

New Zealand as ecosystems

The ecosystem concept as a tool for
environmental management and conservation

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Cover: New Zealand ecosystems as a continuum from the sea to mountain tops: looking east to Wanganui River and the Southern Alps from Mt Oneone, South Westland. Photo: Audiovisual Library, Department of Conservation.

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Preface

By publishing this volume, the Department of Conservation is pleased to be associated with Geoff Park's work. Much of the research on which his writing is based was undertaken during the years he was employed with DOC's Science & Research Unit. Nonetheless, the inspiration and energy behind it is his, and he deserves full credit for the result. We have provided support and encouragement throughout Geoff's time with us, to explore this important subject and are proud to document some of his wisdom here.

The book does not represent the official DOC view on all of these matters because that may have constrained debate on a topic that requires a wide array of opinion. Still, we acknowledge the need to take a broad and holistic approach to protection and management of New Zealand's nature, and our own policy and planning systems are evolving accordingly.

The concept of New Zealand as ecosystems helps underpin the vision of the nation's Biodiversity Strategy, our response to the global biodiversity crisis. It also helps establish some of the founding principles for the sustainable management of natural resources in the long term.

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One of the most important alternative suggestions, dating back in essence to Heraclitus, is that the world consists of complex systems of interacting processes varying in their stability. Each such system—of which a human being is one—can survive, like a flame, only so long as it can interact with surrounding systems in particular ways, drawing upon and giving out to the systems around it. It can die by choking on its own wastes or because it has exhausted its resources. That way of looking at the world, which ecological investigations help to substantiate, makes it perfectly plain why ‘You can’t do one thing at a time’; it destroys, too, the belief that human beings are somehow different, outside the ecosystem, whether as villainous intruders or heroic manipulators. [John Passmore]¹

¹ John Passmore (1974), ‘Man’s Responsibility for Nature’. Duckworth, London. 183 p.

Introduction

In conservation programmes throughout the world, there is mounting recognition that the focus on species and their communities, and on protected areas that preclude human use, is not working. Sufficient biodiversity cannot be preserved in perpetuity by reliance only on the protected natural areas that have been set aside from land development. Current trends in many New Zealand ecosystems suggest that, without more ecologically coherent landscapes—greater linkage between natural areas and restoration of natural processes—the margin of insufficiency will only increase in the near future.

Driving this concern is a sea change in ecological theory and science, revitalising the ancient view that holds the life of the world as a myriad of interacting systems, alive and effortlessly self-organising in its own chaotic ways. It recognises that to sustain biodiversity over generations we will need to think beyond places, to processes. We will have to reach beyond the remnant, indigenous patches that so often make up the conservation estate to the integrity of the whole, landscape-sized life-support systems of which they are part.

An expression of this is the emergence of the ecosystem concept in New Zealand's nature conservation and resource management laws. Yet despite the legal requirements to represent ecosystems and protect their intrinsic values, interpretation of the ecosystem concept remains vague and uncertain.

This book explores this new frontier for conservation biology, environmental management and sustainability. It was compiled between 1993 and 1996, at a time of active incorporation of 'ecosystem management' in public policy, notably in the United States and Canada, and consequent active debate on the ecosystem concept and means of depicting ecosystems. It introduces the various means by which New Zealand could be understood and cared for as ecosystems. It recognises that the need for a national

ecosystems framework has arisen not only in biodiversity conservation, but also where the linear logic of the law meets the chaos of nature: in the debate on sustainable land management and state-of-the-environment reporting.

Land as ecosystems

Conservationists need some way of identifying kinds of ecosystems—ideally, defined by both biotic and abiotic qualities—that have suffered disproportionate losses since European settlement. These ecosystems would be logical priorities for protection and restoration. [Reed Noss]²

ECOLOGICAL OPPORTUNITIES FOR MANAGING THE ENVIRONMENT

The maxim of the modern science of ecology, as of the traditional knowledge systems of most nature-based peoples, is that everything is systemically connected to everything else. This inter-relatedness is central to the basic unit of ecology: the *ecosystem*. Humanity has evolved and spread across the earth by dependence on resources wrought from ecosystems. As the stress on ecosystems increases, and global concern about their future sustainability deepens, there is disillusionment among biologists and resource managers about how to approach, operationally, the seemingly overwhelming charge of conserving their biological diversity in the long term. Paralleling this is growing concern at insularity and the explicit, exclusionist misanthropy of many protected area strategies such as New Zealand's³.

At the heart of this shift is the ecosystem as a unit of resource management. This requires thinking long-term, and beyond protected area boundaries; understanding and managing processes; and taking human ecology seriously without making it the centre of creation or ecologically separate from the rest of life.

² Reed Noss (1995), *Endangered Species Left Homeless in Sweet Home*, Editorial, in *Conservation Biology* 9(2): 229-231.

³ The Liz Claiborne and Art Ortenberg Foundation, New York (1994) *The View from Airlie: Community Based Conservation in Perspective*; Deborah Bird Rose (1996), *Nourishing Terrains: Australian Aboriginal Views of Landscape and Wilderness*, Australian Heritage Commission, Canberra.

The new ecology bids us to think beyond the places specially set aside from human activities and the individual species that, world-wide, have been at the centre of the conservation effort, to the wider life-support systems of which both are constituents.

The question is how best to delineate ecosystems, measure them quantitatively and evaluate them qualitatively. Representation of the full range of ecosystems is arguably the most accepted conservation goal world-wide⁴. Conserving their health and integrity is now widely considered to be the best way to sustain biodiversity and prevent species from declining to the point where they require individual attention. Similarly, country-wide, ecosystem-by-ecosystem assessment is considered one of the most effective ways to monitor the state of the national environment.

The ripples of a given land use spread far and wide. Not least of the changes we need to bring to the way we manage our landscapes will be education that helps landowners to see the harm they cause, and judges and tribunals to see how one land parcel is inevitably linked to the next. The key to this will be the framework within which ecosystems are defined. As well as being scientifically valid and relevant to New Zealand landscapes, it must be simple, cost-effective and easily understood.

It will need to integrate non-native and native ecosystem components on public and private land; an ecosystem whose native state has been altered by agriculture will need to be depicted in such a way as to include its pasture and cropland as well as its indigenous forests and wetlands. To assess the rates and trends of change in many of our fragmented, often tiny remains of indigenous ecosystems, it will be crucial to gather information on their primary, pre-settlement ecology.

⁴ Reed Noss (1992), *The Wildlands Project*, Land Conservation Strategy. *Wild Earth*, Special Issue; Reed Noss and Allen Cooperrider (1995), 'Saving Nature's Legacy', Island Press, Covelo, California.