

## WHEN THE KILLING'S DONE

Boyle, T.C. 2011. Viking (Penguin). 384 pp. Hardback: ISBN 9780670022328, U.S. \$26.95. Paperback not yet published: ISBN 9780143120391, U.S. \$16.00

It was inevitable with the increasing island conservation efforts worldwide that the inherent conflicts of life and death and choice would provide the grist for literature. Art initiates science is the theme of this novel, a fictional account drawn from the real life world of seabird biology, National Park management and animal rights. Along came T. C Boyle, a writer cut from some renown, finding characters in situations of conflict, travel and southern California geography with a touch of the absurd that makes for good storytelling. The referenced killing takes place in Santa Barbara, and the Channel Islands, where a dreadlocked animal rights activist, an antagonist named Dave LaJoy, tries to monkey-wrench the eradication of invasive mammals on Anacapa and Santa Cruz Islands.

The protagonist is a female Asian Park Service biologist, with experience on Guam, now living with her seabird biologist boyfriend and functioning as the PR point person on this series of eradications. Boyle cleverly takes real incidents that occurred at Anacapa, like a bloke boating out there to distribute Vitamin K to neutralize the effects of rodenticide, and weaves a story, overarching the island history to the present, showing us how the park had a former life as a working ranch, in times of former values. The plot seems familiar to us if we've attended enough PSG conferences, maybe we've even met these types, but as the book jacket sums it up: "Boyle ... examines one of the essential questions of our time: who has the right of possession of the land, the waters, the very lives and breath and souls of all the creatures who share this planet with us?"

While Boyle creates a plausible plot in which these two main characters operate, come together at public meetings and lead separate plotlines that ultimately intersect in conflict, I had some problems with his character development. It's hard to

fathom the white dreadlocked middle-aged animal rights activist's motivations beyond the glory of leading a movement. He shows little righteousness that a prim do-gooder would, in say a Maugham, Hawthorne, or Conrad novel. While the female protagonist is entirely sympathetic, I would like to have seen the opposite sides develop, so I could like the bad guy and hate the good guy and be surprised at the reversal at the end of the book.

Boyle's biology is correct; he covers the motives of the eradications, the complexities of the science, i.e. golden eagles that take island foxes must be trapped, brown tree snake control could involve aerial dropping Tylenol-laced mice wearing parachutes into the canopy. Indeed, how often is the Xantus's Murrelet a hero in a book?

Of greatest interest to seabird biologists per se is the slanderous portrayal of our namesake character here. Of course, he is strong, handsome and handy with boats, but turns out he is also the biggest schmuck (well almost). He gets the protagonist pregnant, won't or can't discuss her wanting the child, splits and is incommunicado as he flees to a field season on the Farallon Islands, then pulls out all his gear and moves to Alaska to work seabirds with some unknown UA, Fairbanks professor. Life imitates art?

Boyle wraps up his character arch in the end. The eradications go forward successfully, a baby is born, an island renewed, a rattlesnake symbolically reaches Santa Cruz Island while the antagonist dies at sea. I wouldn't want to give away more details, for perhaps you would like to be surprised at the literature of our field.

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## RAT ISLAND, PREDATORS IN PARADISE AND THE WORLD'S GREATEST WILDLIFE RESCUE

Stolzenburg, W. 2011. New York: Bloomsbury. 288 pp. Trade Paperback: ISBN 9781408825112, £12.99.

This is a nonfiction account of the island conservation in New Zealand, Hawaii, California and Alaska, a summary of milestones and the key scientists (many members of Pacific Seabird Group are named), as seen through the foreshortening lens of journalism. The dedication, "For Don Merton and Richard Henry Kakapo," summarizes this book, one I wished I'd written. Don Merton was a New Zealand biologist most associated with recovery of the rarest and most charismatic island birds, the flightless owl parrot, the Kakapo (*Strigops habroptilus*). Richard Henry Kakapo was the last in a lineage of genes from Fjordland, and sadly, both died shortly after this book was finished. But their legacy lives on, and Stolzenburg honors it with a detailed account of how the field of island conservation progressed from the Kiwi pioneers like Ian

Atkinson and Brian Bell, to the zenith of the movement—Rat Island, AK where the largest US effort resulted in the successful eradication of rats.

Stolzenburg sets the stage with historical figures like Sea Otter Jones of the Aleutians who began to remove foxes there in the Fifties, followed by Art Sowls, Vern Byrd, Steve Ebbert and the storm-troopers he mustered. The long-held secret of the fox eradication, shielded from public view so as to operate under the radar of those who would try to shut it down due to the use of leg hold traps, is finally told. The successful removal of foxes allowed the science to progress to the next level and begin removing rodents on a landscape level by following the Kiwi model.

The Kiwi model of rat eradication modestly began with hand baiting stations with warfarin and scaled up to the capacity enhancement of helicopter distribution of second-generation anticoagulants like Brodifacoum. Stolzenburg gets it right by acknowledging the stepping stone projects like Breaksea Island's Rowley Taylor and Bruce Thomas, to Langara British Columbia's Gary Frazer and Gregg Howland. Stolzenburg follows Howell and comes in for a landing with the Island Conservation and Ecology Group's Bernie Tershy, Don Croll, Josh Donlan, and Brad Keitt's work in Mexico as they are transforming from Birkenstock-shod surfer dudes into island conservation leaders. The rolling front of Mexican eradication successes sweeps up a team including Bill Wood, cat trapper extraordinaire. I recall the same talk that Stolzenburg cites of this humble bobcat trapper transfixing his audience of biologists. Their creation of a NGO importing the Kiwi brand of eradication with Yankee ingenuity delivers successes in clearing islands of cats and rats. This leads to the Anacapa chapter of the US's first aerial eradication. And here *Rat Island* coincides with the fictional *When the Killing is Done*. In *Rat Island*, Gregg Howell recounts how a Mr. Puddicombe found himself stranded on purpose on Anacapa, flinging pellets of vitamin K, the antidote to rat poison, while in *Killing*, it's the dreadlocked antagonist, Dave LaJoy.

Looking northward again, Stolzenburg finishes the rest of the history from the point of view of Kiska and the fantastic auklet colonies under threat of rat predation. Here, I even make it into the book, when I joined Art Sowls on an early rat assessment expedition. A years later, a ship grounding at Unalaska provided the restoration

settlement funds to scale-up the eradication of rats, not from Kiska but nearby from Rat Island. Island Conservation, along with the Alaska Maritime Refuge and The Nature Conservancy, combined forces to attack Rat Island in 2008 with all they had and left an island cleaned of black rats that had infested the place since 1780! The publicity blowback on 43 dead eagles wilted the enthusiasm but time will show these birds did not die in vain.

At the end of the 200 page story, we end where we began, with the last several banner years for kakapo reproduction (the total now totals 150), and we are left amazed at how Stolzenburg delivers on his promise in the subtitle—the greatest wildlife rescue, is well and finally told.

My only criticism is, in spite of naming names of prominent practitioners, the value of advocates and funders like PSG and the Packard Foundation are forgotten. PSG played a critical role in the early days as the clearinghouse for seabird conservation success stories, workshops for practitioners, and a catalyst where Kiwi, Mexican and American biologists met to plan the Mexican eradication priorities, under the auspices of a NAFTA grant. PSG continues to play a major role but as the science has matured as an academic field, the publications and talks have shifted to more esteemed restoration/conservation journals, and books like this write the history and old inspirations are forgotten.

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## THE FLEXIBLE PHENOTYPE: A BODY-CENTRED INTEGRATION OF ECOLOGY, PHYSIOLOGY, AND BEHAVIOUR

Piersma, T. & Van Gils, J.A. 2011. Oxford University Press, Oxford. 248 pp. 120 B&W illustrations. Hardcover: ISBN 978-0-19-923372-4, £65.00. Paperback: 978-0-19-959724-6, £29.95.

In 1978 while a graduate student at Groningen University in The Netherlands, I attended a public lecture given by Rudi Drent to mark the inauguration of his professorship. The links between that event and this book are several, beginning with the book's dedication: *To Rudi Drent: ethologist-extraordinaire, who never lost sight of ecological context*. Indeed, one of the authors (TP), then an undergraduate, was also in the audience that day (JAVG was still a schoolboy), and both authors acknowledge Drent (p. 11) as their mentor. Most importantly, this book carries on the program that Rudi outlined that day, but is much more expansive.

The central theme is that an organism's ecology pervades every aspect of the design of its morphology and physiology, and especially how flexible it is in dealing with its environment. The emphasis is on function in the field, and thus continues a long tradition in Dutch biology. The central character is the red knot, a long-distance migrating sandpiper, but there is a vast supporting cast, from 'Dutch dream cows' (Figure 5) to barnacle penises (Figure 47) to snake guts (Figure 52) to the immune system (Figure 94), and much else besides. The cast of topics is equally broad, encompassing symmorphosis, allometry (Box 2 on this topic should

studied by all students in biology), physiology, organ systems and metabolic ceilings, foraging models, the Red Queen, predation risk, migration, life history, global change and more. The central narrative focuses on phenotypic and other sorts of flexibility (see Table 1 on p. 3) and their relations with each of these topics.

The book begins by considering the basics of organismal design, specifically how water, heat, nutrient and energy budgets are maintained. It moves on to consider how these systems are matched to each other ('symmorphosis'), and the role of metabolic ceilings in how animals perform in the field. Flexible adjustments in design ('phenotypic plasticity'), optimizing behaviour, co-evolutionary races with parasites, and the effects on populations are discussed, and the book closes with a more general discussion on the evolution of flexibility.

The book is engagingly written, relating the intellectual history of many of the basic topics. Many of the topics discussed are directly pertinent to seabirds, but the book's real relevance lies in its synthesis of facts and concepts. It is synthetic in the sense meant by Peter Medawar in his essay *The Art of the Soluble*, in which he asserts

that far from endlessly expanding and generating an unsustainable flow of facts that requires ever-increasing specialization, good science continually incorporates facts into an increasingly coherent framework—and in that sense annihilates them.

Rudi Drent made important contributions to the study of incubation and parental care, but he was also an early seabird researcher. His 1965 paper on pigeon guillemots is still cited regularly. His emphasis on studying organisms in light of their ecology inspired a whole generation of ecologists, including the writer of this review. Sub-disciplines in ornithology, often defined by the taxa of

interest (e.g. seabirds, shorebirds etc.), are somewhat balkanized by different emphases, assumptions and beliefs about what is important. These are usually determined by history and custom rather than by objective analysis, and ornithology as a whole would benefit from greater annihilation of facts and more building of conceptual bridges of the sort engendered by this book. In spite of the fact that no seabirds are mentioned, it is recommended reading for all students of seabird biology.

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## ECOSYSTEM-BASED MANAGEMENT FOR THE OCEANS

McLeod, K. & H. Leslie (Eds.) 2009. Washington, DC: Island Press. 368 pp. Paperback. ISBN 1-59726-155-6. U.S. \$45.00

Ecosystem-based management (EBM), the latest buzz in marine resource management, is a science-based planning process leading to an integrated management plan at an ecosystem scale. With roots extending back several decades, its growing popularity among scientists and decision makers hints optimistically at improvements in marine conservation and resource management worldwide. The goal of EBM is to address cumulative effects, socio-economics, conflicts among marine uses, collaborative and integrated governance, and human communities. EBM is relevant to marine ornithologists because of the comprehensive nature of this planning process. The spatial specificity of seabird foraging and nesting sites, the complexity of the marine food webs seabirds rely on, and the diversity of threats from human activities are among the many reasons why marine ornithologists might be interested in EBM.

This book provides an introduction to EBM for those without access to the primary literature. The 42-author team is mostly US-based research scientists, with some contributions from Canada, Mexico, Australia, New Zealand and Denmark. The book contains perspectives from academia, government, private industry and non-profits, with experts in ecology, economics, sociology and conservation.

According to the editors, the goal of EBM is to “sustain the long-term capacity of systems to deliver ecosystem services” and this is explained well in the beginning of the book. Not all scientists or policy analysts would define EBM in this way but it is a reasonable definition. The book defines the three key elements of EBM as connections, cumulative impacts and multiple objectives. The 19 chapters are grouped into five parts and for those with sporadic reading opportunities, the chapters can easily be read out of sequence if one already has a basic knowledge of EBM.

The book launches enthusiastically into the complexities of EBM with a compelling call for social change (Foreword by Jane Lubchenco) and the promises of reformed ocean management on the west coast of the United States (Preface by Anne Guerry). Next, in Part 1, *Setting the Stage*, two chapters provide an overview of why EBM is needed for the oceans, and what managers need to do to engage in this process. Marine ornithologists with little knowledge of EBM will gain a better understanding of the concept

by reading the definitions for the key elements in Chapter 1 (pages 4-5) and the principles of EBM (page 14) and “a way forward” (page 26-28) in Chapter 2.

In Part 2, *The Conceptual Basis for Ecosystem-Based Management*, four chapters describe the ecological concepts behind EBM, such as drivers, resilience, scale, equilibrium, and ecosystem services. Chapter 3 describes oceans as “peopled seascapes” and discusses the status of marine ecosystems. The authors use a confusing number of different ways to describe peopled seascapes and muddy the waters further by failing to explain clearly the importance of people and traditional ecological knowledge in the human community aspect of EBM. The attempt to summarise the status of marine ecosystems fails because there are too few concrete examples or statistics used and perhaps this topic might best have been left out of the book. Chapters 4 through 6 are highly theoretical, and I think the respective authors might have misjudged the readers’ enthusiasm for abstract descriptions of models and their output. Chapter 6, the first of two chapters on ecosystem services, is a reasonable primer on microeconomic theory, in particular endpoints and production functions.

Part 3, *Connecting Concepts to Practice*, begins the book’s attempt to bring EBM into practice but is unfortunately one of its weaker sections. Chapters 7, 9 and 10 are surprising theoretical for a section linking EBM concepts to practice. Chapter 8, one of the most interesting reads in the book, saves this section, providing a description of ecosystem services and the difficulty of placing a monetary value on nature.

Part 4, *Marine Ecosystem-Based Management in Practice*, is intended to provide substantive, real-life examples for other scientists and managers engaged in EBM and, for me, is the best part of the book. Globally, implementation of EBM is ongoing, thus claiming success is premature, but steps to apply EBM are underway in an increasing number of locations. Chapters 11 to 15 relate six case studies where an ecosystem approach is being applied in USA, Canada and Mexico. Chapter 11 provides an inspirational account of EBM in Morro Bay, California by the San Luis Obispo Science and Ecosystem Alliance (SLOSEA). Their integrated planning process addresses the threats from offshore oil development to local

water quality, and this chapter is an excellent read for newcomers to EBM. The next three chapters provide some useful information on developing ecosystem indicators to inform EBM (Ch 12: Puget Sound, USA), the challenges of advancing sustainability efforts at a large scale (Ch 13: Gulf of California, Mexico) and evaluation of EBM in light of a major fishery collapse (Ch. 14: Eastern Scotian Shelf, Canada). Probably the most famous long-term example of using EBM in North America is Chesapeake Bay, in the eastern United States, and this story is detailed exceptionally well in Chapter 15. The authors explain what was known about the effect of nitrogen inputs in 1972 after a large hurricane, the role of science to advance federal policy, and the ultimate failure by decision makers to establish policy benchmarks to reduce non-point-source inputs of nitrogen. This information, along with the succinct descriptions in Chapter 16 of lessons learned, is valuable because it includes pertinent dates and processes that led to EBM implementation at several scales, and the challenges those processes faced.

Chapters 18 and 19, *Looking Forward*, end the book by describing a new ethic for the oceans. These final chapters offer surprisingly little concrete clear thinking on EBM and include perhaps one of the most disappointing comments in the book in a call for more research. With over 10,000 scientific citations for the Chesapeake Bay ecosystem, for example, it is hard to believe that more research is the answer. The lesson from Chesapeake Bay is likely one of governance. How else to interpret a multi-decadal marine EBM effort where scientific advice was largely consistent yet a government was unable to implement its own policies formulated at the highest levels?

To think creatively into the future, readers would greatly benefit from a short history of EBM, acknowledging the efforts to reform management of publicly owned resources. This should include contributions from scholars of common property such as Nobel laureate Elinor Ostrom (Ostrom 2009). The challenge of marine EBM—to moderate anthropogenic impacts with wise-use practices, guided by the best available science—requires detailed consideration

of the economics of common property resources and structuring of institutions to promote sustainable behaviour. Surprisingly, a discussion of integrated governance receives virtually no attention in the final chapters of the book. For marine ornithologists working to ensure the longevity of seabird populations, it is worth our efforts to encourage marine EBM proponents to connect more fully with the governance issue of integration and the public policy discussion of common property resources. EBM continues to gain political prominence worldwide as the preferred approach for reforms in ocean management. Seabirds, in common with most marine organisms, depend on entire ecosystems for their survival and thus marine ornithologists are logical partners in seeing EBM through to implementation.

I had high expectations for this volume given the calibre of the contributing authors, but I was disappointed. Despite the book's proclamation, most of the content falls far short on delivering the 'how' for EBM because it leans too heavily on pure ecological theory and too lightly on the practical aspects of EBM such as developing integrated governance. In the foreword to the book, Dr. Jane Lubchenco tells the reader that "this book provides concrete assistance for understanding the complexity, the connections, and the resilience of ecosystems, in short, for becoming good stewards" and while this is largely true, understanding ecosystems is only one piece of the puzzle. As a scientist actively engaged in EBM in Canada, I found this book failed to deliver strong, concrete examples linking science and governance to the enormous challenges and ultimate success of implementing EBM.

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