

Wildlife Diseases: Landscape Epidemiology, Spatial Distribution and Utilization of Remote Sensing Technology

PREFACE

To properly manage and conserve wildlife, an understanding of their health and disease conditions is necessary. The purpose of this book is to provide a reference on the various parasites, diseases and other factors that cause or may cause morbidity and mortality in wildlife. The study of wildlife disease is a dynamic activity dealing with a dynamic resource. Transmission of pathogens from domestic livestock to wildlife or vice versa, and to humans has been occurring for centuries. It is estimated that 60% of all infectious disease agents affecting human populations typically reside in vertebrate wildlife reservoirs, and approximately 75% of emerging diseases have animal origins. The outbreaks and intercontinental spread of severe acute respiratory syndrome (SARS) and avian flu indicate how disease agents that normally reside undetected in animal populations can be transmitted to humans around the world. In order to understand the epidemiology of these zoonotic diseases, it is necessary to understand the biology, ecology and behavior of the infectious agent, the reservoir, and in many cases the vectors that transmit the disease.

Because of the multidisciplinary interests in wildlife diseases, this book is aimed at a broad and varied audience. The book presents basic facts regarding selected wildlife diseases in amphibians, fish, birds and mammals, and describes certain emerging infectious diseases. Within the limits of the space allotted, authors of respective chapters provide historical literature on an agent or disease, information on current knowledge of the etiology, pathogenesis, immunity and diagnosis, as well as discussions of the implication of the pathogen or the disease on wild animals and people. Relevant current information on the biology and epidemiology of pathogens gained by molecular and the utilization of remote sensing technology is presented.

The book consists of 32 chapters grouped in six parts. Part I includes five chapters and covers emergence and re-emergence of viral, bacterial, fungal and prion diseases. Survey of amphibians—tadpoles, frogs, toads and salamanders—diseases are presented in Part II. Diseases of fish and birds are included in six chapters in Part III. Section IV considers diseases that afflict certain wild animals in the USA and Africa. Additionally, Lyme disease, Hanta virus disease and marine mammal diseases as well as the mode of monkeypox transmission are covered in this section. Certain pesticides' effects on wildlife and in marine organisms, as well as sampling procedures and disease diagnosis are presented in Part V. Three chapters on use of remote sensing, Geographic Information Systems (GIS) and Global Positioning System (GPS) to locate and track the distribution and spread of diseases among wildlife populations are covered in Part VI.

The book provides up-to-date and comprehensive presentations on wildlife diseases, and it will be of value to wildlife biologists, public health officials, veterinarians, undergradu-

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ate and graduate students, sportsmen and others interested in wildlife management. It is hoped that all persons interested in wildlife management will find this book a most helpful and useful reference.

We gratefully acknowledge the effort that the authors dedicated to their contributions. The authors spanned the disciplines of wildlife biology, veterinary medicine, pathology, genetics, microbiology and geography. The editors also express their respective gratitude to Lafayette College, East Stroudsburg University, Grove City College, the University of Pittsburgh at Bradford, and the Pennsylvania Academy of Science for their support in the preparation and publication of this book.

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Dedication

This book is dedicated in memory of *Dr. E. Willard Miller*, who was a renowned educator, an acclaimed scholar and an enthusiastic explorer. Dr. Miller served as President of the Pennsylvania Academy of Science (1967–1969), co-edited 25 Academy sponsored books and wrote numerous articles for the Academy's Newsletter.

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