Environmental Conservation **29** (3): 399–406 © 2002 Foundation for Environmental Conservation DOI:10.1017/S0376892902000280

BOOK REVIEWS

The Unified Theory of Biodiversity and Biogeography

BY STEPHEN P. HUBBELL

xiv + 375 pp., 21.5 × 14 × 2.2 cm, ISBN 0 691 02128 7
paperback, US$ 29.95/GB£ 19.95, Princeton, NJ,
USA/Woodstock, UK: Princeton University Press, 2001

The search for a comprehensive theory of biogeography and biodiversity has a long and distinguished history. Even prior to the publication of Darwin and Wallace's ground-breaking ideas on natural selection, the human fascination with natural history was driving a vigorous search for order, pattern and meaning in the complexities of biotic distributions. Islands have featured persistently in the generation of such theories. Indeed, both Darwin and Wallace derived their evolutionary ideas from observations made principally on groups of islands and, that most engagingly simple model of biogeographical distribution, MacArthur and Wilson's equilibrium theory, is founded on island biogeography. So too it is with Stephen Hubbell's thought-provoking new book which, somewhat ambitiously, purports to offer a unified theory of both biodiversity and biogeography. Without doubt this is a lofty aim, but it is an important one. As Hubbell notes, the science of biodiversity is a fledgling one and arguably is no more advanced than was medicine in the Middle Ages. Conceptually speaking, we are 'still cutting open the bodies to find out what organs are inside (p. ix) in respect of our understanding of what organisms exist on earth (and in it) and where they are distributed. He argues persuasively that an understanding of biogeographical process should be an international scientific priority.

This book aims to present a new theory of biodiversity, essentially in a spatial context, and is in essence an attempt to combine theory regarding the biogeography of islands (which do not, of course, have to be only of the oceanic variety, since patches of habitat also qualify) with theory on species relative abundance. There is an important additional element to the theory presented here and one that offers a major advance over the simple (some would argue simplistic) equilibrium explanations of species diversity that the equilibrium theory represents. Hubbell introduces speciation into the mix and at once adds a critical fourth, dynamic, dimension to a potentially powerful explanation of diversity and abundance within defined geographical space. The incorporation of evolution into island biogeographic theory, performed mathematically of course, generates a dimensionless number, the fundamental biodiversity number θ which is equal to twice the speciation rate multiplied by a term defined as 'metacommunity size'. By adding in a basic measure of island size and immigration rate, the theory is able to successfully predict relative species abundance as well, something that MacArthur and Wilson's model also failed to do. The theory is regarded as neutral in that it treats all individuals within all species within a community (more accurately, within a trophic level) as having an equal probability of birth, death, migration and speciation. This is a controversial viewpoint, but one which Hubbell defends vehemently, the crux of his argument being that this enables both number of species and their relative abundances to be predicted from first principles. In this sense, the theory also addresses the issue as to whether or not communities are dispersal-assembled (i.e. essentially random collections of species coming together through the operation of largely stochastic processes) or niche-assembled (i.e. systematically constructed through the operation of very strict ecological rules concerning competition for resources and the allocation of highly specific niche-spaces). There is palaeoecological evidence to support both hypotheses, since there are both analogue and non-analogue communities in the fossil record (the likelihood of non-analogue communities increases with depth of geological time) and Hubbell is at pains not to attempt to take 'sides' here, since actual communities are a product of both processes. The solution to this problem lies in geographical and temporal scales and the unified theory offers a resolution based on these factors.

The book is structured in 10 chapters. After a brief introduction aimed at providing a motivation and context, chapters two and three review the intellectual roots of the new theory, namely island biogeography and species abundance. The theory itself is constructed in chapters four and five, the first of which examines rapid dynamics on islands and the second considers the slower dynamics of spatially and temporally larger metacommunities. These ideas are unified in chapter six, which presents a dynamical theory of species-area relationships, and in chapter seven, which explores the issue of biodiversity at the metacommunity landscape scale. Chapter eight incorporates the idea of evolution into the neutral theory while chapters nine and ten deal with its 'generality' and relevance to the aforementioned dispersal-assembled or niche-assembled community debate.

Much of the theory is constructed mathematically and this entails that, occasionally, substantial chunks of chapters are cryptic and difficult to read. Nevertheless, the book is in general very coherently structured and the summary sections at the end of each chapter (no doubt arising from the fact that the book was based on a course of lectures given at the University of Georgia) are most helpful. This is an important contribution to the development of a much sought-after explanation of pattern and process in an increasingly threatened global resource. Academic libraries, researchers and graduate students of biogeography will want to familiarize themselves with Hubbell's tantalising theory. The goal of understanding not only why islands have particular numbers of species,

but also why they develop recurring patterns of species abundances is a worthy one; achieving it is potentially vital to saving a meaningful proportion of the earth's biological diversity.

MICHAEL E. MEADOWS
Department of Environmental and Geographical Science
University of Cape Town
Rondebosch 7701
South Africa

African Rain Forest Ecology and Conservation: An Interdisciplinary Perspective

EDITED BY WILLIAM WEBER, LEE J.T. WHITE, AMY VEDDER AND LISA NAUGHTON-TREVES

xiii + 588 pp., 26 × 18 × 3 cm, ISBN 0 300 08433 1 hardback, US$ 65.00/GB£ 50.00. New Haven, USA/London, UK: Yale University Press, 2001

This volume is an important contribution to understanding of Africa's rainforests, written for the professional biologist. The 32 chapters are divided into six sections with an overview for each section. The first section provides an overview of the climate, vegetation and human dimensions. Section two deals with past and present trends in Africa's forests, including geology, biological hotspots, rates of forest loss, and the effects of climate change. The chapters in section three deal with the forest ecosystem, namely vegetation, ungulates, elephants, carnivores, birds, fishes, amphibians and reptiles. No chapter covers invertebrates. The fourth section addresses human impacts on the forest, while section five deals with applied research and forest management. Conclusions are given in the last chapter and epilogue.

It is not surprising that, with 43 authors, the quality and style of the chapters are highly variable. Some chapters would have benefited from more headings and subheadings, but this is a relatively minor detraction.

Perhaps the most important criticism to be made of this book is that it appears to have been seriously delayed in its publication, apparently by 4–5 years. Whether this was due to the editors and/or publishers is unknown. Although there are a few references cited after 1996, most of these refer to articles by the editors or authors of specific chapters in this book; little else is cited from 1997 onward.

This flaw was especially apparent to me in the section dealing with applied research and management. In particular, the chapters by A. Plumptre and J. Kasenene on logging impacts and practices would have benefited from reference to my 1997 book *Ecology of an African Rain Forest: Logging in Kibale and the Conflict between Conservation and Exploitation* (University Press of Florida). For example, Plumptre develops a model predicting changes in forest ecosystems in response to disturbance based on excellent new data from Budongo. However, a rather similar model, but one that included several additional points and concepts not considered by Plumptre, was published 5 years earlier in my 1997 book and similarly, much of the data in Kasenene's chapter. More importantly, we sometimes differed in our recommendations based on research in the same study sites. For example, Kasenene recommended that gaps created by logging should be no larger than 600–800 m^2, if there is to be natural regeneration of forest trees in these gaps. However, his own data, as reviewed in my 1997 book, indicate that this is much too large. I concluded from the same data set that gaps generated by logging should be no larger than 300 m^2 in order to foster natural forest regeneration. Likewise, the chapter by L. White and C. Tutin on the impacts of logging on chimpanzees and gorillas uncritically accepted the conclusion by V. Reynolds and Plumptre that logging had no adverse impact on chimpanzees in Budongo. However, in my 1997 book I re-evaluated these same data and pointed out that chimpanzee numbers declined appreciably after logging in Budongo.

The unusually long delay in publication of chapters, most of which were apparently completed by 1996 or very early 1997, is a disservice to the authors and readership, but the book nevertheless represents a wealth of information and vital reading for all who are interested in Africa's rainforests.

THOMAS T. STRUHSAKER
Research Scientist, Department of Biological Anthropology and Anatomy
Box 90383
Duke University, Durham, NC 27708
USA

Coastal Dune Management. Shared Experience of European Conservation Practice

EDITED BY J.A. HOUSTON, S.E. EDMONDSON AND P.J. ROONEY

xiii + 485 pp., 24.5 × 17 × 2.4 cm, ISBN 0 85323 854 5 paperback, GB£ 23.99, Liverpool, UK: Liverpool University Press, 2001

This text represents the proceedings of a European symposium held in Southport, UK in 1998. It contains papers from many of the key proponents in the field of dune research, and covers a wide range of topics, ranging from reports on practical approaches to dune management, to those dealing with more managerial and conservation issues.

The volume is laid out in six key sections, each dealing with one aspect of the symposium. In terms of subject matter however, there is the inevitable debate over whether papers should be in the sections in which they are placed or whether they should be elsewhere. Whilst this is difficult to remedy in such a volume, the inclusion of an index at the end would have made things easier, and would also have allowed the reader who 'dips into' the volume to be aware that other relevant papers do occur in other sections. The sections adequately cover a range of dune-related issues and include both the theoretical and focused study. Individual sections, in the order in which they occur, are geomorphological processes, nature management, people and dunes, the Sefton Coast Life Project, international and national priorities, and monitoring. Each of these sections contains a range of papers and a final appendix provides a useful bibliography of dune references divided on the basis of country.

Whilst symposium and conference proceedings are notoriously difficult to edit, largely because they typically have to incorporate all papers presented, I do not feel that the editors consistently present papers in the most effective way possible. For example, should the section dealing with monitoring dune habitats occur last?

The volume opens with a keynote paper by W. Richie, which effectively sets the scene by discussing the historical background and identifying the key contemporary issues in dune management. This immediately leads into section one, yet the first paper by K. Pye deals with more background issues relating to long-term geomorphological changes in dunes in response to sea-level rise and concludes with the points that dunes and beaches can cope with several millimetres of rise given adequate sediment supply, and that frontal dune erosion can occur under sea-level stand or fall, due to a range of other factors. Together these papers provide an informative base on which the volume builds.

The next set of papers starts by dealing with current research and recent advances in dune process management. J. Power *et al.* use Irish beaches to emphasize problems which arise due to the lack of understanding of process by local authorities. This relates well to some of the management and public perception papers covered in section three. R. Paskoff then illustrates the use of artificial dunes in France and outlines the problems of these, particularly with respect to arguments concerning mechanical re-profiling versus the use of fencing and planting. R. Morkunaite and A. Cesnulevicius' paper then discusses comparisons of old and new spit dunes, whilst S.E. Edmondson *et al.* report on relatively stable, accreting dunes at the northern end of Sefton. Both of these topics would perhaps have been better placed immediately after that of Pye. Following this, R. Ketner-Oostra reverts to management issues in a discussion of dune face management and associated nutrient problems for vegetation communities.

The next section deals with nature management and includes 10 papers dealing with the use of animals, natural or introduced, in managed dune systems. Much of this section relates to grazing pressures and the management of thereof. The use of cattle, sheep and ponies are discussed by P. Burtom (Sandscale Haws); rabbits by M. Drees and H. Olff (Netherlands), J.A. Potter and C.A. Hosie (North Wales) and L.A. Boorman and M.S. Boorman (Norfolk); and finally donkeys by M. Hoffman *et al.* Each of these papers investigates issues pertaining to the use and impacts of such grazers. Also within this section, management of dunes for the conservation of certain species is also considered. The management of woodland for squirrels is discussed by C.M. Shuttleworth and J. Gurnell. Other papers in the volume, such as by S.E. Edmondson and C. Velmans in Section 3, look at woodland as more of a management problem in dunes and it is interesting to look at both of these papers with such juxtaposition in mind. Habitat management for birds is discussed by O. Bronte and M. Hoffman, for lizards (particularly in response to cat predation) by C.T. Larsen and R.E. Henshaw, and Bryophytes by D.H. Wrench. Overall this section provides a useful insight into the management of dunes for a range of conservation issues, and provides some interesting managerial contrasts and potential problems when compared to some other papers in the volume which argue the case for management due to other criteria, such as golf courses, the military or tourism.

Section three looks at the relationship between people and dunes, particularly the growing area of public perception and acceptability of management. In this respect, the section provides key information into how future management policies need to incorporate elements of public education and participation. L. Geelan provides an insight into public relations with respect to a Dutch dune restoration scheme. This paper should be read with reference to others on the Sefton coast which follow it (not necessarily in this same section), because there are a series of developing themes here that need to be worked on to fully comprehend the message which comes across. Unlike a 'normal' text book where such themes could be properly explained, the nature of symposium proceedings make this very difficult to get across to the reader. Other examples presented here include machair conservation in Scotland (S. Angus), the role of golf courses and military land as conservation 'tools' (D. Stubbs and J. Baker respectively), and perception issues around dune management (S.E. Edmondson and C. Velmans, R.H. Davies, and F. Zwart). Finally, the role of public pressure in dune erosion, such as by tourism, is addressed in the context of public education and perception. Being attractive to visitors, dunes can, in effect, promote the very agencies of erosion that will eventually seal their fate. As such the management of tourism has always been of key importance in dune areas. In the context of this section, papers from M. Reimers (Denmark) and A.M. Wood (Scotland) develop themes along these lines.

Section four focuses entirely on the Sefton Coast Life Project. Being the focus of major European dune initiatives, and local to the symposium, this clearly makes for an effective case study. It is here though that one problem does arise in that it is difficult to gain an overall picture of the case study given that some papers relating to Sefton are not in this section at all. Whilst the editorial difficulty is clearly acknowledged, people dipping into the book for specific things may not realize the significance of papers located elsewhere. Of the four papers that do occur within this section, P.J. Rooney provides an introduction to the range and scope of the project overall, with the three subsequent papers addressing some main issues. Firstly, restoration of open dunes is covered by D.E. Simpson and M. Gee, then management of Ainsdale dune by D.E. Simpson *et al.*, and finally, golf course management by D.E. Simpson *et al.*, clearly, this latter paper also links to the earlier paper by Stubbs, yet there is no way of telling this without checking through the contents list. In this respect, an index would be useful.

This case study leads nicely into section five, which strives to identify priorities for dune management in the international setting. This is tackled in several ways, yet it is clear from the contents that other papers within the volume may also be applicable here. However, the seven included within the section cover a range of different initiatives in different countries. J. Hopkins and G. Radley, and K. Duncan both deal with the Habitats Directive as it concerns the UK, C.H. Oversen discusses management and practices in Denmark, J.-L. Herries and I. Killemaes focus on Flemish dunes, A. Salman on Greek dunes, K. Gaynor and G.J. Doyle look at Irish dunes, and Calda and Honrado discuss Portuguese dunes. Each paper looks at the different national perspectives and draws useful comparisons between different national approaches. This section should, however be considered along with that preceding it, as well as other papers throughout the volume.

The final section, and perhaps one which is rather misplaced, focuses on methods and applications of dune management. However, it appears a little strange in that it also contains papers that could equally well fall into other sections. In particular, P.M. Rhind *et al.* (evolution of Newborough Warren dune system), S. Provoost and W. van Landuyt (flora of the Flemish coast) could all perhaps better fill the criteria for other sections. However, those papers which concentrate on methodologies do tackle some pertinent issues, such as the use of cost benefit analysis in grazing management (G.J.M. Harrie *et al.*), methods of water table investigation (C.S. Bristow and S.D. Bailey), the recording of

edaphic characteristics (C. Ample and R. Langohr), morphological characterization of humus forms (Ampe and Langhor), monitoring of spatial change (S. Crummay *et al.*), spatial data collection methods (G. Edwards and A. Koh) and habitat modelling (J. Delf). Overall, this section sits a little apart from the rest of the text, but does contain some useful investigative methods.

Overall, I found this a useful text for updating key dune management issues. It is not comprehensive, but then this is not its fault, being a symposium proceedings volume. I do feel that it would benefit from a re-ordering in places and the inclusion of some form of index and cross-referencing to enable the reader to get more out of this useful volume. Despite this, I would recommend the volume to those who have an interest in European dune management.

PETER FRENCH
Department of Geography
Royal Holloway
University of London
Egham
TW20 0EX
UK

A History of Environmental Politics Since 1945

BY SAMUEL P. HAYS

ix + 256 pp., 23.4 × 15.5 cm × 1.5 cm, ISBN 0 8229 5747 7 paperback, US$ 19.95, Pittsburgh, USA: University of Pittsburgh Press, 2001

This book is a *tour de force* examination of the perspectives and issues underlying environmental politics of the USA in the post-war period. Written by one of the most eminent American historians working on the environment, the book succeeds in synthesizing an enormous range of issues and ideas into one readable book. This book, for instance, enables us to place President George W. Bush in his political context, and explain the motivations behind the President's stance on the environment.

Based on the observations the author has gained over his career and extensive primary research, the book presents in a succinct analytical fashion a number of key issues that inform the way the people of the USA govern, or do not govern, their environment. The emphasis of the book is less on providing data than presenting the grand picture of how those seeking to protect the environment and those forces resisting the regulation interact in a way that produces the outcomes we see in the USA. I know of no other book that, in such a succinct and simple fashion, tries to put into context the complex territorial, legal, economic, cultural, technological and political issues involved. The way the author goes about untangling complex issues makes this book an excellent starting point for further investigation into USA environmental politics. Some of the insights and conclusions will be familiar to scholars working on the USA or on environmental policy more generally, but the tremendous range ensures that it will be worthwhile reading for all scholars. In particular, the analysis of the environmental opposition, the smaller environmental non-governmental organizations, the environmental dimension in the city and state or region and policy evaluation provide new insights. Environmental practitioners as well will find material that can inform their thinking.

The one dimension that the book does not examine in a specific framework is the role of the international arena (World Trade Organization, North American Free Trade Organization, and so forth) and how it interacts with USA national politics, but this is very understandable given the book's already tremendous sweep and its clearly defined aims. The style of the book is very logical and concise, which means that upper-level undergraduates as well as scholars can follow its arguments. Those scholars and students of environmental politics and policy in the USA and advanced industrial nations more generally will greatly profit from reading this book.

ANTHONY R. ZITO
Department of Politics
University of Newcastle
Newcastle upon Tyne NE1 7RU
UK

Toward a Sustainable Whaling Regime

EDITED BY ROBERT L. FRIEDHEIM

x + 382 pp., 23.5 × 15.5 × 2.5 cm, ISBN 0 295 98088 5 hardback, GB£ 24.95, Seattle, USA/London, UK: University of Washington Press, 2001

This volume draws together contributions from a number of expert authors, which examine the current whaling regime and, in particular, the role of the International Whaling Commission (IWC). The book is well presented, although with few tables and figures, and no illustrations, its almost 400 pages provide a challenge to even the most serious IWC student. The views of the various authors are largely convergent on many key issues and its editor, the late Robert L. Friedheim, who was a professor of international relations at the University of Southern California, dominates the text, providing three key chapters, including the book's final conclusion. He reveals that the impetus for this volume came from a small group of experts that formed in the mid-1990s to 'examine what, if anything, should be done to fix the whaling regime'. Indeed, almost all the book's authors agree that some 'fixing' is needed.

The book is divided into three sections. In the first, 'Critiquing the performance of the whaling regime', William T. Burke and Jon L. Jacobson provide legal reviews of the IWC, but of greater personal interest to me (because of the importance of 'science' in the whaling debate) was the chapter that follows, by William Aron on 'Science and the IWC'. Aron was the USA's Commissioner to the IWC in 1977 and, from 1972–1977, was a member of the IWC's Scientific Committee (the book provides useful biographies of all the authors).

In the chapter that follows, Milton Freeman focuses on what he sees as the injustice of the whaling regime for whale hunters. Russel Barsh then builds on this in the next chapter, where he considers 'food security', rights and treaties. Then, in the next section, 'Explaining the Politics of the Regime, Elizabeth DeSombre delivers a strong polemic concerning how business is done at the IWC. She is fiercely critical of the USA, another theme that runs

through many of the other contributions, including the chapter by Steinar Anderson. His reflections are again based on a perceived state of stalemate at the IWC. Sandwiched between these chapters are Friedheim's interesting insights on 'Negotiating in the IWC environment'.

Christopher Stone and David Victor both provide summing-up chapters in the final section: 'Testing our arguments and finding a solution'. They ponder the implications of whaling 'law' for international governance. Whilst Victor describes the IWC in harsh words, he also comments that 'the imperfections of the whaling regime are less outrageous than initially appears, and, importantly ... feasible alternatives would be worse than maintaining the uneasy status quo'.

Friedheim, in the final chapter, disagrees with Victor and makes a number of challenging recommendations aimed at 'fixing' the IWC. In fact, some of his recommendations seem to already be in play at the IWC. For example, he states that 'the linchpin of a serious effort to restore the IWC to proper functioning is the development and approval of a revised management scheme (RMS)' and very serious consideration of RMS drafts is indeed currently ongoing.

The book provides a solid single reference source for the arguments used in support of whaling and I regret that I cannot recommend any single similar source for the counter arguments. Whilst I do not consider this book a balanced entry point for anyone new to the whaling issue, it is nevertheless a very important contribution.

However, I also note that, despite years of what most authors in the book would characterize as an 'impasse', the situation within the IWC, has, to my mind, recently changed quite radically because a number of new pro-use countries have jointed the Commission. This important trend looks set to continue but is not acknowledged in the book, almost certainly because it has happened since the text was produced.

Furthermore, much of the material presented is based on the notion that current scientific knowledge provides robust support for whaling activities. I believe that this is actually not so straightforward. For example, there is now clearly no pan-global single population of minke whales but, instead, acknowledged to be at least two species, and many different populations. Similarly, it has recently become apparent that there is no agreed population estimate for the Southern Hemisphere Antarctic minke whale stock (currently still targeted by Japanese 'scientific whaling' in the Antarctic). Such developments challenge the interpretation of scientific knowledge used at various points within the book.

MARK SIMMONDS
Director of Science
Whale and Dolphin Conservation Society
Alexander House, James Street West
Bath, BA1 2BT
UK

Insatiable Appetite: The United States and The Ecological Degradation of the Tropical World

BY RICHARD P. TUCKER

xiii + 551 pp., 23.5 × 16 × 3.5 cm, ISBN 0 520 22087 clothbound, US$ 45.00/GB£ 28.50, Berkeley, USA: The University of California Press, 2000

Many Americans believe that their major damage to the environment comes through littering (relatively unimportant) and driving gas-guzzling automobiles (very important). All too few realize the enormous impacts citizens of the USA have because of their consumption of mundane items ranging from bananas and coffee to hamburgers, magazines and trophy homes. Richard Tucker's monumental book could help cure that ignorance, but it will probably do little because too few people will read it.

I have done research in the banana plantations, coffee fincas and degraded pastures that cover so much of Costa Rica, and have personally seen the march of biologically depauperate oil palm monocultures replacing rich tropical moist forests in peninsular Malaysia, Borneo, and the Choco of Ecuador. I have watched trucks hauling huge logs out of Costa Rican forests where logging is 'forbidden'. But few Americans have had the opportunity to observe the consequences of their addiction to caffeine, fast food, automobiles and hardwood floors. And, from speaking to hundreds of tourists in the tropics around the world, I know that most people from rich countries do not recognize ecological devastation in the tropics when they see it. Our group does research in a ravaged landscape in Costa Rica that four decades ago was solid mid-altitude forest. Because a few patches of degraded forest still stand, and African grasses coat the hillsides, tourists there often think they are viewing tropical nature in the raw.

Tucker details the histories of the destruction of rainforests over much of the world to gain sugar, coffee, rubber, beef, timber and pulpwood, much of it destined for the USA. He does it with care for the nuances of biology, hydrology, politics, property rights and the fates of powerless peoples, be they indigenous or imported slave or semi-slave labour. He takes us from the Caribbean and Hawaiian lowlands to the hill country of Brazil and the forests of the Philippines, detailing the careless deforestation, erosion and squalor generated by enterprises that bought governments and cared nothing for sustainability. It is not a pretty story. But it is a supremely important one, and Tucker tells it very well. The book would be worth the price just for the fascinating account of the United Fruit Company. I, and many other environmental scientists, will find it an invaluable source.

What would I have liked to see included that is not in the book? More coverage of oil palms, which not only supply cheap cooking oil to poor people, but are unhealthy additives to many processed foods like soups, pizzas, crackers, and so on. And more elucidation of the impact of American population growth on the demand of the USA for tropical products would be helpful. When the overpopulation of the USA is discussed, all too rarely is the point made that the 140 million Americans of the World War II era demanded much less than did the 285 million Americans at the beginning of the 21st century. The role of population growth, among both rich and poor, in causing tropical deforestation is very complex, and its indirect influence through increasing demand frequently is neglected. Tucker describes how that demand has been met, and happily mentions the efforts of conservationist William Vogt to bring sanity to Central American rural development after World War II. Vogt's

brilliant 1948 book, *Road to Survival*, was the first to stimulate my interest in population environment issues, and he carried Tucker's basic message very well: 'By excessive breeding and abuse of the land mankind has backed itself into an ecological trap ... I do not mean the other fellow. I mean every person who reads a newspaper printed on pulp from vanishing forests ... who eats a meal drawn from steadily shrinking lands ... puts on a wool garment derived from overgrazed ranges ...' (p. 284). Vogt's book has a section entitled 'Too many Americans'. I wish Tucker's wonderful volume had one too!

But these are truly quibbles. My main complaint is that *Insatiable Appetite* is a landmark book whose message every American, indeed every citizen of a rich nation, should know well. But Tucker tells much more than the average person wants to know about the role of the USA in the overexploitation of the natural capital of the tropics. It would be wonderful if he could produce an abridged paperback version which could be distributed by NGOs helping with the daunting task of convincing the USA that its population is much too large, and that on average, its citizens consume far too much.

PAUL R. EHRLICH
Center for Conservation Biology
Department of Biological Sciences
Stanford University
Stanford, CA 94305, USA

Ecology, Uncertainty and Policy. Managing Ecosystems for Sustainability

EDITED BY J.W. HANDMER, T.W. NORTON AND S.R. DOVERS

xv + 320 pp., 23.5 × 15.5 × 1.7 cm, ISBN 0 13 016121 7 paperback, GB£ 24.99, Harlow, UK: Pearson Education Limited, 2001

Ecology is not a well-recognized player in policy debates though most ecologists wish otherwise (p. 2). This is one of the starting points of this interesting collection, which addresses the relationship between ecological knowledge and policy processes. The book is composed of 13 articles with a multi-disciplinary purpose. Most authors are ecologists, but also social and political scientists are present.

In the introductory chapter Handmer *et al.* identify several causes of the weak linkage between ecology and policy. Some of them go back to scientific principles and practices: in brief, natural systems are complex and ecological theory is incomplete. The editors also point out that highly specialized professions (ecologists) often have a very limited understanding of processes outside their own expertise (policy processes). Moreover, the characteristics of policies are of central importance, because science is subjected to reinterpretations when it enters the arenas of planning and decision-making. Thus, Handmer *et al.* define uncertainty and ignorance as the key concepts in the exploration.

The basis of this book is broad in several senses. The main issue is ecosystem management, and a few management approaches such as bioregional management are introduced. To their credit, most of the articles are based on case studies. The set of cases is, however, markedly heterogeneous: it includes, among others, fire management and biodiversity, wetland policy, fisheries management, and the policies on climate change and on acid rain. Further, since the separate cases reflect the practices of management and policy on three different continents (Oceania, North America and Europe), comparisons are difficult.

Uncertainty is a multi-layered concept and, as the editors note (p. 293), also a powerful tool of social control. Some articles are limited to the scientific uncertainty, while others look also at the political dynamics to which science is subjected. The latter approach is highlighted by Sonja Boehmer-Christiansen's article, which strongly criticizes the 'consensus science' in the background of the climate change policy. Bohmer-Christiansen writes that research should thrive on debate and controversy, not on consensus. Thus, she concludes (p. 134): 'The political weakness of science that is funded to be consensual and policy-relevant tends to result in advice that is ambiguous because it strives to serve all parties'.

In addition to the chapters by the editors and Boehmer-Christiansen, the viewpoints of environmental social science rest on the articles by Andrew Tickle and Ken Walker. Walker especially aims to take a comprehensive look at policy-making and processes by which scientific knowledge is transferred to the domains of policy. Interestingly, he brings in several approaches tackling on political agency and policy networks. However, this conceptual work by Walker unfortunately lacks illustrative connections to other pieces in the collection. The book ends with a substantive discussion by the editors, where they advocate, among others, the precautionary approach and contingency planning.

The book shows that a purely instrumental use of scientific results in the policy process is highly problematic. Thus, the overall argument is that we should break with the naive idea of 'better science results in better policy'. This implies that ecological science should become more reflexive on its own criteria and more critical of its own limits. Ecologists should put greater emphasis on the local context and, further, on the local networks and negotiations on issues of environmental management. They should be suspicious about universal ideas of ecosystem management and environmental policy, and thus, of global expertise.

Ecology, Uncertainty and Policy provides a rich overview of the multi-dimensional interplay between science and policy. It is certainly excellent reading for ecologists and environmental social scientists, as well as for the practitioners of environmental policy. Some readers may find the idea of social construction of science strange. The editors propose to them: 'Anyone who doubts that science is constructed should consider the contested nature of almost all ecological concepts' (p. 294).

PEKKA JOKINEN
Department of Regional Studies and Environmental Policy
University of Tampere
Finland

Fate of the Wild: the Endangered Species Act and the Future of Biodiversity

BY BONNIE B. BURGESS

xix + 211 pp., 23.5 × 16 × 1.5 cm, ISBN 0 8293 2296 2 hardback, US$ 29.95, Athens, GA, USA: University of Georgia Press, 2001

Fate of the Wild (*Fate*) is a summary of the social, political, and technical issues surrounding the USA's Endangered Species Act (ESA).

It also includes an attempt at prescribing an 'antidote' to species endangerment. The best of *Fate* is its summary of political issues and actions. Beyond that, this is a difficult review to write for someone who strongly agrees with the author about the need to conserve biodiversity.

Fate reads like an exceptionally well done master's thesis in environmental science, which apparently it is, but there is a reason why few master's theses are published. Despite the publisher's claim about 'Burgess's meticulous and exhaustive research' (inside jacket), the 'References' section is characterized by letters, memos, websites, brochures, newsletters, speeches, testimonies, newspaper articles, briefs, working papers, business files, and even 'comments'. Only four articles from a peer-reviewed academic journal are cited; all are from *Conservation Biology*. Most of the remaining references are to less rigorous academic or popular journals (for example *National Wildlife*) and books. While I would be in the same political camp as Burgess, I am not enamoured with the academic merits of *Fate*.

For policy scholars, *Fate* falls primarily under the rubric of pluralism, the study of interest groups and their political machinations (Scheider & Ingram 1997). Burgess calls the protagonists 'enviros', with the antagonists being led by property rights activists. Burgess does a good job of pluralistic accounting and I recommend the book for those seeking a summary of recent ESA political history. Chapters 6–9, especially, would be useful in 'biopolitics' courses or sessions.

Another public policy perspective evident in *Fate* is 'policy sciences', which focuses on improving agency structures and procedures (Scheider & Ingram 1997). Burgess thinks the solution for biodiversity conservation is largely a matter of retooling government agencies to practise 'ecosystem management'. 'Single species management is useful as a crisis discipline. Ecosystem management, on the other hand, is a conservation discipline' (p. 151).

Academicians and political bureaucrats have been ascribing magical properties to the phrase 'ecosystem management' for over 15 years, and many students have been pulled in by the rhetoric. Plenty of academic careers and budgets were built upon ecosystem management in the 1990s, but natural resources professionals were practising 'ecosystem management' since the days of Aldo Leopold, for example by managing across landscapes, collaborating with stakeholders and considering the long term (Czech & Krausman 1997). Having been in the trenches of wildlife conservation during the supposed 'transition', I still think there has been no significant shift from 'single-species' to 'ecosystem' management, but that we need a paradigm shift from 'management' to 'conservation' (Czech 1995).

Burgess (p. 156) is correct in stating: '... recovery plans, the formal embodiment of single-species management, are not working well', but is just as correct with her next sentence: 'The primary problem is lack of agency resources compounded by political foot-dragging'. This begs the question, how will 'ecosystem management' make the economy less hungry for natural capital (erstwhile species habitats) and put an end to the political foot-dragging?

This also leads to my strongest criticism, namely that of Chapter 9, 'Species economics'. To Burgess's credit, the fact that she even includes such a chapter is commendable, and she does identify some key economic issues. The shortcomings owe as much to the wildlife profession, which has been remiss in addressing the macroeconomics of conservation (Czech 2000*a*), as to students. Nevertheless, Burgess fails to identify the theoretical foundations for the fundamental conflict between economic growth and biodiversity conservation. She comes close, noting the seminal work of Herman Daly (p. 136), but arrives at it via secondary literature (a conservation biology textbook) and gives it short shrift. In this chapter and others, she relies mostly on anecdotal evidence of a conflict, evidence that neoclassical economists refute with ecologically ignorant theory yet with great public effect (Czech 2000*b*). Until the ecological principles (for example, niche breadth, competitive exclusion, trophic levels) underlying the conflict between economic growth and biodiversity conservation are understood by the majority in a capitalist democracy, we can practise all the contingent valuation, ecosystem management, and 'government intervention' we want, but we will make little progress toward establishing the steady state economy that is the macroeconomic manifestation of biodiversity conservation (Czech & Krausman 2001).

The lack of macroeconomic depth comes back to haunt *Fate* in the concluding 'antidote' pertaining to 'individual responsibility' (pp. 186–189). While I agree wholeheartedly with the prescriptions (for example, 'Reduce consumption and reduce discards ... Have fewer children ... review our definition of prosperity ...'), the choir needs no more preaching. Outside the choir, such prescriptions will ring hollow to the many citizens who have been misled by the economic growth rhetoric of corporations and their political lackeys. Burgess would probably be surprised to find that one of her apparent heroes, Bruce Babbitt (Secretary of the Interior under President Clinton), once claimed, 'There is plenty of room in this country. We can develop without limit in terms of economic growth and jobs' (Babbitt 1998, p. 16). We can hope that common sense prevails and that most *Fate* readers not already in the choir will figure out the importance of her prescriptions to biodiversity conservation (and posterity's prospects). 'Skeptical environmentalists' such as Lomborg (2001) and numerous followers will need to look elsewhere, however, for a convincing refutation of neoclassical economics with its theory of perpetual economic growth.

Burgess' writing style is straightforward and conducive to public readership, and I look forward to her next effort. I hope that effort, however, gets beyond the obvious political conflicts between 'enviros' and property rights advocates. There will always be room for the reporting of political events pertaining to the ESA, but Burgess has more to offer than this. If she continues with her political focus, let us hope she examines the iron triangle of corporations, politicians, and neoclassical growth economists that keeps conservation interests out of the economic policy arena. If she develops her economic analysis, may she apply the many ecological principles relevant to the human economy.

References

Babbitt, B. (1998) Protecting our common heritage – keynote. Transactions of the 63rd North American Wildlife and Natural Resources Conference, pp. 11–18.

Czech, B. (1995) Ecosystem management is no paradigm shift; let's try conservation. *Journal of Forestry* **93**(12): 17–23.

Czech, B. (2000*a*) Economic growth as the limiting factor for wildlife conservation. *Wildlife Society Bulletin* **28**(1): 4–14.

Czech, B. (2000*b*) *Shoveling Fuel for a Runaway Train: Errant Economists, Shameful Spenders, and a Plan to Stop Them All*. Berkeley, California: University of California Press.

Czech, B. & Krausman, P.R. (1997) Implications of an ecosystem

management literature review. *Wildlife Society Bulletin* **25**(3): 667–675.

Czech, B. & Krausman, P.R. (2001) *The Endangered Species Act: History, Conservation Biology, and Public Policy*. USA: Johns Hopkins University Press.

Lomborg, B. (2001) *The Skeptical Environmentalist: Measuring the Real State of the World*. Cambridge, MA, USA: Cambridge University Press.

Scheider, A.L. & Ingram, H. (1997) *Policy Design for Democracy*. Lawrence, USA: University Press of Kansas.

BRIAN CZECH
5101 S 11th Street
Arlington, VA 22203
USA