

## CONTENTS

LIST OF AUTHORS .....	v
FOREWORD..... David Challinor	1
INTRODUCTION	
Tidal marshes: Home for the few and the highly selected .....	Russell Greenberg 2
BIOGEOGRAPHY AND EVOLUTION OF TIDAL-MARSH FAUNAS	
The quaternary geography and biogeography of tidal saltmarshes .....	
..... Karl P. Malamud-Roam, Frances P. Malamud-Roam, Elizabeth B. Watson, Joshua N. Collins, and B. Lynn Ingram	11
Diversity and endemism in tidal-marsh vertebrates.....	
..... Russell Greenberg and Jesús E. Maldonado	32
Evolution and conservation of tidal-marsh vertebrates: molecular approaches .....	
..... Yvonne L. Chan, Christopher E. Hill, Jesús E. Maldonado, and Robert C. Fleischer	54
ADAPTATION TO TIDAL MARSHES	
Avian nesting response to tidal-marsh flooding: literature review and a case for adaptation in the Red-winged Blackbird .....	Steven E. Reinert 77
Flooding and predation: trade-offs in the nesting ecology of tidal-marsh sparrows....	
..... Russell Greenberg, Christopher Elphick, J. Cully Nordby, Carina Gjerdrum, Hildie Spautz, Gregory Shriver, Barbara Schmeling, Brian Olsen, Peter Marra, Nadav Nur, and Maiken Winter	96
Osmoregulatory biology of saltmarsh passerines .....	David L. Goldstein 110
Social behavior of North American tidal-marsh vertebrates .....	
..... M. Victoria McDonald and Russell Greenberg	119
Trophic adaptations in sparrows and other vertebrates of tidal marshes.....	
..... J. Letitia Grenier and Russell Greenberg	130
REGIONAL STUDIES	
Breeding birds of northeast saltmarshes: habitat use and conservation.....	
..... Alan R. Hanson and W. Gregory Shriver	141
Impacts of marsh management on coastal-marsh birds habitats.....	
..... Laura R. Mitchell, Steven Gabrey, Peter P. Marra, and R. Michael Erwin	155
Environmental threats to tidal-marsh vertebrates of the San Francisco Bay estuary .....	
..... John Y. Takekawa, Isa Woo, Hildie Spautz, Nadav Nur, J. Letitia Grenier, Karl Malamud-Roam, J. Cully Nordby, Andrew N. Cohen, Frances Malamud-Roam, and Susan E. Wainwright-De La Cruz	176

Are southern California's fragmented salt marshes capable of sustaining endemic bird populations?.....Abby N. Powell 198

CONSERVATION BIOLOGY

The diamondback terrapin: the biology, ecology, cultural history, and conservation status of an obligate estuarine turtle ..... Kristen M. Hart and David S. Lee 206

High tides and rising seas: potential effects on estuarine waterbirds..... R. Michael Erwin, Geoffrey M. Sanders, Diann J. Prosser, and Donald R. Cahoon 214

The impact of invasive plants on tidal-marsh vertebrate species: common reed (*Phragmites australis*) and smooth cordgrass (*Spartina alterniflora*) as case studies..... Glenn R. Guntenspergen and J. Cully Nordby 229

Tidal saltmarsh fragmentation and persistence of San Pablo Song Sparrows (*Melospiza melodia samuelis*): assessing benefits of wetland restoration in San Francisco Bay..... John Y. Takekawa, Benjamin N. Sacks, Isa Woo, Michael L. Johnson, and Glenn D. Wylie 238

Multiple-scale habitat relationships of tidal-marsh breeding birds in the San Francisco Bay estuary ..... Hildie Spautz, Nadav Nur, Diana Stralberg, and Yvonne Chan 247

The Clapper Rail as an indicator species of estuarine-marsh health..... James M. Novak, Karen F. Gaines, James C. Cumbee, Jr., Gary L. Mills, Alejandro Rodriguez-Navarro, and Christopher S. Romanek 270

A unified strategy for monitoring changes in abundance of birds associated with North American tidal marshes..... Courtney J. Conway and Sam Droege 282

An agenda for research on the ecology, evolution, and conservation of tidal-marsh vertebrates ..... The Symposium Contributors 298

LITERATURE CITED ..... 300