

Publications

Cougar: Ecology and Conservation edited by Maurice Hornocker and Sharon Negri (2009), 304 pp., The University of Chicago Press, Chicago, USA. ISBN 9780226353449 (pbk), USD 49.00.

Carnivores in general, and large felids in particular, are amongst the most threatened mammals (Ceballos et al., 2005, *Science*, 309, 603–607). Because felids are in direct conflict with humans for space and food, rising human populations and their increasing mastery over nature now threaten all large cats. The plight of the cougar, the new world counterpart of the adaptable leopard of Asia and Africa, is no exception. Despite possessing a wider geographical range, which is far less densely populated by humans than that of the leopard, the cougar is still in trouble, partly because it has to contest human cultures that are much less tolerant of predators while being technologically more capable. This impressive volume on ecology and conservation of the cougar—the most well studied of all big cats—therefore holds valuable lessons for all those who are struggling to conserve other large carnivore species.

The authors of the various chapters, led by pioneer Maurice Hornocker, have impeccable credentials to deal with their assignments. As a result the goal of providing researchers and conservationists with the essence of studies on cougars, which are scattered in scientific journals, has been ably met. Even the technical text is lucid and readable, as is the foreword written by Alan Rabinowitz, the ultimate brand ambassador for felids.

The book is divided into four Parts, each beginning with short evocative essays, one each by Hornocker, Kerry Murphy, Linda Sweanor and Harley Shaw. Part I summarizes the history of modern wildlife research on cougars. The first chapter is a wonderful personal narrative of how Hornocker, together with a tough bunch of hunters and woodsmen, initiated chemical capture of cougars in the 1960s, marked them with tags—and incredibly by today's standards—how all subsequent data of cougar locations came by harrying the tagged cat into a tree, with hunting dogs, so that the tag could be read! Then came radiotelemetry: Hornocker's disciple John Seidensticker was the first biologist to track cougars non-invasively using this method. Part I also contains an excellent summary by Bruce Gill on the evolving American

conservation ethos, starting with rapacious exploitation of nature, to Aldo Leopold's land ethic and eventually to preservation centered societal values by the late 1960s. But by then the cougar had been wiped out from most of the eastern USA! A chronicle of how cougar research developed (Harley Shaw), an essay on taxonomy and evolution (Melanie Culver) and an excellent account of management of wild cougar populations in North America by Charles Anderson, Fredrick Lindzey, Mark Boyce, Kyle Knopff and Martin Jalkotzy complete this Part.

Part II focuses on cougar population ecology and predatory behaviours. These chapters present core findings of modern ecological research. Subjects covered include population dynamics (Howard Quigley and Hornocker), followed by chapters on cougar ecology in tropical forests (John Laundre and Lucina Hernandez) and temperate habitats (Susan Walker and Andre Navarro) in Latin America. Part III focuses on ecological relationships among cougars, their principal prey and other competing predators. Kenneth Logan and Linda Sweanor cover social organization, followed by Kerry Murphy and Toni Ruth, who have written three back-to-back chapters covering diet/prey selection, predator: prey relationships, and interactions between cougars and other predators. Both Parts I and II are substantial, with as much meat as any predatory reader could desire.

Part IV brings back the human element: cougar coexistence with humans and conservation issues. Paul Bier has written an excellent chapter on the conservation value of cougars, Linda Sweanor and Kenneth Logan write about cougar-human interactions, David Mattson and Sue Clark deal with the politics of cougar conservation, and Sharon Negri and Howard Quigley provide an account of civil society groups furthering cougar conservation. Hornocker wraps up the book with an ardent plea for rational action to recover the ground for cougars. The book is data-rich, with five useful appendices covering genetic techniques, cougar hunting records, lists of conservation advocacy groups, and summaries of litigation and political initiatives affecting cougar conservation.

Although to some extent deficient on coverage of cougar ecology in the tropical Americas (no doubt because of paucity of comparable research) and on application of modern population analyses to cougar population or spatial data (e.g. Williams

et al., 2002, *Analysis and Management of Animal Populations*, Academic Press), I believe this volume is an outstandingly useful compilation. It fully meets Mao Zedong's cardinal principle, approvingly quoted by the editors in the preface: 'All genuine knowledge originates in direct experience'. Theory and practice of cougar science and conservation are well-blended in this volume, which is essential reading for anyone seriously interested in large carnivore conservation.

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Ecological Restoration: A Global Challenge edited by Francisco A. Comin (2010), xxv + 291 pp., Cambridge University Press, Cambridge, UK. ISBN 9780521877114 (hbk), GBP 45.00/USD 78.00.

The issue of scale is fundamental to ecology and conservation biology and scaling up is particularly important to the latter. As scientists continue to identify and refine tools and techniques for addressing the biodiversity crisis, they look to deepen their impact by working at increasingly broader scales. Studying and implementing ecological restoration techniques at local scales alone is a difficult task, given the challenges of bounding ecological systems, identifying appropriate targets, effectively measuring results, and generalizing from one system to another. Scaling up from local to regional or global levels adds even more complexity. The global arena for restoration ecology is the focus of this volume, edited by Francisco Comin and with chapters authored by a who's who in the field of restoration.

The book is divided into two major parts: the first outlining global perspectives and research and the second focused on practical applications at the global scale. Comin sets the stage in the first chapter by emphasizing why action needs to take place on the global and not just local or regional scale. While he provides more of a general overview of restoration ecology than specifics on global-scale restoration, he clearly articulates the underlying socio-ecological concerns. Chapter 2 addresses the global carbon cycle, laying out our current

knowledge about, and methods for measuring, carbon sources and sinks in terrestrial systems. The authors contend that the terrestrial carbon cycle is particularly unpredictable because of the influence of human activities and that restoration activities can help to stabilize and improve carbon uptake and storage. Chapter 3 provides an overview of emerging international carbon markets, which have the potential to support restoration of forest systems, and explores the potential conflict between carbon market goals and restoration aims. Chapter 4, by Robert Costanza, contrasts the business as usual future scenario with a restored earth scenario, and provides a general overview of ways to achieve a sustainable and desirable future. Chapter 5 briefly articulates the importance of local, cultural aspects to complement (and to some extent counter) sophisticated ecological techniques and trends towards national and international standards for restoration practice. Chapter 6 encourages consideration of the ethical dimensions of restoration, including attention to democratic participation in planning and implementation.

The first chapter in Part II, by David Lamb, details two interesting case studies—from Australia and Vietnam—that underscore the importance of incorporating underlying macroeconomic factors into restoration planning at larger, landscape-level, scales. Chapter 8 looks at restoration efforts across various ecosystems in China, with mini case studies for some of these. In Chapter 9, William Mitsch discusses wetland restoration from a global perspective, providing specifics on wetland loss across the globe as well as brief case studies from the USA and the Mesopotamian marshlands. Comin coauthors Chapter 10 on restoration in coastal areas, defining the various coastal systems (including urbanized coastal zones), their benefits to humans and threats to their future. Richard Forman covers urban systems in Chapter 11, with planning case studies from Boston and Barcelona, as well as more global discussions of collaborations between urban planners and natural resource planners. Chapter 12 addresses the role of ecological modelling, with a very focused look at two specific models that have been applied in various systems across the world. Amos Brandeis concludes the book with a chapter on two restoration projects situated in areas of conflict, the Alexander River Restoration Project, on a cross-border river in the Middle East, and the Lake Bam project in Burkina Faso. Brandeis details the challenges and opportunities for cooperation across divides to implement restoration activities.

While uneven in quality, the chapters across this book are a step in the right direction for planning and implementing restoration beyond local scales and in determining the distinction between local, landscape/regional and global scale restoration efforts. Happily most of the cases are of areas not previously covered in restoration literature. Particularly important is the book's effort to address the political, economic and cultural context for restoration planning and implementation.

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Trophic Cascades: Predators, Prey, and the Changing Dynamics of Nature edited by John Terborgh and James A. Estes (2010), xx + 464 pp., Island Press, Washington, DC, USA. ISBN 9781597264877 (pbk), GBP 27.00.

Scientists are facing a confluence of challenges with regard to preserving biodiversity and ecosystem function. Climate change, habitat destruction, introduced species, biodiversity loss, loss of topsoil, and increased additions of nutrients and pesticides are all recognized as major drivers of global ecological change. However, the loss of top-down forcing that results from the decline of apex predators (and megaherbivores) has largely been neglected both by ecologists who aim to explain the functioning of the natural world and conservation practitioners who try to preserve what remains. Fortunately, this book effectively synthesizes the knowledge needed to appreciate the role of top-down forcing as a ubiquitous force in nature at a critical time when many systems are experiencing habitat degradation, species loss and, at times, ecosystem collapse as a consequence of predator extirpation.

In this book John Terborgh, James Estes and the many contributors convincingly demonstrate that the Hairston, Smith and Slobodkin (HSS) hypothesis or the 'green world hypothesis', which proposes that the collective regulatory action of predators prevents herbivores from depleting vegetation, characterizes many natural systems. A trophic cascade is a term used to describe instances in which predator additions or deletions induce effects that cascade down food chains or food webs and affect biomass of organisms at least two trophic levels below (e.g. predator effects on primary producers).

Unfortunately, the current trend in most ecosystems is predator removal by human activities, herbivore release, and reductions in primary producer biomass and diversity, leading to drastic changes in the structure and function of ecosystems. Therefore, preserving/restoring many ecosystems requires us to reverse this trend and effectively conserve apex predator populations.

Trophic Cascades is a comprehensive, clearly written work divided into four main sections and has an extensive section of cited literature. The first section synthesizes the evidence for trophic cascades in a variety of aquatic systems: lake and many marine habitats, including intertidal, near-shore and open-ocean. Starting with aquatic ecosystems is logical as aquatic systems provide the classic examples of trophic cascades, including starfish effects on rocky intertidal communities, sea otter influence on kelp forests, and the role of predatory fish in lakes. The second section dispels the myth that trophic cascades are all wet by providing numerous examples of trophic cascades in terrestrial ecosystems from the tropics to high latitudes. The third section needs to be read by all conservation practitioners. It examines the effects of meso-predator release, trait mediated effects, body size and behaviours of both predators and prey, and interactions among predators, herbivores and fire in structuring vegetation, and also includes a crucial chapter on alternative states in ecosystems. I found the fourth or synthesis section to be somewhat redundant, reiterating many of the previously provided examples. However, this section is important to emphasize that top-down regulation should be universally accepted by professional scientists and conservationists.

Because climate change dominates much of the current scientific discourse it would have been nice to see a chapter that modelled and quantified the effect of predator presence or absence on carbon sequestration in various ecosystems. It is clear that ecosystems are typically 'greener' (i.e. have more plant biomass) in areas with apex predator populations at ecologically effective sizes but to what extent? This addition would have added strength to the argument that apex predators should be preserved and have possibly attracted a broader readership to this issue.

Altogether, *Trophic Cascades* is an important addition to both the ecological and conservation literature. No doubt it will be widely discussed because the HSS hypothesis and the concept of trophic cascades has