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A report on breeding bird atlases in Canada

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The paper summarizes Canadian experiences on bird atlassing, discussing the organization of the projects and their status, but also the problems caused by the vast geographical areas that are sparsely populated.

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1. Introduction

Since the publication of the first breeding bird atlases scarcely over 10 years ago (Sharrock 1976, Yeatman 1976, Dybbro 1976) the production of bird atlases has become the single most popular activity for 'birders' in much of the world. The popularity of the activity can be seen in the now well established lexicon that has developed; those who work on atlases are atlassers and atlassing is the verb to describe collecting data on bird distribution. In Canada when one claims to be "going atlassing" for the weekend there is an aura of respectability and scientific purpose over what used to be considered "goofing off". Now if we could only agree on how many s's' to put in atlases, atlassing and atlassers...!

History will undoubtedly show that the past two and the next decade were major years of progress in bird conservation because of two major aspects of atlases. First, we are experiencing a dramatic increase in systematically collected avian distribution information that can be used for conservation and management. Second, and equally or more important, most of the information is being collected by volunteers who have become highly organized. As a result of atlases in many jurisdictions we now have a well organized network of people with not only an interest in birds but also extensive data bases to provide much needed information.

There are several characteristics of Canada that affect all of our bird atlases to some extent. The first is that we have a very large country; 9 911 023 km^2. With a population of approximately 25 million and perhaps 5 000 extant and potential atlassers there is a lot of land to cover. The second factor, as many of you will already know, is uneven population distribution. Most Canadians live along the southern edge of the country and access becomes increasingly difficult as you travel to more remote areas, we still have lots of wilderness.

Most Canadian Bird Atlases are being conducted along similar patterns modelled after the British Atlas. For the purposes of this overview I have distinguished between systematically gathered grid-based mapping work called atlases and regular distribution mapping based on existing information which I have called distribution studies. Initially, I will provide an overview of the Ontario Breeding Bird Atlas as it is the only one completed to date and is also the one I'm most familiar with. Then I will summarize the atlas and distribution efforts in the other provinces and territories with an emphasis on any aspects that make them unique.

2. Ontario Breeding Bird Atlas

After two years of planning, five years of field work and two years of write-up, this volunteer-based project has just been completed. The project was sponsored by the Federation of Ontario Naturalists and the Long Point Bird Observatory and supported by more than 20 organizations including private foundations, industry and the Federal and Provincial governments.

Administration

The project had a permanent Management Committee and a permanent Technical committee to oversee and direct activities. Other committees such as Data Review, Publication, and Data Management were struck as required and reported to one of the governing committees. The project had a full time co-ordinator, frequently an assistant co-ordinator, and in latter years a database manager and several editorial assistants.

Grid system

Data collection units were based on the Universal Transverse Mercator (UTM) system. Accordingly they are the same size and shape everywhere. The province was divided into two sectors; a more heavily populated southern sector and the less densely populated northern sector. In the south 1824 grid 'squares' of 10 km × 10 km were completely covered while in the north all major habitats in 96 blocks of 100 km × 100 km were atlassed.

Coverage

Initially a goal of 16 hours minimum coverage was established. After the first 2 years generalized species richness maps were developed for the province that allowed an estimate of the number of species for each square. Adequate coverage then was established as 75% of the estimated number of breeding species with no less than 16 hours. For the north a minimum of 50 hours atlassing per block was established with coverage essential for all major habitat types.

Regions

For organizational purposes the province was divided into 46 regions each of which had a Regional Coordinator. The volunteer Regional Coordinators had extensive responsibilities which included assigning squares, collecting and checking data, maintaining master data records for all squares, acquiring and screening unusual species report forms, and reporting to both the atlas office and atlassers on progress. They were in many ways the vital link in the success of the project.

Methods

The standardized procedures basically followed the Atlas of Breeding Birds in Britain and Ireland (Sharrock 1976). All participants were given a Guide for Participants (Eagles and Cadman 1981) and received a regular newsletter. Data was recorded on standard data cards supplemented with special forms for unusual species. Sixteen standard breeding codes were grouped into three levels of evidence; possible, probable, and confirmed. An additional column on the data card was reserved for abundance estimates using a log scale as follows:

1	1 pair
2	2–10 pairs
3	11–100 pairs
4	101–1000 pairs
5	1001–10 000 pairs
6	more than 10 000 pairs

Data processing and verification

Atlassers sent data cards to Regional Coordinators who checked for missing, incorrect and problematical data. Cards were then forwarded to Atlas Headquarters for key punching and entry into the computer. All records were subject to elaborate error checking and verification. Each year a new 'roll-up' file was created summarizing the highest level of breeding evidence for each square. Over 400 000 records were received and compiled for the 100 000 distribution records of 292 species that make up the final atlas. Nearly 5 000 or 1% of the records required an Unusual Species Report Form (USRF) and adjudication by the Data Review Committee.

Funding

In the 8 years of the project 1979 through 1987 $670 000 worth of funds, equipment, and direct contributions were raised. As well gifts-in-kind such as air-time and lodging made substantial contributions to the success of the project.

Write-up and publication

The Atlas publication has three principal editors and contains the work of 90 experts who wrote species accounts and other special sections. The final large format hard-covered book comprises 640 pages. All species breeding in Southern Ontario have a full page written account plus a map and figure page. Species occurring only in the north have a shorter one-page account including a map and description.

The 1 351 volunteers reported 123 879 hours of atlassing. Many of them had assistants and undoubtedly spent travel time as well so it seems that 2 000 people and 180 000 hours is a reasonable measure of

effort. Breeding evidence was found for 292 species and two additional hybrids. Six new breeding species were discovered with a high of 146 in one square.

3. National Overview

Since the Ontario Atlas was the first volunteer based atlas most subsequent projects have made use of their experiences. Canada is composed of 10 provinces and 2 territories. In the following, I have tried to summarize all ongoing activities that relate to bird distribution rather than just atlases.

Newfoundland

Over the past five years a special effort has been made to run Breeding Bird Surveys (BBS) with the same few exceptionally competent observers. These surveys provide a degree block map of species distribution. As well all historical records are now being computerized. The historical and Breeding Bird Survey data are being combined for a planned book on the Diversity, Distribution, and Abundance of the Birds of Newfoundland.

Maritimes

(Nova Scotia, New Brunswick, and Prince Edward Island). These three eastern maritime provinces have combined efforts to initiate the Maritimes Breeding Bird Atlas modelled after the Ontario project. The project is in its second of a five year field season. They are using a 10 km × 10 km grid initially sampling one out of four squares but will probably sample one out of two in a checker board pattern. There were 452 active contributors in the first year and the project is well underway. It is unique in that they had their computer base mapping system in place when the project started. During the first year a new breeding species was recorded for Canada and several other notable discoveries were made.

Québec

The province of Québec Atlas (1984–1988) is conceptually similar to the Ontario atlas. After some consideration of the problem of handling 15 800 squares of 10 km × 10 km they have decided to concentrate efforts on 'Québec méridional' the area of greatest activity from the US border to 50°30′N. It contains 5 225 squares that can be segregated into three categories: 1 500 wilderness squares with difficult access, 1 850 accessible squares, and 1 850 remote squares. Emphasis is now placed on getting volunteers to complete the 'accessible squares' and trained paid assistant to atlas the 'remote squares'. The combined effort will provide coverage of the majority of 'Québec meridional'. To date the Québec Atlas has collected over 100 000 records and now has more than 800 volunteer participants.

Manitoba — Bird Distribution

A major effort which began in 1985 to compile existing records continues with a view to publication of a new 'Birds of Manitoba' about 1991. Records will be mapped at the NTS map sheet basis in the north and a township basis in the south. In the Canadian 1:50 000 National Topographic System (NTS), each map sheet is 30′ longitude × 15′ latitude or 1/8 of a degree block. Some new distribution work is being conducted, particularly in the northwest.

Saskatchewan — Atlas

The Saskatchewan Bird Atlas began in 1983 to determine the historical and current year-round distribution of birds. The grid basis is again 1:50 000 NTS mapsheet of which there are 740 for the province. Records have been collected in three groupings pre-1966, 1966–1982, and annually since then. They will be separated as historical 'before 1966' and current 'since 1966'. All records are coded by season and summer records are additionally coded by one of 16 standard levels of breeding evidence. Additional records are kept of Unusual Species including colonial, rare and endangered, and uncommon birds and also of Unusual Habitats including areas of exceptional avian diversity or specialized habitat.

Alberta — Atlas

The newest active Canadian atlas project got underway in Alberta this year. The Alberta Bird Atlas which plans to ultimately cover all seasons began their Breeding Bird Atlas this summer. Mapping is based on the UTM grid using a 10 km × 10 km scale. At present in populated areas one 10 km × 10 km out of each 20 km × 20 km block is designated a priority square and should be completed first. In difficult-to-access areas one out of a 100 km × 100 km block is designated as the 'priority square'. They hope to ultimately survey all 10 km × 10 km squares but will complete 'priority ones first'.

Adequate coverage is designated as a record for 75% of the expected species. They have developed a

formula for determining expected species for each square on the basis of habitat present for example:

"– If the square has a substantial amount of forest of various compositions and ages, count 60 species, unless there isn't any significant amount of deciduous forest, in which case count only 50 species. Subtract five species if there isn't any mature forest of large trees.

– If there is alpine tundra, add 5 species.

– If there is permanent settlement add 5 species..." (Thormin & Clements 1987).

The project is highly organized with a planned 'Annual Atlas Day', Annual meeting and a newsletter. It looks like a winner!

British Columbia — Bird Distribution

Efforts of birders in British Columbia to bring together all existing data on British Columbia birds have resulted in the successful compilation of 100 000 specimen records, 8 000 papers and reports, 1 000 000 documented observations and 110 000 nest records. Species maps on a NTS grid (1/8 degree block) have been prepared showing seasonal patterns and complete species accounts including documented breeding ("nest or flightless young") have been prepared for most species. The Birds of British Columbia will be published in two volumes: Non-passerines and Passerines.

Yukon — Bird Distribution

There is some interest in conducting an Atlas in the Yukon but with only 24 000 people in 482 515 km^2 and little road access it will be a daunting task. Recently there has been an effort to increase Breeding Bird Survey activity and some consolidation of historical records.

Northwest Territories — Atlas

A proposal has been developed to conduct a breeding bird atlas of the 3 426 320 km^2 of the Northwest Territories at a grid scale of 100 km × 100 km over a 12-year period from 1988–1999 including a 2-year write-up.

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