

Station provides a controlled environment, as well as the long term habitat management which is so essential to a long-term undertaking of this kind.

Florida Scrub Jays are highly sedentary birds restricted to areas of open oak scrub. This habitat is very localized in Florida today, and is rapidly becoming scarcer. Virtually all suitable habitat is continuously occupied by jays, which defend large territories throughout the year. Typically each territory fulfils all the needs of its resident group of jays, although only a single pair usually breeds there. The other residents — and most territories have one or more helpers — are usually, but not invariably, progeny of the breeding pair. In these groups males dominate females, the breeding birds dominate helpers and older birds dominate younger siblings. The helpers do help — in territorial defense, but also in raising the young. Pairs with helpers raise more young than pairs alone.

The authors argue convincingly that in an environment where all suitable habitat is continuously filled by long-lived birds, it is more advantageous for a young bird to "wait its turn" to breed in familiar surroundings than to risk dispersal. Inbreeding is avoided by females dispersing, but males stay home. Eventually they acquire breeding territories of their own, either by replacement or by territorial "budding" — a process where a group of jays expands the size of its territory, a portion of which is then ultimately taken over by a young bird.

One of the current controversies in population biology today centres on the advantage to the individual of "helping-at-the-nest". Many authors

favour a kin selection explanation, where the helper is seen as assisting close relatives, and hence helping perpetuate some of its own genes. While the present authors recognize the importance of kinship, they argue that the present system would evolve "even in the absence of the indirect, kinship components to fitness".

The study avoided manipulative investigations such as removal of jays, although a fascinating epilogue chronicles a sudden collapse of the breeding population in 1980 which resulted in a remarkably rapid return to its former stable level — a result wholly in keeping with the authors' predictions. Letting nature create the experimental conditions results in small sample sizes at times, but the advantage of working with a stable, natural population clearly outweighs this drawback.

The text is interspersed with numerous figures and tables — enlivened by occasional vignettes of jay activity relevant to the topic of the figure — which provide excellent support to the lucid text. The final chapter presents a reasoned discussion on the evolution of Scrub Jay sociality.

This is an important contribution to population biology. It will be of interest not only to workers in the field, but also as a readable introduction to one of the central topics in ornithology today. For the general naturalist, who should not be inhibited by the occasional algebra and multitude of tables, it's a well-written, thoughtful account of a fascinating subject.

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BOTANY

Microfungi on Land Plants: An Identification Handbook

By Martin B. Ellis and J. Pamela Ellis. 1985. Macmillan, New York. 818 pp., illus. U.S. \$75.

An excellent identification manual, this volume will greatly facilitate the naming of specimens of microfungi. Microfungi are those fungi whose fruiting structures (i.e. those tissues or cells that produce the spores) are at most several millimeters (mm) in extent. Identification of these fungi generally depends on a knowledge of the size and shape of the spores and associated structures which are typically 0.005-0.060 mm in size. Thus a microscope which magnifies 400 to 1000 times is essential equipment in the study of microfungi.

A certain knowledge of the fungi and their taxonomy is, understandably, presumed. For example, the names of major taxonomic groups (Discomycetes, Hyphomycetes, Coelomycetes and Basidiomycetes) are neither defined nor keyed. Unfortunately in some instances the reader is presumed to have quite an in-depth understanding of the genera. For example, the chapter on *Plurivorous Leaf-litter Fungi* lacks keys to the 15 genera of Discomycetes and the reader is expected to know the differences between *Betulina*, *Botryotinia*, *Dasyscyphus*, etc. I feel this is expecting too much, since it requires the use of different books to identify these taxa.

This handbook is well-organized, quite comprehensive (containing 3300 fungi), and with 2125 species accurately illustrated by drawings showing habit and critical microscopic features. The 579 pages of text are divided into nine chapters, with titles such as *Plurivorous Wood and Bark Fungi*, *Fungi Specific to Trees, Shrubs and Woody Climbers*, and *Fungi Specific to Grasses*. Each page carries a header which is the chapter title, a very useful feature. Within the chapters on plurivorous fungi, the fungi are arranged by fungus group (e.g. Discomycetes, Other Ascomycetes) and each group may have a key to the genera. Keys to species are provided if the genus has numerous species. The chapters on fungi specific to certain plant groups (e.g. *Fungi on Ferns, Horsetails and Clubmosses*) have the host plant genera presented in alphabetical order. Within each host genus the fungi are arranged in convenient, often taxonomic, groups.

Each fungus entry contains the Latin or scientific name of the fungus, followed by a description of the pertinent macro- and micro-features, and finally comments are included on host species, the host tissues affected, season of fruiting, and occurrence. The text is concluded by a helpful glossary containing

about 230 technical terms. Two indices are provided, one for fungal names and the other for host genera combined with common names for the hosts.

There is no book on Canadian, or for that matter North American, microfungi that has such a broad scope. Although based entirely on microfungi in the British Isles, the book will be very useful elsewhere because many of the species are widespread. The book provides a quick means of eliminating a large number of possibilities, if the specimen under study is not a fungus treated in the handbook. For example, of the 118 names on page 794 of the index, 30 percent have been reported in Canada. The actual number of fungi on that page which are reported from Canada is closer to 50 percent because Canadian reports preferred a different generic name.

Everyone dealing with the microfungi will want to have a copy of this book available for quick reference. The literature on microfungi is widely scattered and this book will make the work of many of us much easier.

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Wetlands of the United States: Current Status and Recent Trends

By Ralph W. Tiner, Jr. 1984. U.S. Fish and Wildlife Service National Wetlands Inventory. U.S. Superintendent of Documents, Washington. 59 pp., illus. U.S. \$3.

This concise, well-referenced and complete report on the current status of the United States wetlands, a publication of the Fish and Wildlife Service, is a valuable and accurate reference. Tiner begins the booklet with the sobering fact that between 1950 and 1970 the U.S. had a net loss of 9 million acres of wetland, 87% of this loss due to agricultural development; in addition, population and agricultural trends point to pressure for more wetland conversion. Wetlands are defined as transitional habitats where the water table is at or near the surface with periodic flooding, the "degree of flooding or soil saturation and presence of wetland plants and/or hydric soils" being determining factors. Wetlands are classified as marine, estuarine, riverine, lacustrine, and palustrine; the report focuses on estuarine and palustrine wetlands because they are the most abundant types. The value of wetlands for fish and wildlife habitat, for the maintenance of environmental quality and for economic reasons (flood protection and groundwater recharge) is also surveyed.

The rest of the report is an extensive discussion of

the trends that Tiner foresees for wetlands in the U.S. Recent gains (beaver activity, construction of lakes, reservoirs and farm ponds) have been offset by enormous losses due to agricultural drainage, urban development, bottomland hardwood forest conversion to farmland, peat mining, and the rise of the sea level along the gulf coast. To put this in historical perspective we are told that California has lost over 90% of its original wetlands, Iowa 95%, and Illinois has lost 98% of its bottomland swamps: these are just a few examples. The Wetlands Act of 1973 has dramatically decreased the rate of wetland loss, but Tiner sees a number of problem areas. He calls them areas of "greatest jeopardy". They include the estuarine wetlands of the U.S. coastal zone, Louisiana's coastal marshes, Chesapeake Bay's submerged aquatic beds, the Prairie Pothole region's emergent wetlands, and the western riparian wetlands. These areas are discussed in detail.

Future pressure on wetlands will come from population growth, growth of suburban population centres, and increased conversion to agricultural use. Protection of wetlands can occur through federal and state acquisition, federal and state regulation which Tiner feels needs strengthening, and tax incentives.



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