BOOK REVIEW

by David C. Morimoto

A Field Guide to Eastern Forests by John C. Kricher (text and photographs) and Gordon Morrison (illustrations), Houghton Mifflin Company, Boston, 1988; 368 pages, 60 color plates and numerous black-and-white illustrations; $22.95 (hard cover) and $14.95 (soft cover).

We students of nature enhance our experiences by referring to taxonomically oriented field guides to become familiar with the biota of a particular region. These field guides, while essential for serious nature exploration, traditionally include only limited notes on the natural history of organisms. Inevitably, as we spend more time afield observing things, we begin to ask questions. What determines the structure of a forest? How old is that field? Why do birds forage in mixed flocks during winter? Why are there so many viburnum fruits left on the plant in autumn while spicebush fruits are all gone? Why do redstart males take two years to acquire adult plumage? Why did I have 685 pounds of acorns in my yard? Discovering the answers to questions such as these is the most rewarding aspect of nature exploration. John Kricher facilitates and fuels this process in *A Field Guide to Eastern Forests,* No. 37 in the well-known Peterson Field Guide Series.

This "second generation" guide is a refreshing departure from the traditional field guide. It is, as Kricher states, "a field guide to ecology," focusing on the interactions among the components of forest systems and the resulting structure and dynamics that emerge.

Following an introduction to the book, Kricher takes the reader on a pattern-seeking tour through a forest, calling attention to a number of forest field marks such as stratification, types of trees, indicator species, species diversity, type of soil, plant population patterns, forest age, and forest gaps. He also discusses forest borders, or ecotones, old fields, forest fauna, identification of species, and the forest food chain. The chapter ends with a handy "Forest Field-mark Questionnaire" that is useful in guiding the reader through the forest and toward an understanding of it.

But Kricher does much more than simply point out patterns of field marks; he explains why they exist, i.e., the ecological processes giving rise to them. This approach works very well as I discovered when I recently adopted this book as the required text for a college seminar in field-oriented ecology. My students were genuinely excited by looking for and recognizing patterns and by coming to understand the underlying processes. (They certainly preferred Kricher's colorful writing to the tedium of deciphering the many original research papers I also asked them to read.)

Next, Kricher briefly describes each of the forest communities covered in the book and lists indicator plants and animals for each one. The majority of these twenty-five types of forest fall within the Eastern Deciduous Forest Biome and range from Northern Hardwood to Maple-Basswood and Appalachian Cove forests.

Subsequent chapters cover change on ecological and evolutionary time scales. Kricher first discusses the components and types of disturbance and their effects on ecosystems and follows with a consideration of ecological succession, concentrating on old field succession, its field marks and indicator species, and the general sequence of plant communities from the pioneer community to the perennial herbaceous and woody plant community. One important point made is that although we can predict these broad patterns of plant community change, the species composition of old field plant communities is largely determined by chance. This informative discussion is followed by a detailed description of the plant species of old fields, including both species accounts and, most important, discussions of adaptations of species to old field environments. This section also covers sand dune and riverine zonation and the development of vegetation on the substrate of rocky outcroppings and along power lines. As someone interested in landscape ecology, I was pleased to find a section on pattern and process at the landscape level. Kricher describes landscape components such as various patch types and corridors as well as the effects of forest insularization on species number and composition, focusing on bird species of forest interior and edge habitats—a topic of particular importance, given the increasingly human-modified landscape we live in.

In a chapter on adaptation, Kricher distinguishes between "how" and "why" questions and discusses adaptations such as interactions between plants and insects, hibernation in woodchucks, and migration in birds. Following that is an excellent discussion of the mechanics of adaptation—the differential survival and reproduction in populations of individuals possessing genetically determined traits that allow them to fare better than other individuals under certain environmental conditions. An understanding of natural selection is essential to insight into ecological pattern and process, and the theme of adaptation runs through the entire book.

This guide is generously illustrated with many splendid line drawings and fifty-three plates, forty-one in color, by Massachusetts artist Gordon Morrison. The plates are diverse and include select amphibians and fungi; indicator species of various forest types and successional stages; adaptations of various plants; mimicry, camouflage, defense, and predation in insects and reptiles; milkweed natural history; fruits of different quality; irruptive bird species; and nesting behavior, mixed species foraging, and sexual dimorphism in birds. Also included are seven photographic plates, some with as many as eight small

pictures, of landscape components, wild flower adaptations, forest types, and seasonal and successional patterns.

In the closing chapters, Kricher takes a seasonal approach, focusing on ecological patterns and processes in the four seasons. Topics range widely reflecting the exciting diversity of nature year-round—pollination, bird territoriality, vocalizations, stream habitats, and amphibians in spring; leaf and tree geometry, bird nesting patterns, fruiting and seed dispersal, and insect behavior in summer; and soil and decomposition, flocking, winter adaptations, and irruptions of birds in autumn and winter, to name a few.

Kricher successfully and skillfully applies the "Peterson system" (recognition by combinations of field marks) to the identification of ecological patterns in eastern forests but goes well beyond the usual field guide by explaining how and why. Kricher's well-written, carefully edited, and lively text combined with Gordon Morrison's illuminating drawings results in a book that guides the novice and the more experienced naturalist alike on an enlightening tour of exploration, pattern discovery, and interpretation—a most exciting and rewarding process that feeds on itself and provides a lifetime of enjoyment and fulfillment. I recommend it to anyone who wants to learn the fundamentals of ecology, to know and understand forests and fields, and to broaden and sharpen skills as a naturalist.

DAVID C. MORIMOTO is an ecologist who earned his Ph.D. in biology from Boston University in 1989, researching avian community structure in the Massachusetts pine barrens. He now teaches ecology in the biology department of Regis College in Weston and is studying the bird assemblages of Weston's conservation lands. David has been a birder for many years and is a member of Nuttall Ornithological Club. He lives in Weymouth with wife Sandi and two-year-old son Justin, already a budding naturalist.