

## Invasions as a Tool for Basic Research

**Species Invasions: Insights into Ecology, Evolution, and Biogeography.** D. E. Sax, J. J. Stachowicz, and S. D. Gaines, editors. 2005. Sinauer Associates, Sunderland, Massachusetts. 480 pp. \$54.95 (paperback). ISBN 0-87893-811-7.

The topic of species invasions seems to attract edited volumes, and there have been so many good ones that it can be hard to choose among them. This volume sets itself apart from others by approaching the topic of species invasions with an explicitly different goal. As stated by the editors in their well-written introduction, the objective of this collection is not to interpret invasions according to current scientific knowledge, but vice versa: to highlight how species invasions can provide insight into basic questions in ecology, evolution, and biogeography. Although somewhat uneven, this book provided a stimulating focus for our 10-week seminar course, and we recommend it to others interested in learning about a broad range of topics on the more theoretical side of invasion biology.

The book is organized into three sections. The first, on ecology (chapters 1–5), includes broad summary chapters on what invasions can tell us about biotic interactions (Bruno et al.), ecosystem processes (D'Antonio and Hobbie), and infectious diseases (Lafferty et al.), among others. The second section on evolution (chapters 5–11) includes two excellent reviews of genetic bottlenecks (Novak and Mack, Wares et al.) and thought-

provoking chapters on niche conservatism (Holt et al.), sexual selection and speciation (Rice and Sax), and taxon cycles (Ricklefs). The third section on biogeography (chapters 12–17) covers a wide diversity of topics, including range expansion (Kinlan and Hastings), the concept of homogenization (McKinney and Lockwood), and scaling patterns (Labra et al.). Thoughtful summary chapters at the start of each section and at the end of the book round out the volume and give it a coherent feel.

The editors' goal to use invasions to inform understanding of fundamental ideas in biology was worthwhile; nevertheless, many of the authors had a hard time adhering to this objective. In fact, some of the chapters decidedly pursue the opposite goal. For example, Vermeij (chapter 12) explicitly sets out to show how knowledge of past biotic interchanges through the fossil record suggests that invasive species should not be treated as a conservation concern. Many chapters stray into weak or superficial comments on conservation implications or on more applied issues, such as control methods. Nevertheless, despite the wavering focus, all chapters offered provocative comments about the relationship between invasions and natural biological processes.

Another of the stated objectives of the book is to invite participation by leading evolutionary biologists and ecologists who are not usually associated with invasion biology. Although one might fear reinvention of the wheel, the potential benefit

of this approach is to bring in an outsider's perspective and generate novel insights. Only a modest proportion of the chapters are in fact primarily authored by such outsiders, but these do provide some refreshingly new perspectives. These chapters work best when they stick with the original aim of identifying ways that invasive species inform basic biological questions.

As with previous invasions volumes, some of the most interesting insights are provided by chapters that focus more narrowly on well-documented case studies. For example, Huey et al. illustrate how the increasingly well-understood evolutionary dynamics of introduced *Drosophila subobscura* and salmon (*Oncorhynchus* spp.) can contribute to evolutionary ecology. Their chapter provides an excellent reference for anyone not familiar with these classic cases. Similarly, Novak and Mack outline the details of several important studies of genetic diversity in plant invasions.

The perspective of the volume is strongly North American, with 80% of the authors from the United States and more than one-quarter from the University of California. Nevertheless, all chapters strive to outline general approaches or concepts, making the material relevant for an international audience.

As concluded by many of the authors in this volume, we have only just begun to tap the potential of biological invasions as a research tool for studying fundamental, important questions in biogeography, ecology,

and evolution. One of the strengths of this book is the way it brings these fundamental questions into sharp relief. *Species Invasions: Insights into Ecology, Evolution, and Biogeography* has the potential to be a wellspring of new ideas both for invasion biologists looking for new theoretical frameworks and for evolutionary biologists or ecologists looking for creative ways to utilize invasive species in their research.

Ingrid M. Parker,\* Eduardo C. García,  
Katrina M. Dlugosch, Pete Holloran,  
Sarah M. Swope, Kris B. Hulvey, and  
Robert Clark

University of California, Santa Cruz, Santa Cruz,  
CA 95064, U.S.A.

\*email parker@biology.ucsc.edu

## A Swan among Geese

### Island, Fact and Theory in Nature.

Lazell, J. 2005. The University of California Press, Berkeley, CA. 402 pp. (xx + 382). \$49.95 (hardcover). ISBN 0-520-24352-8.

Jeanine Deckers was an accomplished musician before she went public as the “Belgian singing nun.” Other nuns quickly bought guitars. They should not have (The Little Sisters of the Assumption, personal communication). Many biologists too should have left their “guitars” at home. To quote the composer Orlando Gibbons, born in the late 1500s, “alas there are more geese than swans.” James Lazell has done a lifetime of homework, and his cautious, yet informed, use of mathematics adds meaning to the sum of that work. He and his book *Island, Fact and Theory in Nature* should be ranked among the swans. Surely, Lazell is not a singing nun.

Problems in ecology become more difficult to solve as data in biology accumulate, and, in ecosystem study, they are doing so at an ever-increasing rate. I am not sure if

there is such a thing as a simple ecosystem, but some are surely more complicated than others. One way to deal with this complexity is to treat ecosystems mathematically. The idea of mathematical ecology has been around for some time, but it received a boost when G. Evelyn Hutchinson defined ecological niche as “an abstractly inhabited hypervolume” (Hutchinson 1957, 1965, personal communication). The idea of  $N$  dimensions brought about, more generally, a new thinking about ecosystem modeling. The search for a general formula that can be used to model ecosystems overall has been the life’s work of a number of scientists, some more successful than others.

Lazell’s sense of humor is evident throughout the book, but no more than in the mathematics chapters, where he gently chides those looking for a general statement that might define mathematical ecology. In these chapters Lazell gently leads the reader into his version of how the use of mathematics in the study of ecology might bear fruit. Amidst apologetics for what he considers his limited math skill, Lazell takes us from animal counts to trophic levels. His arithmetic prompts an appreciation of all ecosystems and particularly those related to island biogeography. Because of the way Lazell presents the math in these early chapters (it is tidy), this part of the book can be read at three levels. At the most basic, one does not even need to look at his formulae and proofs. His verbal explanations at the end of each chapter interpret with clarity what the numbers say. On a second level one can read the book and be instructed by his arithmetic or, at a third level, take issue with it. I found the math useful, but no more so than Lazell’s general caution, “life is more complicated than that.”

The major focus of *Island* is just that, an island in the British Virgin Islands called Guana, after a rock formation there that resembles an iguana’s head. (On some military

maps the island is labeled “Guano.”) Guana, however, is not his only study island. Lazell has studied many islands, and mainlands, all over the world. He claims every continent except Antarctica, and he has numerous publications to prove it. Lazell has worked on Guana for 25 years, and during that time has continued his work in other places. He has not only gathered new material but has acquired a lot of experience interpreting it, and much of his accumulated wisdom is passed on to the reader in *Island*. Thus, this book is a mature work that combines natural history, ecology, and mathematics, and it contributes to all of these fields. It comes as close as any work I have seen to a position statement about the nature of biological diversity. A book like this is the signature of a field worker’s life. For now, it is Lazell’s general statement. Guana is a phenomenal study area. Its biodiversity is beyond anything predicted by any calculation. In fauna, flora, and fungi, there are more species than expected . . . a lot more. As for the one or two remaining kingdoms, intensive study has not yet begun.

The book, however, does much more than try to explain why Guana is so diverse. It also describes that diversity. A dozen specialists, all accomplished scholars, contributed chapters to the book, and their writings add to the overall quality of *Island*. For instance, the chapter on the flora of Guana is by George Proctor of Kingston, Jamaica. There is no more qualified person in the world. Yet, these specialist statements are more than just a list of species. They are extensively annotated lists that may be considered stand-alone works. Just as they add to this volume, they are enriched by their presence in it.

*Island* is a comprehensive statement about the large number of species on Guana. It is difficult to arrive at a figure that covers the four or five kingdoms in biology, but five or six times the predicted variety would not be too high. Lazell’s primary explanation for this diversity is that

8800 years ago, when the sea level was 120 m lower, Guana was part of a much larger landmass. Lazell calls the landmass "Great Guania." It consisted of "the enlarged Puerto Rico, Caya des Muertos, and all of the Virgin Islands except St. Croix" (Heatwole & MacKenzie 1967 as quoted from *Island* p. 101). According to Lazell, at that time, the portion of land now known as Guana was in equilibrium and supported a large number of coevolved species. When the sea level rose and islands were formed, Guana's environment, because it was in equilibrium, continued to support about the same number of species because there was no competition between them. This is a functional explanation if cautious. Lazell is cautious throughout the book, particularly where the math is concerned, and he is cautious here, perhaps rightfully.

Elsewhere in *Island*, Lazell mentions there are pockets of similar habitats and microhabitats separated from one another by other well-defined habitats. This is verified by satellite imagery. There *are* patches of similar habitats between, next to, and around other habitats that are also similar to one another. It is as if one had 200 or 300 mosaic tiles in 20 or 30 colors, each color representing a habitat. If one were to spread the tiles unevenly in a shape that looked something like Guana Island, one would have a good representation of the arrangement of the patches. Hutchinson said that most of life's variety is found at the interfaces between habitats rather than at the center of any habitat (personal communication). I find that Guana has many, many interfaces.

Despite the fact that *Island* is entertaining and informative about things biological, from species to theory, the book does have its shortcomings, but not many. One of them, "The Cast," a short piece about taxonomy, comes too late in the book and should include more discussion. Lazell, following convention, refers to the system of biological classifica-

tion as the "binomial system." A binomial is two numbers and is something from algebra. Biological classification uses two names, is binominal, so it is the binominal system of nomenclature. Does this mean that all the biology books are wrong? Probably.

In "The Cast" the complete scientific name is given as genus, species, and generally the name of the person who described it. In most such derivations, the date is also included, "*Gibbonsia elegans* Cooper 1864" for instance. As for the use of Latin or Latinate derivations (grammar, etc.), as Lazell states, is not always correct. For instance, *Ekgmowechashala phylatou* is not included. In *Island's* table of contents, the frog *Eleutherodactylis Antillensi* [sic] begins the species name in upper case. I hope it is a typographical error. These problems and a few others are minor.

The number of contributed chapters brings up the question of whether this book should be considered an edited volume. I think not. The 25 years of field research on Guana has been orchestrated by Lazell, and dozens of scientists have worked there, many for multiple years. Lazell, with the support Gloria and Henry Jarecki, the island's owners, has been running a serial scientific conclave for the last quarter century. His contribution to the work of any individual specialist has been as much as that of the scientist him- or herself. The book, like the effort that has gone into it, should reflect this.

In *Island* Lazell mentions that his work is often autobiographical, and he has been criticized for this. His approach is certainly historiographic. As an intellectual history of island biogeography, and biology in general, it is wonderfully referenced and Lazell simply includes himself and his publications in this history. This is a book for various levels of readership, and Lazell's light-hearted comments about himself, his work, and that of others are engaging and his writing style adds to the book's worth.

Lazell sprinkles his text with asides that are set off from the rest of the text with a gray background. These are sometimes personal statements. In one of these he takes to task a former employer of his, a conservation organization, for relocating animals. I was on the board of directors of that same organization for 5 years (not while Lazell was there), and it does a lot of good work. The misdemeanors of the organization that Lazell mentions are, nonetheless, the truth. As for *Island, Fact and Theory in Nature*, it has few and simple misdemeanors. This well-produced book is filled with information that serves a wide range of readership, and it will serve biology and natural history for years.

#### Michael Gibbons

97B Main Street, Wenham, MA 01984, U.S.A.,  
email mgibbons@aya.yale.edu, mgibbons@wellesley.edu

#### Literature Cited

- Heatwole, H., and F. MacKenzie. 1967. Herpetogeography of Puerto Rico. IV. Paleogeography, faunal similarity, and endemism. *Evolution* 21:429-439.
- Hutchinson, G. E. 1957. Concluding remarks. Cold Spring Harbor Symposium. *Quantitative Biology* 22:415-427.
- Hutchinson, G. E. 1965. *The ecological theater and the evolutionary play*. Yale University Press, New Haven, Connecticut.

#### The Selfless Geneticist

**Conservation and the Genetics of Populations.** Allendorf, F. W., and G. Luikart. 2006. Blackwell Publishing, Malden, Massachusetts. 661 (xix + 642) pp. \$69.95 (paperback). ISBN 1-4051-2145-9.

The Florida panther was once considered one of 15 subspecies of puma (*Felis concolor*) in North America. By the 1980s, the last remaining population of the panther was down to just a few individuals that faced a

degraded habitat and severely reduced genetic diversity. Managers of the recovery effort had to decide between preserving the Florida panther as a unique taxon and restoring diversity to the embattled population. A genetic analysis showed that subspecies status was unlikely for the large cat, and managers chose a genetic rescue, releasing eight Texas cougars in southern Florida in the 1990s. With the introduction of new genes, the panther rebounded—the population now numbers close to a hundred, and there are fewer indications of inbreeding. The species may now be poised to expand its range beyond the narrow, swampy confines of southern Florida.

In a time of increasing habitat fragmentation and rapid climate change, it is likely that such translocations and the management of gene flow will require the expertise of evolutionary biologists and conservation geneticists. Wildlife managers will need to understand genetic variation and the effects of inbreeding and outbreeding, if not be comfortable wielding pipettes or running agarose gels. In their wide-ranging book, Allendorf and Luikart set out to train undergraduates and beginning graduate students in the basics of conservation genetics.

As any student of the discipline knows, it is a long journey. Much of the book is introduction, reviewing the basics of genetic variation and evolutionary change. It does not really get underway until Part III on page 305, which includes an excellent chapter on conservation breeding and restoration. The chapter on invasive species is informative—I had never heard of an eradication unit, the evil twin of the evolutionary significant unit or ESU. The last chapter on forensic and management implications provides some nice case studies of the use of DNA in wildlife identification. The appendix on statistical methods, which I intended to skip or at best skim, is surprisingly lucid and would be helpful to any advanced undergraduate or graduate student early in his or her career.

After the development of PCR, with the rapid rise in population genetic studies, geneticists were sometimes maligned for not knowing their species well enough to understand them in the field. Yet DNA technology has done a lot for conservation. In the 19th century, scientific collectors competed with commercial and sport hunters for specimens, helping drive some species to the edge of extinction. Since the molecular revolution, lethal sampling is often unnecessary, allowing the study of systematics and conservation to become more closely aligned. Entire studies can now be based on the flecks of skin sloughed from a whale, the blood from a turtle's tail, or the soon-to-be regenerated leg from a crab. It is no longer necessary to kill a cetacean to understand its life history or capture a carnivore to follow its movements or learn about its diet. DNA from fecal and hair samples make noninvasive studies practical and profoundly informative. Which is not to say they are easy. Allendorf and Luikart's book can help wildlife managers, faced with terms such as *haplotype diversity* and *F statistics* make sense of the information.

How does it compare with some of my favorite introductory texts, Hartl and Clark's (1989) *Principles of Population Genetics* (Sinauer Associates, Sunderland, Massachusetts); Graur and Li's (2000) *Fundamentals of Molecular Evolution* (Sinauer); Groom, Meffe, and Carroll's (2006) *Principles of Conservation Biology* (Sinauer)? It stands up quite well and is an excellent complement to Frankham, Ballous, and Briscoe's (2002) *Introduction to Conservation Genetics* (Cambridge University Press, Cambridge, United Kingdom), which may be more accessible to the nonspecialist. Nevertheless, the volume would have benefited from proper proofreading. (As much as I like the idea of a study of muskrats in Backwater National Wildlife Refuge, it is really Blackwater.) *Conservation and the Genetics of Populations* is a magnanimous book, captured in the

Zen vow that opens the preface: "The many beings are numberless; I vow to save them all." Molecular assays alone will not do that, but in synthesis with ecology, evolution, and systematics, they provide some of the best tools we have.

#### Joe Roman

Gund Institute for Ecological Economics, University of Vermont, 617 Main Street, Burlington, VT 05445, U.S.A., email joe.roman@uvm.edu

### Saving the Planet in the Pacific Northwest

**Restoring the Pacific Northwest: the Art and Science of Ecological Restoration in Cascadia.** Apostol, D., and M. Sinclair, editors. 2006. Island Press, Washington, D.C. 502 (xxvii + 475) pp. \$99.95 (hardcover). ISBN 1-55963-077-9. \$49.95 (paperback). ISBN 1-55963-078-7.

In the introduction to *Restoring the Pacific Northwest*, Dean Apostol writes,

The initial idea [for this book] was to gather leading practitioners to document the state of the art of ecological restoration in the region and thus help advance its practice. This reflects the stage of development of restoration, which is still quite a young field and is advancing primarily through the efforts of field practitioners rather than academic researchers. Practitioners are very busy saving the planet and do not have much time for research and writing, so much of the best technical knowledge is locked up in the heads and field notes of [restoration practitioners].

The claim that restoration knowledge is advancing primarily through practitioners rather than academic scientists is shaky at best. Knowledge is advanced in the scientific tradition through the integration of theory and practice, hypothesis and experiment. Theory guides practice and practice informs theory. In spite of

Apostol's debatable claim, this book is nevertheless an attempt to link theory and practice in applied restoration science, and it includes contributions from academic and nonacademic restorationists. Each chapter focuses on a particular type of ecosystem and begins with a brief review of relevant ecological theory (conceptual models of how the ecosystems work developed mostly by academics) and then proceeds to examples and discussion of the practice of restoration (undertaken mostly by nonacademic practitioners) in that ecosystem. Each chapter also describes case studies of habitat restoration, which is a great idea implemented with various degrees of success. Some case studies are interesting stories illustrating restoration complexity, challenges, and successes. These often involve description of the interactions between science, culture, politics, and human emotion (the real world of restoration). Other case studies merely list restoration actions without deeper exploration of the problems that restorationists confronted and resolved. Some case studies are little more than glib public relations announcements, missing critical analysis or self-examination.

The scope of the book is tremendously broad, covering estuaries and alpine meadows and almost every ecosystem in between. One glaring omission is floodplain restoration, which is only glancingly mentioned in the chapter on riparian woodlands, a chapter that inexplicably omits treatment of the vast bulk of the Pacific Northwest east of the Cascade mountain range. The breadth of the book's scope necessarily entails sacrificing depth and detail in the treatment of each ecosystem. Whole books have been written about each chapter topic, some with specific focus on the Pacific Northwest. Consequently, this book provides good introductions to habitat restoration in various Pacific Northwest ecosystems and is appropriate to a survey-scale advanced undergraduate course

or as a reference for busy environmental professionals, regulators, land managers, and policy makers who want to increase or broaden their exposure to restoration issues but do not have time to investigate the subject deeply. Those wanting a more thorough discussion of a particular ecosystem should consult books with a narrower focus or the primary scientific literature.

One of the most interesting chapters of the book deals with the application of traditional ecological knowledge (TEK) to habitat restoration. The chapter is an eloquent introduction to a promising area of research, and it clearly illustrates the value of including cultural values in habitat restoration. Nevertheless, the chapter is missing a discussion of how TEK might be translated into scientific information. This cultural translation is essential for TEK to be adopted by scientists, but how reliable is TEK for science-based restoration? Has there been degradation of information, given at least several generations of cultural oppression, changed lifestyles, and changed cultures? Are there cultural refugia where the quality of TEK is higher? How do we assay TEK quality except through tests conducted with the scientific method?

An important restoration issue that receives very short shrift is monitoring. Most chapters treat monitoring cursorily, if at all. If this brief treatment reflects "the state of the art of ecological restoration in the region," practitioners are doing little to develop the art into a predictive science. A fuller treatment of general monitoring principles would have discussed and provided examples of a variety of important issues, such as monitoring to audit a project (implementation monitoring); monitoring to evaluate project success in achieving preestablished project goals and criteria for success (effectiveness monitoring); monitoring to quantitatively evaluate habitat restoration-population response relationships (validation monitoring);

monitoring to test predictive models; monitoring cumulative effects and indirect effects; landscape-scale versus site-scale monitoring; monitoring as part of problem identification, problem solving, and solution testing; monitoring as hypothesis testing and its relationship to the scientific method in general; monitoring as part of adaptive management; statistical designs for monitoring; and prioritizing monitoring parameters.

For restoration science to grow and succeed, it needs both practitioners and researchers, and it needs them to communicate with each other and inform each other's endeavors so that research and restoration can both be more effective. This book contributes toward that exchange.

#### W. Gregory Hood

Senior Restoration Ecologist, Skagit River System Cooperative, LaConner, WA 98257, U.S.A., email ghood@skagitcoop.org

### Conservation Resentment Dissected

**Conservation Is Our Government Now: the Politics of Ecology in Papua New Guinea.** West, P. 2006. Duke University Press, Durham, NC. 320 pp. \$79.95 (hardcover). ISBN 0-822-33712-6. \$22.95 (paperback). ISBN 0-8223-3749-5.

Conservation projects can be considered attempts to change human behavior. Interestingly, those who study human behavior, such as cultural anthropologists, have been relegated to a marginal role in conservation efforts to date. In *Conservation Is Our Government Now*, Paige West, an anthropologist at Columbia University's Barnard College, details the implementation and operation of Papua New Guinea's Crater Mountain Wildlife Management Area. The Crater Mountain Project is one wherein conservation

nongovernmental organizations (NGOs), in conjunction with the local Gimi people, worked to protect biodiversity, such as the famed birds of paradise. From the outset Crater Mountain Project was conceived as an experiment in conservation that aimed to achieve the protection of globally significant biodiversity through changes in local behavior, coupled with alternate income through new connections with the global marketplace. West's book documents the considerable social disruption that followed, including a pronounced increase in the demands made on women's labor (for the production of tourist commodities). These demands were subsequently blamed for a death in childbirth; they helped fuel the resentment of conservation that pervades the community; not all disruptions were social ones. One conservationist's offer of money in exchange for the protection of birds of paradise was followed quickly by the loss of the entire lek through hunting. The association of Harpy Eagles and conservation was the impetus for one embittered local chopping down the tree that held the eagle's nest.

Most useful is West's documentation of the convergence of conservationists' vague promises of economic development with local expectations, where the latter involved relationships of reciprocity and recursive obligation rather than particular goods being traded. Conservationists saw their offerings as a *quid pro quo* relationship (i.e., cash for work or jobs for those with "eagle" land), where the ultimate arbiter of fair exchange was the market value of the thing given. In contrast, the villagers saw the relationship as a long-term social relationship of exchange, where ongoing sustained and mutual reciprocation was assumed. When this assumption was not met, justifiable incomprehension resulted. West herself clearly lives by her understanding of desired reciprocation, which is no small burden: given kindness and countless hours of conver-

sation work, which contributed instrumentally to West's thesis, book, and career. West knows it is her social obligation to help the villagers—even from a distance, in New York—with "school fees, money, help finding a doctor, a new wristwatch, help opening a bank account" (p. 235). That West's time is valued much more highly in the global marketplace than the villagers' time is irrelevant to the social relationships she has entered.

In chapters 3 and 4, what becomes clear is that meaning systems, like ecosystems, have their own logic that is often completely invisible to NGO staff and scientists, and yet is assumed by locals to be self-evident. Thus, when a conservation project is interjected into such a system, its success and its reception depend critically on the degree to which preexisting social arrangements and assumptions are understood. And, when things go wrong, it is almost never a matter of good versus bad actors (although there can be some of this), but rather a problem of mutual good intentions whose founding assumptions no party really understands.

In chapter 6 ("Conservation as Development"), West explains how conservationists restricted the food-provisioning activities of the men by attempting to create a substitute market for local rainforest goods while increasing hunting prohibitions. As women's labor to produce net bags for new markets became more valuable, bride prices rose and along with them, pressures on women to work to "live up to" their "price." West is quick to point out that this was not all the fault of conservation project. Any development initiative involving women producing commodities for a global market could have the same impact, but conservation NGOs were the actors in question here and thus the focus of women's resentment.

Also apparent in this case and well captured by the eponymous "conservation is our government now" is

that in nascent nation states or those with relatively informal civic infrastructures, NGOs or aid administrators often become the *de facto* government. This is an enormous responsibility that NGOs may or may not seek, but which should be addressed directly and not by happenstance. A good example of this appears in chapter 6, where West explains how conservationists' governing simplification of land tenure contributed to a family conflict and the chopping down of the harpy eagle tree. To simplify conservation action, conservationists assigned tenure authority to the first person who stated a claim over the land, ignoring the competing claims and the fact that such competing claims are commonplace. Resenting the benefits and prestige flowing to this one privileged actor, the man with the competing claim to the land chopped down the tree. "If I saw the bird, I would shoot it myself," said another, sister to the first man and mother to the second (p. 198). In the eyes of the conservationists, the second man was the "bad actor," although many members of the community supported his counter-claim to tenure. Meanwhile, conservationists naïvely maintained their simplification of the sociohistorical nature of systems of land tenure, wishing to "just find out who owns that land" (p. 196).

Land-based people are just that (land based). First, conservationists should expect long-standing regimes of use and tenure rights that are more complicated than any rules or arrangements one might first be told. Second, land is the economy. So, although new administrative or other jobs not based on the land are often desirable, what is needed more than anything is recognition that conservation projects invariably involve (intentionally and not) the development of a transitional economy of sorts and ultimately necessitate a new sustainable economy. One is left with a general concern about conservation action that involves introducing global markets and creating commodities

out of natural or human-made products that previously had only local exchange value, which is often the case in isolated places where much conservation action is directed. Yes, many of the complexities that arise when the “global” invades the “local” will occur regardless of whether interventions are conservation-and-development or just development, but this does not alleviate the challenge of doing conservation in such places. It will always be hard. Whenever development is involved, change must be expected, and it must be expected to alter the rules that structure economies. For example, crafts, such as net bags—whose exchange value is based partly or largely on consumers’ perceptions of quaintness and genuine traditions—will likely result in one of the following: (1) fail to provide income sufficient to meet the needs and desires of locals or (2) if mass produced, provide sufficient income for desired changes such as health care or education but then lose market share because of consumer

perceptions of what constitutes tradition. (Tradition is a function of those to whom it belongs and not of consumers, even though marketing goods rests on consumers’ naive assumptions about tradition.) Such an economy is either an effective transitional economy or a poor one, but it is not a sustainable new economy, and it cannot be expected to maintain prescribed “cultural values and abilities,” as advertised by marketers (p. 208).

Readers with a biology background will quibble with West’s definition of *primary forest* (as highly diverse, not old growth) and the focus on local (alpha) diversity over global (gamma) diversity in her explanation of the human enhancement of biodiversity. And some of the claims that West makes in prominent locations are not well supported. For example, at the end of chapter 6, West claims that the commodification of nature undermined the inherent value that people saw in Harpy Eagles (which is crucial for conservation success). But

there are multiple notions of inherent value, and the cultural significance of the eagles that West discusses (mostly as characters in didactic myths) does not necessarily demonstrate that locals value the continued viability of eagles. Regardless, these minor points do not detract from the crucial messages richly illustrated here. Some anthropologists seem to see little value in the conservation mission, which understandably unsettles conservationists, but West is not of this camp and clearly has not taken the adversarial stance some believe she has (p. 23). Instead she offers sufficient context and detail to make some initial lessons tangible, which just might be the first step in a more productive relationship between anthropology and conservation.

#### Kai M. A. Chan and Terre Satterfield

Institute for Resources, Environment & Sustainability, AERL, 2202 Main Mall, University of British Columbia, Vancouver, BC V6T 1Z4, Canada, email kaichan@ires.ubc.ca

#### Recently Received Books (April 2007–June 2007)

**Agricultural and Environmental Sustainability. Considerations for the Future.** Kang, M. S., editor. 2007. The Haworth Press, NY. 224 pp. \$65.00 (paperback). ISBN 1-56022-171-2.

**Baboon Metaphysics. The Evolution of a Social Mind.** Cheney, C., and R. Seyfarth. 2007. The University of Chicago Press, Chicago, IL. 348 pp. \$27.50 (hardcover). ISBN 0-226-10243-2.

**The Chicago Guide to Landing a Job in Academic Biology.** Chandler, C. R., L. M. Wolfe, and E. L. D. Promislow. 2007. The University of Chicago Press, Chicago, IL. 160 (x +

150) pp. \$14.00 (paperback). ISBN 13-978-0-226-10130-0.

**Design for Ecological Democracy.** Hester, R. T. 2006. The MIT Press, Cambridge, MA. 512 pp. \$39.95 (hardcover). ISBN 978-0-262-08351-5.

**Farming and the Fate of Wild Nature. Essays in Conservation-Based Agriculture.** Imhoff, D., and J. A. Baumgartner, editors. 2007. University of California Press, Berkeley, CA. 264 pp. \$16.95 (paperback). ISBN 978-0-9709500-3-1.

**The Honest Broker. Making Sense of Science in Policy and Politics.** Pielke, R. A., Jr. 2007. Cambridge University Press, New York, NY. 198 (x + 188) pp. \$29.99 (paperback). ISBN 0-521-69481-7.

**Ladybugs of Alberta. Finding the Spots and Connecting the Dots.** Acorn, J. 2007. The University of Alberta Press, Edmonton, AL-

berta. 169 pp. \$29.95 (paperback). ISBN 978-0-88864-381-0.

**The Last Human. A Guide to Twenty-Two Species of Extinct Humans.** Sawyer, G. J., and V. Deak, creators. Sarmiento, E., G. J. Sawyer, and R. Milner, text. 2007. Yale University Press, Hartford, CT. 256 pp., 71 color illustrations. \$45.00 (hardcover). ISBN 978-0-300-10047-1.

**Marshes: the Disappearing Edens.** Burt, W. 2007. Yale University Press, New Haven, CT. 192 pp., 92 color illustrations. \$35.00 (hardcover). ISBN 978-0-300-12229-9.

**The Ribbon of Green. Change in Riparian Vegetation in the Southwestern United States.** Webb, R. H., S. A. Leake, and R. M. Turner. 2007. The University of Arizona Press, Tucson, AZ. 480 pp. \$75.00 (hardcover). ISBN 0-8165-2588-9.