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Towards the Establishment of Landbird Migration Monitoring Networks in the United States[1]

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Abstract

Migration monitoring of landbirds, in its various forms, is a well-established research endeavor across much of North America. While monitoring efforts at individual sites have contributed much to our knowledge of the biology of migrants, these studies have limited potential for population monitoring and for addressing certain broader questions about migrants. Meanwhile, there is still much to be learned about the habitat use, conservation needs, population trends, demographics, and general stopover ecology of migrants. As a model for migration monitoring networks, the establishment and operation of monitoring and research networks for other purposes in avian research has met with much success. We suggest that the involvement of many monitoring sites in a larger network can provide unique and necessary research, conservation, and monitoring opportunities for the study of birds during migration. While many are willing and eager to participate in such networks, the critical issue has been the ability of institutions to afford personnel to coordinate them. Here we review historical and present networks devoted to avian research and consider applications to the development of migration monitoring networks in the Americas.

Previous and Ongoing Work in Landbird Migration Monitoring

There are many historical and contemporary examples of migration research and monitoring, primarily including banding and counting efforts at bird observatories and research stations scattered across the United States and Canada. The first such station was probably Oliver Austin's at Cape Cod started about 1939. It and many others continued for varying periods and then blinked out. Notably among those were the stations of "Operation Recovery" (Baird et al. 1958), a program founded in the late 1950s whose goal was to band fall migrating birds at stations along the northeastern United States coast and recapture the individuals at stations to the south; recovery rates were very low, however.

The fall operation of the Allegheny Front Migration Observatory can be said to be the oldest continuous running landbird migration monitoring station in North America, beginning in 1957 by the Brooks Bird Club and George A. Hall. In 1960, the first of the more modern stations continuing today was Long Point Bird Observatory in Canada. This, and others since, were all modeled on the European tradition of bird observatories. That is, a central station with capture and banding being principal tools, a concentration on migration, and a substantial reliance upon volunteers. Long Point later expanded into Bird Studies Canada, and now into a model of a migration network, as it incorporates other stations. A year later, in 1961, Powdermill Nature Reserve began a bird observatory, in all but name, and established a still relatively rare tradition of year-round monitoring. In 1963 Point Reyes Bird Observatory was founded, and in 1968 it started its permanent offshore station on the Farallon Islands, the latter very much in the tradition of European observatories. Manomet Bird Observatory began in 1966. Point Reyes and Manomet have both felt it necessary to alter their names to reflect what they felt was their broader geographic or perhaps taxonomic mandates, but fortunately their bird monitoring operations continue to the present.

Early objectives of stations were banding recoveries, but by the late 1960s, investigators have found a multitude of data that can be derived from capture and release of birds (e.g., Ralph and Dunn 2004). Certainly, each individual monitoring site is invaluable for learning about the migratory patterns for a local area. The full potential of individual studies to contribute to population monitoring during migration, among other potential valuable contributions, is only reached when they are incorporated into a network (e.g., Dunn 1995). Successful examples of individual sites joining together for research and monitoring purposes in North America are many and include, for the breeding season, Monitoring Avian Productivity and Survivorship (DeSante et al. 2003), and several during migration, including HawkWatch International (http://www.hawkwatch.org), Hawk Migration Association of North

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America (HMANA) (McCarty and Bildstein this volume), The Program for Regional and International Shorebird Monitoring (PRISM) (Bart et al. this volume), and Operation Recovery (Baird et al. 1958). Notable in Europe is the European-African Songbird Migration Network (Bairlein 1998), a large-scale collaborative effort aimed to work on many of the as-yet unanswered questions about migration.

Below, we consider the need for establishing a formal network for monitoring landbird migration in the United States.

Formation of Migration Monitoring Networks in North America

Momentum towards establishing one or more migration monitoring networks in North America has been present and building during the last several decades. In 1993, a workshop was hosted by the Canadian Wildlife Service and the United States Geological Survey-Biological Resources Division in order to consider the potential utility of migration monitoring as a population-monitoring tool (Blancher et al. 1994, Dunn 1995). Meeting participants made decisions and these resulted in documents, one of which (Hussell and Ralph 1998) has the recommendations for operation of migration monitoring stations. Following this lead, Bird Studies Canada developed the Canadian Migration Monitoring Network (CMMN), a network of approximately twenty individual migration monitoring stations now spread across southern Canada (Dunn 1995). The main goal of the CMMN is to monitor populations of bird species not well monitored during breeding or winter season surveys (Dunn 1995).

Since the formation of the CMMN, several formal discussions in the United States have occurred at national or regional meetings (e.g., at American Ornithologists' Union meetings in 1998 and 2001; at the Western Bird Banding Association meeting in 2001) in order to further formalize a network of U.S. stations similar to the CMMN.

Why Establish a Network in the United States?

There are several compelling reasons for establishing a formal network of migration monitoring stations in the United States. In this paper, we first consider why we need monitoring in the United States and then consider the need for a network. In detecting trends and demographic characteristics, no single method (e.g. Breeding Bird Survey, migration counts) is perfect for their detection (e.g., Dunn and Hussell 1995). It is wise to have two or more programs in place, both in the United States and Canada. A network in the United States could augment efforts by the CMMN, particularly by increasing sample size for less commonly observed migrants. Lastly, the CMMN is not monitoring these factors for all United States migrants, as many of 'our' species have breeding ranges that barely extend into Canada.

The cooperation of many stations in a network allows for increased sample size in population monitoring, particularly for regional and/or geographic comparisons. Participation in a network provides enhanced opportunities for collaborative research. One of the most attractive attributes of a network is the centralization of data storage and work involved in trend analysis, habitat relationships, and demography. A network also provides an opportunity for standardization of methods, as standardization among stations is critical. Lastly, a network can provide clear focus on particular questions (e.g., population trend monitoring or productivity), adding motivation for participants as well as enhancing funding opportunities.

As exemplified by the CMMN, monitoring regional and/or continental bird populations is most effective within a network. Forming an additional migration monitoring network in the United States will augment the CMMN in monitoring migrants that breed largely in Canada and Alaska (by increasing power of trend and other analyses). A United States network will also enable us to better monitor populations of migrants breeding predominantly in the continental United States.

We have become increasingly aware of the importance of stopover habitats (e.g., Moore et al. 1995), and how limiting the migratory period can be in the life history of migrants (Sillett and Holmes 2002). Thus, the opportunity exists for a migration monitoring network to contribute to identification and conservation of important stopover habitats in each region. In this light, broad-scale analyses of habitat use patterns, stopover ecology, and migratory connectivity (e.g., Hobson and Wassenaar 1997, Kelly et al. 2002) will all be much more feasible working within a network.

The goal of establishing a formal network of migration monitoring stations in the United States is well within our reach. Contemporary research networks, like the CMMN or the European-African Network, can serve as guides in our efforts. Bart and Ralph (this volume) discuss further statistical considerations in needs for network establishment. To this end, a joint effort involving the Klamath Bird Observatory, U.S. Forest Service, Cornell Laboratory of Ornithology, Idaho Bird Observatory, and many others is currently moving towards such a network. Over the past several years in

this effort, a continually updated register of migration monitoring stations in North America has been undertaken (http://www.fs.fed.us/psw/topics/wildlife/birdmon/pif/mnstalst.shtml) and expanded.

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