FOREWORD

Cane Toad Wars is the fifteenth installment in the University of California Press's Organisms and Environments series, whose unifying themes are the diversity of life, the ways that living things interact with each other and their surroundings, and the implications of those relationships for science and society. We have sought works that promote unusual and unexpected connections among seemingly disparate subjects, and that are distinguished by the unique talents and perspectives of their authors. Previous volumes spanned topics as diverse as treeshrew behavior and grassland ecology, but none have addressed such an extremely complex conservation dilemma as the one explored herein.

Cane Toad Wars engagingly recounts the most recent phase in Richard Shine's illustrious, career-long obsession with a fascinating continent and its biota. Previously, Rick had mainly studied the natural history of lizards and snakes, but here he turns to the ecological, cultural, and political processes underlying a notorious alien's success story—indeed, his creatures of choice are famously emblematic of human intervention gone haywire. Technically, alien species are those not present in a region prior to modern times; invasive species are aliens whose exploding populations negatively affect native ecosystems and/or human welfare. Averaging roughly two pounds each, Cane Toads were introduced from the Neotropics to the Land Down Under in 1935 to control beetle pests in commercial sugarcane. They are veritable eating and breeding machines and—squat bodies notwithstanding—astonishing long-distance hoppers. Within decades, these drab (some would say grotesque) amphibians had failed at their intended purpose but increased dramatically in population size and distribution, their explosive deployment causing catastrophic declines among some endemic wildlife. In the pantheon of invasive species, Cane Toads were soon superstars.

Rick's story unfolds across the eastern and northern parts of Australia, that long-isolated, mostly arid southern landmass so famous for adaptive radiations of marsupials, of lizard groups only modestly successful elsewhere, and of cobra relatives. What began with its author's concern for the invasive amphibians' potential impact on snakes at his favorite research site turned into a massive, multifaceted attack on the problem. Starting from field observations, taking ecological and evolutionary theory into account, Rick's team designed ambitious experiments; when results were surprising, they revisited theory, headed back into nature, and conducted more experiments. Over the years, he discovered a new form of selection, reached novel conclusions about how best to deal with the toads, and came to admire them. By my reading, these efforts have been successful by virtue of Rick's love of nature and boundless curiosity, but also because of his phenomenal ability to manage people, frame hypotheses for testing, and keep an eye on the matter at hand while thinking outside the box.

This book also reveals how a scientist's research agenda and personal choices can take unexpected turns—from being primarily aimed at answering fundamental questions in ecology and evolution to solving a problem centered on a single species; from framing questions in terms of simplistic, widely accepted concepts to more expansive, nuanced considerations and longer timescales. Now, thanks to years of teamwork—taking data on tens of thousands of tadpoles and toads, getting grants, writing dozens of peer-reviewed publications—some key answers are at hand. Meanwhile, Rick has been honored by Australia's highest awards for scientific achievement, a testament to the importance of studying organisms in the field, careful experimentation, and placing one's work in broader contexts. That *Cane Toad Wars* nonetheless will generate controversy is among its many strongpoints, especially because its author's personal biases are unabashedly on display and because he always circles back to evidence.

For us seasoned professionals, *Cane Toad Wars* passionately synthesizes the capstone endeavors of a renowned biologist—his painstaking research and its yield of far more than the sum of individual projects. For conservation's next generation of practitioners, this volume provides a candid, thoughtful look at how the work gets done and some hints for the path ahead. Lay readers, too, will enjoy Rick's vivid tales from the fieldwork, as well as his lucid explanations and clearly articulated vision of how societies might cope with invasive species. Most profoundly, *Cane Toad Wars* lays out two crucial lessons for everyone concerned about the fate of biological

diversity. First, effective conservation is about more than vilifying aliens and saving endangered species—it also must entail realistic adjustments to our notions of the native, the natural, and the wild. Second, conservation outcomes ultimately hinge on conflicting values—themselves shaped by complex and often murky cultural, economic, and political influences—but evidence-based science should play central roles in just how those struggles play out.

Harry W. Greene