

BOOK REVIEWS

EDITED BY JEFFREY S. MARKS

J Raptor Res. 29(3):215–218
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The Eastern Screech Owl: Life History, Ecology, and Behavior in the Suburbs and Countryside. By Frederick R. Gehlbach. 1994. Texas A & M University Press, College Station, TX. xiv + 302 pp., color frontispiece, 36 black-and-white photos, 23 figures, 27 tables, 10 appendices. ISBN 0-89096-609-5. Cloth, \$45.00.—Many species of birds, including several species of raptors, regularly occupy human-altered habitats in cities and suburbs. Most of these species also occur in more natural habitats. Because urbanization continues at a rapid pace, it is certainly relevant to ask how the behavior and ecology (and, specifically, reproductive rates) of birds in urban areas compare with those of birds in more natural areas. Unfortunately, few investigators have attempted to answer these questions. The objective of Gehlbach's study was to do just that for the eastern screech-owl (*Otus asio*) or, in his words, "to estimate what is needed for the bird's successful coexistence with humanity." This book is based on his work with these owls over a 25-yr period in central Texas.

Each chapter begins with a brief personal note, and all but the last chapter end with a summary. Chapter 1 ("On Studying Screech Owls") describes a 9-yr "exploratory period" during which the author monitored nine nest boxes in suburban Waco attempting "to learn by trial and error, eliminate mistakes, and formulate hypotheses based on personal experience." The study areas and general methods used during the 16-yr "confirmatory study" that followed are also described, along with statistical tests used to analyze the data. Chapter 2 ("Landscapes") contains more information about the study areas and describes nest- and roost-site selection by the owls. Prey use and predatory tactics are discussed in Chapter 3 ("Food Supplies and Predation"). Basic life-history information is presented in Chapters 4 ("Adult Weight, Coloration, and Molt"), 5 ("Eggs and Incubation"), 6 ("Chicks and Fledglings"), and 7 ("Vocalizations"). Factors contributing to lifetime reproductive success are examined in Chapter 8

("Lifetime Reproduction"), whereas survival, productivity, and use of space are examined in Chapter 9 ("Population Structure and Flux"). Chapter 10 ("The Suburban Advantage") summarizes why eastern screech-owls do well in suburbia and provides methodological hints for those who might wish to initiate similar studies of screech-owls. Among the 10 appendices, one includes 24 pages of paraphrased field notes, another summarizes the development of two nestlings raised in captivity, and others provide information about climate, habitat features, cached foods, food availability based on surveys of terrestrial vertebrates, species that mobbed screech-owls, lifetime reproduction, life tables, and scientific names used in the text. The notes section is used primarily to cite references but also to provide "further descriptive details and occasional ancillary observations."

This book contains a wealth of information about the breeding biology of eastern screech-owls. For example, there are valuable data on laying intervals, clutch sizes, duration of incubation and brooding periods, nestling growth rates, nestling survival rates, differences between first nests and replacement nests, and factors that influence productivity and lifetime reproductive success. The different roles played by males and females in reproduction are described clearly. Information is also provided about the relationship between mobbers and "mobbees," body mass dynamics, and the nest-cavity symbiosis between screech-owls and Texas blind snakes (*Leptotyphlops dulcis*). Other notable contributions are the discussions of caching behavior (although see below) and the general descriptions of vocalizations and vocal behavior (although no sonagrams are provided).

As the book's title suggests, a major objective was to compare the ecology of suburban and rural screech-owls. Gehlbach monitored both groups over a 12-yr period and found that suburban owls occurred at higher densities and had greater reproductive success than those in the rural study area (located 7 km from the primary suburban study area). Suburbia may offer several advantages, including a milder climate (because of the urban "heat island" effect), higher

prey densities, and a relatively open habitat that may make for easier hunting. More importantly, suburbia may have fewer competitors and predators, and human activity near owl nests probably deters those predators that are present. In fact, data revealed that "rural owls had as much potential per prospective breeder, but predation just overwhelmed them" (p. 173).

The book did have some weaknesses. There were at least 19 typographic errors, and I disliked one aspect of the book's format. Literature citations plus additional comments were placed in a notes section at the end of the book. I found this arrangement to be inconvenient and would have preferred to have much of this material incorporated into the text. More importantly, Gehlbach sometimes failed to provide sufficient detail concerning statistical tests and methods used in gathering the data. This criticism might not be completely fair because Gehlbach points out (p. xi) that he has written "a personal narrative, so the story might be of interest to all . . ." However, he also points out that "I include quantitative detail sufficient to be relevant to ecologists and ornithologists." In several cases, I believe Gehlbach failed to do so. Although a summary of statistical methods is provided in Chapter 1, Gehlbach sometimes presents *P* values with no indication of the test used and no clear mention of sample sizes. For example, "Flights in open and wooded yards did not differ either but were longer than the 17-m average hunting flights of the boreal owl ($P = 0.05$)" (p. 53).

A cursory description of methods is provided in Chapter 1, but important details are sometimes omitted. For example, Gehlbach indicates that most owls were sexed by body mass (p. 65), but he does not provide the cutoff point separating males from females. In contrast, Smith and Wiemeyer (1992) cautioned against using mass to sex eastern screech-owls. A discriminant function analysis based on body mass plus wing and tail length correctly identified the sex of just 88% of 77 individuals (Smith and Wiemeyer 1992), yet Gehlbach suggests that mass alone can be used to determine sex.

Details about observational procedures are sometimes omitted. For example, Gehlbach notes (p. 81) that females remained inside nest cavities for an average of 5.7 d before laying. However, he did not indicate how this was determined. Did he or his assistants maintain constant watch? If not, how often were the cavities or boxes checked to determine the

location of the females? Gehlbach also asserts (p. 58) that food deliveries to nests by adults exhibited a distinctly bimodal distribution, with the major peak at dusk. Elsewhere, however, he indicates (p. 13) that nighttime observations typically were made from "sunset to around 2200 H and near dawn for an hour or two." Were observations sometimes extended through the night so that patterns of food delivery could be discerned? Similarly, Gehlbach reports data for rodent and snake populations in the "perimeter zone" but not in the suburban plot because "short-term exploratory trapping and rock-turning in suburbia suggested that there were no profound differences." Unfortunately, there is no indication of how "short-term" the trapping was nor what constitutes a "profound" difference. Thus, for reasons that are not clearly explained, rodent populations were estimated by trapping in a tallgrass prairie remnant on the southern edge of his perimeter zone 2 km south of the primary suburban study area. Concerning bird populations, Gehlbach monitored a 6.1-ha plot in the primary suburban study area and indicated (pp. 39–40) that "the birds of this area were trapped, netted, banded, and marked on a map weekly, November to June, 1976–91." He also "mapped all birds" in a 6.1-ha rural plot from 1976–91. Unfortunately, no details are provided; e.g., no indication of how much time was spent in each plot each week. Further, mapping as a census technique does not work well on birds that are not territorial and so is typically used only during the breeding season (Bibby et al. 1992). Despite this, Gehlbach apparently "mapped" birds in his rural plot even during the nonbreeding season.

As another example, vocalizations given by adults at nest sites, and differences between the vocal behavior of males and females, are described, but it is not clear how and when the data were collected. In the first chapter, Gehlbach points out (p. 13) that when making observations at nest sites he would typically "sit against a tree or house about 15 m from their nests." Were all observations of vocal behavior made under such conditions, or were nests sometimes approached more closely? The use of "screech" calls by the owls suggests closer approaches (Sproat and Ritchison 1994).

I would also have liked more information concerning how roosting screech-owls were located (p. 32). Because the owls were not radiotagged, was there a bias toward finding owls in lower, more open roosts? Gehlbach presents much information about

caching behavior but does not describe clearly how these data were gathered. Were all boxes and nest cavities checked daily? On p. 39, he does note that "in only eight percent of 152 larders, which I checked daily . . ." did the owls fail to eat what they had stored. That suggests to me that once a cached item was located, he checked daily to determine its fate. However, there is no information concerning when or how frequently nest boxes and cavities were checked for cached items.

Additional detail about Gehlbach's experiments with radiotransmitters would also have been useful because at three points in the book (pp. 131, 177, and 267) he uses these results to explain differences between his findings and those of other investigators. Gehlbach tried radiotelemetry with two males and reported that, compared with untagged owls, these males lost more weight and moved more often over a wider area. Unfortunately, no mention is made of either the weight of the transmitters or the body mass of the owls that were radiotagged. Further, neither the extent of mass loss nor the movement data are quantified.

Sample sizes or the number of individual owls observed are sometimes not provided (or are not apparent), and sometimes data are simply not presented. For example, concerning winter roosting behavior, Gehlbach points out (p. 34) that "when one sex was present, the other was usually in the nearest cavity ($r_s = 0.77$, $P = 0.001$)." However, no indication is given of how many pairs were observed or how many observations were made of each pair. On the same page, it is noted that $64.7 \pm 8.7\%$ of male screech-owls used their winter-roost boxes for nesting, but again the sample size is not provided. Gehlbach reports (p. 56) that 11 suburban males entered their nest-box roosts an average of 18.7 min before sunrise in December to February. Was this based on one observation per male? Gehlbach found roosting owls on 293 occasions (p. 32). Does this represent 293 different owls, or were some birds observed roosting on more than one occasion? Similarly, 165 hunting forays were observed (p. 39). Were some hunting owls observed more than once? On p. 129, it is reported that "males sometimes attacked me as I climbed to fourth-week nestlings . . . but females did so almost invariably." How many pairs were observed and how many "trials" conducted? On p. 130, Gehlbach notes that 3-4 wk after fledging, owlets "traveled up to 200 m per night but tended to remain together inside parental ranges" and, fur-

ther, that adults "often" chased owlets during natal dispersal. No supporting data are provided. On p. 143, it is suggested, concerning nest defense, that "the larger the predator or other interloper, the bolder its actions, and the more novel or sudden its appearance, the more likely owls are to screech." Once again, however, there are no supporting data.

There were other occasions when I would have liked additional information. Gehlbach points out that individual nesting territories consist of isolated patches around nest sites (boxes or cavities), with males typically defending two or three sites per season but, apparently, not defending the areas between the sites. Such behavior is very different from that exhibited by eastern screech-owls elsewhere (e.g., Kentucky; Belthoff et al. 1993), and information concerning the frequency with which other males used those areas between the defended nest sites (or, using the terminology of Gehlbach, polyterritories) would have been of great interest. Another rather novel suggestion was that female screech-owls temporarily leave their mates during the winter to reduce intraspecific competition for food (p. 36). How was it determined that females had left? Was it assumed that females not found roosting in particular nest boxes or natural cavities had left their mates? Gehlbach notes that the few females located away from defended nest sites were within 0.5 km of their mates but provides no additional information. What was the average distance from mates? How far were the females from the edges of their mates' ranges? Is it possible that the ranges of females and their mates overlapped and, therefore, that females were not actually leaving their mates? In this case, radiotelemetry might have provided much useful information.

As the preceding paragraphs suggest, I liked some aspects of the book but disliked others. On the positive side, there is an abundance of information about the breeding biology of eastern screech-owls and, more precisely, about the comparative behavior and ecology of screech-owls in suburban and rural areas. On the negative side, however, some of these data (and, therefore, some of Gehlbach's conclusions) are, in my opinion, of questionable value because insufficient detail is provided about how the data were collected. As mentioned above, this book represents an attempt by the author to write a story "of interest to all." Unfortunately, Gehlbach has probably included more quantitative detail than many nonbiologists would like but less such detail than most

biologists would require. Although these negatives reduce the value of this book, it should be read by anyone interested in owls (particularly their breeding biology) and, more generally, by anyone interested in finding out how at least one species manages to coexist with humans.—**Gary Ritchison, Department of Biological Sciences, Eastern Kentucky University, Richmond, KY 40475 U.S.A.**

LITERATURE CITED

- BELTHOFF, J.R., E.J. SPARKS AND G. RITCHISON. 1993. Home ranges of adult and juvenile eastern screech-owls: size, seasonal variation and extent of overlap. *J. Raptor Res.* 27:8–15.
- BIBBY, C.J., N.D. BURGESS AND D.A. HILL. 1992. Bird census techniques. Academic Press, San Diego, CA U.S.A.
- SMITH, D.G. AND S.N. WIEMEYER. 1992. Determining sex of eastern screech-owls using discriminant function analysis. *J. Raptor Res.* 26:24–26.
- SPROAT, T.M. AND G. RITCHISON. 1994. The antipredator vocalizations of adult eastern screech-owls. *J. Raptor Res.* 28:93–99.

J. Raptor Res. 29(3):218–221

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The Wisdom of the Spotted Owl: Policy Lessons for a New Century. By Steven Lewis Yaffee. 1994. Island Press, Washington, DC. xxviii + 430 pp., 2 tables. ISBN 1-55963-203-8. Cloth, \$45.00; paper, \$26.95.—The intention of the author was not to write a book about the biology and natural history of the spotted owl (*Strix occidentalis*), but to use the controversy surrounding this species as a vehicle for exploring larger issues concerning resource management in North America. To accomplish this task, he drew on historical documents, internal agency correspondence, agency plans, governmental proceedings, and interviews with key people involved with the issue. Sources of information are catalogued in 34 pages of footnotes at the end of the book.

At the outset, the title is somewhat misleading in that the book deals solely with the northern spotted owl (*S. o. caurina*) and not with the California (*S. o. occidentalis*) or Mexican (*S. o. lucida*) subspecies, each of which is embroiled in its own controversies. As such, the book focuses on management practices for public lands in the Pacific Northwest, primarily Oregon and Washington. As the principal land man-

agement agency in this region, the U.S. Forest Service (USFS) receives the most attention, with the roles of the Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), and various state agencies being treated more superficially. The book includes a brief introduction followed by three major parts: “The Evolution of the Spotted Owl Controversy” (Part I), “Learning from History” (Part II), and “Policy Implementations for the 1990s and Beyond” (Part III). The introduction sets the tone for the remainder of the book and provides a useful overview of each chapter within the major parts.

“The Evolution of the Spotted Owl Controversy” details the separate paths taken by resource agency policies and changing public values from which the northern spotted owl controversy arose. Chapter 1 (“Birth of a Controversy: 1945–1977”) describes early management policies and philosophies of the USFS. These center around resource extraction (principally logging) as it coincided with the country’s current values and how the agency failed to adequately accommodate the increasing environmental, aesthetic, and recreational values of people using forests in the early 1970s and beyond. This chapter also details some of the early research on spotted owls in Oregon and its impact on the development of management plans by the Oregon Endangered Species Task Force (OESTF). The second chapter (“Muddling Through: 1978–1981”) discusses responses by the USFS and BLM to the initial OESTF plan and how these agencies behaved given the management philosophies inherited from previous decades. At this point, both environmental and timber industry groups entered the stage, and the issue became increasingly polarized. In these first two chapters, Yaffee uses excerpts from interviews with biologists and land planners and correspondence among agency officials to provide strong examples of how the controversy that ensued could have been forestalled with more visionary leadership by agency officials presented with a growing body of research on spotted owls. Chapters 3 (“New Science, New Directives, More Muddling: 1981–1984”) and 4 (“The Forest Service’s Last Stand: 1985–1989”) outline attempts by the USFS and BLM to develop formal management plans that would satisfy demands by both environmental groups and the timber industry in the face of the growing controversy. Again, extensive excerpts from interviews and correspondence provide an insider’s view into the issue

and give a personal perspective of the pressures being exerted on agency personnel from outside influences as well as from within their own agencies. Yaffee also provides a glimpse into the back-room planning process, the discussions involved, and some of the personalities involved. At this point, lawsuits by both environmental and industry groups against the USFS and BLM began to escalate, and the possibility of listing the owl under the Endangered Species Act was imminent. However, these are discussed in less detail than I would have liked. Yaffee continues on the track of emphasizing the role of the USFS above all others. The last chapter of Part I ("All Hell Breaks Loose: 1989–1993") is the weakest. It was during this period that the northern spotted owl was listed as "threatened" under the Endangered Species Act, a joint management plan was developed by the USFS and BLM, a recovery plan was written, and President Clinton attempted to settle the dispute with a much-publicized timber summit. Yaffee only briefly covers the problems encountered in listing the species. He fails to mention that one of the early status reviews was doctored by upper administrative officials of the USFWS, and that the draft recovery plan was never adopted. In addition, he fails to mention that the "God Squad" exemption included only 17 of the 44 sales considered and totaled less than 810 ha of timber (p. 139). There were considerable implications for the Endangered Species Act resulting from the spotted owl controversy that could have been examined in more detail. Yaffee also gives minimal credit to the Interagency Scientific Committee (ISC) plan; most biologists (including myself) felt it was the most scientifically credible plan in existence (see Murphy and Noon 1992). Instead, Yaffee considers an earlier USFS plan (the FSEIS) to be the landmark plan. This plan was short on empirical data but long on dogmatic theory; few biologists felt it was as credible as the ISC plan. Despite these flaws, however, Yaffee provides an informative overview of the time period in question and does an admirable job of pulling together the many-faceted aspects of the controversy that set the stage for the remainder of the book.

Part II ("Learning from History") develops the argument that the controversy surrounding the spotted owl involved more than just the owl itself. Yaffee explores the issue in the broader context of land preservation, political autonomy, log exports, and additional economic factors. In addition, he takes a larger view of the nature and structure of our gov-

ernment and society and how these factors work against immediate and timely solutions. The first chapter of this section (Chapter 6, "Tough Choices: A Difficult Issue Under Any Circumstances") details the economic forces and the different value systems and philosophies among land managers, loggers, and environmentalists that almost guaranteed that no middle ground would be acceptable. Chapter 7 ("Avoiding Tough Choices: American Decision-making Processes") explores the structure of land management agencies in relation to each other and the larger administrative framework and how this structure led to political and administrative fragmentation and lack of coherent decisions concerning land management and the spotted owl. Yaffee also discusses our societal propensity toward crisis management and the lack of creativity in resource agencies that might avoid future crisis management situations. One overlooked issue is that of accountability by agency personnel for failure to adequately implement policy. Failure of spotted owl plans stemmed as much from a purposeful failure to follow their intent as from the inadequacies of the plans themselves. Chapter 8 ("Influencing Tough Choices: Actors in American Decisionmaking Processes") examines how individual personalities of key decision makers, media influences on public perceptions, and strategies employed by public interest groups all affect how and when decisions are (or are not) made. Most of the chapter deals with the latter issue and includes interesting examples of how both industry and environmental groups used a variety of tactics to accomplish their respective goals. Yaffee provides in-depth perceptions of the resource agencies, primarily the USFS, in Chapters 9 ("Insufficient Policies and Misleading Politics") and 10 ("Grounded in the Past: Agency Values and Management Approaches"). The latter chapter could as easily have been entitled "The Rise and Fall of the U.S. Forest Service." Overall, these chapters are excellent. Yaffee outlines what the USFS should be, what it once was, and balances that with how resource-based agencies failed in dealing with the spotted owl issue, partly due to their own intransigence and partly due to conflicting societal and legal mandates. For example, the mandate of multiple-use in the USFS worked so long as it did not conflict with consumptive uses. However, conflicts increased as resources became scarcer and values changed, and the USFS was placed in the difficult position of being unable to please everyone all of the time. The agency's inability

to adapt to a changing society only compounded the problem. In general, Part II switched between dogmatic presentation of the author's opinions to what I felt were well-documented interpretations of the situation. Overall, I think Dr. Yaffee introduced perceptive and objective analyses of the situation from different angles, such as how people with disparate values interact with each other and at different scales progressing from the impact of individuals to small interest groups to larger governmental entities.

In Part III ("Policy Implications for the 1990s and Beyond"), Yaffee attempts to use history as a lesson for preventing future mistakes in resource management. The first chapter (11, "The Context for Change") begins by using results from various surveys to examine the backdrop of our society; i.e., how we feel about environmental issues, our relationship with our government, and our value structure. This chapter continues by describing the increased systemic stress on our public lands and the resources contained therein, the lack of fiscal resources to deal with this generalized problem, and the rising influence of competing political action committees. This section provides a multitude of information on public attitudes and federal funding that Yaffee uses to build the case that, while citizens want resource protection, this ambition has not been matched by appropriate levels of funding. The chapter ends on a positive note by examining a number of reasons for being optimistic about resolution of future problems and ways in which the spotted owl issue may have positively influenced how natural resource conflicts will be dealt with in the future. The last two chapters of the book (12, "Building More Effective Agencies and Decisionmaking Processes" and 13, "Building Better Policies") discuss how natural resource agencies can better deal with conflicts. Yaffee does not just criticize, he also offers solutions, some of them quite detailed. Again, the USFS serves as the model for most of the suggestions, although they have broader applicability to other organizations. Yaffee makes suggestions at different operational levels ranging from personnel in the field to upper management levels. His most useful discussions concern changes in the way the USFS, as a whole, should do business, moving from a "quasi-industrial, military style" to "science-based and concurrence-seeking." The final chapter places the issue of public land management in the larger picture, suggesting changes in land classification, the role of

subsidies, regional planning, and public and academic involvement. These two chapters would have been better served by additional interviews with agency personnel as to what their perceptions for improvement are and whether Yaffee's suggestions are feasible.

For the most part, the book is very well written. Dr. Yaffee attempts to remain an impartial observer and performs this task well. He avoids pointing the sole finger of blame at any one person or organization and instead spreads blame over a number of sources. He looks for the disparate sources of problems, identifies them, and then offers solutions. A major failure of the book, in my view, is the treatment of the role of science and scientists. I felt that Yaffee's understanding of the scientific basis for management of spotted owls is limited and, in some areas, inaccurate. His discussion in Chapter 6 of the role of science (pp. 170-177) lacks an understanding of the importance of various aspects of spotted owl ecology. Moreover, it misses the point that, despite uncertainties, toward the end of the planning process more was known about spotted owls than any other non-game species in North America. Yaffee's limited understanding of the role of science was probably a result of lack of interviews with a number of key scientists. In his emphasis on the USFS, he also neglects the distinction between the research and management branches of that agency and the differences in styles and values between the two branches. Statements such as "Even though the ISC was only partly FS researchers, creation of the group with the specific set of individuals that were named as its members ensured the outcome at the outset" (p. 272) suggest an ignorance of the independent nature of scientists from the research branch of the USFS and their often outspoken criticism of USFS management policy when it contradicts scientific results. However, I felt the section entitled "Science and Scientists in the Policy Process" in Chapter 8 was an insightful summary of the role scientists are forced to play in the political arena. His discussion about the role of experts in our society (p. 294) was equally perceptive.

Every book has its strengths and weaknesses, and this book is no exception. However, my rule of thumb in determining the value of a book is whether I learned something and whether the ideas made me think. Steven Yaffee provided both for me. This book should be read by anyone involved in resource management and especially by anyone involved with spe-

cies that are threatened, endangered, or have the potential for being so. Yaffee builds an intricate case study of the spotted owl issue that serves as a valuable lesson for resource and species management in the United States as a whole. Every raptor biologist should read this book because the spotted owl issue started as innocuously as most current raptor studies are now progressing. Working with charismatic species that exist in relatively low densities (e.g., raptors) almost guarantees that conflicts will eventually arise. In order to forestall the same pitfalls that trapped spotted owl researchers, managers, and policy makers, this book offers an excellent set of tools

and ideas to deal with the issue. It should be on the bookshelf of any person who deals with natural resource issues in one form or another.—**Alan B. Franklin, Colorado Cooperative Fish and Wildlife Research Unit, Colorado State University, Fort Collins, CO 80523 U.S.A.**

LITERATURE CITED

- MURPHY, D.D. AND B.R. NOON. 1992. Integrating scientific methods with habitat conservation planning: reserve design for northern spotted owls. *Ecol. Appl.* 2: 3-17.