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0521782708 - Conserving Living Natural Resources: In the Context of a Changing World

Bertie Josephson Weddell

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Conserving Living Natural Resources

Conserving Living Natural Resources provides students, managers, and general readers with an introduction to the principles of managing biological resources. It presents the historical and conceptual contexts of three seminal approaches to the management of living natural resources: utilitarian management for harvest of featured species and control of unwanted species, protection and restoration of populations and habitats to maintain biodiversity, and management of complex ecosystems to sustain both productivity and biodiversity. The book shows how the first two approaches were grounded in the belief that nature is “in balance” and that people are outsiders, and then goes on to show how the “flux-of-nature” viewpoint suggests new strategies for conservation grounded in a view of nature as dynamic, and people as participants in the natural world.

Rather than endorsing a single approach as the only correct one, this book investigates the historical and philosophical contexts, conceptual frameworks, principal techniques, and limitations of each approach.

BERTIE JOSEPHSON WEDDELL teaches principles of conservation in the Distance Degree Program of Washington State University, and is principal of *Draba*, a natural resource management consulting business she founded.

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To Jim, Wes, and Angie

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Conserving Living Natural Resources

in the context of a changing world

Bertie Josephson Weddell

Washington State University



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Contents

Preface	<i>page xi</i>
Introduction: Balance and flux	1
Methodology: Getting the information we need to manage living natural resources	9
The scientific method	9
Controlled experiments	9
Comparative studies	17
Simulations and models	22
Evaluating evidence with a critical eye	23
 Part I: Management to maximize production of featured species – a utilitarian approach to conservation	
1 Historical context – the commodification of resources and the foundations of utilitarian resource management	29
1.1 Historical background	30
1.2 The result: Habitat alteration, declines, and extinctions	32
1.3 Diagnosing the problem	52
1.4 The response to the problem	52
1.4.1 Regulation and protection	52
1.4.2 The disciplines of natural resource management	55
 2 Central concepts – population growth and interactions between populations	60
2.1 Adding to and subtracting from populations	60

vi Contents

2.2 Limits to population size	61
2.2.1 <i>Mortality</i>	61
2.2.2 <i>Reproduction</i>	62
2.3 Types of population growth	62
2.3.1 <i>Exponential growth</i>	62
2.3.2 <i>Logistic growth and density-dependent population regulation</i>	66
2.4 Interactions between populations: Predation	71
2.4.1 <i>Predation as a mechanism of limiting prey populations</i>	71
2.4.2 <i>Factors that compensate for predation</i>	75
2.4.3 <i>Management implications</i>	75
3 Central concepts – habitats	77
3.1 Ecosystems	78
3.1.1 <i>The ecosystem concept</i>	78
3.1.2 <i>Ecosystem components</i>	78
3.2 How habitats provide the resources needed by organisms	80
3.2.1 <i>Resources</i>	80
3.2.2 <i>Juxtaposition of habitat patches</i>	85
3.2.3 <i>Range of tolerance</i>	87
3.2.4 <i>Seasonal variations in resource availability</i>	88
3.3 Changes in communities over time: Succession	89
3.3.1 <i>The concept</i>	89
3.3.2 <i>Examples</i>	93
3.3.3 <i>Implications</i>	96
4 Techniques – harvest management	99
4.1 Classifying species on the basis of utilitarian values	99
4.2 Kinds of harvest	100
4.2.1 <i>Commercial harvests</i>	100
4.2.2 <i>Recreational harvests</i>	100
4.2.3 <i>Subsistence harvests</i>	104
4.2.4 <i>Illegal harvests</i>	104
4.3 Managing for sustained yield	105
4.3.1 <i>In theory</i>	105
4.3.2 <i>In practice</i>	113
4.3.3 <i>Social, economic, and political considerations</i>	118
4.3.4 <i>How successful has harvest management been?</i>	118
5 Techniques – habitat management	123
5.1 Direct modification of plant communities	123
5.1.1 <i>Planting and fertilizing</i>	124
5.1.2 <i>Removing unwanted vegetation</i>	126

5.1.3	<i>Managing water supplies</i>	128
5.1.4	<i>Providing special structures</i>	129
5.2	Indirect modification of habitats: Modifying succession	130
5.2.1	<i>Flooding</i>	132
5.2.2	<i>Grazing management</i>	132
5.2.3	<i>Logging</i>	133
5.2.4	<i>Fire management</i>	135
5.3	Arranging habitat components	137
5.4	Managing for multiple uses	138
5.5	Conclusions	140
6	Techniques – management to minimize conflicts between pest species and people	143
6.1	What is a pest?	143
6.2	How is damage from pests controlled?	145
6.3	Historical background	147
6.4	Case studies	150
6.4.1	<i>Coyote control on rangelands in the western U.S.A.</i>	150
6.4.2	<i>Control of fox rabies in western Europe</i>	151
6.4.3	<i>Human behavior and pigeon pests in urban environments</i>	153
6.4.4	<i>Attacks by black bears and grizzly bears on visitors to U.S. national parks</i>	155
6.4.5	<i>Elephants and crop damage in Africa</i>	156
6.5	Conclusions	157
 Part II: Protection and restoration of populations and habitats – a preservationist approach to conservation		
7	Historical context – the rise of environmental concerns after World War II	163
7.1	Economic and demographic changes	164
7.2	Awareness of ecological problems	165
7.2.1	<i>Invading species</i>	165
7.2.2	<i>Harmful substances in the environment</i>	168
7.2.3	<i>Extinctions</i>	176
7.3	Diagnosing the problem	185
7.4	The response to the problem: The rise of preservationist management	190
8	Central concepts – the causes of extinction	194
8.1	Speciation: The formation of species	194
8.1.1	<i>What is a species?</i>	194
8.1.2	<i>The theory of natural selection</i>	195
8.1.3	<i>The tempo of speciation</i>	199

viii Contents

8.1.4	<i>Adaptive radiation, isolation, and endemism</i>	200
8.2	How many species are there?	201
8.3	Classification	202
8.3.1	<i>Nomenclature</i>	202
8.3.2	<i>Genetic differentiation within species: Subspecies and local adaptation</i>	204
8.4	Extinction	204
8.4.1	<i>Extinctions in the fossil record</i>	205
8.4.2	<i>Why are some species more vulnerable than others?</i>	206
8.4.3	<i>Why are some populations more vulnerable than others?</i>	208
8.4.4	<i>Population viability analysis: A tool for assessing risk of extinction</i>	221
9	Techniques – protecting and restoring species	225
9.1	Overview of options: Strategies for preventing extinctions	225
9.2	Decreasing losses	226
9.2.1	<i>Regulating exploitation</i>	226
9.2.2	<i>Minimizing natural sources of mortality</i>	228
9.3	Enhancing the size and range of populations	230
9.3.1	<i>Increasing population productivity</i>	230
9.3.2	<i>Increasing geographic range</i>	237
9.3.3	<i>Guidelines</i>	242
9.4	Setting priorities: Which species should we try to save?	243
10	Techniques – protecting and restoring ecosystems	246
10.1	Historical background	246
10.2	Protecting communities	249
10.2.1	<i>Designing reserves</i>	249
10.2.2	<i>Setting priorities: Which habitats should we save?</i>	258
10.2.3	<i>Managing reserves</i>	265
10.2.4	<i>Providing economic incentives to set aside preserves: Debt-for-nature swaps</i>	266
10.3	Restoring communities	267
10.3.1	<i>The need for ecological restoration</i>	267
10.3.2	<i>Methods of restoring ecosystems</i>	267
10.3.4	<i>Mitigation</i>	270
10.3.5	<i>Evaluating restoration and mitigation</i>	272
Part III: Management to maintain processes and structures – a sustainable-ecosystem approach to conservation		
11	Historical context – pressures to move beyond protection of species and reserves	279
11.1	Practical considerations	280
11.2	Scientific considerations	281

11.3 Political considerations	282
11.3.1 <i>Confrontations over the U.S. Endangered Species Act</i>	282
11.3.2 <i>Changing direction in natural resource management</i>	284
11.4 Ethical considerations	285
11.4.1 <i>Who bears the costs of protection?</i>	286
11.4.2 <i>Who makes decisions about access to resources?</i>	287
11.4.3 <i>Who is responsible for causing the problem?</i>	288
11.4.4 <i>Biodiversity versus cultural diversity?</i>	290
11.5 Philosophical considerations	291
11.5.1 <i>Attitudes about people and the natural world</i>	291
11.5.2 <i>Defining biodiversity</i>	294
11.5.3 <i>An alternative view</i>	295
11.6 Diagnosing the problem	296
11.7 The response to the problem: The rise of sustainable-ecosystem management	297
12 Central concepts – the flux of nature	301
12.1 Revisiting equilibrium theories	302
12.1.1 <i>Competition and density-dependent population regulation</i>	302
12.1.2 <i>The stable climax</i>	307
12.1.3 <i>The equilibrium theory of island biogeography</i>	313
12.2 A new perspective: The flux of nature	315
12.2.1 <i>Background</i>	315
12.2.2 <i>Key points</i>	316
12.2.3 <i>Minimum conditions for maintaining ecosystem functions</i>	320
12.3 Implications of the flux-of-nature viewpoint for conservation strategies	321
12.4 Conclusions	322
13 Techniques – conserving processes and contexts	327
13.1 Conserving processes	328
13.2 Recognizing limits and assessing vulnerability	331
13.2.1 <i>Variations in ecosystem productivity</i>	350
13.2.2 <i>Variations in soil fertility</i>	353
13.2.3 <i>Variations in adaptations to disturbance</i>	354
13.3 Geographic context	356
13.3.1 <i>Maximizing potential for recovery from disturbance</i>	356
13.3.2 <i>Maximizing movement of organisms through the matrix</i>	358
13.4 Examples	358
13.4.1 <i>Maintaining and restoring structures and functions of late-successional forests in the Sierra Nevada ecosystem</i>	358
13.4.2 <i>Restoring structural heterogeneity in the Negev Desert</i>	362
13.4.3 <i>Restoring variations in river flow on the Roanoke River</i>	364

x Contents

14 Techniques – including people in the conservation process	370
14.1 Sustainable use versus sustained yield	371
14.2 Returning profits from biodiversity-based products to local communities	373
14.3 Integrating economic development and conservation	374
14.4 Basing resource management in local communities	378
14.5 Locating reserves in a compatible landscape	381
14.5.1 <i>Integrating traditional resource uses and conservation: Biosphere reserves</i>	381
14.5.2 <i>Developing alternative resource uses: Nontimber forest products</i>	388
14.6 Evaluating attempts to include people in the conservation process	390
14.7 Conclusions	391
Postscript	396
Appendix: Scientific names of organisms mentioned in the text	398
Index	407

Cambridge University Press

0521782708 - Conserving Living Natural Resources: In the Context of a Changing World

Bertie Josephson Weddell

Frontmatter

[More information](#)

Preface

I wrote this book to introduce students to and to review for managers three different approaches to natural resource management. Until the early 1970s, college courses and texts in natural resource management dealt primarily with a utilitarian approach to resources, with a little preservationist management thrown in (for example, the story of Yellowstone National Park and parks in general). Then endangered species and nongame species began to attract the attention of managers. During this period, a number of ecologists in North America also undertook studies of ecosystem functions and processes. (In Europe ecosystem studies had been receiving attention since late in the nineteenth century.) By the 1980s, courses and texts in conservation biology began to appear. At first these emphasized the management of small, fragmented populations; later, management to maintain fundamental ecosystem processes became a more prominent theme.

I wanted to present these different strands of thought to students who were not necessarily majoring in the natural sciences or in management and to show how these threads interweave in the fabric of natural resource management. This book attempts to do that, by presenting the historical and conceptual contexts of different approaches to resource management. It begins with the utilitarian approach to harvesting featured species, proceeds to recent responses to the biodiversity crisis, and culminates in efforts to manage ecosystems sustainably.

In writing this book, I started from the premise that it is more useful for students and managers to learn about the historical conditions that gave rise to different strategies for resource stewardship and the strengths and weaknesses of each, than to study a single approach as the only correct one. The

Cambridge University Press

0521782708 - Conserving Living Natural Resources: In the Context of a Changing World

Bertie Josephson Weddell

Frontmatter

[More information](#)

xii Preface

book is organized into three main sections, which cover three approaches to conservation, more or less in chronological order: management for products (the utilitarian approach), preserves (the preservationist approach), or processes (the sustainable-ecosystem approach). Utilitarian management focuses on the harvest of featured species to provide desired products, preservationist management stresses the protection and restoration of populations and habitats to maintain biodiversity, and the sustainable-ecosystem approach seeks to conserve both productivity and biodiversity by maintaining healthy ecosystems. Each section describes the historical and philosophical context, the conceptual framework, the principal techniques, and the limitations of the approach in question. By showing how each period in natural resource management has operated within a particular world view, made important contributions, and had definite limitations, I hope this volume will encourage readers to view science and resource management as ongoing processes rather than as static entities. In keeping with its historical bent, the book includes substantial amounts of quoted material from bygone decades. Some of these are from seminal thinkers; others are simply examples that reflect the thinking of the day. It is hoped that this will give students some appreciation of the flavor of the different mind-sets that are discussed.

Many books present the philosophical context of conservation as a dichotomy between anthropocentric and biocentric approaches, or use versus preservation. A number of scholars have recently pointed out, however, that *both* the utilitarian and the preservationist perspective share a similar philosophical context: the idea that people are outside of the balance of nature. At the same time, some scientists have suggested that the flux of nature is a more appropriate metaphor for nature. This leads to novel ways of thinking about the natural world and our role in it.

Parts I and II of this book deal with management strategies that are grounded in the balance-of-nature view. Part I shows how the academic disciplines of forestry, wildlife management, and range management developed in response to the unregulated exploitation of wild plant and animal populations after Europeans colonized the New World, Africa, the Australian region, and parts of Asia. Professionals in these disciplines approach natural resources from a utilitarian perspective, that is, they seek to regulate the exploitation of economically valuable resources such as timber, game species, and livestock forage. To accomplish their objectives, utilitarian resource managers attempt to enhance populations and habitats that provide economic benefits and to reduce or eliminate processes (such as fire) and species (such as predators) that are viewed as detrimental. They focus primarily on a small number of natural processes, such as density-dependent population growth

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0521782708 - Conserving Living Natural Resources: In the Context of a Changing World

Bertie Josephson Weddell

Frontmatter

[More information](#)

Preface xiii

and the development of stable plant communities. The underlying assumption is that managers can maximize the flow of useful products by controlling or compensating for forces that upset the balance of nature.

Part II covers efforts to preserve natural places and living things regardless of their economic values. Whereas utilitarian management attempts to conserve natural resources *for* people, this type of management seeks to protect those resources *from* people. The roots of this movement go back to nineteenth-century efforts to preserve wild places for their intrinsic beauty and spiritual value. A century later, awareness of environmental problems and accelerating losses of species led to a new goal, the protection of biodiversity. Preservationist resource managers apply insights into processes such as extinction and colonization and the genetic consequences of small population size to this challenge. Like utilitarian resource managers, preservationists envision nature as tending toward equilibrium. In this view, the activities of people upset the balance of nature, and the goal of conservationists should be to reinstate that balance by protecting and restoring populations and habitats. The assumption underlying this approach is that the natural world often needs to be protected from the degrading and disturbing influences of people because these influences upset the balance of nature.

Part III investigates an alternative view – that nature is in a state of flux which people are part of. This approach, termed the sustainable-ecosystem approach, draws on insights from both utilitarian and preservationist management, but it suggests new ways of thinking about our place in nature and of managing natural resources to sustain ecosystems. It was fostered by a variety of practical and theoretical considerations that highlight the need for an approach to resource management which emphasizes the variability of nature, addresses social issues of equity and power, and includes the activities of people as part of the natural world. Recent insights into disturbance dynamics and heterogeneous environments suggest new techniques for managing to conserve ecological processes at a variety of temporal and spatial scales. The underlying assumption here is that by preserving ecological processes and natural variability we can maintain both productivity and diversity.

The first chapter in each part describes the historical conditions that set the stage for that particular type of resource management and concludes with a discussion of historical perceptions about fundamental problems in resource management and how they should be solved. I suggest that readers, especially those who are not resource managers or ecologists, begin by reading those chapters (1, 7, and 12) to get some idea of the issues being addressed by the different kinds of resource management. These chapters are followed by one

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0521782708 - Conserving Living Natural Resources: In the Context of a Changing World

Bertie Josephson Weddell

Frontmatter

[More information](#)

xiv Preface

or two chapters that outline the central concepts of each approach, and two or three chapters dealing with its principal techniques.

The sequence presented in this book, of three stages in resource management – utilitarian management, preservationist management, and management to sustain ecosystems – is not, strictly speaking, a chronological one. Although in a general sense utilitarian management led to biodiversity protection and subsequently to management for sustainable ecosystems, there is plenty of temporal overlap between these strategies. Furthermore, all three approaches are thriving and producing useful insights in the twenty-first century. Many resource managers hold views that are a combination of the different approaches covered in this book and practice a type of management that synthesizes elements of the different styles. But even though reality is complicated, and managers don't really fit into pigeon-holes, understanding the different schools of thought that have influenced the theory and practice of resource management during the past century and a half can help us to put current challenges in context. If we understand the assumptions underlying various resource management policies, we are in a better position to evaluate them. Organizing those ideas into three categories – utilitarian, preservationist, and sustainable-ecosystem – is a heuristic device that helps us do that.

Throughout the discussion of these different approaches, I point out that each approach is appropriate under certain circumstances and that each has its limitations. For example, after Aldo Leopold suggested that game species tend to prefer edges, wildlife biologists set out to create habitats with large amounts of edge. This resulted in small patches of forest surrounded by fields. In terms of the objectives of game managers, this has been quite appropriate. Later, however, it became apparent that some species prefer forest interiors, and these species do not do well in highly fragmented landscapes. Most of them are not game species. Their needs were overlooked by game managers, and now some are now threatened or endangered. If our objective is to maximize populations of game species, creating edges is a good idea. But if we seek to preserve enough habitat to maintain viable populations of all species, maximizing the amount of edge is not a good way to do this. Changing objectives often lead to changing strategies.

Students may well ask “If managers no longer believe that maximizing edge is a good strategy, then why should I bother to learn about it?” There are several reasons why learning about “outmoded” ideas is essential. First, there is no single correct way to manage natural resources. As noted above, managing to maximize edge is still appropriate under some circumstances, that is, when the goal is to benefit edge-dependent species. Second, our generation has no special corner on the truth. To act as if we do seems arrogant and only

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0521782708 - Conserving Living Natural Resources: In the Context of a Changing World

Bertie Josephson Weddell

Frontmatter

[More information](#)

Preface xv

invites our successors to wonder how we could possibly have been so naive. Every generation, in every cultural setting, focuses on certain things and develops insight about those things. Likewise, every generation and culture has its own particular blinders and prejudices. Our predecessors did, and so do we. Third, it is important to understand how we got where we are. If mistakes were made in the past, can we learn from them? Although we know that we too have a particular slant on reality, perhaps we can be a little less shortsighted if we understand past shortcomings. Fourth, sometimes without realizing it, we hold on to ideas that are out of date. Many of the ideas that are discussed in this book are widely held, even though scientists are now questioning them. This is partly because science reporters and science teachers themselves do not always keep abreast of the latest developments. But it is also because old ways die hard. That may put us in the position where we are reasoning from contradictions that we do not see. For example, if we try to manage to sustain ecosystem processes, an approach that is based upon the flux-of-nature perspective, yet we continue to envision nature as tending toward balance, the contradictions in our approach are likely to undermine our efforts. With a good understanding of historical context, however, we can understand and disentangle the different threads of thought contributing to our thinking.

A great many people contributed to this book, often in ways that were not apparent at the time. It is not possible to name them all here, but some of the most important deserve special thanks. My mother, Lucy Ellen Wishart Josephson, made sure that I was able to spend my childhood summers away from our apartment in New York City, so that I had some opportunities to be around wild things. My grandmother, Mabel Bradshaw Wishart, taught me the names of plants and animals and ignited my desire to know more. My father, Leon Josephson, taught me the importance of ideas and of history. Nancy Reed Kykuri's enthusiasm and love of people, Cape Cod, and life was infectious. In junior high school, Leah Wallach's intellectual curiosity, honesty, and imagination opened many doors for me and Mrs. Dorothy Young taught me how to organize my writing. In graduate school Richard E. Johnson's meticulous editing trained me to pay attention to the details of written presentation. More recently, my husband Jim has always been supportive and believed that a city girl like me could become a field biologist, even when I had my doubts, and my children, Wes and Angie, were fun to be around and put up with the demands on my time and the piles of books and papers in our home. I also thank Yoram Keyes Bauman, John Donnelly, and John Lawrence for reading and commenting on portions of the manuscript; the other three members of the *Sage Notes* Gang of Four (Karen Gary, Juanita Lichthardt, and Sarah Walker) and Alan Busacca, Jack Connelly, Michael Dexter, Jean Gorton,

Cambridge University Press

0521782708 - Conserving Living Natural Resources: In the Context of a Changing World

Bertie Josephson Weddell

Frontmatter

[More information](#)

xvi Preface

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