BIRD POPULATIONS

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INTRODUCTION TO THE REPORTS

The concept of integrated avian population monitoring (Baillie, S.R. 1990. *Ibis* 132:151-166) originated with researchers at the British Trust for Ornithology (BTO) and formed the basis for their many volunteer-based monitoring programs, the annual reports of which have long been reprinted in these pages. The basic idea of integrated monitoring is that the results from some programs complement and inform the interpretation of results from other programs. In particular, monitoring of primary demographic parameters (i.e., vital rates, such as productivity, survival of adults, survival of young) provides information to explain the demographic causes of the changes in population size documented from monitoring programs that provide count data. In the British model, productivity data from the Nest Records and Constant Effort Sites (CES) programs and survival data from the CES and Ringing programs are used to explain count data derived from the Breeding Bird Survey, Waterways Bird Survey, and Waterways Breeding Bird Survey. In the North American model, productivity and survival data from MAPS (Monitoring Avian Productivity and Survivorship) are used to explain data from the North American Breeding Bird Survey (BBS).

Readers of the reports published or reprinted herein are well aware that the bird populations being monitored by these programs change dramatically from year-to-year and over longer time periods, both at relatively smaller (Britain) and larger (United States and southern Canada) spatial scales, and that these annual changes and longer-term trends vary dramatically from region to region. It is this spatial and temporal variation in population trends that provides the template for determining proximate demographic causes of population change. Indeed, one of the greatest strengths of demographic monitoring programs, such as MAPS and the network of CES programs that now extend over most of Europe, is that they provide spatially explicit data on bird populations over truly large scales. Yet our ability to harness this spatial information has heretofore been hindered by lack of appropriate analytical techniques. Recently, however, a collaboration of researchers at the USGS Patuxent Wildlife Research Center and The Institute for Bird Populations are making great strides in developing analytical methods that can provide visualizations of spatial patterns in demographic rates across entire species' ranges, including areas where there are few demographic monitoring stations. Because demographic monitoring data, whether from mist nets or nest records, is always more expensive to obtain than count data, it will always be relatively more sparse compared to count data. Therefore, major advances in our ability to make robust inferences regarding demographic causes of population trends will occur with the creation of joint spatial models through which count data, such as that provided by either the North American or British BBS, can be directly linked with demographic data from MAPS or the CES programs. This is the analytical "grail" that researchers in this field are currently seeking.

The best models in the world, however, are of little use without the monitoring data with which to populate them. Cleary, maintaining

these long-term, large-scale programs is critical, but it is not an easy task in a world of increasingly more limited resources and increasingly greater demand for those resources. And yet, it is exactly this situation that creates the necessity to gather and model these data. We do know that, in general, significantly more species or populations of birds are decreasing than increasing. For the most part, however, we do not know with certainty the extent to which these declines are being driven by processes operating during the breeding *versus* non-breeding season, or, for migratory species, on the breeding *versus* wintering range. Moreover, we do not know with any degree of confidence the extent to which these declines are ultimately being driven by habitat degradation and destruction, or by weather factors and climate change, or, as is most likely, by the interaction between both habitat and climate change. Because rates of both are predicted to increase over the short term at least, there is a great urgency to gather and model truly integrated avian population monitoring data.

A bright spot in all this is that birds are very charismatic organisms and there seems to be an ever increasing number of persons willing to voluntarily contribute the relatively easy-to-collect count data. Without some amount of accompanying demographic data, however, the count data alone will be inadequate to allow determination of the causes of population changes and the formulation of management and conservation strategies to reverse declines. Thus, each of us engaged in demographic monitoring are called on to spend some of our limited time and energy in recruiting and training new folks to continue and expand the important work that we are championing. – David F. DeSante