

Measuring the Success of Bird Conservation Plan Implementation¹

Rolf R. Koford² and Jane A. Fitzgerald³

Introduction

Partners in Flight Bird Conservation Plans (BCPs) have been under development since 1995. Plans are now available for almost all of the physiographic areas and /or states in the continental United States (BCPs can be downloaded at www.partnersinflight.org). Although the format of and information in each plan varies to some degree depending upon the region and approach taken by its authors, every plan includes a list of bird species in greatest need of conservation attention in the planning unit, with those species then grouped into "suites" on the basis of shared general habitat affinities. The relationships of those species and species suites to the habitats and ecosystems they are dependent upon are discussed, and conservation actions thought to benefit the birds in each suite are recommended. Conservation agencies and organizations in each region are then encouraged to form partnerships able to implement habitat improvements "on the ground." The underlying assumption is that the habitat work will result in measurable, positive change in the populations of the priority species over time as a result of the improved conditions.

The methodology for detecting population change, however, should vary depending upon the scale of the project. Projects designed to increase populations at regional or continental scales must somehow be able to assess the combined impact of many local projects on populations of the species they target. Programs such as BBIRD (Conway and Martin (2000), Monitoring Avian Productivity and Survival, and the Breeding Bird Survey (BBS) are used to monitor population change and vital rates (Bonney et al. 2000). Population change resulting from local projects affecting even several thousand hectares may not be detected by large-scale regional monitoring efforts such as the BBS, either because the habitat change has not occurred within close proximity to a survey route, or because the increase in the number of individuals of a given species that occurred as a result of the project may not be significant enough to affect relative abundance at

the regional scale. Thus it is also important to evaluate implemented BCPs or similar plans at the scale of those plans. A benefit of this smaller-scale evaluation is that population responses can be more closely associated with specific and quantified changes in habitat conditions than is the case with large-scale evaluations.

We organized the Asilomar conference symposium entitled "Measuring the success of bird conservation plan implementation" primarily to illustrate some ways that bird population responses to habitat improvements have been evaluated for projects affecting habitat at different spatial scales. Three papers addressed that topic.

Evaluating Implemented Plans

The first presentation was a premier example of a large-scale evaluation of duck population responses to habitat work implemented under the auspices of the North American Waterfowl Management Plan's Prairie Habitat Joint Venture in Canada. This example incorporated establishment of plan goals, predictive modeling, a decade of empirical study, and mechanisms for involvement of stakeholders. Although unable to contribute a paper to these proceedings, David Howerter and colleagues shared a few lessons learned in the ongoing biological evaluation of the North American Waterfowl Management Plan's Prairie Habitat Joint Venture. This evaluation was at a fairly large spatial (multiple provinces) and temporal (10 years) scale and focused on breeding ducks. While recognizing that other conservation plans would vary in scale and objectives, they thought that "certain overriding principles will likely be common to all successful evaluations." They reiterated the importance of having a strategy to evaluate the performance of planning models and management actions and that it is essential to have clearly defined goals developed with managers and other stakeholders' input. All parties should agree on how they expect conservation actions to affect progress in meeting the goals. As actions are taken, bird population response can be monitored and progress measured. Howerter et al. found simulation models of the system extremely valuable for working across large spatial scales, as it helped organize thoughts about the important responses and factors influencing these responses. Models also allow biologists to project a range of likely outcomes of various

¹A version of this paper was presented at the **Third International Partners in Flight Conference, March 20-24, 2002, Asilomar Conference Grounds, California.**

²USGS, Iowa Cooperative Fish and Wildlife Research Unit, Science Hall II, Iowa State University, Ames, IA 50011

³American Bird Conservancy, 8816 Manchester, Suite 134, Brentwood, MO 63144

management options. With well-developed models such as the Mallard Productivity Model used in this evaluation, sensitivity analyses will assist in identifying key uncertainties and assumptions (Johnson et al. 1987). These analyses can highlight the factors most likely to influence the accomplishment of plan goals.

Evaluations of population responses often involve considerable intervention in the system. In the case of evaluating how duck populations respond, it is important to have estimates of local breeding densities and nest success. Obtaining data for these estimates involves use of vehicles, nest searches, etc. Open communication among biologists, managers, and any stakeholders should identify and resolve conflicts resulting from the evaluation. Local managers may need help understanding the scale of the biological processes under study and of the information needs. It is useful for biologists to have a strategy for providing useful feedback to local habitat managers and regional planners.

A final point mentioned by Howerter et al. was that the processes of planning, implementation, and evaluation occur as a cycle that may be repeated annually or on longer time scales. These repetitions provide an opportunity to adapt to changing natural and social environments, and increase the likelihood of meeting goals of efficient management and increased understanding of the system.

The second paper, by Jacobs et al. (this volume), is included in these proceedings and the reader is referred there for more detail. It describes both a method for assessing population trends over time in ten grassland bird conservation areas in Missouri and Iowa, as well as one which allows conservationists and planners to evaluate more specifically which habitats and land use prescriptions are supporting target species in the greatest abundance. This example illustrates an evaluation at the BCP and Bird Conservation Area (BCA).

Another evaluation-related at the BCA level, is that of Winter et al. (2001), who tested some of the key assumptions of the grassland BCAs that have been proposed in BCPs. Winter and her colleagues examined the effect of size of patches of native prairie, such as might be core areas of BCAs, and the effect of having these patches bounded by neutral (e.g., small grains) or hostile (e.g., woody vegetation) land cover classes.

The third paper in our Asilomar session, presented by David Krueper, illustrated the response of vegetation and bird populations to the exclusion of cattle from riparian areas along the San Pedro River in southern Arizona. Point counts were conducted one year prior to the removal of cattle and five years after, and docu-

mented dramatic increases in riparian obligates, open cup nesters, Neotropical migrants, and insectivores.

Two posters at the Asilomar conference represent evaluation at the local site level. One, included in this section, is a paper by Krietinger and Uptain describing their sample design and results of a study evaluating bird responses to California's Central Valley Project Improvement Act Land Retirement Program. The other poster, by Fletcher and Koford, described changes in bird populations in response to habitat restoration (Fletcher and Koford 2003). Their approach can be summarized as follows: based on an assumption that bird densities in each habitat do not change over time, an evaluation can be done using bird data after the habitat change. Iowa is high on the list of states that have lost virtually all of their native prairie (Samson and Knopf 1994).

Fletcher and Koford estimated how bird communities have changed in the Eagle Lake Wetland Complex, an area with ongoing grassland and wetland restoration, by integrating Geographic Information Systems and recent bird surveys in different habitat types (restored grassland, restored wetland, row crop agriculture, hayfield, and pasture). Predominant land cover of restored areas prior to restoration (early 1980s) included: >80 percent row crop, ~6 percent pasture, <3 percent woodland, and ~1 percent hayfield. Most woodland habitat did not change with restoration; restoration efforts have primarily converted row crop agriculture and pastures into grassland and wetland habitat. Based on amount of land converted, and assuming unchanged bird densities in each habitat, most species have increased in the area, including many species of management concern. For example, the estimated change in the Bobolink (*Dolichonyx oryzivorus*) population was an increase of over 1,000 birds. A couple of species that prefer short or sparse vegetation, such as Killdeer (*Charadrius vociferus*), have apparently declined with grassland and wetland restoration. Fletcher and Koford (2002) also found that abundance in restored grasslands in the Eagle Lake Wetland Complex were similar, with very few exceptions, to abundances in ungrazed prairie remnants in northern Iowa.

The final paper in this section was not an evaluation of plan implementation but was included in the session at Asilomar because it dealt with issues involving planning and evaluation strategies. Daniel Twedt (this volume) provided an evaluation strategy for the Mississippi Alluvial Valley, focusing on a method to determine which species suites should be emphasized at a given site or landscape. Elements of the strategy were quantifying habitat, assessing effects of forest patch characteristics, analyzing demography, and testing population viability.

Literature Cited

- Bonney, B., D. Pashley, R. Cooper, and L. Niles. 2000. **Strategies for bird conservation: The Partners in Flight planning process.** Proceedings RMRS-P-16. Ogden, UT: Rocky Mountain Research Station, USDA Forest Service.
- Conway, C. J., and T. E. Martin. 2000. **The value of monitoring demographic parameters and associated habitat: The BBIRD program.** In: R. Bonney, D. Pashley, R. Cooper, and L. Niles. Strategies for bird conservation: the Partners in Flight planning process. Proceedings RMRS-P-16. Ogden, UT: Rocky Mountain Research Station, USDA Forest Service; 220-205.
- Fletcher, R. J., Jr., and R. R. Koford. 2002. **Habitat and landscape associations of breeding birds in native and restored grasslands.** Journal of Wildlife Management 66: 1011-1022.
- Fletcher, R. J., Jr., and R. R. Koford. 2003. **Changes in breeding bird populations with habitat restoration in northern Iowa.** American Midland Naturalist 150: 83-94.
- Jacobs, Brad, Rolf R. Koford, Frank R. Thompson III, Hope Woodward, Mike Hubbard, Jane A. Fitzgerald, and James R. Herkert. This volume. **Grassland bird conservation efforts in Missouri and Iowa: How will we measure success?**
- Johnson, D. H., D. W. Sparling, and L. M. Cowardin. 1987. **A model of the productivity of the mallard duck.** Ecological Modeling 38: 257-75.
- Samson, F. and F. Knopf. 1994. **Prairie conservation in North America.** BioScience 44: 418-421.
- Twedt, Daniel J. This volume. **An objective method to determine an area's relative significance for avian conservation.**
- Winter, M., D. H. Johnson, J. A. Dechant, T. M. Donovan, and W. D. Svedarsky. 2001. **Evaluation of the bird conservation area concept in the northern tallgrass prairie.** Annual report: 2001. Jamestown, ND: Northern Prairie Wildlife Research Center, Geological Survey, U.S. Department of the Interior. Northern Prairie Wildlife Research Center Home Page. <http://www.npwrc.usgs.gov/resource/2002/bca2001/bca2001.htm> (Version 04MAR2002).