

conservation, and parasites (to name just a few). Each chapter includes a summary of available data, beautiful photographs and artwork, pertinent figures and graphs, and a quirky sense of humor subtly intertwined with scientific details. Also, references are listed at the end of each chapter, allowing for easy access to the primary data used in the discussions. Unfortunately, the authors run into difficulties when generalizing about the biology of the northeast rockfishes. These fish are amazingly diverse in form, color, habitats, and lifestyles. The paucity of data available for many rockfish species is appalling, especially in light of their severe decline. The authors make a valiant effort to summarize rockfish biology, but many more years of research must be conducted before a thorough understanding of rockfish biology is attained.

Part II presents an updated dichotomous key of rockfishes of the northeast Pacific. Drawing upon the key presented by Miller and Lea (1972), the authors include nine rockfish species previously not listed and a dichotomous key for the species *Sebastolobus*. (Miller and Lea provided a key to the genus level but then only described the fish at the species level.) This new, updated key emphasizes using colors and patterns to identify the fish and downplays some of the meristics used in the older key. Perhaps the most useful feature of the updated key is its linking to part III of the book, the species accounts. Once a fish is keyed out to the species level, a page number is listed, referring the reader to more information on this fish in the species account section.

In part III, each species account includes a map and description of a species' range, five to eight color photographs of the species at various ages (except for rare species), etymology, colloquial names, the status of its fishery, and taxonomy and systematics. Additionally, details of the fish's biology are described, in-

cluding coloration underwater and after capture, maximum size, larval settlement and recruitment, substrate and habitat preferences, sexual dimorphic patterns, aging, and diet. Again, the references used to compile this species description are listed at the end of each account.

The remainder of the book is filled with 32 pages of references, detailed maps of the northeast Pacific from the Bering Sea to the Gulf of California, and appendices. In case you are craving more rockfish data yet, the appendices include the following information per species: Von Bertalanffy growth curves; length-weight relationships; conversions between standard, fork, and total lengths; head spine configurations; and meristic measures. Also, the appendices include more references for those in search of more esoteric papers, a list of host parasites, and major rockfish groupings by various fisheries agencies.

I wholeheartedly recommend this book to anyone interested in rockfish of the northeast Pacific. Information is presented clearly and simply to be enjoyed by any marine fish enthusiast, but it will be a necessity and a mainstay to any student, educator, or researcher devoted to the rockfish of the northeast Pacific. With its comprehensive species descriptions; detailed discussions of biology, ecology, and evolution; phenomenal illustrations and photographs; and low cost, *The Rockfishes of the Northeast Pacific* belongs in every natural science library and every marine research vessel on the U.S. West Coast. I only wish it were waterproof and more compact so I could take it underwater with me.

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Qualified Optimism

The Earth Remains Forever: Generations at a Crossroads. Jackson, R. 2002. University of Texas Press, Austin, TX. 189 pp. \$40.00 (hardcover). ISBN 0-292-74054-9. \$19.95 (paperback). ISBN 0-292-74055-7.

"Optimism," said Candide, "is the mania of maintaining that everything is well when we are wretched." Yet, with the knowledge of wretchedness that this volume details, the author proposes a qualified optimism for "generations at a crossroads," the book's subtitle. Ours is not a generation to face the future with expectation and uncertainty or to cope with the problems of the times. Of course, the implication of the "crossroads" is that the wrong road chosen leads to failure and catastrophe.

The Earth Remains Forever is another volume in the same cautionary genre as the 1992 volume *Earth Remains in Balance* by former vice president Al Gore. Both books are reminders of environmental damage the earth suffers and an outline of potential future catastrophes. Specifically, Jackson's volume highlights the results of the 2000 presidential election vote by which the balance scales of government were tipped toward a regime that treats environmental damage with denial, postponement, and retrograde policies. The purpose of both Gore and Jackson is to inform the public and thereby influence governmental processes. Yes, planet Earth will remain forever—if billions of years are "forever." But what will be the fate of the life that teems upon it? With experience in both industry and science, Robert Jackson has excellent credentials for the task of detailing the pertinent facts. Jackson worked

as a chemical engineer for Dow Chemical and is now associate professor in Duke University's School of the Environment and Earth Sciences.

The usefulness of Jackson's book lies in his ability to make his information intelligible and credible to the interested citizen. He convincingly presents the historical data and scientific studies that demonstrate how environmental degradation happens where human populations fail to take care of the world around them and overuse their available resources. Jackson articulates what the ozone problem is all about, the evidence for global warming, damages caused by invading exotic species, the impact of lost habitat and wetlands, shortages of available safe water, and the importance of maintaining biodiversity. There is a helpful index and 30 pages of references for those who want to do more research.

The details will not be news to any practicing environmental scientist, but they will be helpful for the rest of us who want to understand our natural world so that we can have an adequate basis for political decisions about the resources of the United States and the world. We can find the arguments for balancing economic policy with measures to ensure clean water, air, soils, and oceans. For those among us with short attention spans or limited tolerance for scholarly talk, Jackson sprinkles his dissertation with stories, lively examples, quatrains, and cartoons. Not to muddy the unbiased tone of the scientific material, he restricts his recommendations for political solutions to chapter endings and his preaching to a final "Vision for the Future."

Jackson's story-telling talent takes over in his chronicle of Easter Island (Rapa Nui). The Lapita people of Oceania survived a 1000-mile voyage in canoes, established a complex culture lasting 1000 years, created the only written language in Oceania, and ringed the island with peerless Moai statues before they

went into a long, steady decline. Their growing population, using slash-and-burn agriculture, proved fatal to a once lush forest, all but 1 of 30 species of birds, and finally themselves. The magnificent toromiro trees (*Sophora toromiro* [Fabaceae]), which they considered sacred, were used for firewood and as rollers to transport the Moai figures. The trees now exist only in gardens and private collections. Easter Island's history is a canonical case of human triumph and tragedy, a template for the fate of populations that are so numerous and so "successful" that they overwhelm their resources.

The broad base of Jackson's argument for responsible public policy builds with chapters on human population, its exponential growth rate and energy consumption, and biological diversity, from the great apes to microbes and from the rare to the teeming. There is a chapter on biological extinctions, comparing the Permian and dinosaur extinctions with those of recent history caused by human predation. The role of extinctions caused by exotic species invasions is correlated to increasing globalization of human activity. "Altered Horizons" is the title of the chapter on habitat loss. We must feed ourselves, and in so doing we take over land, including forests and wetlands, for agriculture; divert water for irrigation; spray tons of pesticide; and overharvest the fish of the sea, both those we use and many that we just destroy with trawling nets.

Safe drinking water is not available to a billion people, and millions die for lack of sanitation. There is a tragic irony in the benefits of water control. We have built dams and reservoirs and channeled rivers by which we control floods, provide clean water, clean power, and navigable rivers—while in the process wildlife dies, shorelines retreat, salinity rises, fish disappear, and rivers run dry.

Jackson gives a fascinating litany of medicines that have been derived from plants and animals. For exam-

ple, from the rosy periwinkle (*Catharanthus roseus*) of Madagascar, we have cancer drugs to control Hodgkin's disease and children's leukemia. A microbe that thrives in Yellowstone hot springs has become a basic research tool of modern molecular biology. The blue blood of the horseshoe crab provides a clotting agent used in screening for the pathogens of spinal meningitis and gonorrhea. These and many other examples are arguments for maintaining plant and animal diversity as "nature's tool shed," a source of solutions for unpredictable future plagues of humankind.

Because there is not always a simple relationship between causes and effects, the course of governmental response to environmental problems is complicated by the need to educate and convince legislators and administrators. As a prime example, the danger posed by a hole in the ozone layer of the earth's atmosphere is not yet fully accepted. It has taken years, but we do understand the connections between carbon dioxide in the atmosphere, chlorofluorocarbons (CFCs) in aerosols and refrigerators, a hole in the ozone layer of the atmosphere, ultraviolet radiation, and human cataracts and carcinomas. Although international action outlawing CFCs has effected some reduction in the growth of the ozone hole, the problem has not gone away. Jackson tells us why this is a cautionary tale of potential catastrophe if we again ignore or fail to respond to damage inflicted on the earth's atmosphere.

In conclusion, Jackson has a few suggestions for preserving a livable environment. He proposes long-term monitoring of the global climate and roundtable congregations of nations working together to mandate that the price of a product be included in the cost of disposing of it after use. He acknowledges, however, that it will be easier for scientists to lay plans than it will be for governments to balance the imperatives of conservation, population

control, habitat maintenance, and energy use with the contrary imperatives, customs, and indulgences of twenty-first century people.

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Birds in the Human Landscape

Avian Ecology and Conservation in an Urbanizing World. Marzluff, J. M., R. Bowman, and R. Donnelly, editors. 2001. Kluwer Academic Publishers, Dordrecht, The Netherlands. 585 pp. \$159.95. ISBN 07923-7458-4.

Urbanization is a word used to identify the growth of cities and towns and the development of the surrounding landscape by human settlement. It is a process that has been occurring in all developed and many developing nations throughout the world. The rate of urbanization has increased in the last few decades to the point where it is of major concern to conservation biologists. The process has been so pervasive in North America that many refer to it as *sprawl*, a term that some do not like because of its negative connotations. Regardless of individual viewpoints on "progress," urbanization is unquestionably a force to be reckoned with and understood.

Recently and increasingly, urban and suburban environments are being recognized as ecosystems in and of themselves, or as important parts of larger regional ecosystems. This changing view has important implications not only for ecologists but also for conservationists, policymakers, and human society in general. Ecological understanding and conservation issues are no longer relegated to national forests, national parks, wildlife refuges, or wilderness areas; they are intertwined in the increasingly prevalent human environment.

Marzluff et al. have produced an edited volume that takes on the complex processes involved in human development of the landscape and focuses on one taxonomic group, birds, within the realm of biodiversity. A great deal of ecological work has been done on birds, and we know quite a bit of the population ecology, community dynamics, and habitat relationships of this diverse and mobile group. Therefore, it is an appropriate and worthwhile endeavor to focus on the impact of urbanization on avian species and communities. In many ways, this book represents a merging of a new facet of ecology, urban ecology, with an old and venerated one, ornithology.

The editors state several objectives for the book with regard to how birds respond to human settlement, including a review of current knowledge. They also suggest ways of standardizing approaches for study; investigate connections between urbanization and individual birds, bird populations, and bird communities; investigate policy, conservation, and management implications; and suggest research needs and directions.

The book has 27 chapters grouped into five sections. In section 1, an "Introduction to the Study of Birds in Urban Environments" (seven chapters), the authors provide historical and world perspectives on the effects of urbanization on birds, the response of bird populations to development, and approaches to the study of birds in urban environments, such as quantifying urban gradients and applying multi-scale analyses in avian habitat-selection studies. It is a fairly comprehensive section that will be of interest to anyone concerned about urbanization, whether or not the focus is birds. Important contributions include a discussion for standardizing and quantifying terminology such as *urban*, *suburban*, *rural*, and *exurban*. Chapter 3 by Richard F. Johnston is a particularly fascinating account of "synanthropic" birds. Johnston defines biological

synanthropy as human-mediated symbiosis and discusses the life-history strategies of such common birds as House Sparrows (*Passer domesticus*), Rock Doves (*Columba livia*), and other species that show varying degrees of synanthropy. One message is that some species will be able to exploit rapidly changing environments, and there is as much to learn from these species as there is from the ones threatened with local extinction.

Section 2, "Processes Affecting Birds in Urban Environments" (seven chapters), addresses population and community responses to some specific processes that are not unique to urban environments but that are important driving forces in the complexities of urbanization. In this section, the authors discuss interactions of birds with non-native plants, nest predation, and bird tolerance to human disturbance. Several of the chapters make these points in a case-study approach, such as the effects of urban sprawl and juniper encroachment on the abundance of wintering birds in Oklahoma (chapter 10) and the relative importance of anthropogenic sources (e.g., lawns) and natural sources of food for European Starlings (*Sturnus vulgaris*) in France (chapter 13).

Sections 3 (seven chapters) and 4 (five chapters) present information on bird populations and communities, respectively, in urban environments. Among the species discussed are Western Gulls (*Larus occidentalis*), American Crows (*Corvus brachyrhynchos*), Florida Scrub-Jays (*Aphelocoma coerulescens*), macaws (*Ara* spp.), and waterbirds (grebes, loons, waterfowl, terns, gulls). Case studies of bird communities come from St. Louis, Chicago, southwestern Ohio, and Toronto. The chapter on western gulls (chapter 15) by Raymond Pierotti and Cynthia Annett summarizes 22 years of data on reproduction and diet in different colonies with varying amounts of urban influence. Pierotti and Annett point out that the existing paradigm