30	11 km north of Gulf Hammock, FL	29°20'N 82°40'W	2 998 km S48°W
7	0638-71549	L	U	16/06/75	east of Georgetown, PE	46°10'N 62°20'W	—
	PEIFW	00	00	??/??/75	near Ruffin, SC	32°50'N 80°40'W	2 155 km S53°W
8	0408-10420	U	U	03/07/40	Cap Whittle, QC	50°10'N 60°00'W	5 mo.
	HFL	00	01	27/12/40	Virginia	38°90'N 77°90'W	1 867 km S59°W
9	0378-01166	U	U	04/08/39	Cap Whittle, QC	50°10'N 60°00'W	3 mo.
	HFL	00	01	15/11/39	Napierville, QC	45°10'N 73°20'W	1 138 km S69°W
10	0378-01919	L	U	10/07/37	Cap Whittle, QC	50°10'N 60°00'W	14 yr. 4 mo.
	HFL	00	01	Fall/51	Englishtown, Cape Breton, NS	46°10'N 60°30'W	445 km S7°W

Summary of banding statistics: Great Cormorant

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			686
<i>No. encountered per 1 000 banded (1955–1995)</i>			74
Total no. encountered (1921–1995)	150	4	179
No. encountered from foreign bandings	0	0	0
Maximum period from banding to encounter (mo.)	172	95	172
No. Canadian-banded birds moving >0 km	144	3	170
Mean movement >0 km of Canadian-banded birds (km)	609	645	622
Maximum movement from all encounters (km)	2 998	869	2 998
% recovered (encountered dead)	98	100	98
% direct recoveries	54	25	57
% encountered during banding operations	0	0	0

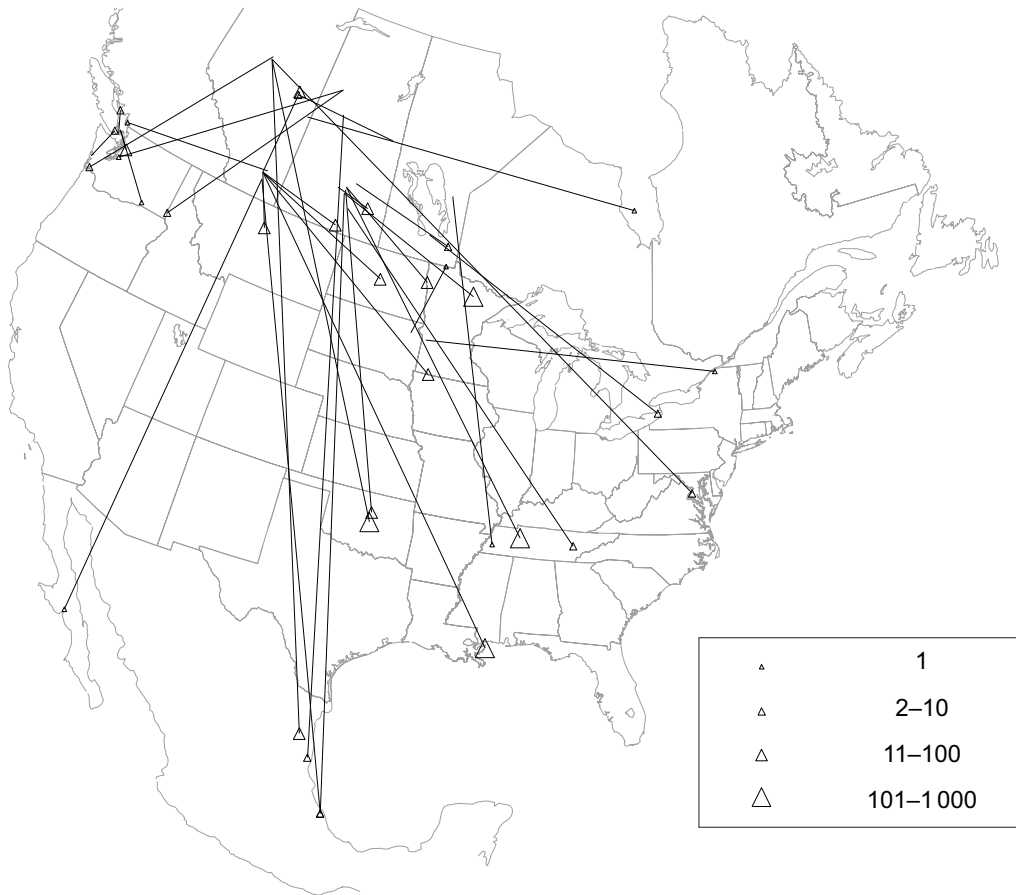
Banding effort: Great Cormorant



Top banders: PEIFW, GH, CKC, NSDNR

Double-crested Cormorant (*Phalacrocorax auritus*) 120.0

Encounters (west): Double-crested Cormorant (block size = 12.1°)

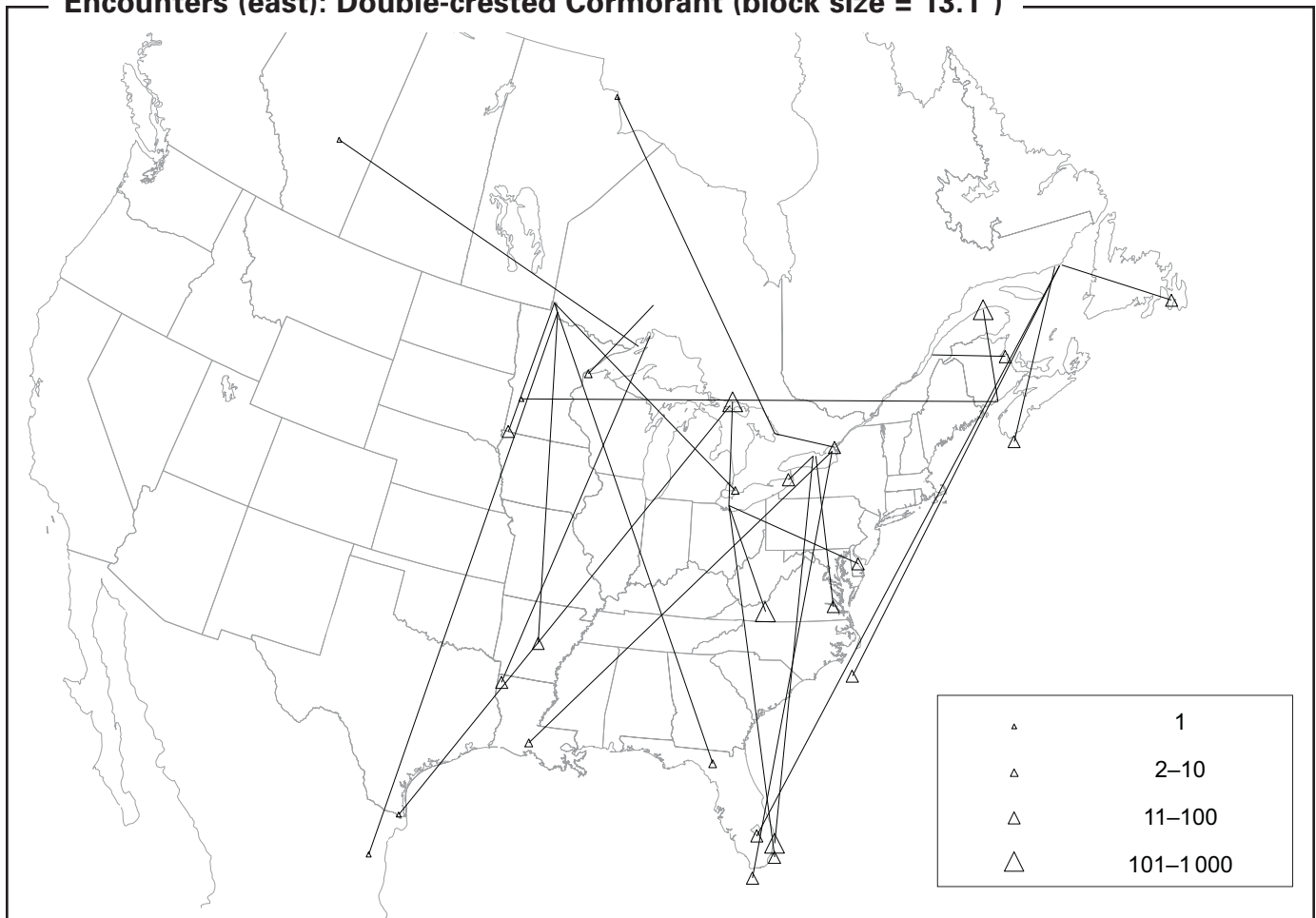


Double-crested Cormorants breed inland on freshwater lakes and rivers, from eastern Alberta through southern Saskatchewan, Manitoba, and Ontario to the St. Lawrence River, and along the sea coasts of the Maritime provinces and northern New England; a small population of the west coast race *P. a. cincinnatus* breeds in southern British Columbia (Campbell et al. 1990a). West coast birds winter locally and south to central California; prairie breeders winter along the coasts of the Gulf of Mexico; birds breeding in the Great Lakes and east coast birds winter mainly in Florida (Palmer 1976).

The relatively high encounter rate of this species would justify a more detailed analysis than is possible here. About half the encounters are from birds banded in the prairies, and one-quarter from Ontario.

Encounters are commonest during the post-fledging dispersal (August–November), especially among juveniles; 38% were found dead, 24% shot, and 17% caught in nets. Encounters of birds banded in British Columbia were mostly in the same province, but large numbers were encountered also in the state of Washington (139), mostly from within 100 km of the border and mostly in the first year after banding. Only three encounters were reported from Oregon, and two from California. One California-banded bird was encountered in British Columbia in March (record 1).

Birds banded in the Prairie provinces were encountered mainly in the Mississippi valley and along the U.S. coast of the Gulf of Mexico (record 2), with a few travelling as far as Baja California (record 3), southern Mexico (record 4), and Virginia (record 5).

Encounters (east): Double-crested Cormorant (block size = 13.1°)

Those banded around the Great Lakes were encountered mainly from Texas to Florida (record 6), with only a single encounter from Mexico (record 7); one bird reached the Bahamas (record 8). Those banded in Atlantic Canada, mainly in New Brunswick, were encountered principally on the U.S. east coast, south to Florida (record 9) and as far west as Louisiana (record 10), with one bird reaching Cuba (record 11). The relatively small overlap in wintering areas between the prairie and eastern breeding populations is clear from the maps.

Houston (1971) described and mapped encounters from his own banding effort in Saskatchewan from 1953 to 1969 and compared them with those of birds banded earlier (back to 1923). Interesting differences emerged, both between birds

banded at different lakes and between birds banded at the same lake in different decades. For example, cormorants banded at Last Mountain Lake since 1953 were recovered, on average, 480 km to the west of encounters of birds banded before 1932. This may be due to changes in the likelihood of dead birds being found, rather than changes in the behaviour of the birds.

The longevity record (record 9) is exceeded by one bird on record as 13 months older at recovery, but the recovery details are incomplete, so the record cannot be confirmed. However, it is clear that an age of 17–18 years is not exceptional in this species; there are more than 40 recoveries of birds 10 years or older, including 11 over 16 years. There would doubtless be even more recoveries of old birds if a more durable

design of band were available. The high encounter rate and relative ease of banding of this species, combined with its potential importance as an indicator of

environmental contamination (Weseloh et al. 1983), make it an ideal subject for more extensive banding and more detailed analysis of encounters.

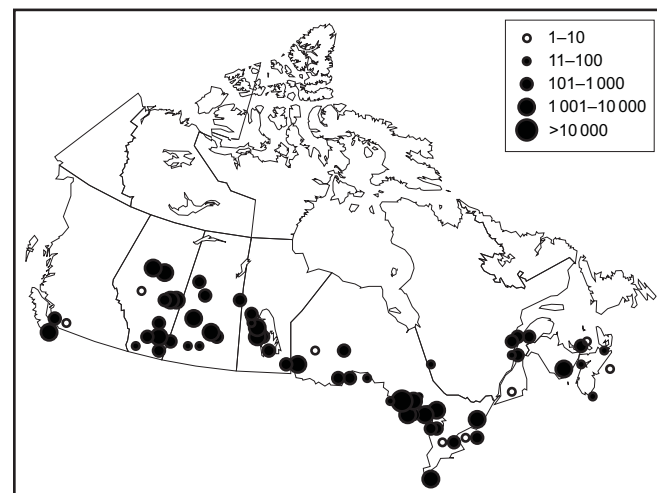
Encounter records: Double-crested Cormorant

1	0638-93961 PRBO	L 05	U 00	14/07/80 FT/03/81	Farallon Islands, CA near Bamfield, BC	37°40'N 123°00'W 48°40'N 125°00'W	8 mo. 1 235 km N7°W
2	0378-00951 FGB	AHY 00	F 04	09/07/48 02/11/48	south of Venn, SK near Fort Polk, LA	51°20'N 105°10'W 31°??'N 93°??'W	4 mo. ~2475 km S28°E
3	0688-06518 UAB	L 03	U 00	30/07/80 08/10/88	Bow River, AB Baja California, Mexico	50°00'N 111°40'W 27°00'N 113°00'W	8 yr. 3 mo. 2563 km S3°W
4	0768-13885 APM	L 08	U 26	01/07/86 ??/02/87	Frog Lake, AB near Veracruz, Mexico	53°50'N 110°20'W 20°00'N 96°40'W	7 mo. 3943 km S23°E
5	0728-02216 APM	L 07	U 44	08/07/82 20/06/85	Uticuma Lake, AB near Woodbridge, VA	55°40'N 115°20'W 38°40'N 77°00'W	2 yr. 11 mo. 3399 km S72°E
6	0748-52710 CWSB	L 05	U 00	27/06/85 20/04/86	Edward Island, ON near Encinal, TX	48°20'N 88°40'W 28°00'N 99°10'W	10 mo. 2438 km S26°W
7	0748-50494 CWSB	L 00	U 98	20/06/84 LT/09/86	Lake of the Woods, ON near Ciudad Victoria, Mexico	49°00'N 94°40'W 24°00'N 98°30'W	2 yr. 3 mo. 2803 km S8°W
8	0368-02656 ISS	U 00	? 00	25/06/42 ??/04/43	Algoma Mills, ON Great Abaco Island, Bahamas	46°10'N 82°40'W 26°50'N 77°00'W	10 mo. 2239 km S16°E
9	0418-09505 HHS	L 00	U 00	30/06/41 99/02/59	Big Pilgrim Island, QC Jensen Beach, FL	47°40'N 69°40'W 27°10'N 80°10'W	17 yr. 8 mo. 2451 km S27°W
10	0768-53799 NBFW	L 05	U 26	23/07/87 04/03/88	near Saint John, NB near Marsh Island, LA	45°10'N 66°00'W 29°40'N 92°00'W	8 mo. 2853 km S62°W
11	0388-06429 HHS	U 00	? 01	21/07/38 10/01/39	Big Pilgrim Island, QC near Guanabacoa, Cuba	47°40'N 69°40'W 23°00'N 82°10'W	6 mo. 2953 km S27°W

Summary of banding statistics: Double-crested Cormorant

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			78 127
<i>No. encountered per 1 000 banded (1955–1995)</i>			32
Total no. encountered (1921–1995)	3 838	9	4 019
No. encountered from foreign bandings	91	1	94
Maximum period from banding to encounter (mo.)	212	76	212
No. Canadian-banded birds moving >0 km	3 198	7	3 370
Mean movement >0 km of Canadian-banded birds (km)	1 225	1 203	1 232
Maximum movement from all encounters (km)	3 943	2 406	3 943
% recovered (encountered dead)	93	100	93
% direct recoveries	53	44	54
% encountered during banding operations	0	0	0

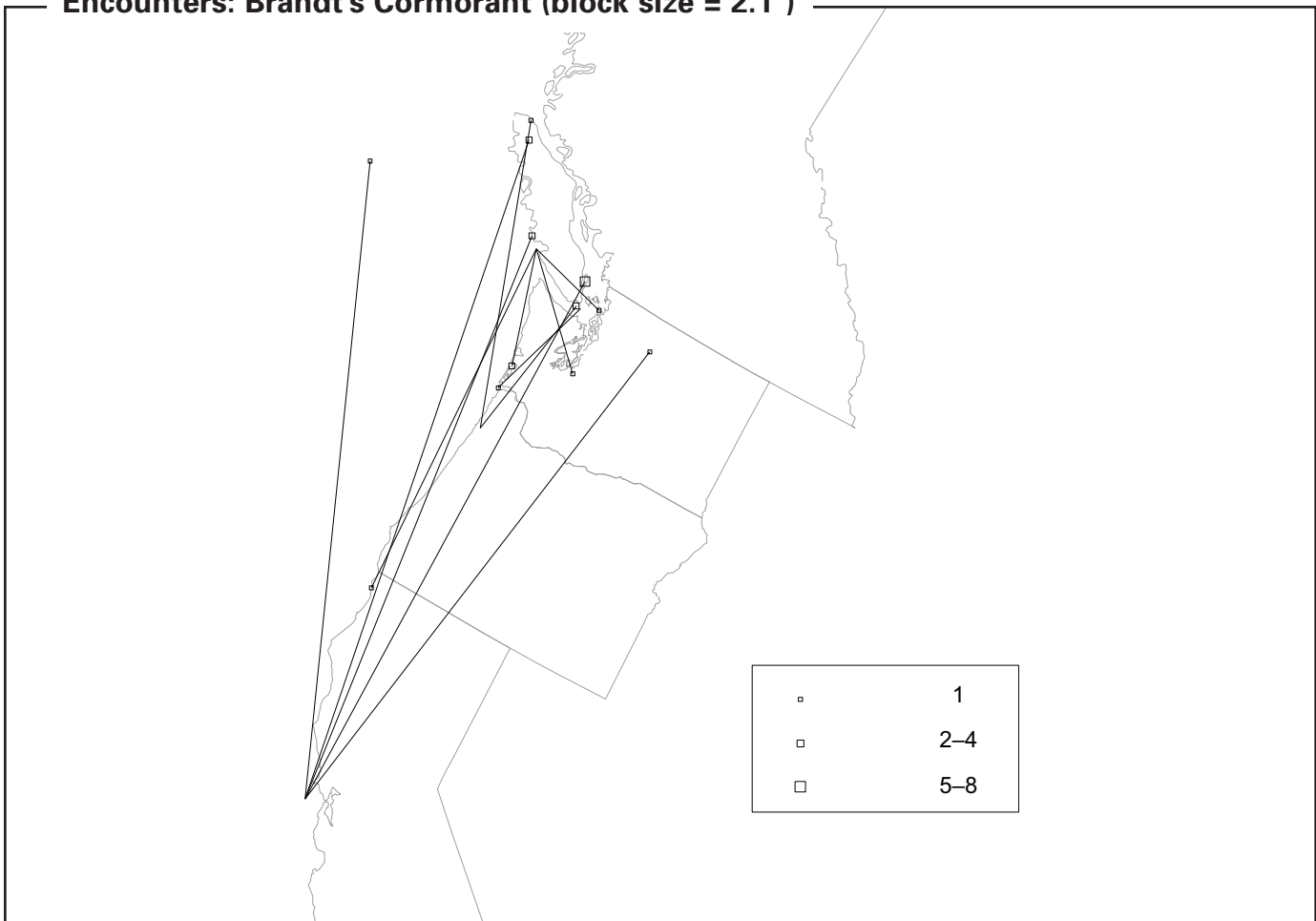
Banding effort: Double-crested Cormorant



Top banders: JPL, APM, CWSB, CSH, JF

Brandt's Cormorant (*Phalacrocorax penicillatus*) 122.0

Encounters: Brandt's Cormorant (block size = 2.1°)



Brandt's Cormorant breeds along the Pacific coast from southern British Columbia to Baja California; in Canada, it breeds mainly on small islands on the west side of Vancouver Island, between Tofino and Ucluelet. Some winter in coastal British Columbia north to the Queen Charlotte Islands (Campbell et al. 1990a).

Of the birds banded in Canada, all as locals, encounters were obtained mainly in adjacent Washington state (5, record 1). One (record 2) was encountered 3 months later in extreme northern California.

There were four encounters in Canada of birds banded in Oregon (records 3 and 4), of which one was

more than 16 years old (record 3). There were also 18 encounters in Canada of birds banded as locals at the Farallon Islands, California (records 5-7). Encounter locations were mainly in the heavily populated Vancouver-Victoria area; the farthest north was 51°40'N, on the mainland coast of Queen Charlotte Sound (record 6), and the encounter occurred only 4 months after banding. Another bird encountered in the same area (record 5) was in its second winter. All but two of the encounters originating from California occurred in the first year, and the rest in the second. Three were within 3 months of banding, indicating a rapid dispersal of young birds from the breeding area (record 7).

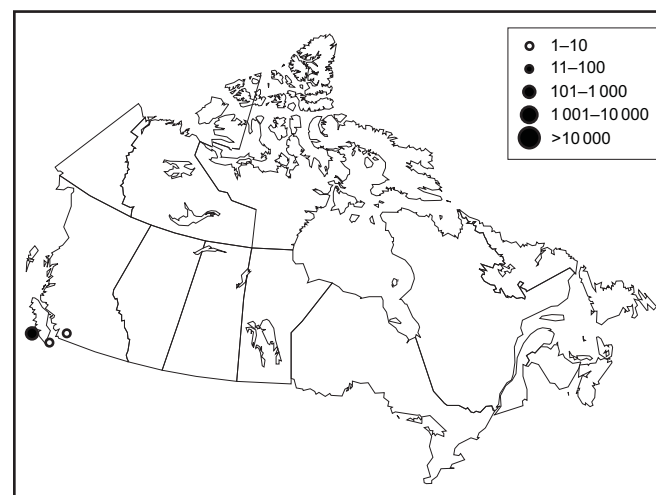
Encounter records: Brandt's Cormorant

1	0587-77835 VM	L 05	U 00	09/09/71 ??/FA/72	near Kildonan, BC Armitage Island, WA	48°50'N 125°20'W 48°30'N 122°40'W	~1 yr. 200 km S80°E
2	0587-77851 VM	L 05	U 00	09/09/71 26/12/71	near Kildonan, BC Castle Rock, CA	48°50'N 125°20'W 41°40'N 124°10'W	3 mo. 803 km S7°E
3	0010-14088 RWF	U 00	U 01	04/07/13 MT/08/29	Tillamook, OR near Matsui Lake, BC	45°20'N 123°50'W 50°50'N 127°50'W	16 yr. 1 mo. 680 km N24°W
4	0368-07469 RWF	J 00	U 00	14/07/39 06/04/40	Tillamook, OR near Fairfield, BC	45°20'N 123°50'W 48°20'N 123°20'W	9 mo. 336 km N6°E
5	0638-92259 PRBO	L 05	U 00	05/07/75 25/12/76	Farallon Islands, CA Sleepy Bay, BC	37°40'N 123°00'W 51°30'N 127°40'W	1 yr. 5 mo. 1 583 km N12°W
6	0638-93358 PRBO	L 05	U 56	10/08/77 14/12/77	Farallon Islands, CA near Oweekeno, BC	37°40'N 123°00'W 51°40'N 127°10'W	4 mo. 1 592 km N11°W
7	0778-06866 PRBO	L 03	U 50	24/07/91 05/09/91	Farallon Islands, CA near Schooner Cove, BC	37°40'N 123°00'W 49°00'N 125°50'W	2 mo. 1 282 km N9°W

Summary of banding statistics:
Brandt's Cormorant

	Age at banding		
	Hatch year	After hatch year	All ages
No. of Canadian bandings (1955–1995)			177
No. encountered per 1 000 banded (1955–1995)			39
Total no. encountered (1921–1995)	26	0	27
No. encountered from foreign bandings	19	0	20
Maximum period from banding to encounter (mo.)	193	–	193
No. Canadian-banded birds moving >0 km	7	0	7
Mean movement >0 km of Canadian-banded birds (km)	299	–	299
Maximum movement from all encounters (km)	1 592	–	1 592
% recovered (encountered dead)	96	–	96
% direct recoveries	53	–	51
% encountered during banding operations	3	–	3

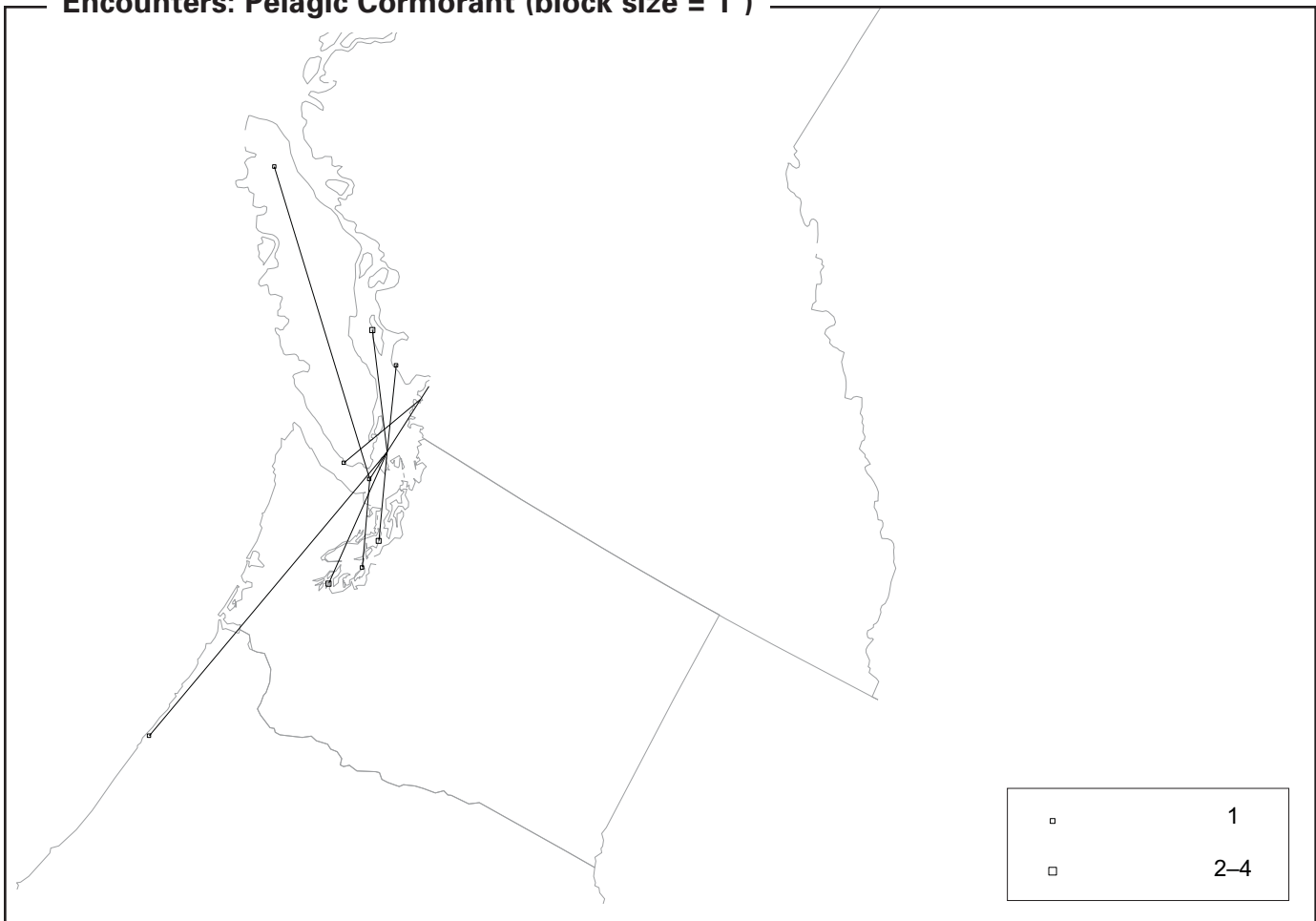
Banding effort: Brandt's Cormorant



Top banders: RWC, VM, EH, GG

Pelagic Cormorant (*Phalacrocorax pelagicus*) 123.0

Encounters: Pelagic Cormorant (block size = 1°)



Pelagic Cormorants breed across the northern Pacific from California to the Sea of Okhotsk. In Canada, they are restricted to the coast of British Columbia, where they are a widespread permanent resident (Campbell et al. 1990a) and, from banding evidence, very sedentary (Boekelheide et al. 1990). There have been no encounters of foreign-banded birds, although substantial numbers have been banded in California.

Of 105 encounters, from birds banded mostly as locals in colonies in the Strait of Georgia, only 11

showed movements of more than 100 km, the most distant travelling 396 km northwest (record 1) and 431 km south (record 2). No trend can be discerned in the pattern of dispersal, and encounters were spread very evenly through the year, with no seasonal peak, suggesting that birds have no fixed seasonal pattern of movements. A surprisingly high proportion (19%) were more than 5 years old when encountered, one was in its 18th year (record 3), and one in its 21st (record 4), the latter holding the longevity record for this species (Hobson 1997). Seventy-two percent were found dead, and 9% each were shot or sight records.

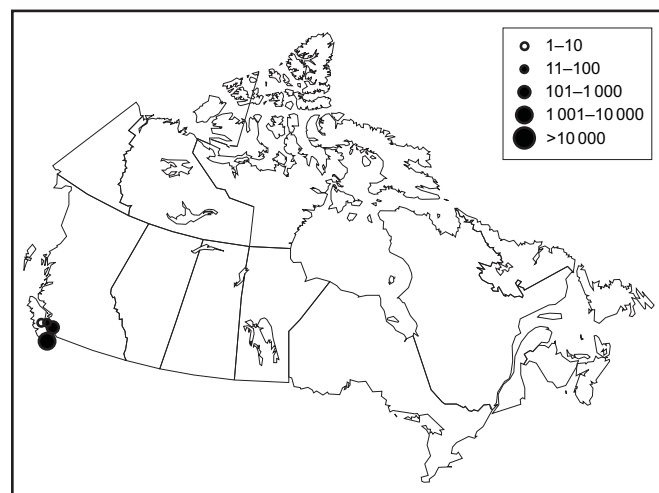
Encounter records: Pelagic Cormorant

1	0937-06056 RBCM	L 5	U 00	30/07/74 ??/08/79	Oak Bay, BC Queen Charlotte Strait, BC	48°20'N 123°10'W 50°30'N 127°30'W	5 yr. 1 mo. 396 km N51°W
2	0508-06261 GFV	L 00	U 00	05/08/60 04/05/61	Imrie Island, BC Gleneden Beach, OR	48°40'N 123°10'W 44°50'N 124°00'W	9 mo. 431 km S9°W
3	0587-01117 EDW	L 05	U 00	29/07/56 29/04/74	Oak Bay, BC Albert Head, BC	48°20'N 123°10'W 48°20'N 123°20'W	17 yr. 9 mo. 12 km N90°W
4	0518-81661 GFV	L 02	U 98	22/07/59 02/04/80	Imrie Island, BC near Anacortes, WA	48°40'N 123°10'W 48°30'N 122°50'W	20 yr. 9 mo. 31 km S53°E

Summary of banding statistics:
Pelagic Cormorant

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			3 158
<i>No. encountered per 1 000 banded (1955–1995)</i>			31
Total no. encountered (1921–1995)	104	0	105
No. encountered from foreign bandings	0	0	0
Maximum period from banding to encounter (mo.)	249	–	249
No. Canadian-banded birds moving >0 km	81	0	82
Mean movement >0 km of Canadian-banded birds (km)	58	–	58
Maximum movement from all encounters (km)	431	–	431
% recovered (encountered dead)	92	–	92
% direct recoveries	38	–	39
% encountered during banding operations	0	–	0

Banding effort: Pelagic Cormorant



Top banders: GFV, EDW, RHD, CWSPYR, IMC

American White Pelican (*Pelecanus erythrorhynchos*) 125.0

Encounters (west/long distance): American White Pelican (block size = 12.1°)



The American White Pelican breeds locally from southern interior British Columbia (Stum Lake) and northern Alberta and Saskatchewan to central Manitoba and extreme western Ontario; in the United States, it breeds south through the Great Plains to Utah and Nevada and west to northern California. It winters from central California and Florida to Costa Rica (Evans and Knopf 1993).

Virtually all banding in Canada has been of nestlings and has been carried out in western Ontario, in all three Prairie provinces, and in British Columbia. Banding in Saskatchewan began in the 1930s, whereas the earliest encounters in Manitoba and Ontario are from banding in the 1960s and the first from Alberta comes from banding in 1980. The likelihood of encounters being reported from different areas may

have changed over time, and this complicates any comparison of encounters from different banding areas in Canada.

Encounters of pelicans banded in Saskatchewan have been mapped and discussed by Houston (1968, 1970, 1972b), who showed an autumn movement south and southeast to wintering grounds extending around virtually the entire Gulf of Mexico. Mexico (records 1–3) and Texas contributed 75% of encounters ($n = 178$) in the Gulf of Mexico of birds from Saskatchewan, as well as all of those from Alberta ($n = 35$).

A few birds banded in the prairies have been encountered inland in Mexico and on both its coasts, suggesting some overlap in winter quarters with birds

Encounters (west/short distance): American White Pelican (block size = 8.1°)

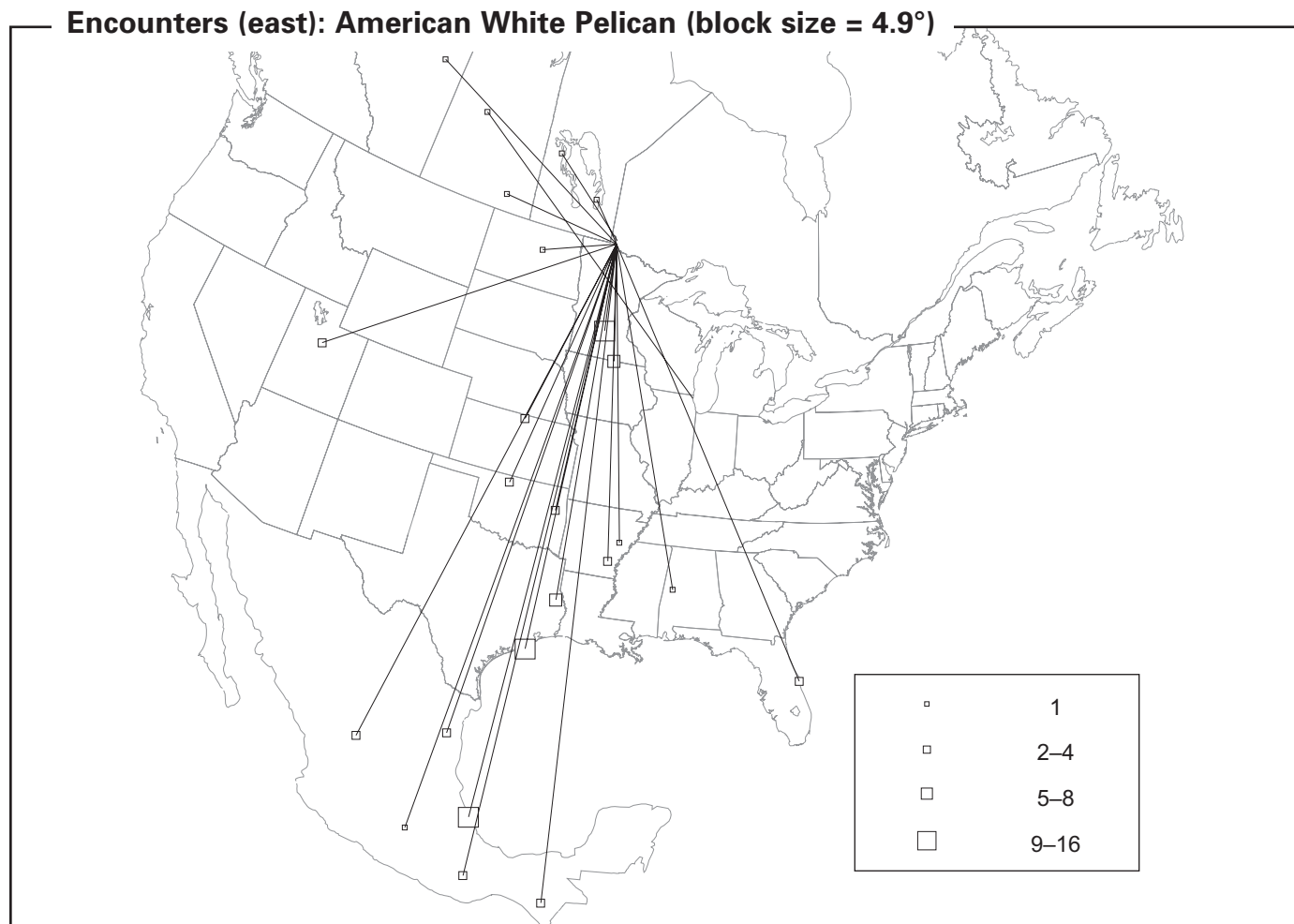


from breeding colonies in British Columbia, which winter west of the continental divide (Vermeer 1970b). Nearly half of encounters outside the breeding areas were from October to March (45%). A single recovery in El Salvador (record 4) is interesting: the species winters regularly to southern Mexico (about 20% of records below 20°N), rarely to Guatemala (three encounters), and accidentally to Nicaragua and Costa Rica (Stiles and Skutch 1989). Birds from Lake of the Woods, Ontario, behaved very much like those from the prairies, with winter encounters from Florida to Mexico (records 5 and 6).

Birds banded in British Columbia were encountered outside the breeding season mainly on the Pacific coast (Washington, 8; Oregon, 5;

California, 11 [record 7]; Mexico, 7), but a few encounters came from the Great Basin states, where they were presumably on passage (Nevada, 2; Idaho, 5; Utah, 1). The farthest south was a bird at 21°N (record 8).

Considering their size, we might expect pelicans to be rather long-lived; Clapp et al. (1982) gave the North American record as 26 years and 5 months, and two encounters in our database give ages of more than 30 years, although neither has complete data. However, aside from these two equivocal records, the oldest encounter is only 17 years, and few birds exceeded 12 years. This is possibly due to band wear, which causes most bands to fall off within 12 years (Strait and Sloan 1975).



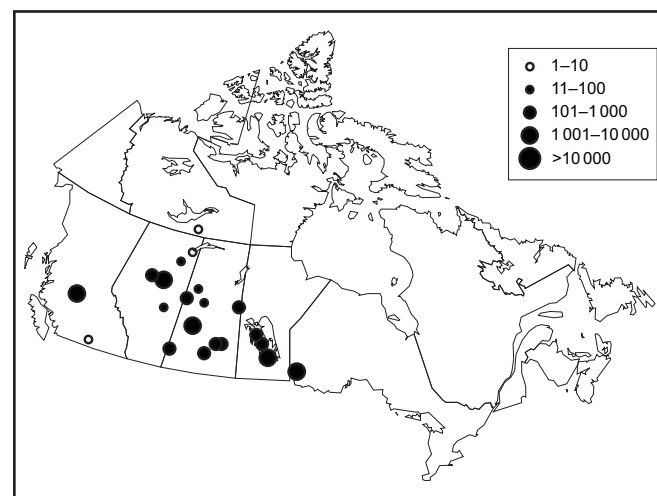
Encounter records: American White Pelican

1	0378-03803 FLF	U 00	U 01	07/07/37 17/01/38	Krydor, SK Michoacán State, Mexico	52°40'N 107°00'W ~19°00'N 102°00'W	6 mo. 3 773 km S8°E
2	0509-02866 FLF	L 00	U 98	23/07/58 27/11/59	near Mossbank, SK Chiapas State, Mexico	50°00'N 05°50'W ~16°00'N 92°40'W	1 yr. 4 mo. 3 966 km S22°E
3	0378-01774 HEM	U 03	U 01	07/07/37 FT/05/73	Redberry Lake, SK Veracruz State, Mexico	52°40'N 107°10'W ~20°N 95°W	35 yr. 10 mo. 3 600 km S27°E
4	0509-31726 CSH	L 00	U 00	27/06/61 26/03/64	Crane Lake, SK Quebrada de la Leona, El Salvador	50°00'N 108°09'W 13°30'N 89°20'W	2 yr. 9 mo. 4 400 km S32°E
5	0509-03677 OMNRK	L 05	U 01	27/07/70 12/07/74	Lake of the Woods, ON Oaxaca State, Mexico	49°00'N 94°40'W ~17°00'N 96°30'W	4 yr. 0 mo. 3 566 km S3°W
6	0509-46880 OMNRK	L 03	U 00	04/07/78 17/04/93	Lake of the Woods, ON near Jewett, TX	49°00'N 94°40'W 31°50'N 96°10'W	14 yr. 9 mo. 1 915 km S4°W
7	0509-45845 KV	L 05	U 00	22/07/68 09/01/70	near Alexis Creek, BC Beverly Gun Club, CA	52°10'N 123°00'W 39°00'N 112°30'W	1 yr. 6 mo. 1 850 km S12°E
8	0619-15874 BCW	L 03	U 01	29/07/88 MT/01/91	British Columbia near Tuxpan, Mexico	52°10'N 123°00'W 21°40'N 105°20'W	2 yr. 6 mo. 3 719 km S31°E

Summary of banding statistics:
American White Pelican

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			14 728
<i>No. encountered per 1 000 banded (1955–1995)</i>			46
Total no. encountered (1921–1995)	902	1	987
No. encountered from foreign bandings	118	0	125
Maximum period from banding to encounter (mo.)	204	–	204
No. Canadian-banded birds moving >0 km	688	1	761
Mean movement >0 km of Canadian-banded birds (km)	1 866	51	1 857
Maximum movement from all encounters (km)	4 400	51	4 400
% recovered (encountered dead)	93	100	94
% direct recoveries	37	0	39
% encountered during banding operations	0	0	0

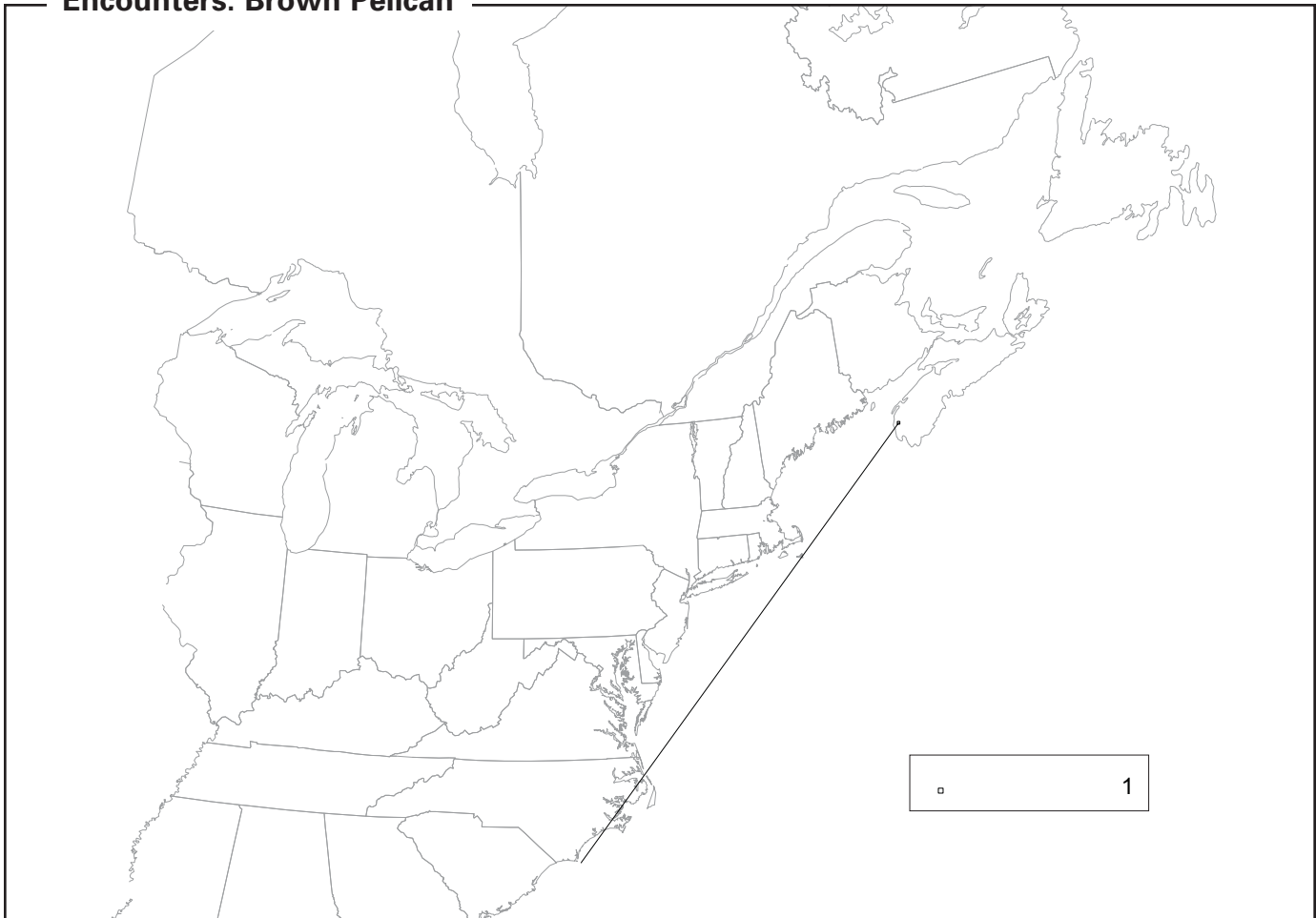
Banding effort: American White Pelican



Top banders: CSH, APM, OMNRK, UM, BCW

Brown Pelican (*Pelecanus occidentalis*) 126.0

Encounters: Brown Pelican



The Brown Pelican breeds on coasts from North Carolina and California southwards, through the Caribbean, to Guyana, and on the Pacific coast south to Peru. It is a regular visitor to southern British Columbia and an occasional visitor to the Maritime provinces. None has been banded in Canada

(hence no banding effort map). The single encounter in Canada involved a bird banded in North Carolina and found in its ninth year in Nova Scotia. The timing of this encounter, in March, is very surprising for a bird that normally is found in tropical and subtropical waters at that time of year (Harrison 1983).

Encounter records: Brown Pelican

1	0728-56824	L	U	05/07/84	near Southport, NC	33°50'N 77°50'W	8 yr. 8 mo.
	JFP	05	00	23/03/93	near Weymouth, NS	44°10'N 66°00'W	1 536 km N38°E

**Summary of banding statistics:
Brown Pelican**

	Age at banding		
	Hatch year	After hatch year	All ages
<i>No. of Canadian bandings (1955–1995)</i>			0
<i>No. encountered per 1 000 banded (1955–1995)</i>			–
Total no. encountered (1921–1995)	1	0	1
No. encountered from foreign bandings	1	0	1
Maximum period from banding to encounter (mo.)	104	–	104
No. Canadian-banded birds moving >0 km	0	0	0
Mean movement >0 km of Canadian-banded birds (km)	–	–	–
Maximum movement from all encounters (km)	1 536	–	1 536
% recovered (encountered dead)	100	–	100
% direct recoveries	0	–	0
% encountered during banding operations	0	–	0

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Appendix 1

Chronological summary of Canadian seabird banding statistics

Species	No. banded					No. banded in Canada, encountered elsewhere		No. banded elsewhere, encountered in Canada	
	1955–1965	1966–1975	1976–1985	1986–1995	1955–1995 total	1921–1954	1955–1995	1921–1954	1955–1995
Laysan Albatross	0	0	0	0	0	0	0	0	1
Black-footed Albatross	0	0	0	0	0	0	0	1	12
Northern Fulmar	2	85	386	36	509	0	1	2	36
Greater Shearwater	39	495	0	10	544	0	9	0	0
Sooty Shearwater	0	65	0	1	66	0	0	0	0
Manx Shearwater	0	0	167	0	167	0	3	1	17
Wilson's Storm-Petrel	111	239	1	2	353	0	0	0	0
Fork-tailed Storm-Petrel	0	2	103	352	457	0	0	0	1
Leach's Storm-Petrel	11 499	17 833	18 274	20 225	67 831	86	1 054	0	4
Northern Gannet	2 094	8 230	1 814	1 174	13 312	56	772	0	0
American White Pelican	2 883	3 379	6 268	2 198	14 728	163	699	18	107
Brown Pelican	0	0	0	0	0	0	0	0	1
Brandt's Cormorant	7	170	0	0	177	0	7	3	17
Double-crested Cormorant	2 787	3 151	27 223	44 966	78 127	1 325	2 546	14	80
Great Cormorant	0	175	471	40	686	127	52	0	0
Pelagic Cormorant	1 866	1 144	0	148	3 158	3	102	0	0
Great Skua	0	0	0	0	0	0	0	2	7
Pomarine Jaeger	0	1	0	0	1	0	0	0	0
Parasitic Jaeger	19	97	20	4	140	0	5	0	4
Long-tailed Jaeger	137	168	133	50	488	0	5	0	0
Laughing Gull	0	0	0	0	0	0	0	0	22
Franklin's Gull	3 219	3 220	20	84	6 543	87	24	5	8
Little Gull	0	2	0	0	2	0	0	0	0
Black-headed Gull	0	0	0	0	0	0	0	2	5
Bonaparte's Gull	8	23	40	6	77	1	0	0	0
Mew Gull	1	7	26	1	35	0	1	0	1
Ring-billed Gull	128 177	73 883	44 880	17 617	264 557	1 050	9 288	147	1 851
California Gull	4 412	5 719	2 020	239	12 390	29	307	12	422
Unidentified Gull	109	1	83	5 100	5 293	233	28	0	10
Herring Gull	60 546	40 730	18 829	3 575	123 680	3 262	4 841	769	1 835

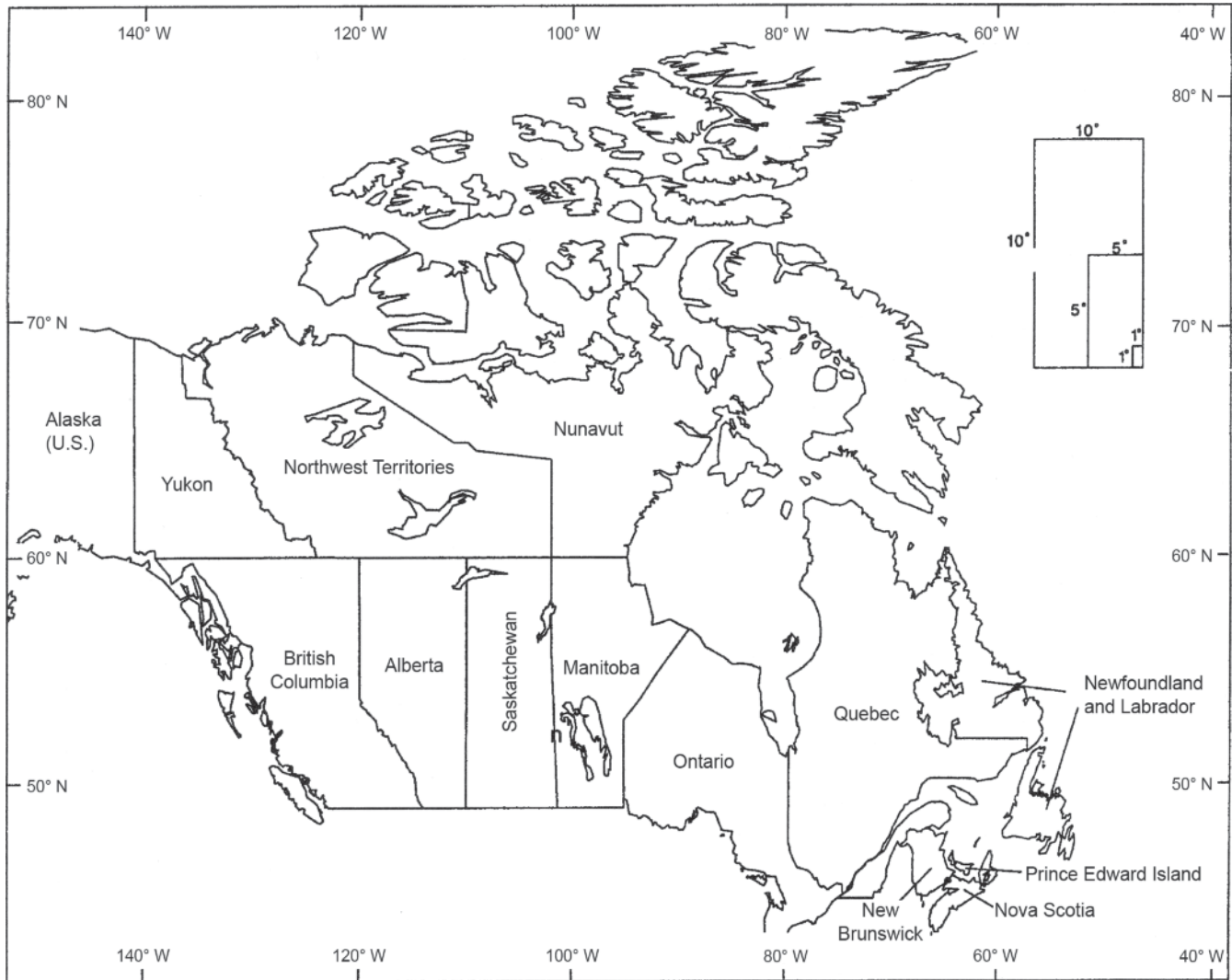
Chronological summary of Canadian seabird banding statistics (*cont'd*)

Species	No. banded					No. banded in Canada, encountered elsewhere		No. banded elsewhere, encountered in Canada	
	1955–1965	1966–1975	1976–1985	1986–1995	1955–1995 total	1921–1954	1955–1995	1921–1954	1955–1995
Thayer's Gull	14	0	5	23	42	0	0	0	0
Iceland Gull	204	0	64	0	268	0	1	1	0
Western Gull	0	0	0	0	0	1	0	11	3
Glaucous-winged Gull	25 815	33 751	9 790	1 806	71 162	338	6 370	49	2 110
Glaucous Gull	101	108	131	126	466	3	1	0	0
Great Black-backed Gull	1 966	2 919	2 363	753	8 001	147	344	9	30
Sabine's Gull	14	20	146	0	180	0	1	0	0
Black-legged Kittiwake	1 330	2 437	757	402	4 926	5	31	12	79
Ivory Gull	0	309	1 184	29	1 522	0	24	0	0
Caspian Tern	4 905	4 575	2 966	3 917	16 363	34	872	9	39
Royal Tern	0	0	0	0	0	0	0	0	4
Roseate Tern	8	88	39	0	135	0	1	3	0
Common Tern	45 768	19 542	10 219	6 475	82 004	146	1 339	40	95
Arctic Tern	599	402	1 401	1 127	3 529	53	36	2	5
Forster's Tern	4	32	0	0	36	0	0	0	0
Black Tern	182	62	194	81	519	0	2	0	0
Black Skimmer	0	0	0	0	0	0	0	0	13
Dovekie	0	0	0	0	0	0	0	1	2
Common Murre	17 169	5 390	1 750	1 673	25 982	431	693	13	0
Thick-billed Murre	12 529	4	15 044	35 194	62 771	19	1 412	6	208
Razorbill	126	99	444	2 830	3 499	59	33	0	0
Black Guillemot	539	271	1 560	64	2 434	57	54	0	2
Pigeon Guillemot	278	181	0	95	554	0	29	0	1
Marbled Murrelet	0	0	0	249	249	0	7	0	0
Ancient Murrelet	0	91	1 009	11 777	12 877	0	15	0	0
Cassin's Auklet	0	0	206	3 689	3 895	0	0	0	0
Rhinoceros Auklet	0	192	1 098	1 701	2 991	0	8	0	0
Atlantic Puffin	7	4 479	2 103	916	7 505	9	73	4	25
Tufted Puffin	5	72	202	78	357	0	0	0	0
Totals	329 479	233 843	173 433	168 833	905 588	7 724	31 090	1 136	7 057

Appendix 2

Maps of Western Hemisphere political boundaries

Canadian provinces and territories
(latitude-longitude blocks of various sizes are shown for reference)

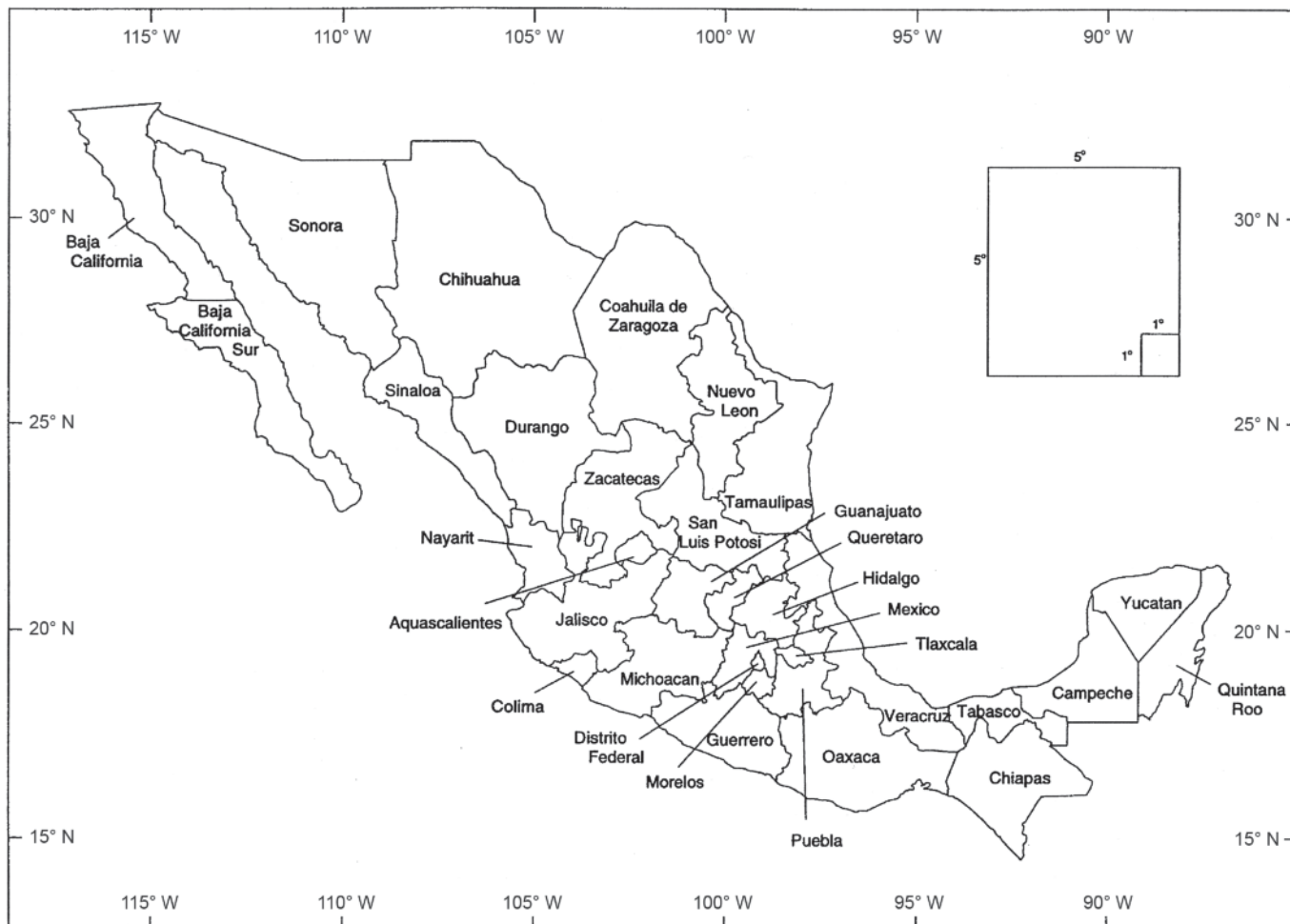


Continental U.S. states
(latitude-longitude blocks of various sizes are shown for reference)



Mexican states

(latitude-longitude blocks of various sizes are shown for reference)



Countries of Central and South America
(latitude-longitude blocks of various sizes are shown for reference)



Appendix 3

Key to codes used in listings of individual encounters

Note: Unless labelled as non-standard, codes are those used in The North American Bird Banding Manual (Gustafson et al. 1997).

Age

U	Unknown (see note below)
L	Local (young prior to age of sustained flight)
J	Juvenile (obsolete code discontinued in 1962; bird could be either L or HY)
HY	Hatch year (capable of sustained flight and banded in calendar year of birth)
AHY	After hatch year (known to have hatched in an unknown calendar year prior to that of banding)
SY	Second year (known to have hatched in calendar year previous to banding year)
ASY	After second year (at least ASY, but true age unknown)
TY	Third year (known to have hatched two calendar years prior to that of banding)
ATY	After third year (at least ATY, but true age unknown)

Note: The system of aging birds by calendar year (HY, AHY, etc.) came into effect in 1967. For records prior to that date, the definitions of “subadult” and “adult” did not correspond exactly to SY and AHY, because the time at which birds changed from one category to the other was not clearly defined. Using current codes, a bird can be given the U code for age only in the fall, when HY and AHY birds of some species are indistinguishable. Prior to 1967, however, it was possible to use the U code for birds banded in the first 5–6 months of the year (when “subadults” and “adults” may be indistinguishable).

Sex

M	Male
F	Female
U	Unknown

Inexact coordinates

(non-standard codes)

??	If shown for both degrees and minutes, no coordinates were reported. If shown only for minutes, location was inexact.
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Present condition

00	Unknown, status of band unknown
01	Unknown, band left on bird
02	Unknown, band removed
03	Dead, status of band unknown
04	Dead, band left on bird
05	Dead, band removed
06	Alive – released, status of band unknown
07	Alive – released, band left on bird
08	Alive – released, band removed
09	Alive – in captivity, status of band unknown
10	Alive – in captivity, band left on bird
11	Alive – in captivity, band removed
12	Alive – in captivity/release status unknown, status of band unknown
13	Alive – in captivity/release status unknown, band left on bird
14	Alive – in captivity/release status unknown, band removed

Data summaries in this atlas series treated birds with “unknown” present condition as “dead.” Present condition codes were not in use prior to 1965, so birds encountered earlier than that were considered “dead” unless the “how obtained” code (see below) was 28, 29, 33, 36, 41, 46, 48, 52, 53, 87–89, or 99.

How obtained

(* indicates discontinued code)

00	Found dead	34	Caught by or found dead due to fish (including bands found in fish)
01	Shot	35*	Caught by or due to clam
02	Caught or found dead due to starvation	36	Caught due to exhaustion
03	Caught due to injury	37*	Caught due to electric shock
04	Caught by or due to traps not meant to catch birds for banding	38*	Caught due to fire
05*	Killed by carnivore not cat	39	Caught or found dead due to striking or being struck by moving aircraft
06	Caught by or due to rodent	40	Caught or found dead due to lead poisoning
07	Caught by or due to miscellaneous birds	41*	Held for propagating
08	Caught by or due to shrike	42	Caught due to striking or being struck by moving farm machinery
09	Caught by or due to hawks, owls, or other raptors (including found in pellets)	43	Caught or found dead due to trichomoniasis
10	Banding mortality (due to traps, handling, etc.)	44	Caught or found dead due to avian control operations
11	Caught by or due to dog	45	Found dead or injured on highway (without information on cause)
12	Caught by or due to cat	46	Caught due to joining flock of domestic or captive birds
13	Caught due to striking stationary object not wires or towers	47*	Band removed (no other information)
14	Caught due to striking or being struck by motor vehicle	48*	Held in captivity
15	Caught or found dead due to weather conditions	49	Caught at, on, or in nest by predator
16	Collected for scientific study or specimen	50	Band with skeleton or bone only
17	Drowned	51	Banding mortality (killed by predators, weather, etc., while in trapping or holding devices)
18	Caught or found dead due to botulism	52	Sight record: band read on free bird
19	Caught by or due to reptile	53	Captured for scientific purposes (not collected), then released
20	Caught due to disease	54	Caught due to striking communication towers, wires, etc.
21	Caught or found dead in building or enclosure	55	Caught due to pesticides
22*	Died from "fright"	56	No information in letter other than that band or bird obtained
23	Caught or found dead due to oil or tar	57	Caught due to entanglement in other than fishing gear (e.g., string, vines, etc.)
24	Caught or killed due to fall from nest	58	Located by electronic sensors (location is for receiver — not necessarily for bird)
25	Caught or killed due to poisoning (excluding by lead, avicides, or pesticides)	87*	Sight record in different 10' block than where banded
26	Caught by or due to entanglement in fishing gear	88*	Found nesting in different 10' block than where banded
27	Caught or found dead due to being struck by moving train	89	Previously banded bird trapped and released in banding operations in a different 10' block than where banded
28	Caught by hand	91	Illegally taken: reported by enforcement agents
29	Sight record: identified by special markers other than metal band		
30	Died in nest		
31	Caught by or due to miscellaneous animal		
32	Caught due to parasite infestation		
33	Caught or observed at or in nest		

96*	Band only
97	Miscellaneous: method not covered by other codes
98	Band or number only obtained; no other information (see 56)
99	Previously banded bird trapped and released during banding operation in same 10' block where banded

Inexact date codes: month

(non-standard codes)

SU	Summer
SP	Spring
WI	Winter
FA	Fall
HS	Hunting season
??	Unknown month

Inexact date codes: day

(non-standard codes)

FT	First 10 days in month
ST	Second 10 days in month
LT	Last 10 or 11 days in month
99	Unknown day of month
??	Date of encounter indicates date of postmark on letter, and there is no information on actual date the bird was encountered.

Banders' initials

Initials	Bander
AB	A. Bunker
ADS	A.D. Smith
AEP	Alberta Environmental Protection
AH	A. Haak
AHM	A.H. Macpherson
AJG	A.J. Gaston
AMW	A.M. Woodbury
APM	Alberta Provincial Museum
AR	A. Reed
ARC	A.R. Clarke
ARL	A.R. Lock
AWD	A.W. Diamond
BC	Bowdoin College
BCPM	British Columbia Provincial Museum
BCW	British Columbia Wildlife Wing

BKM	B.K. Matlack
CEH	C.E. Huntington
CHR	C.H. Richards
CKC	C.K. Coldwell
CSH	C.S. Houston
CSR	C.S. Robbins
CTW	C.T. Wolfling
CWN	Canadian Wildlife Service (Environment Canada [EC]) – Newfoundland office
CWSAR	Canadian Wildlife Service (EC) – Atlantic Region
CWSB	Canadian Wildlife Service (EC) – Burlington office
CWSER	Canadian Wildlife Service (EC) – Eastern Region
CWSOR	Canadian Wildlife Service (EC) – Ontario Region
CWSPYR	Canadian Wildlife Service (EC) – Pacific and Yukon Region
CWSQR	Canadian Wildlife Service (EC) – Quebec Region
DAH	D.A. Hancock
DBS	D.B. Stuart
DFP	D.F. Parmelee
DLP	D.L. Pattie
DMC	D. Macmillan
DM	D. Miller
DNN	D.N. Nettleship
DRH	D.R. Hatch
EDW	E.D. Wood
EH	E. Hamer
EK	E. Kuyt
FC	F. Cooke
FEL	F.E. Ludwig
FGB	F.G. Bard
FGC	F.G. Cooch
FGS	F.G. Scheider
FJW	F.J. Williams
FLF	F.L. Farley
FRW	F.R. Whitman
FSW	F.S. Whiteside
GC	G. Chapdelaine
GFV	G.F. VanTets
GG	G. Galicz
GH	G. Hogan
GK	G. Kaiser
GLH	G.L. Holroyd

HEM	H.E. McArthur	OMNRK	Ontario Ministry of Natural Resources – Kenora
HDH	H.D. Haberyan	OSP	O.S. Pettingill, Jr.
HFL	H.F. Lewis	PDB	P.D. Boersma
HHK	H.H. Krug	PEIFW	Prince Edward Island Fish & Wildlife
HHS	H.H. Southam	PEPO	Prince Edward Point Bird Observatory
HIF	H.I. Fisher	PRBO	Point Reyes Bird Observatory
HKBS	Hawk Cliff Banding Station	RAJ	R.A. Johnson
HO	H. Ouellet	RBC	R.B. Clapp
IAM	I.A. McLaren	RBCM	Royal British Columbia Museum
IMC	I.M. Cowan	RDE	R.D. Elliot
ISS	I.S. Sturgis	REL	R.E. Leech
JB	J. Bédard	RGB	R.G. Brown
JBG	J.B. Gollop	RHD	R.H. Drent
JCM	J.C. Miller	RIGM	R.I.G. Morrison
JEP	J.E. Paget	RKH	R.K. Harper
JF	J. Finnie	RPY	R.P. Yunik
JFP	J.F. Parnell	RRA	R.R. Anderson
JG	J. Guay	RRS	R.R. Sheehan
JH	J. Hatch	RTG	R.T. Gammell
JHB	J.H. Buckalew	RWC	R.W. Campbell
JKL	J.K. Lowther	RWF	R.W. Ferris
JKP	J.K. Proctor	SFU	Simon Fraser University
JMH	J.M. Harvey	SLW	S.L. White
JMP	J.M. Poulin	SWK	S.W. Kress
JMPo	J.M. Porter	TBO	Toronto Bird Observatory
JPL	J.P. Ludwig	TK	T. Knol
JPR	J.P. Ryder	TSH	T.S. Hennessy
JSW	J.S. Weske	TWB	T.W. Barry
KLD	K.L. Diem	UAB	University of Alberta
KV	K. Vermeer	UBC	University of British Columbia
LDK	L.D. Kuhn	UM	University of Manitoba
LGL	L.G. Lambert	VM	Vertebrate Museum, University of British Columbia
LJP	L.J. Peyton	WAM	W.A. Montevicchi
LMM	L.M. Moos	WED	W.E.U. Diffendall
LMT	L.M. Tuck	WEM	W.E. McKay
LPBO	Long Point Bird Observatory	WHD	W.H. Drury
LT	L. Tyler	WIL	W.I. Lyon
MCH	M.C. Henry	WJM	W.J. Maher
MTM	M.T. Myres	WMD	W.M. Duval
MUN	Memorial University of Newfoundland	WOA	W.O. Astle
NBFW	New Brunswick Fish and Wildlife	WPN	W.P. Nickell
NMNH	National Museum of Natural History	WR	W. Rowan
NPWRC	Northern Prairie Wildlife Research Centre	WT	W. Threlfall
NSDNR	Nova Scotia Dept. of Natural Resources	YTG	Yukon Territorial Government
OH	O. Hawksley		
OLA	O.L. Austin		

Appendix 4

Additional details on data coding and analyses

1. Distance and bearing

Distance and bearing were calculated using equations in Cowardin (1977), where:

BLAT = banding latitude
BLON = banding longitude
RLAT = encounter latitude
RLON = encounter longitude
P = *BLON* – *RLON*

Note: if Southern Hemisphere, set latitude to negative
 if Eastern Hemisphere, set longitude to negative
 if *P* > 180, then set *P* = *P* – 180

Distance (*D*) between banding and encounter in degrees was calculated as:

$$D = \arccos\{[\sin(BLAT)\sin(RLAT)] + [\cos(BLAT)\cos(RLAT)\cos(P)]\}$$

where *acos* denotes the inverse cosine function. The distance is then converted to kilometres by multiplying by 6378.15

The bearing (*C*) was calculated as:

$$C = \arctan\{\sec(BLAT)\csc(D)[\sin(\pi/2 - RLAT) - \sin(D - \pi/2 + BLAT)]\}$$

where *hav* and *ahav* denote the haversine and inverse haversine functions:

$$\text{hav}(A) = 0.5(1 - \cos(A))$$

$$\text{ahav}(A) = \arccos(1 - 2A)$$

2. Direct recoveries

Encounters fitting into the categories marked with a D below were considered “direct” recoveries, whereas all others were considered “indirect.” Note that direct recoveries include birds assumed to be dead (see note under “present condition” in Appendix 3) plus all birds encountered at the site of banding within 90 days.

Year	Recovery month	Banding month											
		J	F	M	A	M	J	J	A	S	O	N	D
Banding yr.	J	D	–	–	–	–	–	–	–	–	–	–	–
	F	D	D	–	–	–	–	–	–	–	–	–	–
	M	D	D	D	–	–	–	–	–	–	–	–	–
	A	D	D	D	D	–	–	–	–	–	–	–	–
	M	D	D	D	D	D	–	–	–	–	–	–	–
	J	D	D	D	D	D	D	–	–	–	–	–	–
	J	D	D	D	D	D	D	D	–	–	–	–	–
	A	D	D	D	D	D	D	D	D	–	–	–	–
	S	–	–	–	D	D	D	D	D	D	–	–	–
	O	–	–	–	D	D	D	D	D	D	D	–	–
	N	–	–	–	D	D	D	D	D	D	D	D	–
	D	–	–	–	D	D	D	D	D	D	D	D	D
Banding yr. + 1	J	–	–	–	D	D	D	D	D	D	D	D	D
	F	–	–	–	D	D	D	D	D	D	D	D	D
	M	–	–	–	D	D	D	D	D	D	D	D	D
	A	–	–	–	–	–	–	–	–	–	–	–	D
	M	–	–	–	–	–	–	–	–	–	–	–	D
	J	–	–	–	–	–	–	–	–	–	–	–	D
	J	–	–	–	–	–	–	–	–	–	–	–	D
	A	–	–	–	–	–	–	–	–	–	–	–	D