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# Preface

The disciplinary areas of ecology and toxicology have made significant advances toward common goals of better detection, evaluation, and understanding of the complex interactions of toxicants in environmental settings. More than ever, we can piece together the physical, chemical, and biological influences of these substances and their effects on resident and migratory biota. We can often separate chronic from acute effects and follow substances through food webs, investigate processes at various levels of organization: from molecules and cells through tissues, organs, and organisms, to populations and communities, and are beginning to examine effects of more than one substance or impact on ecosystems. We are also assessing the health of ecosystems relevant to these impacts, and the risk to nonhuman and human inhabitants. The environmental impact review process and superfund site concerns are more closely linking the work of scientists in agencies, consulting firms, and universities. This volume is an attempt to pull together information from appropriate experts to assess: (1) where we are today in these relevant fields, and (2) which tools will be helpful in designing tomorrow's studies.

The volume is divided into three sections: Impact of Multiple Stresses on Ecosystems, Establishing the Health of Ecosystems, and Future Methods in Ecotoxicology. It resulted from an international conference on this topic held October 14-15, 1993. The conference was sponsored by the University of California Toxic Substances Program (Dr. Jerry Last, Director), especially through its Ecotoxicology Program (directed at that time by Dr. Daniel Anderson, now directed by Dr. David Hinton). The UC Ecotoxicology Program is a UC system-wide program that offers support, primarily in the form of traineeships, to students pursuing graduate degrees in areas such as ecology, pharmacology and toxicology, engineering, and others which relate to ecotoxicological investigations. The Davis Campus is currently the leader in the UC ecotoxicology thrust. The conference was also sponsored by the U.S. Environmental Protection Agency through its support of the Center for Ecological Health Research (Dr. Dennis Rolston, Director) located on the Davis campus.

Many individuals contributed to the success of the conference. Its program, leading to the chapters in this volume, was constructed by program committee members Drs. Daniel Anderson, Donald Crosby, and Thomas McKone. The co-chairs were Drs. Joseph Cech and Barry Wilson. Conference-related correspondence was handled by Ms. Marjorie Kirkman and Ms. Brenda Nakamoto of the UC Davis Department of Wildlife, Fish, and Conservation Biology. Ms. Evett Stranghellini-Kilmartin (UC Ecotoxicology Program) and Ms. Cheryl Smith (Center for Ecological Health Research) assisted with conference organization, facilities, publicity, and registration. Graduate student Monica Choi worked with Ms. Smith on the poster displays; and Nancy Autumn, Donna Bartkowiak, Seth Coleman, Steve Detwiler, Ruth Ann Elbert, Andrea Erikson, Adam Harris, Xiaoping Li, and Eric Mielbrecht

assisted with registration, media projection, transcription, and transportation needs. Manuscript preparation was facilitated by Ms. Stranghellini-Kilmartin, Ms. Laura Brink, Ms. Kirkman, and Mr. Eric Paulovich (UC Davis Department of Wildlife, Fish, and Conservation Biology). Mr. Paulovich also facilitated the final editing and the transport of manuscript drafts among the publisher/reviewers, authors, and editors.

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