Avian Research at the Savannah River Site: A Model for Integrating Basic Research and Longterm Management.

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Source: The Auk, 118(4) : 1110-1112

Published By: American Ornithological Society

URL: https://doi.org/10.1642/0004-8038(2001)118[1110:]2.0.CO;2

The Auk 118(4):1110–1112, 2001

Avian Research at the Savannah River Site: A Model for Integrating Basic Research and Long-term Management.—John D. Dunning, Jr., and John C. Kilgo, Eds. 2000. Studies in Avian Biology no. 21, Cooper Ornithological Society. vi + 170 pp, preface, plus 19 contributed papers, numerous tables and figures. ISBN 1-891276-21-4. Paper, $20.00.—A group of esteemed ecologists recently forwarded the idea that besides high-quality research and published results, good science should include informing the general public of the relevance and importance of the work (Bazzaz et al. 1998). Globally, biologists have a stake in maintaining biodiversity and evolutionary options (Sheail 2000, Ehrlich 2001), but ecological research is increasingly being conducted on lands modified by humans and occurring in wholly altered landscapes, thus the application of our research has regional and local relevance (Dale et al. 2000, Theobald et al. 2000). Many natural reserves are inade-

quately inventoried, monitored, and protected, and often little rigorous ecological knowledge is available to inform management decisions. Thus, in addition to our potential ethical responsibilities, we have a purely selfish reason to apply research to management; so much of our research depends on protection of the natural systems within reserves. Integrating research into resource management may be more difficult than it appears and relatively few prescriptions have been provided for developing successful collaborations. This monograph is an excellent collection of examples and prescriptions for such interaction.

This book is the proceedings of a workshop held at the Savannah River Site in 1996. For those of you unfamiliar with the Savannah River Site, it is a 78,000 ha U.S. Department of Energy facility in western South Carolina whose primary mission is production of nuclear weapon material. Its mission also includes natural resources management which has evolved from reforestation of abandoned farmland to sustainable management, restoration, and stewardship. The goal of the workshop was to provide an overview of the avian research conducted on site, examples of how research has influenced management and vice versa, and specific recommendations for enhancing research–management collaborations and integration of ecological data into specific management actions. In an introduction, the editors discuss the varied sources of conflicts between researchers and managers and potential resolutions. Both groups value long-term research, but for different reasons, and the subsequent papers make an effort to address both perspectives.

The papers are organized into three sections. The first section provides a historical perspective to the Savannah River Site and its history of research and management. The first chapter provides an overview of the site itself including a physical site description and a history of land use from presettlement to present. That includes an important perspective that should be retained throughout the rest of the book; at the time of acquisition by U.S. Department of Energy, the site was a mosaic of abandoned farmland and cut-over forests that differed dramatically from the presettlement landscape. The second half of this chapter illustrates the transformation of the site into a managed natural landscape. Early avian research at Savannah River Site was focused on developing inventories, and that work was followed by more specific single-species studies and then work on the distribution and abundance of species relative to habitats and landscape characteristics. Another chapter provides a history of past avian research and suggestions about future research. The last chapter in this section examines historical changes in the distribution and abundance of three upland *Ammodramus* sparrows in South Carolina. Although this paper is interesting in its own right, the authors make little attempt to integrate their findings into the specific challenges of research and management at Savannah River Site.

The second section is a collection of summaries of long-term avian research conducted on site. As with many proceedings, relevance of individual papers to the overall goal varies, but some papers provide useful insights into integration of research and management; others provide relatively little. Many papers emphasize the need for long-term research and adaptive management that can respond to research findings. They also explore potential value of long-term monitoring; historical data can be used to test hypotheses about current observations. Most papers in this section are by researchers and thus might be useful for managers seeking to understand their perspective. For example, Bryan and his coauthors describe research on Wood Storks (*Mycteria americana*), some of which was conducted off-site because the appropriate conditions did not exist on Savannah River Site, emphasizing the point that local management needs may depend on biological data collected at multiple spatial scales. Several papers then deal with avian ecology at the landscape scale and how development of predictive bird–habitat models can influence management and how management needs provide novel hypotheses to test those models. Because much of the research at Savannah River Site has been motivated by management needs, it is quite possible that some species fall between the cracks. But the status of Savannah River Site as a national environmental research park should include ''a more proactive attempt at comprehensive long-term monitoring of the avifauna'' and McCallum and coauthors provide a review of which species have been well studied and which have not.

Perhaps of most use to both managers and researchers is the final section which presents a variety of conceptual approaches to merging research and management needs. Those papers discuss different characteristics, attitudes, and motivations of researchers and managers and also their common goals. Moorman suggests that adaptive resource management, in which management actions are treated as large-scale scientific experiments, is the best approach to integrating research and management. Research at that scale may have some constraints, such as lack of randomization and true replication and cost and logistics of field work. Although inductive statistics may be hampered by such research designs, deductive results can be applied to management and may lead to inductive experimental designs that can be conducted at smaller scales (Okasanen 2001). Several papers also mention the need for academia to reward publication in manager-oriented publications. As in the previous section, some papers admirably achieve their goal, but others seem more like self-serving appeals illustrating how Savannah River Site is ideal for their partic-

ular research interest without really illustrating how that perspective might aid management.

Although most of us conduct our research in smaller areas, without the resources or broad management perspective of Savannah River Site, this collection of papers aptly illustrates the difficulties of successfully integrating research and management. Blake and LeMaster provide an educational review of the history of identifying management information and research needs, designing research with both credible and useful results, and translating those results into land management decisions at the Savannah River site. Having worked on public lands for years, I can only admire the process they developed, the research that has resulted, and the management that has occurred. This book deserves to be carefully read by everyone whose research depends on the continued management of their research site and by every manager. Ecologists struggling with the dichotomy between ''basic'' and ''applied'' ecology can find heart in the rigorous research opportunities that exist within an applied framework.—REED BOWMAN, *Archbold Biological Station, P.O. Box 2057, Lake Placid, Florida 33862-2057, USA. E-mail: rbowman@archbold-station.org*

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