

## Forest Fragmentation: Wildlife and Management Implications

Edited by James A. Rochelle, Leslie A. Lehmann  
and Joe Wisniewski, 1999.

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FRAGMENTATION of natural ecosystems occurs throughout the world due to processes such as agriculture, forestry, mining and urbanization. Much of the wheatbelt regions of south-west and eastern Australia face major problems relating to the decline and extinction of resident flora and fauna. Much of the problem relates to the lack of knowledge of the processes and consequences of fragmentation. By the time problems have been addressed, damage to the ecosystems are often irreparable. In North America, much of the forested regions of the Pacific Northwest have also experienced broad-scale fragmentation of the natural forested ecosystems through extensive silvicultural practices.

*Forest Fragmentation: Wildlife and Management Implications* summarizes findings from a conference of the same title held on 18–19 November, 1998 in Portland, Oregon. The text comprises fifteen chapters presented at the conference concerning fragmentation issues of managed forests of the Pacific Northwest of North America.

The text begins with a comprehensive foreword that introduces fragmentation as a “panchreston” concept with “broad appeal” relating to the diverse interpretation of the concept, “typically proving to be too broadly conceived and therefore oversimplified to be of any practical use”. Fred Bunnell, author of the foreword, states that the goal of the text is to “... (give) meaning to ‘fragmentation’; particularly, meaning that is of practical use” and to dismiss the panchreston. By his own account, Bunnell acknowledges the failure of the text’s papers to provide a universal definition for the concept of fragmentation, and attempts to provide reasons for the confusion as well as provide a comprehensive overview of the conceptual breadth of fragmentation.

The fifteen chapters cover a wide range of issues including fire effects on fragmentation, landscape pattern dynamics, landscape connectivity, edge effects, role of genetics in forest fragmentation, integrated landscape management as well as four chapters dealing exclusively with the effect of fragmentation on birds.

The text is well structured with a thorough introduction in the first chapter, drawing on the connection between the fragmentation/habitat loss concept and the equilibrium theory of island biogeography. This is followed by an overview of the effects of fragmentation on landscape patterns within the Pacific Northwest. The last of the broad

perspective chapters covers the ever-important question of whether habitat loss or fragmentation is the most important determinant of the persistence of forest-dwelling wildlife. The text then follows with issues relating to the consequences of fragmentation within forested systems of the Pacific Northwest. The main body of the text concludes with two case studies on the application of fragmentation concepts in forest planning. The final chapter provides a useful and comprehensive summary of the conference contributions; utilizing key findings and concepts as well as providing more pointers toward a universal definition of the concept of forest fragmentation. Management considerations and research needs are also proposed. Preceding the summary statements is a key word index with a list of the key words from the individual chapters. This list is somewhat superficial and should have been complemented with a subject index or key word index of words throughout the chapters rather than the chapters’ key words. Similarly, an appendix of complex terms would have assisted in the interpretation of some results.

The use of a wide range of photographs and tables as well as colour and black and white figures provided easy interpretation of the results presented. Conceptual models in some of the chapters (Pp. 87, 164, 176) were easy and clear to understand. Some figures, however, were confusing, in that there were often up to four shades of grey in graphs and maps (Pp. 68–81). Utilizing different patterns would have made interpretation easier. Similarly, in Kremsater and Bunnell’s chapter on edge effects (Pp. 119), there was no scale provided on the diagram. It was up to the reader to determine that the scale was in metres and not in some other empirical measure through reading the diagram’s footnotes.

Each chapter contains a multitude of references from throughout the world, emphasizing the similarity of issues addressed in the Pacific Northwest, with all other regions of the world experiencing forest fragmentation. Implications for landscape management and future research directions are included at the conclusion of all chapters, providing a valuable insight into management and legislation procedures required to manage fragmented habitats.

Various errors do occur throughout the text including referring to wrong figures so care is required in order to search for the figures that correctly correspond to the specific text explanation. Numerous spelling mistakes were also noted, including the misspelling of “vegetation” as “vegeatation” in the figure caption on page 132.

The text’s main findings can be summed up with the notation that in the Pacific Northwest of the United States of America, total amount of habitat, and habitat loss issues are of greater significance for

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vertebrate survival and persistence in human-altered landscapes than is forest fragmentation and connectivity.

The book is stated to be aimed at helping "... resource managers, planners and scientists ...". With the broad scale changes taking place throughout the world as a result of habitat loss and inevitable fragmentation, *Forest Fragmentation: Wildlife*

and *Management Implications* is also a useful reference text as well as a case study text for advanced students of environmental management and advanced ecology. Although the text is centred on processes present in the Pacific Northwest, fragmentation, and the consequences of fragmentation are similar throughout the world, thus the content and concepts of the text are applicable and valuable throughout other regions, including Australia and the Pacific.

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## Nature's Services: Societal Dependence on Natural Ecosystems

Gretchen C. Daily, 1997.  
Island Press, Washington, DC.  
ISBN 1-55963-476-6.  
Pp. xx and 392, 12 Chapters.  
RRP US\$24.95.

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UNPRECEDENTED growth and global expansion of human populations over the last 100 years has resulted in the widespread degradation of natural ecosystems. Of equal concern is the basic failure of people to appreciate the ecological, economic and social values of the services natural ecosystems provide and the ultimate impacts of their loss.

*Nature's Services* was initiated by ecologists following a dinner discussion regarding this lack of public concern. The decision was made to assemble a group of natural and social scientists to combine their knowledge of ecosystem services and their value to society, and to report this information to an educated audience. The resulting text consists of contributions by 32 scientists including Paul Ehrlich, Gretchen Daily and Norman Myers. Although from diverse backgrounds, the authors were united in their approach, all believing "... while civilization is presently careening along on a dangerous course, its fate is not sealed", that "... society is poorly equipped to deal with environmental tradeoffs," and although much is known about the importance and value of ecosystem services "... the information has neither been synthesized nor effectively conveyed to decision makers or to the general public."

The book is divided into five sections. An introduction briefly describes what natural services are, the impacts humans have had on them, and what may happen if we continue to abuse global ecosystems. Part One provides a detailed account of how ecological services and goods are valued and outlines some of the difficulties that arise when valuing "free" goods. Parts Two and Three describe the services provided by different components of the natural environment, evaluating each from social and economic perspectives and providing ideas of the costs and complexities of replacing these services with manufactured equivalents. Case studies in Part Four outline our dependence on natural services and the day to day interactions between humanity and the environment. The concluding section presents an overview of major findings and discusses the need

to identify, value, monitor and ultimately safeguard ecosystem services. Each section has a concise introduction and most chapters present a conclusion and extensive reference list. An eighteen-page index and use of clear headings and sub-headings make navigation of the wealth of information presented in *Nature's Services* quick and simple.

The ecological information presented in *Nature's Services* is simple, clear and easy to understand, even without an environmental background. The authors cover a wide variety of environmental services, many of which may surprise some people. Some, such as those provided by pollinators and soil microbes, are described in great detail, the text also covers general functions of large biomes such as oceans and forests.

The chief aim of the book was to "... characterise the ways in which earth's natural ecosystems confer benefits on humanity ...". To do this *Nature's Services* addresses the long-held belief that environmental goods are free and the resulting dilemma that society does not protect that which has no economic value. Environmental economics is a major focus of *Nature's Services*. The chapters presented in Part One are therefore invaluable as they introduce a range of issues pertinent to the valuation of environmental services. However, the text in this section is often quite technical, weighed down by extensive use of numbers, percentages and monetary values and may confuse readers with little or no economic background. A comprehensive glossary of economic (and environmental) terms would enhance the effectiveness of these chapters.

In presenting works by economists, social scientists and ecologists the reader is made to consider all value issues as parts of a whole rather than in isolation. Through this, the book succeeds in dispelling the "free good" myth, illustrating not only that ecosystems are invaluable in supporting world economies but, also provide the most basic needs of society.

Although social values were considered, *Nature's Services* focuses heavily on economic issues. It is a sad indictment of society when the people most aware of the need to preserve ecosystems feel they can most effectively argue their case through economics. Natural things and places have intrinsic values that cannot be bought or sold. Have people forgotten this? We hope not.

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