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Review of Sampling and Statistical Methods for Behavioral Ecologists

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Review

Reviewed Work(s): Sampling and Statistical Methods for Behavioral Ecologists by Jonathan Bart, Michael A. Fligner and William I. Notz

Review by: Dean C. Adams

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try should be totally free to pursue its own economic course.

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SAMPLING AND STATISTICAL METHODS FOR BEHAVIORAL ECOLOGISTS.

By Jonathan Bart, Michael A Fligner, and William I Notz. Cambridge and New York: Cambridge University Press. \$74.95 (hardcover); \$29.95 (paper). xii 1 330 p; ill.; index. ISBN: 0-521-45095-0 (hc); 0-521-45705-X (pb). 1998.

This book presents some of the statistical difficulties that behavioral ecologists face in their research. It covers a wide range of topics relevant to ecological research, including survey sampling methods, regression, pseudoreplication, behavioral sampling, monitoring abundance, capture-recapture methods, survivorship estimation and resource selection. The authors view this book as a supplement to introductory statistics courses; their goal is for behavioral ecologists to find the book relevant, and for statisticians to find it rigorous. Although they are somewhat successful in their first goal, they fall short of the second.

The first five chapters describe topics typically covered in introductory statistics courses. They explain the meaning of expected values, variance and covariance, standard deviations and standard errors, discuss the use of Taylor series approximation and maximum likelihood for estimating standard errors, and describe several basic statistical tests (one- and two-sample t-tests, correlation, regression). Many statistical tests used by behavioral ecologists (e.g., all analysis of variance models) are not included, so readers must go elsewhere for information on these important methods. Further, the statistical details of the methods that are discussed are placed in an appendix. This detracts from the presentation of the methods, as readers must continually refer to the appendix to understand the variables being discussed in the text.

The remaining chapters are devoted to more specific difficulties encountered by behavioral ecologists. Adequate summaries of pseudoreplication, monitoring abundance, and estimating survivorship are presented, as well as the statistical difficulties of these topics. A particularly thorough discussion of the computer programs currently available for estimating population sizes from capture-recapture studies is found in Chapter 9. None of these topics, however, are discussed in enough detail for readers to apply these techniques in their research. Readers must again go elsewhere to learn the statistical details. This is most evident in the one-page discussion of all multivariate methods used in com-

munity analysis, which is simply a list of available methods with no discussion.

Readers will find most useful the discussion of survey sampling methods in Chapter 4, which contains a thorough summary of the different methods available for sampling data and their statistical implications. Of particular interest is a simulation showing that fewer data taken from many large regions can have higher statistical power than more data taken from fewer large regions. This result has important implications for behavioral ecologists with respect to where sampling effort should be placed. Overall, however, the authors have attempted to address too many topics in this book, and have not covered any of them in sufficient detail for the book to serve as a useful "how-to" guide in behavioral statistics.

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HABITAT CREATION AND REPAIR.

By Oliver L Gilbert and Penny Anderson. Oxford and New York: Oxford University Press. \$75.00. ix 1 288 p; ill.; index. ISBN: 0-19-854967-9 (hc); 0-19-854966-0 (pb). 1998.

This book claims to cover "everything from the ethics, theory, and principles of habitat creation to the practical detail of designing habitats for wildlife." The book may "cover" these areas, but only the practical detail is provided in such a way that, in my view, an ecologist, developer or resource manager might benefit.

Other researchers have provided helpful contributions to the why, the benefits, and the principles of habitat modification to benefit sites or ecosystems. Gilbert and Anderson, however, failed to use these excellent sources to clarify what is being discussed, to build a case for habitat creation, and to identify the benefits from actions other than "feel good" or "build it and they will come" (maybe). As a consequence, I think that the authors do not appreciate that habitat creation is still an experiment, a test of our ecological understanding, and an action whose trajectory (and benefit or end result) is largely unknown (there has been limited assessment of benefits and conditions from habitat modification after the action has taken place).

The authors, however, reinforce important principles, such as "habitat creation is not a substitute for preservation and conservation," and "promote and take advantage of natural succession." They also provide good examples of primarily terrestrial site-specific approaches for changing habitat, and pull together recent, and often not widely circulated, literature primarily from the U.K. These contributions will be welcome to practitioners and promoters of habitat creation and conservation. I