

Painted Bunting, and Dickcissel showed significant declines.

Reliable and timely information on bird population trends can serve as an important early warning system of environmental change. Knowing that a number of species are declining in a particular region should lead to follow-up studies to determine possible causes. Knowing that a species is in trouble before it is extremely rare should lead to early, and perhaps less expensive, attempts to turn the tide. The Breeding Bird Survey (BBS) should be extremely useful for these two applied purposes; it monitors 175 to 233 relatively common species well. Analysis of Christmas Bird Counts (CBC) could add 80 to 100 relatively common species to the list of species with good quantitative data. With improved coverage, about 20 species of colonial waterbirds could be monitored in some coastal areas using the Colonial Bird Register (CBR). Computerized data from both the CBC and the CBR are available from the Cornell Laboratory of Ornithology. Good quantitative surveys need to be designed for those species that are poorly covered by the BBS, CBC, and CBR. Modifications of the BBS methodology seem promising for nocturnal species (when routes are run at night) and for rarer species (when the density of routes is increased over the area of interest).

One of the reasons that the BBS covers so few species well is that it is a roadside survey and misses species that require undisturbed habitats (especially wetlands and forest interior). In addition, BBS routes are few in boreal and arctic regions of Canada and Alaska and the inland, arid regions of the west. Efforts to increase coverage in these areas, perhaps by paying travel expenses of observers, would result in dramatically improved coverage for a number of species.

Confidence in the reported results requires confidence in the techniques used to calculate the trends and the annual indices. These techniques are described in the text, in an appendix, and in P. H. Geissler and B. R. Noon, 1981, Estimates of avian population trends from the North American Breeding Bird Survey, *Stud. Avian Biology* 6:42-51. In the latter paper, the methods used were compared with other available methods. Minor changes have been proposed to the trend program to reduce bias, and major changes are being planned to the program to calculate annual indices (P. H. Geissler, pers. comm.). More avian population biologists should pay close attention to this vital technical area.

When deciding whether or not BBS results are expected to reflect population changes in nature, one must decide about the reliability of the observers who collect the data. A major effort has been made over the past 20 years to recruit the best field birders in North America for this project, and I have no general concern about the quality of the data. However, concerns remain because of the BBS's dependence on the ability of observers to hear birds (censuses in which a larger proportion of birds are seen may have lower variance). A number of variables are known to affect both birds and humans in ways that dramatically change an observer's likelihood of hearing and identifying a nearby bird. Many studies on this topic are cited in studies in *Avian Biology* 6.

Although the BBS was designed to monitor bird pop-

ulations for applied reasons, there are a number of theoretical questions in avian population biology that can be addressed better with the BBS database than with any other available data set. For example, Brian Maurer and James Brown at the University of Arizona are using BBS data in a large-scale study of the biogeography of North American birds. In a series of papers, Carl Bock demonstrated the usefulness of Christmas Bird Count (CBC) data for biogeographical studies; I'm sure that Brown and Maurer are finding the BBS data equally valuable. One of the major advantages of both BBS and CBC data for biogeographical studies is that they provide information on relative abundance within a species's range, in addition to information on range boundaries.

Less work has been done with either database to explore major issues involving the population dynamics of North American birds. One exception is the work of Carl Bock, David Davis, and others using CBC data to study winter irruptions of Fringillid finches, Northern Shrikes, Snowy Owls, and other species. A number of breeding species also show highly variable populations in space and time; the BBS data provide a basis for quantifying differences in the relative stability of populations. Cedar Waxwing, Dickcissel, Evening Grosbeak, and Pine Siskin stuck out as particularly variable during a quick look through the 15-year summary. Do these and other species with variable breeding populations share any ecological characteristics that might explain their relative variability in numbers? Are there ecological events that correlate with changes in breeding numbers of these variable species?

Despite the cautions mentioned above, I remain convinced that the 15-year summary of the BBS contains the best information available to date on the long-term population dynamics of most of the 230+ species included in the volume. I urge ornithologists to take better advantage of the database. In addition, I urge ornithologists to take a more active role in ensuring that quality data continue to be collected. A number of routes lack an assigned observer. Also, if more observers were available in the west and in the north, more routes could be created. To volunteer, call your state coordinator (listed in the book) or Sam Droege, Patuxent Wildlife Research Center, Laurel, MD 20708. Also, if you need a copy of the book, contact Sam Droege.—GREGORY S. BUTCHER, Cornell Laboratory of Ornithology, 159 Sapsucker Woods Road, Ithaca, NY 14850.

BOOKS RECEIVED

- KAVANAU, J. L. 1987. Lovebirds, cockatiels, budgerigars: behavior and evolution. Science Software Systems, Inc., Box 241710, Los Angeles, CA 90024. xxvi + 1,002 p. \$69.
- LACK, P. 1986. The atlas of wintering birds in Britain and Ireland. British Trust for Ornithology, Irish Wildbird Conservancy. Buteo Books, P.O. Box 481, Vermillion, SD 57069. 447 p. \$55.
- NETHERSOLE-THOMPSON, D. & M. 1986. Waders: their breeding, haunts and watchers. T. & A. D. Poyser, Calton. Buteo Books, P.O. Box 481, Vermillion, SD 57069. 400 p. \$45.
- O'CONNOR, J. O., AND M. SHRUBB. 1986. Farming

- and birds. Cambridge University Press, New York. xi + 290 p. \$34.50.
- OWEN, M., G. L. ATKINSON-WILLES, AND D. G. SALMON. 1986. Wildfowl in Great Britain. 2nd ed. Cambridge University Press, New York. xiii + 613 p. \$59.50.
- RAIKOW, R. J. 1987. Hindlimb myology and evolution of the Old World subsocial passerine birds (Acanthisittidae, Pittidae, Philepittidae, Eurylaimidae). Ornithological Monographs No. 41, The American Ornithologists' Union, Washington, DC. Available from Frank Moore, Dept. of Biology, University of Southern Mississippi, Southern Station, Box 5018, Hattiesburg, MS 39406. viii + 81 p. \$12.50 (\$9.50 to AOU Members).
- SCOTT, J. M., S. MOUNTAINSPRING, F. L. RAMSEY, AND C. B. KEPLER. 1986. Forest bird communities of the Hawaiian Islands: their dynamics, ecology and conservation. Studies in Avian Biology, No. 9, Cooper Ornithological Society. Available from J. R. Northern, Dept. Biology, University of California, Los Angeles, CA 90024. xi + 431 p. \$26.50, prepayment with order required, check or money order payable to C.O.S.
- SIMMONS, K. E. L. 1986. The sunning behaviour of birds: a guide for ornithologists. British Ornithological Club, % The Anchorage, The Chalks, Chew Magna, Bristol BS18, 8SN. xvi + 119 p. \$14.00 (+10% for overseas postage).
- SKUTCH, A. 1986. Helpers at birds' nests: a worldwide survey of cooperative breeding and related behavior. University of Iowa Press, Iowa City. x + 298 p. \$25.
- SMYTHIES, B. E. 1986. The birds of Burma. 3rd ed. Nimrod Press and Silvio Mattacchione & Co., Pickering, Ontario L1W 3H2, Canada. xxxii + 432 p. \$95. Special leather edition, \$475.
- STEPHENS, D. W., AND J. R. KREBS. 1987. Foraging theory. Princeton University Press, Princeton, NJ. xiv + 237 p. \$40., cloth; \$14.50, paper.
- WILBUR, S. R. 1987. Birds of Baja California. University of California Press, Berkeley. ix + 253 p. \$40.

STUDIES IN AVIAN BIOLOGY NO. 9

FOREST BIRD COMMUNITIES OF THE HAWAIIAN ISLANDS: THEIR DYNAMICS, ECOLOGY, AND CONSERVATION, by J. M. Scott, S. Mountainspring, F. L. Ramsey, and C. B. Kepler. 431 pages. Price \$26.50. Price includes postage and handling. Make checks (US funds only) payable to the Cooper Ornithological Society and mail to:

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JUST PUBLISHED STUDIES IN AVIAN BIOLOGY NO. 10

ECOLOGY AND BEHAVIOR OF GULLS, Edited by J. L. Hand, W. E. Southern, and K. Vermeer. ±140 pages. Price \$18.50. Price includes postage and handling. Make checks (US funds only) payable to the Cooper Ornithological Society and mail to:

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