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# Science

FINDINGS

*“Science affects the way we think together.”*

Lewis Thomas

## OLD GROWTH REVISITED: INTEGRATING SOCIAL, ECONOMIC, AND ECOLOGICAL PERSPECTIVES

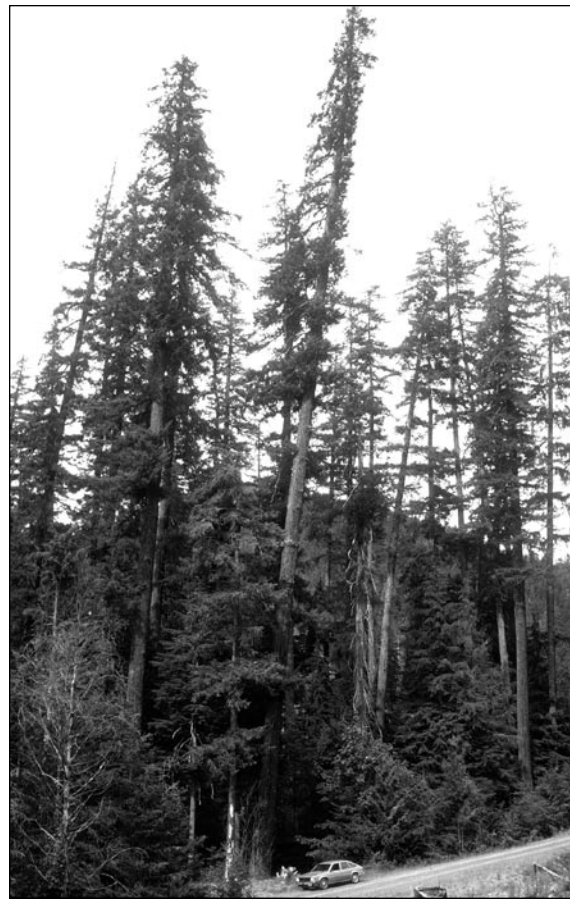
*“Natural resource management today is about decision-making in the face of complexity, uncertainty, and divergent but legitimate claims.”*

—Julia M. Wondolleck

In the final decades of the 20<sup>th</sup> century, the old-growth controversy seemed well-defined: loggers versus environmentalists. Reduced to sound bites and headlines, however, the issue was oversimplified. As ecosystem science has matured and the complexity of forest dynamics is revealed, what was once a polarized shouting match has become more like a passionate conversation.

In May 2005, the National Commission on Science for Sustainable Forestry sponsored a workshop in Washington state to characterize the state of old-growth conservation and management in the Pacific Northwest. From that workshop came the idea for a book to frame the emerging dialog and give a voice to representatives from various stakeholder groups.

*Old Growth in a New World: A Pacific Northwest Icon Reexamined*, published by Island Press, characterizes and synthesizes the views of ecologists, economists, environmentalists, historians, managers, philosophers, silviculturists, sociologists, and timber producers. Tom Spies, a research



Tom Spies

*“Old growth” defies a single definition: it differs by forest type and the values of the definer.*

forester with the Pacific Northwest Research Station in Corvallis, Oregon, and Sally Duncan, policy research director at the Institute for Natural Resources at Oregon State University, are the book’s co-editors. Among the chapter authors are seven other current or retired station scientists.

### IN SUMMARY

*How should old-growth forests be managed? Should they be managed? Stakeholders with differing values and agendas have debated these questions for years. Over time, the debate has evolved: now there is greater awareness about the complexity of old-growth ecosystems and different ways humans value them. A scientist at the Pacific Northwest Research Station has co-edited a book to provide a comprehensive, multidisciplinary overview and synthesis to further this discussion. Written for a lay audience, Old Growth in a New World: A Pacific Northwest Icon Reexamined is meant to help deepen policymakers’ and public understanding of old growth.*

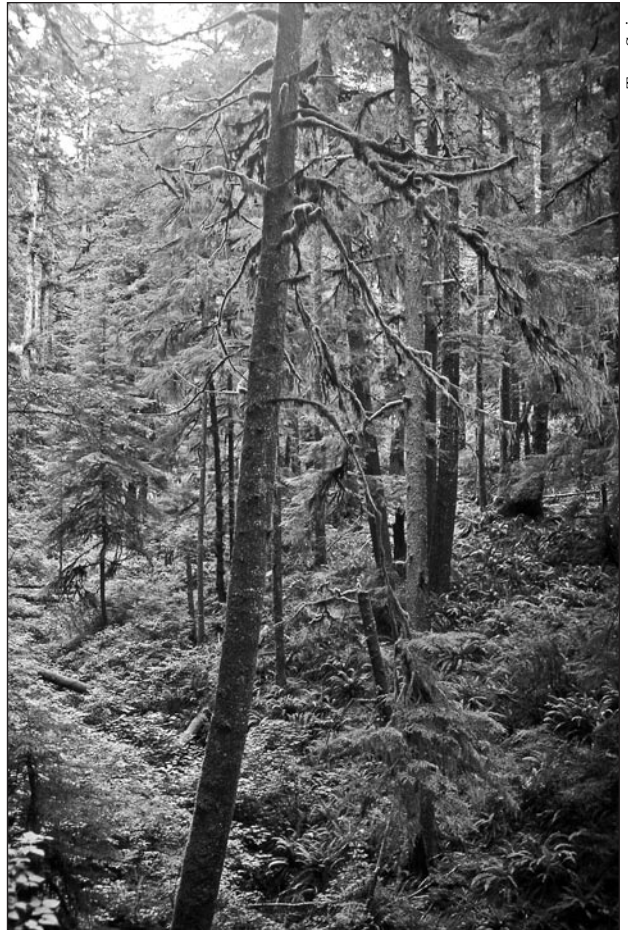
*The book highlights the complexity of old growth and the dialog surrounding it. Forest management is as much a social issue as a scientific one. And the authors contend that intrinsic values of aesthetics, mystery, and spirituality must be considered alongside issues of carbon storage, habitat conservation, and timber production. Society may not agree on a definition of old growth, but working definitions based on subregional forest types are needed to help guide forest management. As stakeholders become willing to hear other sides of the old-growth issue, collaborations and ideas for new economic models are arising that may help maintain or restore the ecological diversity of our valued forests.*



## KEY FINDINGS



- The history of old growth in the Pacific Northwest is a history of social change, reflecting the influence of Native Americans, pioneer farmers, early loggers, modern forestry, and a new era of ecological and social forestry.
- The science of old growth is maturing to incorporate ecosystem dynamics and complexity, including structural diversity and its impact on biodiversity.
- Instrumental values of old growth, such as carbon storage and wildlife habitat, may be less important in forest management debates than intrinsic values, such as spirituality, mystery, and the search for meaning.
- Although the “forest industry versus old growth” controversy is largely over, unintended consequences of mandated management practices include the loss of mill capacity and workers to help carry out restoration, especially in dry regions.



Tom Spies

*This old forest in a riparian zone in coastal Oregon is characterized by its dense, diverse understory.*

“For all the books that have been written about the old-growth controversy—and there have been a number of good ones—none of them really took a broad multidisciplinary view of the problem,” Spies says.

The book provides historical background on the old-growth controversy and context for new scientific understandings about ecosystem dynamics for nontechnical readers. Although it offers some ideas about how stakeholders might work together to manage valuable forest resources, an overarching theme arising from the book is that nothing is clear cut. “It’s really intended to provide decisionmakers and the public with a broader perspective on the dimensions of the issue—

more insights into some of the complexity that they might find helpful in trying to craft solutions,” says Spies.

“Everyone has begun to understand that it’s not as simple as we would like to think,” says Duncan. “We all carry our own values, and we all like to think ours are the right ones.”

The book’s purpose is to allow this wide spectrum of values to be considered. “There are many, many different perspectives on the old-growth issue, and so it was impor-

tant to us in pulling this book together that we reflected the multiple voices that had weighed in,” Duncan says. “Of course, this was easier to do once some time had passed.”

### *Purpose of PNW Science Findings*

To provide scientific information to people who make and influence decisions about managing land.

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Tom Spies

*In this old ponderosa forest in central Oregon, understory is absent because fire has played a more frequent role in shaping the forest.*

## DEFYING DEFINITION

A major problem in discussing “old growth” is that it defies a single definition. It matters who is doing the defining.

From an ecological standpoint, an old-growth forest is generally described as one “in the later stages of development with complex structures and heterogeneity,” says Spies. But the devil is in the details. The forest must be viewed as a continuous system that is always changing. “There is no clear point at which you can say, from an age standpoint, this is certainly old growth and this isn’t,” he explains.

Counting big old trees or dead trees, measuring density, or characterizing the understory also have their limits because these components can vary widely within and among forest types. Ecologists also are discovering that younger forests can have many characteristics in common with old-growth forests in terms of biodiversity and the ability to provide wildlife habitat.

In general usage by the public, the term “old growth” tends to connote noninterference by humans and their domestic animals. It has become an icon symbolizing “unspoiled nature, ecological stability, pristine habitat, and other lofty values,” notes Spies. The problem with this definition, according to Spies, is that old growth is measured in centuries, and

it can be difficult to determine human impact over the long course of a forest’s history.

For some people, the term “old growth” is entirely subjective, making a meaningful scientific description impossible and perhaps irrelevant. Its meaning is experienced by appreciating the profound mystery and spiritual aesthetics of being in or thinking about a forest.

Kathleen Dean Moore, philosophy professor at Oregon State University, addressed the spiritual perspective on old growth in one chapter of the book. Aspects encompassed in her definition of an old-growth forest include continuity of ages, great height, complexity, tranquility, “natural” condition, and beauty. She stressed, however, that its intrinsic value goes beyond what can be described or experienced by human beings.

Spies points out that this cloud of definitions is not surprising. “It’s just the reality of dealing with something that on one hand is complex and diverse ecologically and on the other is complex and diverse from a social perspective.”



Tom Spies

*Fire created a complex mosaic of burned and unburned patches in this old forest in southwestern Oregon, making it difficult to classify the forest into a few simple stages.*

Although there is no universally accepted definition, and likely never will be, working definitions based on subregional forest types are necessary to help guide forest management practices, says Spies. Definitions are essential, but they must be held loosely and with the understanding that they are always based on values and agendas, he explains. The co-editors believe that people to whom the forest is sacred deserve a seat at the table—“a voice in the range of voices”—and their views must be honored when considering management alternatives.

## FINDING COMMON GROUND

In addition to identifying points of continued conflict in the old-growth controversy, the book identifies the beginnings of convergence on some issues. “There really is some common ground,” Spies says.

Scientists have made new findings about ecosystem dynamics in recent decades, and particularly since the adoption of the Northwest Forest Plan in 1994. They recognize the need to manage old growth in this context. Recent major losses of valued old-growth stands to wildfire have led many protectionists to acknowledge the need for some level of active management to reduce ladder fuels and the threat of insect infestation and disease, particularly in the drier subregions.

“Fire suppression and other activities over the years have resulted in increasing the risk

to some of the old forests we want to retain,” says Spies. “So reexamining and bringing to light the challenges of conserving old growth in fire-prone ecosystems was one of the goals of the book.”

Contributors to the book also recognized the need to manage for ecological diversity in some uniform stands on federal and private lands. Spies suggests that it is time to think across landscapes and ownerships.

“It’s important to look at the whole landscape and not just focus on the old-growth part,” he says. “So much of the debate has been really simplified—it’s either old growth or it’s not. Several chapters point out that a well-managed forest can produce many of the habitat values that people associate with old-growth forests—not all, but many.”

But the convergence goes deeper than just the recognition of possible management

compromises. Multiple voices weigh in on the inherent mystery of the icon.

In a “post-modern world where people are pushed and stressed by technology and schedules and rules, there is a real crying need for some other way of experiencing the world,” says Spies. Simultaneously, scientists are beginning to understand the interconnectedness and unpredictability of natural systems.

“They are beginning to find wonder in all the connections—between an owl and a mouse and a mycorrhiza,” says Spies. In other words, many scientists are beginning to more fully appreciate the intrinsic values that have long been espoused by those who put more emphasis on aesthetic values. The convergence of the spiritual and scientific in this way confirms the power of the icon and the need to tread lightly as management alternatives are considered.

Science Findings is online at: <http://www.fs.fed.us/pnw/>

The site also includes **Science Update**—scientific knowledge for pressing decisions about controversial natural resource and environmental issues.

# UNDERSTANDING THE SOCIAL ASPECTS OF FOREST MANAGEMENT

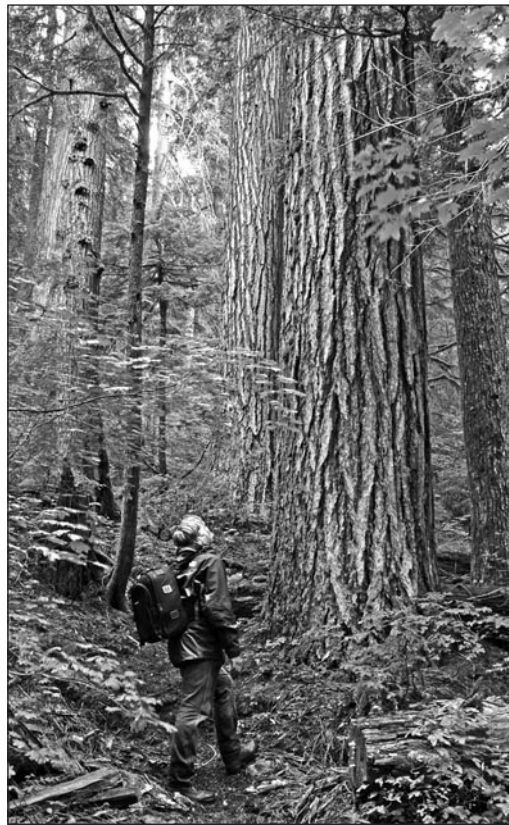
If a consensus on defining old growth is impossible, can we come to consensus on how—or whether—these forests should be managed?

“Early on, it was thought that if the ecologists could just figure out what the owl needed or how we define old growth then everything would be fine—scientists would just solve it,” says Spies. But science is suspect or beside the point in certain sectors, so “it’s all really a social problem.”

Given the many values and agendas, expecting consensus on management is unrealistic. “You can’t take a rational scientific approach to what is fundamentally a personal subjective system that does not lend itself to the technology approach to problem solving,” says Spies. “Social scientists are integrated into the problem now in a much bigger way than they were before, and they are helping us to see where some of the intersections of social science and ecological science lie.”

So the challenge is accepting that conflict is bound to occur and that everyone’s view is valid. Enter conflict management.

Julia Wollendeck, associate professor in the School of Natural Resources and Environment at the University of Michigan-Ann Arbor, contributed a chapter about the role of conflict resolution in forest management decisionmaking. She points



Tom Iraci

Common ground is surfacing as various factions begin to agree that some level of active management may be needed to maintain old forests.

out that it is not a question of “who is right or whose values should prevail,” but whether we can find ways to work together to solve problems.

Wollendeck observes that the old-growth conflict has served a valuable purpose in bringing to light important issues and providing an opportunity to reassess long-standing management practices. “It galvanized attention and concern, expanded the scope of scientific inquiry, stimulated new policies and plans, encouraged economic transitions in some communities, and enhanced public and scientific understanding of the old-growth ecosystem,” she writes.

She and other contributors note that progress has been made in working collaboratively despite differences in values and agendas. As an example, conservationist Rick Brown outlines his journey of getting from “no” to “yes” as he became involved with the Lakeview Stewardship Group in the late 1990s. The group consists of mill owners, civic leaders, citizens, and conservationists who are working together to complete a long-range management plan for 600,000 acres of the Fremont National Forest.

Spies also notes that a major challenge is finding ways to keep management policies aligned with society’s values as those values shift and change over time. “Social values are changing more rapidly these days than policies,” he says. “We need new institutions, new ways of integrating and interacting with people around changing social and ecological perspectives.”

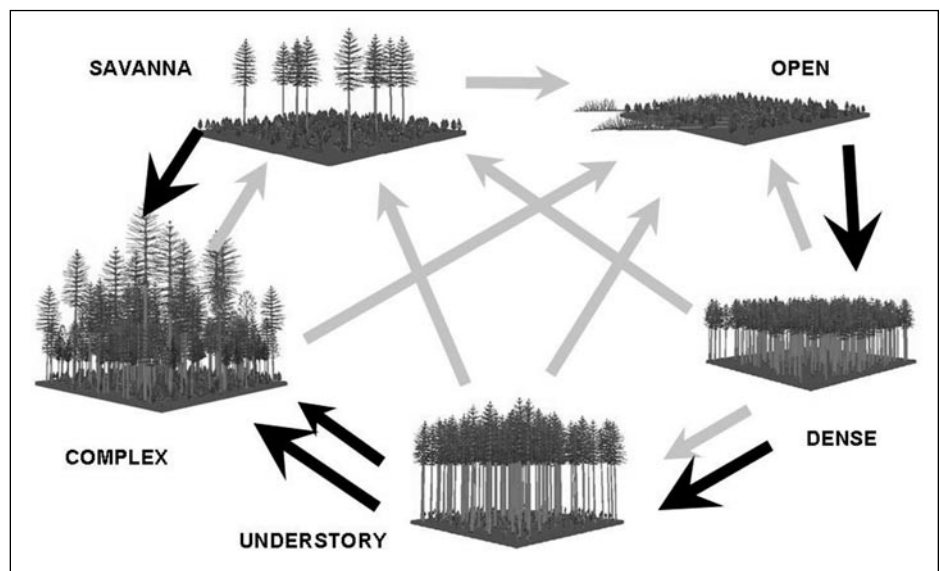
## INTEGRATING ECOLOGY AND ECONOMICS

In their synthesis, Spies, Duncan, and other contributing authors discuss the ironies and unintended consequences of the current forest management policies.

For example, biodiversity and species protection were the motivating factors for closing federal forests to logging in the early 1990s. In the aftermath, the availability of large-diameter timber decreased dramatically, and mills with the capacity to process big logs were closed.

“There was a loss of economic incentive to grow big trees,” says Spies. Even-aged plantations of smaller-diameter trees have become the norm, which does not support the cause of biodiversity.

Now there is some recognition among protectionists that active management such as thinning may be required to protect certain old-growth stands from wildfire, but the capacity of the forest industry to respond has been compromised.



Growth and disturbance are two pathways of change for a forest stand. Over time, the various stages meet the needs of different species. Here black lines show changes created by growth, and grey lines show pathways created by disturbances.

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Tom Spies

A high-severity wildfire in an old-growth stand left many standing dead trees—creating new wildlife habitat and a legacy for the new stand.



Tom Spies

Small live and dead trees have accumulated as fire has been suppressed, changing the physical characteristics of old stands in dry forests and increasing the fire hazard.



## LAND MANAGEMENT IMPLICATIONS



- A single definition of old growth is not possible and should not be expected because ecological conditions and social perspectives and forests are too diverse. Nevertheless, working definitions based on subregional variation and forest type can aid management decisions.
- Because humans have altered forest stand and landscape structures in ways that affect current and future old growth, some level of human activity may be required to conserve old growth. Active management, adapted to stand type, may be required to deal with threats such as fire, insects, and disease.
- Private landowners are seeking ways to promote old-growth characteristics such as wildlife habitat and carbon sequestration while managing for multiple objectives, including wood products. New silvicultural approaches and economic models could help promote these efforts.

“Because of the overall decline in the forest industry, there are fewer mills and fewer people to go out and do that work with the smaller-diameter wood,” says Spies. The existence of fewer mills increases hauling costs and reduces the financial incentive for forest products companies to become involved in thinning activities.

A shade of gray begins to emerge: it appears that forest biodiversity and economic health are not necessarily mutually exclusive.

“You can begin to see that if you want to do fire hazard reduction in some of the drier areas, you are going to need some human capacity to do that, and you are going to need some viable forest industry to process the logs,” says Spies. “So there is a connection between economics and ecological restoration.”

Spies suggests that these connections, in addition to changing social values, provide opportunities to examine new economic models. For example, management objectives such as biodiversity, carbon sequestration, recreation, and water quality are ecosystem services that have real economic values.

“Many of these old-growth associated values are important to society, and without new economic approaches, we may not have the resources to obtain them where management actions are needed,” he says.

Any new approach likely will be shaped by the need to manage for uncertainty. Unknowns such as changes in disturbance regimes triggered by changes in climate may shape stakeholders’ views of forest management in the future. *Old Growth in a New World* may well serve as a starting point for these future discussions about science and society’s values.

*“The illusions in question boil down to the belief that the ‘messiness’ of the human world is but a temporary and repairable state, sooner or later to be replaced by the orderly and systematic rule of reason.”*

—Zygmunt Bauman

### FOR FURTHER READING

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