

Nest Record Card Program in Canada

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Abstract. A brief account is given of the purposes of nest record card programs, their history and present organization in Canada, problems in use of nest record data, examples of papers based on Canadian nest records, and prospects for their future use. The importance of nest recording as an aid in conservation education is emphasized.

The purpose of this account is to explain the nature and purposes of nest record collection programs in Canada, to outline the progress towards the various objectives, and to discuss the future of nest record study in Canada. A brief note (Peakall, 1967) with the same title and objectives aroused an extended comment in this journal (Myres, 1967) a few years ago. This article will not resolve all of the critical points raised by Myres, but it should help naturalists to realize some of the potential values of nest records while avoiding the more obvious pitfalls in their collection and use.

A nest records scheme is a program for gathering detailed information on the nesting of birds, particularly from people who would not otherwise publish their data. Observers enter their findings on nest record cards (Fig. 1a and b) which are turned in to a central file. The main purposes for assembling such observations include studies of (a) breeding success, (b) nesting biology, and (c) breeding distribution. The first objective is of interest to all persons concerned about the continued existence of birds, and particularly those responsible for conservation and management of bird populations. It is the most critical as well as the most difficult objective. The second is probably most often pursued in university research programs, while the third objective is a primary concern of museums. Persons pursuing the other objectives can contribute to the first one, which by other means can only be studied on a local scale. Naturalists are interested in all of these, but especially in the last two objectives.

Nest record schemes are not and never have been a substitute for detailed research, but they can be very helpful. Examination of nest record

files at the start of a study shows quickly whether nests of a given species are easy or difficult to find, where studies may begin, and which people may be able to give useful advice. Nest records extend the range of special studies by providing data from areas which the research worker could not visit in the time available. And they save for future studies the by-products of other field activities, i.e. observations not bearing on the study in hand, which would otherwise pass unrecorded or remain unheeded in a notebook.

Tim Myres brought the English idea of a nest records scheme to British Columbia in 1955. Now the coverage spans the country, except for Keewatin and Franklin (Table 1). Over 85,000 cards are already on file, and about 9,000 more are received each year. All the files contain some records from years before the local program began; there has been a major effort in Ontario to seek out such records, which now make up at least 10,000 of their cards. The Ontario scheme was not well publicized and supported until 1964, and the Quebec program similarly languished until 1968. The other major programs grew rapidly for three or four years and then levelled off.

The regional nest records schemes operate independently, and the activity of each has fluctuated with the varying enthusiasm of its co-ordinators. The Canadian Wildlife Service (CWS) supported the Maritimes and Newfoundland schemes from their starts, and in 1968 I was asked to co-ordinate the efforts of the regional nest records programs, as part of the CWS non-game bird populations studies. CWS has undertaken to supply nest record cards to the regional schemes, using a standard card design developed in consultation with the regions; to maintain liaison between the regional co-ordinators through visits and a series of newsletters; and to explore the fields of storage, retrieval, duplication, and analysis of nest record data, by computer and other means.

TABLE 1. — Canadian nest record programs.

| Name | Area covered | Year started | Total cards§ | Address of regional file |
|---|--|--------------|--------------------------------|---|
| British Columbia NRS* | British Columbia, Yukon | 1955 | 27,337† | Dept. of Zoology, University of B.C., Vancouver 8, B.C. |
| Prairie NRS | Alberta, Saskatchewan, Manitoba, Mackenzie | 1958 | est. 13,800 (12,695 thru 1969) | Manitoba Museum of Man and Nature, 190 Rupert Ave., Winnipeg 2, Man. |
| Ontario NRS | Ontario | 1956 (1964)‡ | est. 30,000 (25,262 thru 1969) | Dept. Ornithology, Royal Ontario Museum, 100 Queen's Park, Toronto 5, Ont. |
| Fichier de Nidification des Oiseaux du Québec — Quebec NRCP | Quebec | 1959 (1968)‡ | 3,537 | Section d'Ornithologie, Musée national des Sciences naturelles, Ottawa, Ontario — Ornithology Section, National Museum of Natural Sciences, Ottawa, Ontario |
| Maritimes NRS | New Brunswick, Nova Scotia, Prince Edward Island | 1960 | 11,744 | Natural Science Dept., New Brunswick Museum, 277 Douglas Avenue, Saint John, N.B. |
| Newfoundland NRS | Newfoundland | 1969 | 562 | Canadian Wildlife Service, Room 611, Sir Humphrey Gilbert Bldg., St. John's, Nfld. |

§Through 1970; Ontario and Prairie totals estimated from annual intake and totals through 1969.

*NRS = Nest Records Scheme; NRCP = Nest Record Card Program.

†Total for British Columbia only; Yukon cards numbered less than 100.

‡Activity in Ontario and Quebec was at low levels until the dates in parentheses.

Contact with individual observers, and distribution, collection, and storage of the cards, remain the concern of the regional co-ordinators, who know many of their contacts personally. The cards are kept in the regional files since most studies must examine the data region by region before combining records from diverse areas.

The kinds of results that may be obtained from nest record cards are extremely varied (for more details, see e.g. Myres *et al.*, 1957; Mayer-Gross, 1970). Descriptive data such as regional preferences for particular nest sites or habitats; vital statistics such as clutch or brood size, incubation or nestling period; variation of laying date with area or habitat or temperature;

these and many other topics may be explored with the help of large numbers of carefully filled-out nest record cards. Whereas the disastrous declines in breeding success of certain raptorial birds (Peregrine Falcon, Bald Eagle, Osprey) were detected by special field studies, examination of nest record cards for other species may show up further side-effects of application of toxic chemicals or of changes in land use — if sufficient data have been placed on file. A single nest record by itself may not be especially valuable, but if 1000 or more persons across Canada each sent in one nest record (of Robins, for example) these could add up to a coherent picture. Both quantity and

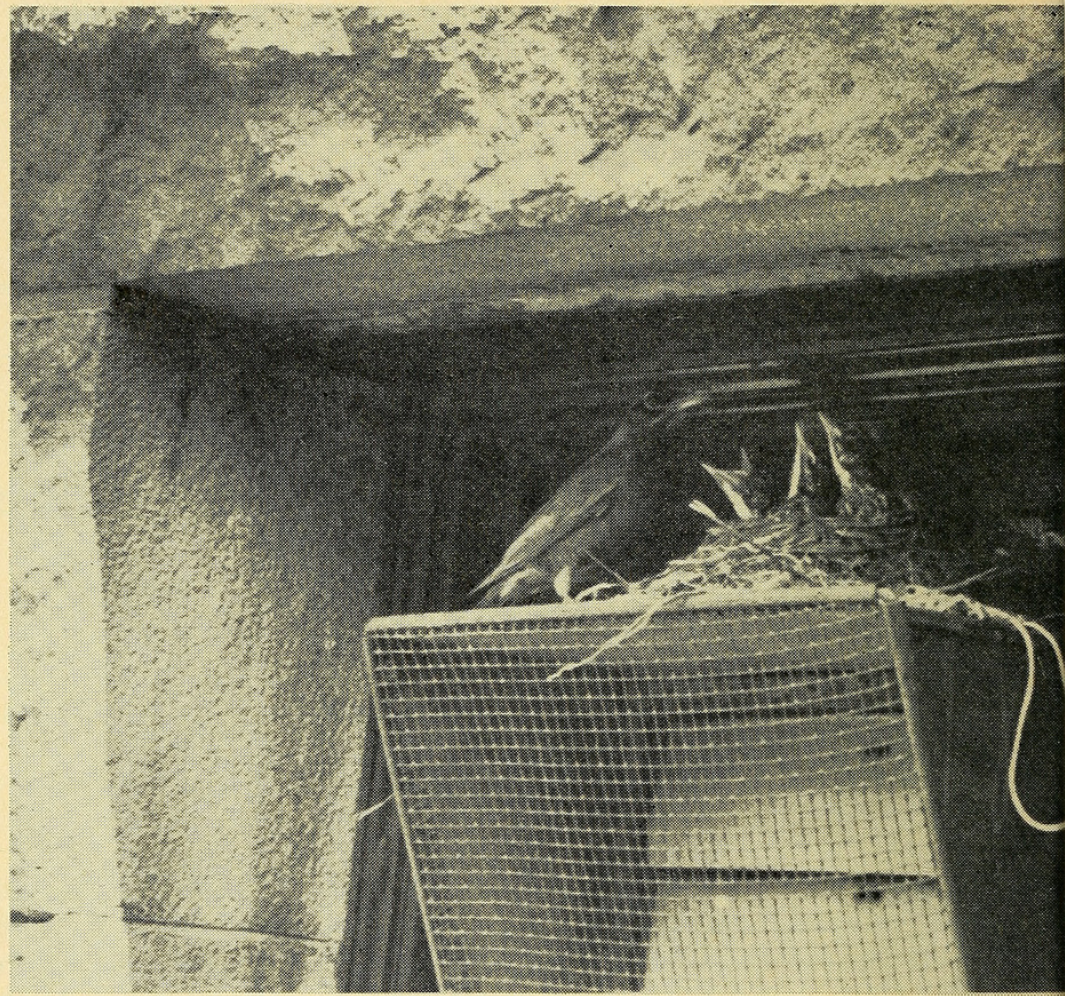
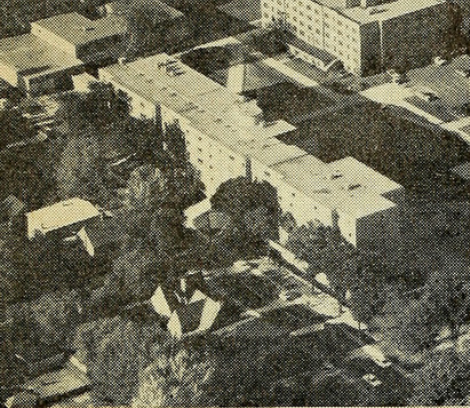
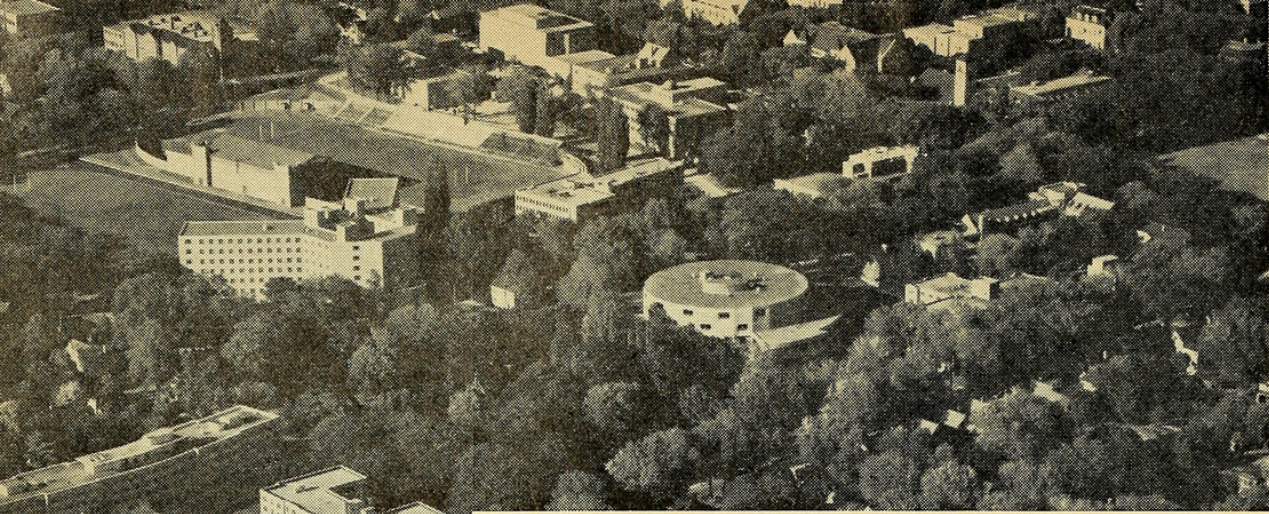


FIGURE 2. Adaptable birds such as Robins (b) often nest on city buildings even when trees are present (a), so long as adequate feeding areas — lawns and gardens exist nearby. Concrete and asphalt (c) offer scant opportunity for foraging. Mini-parks with trees and grass in the downtown areas of cities would better serve people — as well as birds — than do parking lots. (Credits: (a) and (c) — National Film Board; (b) — Author.)

quality of data are necessary when one considers a country as vast and varied as Canada.

One major problem is that most nest records are incomplete. Among Barn Swallow nest records in the four major Canadian files through 1969 (unpublished data), only 33-51 per cent gave a laying date accurate to ± 2 days; 22-38 per cent gave a confirmed clutch size (i.e. counted twice or more at intervals of more than 24 hours); 21-38 per cent were found before laying was completed (the preferred stage for determinations of success; Snow, 1955b), but barely half of these (8-23 per cent of the total) were followed until they either succeeded or failed. The fraction of cards usable varied rather little between groups of years (most samples were too small to be worth comparing individual years), although Ontario and British Columbia showed decreases in usability for these purposes in 1967-69. The fraction of usable cards for Barn Swallows was markedly higher on the Prairies than elsewhere. Probably this is a result of easy access to their nests in prairie farm buildings, as the cards from the Prairies were not better for the other species examined: Starling, Brewer's Blackbird, Common Grackle, Song Sparrow. The recent decline in usability in British Columbia was partly owing to an unsuitable nest record card, which can easily be remedied.

A high proportion of incomplete cards is an inevitable result of the method. The nest record movement rests on the assumption that every single visit to a nest can provide some useful biological information. A single visit to a nest of a seldom observed species or in a seldom visited area can be quite valuable, in the absence of other data. Unfortunately, far too many cards for all species, even in easily accessible areas, are left incomplete. A nest record has a far greater value if the contents of the nest have been accurately determined, even only once, than if no details are observed. Additional visits escalate the value much farther. About six suitably timed visits will provide almost all the data one requires from a nest record, and even three or four visits will provide most of this (cf. Erskine and Teeple, 1970). A certain level of quality is essential and should take pre-

cedence over almost any quantity of undetailed records.

There is an increasing need for responsible attitudes in the collection and use of nest records. The welfare of the nest should be paramount; extra visits beyond those needed to obtain the basic data will do more harm than good. The most important points to avoid are: attracting attention to the nest by one's presence or trail, damaging or exposing the nest by careless or over-zealous actions around it, and frightening the adults into desertion or the young into premature fledging. In the long view, a nest known to have succeeded (even though some details were missed) is more valuable than one fully documented in the early stages but later destroyed as a result of the study.

Use of data filed in nest records schemes varies with the policy of the regional co-ordinator. One basic dilemma is: should one reduce access to the data by insisting that the investigator clear it with the original observers before use or publication; or should one make the data available more or less on demand? The latter approach is simpler, and many observers neither expect nor wish for further acknowledgement than they have already received (a letter or card confirming receipt of their completed cards, and mention by name in the annual summary of the regional program). The other extreme, to require clearance from every observer (even those who sent in one card many years ago) is obviously unworkable, so we encourage a middle course. In the present state of Canadian nest records, any observer who contributed 50 or more cards for the species under study during the preceding five years or who is known to have a continuing interest in a particular species should be contacted, and any observer who provided really important data — regardless of the number of cards or when they were submitted — deserves similar courtesy. The time required to write the relatively few letters needed is much less than that spent to find the nests, and most observers are happy to know that their data are being used. Their contribution should be acknowledged in any resulting publication. This is one way in

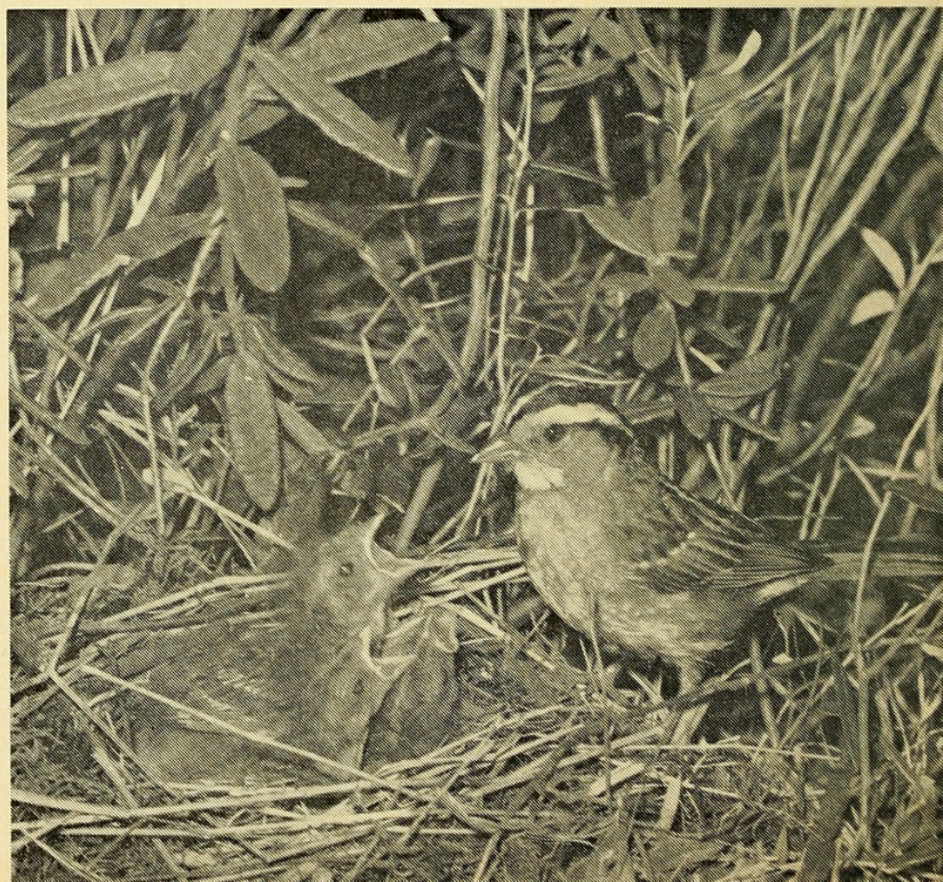
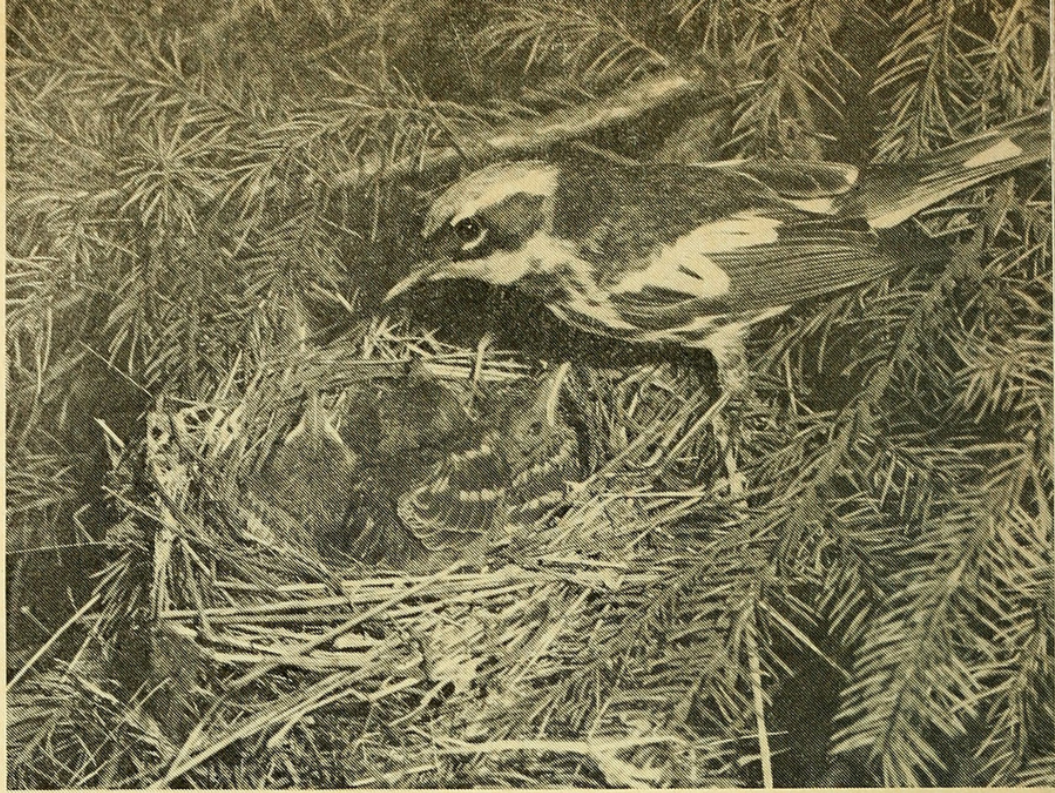


FIGURE 3. An acre of softwood forest (b) will yield enough newsprint for one day's run of a city newspaper, most of which is discarded next day as trash. An acre of softwood forest can offer a recreational opportunity for many people, as well as nesting places for Magnolia Warblers (a), White-throated Sparrows (c), and many other birds. We can have both forests and newspaper if we will insist that waste paper be salvaged and recycled. (Credits: (a) and (c) — Dalton Muir; (b) — Author.)

which people can be encouraged to feel that filling out nest record cards is a worthwhile activity. An attitude of "You do the work and we'll write the papers" could rapidly kill interest in the program. One special case requires further comment: the cards for rare or threatened species are not released without special clearance, since the activities of collectors pose a real threat to these birds if the nest locations are widely known.

Another problem is preservation of the original records. There is no difficulty in consulting nest record cards in the regional files, but many people find it inconvenient to visit the more distant files in person. Lending the original cards brings a risk of loss or damage in the mails or at their destination, so most co-ordinators now copy (usually xerox) the records in response to enquiries involving fewer than 100-200 cards. But even this scale of copying is expensive, and it is no solution for species with hundreds or even thousands of cards in a regional file. Computer operations may prove worthwhile for the major species, but these will be still more expensive. Persons wishing to study large numbers of nest record cards must recognize that the cost, whether of travelling to the regional files, of having xerox copies made, or of having a computer tabulation prepared, will be far less than that of collecting the equivalent data in the field. Nest recording is a co-operative activity, not a one-way street.

Have the Canadian nest record programs produced any worthwhile results in the fifteen years since their start? Even though few major nest record studies have yet been published, a list of publications based on nest records in Canada would be a lengthy one. It would include both major compilations: e.g. Drent *et al.* (1961, 1964), on sea-bird colonies in British Columbia, and on the breeding birds of Maudslayi Island, B.C.; and brief studies: e.g. of Purple Martin distribution in New Brunswick (Hunter, 1967), and of rural vs. urban Starlings on Cape Breton Island (Erskine, 1970). Many publications dealing only indirectly with nesting (e.g. local bird lists) have referred to nest record data, and the total number of occasions on which Canadian nest record cards have

been consulted and used (if not always acknowledged) must be many hundreds or even thousands. The potential for use of these records is still greater, if they can be made available to bird students, and if it is recognized what problems they can and cannot solve.

Myres (1955, 1957) and Snow (1955a and b) showed how nest records may be used to study breeding seasons, clutch size, and nesting success in Britain and Canada. Von Haartman (1969) summarized Finnish nest records for nest site and height, clutch size, laying date, and incubation and nestling periods, but Udvardy (1970) pointed out how little data these gave on certain subjects. Peakall (1970) included Canadian records in his compilation of North American nesting data for Eastern Bluebirds, the first computer analysis of nest records by the program at Cornell University (Ithaca, New York, U.S.A.). Recently (Erskine, in press) I summarized Canadian nest records for Common Grackles; the samples were too unevenly distributed to give representative data on range, habitat and nest site, but they allowed the first comprehensive survey of breeding seasons and clutch size in Canada for this common species.

Where do we go from here? It is an oversimplification to urge that the masses of data already in nest records schemes be written up and published. The totals for the top 20 species, excluding ducks and colonial water birds (Table 2), show how few cards are on hand in any one region for most of them. My recent Grackle study used about 1,500 nest record cards; when the totals were reduced to those giving useful information, it was not worth attempting a study of nesting success, although other topics were explored successfully. Unless the quality of cards is unusually high, at least 500 cards of a species are needed from any one region, to allow comparison between sub-samples. At present, only Robin, Red-winged Blackbird, and Barn Swallow have achieved this level in all four long-term files. A start can and should be made for these major species. The data for many others are worth summarizing for regional studies, although they would not warrant formal publication on their own. One may fairly ask how often the clutch size given for a species

TABLE 2. — The 20 species (excluding ducks and colonial water birds) represented by the largest numbers of cards in Canadian nest records schemes, through 1970*.

| Species | B.C. | Prair. | Ont.* | Que. | Mar. | Nfld. | Total |
|----------------------|------|--------|-------|------|------|-------|-------|
| Robin | 2023 | 592 | 2091 | 251 | 1504 | 76 | 6537 |
| Red-winged Blackbird | 545 | 624 | 1839 | 243 | 524 | 2 | 3777 |
| Barn Swallow | 1088 | 459 | 725 | 126 | 621 | 1 | 3020 |
| Tree Swallow | 572 | 622 | 896 | 126 | 301 | 3 | 2520 |
| Starling | 740 | 157 | 779 | 73 | 506 | 13 | 2268 |
| Common Grackle | 3 | 92 | 717 | 94 | 951 | 0 | 1857 |
| Brown-headed Cowbird | 245 | 328 | 785 | 79 | 82 | 0 | 1519 |
| Song Sparrow | 294 | 122 | 585 | 99 | 364 | 2 | 1466 |
| Cliff Swallow | 919 | 90 | 116 | 69 | 197 | 0 | 1391 |
| Crows (combined) | 270 | 444 | 276 | 41 | 113 | 5 | 1149 |
| Flickers (combined) | 407 | 159 | 326 | 47 | 114 | 7 | 1060 |
| Mourning Dove | 120 | 250 | 678 | 9 | 2 | 0 | 1059 |
| House Sparrow | 315 | 135 | 372 | 28 | 192 | 1 | 1043 |
| Yellow Warbler | 67 | 180 | 556 | 60 | 163 | 14 | 1040 |
| Eastern Bluebird | 0 | 29 | 851 | 111 | 6 | 0 | 997 |
| Chipping Sparrow | 217 | 115 | 378 | 80 | 129 | 0 | 919 |
| Killdeer | 250 | 213 | 361 | 48 | 45 | 0 | 917 |
| House Wren | 184 | 399 | 314 | 12 | 0 | 0 | 909 |
| Bank Swallow | 251 | 45 | 243 | 97 | 245 | 0 | 881 |
| Catbird | 79 | 140 | 508 | 32 | 76 | 0 | 835 |

*Through 1969 only for Ontario.

in a provincial bird book was based on observations in that province; in future it should be possible to use local figures for many species. For example, a new account of the breeding birds of Ontario, last summarized by Baillie and Harrington (1936-37), will be based largely on nest record cards (G. Peck and R. Montgomerie, in preparation).

With increases in environmental contamination, nest records have been suggested as an aid in following the effects of pollution on breeding birds. This approach has been followed up in Great Britain, where about 24,000 nest record cards are received annually from an area of 50,000 square miles with a population of about 50 million people (say, 2½ times Canada's population in an area the size of the Maritimes). The top 10 species make up about one-half of the annual total. Two years of full-time work for one man was needed to summarize the data received for these 10 species since 1950. After all this effort, the conclusion was that it could not be proven that environmental contamination had affected breeding success of the birds

studied. In one sense, this is encouraging, since the song birds reported in largest numbers are those which nest around gardens and farms, where toxic chemicals are most often applied deliberately. But it is unhelpful in another sense, since the scarce birds near the ends of predator food chains where toxic chemicals are accumulated, and the water birds into whose habitats runoff washes the pollutants, are seldom represented in useful numbers in nest record programs. Bird observers spend little time and report few nests in areas blighted by urban sprawl or industrial pollution. Nesting success cannot be measured by nest record programs if there are no longer any nests to be reported because the population has declined. Thus, sophisticated analysis of nest record data is not necessarily or always the best means of monitoring effects of pollution on birds breeding in an area; it may be helpful when used with other methods, and in some situations it may be the only available approach.

Finally, someone is sure to ask, "How important is all of this anyway?" We can only

reply that we don't know, but we think it may be vital. Pessimists tell us that within 10 years man will have poisoned the environment so that neither birds nor men can exist in it, and that no measures acceptable to people used to a North American standard of living can prevent this disaster. Optimists tell us that things may have been a bit messy for a while but that modern technology has them under control now. Still others will invoke "The will of God" or "The basic goodness of man" as reasons why such events will or will not come to pass. I feel that by encouraging people to look at birds and their nests with care and judgement we are stimulating public awareness of our natural environment as something to be treasured. Collections of nest record cards extending over many years may prove particularly valuable in providing documentation acceptable to the legislators who must formulate the restrictions on man's abuses of the environment. The act of looking critically at our natural environment and acting to ensure its conservation may seem far removed from noting that the Barn Swallows are building under the porch eave again, but the two are related. Man finds it easy to identify with birds, easier than with most other living things: birds communicate with each other by voice, they build complicated homes, some even go to Florida for the winter. Like man, birds depend on their environment, but only man can ensure that it survives.

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