

The Need for a North American Coordinated Bird Monitoring Program¹

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Introduction

Bird monitoring is at a crossroads. While monitoring programs have existed in North America for nearly a century, recent political, biological, sociological, and economic changes necessitate a new and more efficient approach. Fortunately we now have tools available to meet the demands, including powerful coalitions of the willing within agencies, organizations, and universities. Further, rapid advances in several areas auger well for the process: specifically advances in monitoring methods, data archiving, and extremely powerful computer tools that allow retrieval and analysis, all have reached unprecedented levels of sophistication.

The waterbird, shorebird, and landbird initiatives have all begun work on taxa-specific monitoring programs (e.g., Brown et al. 2001, Donaldson et al. 2001, Kushlan et al. 2002, Rich et al. 2004). Their plans identify species that warrant monitoring, important habitat relationships, declare goals for long-term estimates of trend in population size, and – to varying degrees – describe how the goals can best be achieved. Coordinated Bird Monitoring (CBM) is an attempt by the initiatives, working with many agencies, non-government organizations, and individuals, to forge a comprehensive approach to monitoring that will provide information on all nongame birds. Here, we briefly describe the CBM approach, how it can help implement the initiatives' proposals, and suggest which aspects of the general approach should be emphasized during the next several years.

Vision, Goals, and General Approach

The vision of CBM is that monitoring should be, at one level, issue-driven, science-based, scale-dependent, and implemented through partnerships. It should also be opportunistic, encompassing methods or metrics that give warning of unanticipated environmental changes. The broad goal of CBM is to increase the efficiency

and utility of bird monitoring through improved coordination. Two pervasive principles that affect all aspects of CBM are (1) that design of monitoring programs depends on the management issues that the monitoring will help address, and (2) that coordination should occur at the scale of the management issue.

Identifying the management issues that long-term, multi-species monitoring programs will address is difficult because many of the specific issues that will use these monitoring data arose long after initiation of the program. For example, a substantial effort has been made recently to estimate landbird population sizes using historic Breeding Bird Survey (BBS) data (Rich et al. 2004). This particular use of the BBS, however, was certainly not one of the envisioned applications when the BBS was started. Only with computer and analytical technology in the last few years, has it become feasible. As another example, recent efforts to identify portions of northern Alaska, in the National Petroleum Reserve, that are most important to preserve, in view of imminent oil exploration activities there, have been based largely on long-term, multi-species aerial surveys, begun in the mid-1980s. These surveys were not initially designed to gather information for this specific purpose, but the surveys have proved highly effective in this regard.

We feel that long-term, multi-species surveys should be designed at the national or continental scale. This is because the changing needs, and the difficulty in predicting these needs, require surveys to be designed to provide information on broad management efforts (*table 1*) that are likely to be relevant in the future. Since, as stated in the second principle above, coordination should occur at the scale of the management issues, it would follow that in order to avoid duplication, the surveys should generally be on a national or continental scale. One of the major uses of these surveys is to obtain rangewide estimates (e.g., of population size, trend, habitat relationships). Designing at a smaller scale may meet more local objectives, such as estimating trends within a state, but usually hinders development of the larger-scale programs because regional and local groups become attached to methods that are hard to coordinate and may be incompatible with one another. Thus, state and federal agencies, and non-government organizations need to work together,

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not independently, in designing the needed new continental programs to monitor bird abundance.

Table 1—*Management issues that monitoring can help address.*

1. Setting harvest limits.
2. Setting population or habitat conservation targets.
3. Deciding whether to give a species special protection.
4. Designing a strategy to reverse undesirable trends.
5. Deciding which habitats to protect.
6. Evaluating and improving existing projects.

A Super-Abundance of Abundance Surveys, and What to Do about It

The development of monitoring programs has resulted in a healthy diversity of methods, objectives, and programs. While having many programs helps ensure that no species is left behind, the choice may instead be between avoiding redundancy, and allowing replication. The issue of just how many independent programs are needed does warrant careful study. One part of the CBM project has been to identify programs whose intent is to be collecting long-term information on bird abundance and habitat. Most state programs have not yet been included in this effort, yet we already know of 251 separate survey programs (e.g., the Breeding Bird Survey is a single program). With state and other programs, the total number surely exceeds 1000 survey programs. This fact clearly demonstrates the need for a coordinated effort to consolidate the long-term surveys into a smaller number of coordinated surveys. We do not need 1000 independent bird abundance surveys. We do need several thousand interconnecting efforts that utilize common and interacting methods. The CBM project is attempting to help consolidate surveys by: (1) defining a relatively small number (*table 2*) of survey methods and programs; (2) reaching agreement on methods, including data management procedures, for each one; and (3) convincing the federal agencies and national organizations to take leadership roles in coordinating and conducting these surveys. This is not to say that a few, broadly overlapping programs or methods would not be a good thing: replication, rather than redundancy. In fact, some national programs that

began with broad mandates and enthusiastic backers have become the victims of the selective process of inattention or imagination of agencies or organizations.

Methods do not need to be totally standardized as long as results are reliable, include a common core set of variables (e.g., location, effort, date, species, and numbers), and as long as data management does not become too complex. A general approach to data management has been developed that involves consolidation of databases to as small a number as practical, such as the Avian Knowledge Network and its eBird program of the Laboratory of Ornithology at Cornell University (Kelling and Stewart this volume), but while still recognizing that many groups will need to maintain their own databases. A web-searching approach is being developed at the Laboratory so that cooperating data providers can make their data available to others, while retaining control of the data and responsibility for data entry and error checking. This approach has the considerable advantage of providing at least one permanent repository that any participant can use, while also allowing others to maintain their own databases and still participate in the program.

The Future of Bird Monitoring

A coordinated approach for monitoring of nongame, and ultimately all birds, is clearly required to insure that monitoring resources are used efficiently. Thus, implementing CBM, or an approach like it, should be a primary goal for all initiatives, organizations, and agencies involved with bird conservation during the next several years. At present, several states are working on State CBM plans that summarize existing work on bird monitoring within the state's borders, and identify the highest priority surveys for the coming few years. The initial version of the state CBM plans also provides detailed descriptions of aquatic areas within the state and how to survey them. A detailed format has been developed for these descriptions (see <http://map.wr.usgs.gov>). Other CBM efforts include carrying out detailed power analyses to estimate the accuracy of different comprehensive bird monitoring programs, developing recommendations for the infrastructure needed to support bird monitoring in Canada and the

Table 2—*Initial list of broad bird abundance surveys to be organized at the continental level.*

Survey	Season	Region
1. Breeding landbirds	Breeding	Temperate
2. Migration surveys	Migration	Temperate region
3. Aquatic bird surveys	Year round	Temperate region
4. Northern surveys	Breeding	Boreal and arctic regions
5. Winter surveys	Winter	Temperate region

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United States, and developing guidelines for the design of short-term, management-oriented bird monitoring projects. An analysis was recently completed of the BBS (Bart et al. 2004), with a recommended accuracy target, with estimates of the number of BBS routes in each province and state, and suggestions for bias-reduction methods needed to achieve the accuracy target. Thus, while much remains to be done, there is ample reason for optimism that much progress will be made in bird monitoring during the next few years, particularly through creation of a North American Coordinated Bird Monitoring Program.

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