

# Chronology of nesting in urban birds as a guide to timing of censuses

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*“six species rear two or more broods per year . . . all actively nesting only in late May and June . . .”*

## INTRODUCTION

Interest in urban bird populations has increased in recent years, and urban bird censuses have been conducted in various countries (e.g., Finland—Nuorteva, 1971; Italy—Walter und Demartis, 1972; Canada—Weber, 1972; United States—Emlen, 1974). Timing of the census taking of urban birds has been discussed only generally and instructions refer only to a recommended minimum number of counts (usually 5 to 8) to be carried out “at the height of the breeding season” or “in late spring and summer”. In rural areas and forests, where a large proportion of the birds are migratory, insectivorous species, which do not reach north temperate latitudes until May, these censuses have most often been made from mid-May into July. But in urban areas, where resident and omnivorous birds are important, some censuses have been started as soon as the ground is snow-free, in early April or even March. These counts may extend into July and August. Most observers are aware that the Great Horned Owl, *Bubo virginianus*, may start nesting in March, while the Cedar Waxwing, *Bombycilla cedrorum*, and American Goldfinch, *Spinus tristis*, commonly do not begin until July, after many other species have fledged their first or second broods. In the artificially warmer urban environment, nesting may begin still earlier and determining the best time for mapping censuses may be very difficult.

Urban and rural area breeding may not be closely synchronized. Snow (1958) showed that the

European Blackbird, *Turdus merula*, nesting in the Botanic Garden (a city park) in Oxford, England, bred on average 10 days earlier than those in nearby Wytham Wood. Also at Oxford, Lack (1966) noted that Great Tits, *Parus major*, bred 4 or 5 days earlier in city gardens than in rural woods. In Nova Scotia, the author reported (1970) that Starling, *Sturnus vulgaris*, nestings in Glace Bay (a large town) had a median date 12 days earlier than nests in rural areas of Cape Breton Island.

We examined records of seven species commonly nesting in towns and cities from the files of the major Canadian nest record programs. This direct approach reduced the need for comparing rural and urban records to cases where the latter were too few to be useful. The purpose here is to indicate the periods when mapping censuses may most profitably be carried out in urban areas of southern Canada. Most northern states would probably average slightly earlier than adjoining regions in Canada, and suggested schedules may be judged by comparing their mean monthly temperatures

## METHODS

Only records from cities and towns of 3000+ inhabitants were considered. The location given was taken as definitive, unless the habitat was clearly non-urban. More precise knowledge of the locale would probably have excluded some records used.

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Dates of laying of the first egg in a nest were estimated by the methods outlined by Myres (1955). The range of dates to which each record could be assigned was also noted. Median dates were derived for each sample of five or more records, and interquartile ranges for all samples of 10 or more. Such figures were derived separately for all areas for which useful samples were available, provided these were at least 50 miles from other areas. Such subsamples were later combined if no clear differences from nearby regions were found. If species records in one region showed a span of dates too long for a single nesting with re-nesting after failures, the calculated dates were plotted against time to see if two more or peaks in nesting effort could be distinguished. When more than one peak was found, median dates and interquartile ranges were derived for each, and the intervals between median dates for successive peaks were checked against the minimum time possible between broods. No overlap was assumed between the fledging of young from one nest and the laying of eggs for a later effort, but feeding of flying but dependent young and building of later nests were not excluded from overlap.

## RESULTS

The numbers of records, grouped by species and province or region, are given in Table 1.

Laying dates for six species are summarized in Figure 1 - Figure 6.

**Table 1. Numbers of nest records from urban areas, grouped by region, for selected bird species, through 1972 with a few from 1973. Samples of 25 or fewer records are enclosed in parentheses.**

Species	Number of cards in				
	Maritimes	Québec	Ontario	Prairies	B.C.
Rock Dove	41	(0)	(18)	(8)	70
Tree Swallow	44	(15)	(7)	(17)	(7)
American Robin	121	42	304	71	379
Starling	48	(5)	(22)	(4)	(7)
Yellow Warbler	(19)	(0)	(3)	(8)	(2)
House Sparrow	42	(6)	55	(10)	144
Chipping Sparrow	35	(13)	39	(12)	(9)

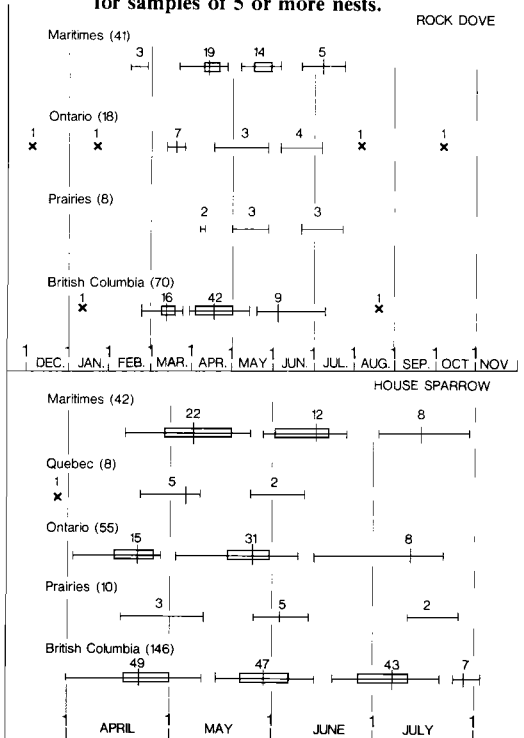
## DISCUSSION

The choice of species was influenced by a desire to represent a variety of families and by the availability of useful samples. Purple Martin,

*Progne subis*, is much the most urbanized swallow, but the nest record data were totally inadequate except in Ontario. The samples for Common Nighthawk, *Chordeiles minor*, were also too small. Many of the regional samples were inadequate for one or more species, but the composite picture from all regions was consistent for each.

In Canadian urban areas, Rock Dove, *Columba livia*, may nest five or more times each year, the only period unrepresented is from October 6-December 3. This is not certainly correlated with moult, which Murton *et al.* (1974) have shown overlaps broadly with later broods in England. It may simply reflect lack of searching during this season. Evidently most breed about three times (Fig. 1), with peaks in March, April-May, and June in all regions. December and January breeding was noted only in southern Ontario and coastal British Columbia, the areas with mildest winters (Table 2)

**Figure 1 through Figure 6. Ranges, interquartile ranges, and medians of laying dates for urban-nesting birds of various species, by regions or provinces. Sample size for each region in parentheses; subsamples show each wave of nest initiation. Interquartile ranges given for samples of 10 or more nests; median dates given for samples of 5 or more nests.**



**Figure 1. Rock Dove, Figure 2. House Sparrow**

House Sparrow, *Passer domesticus*, shows three peaks of nest initiation, which Weaver (1939) and

Summers-Smith (1963) showed do not correspond directly with first, second, and third broods, since some pairs rear four broods and others no more than two. Breeding did not begin until the very end of March, even in the warmest areas, and it ended by early August.

American Robin, *Turdus migratorius*, also appears to rear three broods annually. There were progressively fewer records for the later broods, which probably reflects less searching and fewer of the population taking part in later nestings. The coastal British Columbia and southern Ontario records began earlier than elsewhere. Four records from the Maritimes and two from Manitoba (Prairies) were two to three weeks earlier than any others in those regions; most of these are believed in fact, to be May dates mistakenly entered as April. It is, of course, possible that an experienced pair using a well-sheltered site might nest much earlier than most others in an area, but all except one of these records occurred in months with mean temperature below normal for these areas.

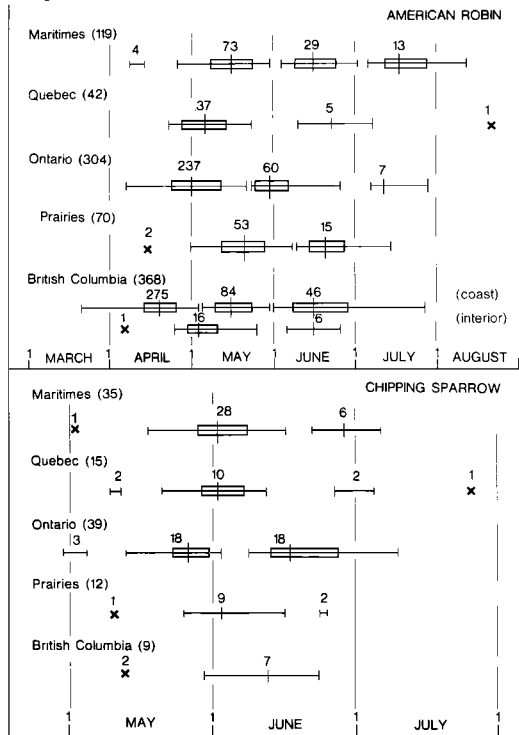


Figure 3. American Robin, Figure 4. Chipping Sparrow

Chipping Sparrow, *Spizella passerina*, had two peaks of nesting in all regions, with one possible third brood in Québec. In all regions except British Columbia, one to three records were earlier by one to two weeks than any others. If correct, such birds must have begun laying immediately upon arrival,

whereas most of the population delays for about three weeks. As with the very early robin records, these may have been June records mistaken for May. Three of these occurred in months much cooler than normal, and two more were slightly cooler than average, which makes such early dates even more improbable.

Tree Swallow, *Iridoprocne bicolor*, suggest no second broods anywhere, with all records in each region falling in a five-to-seven week period. The two earliest records in the Maritimes are suspect

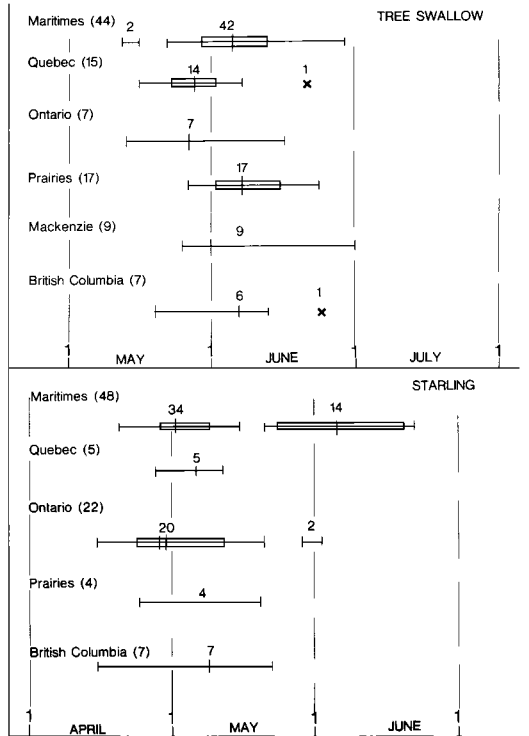


Figure 5. Tree Swallow, Figure 6. Starling

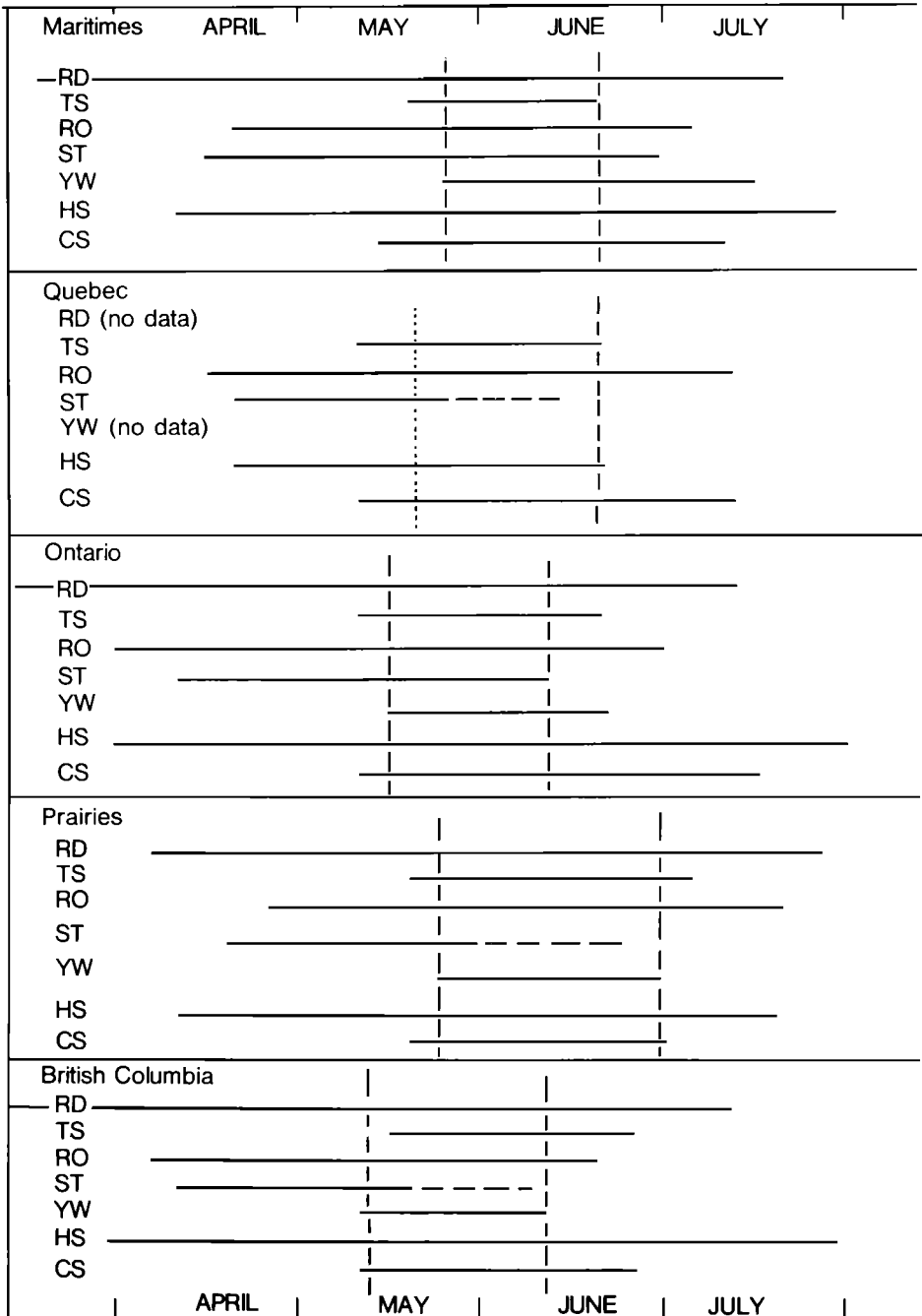
Starling was evidently double-brooded in the Maritimes and Ontario, and the samples elsewhere were very small. Probably some attempt second broods all across southern Canada, though possibly in varying proportions in different years (cf. Dunnet, 1955; Erskine and McLaren, in press)

The breeding schedules for different regions vary relative to their temperatures. Each species begins breeding after a certain temperature threshold is reached (Nice, 1937). Table 2 shows that March temperatures were generally below freezing except in British Columbia, and only there was nesting noted in March, except by Rock Doves. In April and May, when most species began nesting, mean

Figure 7. Periods of maximum breeding activity in urban-nesting birds of various species, by region. The period when most or all species are active is set off by heavy, vertical, broken lines. These extend from about three days before the start of laying in the earliest period of nesting (from Figs. 1-6), ignoring isolated early dates, to about five days after the end of laying in the

last period of nesting. (Note: The nesting period for Starling probably extends later than shown in most regions, as suggested by the broken horizontal lines.)

Abbreviations: RD-Rock Dove, TS-Tree Swallow, RO-American Robin, St-Starling, YW-Yellow Warbler, HS-House Sparrow, CS-Chipping Sparrow.



monthly temperatures were highest in British Columbia, followed by Ontario. Québec, the Maritimes, and the Prairies were cooler. Nesting followed much the same order when samples of 15 or more nests per region were available; smaller samples were often erratic (early or late). Urban centers east of the Coast Mountains in British Columbia were cooler in March than those on the

Birds are most easily detected on mapping censuses during courtship, egg laying, and into early incubation, when the adults, especially males, are most active and vocal. These periods vary between species, and are summarized for the various regions in Figure 7. The periods when all of these species are active are:

Maritimes	May 25	-	June 20
Québec	(May 20 ?)	-	June 20
Ontario	May 15	-	June 10
Prairies	May 25	-	June 30
British Columbia	May 10	-	June 10

**Table 2 Mean monthly temperatures for urban centres in various regions of Canada (from Monthly Record of Meteorological Observations in Canada, Atmospheric Environment Service, Environment Canada).**

Region	Mean monthly temperature (°F) for		
	March	April	May
Maritime Provinces (Sydney, Halifax, Kentville, Amherst, N S, Charlottetown, P E I; Moncton, Saint John, Fredericton, Campbellton, N.B.)	23°-29°	36°-40°	47°-51°
Québec (Québec City, Trois Rivières, Sherbrooke, Montreal, Hull)	23°-27°	38°-42°	51°-55°
Ontario (Ottawa, Kingston, Trenton, Toronto, Hamilton, London)	25°-31°	41°-44°	53°-55°
Prairie Provinces (Winnipeg, Manitoba; Regina, Saskatoon, Saskatchewan; Edmonton, Calgary, Alberta)	18°-24°	38°-40°	50°-52°
British Columbia (Victoria, Vancouver, Chilliwack, Vernon, Kamloops)	36°-44°	47°-50°	54°-58°

In all regions, the period of maximum activity extends for four or five weeks, roughly from the arrival of Yellow Warblers to the end of laying by Tree Swallows. Even in the Maritimes, where samples are adequate for most species, there is little purpose in conducting urban censuses after July 5, unless other, later-nesting species are present, in most southern regions July counts are not useful, since most species have finished breeding by then. Even in coastal British Columbia none of the insectivorous species are nesting before the second week of May. In general, although they average slightly earlier, these dates differ little from those already accepted as suitable for census in rural and wilderness areas. Obviously too, there will be no harm in conducting additional censuses in April and July, provided that an adequate number of counts are taken during the height of the nesting season.

### SUMMARY

The chronology of nesting of urban birds in southern Canada was examined as an aid to selecting the most effective period for conducting bird censuses in towns and cities. Six of seven species studied attempted to rear two or more broods per year, the nesting season generally extending from April into July (longer in Rock Doves). The seven species were all actively nesting only in a five-week period in May and June, between the arrival of Yellow Warblers and the end of egg laying by Tree Swallows.

### ACKNOWLEDGEMENTS

I wish to acknowledge the use of nest record data stored in the Maritimes Nest Records Scheme, c/o Canadian Wildlife Service, Sackville, N.B.; in the Quebec Nest Record Card Program, c/o National Museum of Natural Sciences, Ottawa, Ont.; in the

coast, and temperatures at Québec City and Trois Rivières were lower in both March and April than at more southern inland localities; nesting was later in these cooler areas, but the samples were insufficient to warrant separate reporting. No differences were found between temperatures or nesting schedules in different parts of the other regions, which were more homogeneous both in latitude and elevation.

Ontario Nest Records Scheme, c/o Royal Ontario Museum, Toronto, Ont.; in the Prairie Nest Records Scheme, c/o Manitoba Museum of Man and Nature, Winnipeg, Man.; and the British Columbia Nest Records Scheme, c/o B.C. Provincial Museum, Victoria, B.C.; and I thank all the persons responsible for the collection and storage of this valuable material, without which such studies as this would scarcely be feasible. Chandler S. Robbins and Wayne V. Weber read and commented helpfully on an earlier draft of the paper.

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## A new American Birds ... a request for comment

Buried near the very end of the February, 1976 issue of *American Birds* was a brief article of editorial comment entitled "The Last Word," and in that article were several paragraphs alerting the reader to plans that are now being considered to expand and improve *American Birds*, with a new look, a fresh approach, a larger page size and more color creating, in effect, a "new" magazine with, hopefully, a much broader general appeal.

In that article we said "But we are not going to change *American Birds* without consultation with the loyal subscribers now reading the periodical, as well as the thousands we want to add . . . we want your views. We want to know what you like about *American Birds* now; what you would like to see added, changed, improved, dropped. Tell us what

kind of *American Birds* would excite you. Your letters will be instrumental factors in our final decisions."

A modest number (under 50) of readers have written us, some in great detail, thoughtful and articulate responses to our invitation. But the vast majority of our readers have thus far kept their own counsel. Is *American Birds* exactly to their liking today? Are there no suggestions for improvements that readers wish to make? Was our invitation for reader comment buried too far back in the magazine to be noticed? If so, here it is again, in a prominent location, hard to miss. To read the full discussion, see *American Birds*, February, 1976, pp. 148-9.

We are serious in our solicitation of your views and your ideas.