

### **Ecosystems of a Unique and Beleaguered State**

**Ecosystems of Florida.** Myers, R. and Ewel, J., editors. 1990. University of Florida Press, Orlando, Florida. 728 pp. \$75.00 cloth, \$29.95 paper.

Florida, site of the greatest sale on earth (the real estate boom that began in the 1920s) is a state with a long history of disregard for conservation of natural lands and resources. But in the last 25 years, a growing number of voices have objected to the rampant development and exploitation. *Ecosystems of Florida* describes the basic biology and geology of the local communities and will be useful for anyone interested in protecting or simply knowing about this remarkable part of the United States.

This volume, the result of the efforts of numerous experts writing under the strong editorial leadership of Myers and Ewel, is an enormously successful and multipurpose tome. Part 1 lays the groundwork for the community descriptions to follow: climate, soils, and biogeography. The climate chapter (Chen and Gerber) provides detailed comparisons of different areas, reviewing cycles of drought and freezes; although very detailed, it is easy to read and informative thanks to many illuminating figures. The soils chapter (Brown, Stone, and Carlisle) is equally thorough (though overly detailed about Pasco County), with discussions of water tables, pH, aeration, and penetrability, making it clear why soil type has such a profound effect on plant distributions. In Webb's chapter on historical bio-

geography, we learn that Florida was a part of Gondwanaland, with pollen and other fossils showing more affinity with Africa than with North America. Fossils galore are described, but only north of Lake Okeechobee, ignoring much recent and important work done elsewhere. The site-by-site presentation of archaeological excavations is overly laborious. The Alum Bluff flora was an endemic tropical flora being invaded by temperate flora, begging for comparison between south Florida and the Caribbean; but this author, like the others, did not venture outside the state. An entire chapter on contemporary biogeography, putting Florida in the context of North American and Latin American/Caribbean influences, would have been a welcome addition.

In Upland Ecosystems (part 2), Abrahamson and Hartnett compare many different sites within the state to come up with general vegetation categories for pine flatwoods and dry prairies; they also cover typical fauna, and the effects of animals (including humans) on these communities. Myers does a good, thorough job of describing the flora and fauna typical of the pyrogenic scrub and high pine communities. Platt and Schwartz are the only authors that bring Florida forests into comparison with other (temperate) forests in the United States. I disagree, however, with their designation of "tropical rain forest" to describe our south Florida hardwood hammocks; these hammocks are subtropical deciduous (dry) forest. There is excellent coverage of the unusual rockland communities of south Florida by Snyder, Herndon, and Robertson; they describe both flora and fauna in detail, and provide beautiful photographs. Indeed, the entire book includes informative figures and good quality photographs which enhance the presentation.

Marjorie Stoneman Douglas, in *The River of Grass*, first made Floridians aware that freshwater wetlands and aquatic ecosystems are the

life-blood of Florida (and it seems odd to me that a book aiming for a broad audience would neglect to cite this now 101-year-old heroine of Florida conservation). Part 3 of *Ecosystems of Florida* provides us with a scientific overview of the importance of wetlands. Katherine Ewel observes that swamps have been used for wastewater purification for more than 45 years. She cites four key ecological characteristics of swamps that can be identified and used in management plans: hydroperiod, fire frequency, organic matter, and water source. Swamps are related to other ecosystems, both upland and aquatic, and Ewel urges that they be managed as part of a complete landscape. Freshwater marshes have been severely altered by both drainage and unnatural flooding, and Kushlan provides us with the detailed hydrology to understand the changes that have taken place. He describes six types of marshes in Florida, with complete descriptions of their flora and fauna. Brenner, Binford, and Deevey cover lakes. Lake origins in Florida are mostly from dissolution or excavation of limestone bedrock. The authors provide many limnological details, and information on lake fishes (native and introduced). Phytoplankton, zooplankton, and higher plants are briefly discussed. In Nordlie's refreshing chapter on rivers and springs, the focus is on fish, and higher plants are only mentioned with reference to weed control. The effects of boats on manatees are discussed, as are the negative effects of power plant warming on manatee migrations.

Coastal ecosystems, dunes, and maritime forests have been highly altered by man via real estate development and the introduction of exotic plants, and by nature via hurricanes. Though Johnson and Barbour use too many detailed topographic diagrams to describe the vegetation, they do a great service in providing a list of all the plant lists (many unpublished) that have been

compiled for coastal areas of Florida. Much of the original salt marsh ecosystem has been diked and flooded for mosquito control; Montague and Wiegert explain the dynamics of this control and its impact on other fauna. This saltmarsh chapter contains fascinating descriptions of the many food webs of the marsh, as well as complete descriptions of vegetation and case histories of endangered and threatened fauna. The varied diagrams and illustrations of this chapter are excellent. Odum and McIvor provide a current and well-researched chapter on mangrove ecosystems. Mangroves are facultative halophytes and important as land stabilizers, not land builders. Livingston reviews in-shore marine habitats, delineating abiotic and biotic factors shaping them, and illustrating how important estuary habitat is for certain invertebrate and vertebrate species. Jaap and Hallock detail the various types of reefs, and the communities associated with them, providing a complete account of coral biology and describing the interactions in which the reef-building corals are involved. Reef-associated fisheries and the exploitation by humans of coral reefs are described, along with the history and prospects of reef management.

The book has an up-beat conclusion, highlighting the many positive changes that have taken place in the attitudes of Floridians and various government agencies toward their environment. The major threats are land conversion, exotics, fire exclusion, and water demands. Ecosystem-level conservation is necessary to preserve diversity at the community level though it might be too late for some communities. What are the prospects for restoration of Florida's greatly altered communities and ecosystems? And, just how unique is Florida? Few of the authors provided any comparisons with other parts of the U.S., or the Caribbean; such comparisons would have made the book more useful. But even with these omissions, it is an excellent book

that fills many needs within the state of Florida and beyond. It is a thorough, multi-faceted description of an extraordinary peninsula, loved and exploited nearly to death. This book will help us understand and manage these and similar ecosystems for the continued benefit and enjoyment of future generations.

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