

Creating a Forestry for the 21st Century

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The Science of Ecosystem Management

Edited by Kathryn A. Kohm and Jerry F. Franklin
Foreword by Jack Ward Thomas

ISLAND PRESS 475 p.
Washington, D.C. • Covelo, California

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Library of Congress Cataloging-in-Publication Data

Creating a forestry for the 21st century: the science of ecosystem management / edited by Kathryn A. Kohm & Jerry F. Franklin.

p. cm.

Includes bibliographical references and index.

ISBN 1-55963-398-0 (cloth). — ISBN 1-55963-399-9 (pbk.)

1. Forest management—Northwest, Pacific. 2. Forest ecology—Northwest, Pacific. 3. Forests and forestry—Northwest, Pacific. 4. Ecosystem management—Northwest, Pacific. 5. Forest management. 6. Forest ecology. 7. Forests and forestry. 8. Ecosystem management. I. Kohm, Kathryn A. II. Franklin, Jerry F.

SD144.A13C74 1997

634.9—dc20

96-32771

CIP

Printed on recycled, acid-free paper ♻️

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1

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Foreword

Two separate but connected factors have combined in recent decades to dramatically alter the practice of forestry in the United States. The first has been a rising environmental consciousness among a significant and politically effective segment of the population. The second was a spate of environmental legislation enacted in the 1960s and 1970s. Among laws that changed the practice of forestry are the National Environmental Policy Act of 1969, which requires the federal government to perform a detailed assessment of costs and benefits of all federally financed activities; the Endangered Species Act of 1973, which established a government policy that species should be preserved; and the National Forest Management Act of 1976, which sets high standards for management of national forests.

Of particular note is the statement of purpose included in the Endangered Species Act. Twenty years after passage of the act, that statement has emerged full-blown, with far-reaching consequences for federal land management. That statement is: "The purposes of this act are to provide a means whereby the ecosystems upon which endangered species and threatened species may be conserved" and not merely the welfare of the single species identified as 'endangered' or 'threatened.' In addition, there were regulations promulgated by the federal government pursuant to the National Forest Management Act that called for the retention of viable populations of vertebrate species well-distributed on national forests with particular emphasis on habitat.

In combination, these laws and regulations have had a profound effect on forest management on federal lands. These changes came about over a period of 25 years as governmental agencies (most notably

the Forest Service and Bureau of Land Management) struggled to maintain or increase historic timber sale levels, satisfy the needs of traditional constituencies (such as grazers, hunters, fishers, and recreationists), and simultaneously remain in compliance with environmental laws. Under the U.S. legal system, citizens may challenge the government's compliance with law. Over the past 25 years, there have been numerous such challenges to federal land management activities—many of which have been successful. These federal court decisions have forced federal land management agencies to change some of their traditional approaches to forest management.

The most noted of these legal challenges is the case of the northern spotted owl (Thomas et al. 1990). This subspecies of the genus *Strix* was declared by the U.S. Fish and Wildlife Service to be "threatened" in early 1990. It is considered closely associated with the habitat conditions most commonly found in the late-successional/old-growth forests of the Pacific Northwest. These forests have been diminished significantly in amount and quality through timber harvesting (most commonly clearcutting) and losses to fire, blowdown, and other natural events since the late 1800s (Thomas et al. 1990). The late-successional/old-growth forests of the Pacific Northwest are extremely valuable as a source of large volumes of high quality timber and as a significant source of employment (FEMAT 1993). The reservation of significant amounts of old-growth from timber harvesting to maintain a range-wide viable population of a subspecies of owl (Thomas et al. 1990, FEMAT 1993) has been fraught with social, economic, and ecological consequences that have translated into prolonged legal and political battles which

able sale quantity of approximately 1.2 billion board feet, with an additional 100–150 million board feet potentially available from thinning stands younger than 80 years for silvicultural purposes. This probable annual timber sale level compares to 4.6 billion board feet cut annually from 1980–1989, and 2.4 billion board feet cut annually from 1990–1992. However, a significant portion of the decline can be attributed to the accumulated experience of managers with conditions that precluded maintaining the sale quantities projected in the initial modeling efforts for forest plans.

Scientists doing the ecosystem assessments for President Clinton noted that despite the political and economic advantages of stable timber yields over time, experience has shown that this is unlikely over the long term. The world of forest management in the Pacific Northwest is, clearly and simply, inherently unstable—ecologically, economically, legally, and politically. Forest management plans are frequently changed and often unpredictable. They are subject to the vicissitudes of droughts, fires, insect and disease outbreaks, and volcanic eruptions, as well as funding shortfalls, frequent changes in laws and their interpretation, legal actions, court orders, public acceptance, and changes in policy. The only certainty seems to be the certainty of changing conditions—biological, social, economic, and legal.

The case of the spotted owl and old-growth/late-successional forests in the Pacific Northwest is but one example of the dramatic changes in forest management that are occurring in the United States. State after state has, or is in the process of, tightening up regulations defining appropriate forestry practices for private and state lands. Much of this revision seems to be a response to public demands for forestry practices that are more aesthetically acceptable and more sensitive (realistically or perceptually) to actual multiple-use values—primarily those associated with fish and wildlife habitat—than past practices almost solely directed toward profit and job maximization from timber production, harvesting, processing, and utilization.

Of particular interest to ecologists is the emphatic shift in public interest toward concern for all species of wildlife along with an increasingly holistic sense of ecosystems. This broadened perspective replaces the historic, rather single-minded emphasis on habitat

for game species such as white-tailed deer, mule deer, and black-tailed deer. There is every reason to believe that this trend will continue. As a result, biologists will have to broaden their interests, increase their expertise, and work with foresters to produce habitat conditions for a myriad of life forms and ecosystems.

There are, however, countervailing pressures at play. The changes in forestry currently underway come about at significant costs. Those costs are measured in higher prices for wood, jobs lost or foregone, loss of revenue to federal and county treasuries, and disproportionately negative impacts on rural communities dependent on the timber industry and timber harvest levels that existed from 1980–1992 on federal lands (FEMAT 1993).

Yet the trend toward ecosystem management and forestry that is more benign in environmental and aesthetic effects seems likely to continue for the foreseeable future. These changes reflect evolving public demand and current law as interpreted by the courts. There seems to be a distinct and growing distrust of natural resource managers—particularly government and corporate managers—by at least a vocal portion of the public. That distrust must be allayed if land managers are to retain any semblance of their historic management prerogatives. One lesson to be learned is that, in a democracy, forests are managed at the sufferance of the citizenry or at least by the majority of the minority of that citizenry that cares about the issue. The greatest challenge that foresters and other natural resource management professionals face in the practice of their professions may not be the technical aspects of forest management, but public acceptance of those practices.

These are among the many issues raised and discussed in *Creating a Forestry for the 21st Century*. In this volume, well-qualified experts have combined to produce a comprehensive view of ecosystem management.

Ecosystem management is a concept whose time has come. But ecosystem management is only a concept for dealing with larger spatial scales, longer time frames, and many more variables (ecological, economic, and social) than have commonly been considered in past management approaches. To be useful, a

continue today. The details surrounding this continuing controversy have been described by Thomas et al. (1993).

As the political and legal drama over old-growth forests and the northern spotted owl evolved, it became more and more obvious that the issue, as clearly foreseen and prescribed in the Endangered Species Act, was not one of saving or maintaining viable populations of an individual subspecies. Rather, it was centered on public and scientific concerns with the maintenance of ecosystem functions. These evolving concerns of scientists (and in turn the public) also began to surface under other names and allied concepts such as "sustainable forestry," "biodiversity retention," "new perspectives in forestry," and "new forestry." But most recently and predominantly, these concepts have come to be known as "ecosystem management" (Thomas 1993).

Ecosystem Management

By mid-1993, both the Forest Service and the Bureau of Land Management announced that they were embarking on a course of ecosystem management. That pronouncement was made without a detailed assessment of what such a management approach might entail or how it might be accomplished. However, the chief of the Forest Service did say that the agency would move away from clearcutting (except in certain circumstances) as the primary silvicultural prescription for stand regeneration.

By 1993, repeated successful lawsuits by organized environmental groups essentially brought timber sales on federal lands in the Pacific Northwest to a halt. Federal court judges ordered federal land management agencies to cease selling timber on lands designated by the U.S. Fish and Wildlife Service as critical habitat for the northern spotted owl. This impasse prompted vocal public concern, and received attention from all three major candidates during the presidential election of 1992. In the course of that campaign, candidate Governor Bill Clinton of Arkansas promised that, if elected, he would convene a conference to devise a means of ending the court-ordered injunction—that is, he would break the "gridlock."

Shortly after his inauguration, President Clinton

convened a forest conference in Portland, Oregon, on April 2, 1993. At the close of that conference, the president promised a solution to the impasse over forest management in the Pacific Northwest within 60 days. He instructed the secretaries of Agriculture, Interior, Commerce, and Labor to carry out that promise. Three teams were organized to formulate management options for the president's consideration. The instructions given to one of those teams, the Forest Ecosystem Management Assessment Team (FEMAT), stated that an "ecosystem management approach" was to be included in their report, and that late-successional/old-growth ecosystems and species associated with those ecosystems that were listed by the U.S. Fish and Wildlife Service as "threatened" (northern spotted owls and marbled murrelets) were to receive specific consideration.

Approximately 90 days after the conference, the president selected an option from among 10 presented to him (FEMAT 1993). The consequences of that selection have been ecologically, economically, and socially profound. Of the land in federal ownership within the assessment area (the range of the northern spotted owl), 7.05 million acres (2.85 hectares) of reserves were established where late-successional/old-growth forest conditions are to be preserved and enhanced over time. An additional 2.23 million acres (.90 million hectares) were designated as riparian reserves to meet water quality standards and protect and enhance habitat for native fishes—particularly anadromous fishes considered to be "at risk" of being listed as "threatened" or "endangered."

These late-successional/old-growth and riparian reserves were established in addition to 6.98 million acres (2.83 hectares) already designated as wilderness or national parks or otherwise withdrawn from timber management activities for reasons such as soil stability, scenic corridors, or recreation needs. Approximately 7.34 million acres (2.97 hectares) out of 24.26 million acres (9.22 million hectares) in the analysis area remained available for timber harvest (about 30 percent of the total area). However, it should be noted that significant portions of the total area support no trees, offer little potential for growing trees, or have fragile soils, steep slopes, or other circumstances that preclude timber harvesting.

The acreage available for harvesting yields a prob-

concept must be rendered operational. That requires placing the concept in context and in operational terms.

This book is an attempt to take that critical next step—to move the concept of forest ecosystem management into an operational context. Other such efforts are underway. But this, in my opinion, is the best of such efforts to date.

This book can be likened to a river that is fed by

many streams. It flows more strongly with the addition and mixing into the current of each stream. This volume has identified many of the contributing factors that must be considered and integrated to make up the first efforts of forest ecosystem management. It is an exciting prospect.

Jack Ward Thomas

Chief, USDA Forest Service

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Acknowledgments

Like most projects of this size and scope, this book is the result of the work, support, and cooperation of many people and organizations. The rallying point for this project was a conference entitled "Creating a Forestry for the 21st Century" held in Portland, Oregon, in September 1993. Sponsors of that event included the Olympic Natural Resources Center at the University of Washington College of Forest Resources, the Cascade Center for Ecosystem Management, the USDA Forest Service Pacific Northwest New Perspectives Program, the Consortium for the Social Values of Natural Resources, the Coastal Oregon Productivity Enhancement Program at Oregon State University's College of Forestry, the Washington State Department of Natural Resources, the British Columbia Forest Service, and the USDI Bureau of Land Management.

Substantial support for the editing of the book as a whole and preparation of some chapters came from The Pew Charitable Trusts. The grant was administered by The Nature Conservancy.

Carrie Bayless, Chuck Ayers, and Gordon Smith deserve special thanks not only for their careful reading of the manuscripts, but also for their support and encouragement throughout the project. In addition, Virginia Lore and Cynthia Cimperman provided valuable editorial assistance.

Finally, we thank all of the authors who stuck with us through many drafts. Without their ideas, insights, and expertise, the book truly would not have been possible.