

of less nebulous components: resilience and variability (population parameters), persistence and resistance (community parameters). Questions such as what contributes to the variability of a population, what determines population resilience (bounce-back), which communities can persist in the face of invaders, and what happens when a species is removed from a community, are discussed. Theory and models form the basis for discussion followed by a review of the available data collected from many sources. Necessary mathematics and modelling techniques are introduced gently, leading to a clear understanding of how theory and data interact in ecology.

The book emphasizes some gaps in our knowledge; we clearly need more long-term data, we need to repeat experiments in time and space and we need to know which experiments produced non-significant results. We also need to know more about the interface between the traditionally separate population and community ecology because how a population responds to perturbation may well depend on other species. Given these gaps in our knowledge, the book is rather preliminary and theoretical in many respects. Those at the 'sharp end' of wildlife conservation may find the emphasis on theory frustrating, but much of the available data is well summarized, and could lead to some useful practical insights.

The book does have imbalances. Data and concepts from plant ecology are under-represented, even where relevant (for instance in discussions of population variability and community assembly). Not surprisingly, given Pimm's involvement in food web theory, this

area of community ecology is overemphasized. Sometimes Pimm uses an anecdotal style, reporting individual studies in more detail than can be justified by the conclusions that can be drawn from them and he seems ready to make fairly strong general statements based on only a few examples.

Despite these reservations, I recommend this book to anyone interested in the science of ecology and learning about what it and ecologists can contribute to an understanding of community and species loss. Potential readers range from motivated upper level undergraduates to practising scientists. I certainly learned a lot from it and gained some surprising and illuminating insights, which will be included in my future teaching and research.

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**Economics for the Wilds – Wildlife, Wildlands, Diversity and Development** edited by Timothy M. Swanson and Edward B. Barbier (Earthscan Publications, London, 1992, ISBN 1 85383 124 7, 226 pp., SB £12.95)

The sustainability debate rolls on. While many acknowledge that wildlife use can provide an economic incentive for conservation – and argue that in many cases sustainable exploitation is the only option available – there are those who view the concept of wildlife exploitation with deep distrust.

In recent years the 'use it or lose it' lobby has gained relatively wide credibility, yet examples of successful sustainable wildlife management remain sparse. One reason is

that sustainability encompasses so many issues – not only biological, ecological, and environmental but also sociological, legal, political, and, as the authors of this book argue, economic.

This is a book written, by and large, for economists by economists. It attempts to review, from an economist's perspective, the reasons for the impoverishment of 'wildlands', and surveys the obstacles that prevent both recognition of the true economic value of biodiversity and the establishment of sustainable management.

One of the strengths of the book is that a good range of case studies are presented to illustrate the various points raised, much of the original research being supported by the IUCN and WWF. However, while the various authors make concerted attempts to tackle these important subjects the discussion is continuously clouded by verbose and poorly edited text.

Seven of the book's 10 chapters are written wholly or jointly by the two editors, both from the London Environmental Economics Centre. An external editor would, I suspect, have been a wise investment because, without doubt, many potential readers will be put off by economists' jargon and indigestible prose.

There are more fundamental problems with this book: all too often one is left feeling that much of the discussion is academic and divorced from reality. Not only are there too many heavy-handed attempts to make extremely complex ecosystem processes fit economic theories but there is an extremely important problem the authors choose to ignore. This is the much broader question of the appropriateness of using the market economy as a

conservation tool. For instance, should it really be necessary – even if it were possible – to put a dollar value on a stable climate or predictable tides?

At best it seems likely that conventional market economics will continue to foster corruption and greed, both enemies of conservation. Much more worrying, economic growth – a central pillar of all national economies – is itself patently unsustainable on a finite planet. This is an issue that no one can afford to ignore – least of all environmental economists.

Moreover, many biodiversity problems are now international and subject to the vagaries of the international political agenda. International debt is widely recognized as extremely damaging to the interests of conservation but is barely discussed in the book and the General Agreement on Tariffs and Trade (GATT, which could also become a huge obstacle in the path of achieving sustainable management of wildlands) rates not a single mention.

On balance, the authors do make a convincing case – that wildlife managers cannot afford to ignore economics and that economists must incorporate the true values of wildlife and biodiversity into local and national economic and land-use planning. They also make a strong and sensible case for local involvement in all wildlife management projects.

From the conservationist's (as opposed to the economist's) perspective much the most stimulating chapter is that written by Timothy Swanson with Richard Luxmoore, Director of the Wildlife Trade Monitoring Unit of the World Conservation Monitoring Centre. This chapter reviews the wide range of intensities and types that wildlife use can encompass, considers the conservation and

economic consequences of domestication, captive breeding, ranching and wild harvesting and concludes, perhaps unsurprisingly, that the less intensive forms of management are the most likely to succeed.

Unfortunately, the typographical errors that pepper the book reach ludicrous quantities in this chapter. It is hard to imagine how so many errors – there are dozens – can have been allowed to remain.

Overall this is a worthy book on an important subject, sadly marred by a somewhat blinkered approach and very poor editing.

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**The Global Status of Peatlands and their Role in Carbon Cycling.** A report for Friends of the Earth by the Wetland Ecosystem Research Group, Department of Geography, University of Exeter, C.P. Immirzi and E. Maltby with R. S. Clymo (Friends of the Earth, London, 1992, ISBN 1 85750 105 5, 145 pp., SB £17)

This authoritative and substantial report examines the past, present and potential future role of peatlands in the global cycling of carbon. The main body of the report consists of eight sections, and starts with a review of the various definitions and classifications of peat (Section 1), the processes and dynamics of peat formation (Section 2), and the global extent of peatlands (Section 3). The global impact of agriculture, forestry and extraction of peat for fuel and horticultural use, is extensively documented in sections 4 and 5. The last three sections consider the role of peatlands as a source and sink of carbon dioxide and methane. The report's findings

are presented in an executive summary.

The report concludes that despite their relatively small global area, about 397 million hectares (3 per cent of the earth's surface), peatlands have played and will continue to play an important role in global cycling of carbon. Under natural conditions mires are capable of sequestering 2.25 tonnes of carbon per hectare. Although their ability to sequester carbon decreases with age, they continue to function as long-term carbon sinks. The report estimates that peatlands contain between 329 and 528 billion tonnes of carbon, about three times the size of the carbon pool associated with tropical rain forests. However, with disturbance and drainage, carbon, which has accumulated over millennia, is rapidly released, converting peatlands from a carbon sink into a significant carbon source. It is abundantly clear from the information presented in this report that peatland should not be disturbed and where possible water levels should be maintained.

These conclusions are supported by a rigorous and critical assessment of published material. The assumptions and basis used by the authors to assess the extent and magnitude of carbon fluxes associated with peatlands are explicitly stated and justified. The authors avoid making excessive or unsubstantiated claims in the report, which is well written and contains a wealth of information on the global status of a natural habitat that receives remarkably little effective protection. They highlight the lack of data on the extent of tropical peats, which are being rapidly exploited throughout the developing world.

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