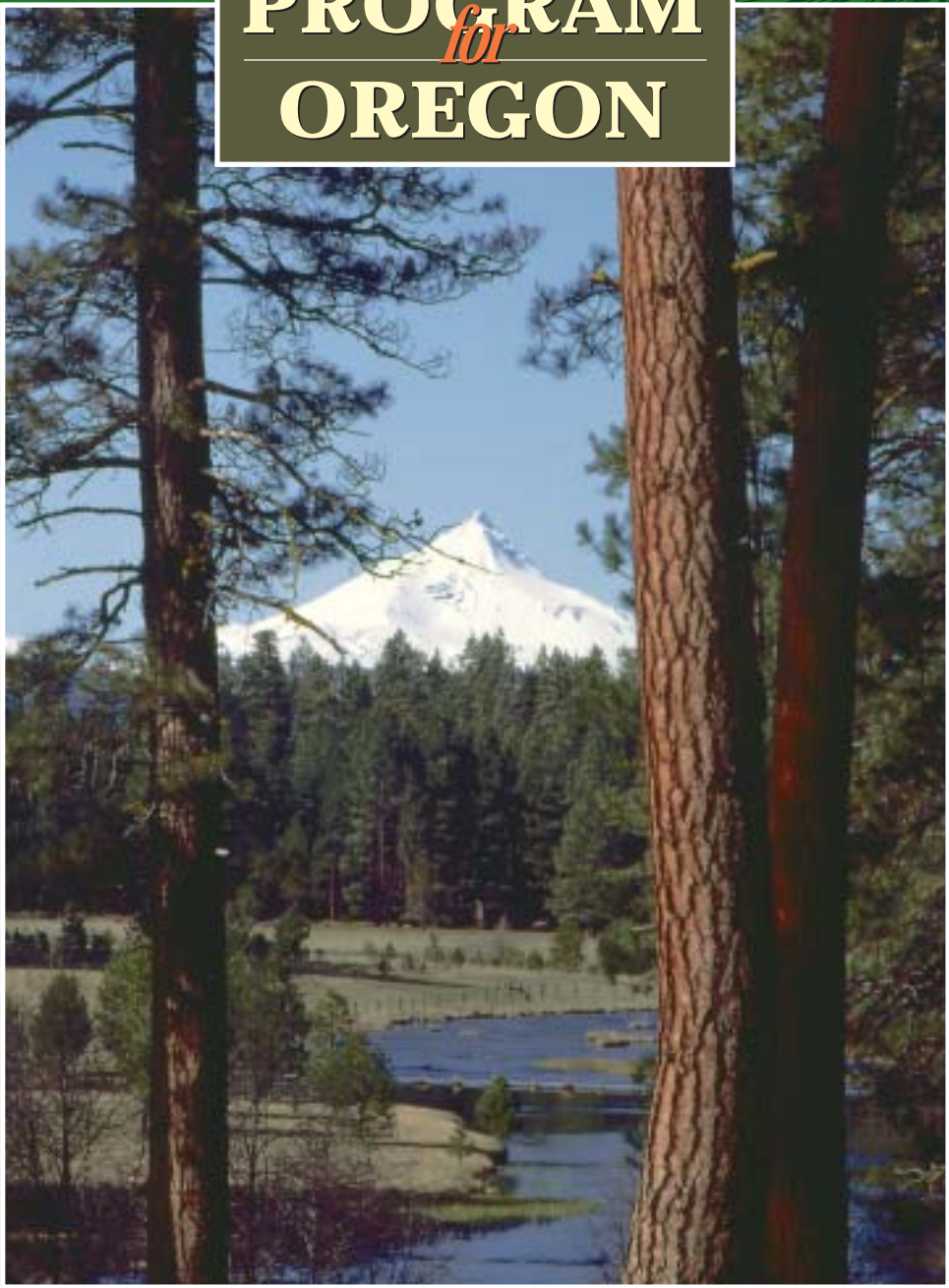


FORESTRY
PROGRAM
for
OREGON



Oregon Board of Forestry

2003

FORESTRY PROGRAM *for* OREGON

2003

Published by
the Oregon
Board of Forestry



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Cover photo: Metolius River,
central Oregon. Photo by
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The Board of Forestry
extends its thanks to
the many people who
helped guide and develop
this edition of the
Forestry Program for Oregon.

The Oregon Board of Forestry meeting at Department of Forestry headquarters in Salem in the 1960s.



Photo by Rod Nichols, ODF

The Oregon Board of Forestry meeting in Sutherlin, Oregon in July 2003.

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Photo by Tom Fields, DRPA

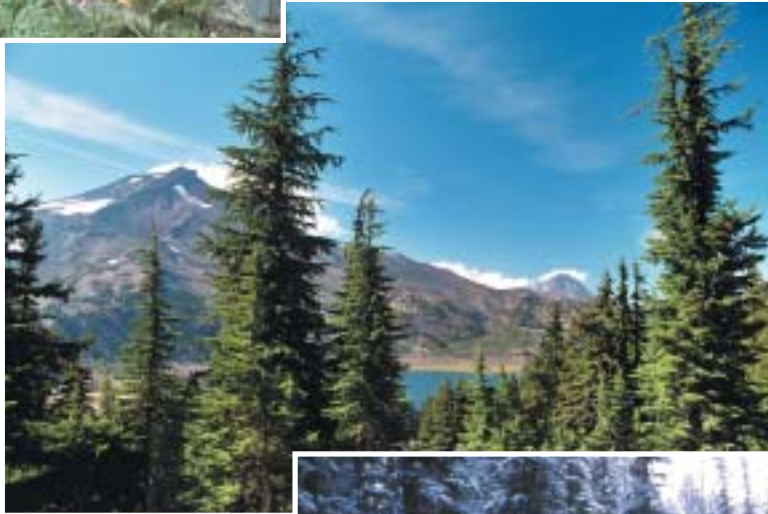


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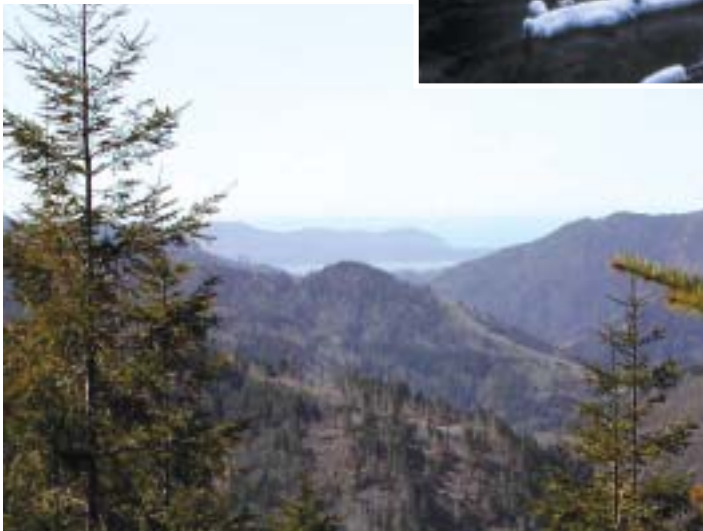


Photo by Robert Gustavson, ODF

Welcome to the 2003 Forestry Program for Oregon

Oregon is justly renowned for the magnificence of its forests—some of the most beautiful and productive in the world. Forests have shaped Oregon’s history since presettlement times, and they continue to define the state’s economy, society, and culture. Oregon’s forestlands contribute greatly to our state’s environmental, economic, and social well-being.

The *Forestry Program for Oregon* is the strategic plan established by the Oregon Board of Forestry. It sets forth the board’s mission and vision for Oregon’s forests and the values and strategies that will guide the board’s decisions over the next eight years. This edition of the *Forestry Program for Oregon* also introduces a new framework for discovering, discussing, and assessing the sustainability of Oregon’s forests.

Three sectors

It is sometimes assumed that the benefits from the forest cannot equally achieve environmental, economic, and social goals—that what is gained in one sector is necessarily lost in another. The Board of Forestry believes, on the contrary, that sustainable forest management can and must succeed in all three sectors. To be truly sustain-



able, forest management must be economically viable, environmentally robust, and socially acceptable.

If environmental values are not protected, forest health and productivity will suffer. If economic values are not honored, society cannot afford to protect

the environment or provide social benefits from forests. If social values are not accommodated, the license to manage forests for any purpose will be lost. Acknowledging this interdependence among values is key to supporting sustainability. The Board of Forestry recognizes that integrating the environmental, economic, and social sectors is critical to Oregon’s future.

In this fifth edition of the *Forestry Program for Oregon*, the Board of Forestry is expressing its conviction that Oregon’s forests can and do support the state’s economic well-being and strengthen its social fabric. At the same time, they represent a range of forest ownerships, owner objectives, and natural ecosystems that are sustainable across the landscape and through time.

Three principles

This *Forestry Program for Oregon* sets forth the Board of Forestry’s strategic vision for Oregon’s forests for the next eight years. This vision is based on three principles:

- Widely recognized international criteria and indicators serve as a useful framework for discovering, discussing, and assessing the sustainability of Oregon’s forests.

What is sustainable forest management?

“Sustainable forest management” means forest resources across the landscape are used, developed, and protected at a rate and in a manner that enables people to meet their current environmental, economic, and social needs, and also provides that future generations can meet their own needs [based on ORS 184.421].

On a statewide basis, sustainable forest management will provide:

- Healthy and diverse forest ecosystems that produce abundant timber and other forest products;
- Habitat to support healthy populations of native plants and animals;
- Productive soil, clean water, clean air, open space, and recreational opportunities; and
- Healthy communities that contribute to a healthy state economy.

- Sustainability requires maintaining a diversity of forestland ownerships and management objectives across the landscape and through time.
- Cooperative, non-regulatory methods are strongly preferred in achieving public benefits on private lands.

A language for discussion and measurement

To fulfill the first principle, the board has decided to use an internationally recognized framework for assessing sustainability of forests. This framework was crafted by 12 nations with forests like ours. These nations recognized the need to keep forests sustainable in all three sectors—economic, environmental, and social. They developed a system that establishes criteria for organizing discussions about sustainability, and indicators for measuring progress. The international framework does not establish targets or goals. It is simply a “language for discussion and measurement” in which citizens and experts alike may have an ongoing conversation, come to a common understanding of forest sustainability, and work together to determine their own goals. The Board of Forestry has adapted this system to Oregon’s particular circumstances.

The Board of Forestry believes using this framework will help make sustainable forest management demonstrable and measurable, and it will enable Oregon’s citizens to

discuss forest management and policy in a common language. By choosing the international criteria and adapting them to Oregon’s needs, the board has made Oregon the first state in the nation to embrace this “language for discussion and measurement” of forest sustainability. Within this framework, the board hopes to encourage all forest landowners, forest managers, and citizens to learn this language, and to work together to achieve sustainability of our forests in all three sectors.

A healthy diversity

To fulfill the second principle, this *Forestry Program for Oregon* supports the diversity of ownerships that now characterizes Oregon’s forestlands. Oregon’s forests are held by a rich variety of owners—federal, tribal, state, and local governments, as well as private industrial owners and family forest landowners. The board believes that the optimum mix of economic, environmental, and social benefits can be achieved only through a diversity of owners managing for a variety of objectives and values (See sidebar p. 3).¹ These varied benefits are the product of different actions in different places at different times. The ownerships complement one another precisely because not every acre of forest is managed in the same way for the same thing. The board believes that, like ecosystem diversity, ownership diversity enhances forest sustainability. It gives Oregon a strong foundation for assessing

whether our forests are in total being managed sustainably.

Emphasizing incentives over regulations

Private forest landowners are regulated in many ways. These lands already provide many public benefits, such as sustaining watershed health, keeping the land in forest cover, and contributing to the vibrancy of rural communities. To fulfill the third principle, this *Forestry Program for Oregon* supports cooperation and incentives as the preferred tools for promoting desired public benefits on private lands. This document, therefore, should not be viewed as a recipe for future government regulations.

Framing the future

The *2003 Forestry Program for Oregon* expresses the Board of Forestry’s vision of how Oregon’s private and public forest landowners can work with the rest of Oregon’s citizens to ensure that our forests are managed for the best mix of economic, environmental, and social benefits, as defined by Oregonians themselves. This document is therefore a work in progress, a framework for shaping the future of Oregon’s forests over the next eight years. It is a conversation with Oregonians, a conversation that will, we hope, lead to a more unified vision of forest sustainability and a more united effort to achieve it.

¹ Based on presentations by Dr. Hal Salwasser, Dean of the College of Forestry, Oregon State University.

Managing diverse forests for different purposes:
A pathway to sustainable forestry

Oregon's forests are diverse, and so are the objectives of forest landowners. To promote sustainable forest management, we first focus on sustaining our forestland base, and then take advantage of different management strategies for different forest types, ownerships, and locations.

Forest management strategies can be grouped into four broad categories:

Wood production

Much of the world's wood will come from this forest use.

Goal: Most efficient wood/fiber production

Challenges:

- Increase wood yield up to two times over natural rates
- Reduce environmental footprint
- Improve product quality
- Produce high return on investment
- Maintain social license to operate

Multiple-resource

Most of the world's accessible forest will be in integrated management.

Goal: Meet various landowner objectives

Challenges:

- Optimize joint production of products and benefits

- Sustain desired diversity of environmental, economic, community conditions and results; i.e., risk, forest health, vitality, productivity
- Produce multiple benefits at reasonable costs

Reserve

Parks, reserves, wilderness, special areas for natural, cultural values.

Challenges:

- Manage people to reduce impacts
- Manage forests to restore "naturalness"
- Manage ecosystems to be resilient to natural disturbances, such as wildfire, and resistant to invasive species, pollution, other human-caused disturbances

Residential value emphasis

Urban and community forests, forested rural residential areas, wildland/urban interface areas.

Challenges:

- Connect people with forest resources
- Maintain pleasant neighborhoods
- Conserve resources
- Minimize sprawl
- Safety to life and property, risk reduction
- Maintain and enhance wildlife habitats

Oregon Board of Forestry



Howard Sohn
Chair



Marvin Brown
State Forester/
Board Secretary



Larry Giustina



Chris Heffernan



Bill Hutchison



Sam Johnson



Diane Snyder



Brad Witt



Photo by Nancy Hirsch, ODF

“The West is beginning to understand itself in a new way, as a region with its own cultural identity, an identity strongly shared by the landforms that define the territory and give shape to its communities. The love of the land that brought so many people to the West and keeps them there is common ground on which westerners can articulate and enact a commitment to a shared agenda of living well in a well-loved place.”

—Daniel Kemmis, *This Sovereign Land*, p. 115

The 2003 Forestry Program for Oregon:

A conversation about the future of Oregon's forests

Introduction

Oregon is a “well-loved place”—in large part because of its forests. Oregonians have always loved our forests and we continue to love them, for many reasons. With nearly 45 percent of Oregon’s land base covered by forests, working forests—those on which we have depended to provide our economic well-being—historically have defined Oregon’s

environmental, economic, and cultural landscape (Figure 1).

However, as the state becomes more populated and its economic and cultural base changes, many people’s connection to a working forest landscape grows weaker. Oregon’s citizens have always expected their well-loved forests to provide values such as clean water and scenic beauty along with economic values. All these values are as

important today as ever. But, in particular, the economic contributions of Oregon’s forests are vital to our continued ability to live well in a well-loved place.

The challenge facing the Oregon Board of Forestry is not only to help all Oregonians see and appreciate what our forests have been, but also to involve them in developing and implementing a vision of what these forests

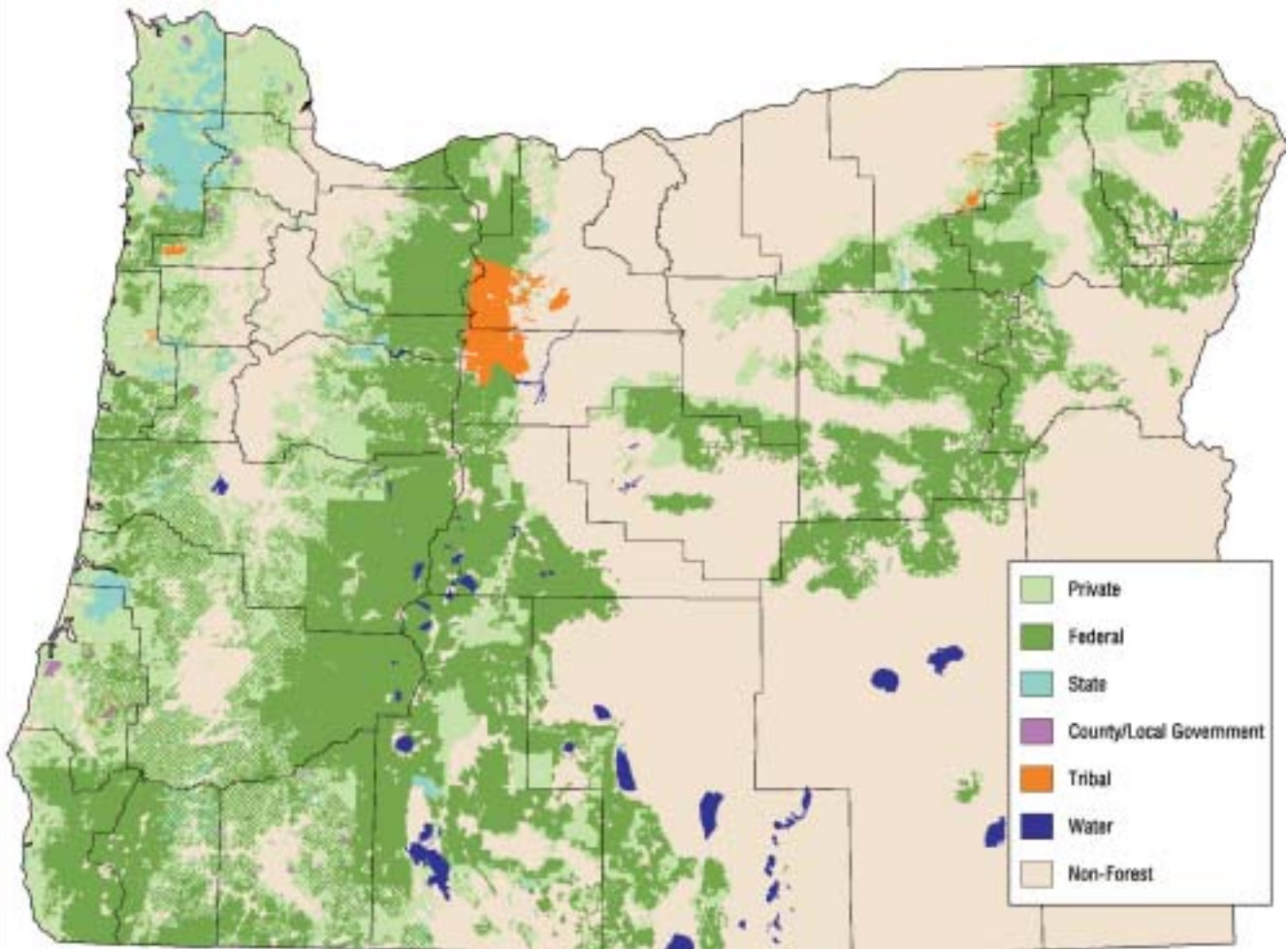


Figure 1. Forestland ownership in Oregon.

can be. The future will depend on the choices we make today.

Recent polling tells us Oregonians want forests to provide clean water and air, fish and wildlife habitat, wood products, jobs, revenues, and recreation. They want all the benefits and values forests contribute to our quality of life. They want forest management that produces these benefits in an integrated way, now and for the future.

Until now we have lacked a common language in which to discover, discuss, and come to a common understanding about forest sustainability and the actions required to achieve it. With the *2003 Forestry Program for Oregon*, we hope to increase this common understanding by defining “sustainable forest management,” in the context of Oregon’s unique circumstances, through a public process designed to address the needs, challenges, and opportunities facing Oregon’s forests.

The *Forestry Program for Oregon* represents our vision and guidance to the state forester, Legislature, governor, and the citizens of Oregon on important matters of forest policy. It guides our priorities and those of the Oregon Department of Forestry as we work with the public, the Oregon Legislature, the forest landowner community, non-governmental organizations, and other agencies to develop and carry out sound forest policy. We ask all Oregonians to help us with this task.

What’s in this edition of the *Forestry Program for Oregon*?

In our “welcome” statement (p. 1), we introduced you to the main concepts of this edition of the *Forestry Program for Oregon*. In this section, we

- Explain the Oregon Board of Forestry’s role in over-seeing state forest policy;
- Tell how the *Forestry Program for Oregon* has evolved in response to changing knowledge and values about forests;

“The concept of sustainability will enable Oregon to achieve greater economic prosperity, more vital communities, and a healthier environment. We should not and cannot afford to let these three goals be in conflict with one another.”

— Governor Theodore R. Kulongoski

- Give more detail about the board’s adaptation of internationally recognized criteria as the framework for discussing and measuring forest sustainability in Oregon; and
- Tell how the *Forestry Program for Oregon* will guide strategic planning for the board and for the Department of Forestry.

The next section, The Key Elements of the *Forestry Program for Oregon* (p. 11), is the meat of the document. We set forth the Board of Forestry’s mission, vision, and values. Then we list the seven strategies, adapted from the international criteria, for achieving

long-term sustainability of Oregon’s forests. Under each strategy are listed the actions that will be needed to achieve the board’s desired vision for the future of forests in Oregon. Some of these actions are deemed urgent enough to be called key actions; these are highlighted in the list.

Next, we provide detailed background information on each of the strategies (beginning on p. 19). Following the conclusion (p. 67) is a list of selected references for further study (p. 69). The appendix (p. 73) compares the seven strategies with the seven international criteria and explains how the Board of Forestry adapted the international framework to meet Oregon’s particular needs. Finally, we provide a glossary of terms (p. 75).

What is the Oregon Board of Forestry?

The Board of Forestry is a seven-member citizen board appointed by the governor and confirmed by the senate. It is empowered by the Oregon Legislature to oversee all forest policy within the jurisdiction of the State of Oregon. The board appoints the state forester, adopts rules regulating forest practices and other forestry programs, and provides general supervision of the state forester’s management of the Department of Forestry. The board’s leadership helps shape public debate and policy on state, private, and federal ownerships, addressing sustainable management of Oregon’s 28 million acres of

forests. Issues such as environmental incentives and regulations, management of state-owned forests, federal forest management, assistance to private forest landowners, and wildland fire prevention and suppression are common topics discussed and acted upon at the board's meetings.

The Board of Forestry is charged by law to represent the public interest. No more than three members of the board may receive any significant portion of their income from the forest products industry. At least one member must reside in each of the three major forest regions of the state. The term of office is four years, and no member of the board can serve more than two consecutive full terms.

The evolving Forestry Program for Oregon

Since the first version was published in 1977, the *Forestry Program for Oregon* has played an important role in shaping the Board of Forestry's strategic vision. Through each edition, the Board has tried to establish and further refine a pathway to ensure that the values we enjoy from our forests are sustained over time.

Forestry in Oregon has evolved significantly over time as each generation decides what set of values it wishes to emphasize and what pathway it will follow. Over the past 150 years, this emphasis has changed from unmanaged forest exploitation, to forest conservation, to managed forests as a source of wood for

the post-World War II housing boom, to wilderness and environmental protection, to today's interest in sustainable forestry.

In the same way, the *Forestry Program for Oregon* has changed over time to incorporate new scientific information and to reflect changing public concerns. Still, the *Forestry Program for Oregon* has always been centered on the theme of sustainability. Early interest in a sustainable timber supply (1977 and 1982 editions) was followed by an interest in sustaining multiple values (1990), which evolved into an interest in identifying the cumulative effects of forest practices over time and across forest landscapes (1995).

Introducing a new framework

The *2003 Forestry Program for Oregon* introduces a framework for organizing the board's strategies and actions by means of an internationally recognized language of categories and measurements. This framework also lends itself to organizing research information about forests and to supporting a dialogue about how they may be managed sustainably. Using this framework, the Board will be better able to communicate how Oregon's forests can be managed sustainably to meet short- and long-term objectives for the environment, economy, communities, and the larger society through a diversity of owners who manage for a variety of objectives and values (Figure 2).

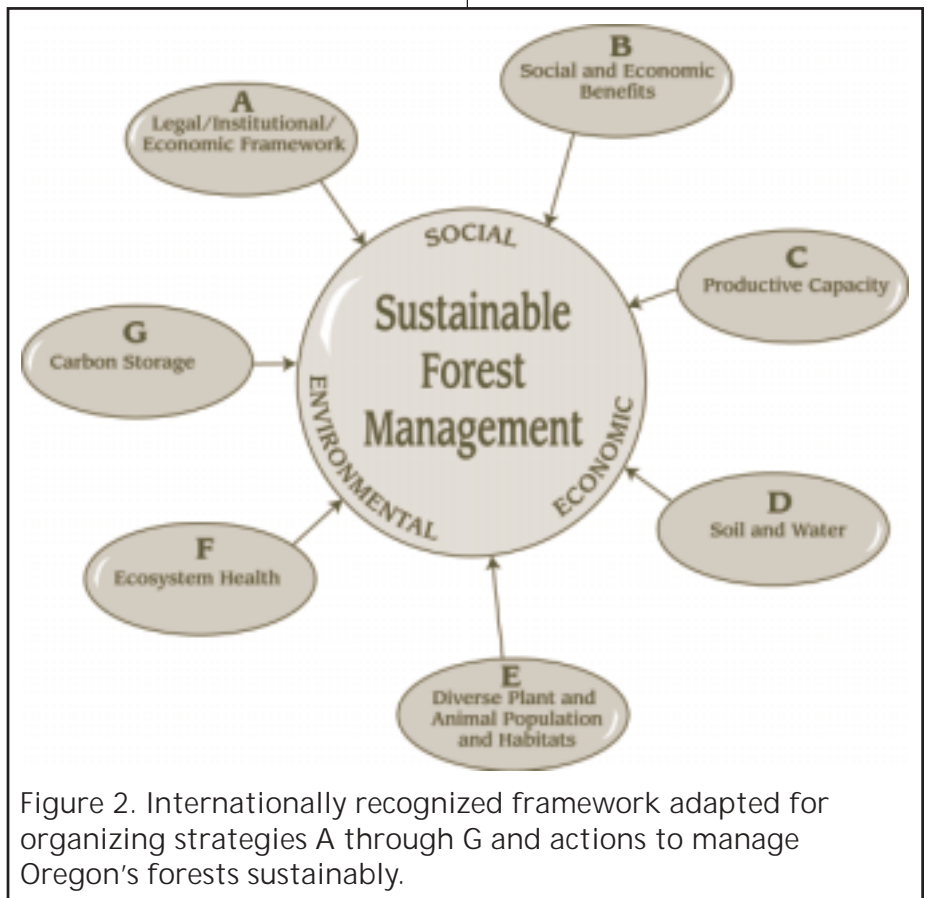


Figure 2. Internationally recognized framework adapted for organizing strategies A through G and actions to manage Oregon's forests sustainably.

Developing the *Forestry Program for Oregon*

The Board of Forestry adopted the criteria-and-indicators framework to better respond to legislative direction to assess and report on the cumulative effects of forest practices. In 2000, Oregon became the first state in the nation to publish a “first approximation report” to measure the status and trends of the state’s forests against internationally recognized measures of conservation and sustainable forest management.

Oregon’s First Approximation Report for Forest Sustainability provides a snapshot of Oregon’s forests in light of these seven topics, and it provides a starting point for a conversation with Oregon’s citizens about future forest sustainability. The report found much good news about Oregon’s forests, including that they are among the best-managed in the world, that Oregon’s strict reforestation requirements are effective, and that there is a growing commitment to restoration of watersheds. The report also identified challenges posed by global market forces, risks of harm to forests from wildfire and invasive species, business problems

facing family forest landowners, and suburban-type development on forestlands.

The 2003 Oregon Forests Report continued the discussion that started with the First Approximation Report and identified “breakthrough” opportunities to continue or improve work toward sustainability of Oregon’s

“We have talked about the importance of educating the public, but one piece we have left out is the education of policy-makers. Lawmakers come from different backgrounds. We want the quick answer because there are so many issues and so many problems to deal with.”

— Representative Deborah Kafoury
(D-Portland)

forests. Following through on these opportunities could help accomplish genuine economic recovery for many Oregon communities, a stable return on Oregon’s natural assets, and significant improvement in the health of Oregon’s forests. Many of these opportunities have been incorporated into the *2003 Forestry Program for Oregon* in the form of actions to be undertaken over the next eight years.

The 2003 Forestry Program for Oregon also has been influenced by other scientific and policy developments

since 1995. These include new incentive concepts; the latest scientific findings on forest practices; policies and plans for state-managed forests under the Greatest Permanent Value Rule²; the Oregon Plan for Salmon and Watersheds; the Northwest Forest Plan for federal lands; administration of the federal Endangered Species Act, Clean Air Act, and Clean Water Act; growing concerns about wildfires and forest health; forest certification; and discussions about sustainability.

In March 2001, the Board of Forestry chose “the conservation and sustainable management of Oregon’s forests” as the central theme, and chose the seven criteria for sustainability as the basis for strategies for the *2003 Forestry Program for Oregon*.³ In October 2001, the board hosted a two-day symposium and workshop at Oregon State University to hear presentations on Oregon forest resource and economic and social trends and conditions, and to discuss potential policy changes with key opinion leaders. The public involvement process that began with the October 2001 meeting continued throughout 2002 and early 2003 through discussions at regular Board

² The board has adopted an administrative rule that defines “greatest permanent value” to mean healthy, productive, and sustainable forest ecosystems that over time and across the landscape provide a full range of social, economic, and environmental benefits to the people of Oregon (OAR 629, Division 35).

³ These actions are consistent with ORS 184.423, which requires state agencies to promote efficient use of energy, water, and resources; partner with communities and businesses; reduce adverse impacts on native habitats and species and restore ecological processes; efficiently use and reuse resources and reduce contaminants released into the environment; and encourage local communities to become resilient and economically diverse.

of Forestry business meetings, other public meetings and forums hosted by the board, an interactive website, newsletters, television and print media, presentations by Department of Forestry staff, interactions with key stakeholders, and other methods. This process has resulted in a document that reflects the opinions of a wide range of scientific, public interest, and forest landowner groups and addresses current environmental, economic, and social needs, opportunities, and concerns.

The conversation continues

The Board of Forestry has adopted the *2003 Forestry Program for Oregon* based on its broad statutory authority. *The Forestry Program for Oregon* provides a coherent foundation for future board policy deliberation. It is neither a statute nor an administrative rule and, therefore, does not have, and is not intended to have, the effect of either a statute or an administrative rule on the board, the department, or forest landowners.

This *Forestry Program for Oregon* is not an end-product. It is the foundation for discussion and planning over the next several years. We would like this edition to be more widely read, understood, and used than past editions. We want it to show a clear connection between the board's strategies and actions, Department of Forestry programs, and the policies of other natural resource agencies with responsibilities that affect forestlands. Future board and department planning efforts will help complete these linkages.

During 2003, Board of Forestry members consulted Oregon's citizens for their ideas on revising the *Forestry Program for Oregon*.



Photo by Rod Nichols, ODF



Photo by Rod Nichols, ODF

The 2003 Forestry Program for Oregon as a guide for strategic planning

The *Forestry Program for Oregon* is the Board of Forestry’s framework for strategic planning. The board will direct the Department of Forestry to complete a comprehensive, iterative strategic planning effort consistent with the actions listed in the *2003 Forestry Program for Oregon*. The Board of Forestry intends that its strategic plan and the department’s strategic plan be fully integrated and that these plans also lead to better integration of Department of Forestry programs (Figure 3). This strategic planning effort is designed to help Oregonians achieve the “triple bottom line” of sustainable environmental, economic, and social performance.

Strategic planning strengthens the board’s ability to be an effective policy-maker in partnership with all Oregonians. The primary purposes of our strategic planning are to:

- Clearly define and communicate (internally and externally) what the Board of Forestry is and what it does;
- Establish the board’s fundamental guiding values and priorities;
- Direct the department in implementation of the Board of Forestry strategies and actions in the *Forestry Program for Oregon*;

- Focus resources and efforts on the most important issues and priorities that will promote and create the desired future;
- Measure and report performance (both successes and setbacks); and
- Provide an improvement cycle that allows both the board and the department to make informed changes when necessary.

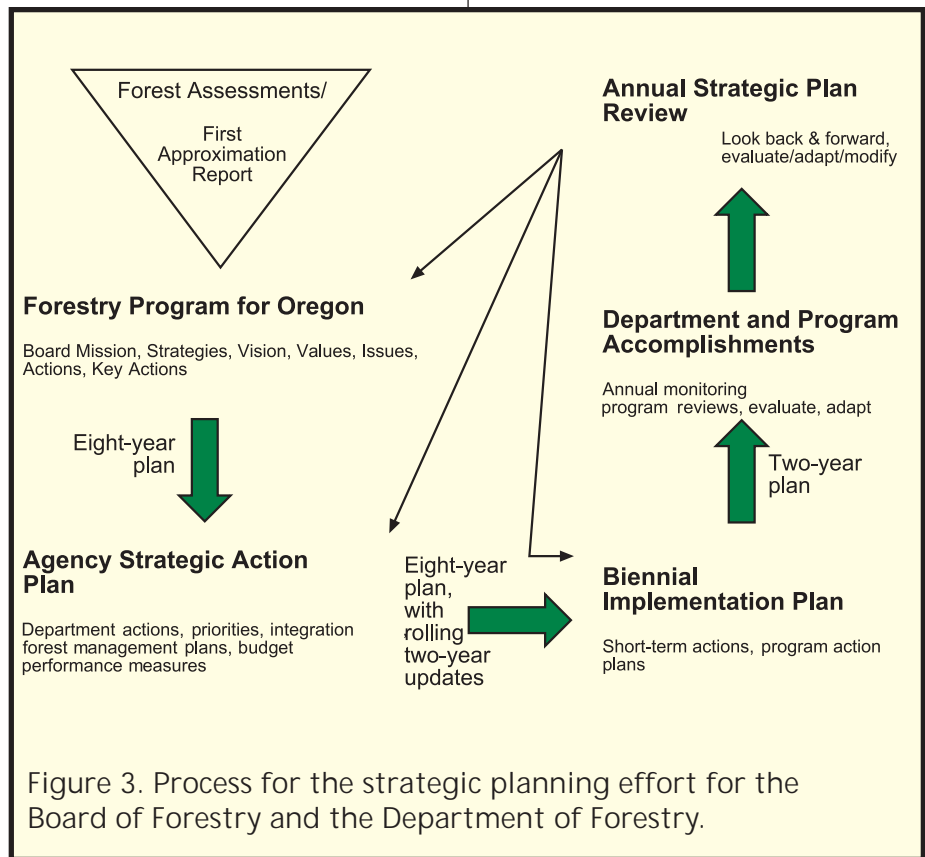


Figure 3. Process for the strategic planning effort for the Board of Forestry and the Department of Forestry.

The Key Elements of the 2003 Forestry Program for Oregon

The 2003 Forestry Program for Oregon has seven key elements. The mission statement (see below) establishes the overall purpose of the Board of Forestry. Seven strategies (see p. 12) identify what the Board of Forestry wants to achieve over the next eight years. They provide the framework for establishing actions and for designing and implementing agency programs. The order in which the strategies are listed is not intended to indicate priority, nor is it intended that all strategies should be applied equally on every forest ownership. Instead, the strategies should be viewed from a state-wide, landscape perspective, with different landowners making different contributions. It is also important that the seven strategies be viewed and understood collectively and not individually.

The vision statement (see p. 12) describes what the board wants to accomplish through its seven strategies, looking at a 20-year horizon. Values (see



Photo by Dave K. Thompson, ODF

p. 12) identify the board's guiding philosophies related to forestry. Viewed together, the mission, strategies, vision, and values describe the future that the board will strive to achieve.

In light of the mission, strategies, vision, and values, the Board of Forestry has developed a set of actions (see p. 14) upon which it intends to focus its efforts. Finally, the background text for each strategy (beginning on p. 19) includes descriptions of issues relevant to that strategy. These descriptions discuss current problems, suggest opportunities for constructive action, and identify matters requiring public understanding and policy decisions. The actions form a

pathway for achieving the board's desired future. The ongoing challenge for the board is to work both within and outside state government to implement these actions to make this desired future a reality.

The board understands that economic conditions, agency budgets, and other short-term factors may limit its ability to fully implement elements of the *Forestry Program for Oregon*. To address these potential constraints, the board has identified key actions within the longer lists of actions under each strategy. Key actions are actions that the Board of Forestry believes are high priorities for attention through agency implementation, budgeting, and coordination. Key actions will both guide new actions and help in prioritizing strategic downsizing in response to budget changes.

Oregon Board of Forestry Mission Statement

The Board of Forestry's mission is to lead Oregon in implementing policies and programs that promote environmentally, economically, and socially sustainable management of Oregon's 28 million acres of public and private forests.

Oregon Board of Forestry Strategies

Strategy A. Promote a sound legal system, effective and adequately funded government, leading-edge research, and sound economic policies.

Strategy B. Ensure that Oregon's forests provide diverse social and economic outputs and benefits valued by the public in a fair, balanced, and efficient manner.

Strategy C. Maintain and enhance the productive capacity of Oregon's forests to improve the economic well-being of Oregon's communities.

Strategy D. Protect, maintain, and enhance the soil and water resources of Oregon's forests.

Strategy E. Contribute to the conservation of diverse native plant and animal populations

and their habitats in Oregon's forests.

Strategy F. Protect, maintain, and enhance the health of Oregon's forest ecosystems, watersheds, and airsheds within a context of natural disturbance and active management.

Strategy G. Enhance carbon storage in Oregon's forests and forest products.

Oregon Board of Forestry Vision Statements

If the *2003 Forestry Program for Oregon* is implemented successfully, Oregon will have:

1. Healthy forests providing a sustainable flow of environmental, economic, and social outputs and benefits.
2. Public and private landowners willingly making investments to create healthy forests.
3. Statewide forest resource

policies that are coordinated among Oregon's natural resource agencies.

4. A Board of Forestry recognized as an impartial deliberative body operating openly and in the public interest.
5. Citizens who understand, accept, and support sustainable forestry and who make informed decisions that contribute to achievement of the

vision of *2003 Forestry Program for Oregon*.

6. Adequate funding for the Department of Forestry to efficiently and cost-effectively accomplish the mission and strategies of the Board of Forestry, and department personnel policies that encourage and recognize employees, allowing them to meet their full potential in providing excellent public service.

Oregon Board of Forestry Value Statements

The Board of Forestry values:

1. A global context. We believe Oregon's forests are important to the global environment, economy, and society, and that forest managers, government agencies, interest groups, and all other Oregonians should consider the impact of their decisions at local, state, national, and international levels.
2. The dynamic nature of Oregon's forests. We recog-

nize that Oregon's forests are diverse, dynamic, and resilient ecosystems at a landscape scale. A broad range of forest conditions exists naturally, and various forest values, in proper proportion, are mutually compatible over time.

3. Active management. We believe Oregon's forests should be actively managed to maintain forest health, to conserve native plant and animal species, and to produce the products

and benefits people value. In this context, we define "active management" as the application of practices through planning and design, over time and across the landscape, to achieve site-specific forest resource goals. Active management uses an integrated, science-based approach that promotes the compatibility of most forest uses and resources over time and across the landscape.⁴

⁴ Based on OAR 629-035-0000(1).

Value Statements (continued)

- | | | |
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| <p>4. Landowners and the public sharing responsibility for sustainable forests. We believe forest sustainability depends on the contributions of both landowners and the public. We support the private landowner's right to practice forest management in an environmentally sound manner that is already regulated by Oregon's strong Forest Practices Act. The public must also play an active role by supporting incentives and other non-regulatory methods that encourage continued investment in Oregon's forests to maintain and enhance environmental, economic, and social benefits.</p> <p>5. Forests that contribute to quality of life. We believe Oregon's forests play a significant role in providing for Oregon's quality of life, including products, jobs, recreation, tax revenues for purposes such as education and public safety, and a quality environment.</p> <p>6. Meeting current and future needs. We believe forest resources should be used, developed, and protected at a rate and in a manner that enables people to meet their current environ-</p> | <p>mental, economic, and social needs, and also provides that future generations can meet their own needs.</p> <p>7. Different landowners playing different roles. We believe different land ownerships play different roles in achieving the full suite of environmental, economic, and social needs met by the forested landscape. Family forest landowners play unique and valuable roles in Oregon's forest landscape, but their continued existence is threatened by development, regulation, and economic challenges.</p> <p>8. Informed public participation. We value broad-based, informed public participation and consensus-based decision-making whenever possible, utilizing the following working principles adopted by the Western Governors' Association⁵:</p> <ul style="list-style-type: none"> ● National Standards, Neighborhood Solutions—Assign responsibilities at the right level ● Collaboration, Not Polarization—Use collaborative processes to break down barriers and find solutions ● Reward Results, Not Programs—Move to a performance-based system | <ul style="list-style-type: none"> ● Science for Facts, Process for Priorities—Separate subjective choices from objective data gathering ● Markets Before Mandates—Pursue economic incentives whenever appropriate ● Change a Heart, Change a Nation—Environmental understanding is crucial ● Recognize Benefits and Costs—Make sure all decisions affecting infrastructure, development, and environment are fully informed ● Solutions Transcend Political Boundaries—Use appropriate geographic boundaries for environmental problems <p>9. Continuous learning. We are committed to continuous learning. The results of forest management policies and programs should be evaluated and appropriately adjusted based upon ongoing monitoring, assessment, and research.</p> <p>10. Healthy rural Oregon. We believe a healthy rural Oregon, which relies on working landscapes, is vital to the quality of life enjoyed by all Oregonians.</p> |
|---|---|---|

⁵ Western Governors' Association, 1999. In 2002, the Western Governors' Association renewed its commitment to the Enlibra principles to guide natural resource and environmental policy development and decision-making in the West. The doctrine is based upon the listed principles, each of which is dependent upon the others. The integration of these principles is critical to the interpretation and the success of the new doctrine. More information is available at the Association website.

Planned Oregon Board of Forestry Actions

The Board of Forestry believes the actions listed below will be needed for the board's strategies to be successful and to achieve the board's mission and vision, reflecting the board's values. Key actions are highlighted.

Strategy A. Promote a sound legal system, effective and adequately funded government, leading-edge research, and sound economic policies.

ACTIONS:

- A.1. The board will continue to support an effective, science-based, and adaptive Oregon Forest Practices Act and a strong but flexible Land Use Planning Program as the cornerstones of forest resource protection on private lands in Oregon. (KEY ACTION)
- A.2. The board will foster collaborative partnerships with federal natural resource regulatory and forestland management agencies. The board will actively support federal policies that are consistent with the board's strategies and actions and actively seek changes to federal policies that are inconsistent with the board's strategies and actions. (KEY ACTION)
- A.3. The board will promote active, adaptive forest management and the outreach monitoring, assessments, research, and evaluations that support it

as a continuous learning and improving process for all seven strategies. (KEY ACTION)

- A.4. The board will promote congressionally approved experiments in Oregon and other states where local communities with mature, successful histories of collaboration are empowered to demonstrate their stewardship of federal forestlands and are held accountable for the results. Such experiments should be implemented under a framework of national management and monitoring standards (KEY ACTION)
- A.5. When forest practice regulations are necessary, the board, consistent with state statutes, will work to minimize the adverse financial effects of regulations that may require private landowners to contribute forest resources to provide increased public benefits.⁶
- A.6. The board will continue to support local land-use planning to stabilize the forestland base and encourage long-term investments in forestland.
- A.7. The board will encourage the use of nonregulatory methods, such as landowner incentives, to achieve public-policy goals on private forestlands.
- A.8. The board will promote collaboration, partnerships, dialogue, and consensus-building as preferred pathways

to resolve natural resource conflicts.

- A.9. The board will promote policies and programs that will reinvigorate rural areas by promoting active forest management, economic and community investment, urban/rural partnerships, and public education about the benefits that forests and rural areas provide all Oregonians.
- A.10. When developing Oregon forest policies, the board will consider them in the context of the Oregon environment and economy, but also in the context of the global environment and the global economy.

Strategy B. Ensure that Oregon's forests provide diverse social and economic outputs and benefits valued by the public in a fair, balanced, and efficient manner.

ACTIONS:

- B.1. The board will work with other organizations to create and maintain a favorable investment climate for environmentally sensitive, socially responsible, and globally competitive forest-based businesses throughout Oregon that will generate high quality, value-added products; high quality, stable employment; and increased export capacity. (KEY ACTION)
- B.2. The board will promote the development of programs that enhance Oregon's

⁶ ORS 527.714 establishes standards that must be met prior to the board's adopting forest practice regulations affecting private property.

Actions (continued)

forest industry competitiveness, industrial development, and both in-state and global recognition that Oregon forest products come from sustainably managed forests. (KEY ACTION)

B.3. The board will promote increased public dialogue about the challenges of satisfying increasing consumer demand for forest products, the need to keep private forestland in forest uses, the desire for healthy forests, and the need for greater rural economic and community resilience. (KEY ACTION)

B.4. The board will continue to assess the unique challenges and opportunities facing family forest landowners and promote policies that encourage continued retention of, and investment in, family-owned forestlands. (KEY ACTION)

B.5. The board will promote environmentally sound, active forest management policies that encourage long-term investments, sustainable timber supplies, recreation and cultural opportunities, special forest products, fish and wildlife habitat, clean air and water, renewable energy, other forest outputs and benefits, and high levels of employment and income.

B.6. The board will direct the Department of Forestry to analyze barriers to forest industry investment and to

assess the ability of Oregon's forest-related industries to remain globally competitive and to sustain production of other desired environmental, economic, and social values from Oregon's forests.

B.7. The board will direct the Department of Forestry to conduct a study of economic contributions and trends of Oregon's forest recreation and non-wood products industries.

B.8. The board will promote new employment opportunities by encouraging an assessment of what and where wood could be removed from federal forests to improve forest health, consistent with other management objectives, and encouraging the development of the infrastructure needed to accomplish the desired future condition for these forests.

B.9. The board will develop and implement forest policies potentially affecting recognized Indian tribes in consultation with those affected tribes.

B.10. The board will support programs that maintain and protect archeological and cultural sites on forestlands.

B.11. The board will support programs that enhance urban and community forest values and that increase Oregonians' understanding of the important role urban and community forests play in providing environmental, economic, and social benefits.

B.12. The board will work with other organizations to revitalize the economy and social

fabric of rural communities and ensure that the values they provide to all Oregonians are maintained and compensated. The board will consider the social effects on rural communities from current and proposed forest management policies and practices.

STRATEGY C. Maintain and enhance the productive capacity of Oregon's forests to improve the economic well-being of Oregon's communities.

ACTIONS:

C.1. The board will promote retention and improvement of the forestland base and long-term forest investments by landowners through Oregon's land-use and tax programs, regulations, forest products market development, and appropriate incentives. (KEY ACTION)

C.2. The board recognizes that different owners have different objectives for land ownership with different emphases on conservation, commodity production, multiple use, and residential values. The board will promote a policy framework that recognizes that the management of these different ownerships can provide a suite of benefits which collectively will meet Oregon's environmental, economic, and social needs.

C.3. The board will encourage the federal government land management agencies to achieve their statutory objectives by actively managing

Actions (continued)

federal forestlands, including the use of commercial timber harvests where appropriate.

- C.4. The board will support proper management to protect and enhance the multiple values of Oregon's urban and community forests and forests in the wildland/urban interface.
- C.5. The board will encourage forest landowners to manage their forests in a manner that ensures long-term wood volume growth in Oregon equals or exceeds rates of timber harvest and mortality across all ownerships.
- C.6. The board will support continued assessments and research on the capability of Oregon's forests to produce timber, non-wood forest products, recreation, water, fish and wildlife habitat, and other forest values.

STRATEGY D. Protect, maintain, and enhance the soil and water resources of Oregon's forests.

ACTIONS:

- D.1. The board will support and contribute to continuing statewide efforts under the Oregon Plan for Salmon and Watersheds to protect and enhance Oregon's native fish populations and water quality, while sustaining a healthy economy. (KEY ACTION)
- D.2. The board will continue to use the Forest Practices Act as the primary means to protect soil productivity and
- water quality and also promote ongoing voluntary resource restoration and enhancement efforts by forest landowners through the Oregon Plan.
- D.3. The board will promote understanding, acceptance, and support across all land uses for relevant indicators of water quality conditions based on beneficial uses, and the use of these indicators to develop stream protection policies that result in consistent application of state water quality standards across land uses.
- D.4. The board will ensure that forest landowners comply with state non-point source water quality standards as their contribution to providing Oregonians with high quality drinking water.
- D.5. The board will promote renewed, long-term watershed research to study the effectiveness of the most current forestry best management practices in providing protection for soil and water resources.
- D.6. The board will promote continued research and monitoring on the condition of forest roads and the effectiveness of forestry best management practices for roads.
- D.7. The board will promote the maintenance of forestland in forest uses and promote the establishment of new forests as key elements in promoting high quality water and protection of soil productivity.
- D.8. The board will support adequate funding for appro-

appropriate regulation and incentive programs that serve to encourage the establishment and retention of forestland.

STRATEGY E. Contribute to the conservation of diverse native plant and animal populations and their habitats in Oregon's forests.

ACTIONS:

- E.1. The board will collaborate with other state, federal, and tribal agencies; universities; conservation groups; and private landowners to promote the development of a comprehensive, science-based, coarse-scale statewide assessment that evaluates the characteristics, conditions, and trends of native vascular plant and vertebrate animal populations and habitats on all land uses and ownership classes. (KEY ACTION)
- E.2. Following completion of the assessment, and within the broader context of continuing to meet Oregon's environmental, economic, and social needs, the board will collaborate with other agencies, universities, organizations, and landowners to promote development of a coordinated, statewide Oregon native plant and animal conservation policy addressing all land uses and ownership classes. This policy should be ratified by all of Oregon's natural resource boards and commissions, as well as the Oregon

Actions (continued)

Legislature, and acknowledged by federal natural resource agencies. The adopted policy should:

- Recognize that the primary purpose of most private forestland is to grow and harvest commercial tree species.
- Clearly consider public expectations for the contributions of private landowners on all uses to achieve state goals and how, in light of the technical assessment results, those expectations can be met in a fair and equitable manner.
- Ensure that any additional contributions by private forest landowners are sought first through non-regulatory methods and only through regulation if the assessment shows a clear, compelling need, consistent with ORS 527.714. (KEY ACTION)

E.3. The board will promote a variety of non-regulatory tools, such as landowner recognition, incentives, easements, exchanges, and technical assistance, to help implement the state native plant and animal habitat conservation policy. (KEY ACTION)

E.4. The board will support continued active management of Oregon's state forests through the use of structure-based management combined with ongoing science-based implementation monitoring and evaluation. (KEY ACTION)

E.5. The board will evaluate and develop Oregon forest policies in the context of the diverse roles and management objectives of the state's public and private forest landowners, along with other land uses, to sustain the state's natural heritage of native plant and animal species and communities.

E.6. The board will promote continued monitoring and evaluation of both the short-term and long-term effects of current forest practices on Oregon's biological resources

STRATEGY F. Protect, maintain, and enhance the health of Oregon's forest ecosystems, watersheds, and airsheds within a context of natural disturbance and active management.

ACTIONS:

F.1. The board will promote active fuels and vegetation management⁷, along with aggressive wildfire suppression, as key tools to manage forest health on public and private forestlands. (KEY ACTION)

F.2. The board will promote forest landscape conditions that are resilient to natural disturbances, reducing the adverse environmental impacts and losses of forest resources to wildfire, insects, diseases and other agents in a cost-effective, environmentally, and socially acceptable manner.

F.3. The board will encourage state and federal agencies to closely monitor and aggressively act to prevent and mitigate the adverse effects of air pollution and invasive, non-native species on Oregon's forests.

F.4. The board will continue to promote smoke management programs that maintain and improve air quality while allowing sufficient opportunities for prescribed burning, fuel reduction, and forest health improvements.

F.5. It is the policy of the board that wildfire suppression actions in all of Oregon's forests reflect the following protection priorities: (1) human lives, (2) forest resources, (3) dwellings and other developments.

F.6. The board will promote shared public and landowner funding to maintain the most efficient level of fire protection and other forest health activities on non-federal forestland.

⁷ In this context, "active fuels and vegetation management" may include a combination of prescribed fire, mechanical treatments, and both commercial and noncommercial tree removal.

Actions (continued)

STRATEGY G. Enhance carbon storage in Oregon's forests and forest products.

ACTIONS:

- G.1. The board will encourage maintaining and increasing Oregon's forestland base and promoting urban forests to enhance carbon storage and reduce greenhouse gases.
- G.2. The board will encourage development of tools to predict how forest management and wildfire affect carbon pools and calculate the amount of carbon stored in these pools.

- G.3. The board will promote increased public and forest landowner understanding of the potential contributions of trees and forests in storing carbon.
- G.4. The board will promote the development of forestry carbon-offset markets, and provide landowners information about the market rules for the sale or exchange of carbon offsets.
- G.5. The board will promote the use and reuse of Oregon forest resources, avoiding the higher level of carbon dioxide

- emissions resulting from the manufacture of many wood product substitutes.
- G.6. The board will work with forest landowners and encourage other organizations to work with wood products manufacturers and retailers to develop local markets for wood products from Oregon forests.
- G.7. The board will encourage greater consumer awareness of the environmental advantages of using renewable and recyclable Oregon forest products.

Background on Strategy A:

Promote a sound legal system, effective and adequately funded government, leading-edge research, and sound economic policies

Do we have the basic institutional framework we need?

Achieving a win-win solution

The institutional framework in place outside the forest greatly affects what happens within it. The soundness and effectiveness of our laws, government processes, research institutions, and economic policies will determine our success or failure to define and achieve sustainability. If we fail to provide an adequate and appropriate institutional framework for the management of our forests, we will significantly reduce our ability to achieve any of the strategies proposed in this *Forestry Program for Oregon*.

Many of the existing forestry laws and institutions were created to address past management practices, provide for economic development, or address catastrophic events such as wildfire. These laws and institutions have evolved significantly over time. While Oregon has well-developed legal, institutional, and economic systems, some elements of our current framework with regard to forest policy and practice are inadequate. These shortcomings make it difficult to address larger landscape-scale forestry issues or issues that cross jurisdictional bound-



The Board of Forestry meeting in Salem, Oregon, in September 2003

aries. Our laws, policies, and economic traditions have not always kept pace with scientific advancements, and many progressive efforts are underfunded. Because it has evolved to meet changing objectives over time, our institutional forestry framework contains internal contradictions. Perhaps most important, this framework is based largely on an ideal of maintaining static conditions in a dynamic environment.

One of the greatest challenges facing the board in defining sustainable forest management for Oregon is the conflict over active management of forests, both public and private. This conflict began in the 1970s, with environmentalists expressing legitimate concerns over forest management practices and the future of sensitive species, and the forest industry, which had served as the foundation of the state's economy, equally concerned about increasing government regulation and a shrinking supply of logs for its mills.

This conflict has become a polarized debate, with most Oregonians, as well as more moderate elements from the environmental and forest industry organizations, caught in the middle.

Oregonians view this conflict as a major problem. Polling results show the public is frustrated with the stubborn posturing and endless bickering on both sides and wants better-integrated, politically sustainable solutions. Such solutions are being explored. Private companies are looking at market-based management systems like forest certification to document that their forests are well managed, or to regain credibility with the public, or both. Many private and nongovernmental interests are willing to work collaboratively with stakeholders to develop policy. However, other parties use litigation or civil disobedience to stop or delay activities that are planned and permitted.

This conflict raises a fundamental question: Is it possible to develop "win/win" solutions in the forest policy arena? We believe the Board of Forestry is positioning itself correctly to bring interested parties to the table to strengthen what is developing as a powerful new "center."

Photo by Rod Nichols, ODF

We would point to successes such as watershed councils, the Oregon Plan for Salmon and Watersheds, and other grassroots efforts in which participants favor **and/and** solutions (meeting environmental **and** economic **and** social goals) over **either/or** solutions.

The evolving “contract with rural America”⁸

Because rural economies in Oregon have been affected more than urban and suburban economies by changes in forest policies, the board has taken a special interest in the changing “contract with rural America.” The rural policies of the United States date back to the colonization of undeveloped lands following the Declaration of Independence. More recently, rural policies have included the Homestead Act of 1862, the creation of land-grant universities and the Extension Service, intercontinental and interstate transportation systems (first with railroads, later with highways), the development of mineral, grazing, and timber resources on federal lands, and rural electrification in the mid-1900s. The development of dams and irrigation systems was also an important part of evolving rural policies.

Many of these policies had agricultural development as their goal—providing the country with abundant food. That policy evolved in the later part of the 1900s to supplying

surplus food to a hungry world. Through the early 1960s, these policies stood as a well-defined and established “contract,” with the federal government and urban residents being one party and rural America the other. This contract promoted agricultural and natural resource development and created longstanding expectations and investments.

With the beginning of the environmental movement in the 1960s, many of the goals and practices of the development of rural America were questioned. Traditional western rural policies, such as laws relating to water use and management of federal lands, were challenged politically and legally, and in some cases changed. The urbanization of the West created another set of

“We need a new social contract between rural and urban Oregon. The capacity to finance investment in the land is primarily in the urban areas; however, the most cost-effective place for the investment in ecological restoration is in the rural areas. We must invest in a manner that sustains local economies and social systems at the same time that we are recovering the ecological values that we care about.”

— Sara Vickerman, West Coast director, Defenders of Wildlife

challenges to traditional rural policies. Urban populations and new rural residents often embraced the environmental and social values of rural lands, but viewed traditional economic uses as harmful to their values and interests.

Ironically, those who object to economic uses of rural lands often have consumption habits that belie their convictions, such as owning large homes and driving big cars. This apparent mental disconnect between production and consumption of natural resources is evidence that the social contract between urban and rural America no longer exists.

As a result of these combined pressures, the management of federal forestlands has radically changed. Timber harvested on federal lands in Oregon came to 5.5 billion board feet in 1972 and 4.3 billion in 1989. Restrictions due to concerns over the northern spotted owl, marbled murrelet, and other old-growth-dependent species on federal lands led to the Northwest Forest Plan in 1993. As a result, in 1994 the federal harvest in Oregon dropped to 687 million board feet. The decreased federal harvest in Oregon stayed relatively stable until 1998. Then, because of lawsuits against the Forest Service and Bureau of Land Management for failing to adequately survey rare and uncommon species before harvesting, the volume offered under the Northwest Forest Plan was reduced to 173 million board feet in 2001.

As the contract with rural America has eroded, the traditional practices of both agriculture and forestry have

⁸ Based on Stauber, 2001.

increasingly come under public disapproval. Tools and strategies that rural landowners and managers once took for granted have been prohibited or severely regulated, or have become economically out of reach. Rural Oregon is at risk of losing its middle class and becoming home only to the very rich and the very poor. The social fabric of many of the state's rural communities is not sustainable under such conditions.

To solve these ongoing federal land management conflicts and the challenges facing private forest landowners, we must develop a new rural policy and gain public agreement on its key benefits to society. These benefits might include promoting the survival of the rural middle class, reducing rural poverty, and sustaining and improving the quality of the natural environment.

What is the current legal and institutional framework for forest policy?

The United States Constitution and Oregon State Constitution and the statutes developed under them provide our legal and institutional foundation for forest management and regulation of forest practices. They establish the distribution of powers and authorities among federal, state, and local governments, each of which is involved in establishing forest policies. This section describes and gives examples of how federal, state, and local laws and institutions affect forest policy.

The state and federal constitutions permit governmental regulation for a wide range of public purposes. There are, of course, limits on the exercise of governmental power. One of the most important limits on land management regulation is the requirement that private property not be taken for public use without just compensation. There is considerable debate in academic circles and the courts over the meaning of this limitation and the circumstances in which regulation rises to the level of compensable "taking." This debate has very real significance in the forest practices regulatory arena.

Federal government

Congress

Congress affects forest policy through federal laws that set standards of performance and prescribe mechanisms of enforcement. Congress has broad authority to adopt regulatory programs. Key federal laws related to forest policy processes are the Endangered Species Act, the National Environmental Policy Act, and the Clean Water Act. Key federal laws related to federal land management policy are the National Forest Management Act and the Federal Land Policy and Management Act.

In most cases, Congress delegates to the federal agencies the authority to adopt rules to implement regulatory and land management policies and programs. The fed-

eral rulemaking process affecting Oregon forests takes place in Washington, D.C., where federal administrative law provides the context within which these rules are adopted.

In some cases, federal regulatory programs are delegated to the states; implementation of the federal Clean Water and Clean Air Acts are two examples. In addition, Congress affects forest policy through its spending power and allocation of funds to support federal and state programs. Examples include fire suppression, forest restoration, reforestation, and road maintenance budgets on federal lands and funding for stewardship incentives and for technical assistance programs for family forest landowners.

The executive branch

The executive branch has significant discretion under the various policies to direct federal agencies to adopt policies or take actions that best reflect the executive branch's viewpoint. The federal Northwest Forest Plan was developed by the Clinton Administration after the USDA Forest Service and USDI Bureau of Land Management were both successfully challenged in court for failing to comply with their governing federal statutes. Congress has also given the executive branch the power to protect certain lands through special designations such as National Monuments.

The judicial branch

The judicial branch provides significant oversight of federal policies and laws, because most of the major forest and environmental policies grant considerable opportunity for judicial review of proposed federal agency actions. Oversight can also be initiated by third-party lawsuits.

Tribal governments

The federal government maintains a trust relationship with tribal governments. This trust relationship affects the management of federal and tribal forestlands and of fisheries.

Research programs

The USDA Forest Service maintains a system of eight research stations that conduct basic forestry and forest products research. The Pacific Northwest Research Station headquartered in Portland, is one. The goal of this research is to expand our knowledge about biological, physical, ecological, social, and economic aspects of forests and forest management and make that information readily available to resource specialists, managers, scientists, and the public. This information is crucial to ongoing monitoring and assessment work and may provide the foundation for future legislative and policy development at both state and national levels.

Incentives

A number of nonregulatory federal incentive programs are

in place to encourage sound forest management. These have traditionally taken the form of federal cost-share funding of management practices. These programs are typically administered by state agencies, including the Department of Forestry.

State government

Legislation

The first forest-related laws in Oregon were regulations adopted in 1911 to protect Oregon's forests from uncontrolled wildfire. Since that time, Oregon has adopted forest protection laws, including the 1941 Conservation Act, an early reforestation law (see Strategy F).

The Forest Practices Act

Oregon was the first state to enact a comprehensive forest practices law. The Oregon Forest Practices Act, adopted in 1971, regulates harvest practices and other forest operations to protect forest resources including timber, water, soil, and fish and wildlife habitat. A key purpose for which the law was enacted was to ensure that forest operations are conducted to meet state water quality standards adopted under the federal Clean Water Act and implemented by the Department of Environmental Quality. The Forest Practices Act promotes compliance through prevention and education, but it is also enforceable through both criminal and civil processes. Under either approach, operators are required to repair damage to the extent practicable. Surveys for forest prac-

tices show high levels of compliance with the law.

The Oregon Board of Forestry, under ORS Chapter 527, has authority to make regulations to implement the Forest Practices Act. ORS 527.714 requires the board to satisfy specific requirements and findings before adopting new forest practice regulations under its broad rulemaking authority.

The Oregon Endangered Species Act

The Oregon Endangered Species Act applies to actions of agencies responsible for managing state-owned or -leased lands. The Oregon Department of Fish and Wildlife is responsible for wildlife protection and the Oregon Department of Agriculture is responsible for protecting plants. Once a plant or wildlife species is listed, these agencies are required to develop and implement plans to ensure that listed species are not harmed by any state agency actions.

Other state laws and regulations directed at protecting environmental quality may also apply to forestlands and forest operations. These are listed on page 23 along with the Forest Practices Act and the Oregon Endangered Species Act.

Land-use planning rules

Oregon's statewide land-use planning program was created in 1973 with the enactment of the Oregon Land Use Act. The program's mission is to conserve farmland, forestland, coastal resources, and other important natural resources; encourage efficient develop-

ment; coordinate the planning activities of local governments and state and federal agencies; enhance the state's economy; and reduce the public costs that result from poorly planned development.

State responsibilities under the program are to set statewide planning goals, develop guidelines for meeting goals, review city and county comprehensive plans, and review appeals of land-use decisions under the Land Use Board of Appeals. The program requires all cities and counties to adopt comprehensive plans to meet state standards. The standards consist of nineteen statewide planning goals that deal with land use, development, housing, transportation, and conservation of natural resources.

State agencies are also required to adopt and implement their programs in a manner compatible with local government plans.

The land-use program has generally worked well to protect forestland from outright conversion to other land uses, but it may be less successful in

Oregon's key state environmental-protection laws and regulations that may apply to forestlands or forest operations are listed here along with the agencies responsible for their enforcement.

The Oregon Forest Practices Act and laws governing protection from fire	Oregon Department of Forestry
Statewide land-use program	Oregon Department of Land Conservation and Development and local governments
Fill and Removal Act	Oregon Division of State Lands
Oregon Endangered Species Act	Oregon Departments of Agriculture and Fish and Wildlife
Oregon State Scenic Waterways Act	Oregon Parks and Recreation Department and Oregon Division of State Lands
Laws governing the Willamette River Greenway	Oregon Parks and Recreation Department, Oregon Department of Land Conservation and Development, and local governments
Laws governing the Columbia Gorge Scenic Area	Columbia Gorge Commission
Laws governing pesticide applicator licensing and pesticide product label enforcement	Oregon Department of Agriculture
Implementation of federal clean water and clean air requirements and laws governing chemical spills and hazardous materials	Oregon Department of Environmental Quality
Laws governing rock pits, stormwater drainage permits for quarries, and mined-land reclamation	Oregon Department of Geology and Mineral Industries, Oregon Department of Land Conservation and Development, and local governments
Water use permits and laws governing water rights for impoundments, dams, and dam safety	Oregon Water Resources Department
Laws governing preservation of state historical and archaeological sites	Oregon Parks and Recreation Department

managing development that conflicts with forest uses. In the wildland-urban interface, for example, poorly sited dwellings may be vulnerable to landslides and wildfire and make suppression of forest fires more difficult and expensive (see Strategies C and F).

Sustainability in government

As state government's first step toward meeting the goal of sustainability, state agencies have been directed by statute, ORS 184.421, to focus on improving the sustainability of their internal operations. "Sustainability" is defined as

“using, developing and protecting resources in a manner that enables people to meet current needs and provides that future generations can also meet future needs, from the joint perspective of environmental, economic and community [social] objectives.” Local governments have adopted similar sustainability efforts and have led with innovative practices to collect and recycle materials such as glass and plastics. Several Oregon cities have adopted purchasing policies favoring sustainably produced commodities.

Boards and commissions

Oregon’s legislature has delegated significant policy-making authority to various boards and commissions. Policies, programs, and laws at both the state and federal levels are subject to swings in political power that can create problems for a long-term activity like forest management. The board-and-commission system provides some policy stability by mitigating these political shifts.

The Board of Forestry has been delegated both broad policy authority and specific regulatory authority, as well as some quasi-judicial powers. Oregon requires an open and transparent rulemaking process that is simpler than federal processes and that requires significant public involvement. The Oregon Board of Forestry, like all boards and commissions, follows the Oregon

Administrative Procedures Act⁹ and often uses public advisory committees in developing rules and other policies.

Dispute resolution

State law requires that the Oregon Dispute Resolution Commission, the Department of Justice, and the Department of Administrative Services collaborate to help state agencies resolve disputes without resorting to litigation. The Department of Forestry has utilized alternative approaches in resolving forest practice violations and contract disputes.

Research programs

State government maintains forest research and extension programs through its land-grant university, Oregon State University. Forest research has generated key information for policy-making as well as for land management. Extension provides a means of transferring knowledge to forest landowners and others concerned with the field application of research. Research and extension at the state level are coordinated with the companion federal effort.

Besides leading in research, Oregon State University, along with other Northwest universities, has the capacity to educate enough natural resource specialists such as biologists, geologists, hydrologists, soil scientists, forest managers, and engineers to meet the growing demands of managing our forests.

Oregon Forest Resources Institute

The Oregon Forest Resources Institute (OFRI) was created by the Oregon Legislature in 1991 to improve public understanding of the state’s forest resources. OFRI’s mission is to provide information on Oregon’s forest practices and encourage sound forest management. The Institute is funded by a tax on forest product producers.

State forests

Oregon owns and manages a limited amount of forestland (three percent of Oregon’s total). Most of this land is owned and managed by the Board of Forestry under a “greatest permanent value” policy¹⁰ that requires the board to manage for a variety of values “over time and across the landscape.” Board of Forestry forestlands provide revenue for schools and other taxing districts in the counties where the forests are located. The remaining lands are Common School lands managed by the Department for the State Land Board. Common School forestlands provide revenue for schools, pursuant to the federal Oregon Admission Act of 1859.

Tribal relations

Nine federally recognized Indian tribal governments are located in Oregon. Oregon has formalized its relationship with tribal governments in law to provide a process to resolve potential conflicts, maximize

⁹ ORS Chapter 183.

¹⁰ OAR 629-035-0020.

intergovernmental relations, and enhance the exchange of ideas and resources. State agencies are required to consult with tribal governments in developing state policies that may affect tribes.

Benchmarks

Oregon, like many states, uses strategic planning to develop and implement its programs. Oregon is unique, however, in the establishment of “benchmarks” (indicators of environmental, economic, and social health) to track progress. The Oregon Progress Board is an independent state planning and oversight agency charged with developing and tracking the Oregon Benchmarks. This *Forestry Program for Oregon* is one example of strategic planning undertaken by a state board to document its mission, strategies, vision, values, and actions to address issues and opportunities.

Oregon Plan for Salmon and Watersheds

In response to the federal Endangered Species Act listing of salmonids across most of Oregon, the state in 1997 developed the Oregon Plan for Salmon and Watersheds to recover salmon and other native fish and to improve water quality. The Oregon Plan has a regulatory foundation, but it relies heavily on cooperation and voluntary activities for its success (see Strategy D).

One of the Oregon Plan’s strengths is its encouragement of a local, grassroots approach

through state support of watershed councils and other local institutions. Watershed councils are charged with assessing watersheds and developing local, collaborative, watershed-based restoration plans. The Oregon Plan legislation also created the Oregon Watershed Enhancement Board (from the former Governor’s Watershed Enhancement Board) and charged it with supporting watershed councils and restoration projects. In 1999, Oregonians passed a ballot initiative

“It is important that this Forestry Program for Oregon talks about not only what kind of forest management we need, but what kinds of institutions we need to address the problems we see before us in natural resources.”
 — K. Norman Johnson, professor,
 College of Forestry, Oregon State University

guaranteeing a portion of lottery receipts to fund Oregon Plan efforts.

Local government

Local governments (counties and cities) operate in a manner similar to Oregon state government. However, with regard to forest policy, Oregon has established clear limits on the ability of local governments to regulate forest practices. Local government may regulate forest practices only within Urban Growth Boundaries. Some counties own and manage forestland of their own, but management of these forests is regulated under the Forest Practices Act.

Local governments play an important role in implementing the state’s land use planning

program. Local governments also manage urban and community forests, the mosaic forest of the planted landscape and the remnants of native forest left behind as our cities developed. These are forests where people are not just visitors, but rather where most Oregonians live. Urban and community forests make very important contributions to the environmental, economic, and social health of the state. Among other benefits, forests in and near cities absorb carbon dioxide and air pollution while releasing oxygen. They help conserve energy and maintain water quality. These forests also increase property values and generally enhance the quality of community life.

Regional government

An important trend is the growing number of regional institutions or regional planning frameworks. The Bonneville Power Administration and its outgrowth, the Northwest Power and Conservation Council, were established to address regional power issues. These authorities indirectly affect forestlands through projects to restore wildlife habitat. Federal agencies recently partnered with Pacific Northwest state and local governments in a planning process to address the management of federal lands in the interior Columbia Basin region. A growing region-wide focus in forest policy issues is now represented by the Western

Governors' Association's work on such concepts as the Enlibra principles¹¹ (see Value Statement 8).

Nongovernmental organizations

Private forest institutions, both industrial and nonindustrial, have a long-standing and important role in the evolution of Oregon's forest policies. Many private forest products companies own both forestland and manufacturing facilities. Nonindustrial owners are a diverse group of individuals, families, and organizations that own forestland for a diversity of purposes. Both industrial and nonindustrial owners have associations to represent their political interests.

Nonprofit institutions, with their range of views, objectives, and methods, are also important in developing forest policy. Most nonprofit groups work at the public policy level or through judicial actions to achieve their goals. Others are more directly involved in land management, acquiring lands or easements to fulfill their organizational mission.

Various forest certification systems represent a new type of nongovernmental institution. Certification is evolving as a market-based incentive, encouraging products that are guaranteed to have met certain environmental, economic, and social standards in their production. Interest in forest certification in this country

first emerged through pressure applied on retailers by nonprofit institutions to make certified products available. More than 50 forest certification systems have been developed internationally. This new trend is evolving rapidly, and there is increasing effort to develop reciprocal arrangements among the certification systems.

Finally, working outside the framework of legal institutions, some activist groups and individuals on the extremes of various issues have engaged in unlawful activities such as eco-terrorism to promote their interests. Unlawful activism has become an increasing problem both in Oregon and nationally.

What are the main issues surrounding Oregon's legal and institutional framework?

Federal forest management and local collaboration¹²

Gifford Pinchot, the first chief of the USDA Forest Service, envisioned that federal land management decisions would be made at local levels. However, because of the way federal laws have evolved toward more centralized decision-making over the last century, decisions are now made primarily at the national level, with very little decision space for local federal forest managers. While national laws are the result of mutual agreements at national level, similar agreement with these laws is

often not achieved at local scales. In some cases the broad implementation of national forest management standards has caused unintended harm to local forest resources and forest-dependent economies and communities.

Local efforts to collaborate on natural resource and sustainability issues are springing up throughout the American West, especially in Oregon. The impetus behind the local collaboration movement has little to do with seizing power and control. Instead, it is more often about the very survival of rural communities. Many rural communities in the western United States are not interested in gentrification or retirement communities. Their citizens want to continue to work on and with the land. However, where federal lands and federal laws are involved, local collaboration to achieve a desired future is often stifled by a lack of flexibility and a lack of decision space for local federal officials.

A national discussion is needed to resolve the tension between national interests and local interests in the management of federal forestlands. People living near federal forests need to be empowered to take part in decisions affecting the forest's future, so intimately tied up with their own. Society must acknowledge that centralized national decision-making processes and local collaboration processes are

¹¹ Western Governors' Association, 1999.

¹² Based on remarks by Daniel Kemmis, Center for the Rocky Mountain West, at the Sustainability Forum, May 30, 2003. Portland, Oregon.

inherently incompatible models. National-scale decisions frequently lead to litigation and a resulting low level of satisfaction for all stakeholders. While they may lend themselves to a formal process of public involvement, they are not well suited for the give-and-take of complex problem solving. In contrast, local collaboration can be an effective problem-solving process.

Americans are not ready to turn entire national forests over to local collaboration, but perhaps the collaborative model could be tried experimentally in a small number of places to work out the practical difficulties and to build public trust. New initiatives have been proposed to allow stakeholders in certain localities to prove their stewardship of federal forestlands. Governed by local boards of trustees approved by Congress, and operating under a framework of national standards and monitoring requirements, local collaboration groups should be given an opportunity to show what they can do.

The federal Endangered Species Act

Under the ESA, to “take” a species listed as threatened or endangered means to harm an individual of the species in such a way that injury or death results. “Taking” listed species is prohibited (subject to certain qualifications), and a violation may result in significant legal



Photo by Mike McMurray

Many Oregon salmon stocks are listed as “threatened” under the federal Endangered Species Act. Several salmon runs have increased dramatically in recent years.

consequences. The continuing debate about what constitutes “take” of federally listed threatened and endangered species under the ESA creates uncertainty about landowner requirements and expectations. The ESA allows people to better understand, protect, and monitor the status of species at risk. However, uncertainty about regulations, current and future, has left landowners reluctant to produce or retain

“The era of single-issue or single-entity or single-focus management is over. It’s over for the Forest Service. It’s over for the Fish and Wildlife Service. It’s over for the state. It’s over for the Department of Forestry. And I believe it’s over for corporate, private owners.”

— Kemper McMaster, state supervisor, U.S. Fish and Wildlife Service

forest habitat that could be occupied by wildlife of a federally listed species, such as the northern spotted owl, because if one of these species did occupy a site it would severely limit a manager’s future options.

Scientific debate over the meaning of “take,” as well as legal proceedings to prevent or punish alleged instances of

“take,” may directly affect the board’s policymaking activity. Protection of listed species remains at the heart of many debates over forest management practices (see Strategy E).

Lawsuits

Lawsuits by nonprofit environmental groups, industry and landowner associations, and citizens have increasingly involved the federal court system in the interpretation and application of federal environmental laws. These lawsuits can be initiated at little or no cost to the plaintiffs. Even federal programs with substantial public support, such as the Blue Mountain Demonstration Project and the Northwest Forest Plan, have not been fully implemented because of process constraints or the threat or reality of lawsuits. Part of the problem may be that regulatory and planning laws do not provide an effective means for forest managers to take action that would pose short-term risks to forest resources in order to maximize long-term benefits. Lawsuits are costly to govern-

ment agencies and divert resources from other important work. Litigation has not proved to be an effective tool in developing lasting policy solutions to complex natural resource problems.

Segregation of laws and programs

A serious weakness of both the state and federal legal frameworks is that recent laws

have not been well integrated with older ones. For example, the federal Clean Water Act and Endangered Species Act conflict in some respects with earlier legislation such as the 1897 Organic Act, which mandates a continuous supply of timber from federal lands.

Similar problems exist with coordination of state laws and with integration of state and federal laws. The Forest Practices Act is an exception to this general observation in that the Legislature passed specific statutes (1987 and 1991) to integrate it with Oregon's land-use, air-quality, and clean-water programs.

While forestlands have a regulatory framework of best management practices to implement the requirements of the water quality standards, other land uses have more limited frameworks. This creates issues of equity and may create a disincentive to retain private forestland for forest uses.

Federal agencies have at times tried to influence state programs such as the Forest Practices Act to implement federal Endangered Species Act standards. Yet, often, the standards applied through state programs already go beyond the basic federal "take avoidance" standard required on non-federal lands.

They are more comparable to the higher levels of protection found in federal habitat conservation plans.

Regulation, incentives, education, and research are all important tools for achieving public policy goals, but they are often used in uncoordinated ways. For example, prior to 2003, the Department of Forestry's regulatory program was administratively separate from the landowner assistance program. This separation hampered coordination of policy on regulation and incentive approaches to resource protection and customer service, and resulted in program

than agricultural lands (for example, the Conservation Reserve Enhancement Program is not applicable to lands that are already forested). This may be the result of existing regulations for forestlands, while comparable regulations are lacking for agricultural uses.

What is our current economic framework for forest policy?

The U.S. economic system is market-based, but natural resource values cannot always be quantified in dollars and cents. Regulations are used to ensure that non-market resources are given appropriate value. When they develop

regulations, policymakers often want cost/benefit analyses. Generally, the costs of proposed regulations are much easier to quantify than the benefits. Many natural resource benefits cannot be valued in our economic system because no cause-and-effect relationship can be identified that can clearly links the proposed

change to a quantifiable benefit. For example, in developing rules to leave more trees along streams, it is fairly easy to determine the costs, but it is difficult or impossible to determine how many more fish might be produced or what water quality benefits might



Before treatment



After treatment

Photos by Andrew White, ODF

Fuel reduction and forest health treatments like this one in northeast Oregon are needed on millions of acres of Oregon's forests. On federal forests in Oregon, lengthy administrative processes and a lack of funding are significant obstacles to conducting such projects.

inefficiencies. At the federal level, the USDA Forest Service provides private landowner assistance, while other agencies regulate programs such as the federal Endangered Species Act and Clean Water Act.

Forestlands have fewer federal cost-share programs

ensue. Research is rarely directed at developing this information.

Consumption

Under a market-based system, consumption choices are left to the individual. Consumers are often unaware of the market and environmental tradeoffs of their behaviors and choices. As a result, public opinion and public behavior are often in conflict.

Tax policies

Taxation is a major policy tool used to encourage management and retention of lands in resource uses. Income taxes and property taxes make up the majority of state government revenues. "Payments in lieu of taxes" are federal payments to local governments that help offset losses in property taxes because of the presence of nontaxable federal lands within their boundaries. However, the ability of tax policies to support non-timber goals remains limited due to budget and political constraints.

Manufacturing capacity

Major opportunities exist to process small-diameter logs and economically accomplish work to improve forest health. Forest industry-related manufacturing capacity has retooled over the past 20 years to process second-growth wood into an array of solid, engineered, and composite wood products and pulp. Capacity to handle large trees has been substantially reduced, and past market premiums for large-diameter



Photo courtesy of Green Mountain Woodworks, Inc., Phoenix, OR

Secondary wood products industries, using Oregon-grown wood in furniture, window frames, and other products such as this steamed madrone flooring, are a growing source of jobs in the state.

logs have disappeared. Due to limited log supplies from federal forests, manufacturing capacity in eastern Oregon has been substantially reduced. However, much forestland in that region is in need of management to improve its vigor and its resistance to wildfires and insect and disease infestations. An assessment of how much and what kind of wood should be removed from these forests could serve as the foundation for reviving the industrial infrastructure and achieving both more vital forests and more vital communities.

Workforce

With major changes in federal land management policy and improved efficiency in industry, the forest products workforce has changed. While highly skilled workers are still needed, there are fewer jobs for skilled workers and fewer

small businesses that support forest management and manufacturing. Federal efforts to retrain displaced workers into "ecosystem workers" has had limited success.

Certification systems

Market-based forest certification systems are being used by some parties to promote their desired environmental or market outcomes. The certification systems are still evolving, and the long-term role they may play in promoting sustainable forestry is still unclear.

What are the main issues surrounding Oregon's economic framework?

Under current land management policies and projections of population growth, Oregonians living today may see a time when the state will no longer be producing enough forest products to meet its own needs.¹³ Reflecting global economic pressures, between 1980 and 1995 the world's forests were reduced by 12 million hectares per year. That is equivalent of 30 million acres, more than the total amount of forestland in Oregon. During this period, the amount of forestland increased in the industrialized countries by 20 million hectares. Clearly, the sustainability of forests in developing countries is most at risk. Therefore, it is important to ensure that Oregon's forest resource policies, which may make sense within our state's borders, do not result in unintended adverse effects to the global environment or place

¹³ Richard Haynes (PNW Research Station), personal communication, Board of Forestry Symposium, October 2001.

Global implications of Oregon timber harvest constraints

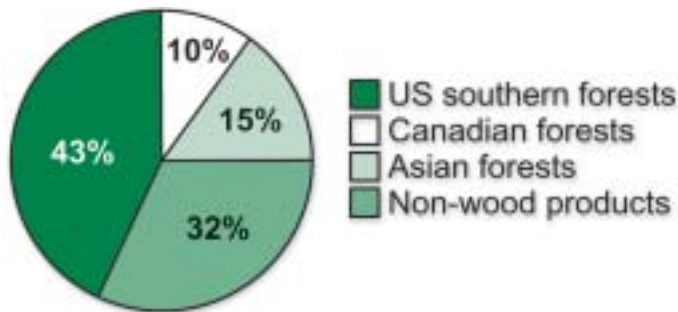


Figure 4. One effect of continued constraints on timber harvesting in Oregon will be that demand will be met in the indicated percentages by forests in other parts of the world and by the substitution of less environmentally friendly products such as concrete, steel, and plastic. (Source: Perez-Garcia, John. 2003)

and public consumption of forest products. Until the existing systems can provide for reconciliation among these factors, unsustainable practices will be encouraged in other parts of the world.

What are the key interactions of this strategy with other strategies?

The promotion of a sound legal system, effective government, excellent research institutions, and sound economic policies strongly affects, and is affected by, all other strategies and policies for managing Oregon's forests.

Oregon forest landowners and businesses at a disadvantage in the global marketplace (Figure 4).

International political and economic forces are now affecting governmental policymaking at the national, state, and local levels. International political goals are focused on sustainable development. Global economic pressures are reducing some of the historical competitive advantages of timber produced in the Northwest, and may also be

lowering the value of larger-diameter timber in the global marketplace. Rotation ages on Oregon industrial timberlands are declining as managers produce smaller trees to maintain global market access.

In the meantime, per capita consumption of wood in the United States continues to increase. Domestic consumption has exceeded domestic production since at least the late 1950s. There is a lack of consistency between public opinion about forestry issues

What are potential indicators to measure progress toward accomplishing this strategy?

1. Capacity to undertake forest-related planning and assessments
2. Capacity to measure and monitor changes, including the availability and extent of data measuring the indicators for all seven *Forestry Program for Oregon* strategies

Background on Strategy B:

Ensure that Oregon's forests provide diverse social and economic outputs and benefits valued by the public in a fair, balanced, and efficient manner

Why is providing recreation, commercial forest products, environmental benefits, and social and cultural uses important?

Forests are important to people because they offer a range of social, cultural, and economic values. Some of the values that come from forests are obvious—forests provide direct social and economic benefits that include wood products, recreation, jobs, incomes, and timber sale and tax revenues to governments and school districts. Other values are less tangible, such as solitude, scenic beauty, habitat for plants and animals, and spiritual renewal. Oregon's forests also provide environmental benefits such as purifying the state's air and water resources. These values may not be measurable in dollars and cents, but they have an economic impact—they contribute to Oregon's high quality of life and help the state attract desirable industries and skilled workers. This contribution in turn generates additional jobs, incomes, and tax revenues.

If forests continue to provide the social and economic values and environmental services that people want and need, it is likely they will be sustained. If forests cease to provide these benefits, they will be perceived as increas-

ingly unimportant and risk being converted to other uses.

Rural and urban well-being

The economic and social well-being of many of Oregon's rural communities is directly linked to the health of forests and the forest economy. These rural economies depend on the availability of timber and non-wood products, recreational opportunities, and other resources from the forest. They are also affected by national and global markets and broader economic conditions.

Economic conditions are always changing, and some communities are better able to adapt to change than others. It is especially difficult for remote rural communities to adjust to economic change. These communities are more likely to suffer from poverty, unemployment, domestic violence, and other social problems. A diverse Oregon economy that includes a healthy forest products industry enables rural communities to be more adaptable and flexible, and enhances their economic and social well-being.

Not only rural communities benefit from a healthy forest products industry. There is much interdependence between Oregon's metropolitan areas and its smaller

communities. Goods and services produced in the metropolitan areas flow to small towns and rural communities; these communities in turn provide workers and goods such as lumber and wood products to the cities. There are other interdependencies: revenues from Oregon's public forests go to schools across the state; and, because much urban income and employment depends on regional trade, Oregon's cities depend on natural resources for their livelihood just as rural communities do, although less directly. For example, one-third of Eugene's jobs and incomes are derived from the city's role as a regional trading center.

A disconnect of perception

Negative attitudes toward active forest management seem inconsistent with Oregonians' desire to have healthy and productive forests and also to consume large quantities of wood products. During the past decade, timber harvests in Oregon have declined, owing in large part to organized public opposition to active management of Oregon's public forests. At the same time, Oregon's consumption of wood products has increased. Active forest management is viewed by many as inconsistent with forest sustainability, but recent research suggests that human

intervention is needed to bring some of our forests back to a more natural and sustainable condition.

What do we know about Oregon's forest economy and its ability to produce expected social and economic benefits?

We know a great deal about the lumber and wood products industry, less about forest-related recreation and tourism industries, and very little about mushrooms, floral greens, and other non-wood forest products. We also know that forest-based industries contribute

relatively more to rural economies than to urban economies, and that local communities vary greatly in their dependence on forest-based industries.

Since 1990, timber harvest levels have dropped in Oregon, primarily because of reductions in harvests from federal lands. Employment in Oregon's wood-processing industries also has fallen, but not as much as harvest levels have. A number of factors have partially offset harvest declines; namely, growth in the manufacturing of secondary wood products (e.g., furniture and window frames,

etc., made from primary products like lumber and plywood), declines in log exports, imports of logs from other states and Canada, harvesting and processing of more labor-intensive smaller timber, more efficient wood utilization, and increased use of recycled fiber (Figure 5).

Oregon's primary and secondary wood processing industries generate approximately \$10 billion in annual sales, nearly 75,000 direct jobs, about \$2.8 billion in worker income, and about \$1.1 billion to landowners from timber sales. Additional employment and income is

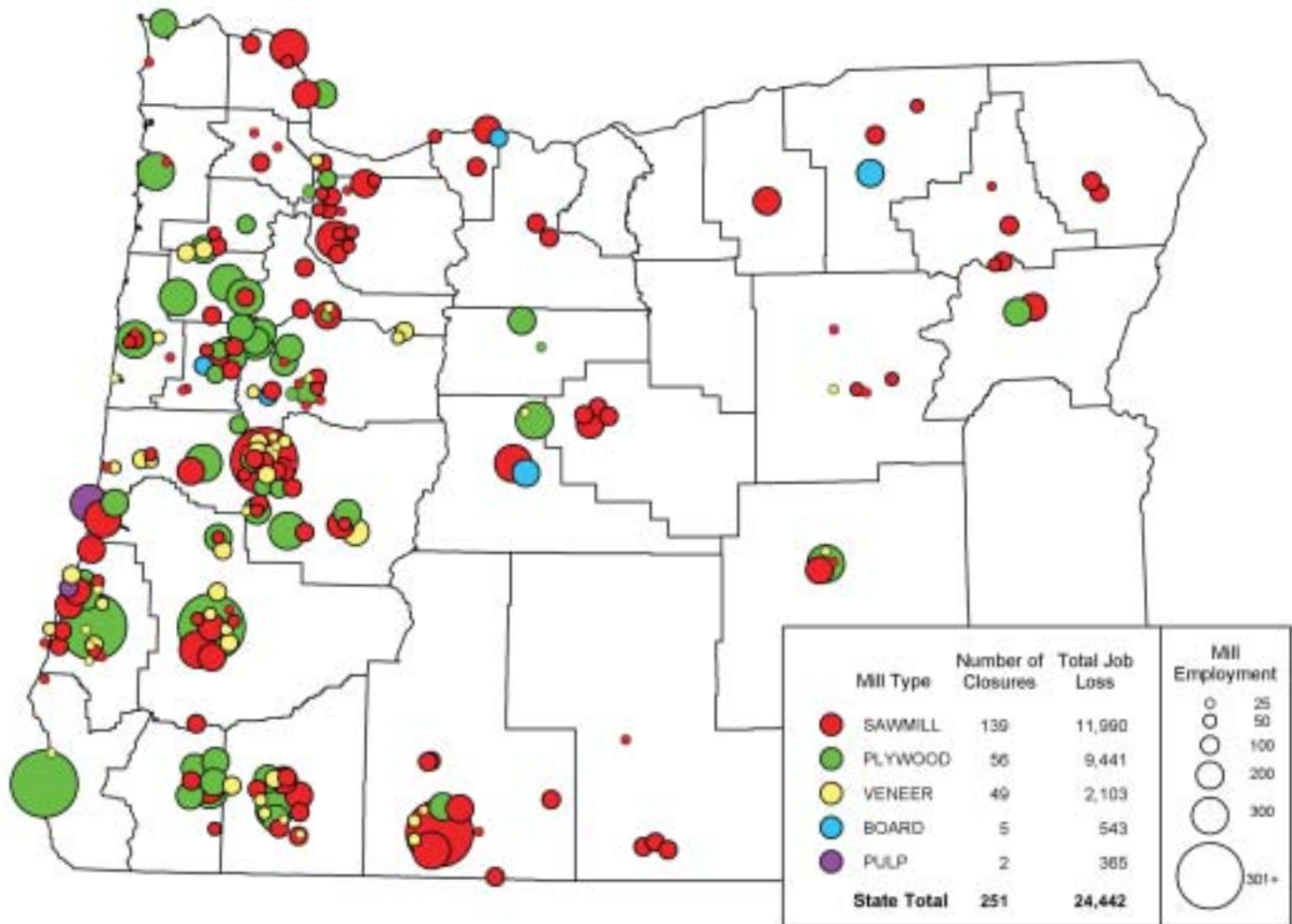


Figure 5. Type of mill closures in Oregon and related job losses, 1980-2003 (Source: Ehinger, Paul F. and Associates, 2003)

generated by businesses supplying products and services to forest products companies and by businesses catering to wood products workers and their families. Future employment in the industry is projected to be stable under current policies, but the potential exists to increase timber harvest levels and, in turn, wood processing employment.

We have less information about other forest-related economic trends. We lack, for example, complete and consistent data about recreation visits to national and Oregon parks and other public lands. We also have very little information about the economic contributions of non-wood forest products such as wild edible mushrooms, floral greens, Christmas greens, ornamentals, and medicinal plants. We need more information about the non-wood components of Oregon's forest industry in order to evaluate their contributions to Oregon's economy.

How can Oregon's forests better contribute to the supply of timber, other forest products, environmental benefits, recreation, and tourism?

Several current federal and state actions are aimed at enhancing the economic and social contributions of forests to local and state economies. These actions, however, lack a consistent policy basis. There is no coordinated state

and federal policy regarding community stability and the contributions of lumber and wood products industries to the economy. These efforts do not fulfill their potential to contribute to increased sup-

"We have to put our thinking about sustainability into a global context. Over 30 percent of the industrial wood used in the world every year has crossed at least one international boundary between the time it was a tree and the time it becomes a wood product of some sort. Even if you are selling into a local market, the prices you get are influenced by global economic forces."

— Hal Salwasser, dean, College of Forestry, Oregon State University

plies of forest products, greater environmental benefits, and greater economic benefits to state and local economies. We have every reason to expect that better-coordinated, well-funded approaches based on clearer policy would help Oregon generate additional environmental, economic, and social benefits from its forests.

With better-coordinated policies on economic development, community stability, and forest health, landowners could employ different approaches to produce different economic benefits—air and water purification, timber supply, non-wood forest products, recreation, and tourism. These approaches would vary depending on who owns the forest and where it is located within the state, and on the supply of and demand for the multitude of forest

values produced by Oregon's forests.

Much new information useful for implementing effective economic and social forest policies has been jointly developed by the Department of Forestry, Oregon State University College of Forestry, the USDA Forest Service Pacific Northwest Research Station, and others. However, more information is needed about conditions and trends of Oregon's forests to better craft coordinated approaches and to understand the implications of changes in forest policy and management at the landscape level and across ownerships. Once we have this information, we will be better able to implement a more coordinated management approach that is needed to promote the desired balance of forest value production.

How can needed investment in the forest sector be maintained or enhanced?

Oregon's forest landowners invest large sums in reforestation and other management practices. Owners of processing plants have made similar investments, retooling their operations in response to changing raw materials and market realities. These investments have made Oregon's forest products industry extremely efficient. There may be more opportunities for investment, but additional research is needed to discover, evaluate, and imple-

ment them. If further opportunities are to be uncovered and used, we need comprehensive assessments of Oregon's forest-related industries, a better understanding of Oregon's rural communities and their relationship to urban areas, and an understanding of how such investments could strengthen the abilities of rural communities to provide the benefits expected by the urban population.

We also need more information about how non-wood forest products and recreation contribute to state and local economies, how the various elements of the forest products industry interact with one another, and how economic benefits could be increased by removing barriers to competitiveness and investment.

We need to maintain investment in both industrial forestlands and family forestlands (defined as ownerships of less than 5,000 acres) for both the public values and the private values these lands provide. Being closer to urban and rural residential areas, family forestlands face unique challenges. They are generally more visible to the public than forest industry lands or public lands, and they are expected to provide many of the forest benefits enjoyed by urban and suburban residents. In short, public expectations for private forests can discourage landowners from investing in forest



Photo by Cynthia Oriando, ODF

Ron and Clint Bentz, family forest landowners in Scio, Oregon and 2002 National Tree Farmers of the Year. Ron Bentz passed away in November, 2002. Family forestlands are a substantial part of Oregon's culture and natural environment and play a vital role in Oregon's natural resource economy.

management.

In addition, small woodland owners do not have the economies of scale or marketing expertise of industrial owners. This makes managing their forests more expensive and getting the best prices for their products more difficult. Forest regulations can proportionally affect smaller ownerships more severely than larger owners, causing financial hardships.

As management operations become more expensive,

"It takes six generations of family to take advantage of two generations of forest stands. It is a lot easier to grow two generations of trees than it is to hold the land in the family for six generations."

— Clint Bentz, 2002 National Tree Farmer of the Year, and family forest landowner

smaller forestlands are more likely to be removed from active management, and alternative investments are more likely to become more

attractive. This could encourage conversion of forestland to other uses, resulting in the loss of the environmental, economic, and social benefits these forestlands provide (Figure 6). For these reasons, incentives that provide financial, educational, and technical assistance to enhance public values on private family forestlands are preferred over increased regulation.

How will rapidly changing national and global economies and environmental programs affect the future management of Oregon's forests?

Oregon influences forest economies and environments well beyond its borders. Changes in forest management in Oregon cause changes in national and international forest products markets and may affect social, economic and environmental conditions in other states and nations. In the same manner, changes at the national and international levels affect markets and environmental conditions in Oregon. The type and magnitude of these interactions are currently unclear. We need additional research to determine how the flow of wood among Oregon, the United States, and other countries affects changes in timber supply, and how it affects the substitution of other products for

wood products in different regions. We also need research to find links between environmental changes and changes in wood flow, specifically examining changes in land use, management practices, product substitution, energy use, and carbon flows.

What mechanisms exist to address the unique social and cultural interactions between Native Americans

and Oregon's forests?

Nine federally recognized Indian tribal governments are located in Oregon. These tribes have a unique legal status and play a unique role in Oregon's society and culture. The tribes and the State of Oregon work together in an atmosphere of mutual respect for the sovereign interests of both parties. The government-to-government relationship that exists between Oregon's

Indian tribes and the State of Oregon has been formalized in state law, providing a process that can help resolve conflicts, maximize intergovernmental relations, and enhance an exchange of ideas and resources. This respectful relationship between Oregon and Indian tribes works toward the greater good of all of Oregon's citizens, whether tribal members or not.

One issue of strong inter-

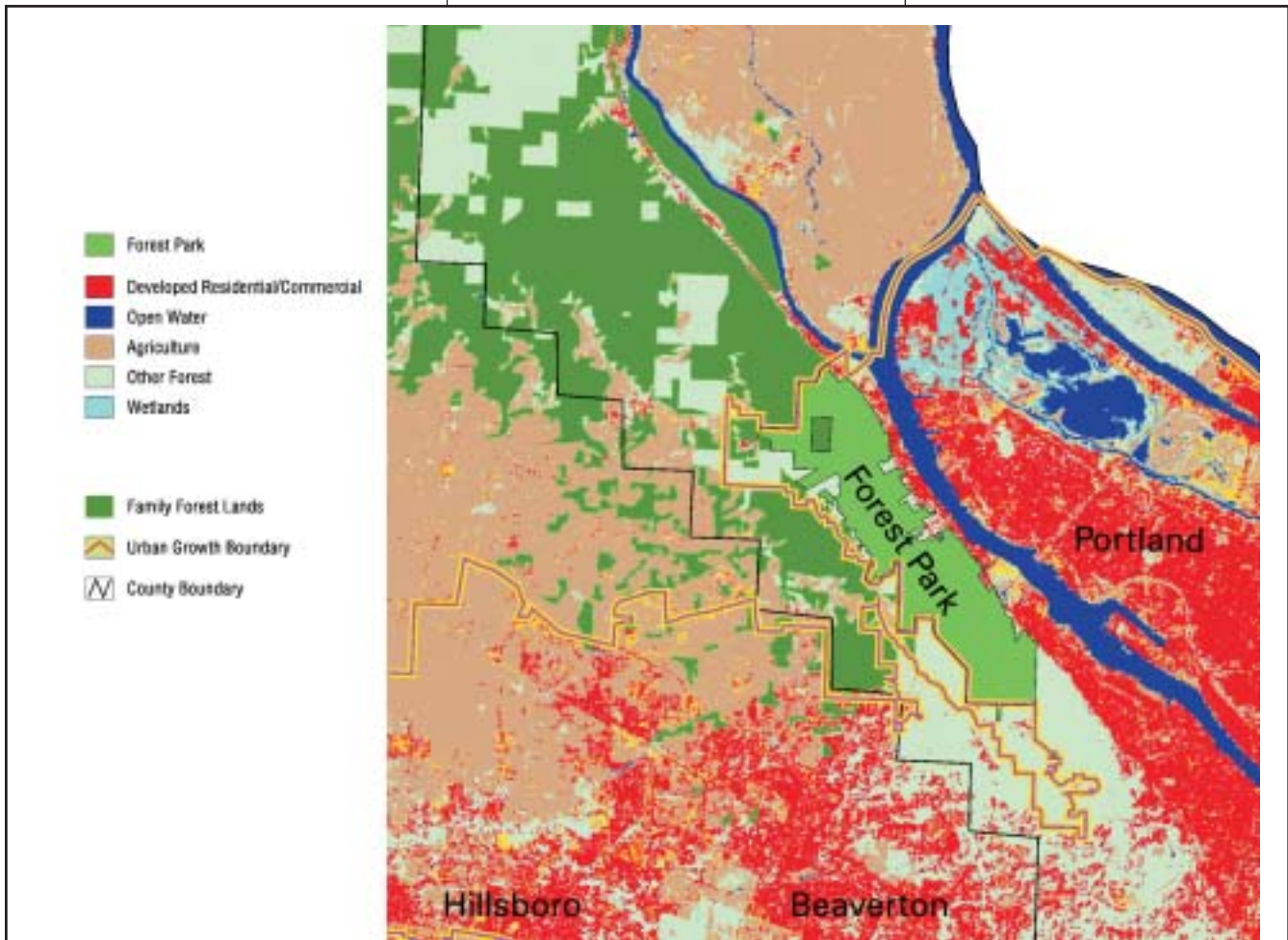


Figure 6. Family forest ownerships in northeastern Washington County and northwestern Multnomah County provide an important environmental benefit by linking wildlife habitat in Portland's Forest Park with habitat on large public and industrial forestlands farther to the northwest. However, these same family forestlands are at risk of conversion to non-forest uses to accommodate urban development.

est to Indian tribes and to many other Oregonians is the protection of cultural and archeological resources on forestlands. Such sites are finite and irreplaceable, and they are an intrinsic part of the cultural heritage of the people of Oregon. All Oregon landowners have an obligation to be aware of state and federal statutes and rules regarding the protection of culturally or archeologically significant sites. Public land stewards are held to a higher standard and have a direct responsibility to protect these sites.

What is the status of Oregon's urban and community forests?

Oregon's urban and community forests are major contributors to the health and well-being of its citizens. They contribute strongly to one of Oregon's major economic advantages, the perception of unsurpassed livability. This quality-of-life advantage helps attract desirable businesses and highly qualified workers. Urban and community forests also provide numerous health and environmental benefits: they help purify our air and water, control stormwater runoff, provide shade, reduce soil erosion, create wildlife habitat, and enhance the health of riparian areas.

In recent decades, as Oregon has become more populated and more urban, resources to manage the

urban forests have lagged. Only a few million dollars are spent each year on planting and managing urban and community forests. This is likely well below the level needed to maximize these forests' contribution to the social and economic well-being of Oregonians.

What are the key interactions of this strategy with other strategies?

Balancing the use of forests for recreation, timber and other forest products, and cultural uses affects, and is affected by, other strategies and policies for managing Oregon's forests. Here are some examples of these interactions:

- Abundant fish and wildlife populations and biologically rich native forests can provide significant market and non-market economic benefits.
- Maintaining the size and productivity of the forestland base is essential to providing the long-term social and economic benefits Oregonians expect from their forests.
- Keeping timber harvest and growth in balance and ensuring that forests are being restocked with site-appropriate species is important to assure a continuous supply of timber and other forest outputs, which are necessary to provide local com-

munities with family-wage jobs and a high quality of life.

- Forest practices affecting long-term soil productivity (i.e., soil compaction, mass movement, erosion, nutrient availability, and water-holding capacity) help determine future availability of timber and forest resource outputs.
- Altering management practices on Oregon's forests to maintain and enhance their storage of carbon could affect the availability of timber and other forest resource outputs.

What are potential indicators to measure progress toward accomplishing this strategy?

1. Value of investment in forest health and management, reforestation, wood processing, recreation, and tourism
2. Value and volume of wood and wood products production, including value added
3. Degree of recycling of forest products
4. Area of forestland managed for general recreation and tourism in relation to the total area of forestland
5. Visitor-days attributed to recreation and tourism
6. Direct and indirect employment in the forest sector
7. Viability and adaptability of forest-dependent communities to changing economic conditions

Background on Strategy C:

Maintain and enhance the productive capacity of Oregon's forests to improve the economic well-being of Oregon's communities.

Why is it important to maintain and enhance the productive capacity of Oregon's forests for economic purposes?

The economic productivity of Oregon's forests contributes to a diversified Oregon economy that can better weather downturns in the national economy. Economic productivity of forestlands provides incentives to maintain the forestland base, which in turn provides a host of values other than economic ones. Most of the economic activity generated by Oregon's forests occurs in rural areas, where it is most needed. This economic activity is vital to rural communities, which are an essential component in the richness of Oregon's character.

Maintaining the productive capacity of Oregon's forests means maintaining the amount of forestland and making sure harvest rates for timber and non-wood products do not exceed growth rates. Maintaining and enhancing the timber economy and developing the economic potential for non-wood forest products and recreation could diversify Oregon's economy and add to the growth contributed by Oregon's high-technology and other sectors. It could also encourage forest landowners to invest in management practices that ensure

a large and sustainable stream of forest products and other forest values from their lands. Such investments help them both to become competitive in global markets and to maintain their land in forest uses.

What do we know about the productive capacity of forests?

To maintain the productive capacity of our forests, we must know how much forestland exists, the management



Photo by Mike McMurray

For over 30 years, Oregon's Forest Practices Act has required prompt reforestation of areas where trees are harvested. Voluntary landowner compliance with the law remains very high.

practices of public and private landowners, and how fast timber and non-wood resources are growing and being harvested. We also need

to know the economic and social dynamics behind shifts of forestland into and out of forest use. We need to be able to identify and quantify the influences of natural and human-caused disturbances, forest management activities, and other land uses on the productive capacity of Oregon's forests.

In the past, we have not had adequate information to measure how well the productive capacity of our forests was being maintained. However, recent inventory and assessment work has provided information about land-use change, land available for timber production, merchantable and non-merchantable growing stock available for timber production, the sustainable level of wood products removal, and whether forests are being restocked with site-appropriate tree species. We do not have comprehensive information about the availability and sustainable removal of non-wood forest products.

Are we maintaining the size and productivity of the forestland base?

Since 1990, relatively little forestland in Oregon has been converted to non-forest uses. Because of their remote locations and the laws and policies affecting them, Oregon's federal forestlands—about 57

percent of the state's total — are not threatened with development. However, potential conversion of private lands that make up 38 percent of Oregon's forest land base has been an enduring policy concern. Forestland developed for other uses will produce less timber, fish and wildlife habitat, and other traditional forest values on a sustainable basis. The Oregon legislature passed the Land Conservation and Development Act in 1973 to limit the loss of the most productive of these lands.

“It appears that low-density residential development in or near forests has not affected harvest rates in western Oregon. However, it may be reducing forest investment, as exemplified by planting and thinning rates which could alter forest characteristics in the future.”

— Jeffrey Kline, research forester, Pacific Northwest Research Station, USDA Forest Service

Despite rapid economic and population growth since then, conversion of forest lands to other uses has declined dramatically (Figure 7). Overall, a large majority of western Oregon's private forestland zoned for forest uses is free of the effects of population or development. However, in some areas development is occurring within forested lands (Figure 8). With Oregon's population

expected to grow by a million people over the next 20 years, we will need to ensure that future development of forestland is carefully managed.

Are statewide timber growth and harvest in balance?

In general, the timber growth rate exceeds the

Figure 7. Change in private timberland area in Oregon (in thousands of acres), 1953-1997.

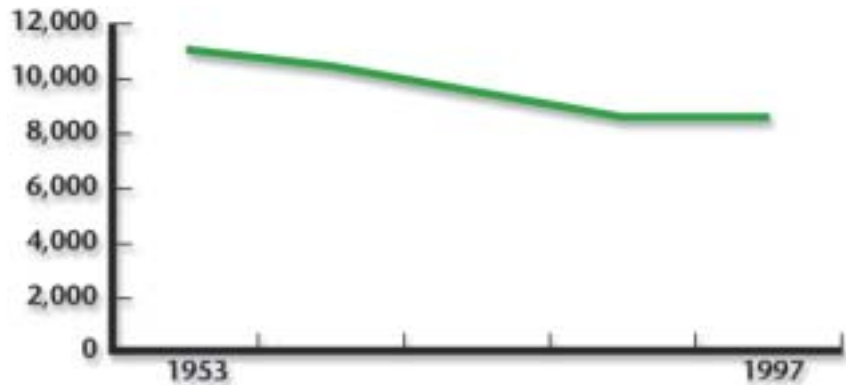


Figure 8. Average annual change in dwellings per square mile on western Oregon nonfederal lands, 1973-2000.

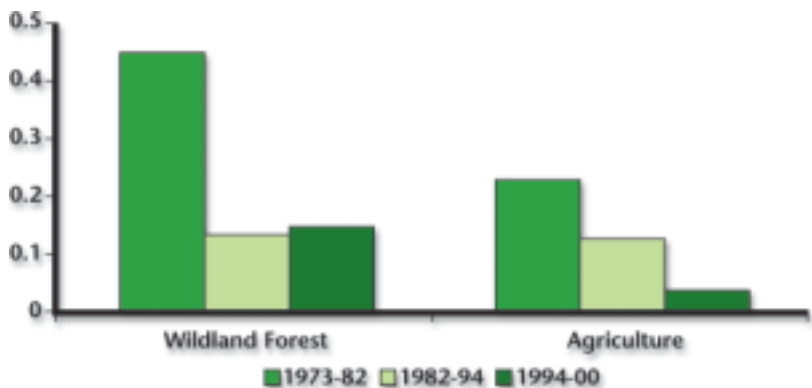
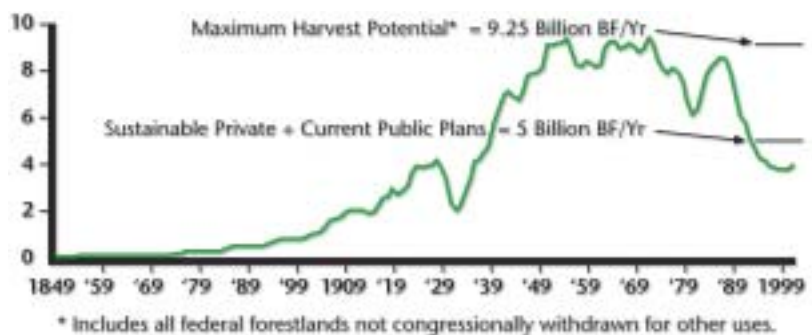


Figure 9. Oregon timber harvests (in billion board feet), 1849-2002.



harvest rate in Oregon, but there are exceptions with some owners and in some geographic areas. Since 1990, timber harvest levels have dropped in Oregon, primarily due to reductions in harvests from federal lands, and the statewide total is less than half of historic levels. The 2001 timber harvest in Oregon was 3.44 billion board feet, far below the state's maximum potential to produce wood on forestlands not congressionally withdrawn for other uses, and it is below estimates of a sustainable harvest level under current laws and forest policies (Figure 9).

By any measure, harvest levels over the last decade have been at or below sustainable levels except on certain industrial owner-ships in eastern Oregon. According to a forthcoming study on harvest potential of private timberlands in eastern Oregon, "Past harvests [on these eastern Oregon lands] have steadily reduced the industrial inventory base, shifting the concentrations of both numbers of trees and volume into the smaller diameter classes. The result has been lower aggregate growth and reduced long-term harvest potential." The study projects that industrial harvest potential in eastern Oregon will fall by as much as 50 percent over the next 50 years.¹⁴ In western Oregon



Photo courtesy of the University of Oregon Map and Aerial Photography Collection

Oregon's land use planning laws have been successful at managing where development occurs and minimizing the conversion of forestlands to non-forest uses.

and other forestlands in eastern Oregon, growth rates continue to exceed harvest rates.

"In eastern Oregon, projections indicate that industry lands do not have the potential to maintain recent historical harvest levels—with reductions of 50 percent or more anticipated. This ownership has a lot of its inventory in the smaller size classes. As these smaller trees mature, inventory will grow and future harvest potential will expand, but in the near term, the harvest will be sharply restricted because of a lack of merchantable volume."

— Darius Adams, professor,
College of Forestry,
Oregon State University

Although harvest levels have been sustainable statewide, average final harvest age has dropped to 50 years or less in western Oregon, and in eastern Oregon the average

diameter of harvested trees is decreasing. Conifers normally put on growth rapidly until they are well past 60 years old, but global forces in wood and financial markets are driving landowners to harvest before trees' growth rate has peaked. The higher returns from alternative investments and the lack of financial incentives for harvesting larger trees is resulting in lower harvest ages. If private forestland owners waited a few more years to harvest their trees, they would get a better yield in the long run. Longer

rotations would mean fewer entries into forests for commercial harvesting, which might increase some other forest values, while decreasing others. Short rotations with high average growth rates are sometimes possible and desirable, but they require highly intensive forest management.

In general, Oregon's forests are adequately stocked. Under the Oregon Forest Practices Act, forestland retained in forest use must be reforested promptly and successfully after timber harvesting. Compliance with the reforestation requirement is very high. Stocking with inappropriate tree species may be a problem in some areas as a result of planting practices in the past, before much was known about matching species with sites. In

¹⁴ Adams, Darius M. et.al., 2003.

addition, exclusion of fire in some forests has favored natural regeneration of species that are less well suited to the site than those favored under natural fire regimes (see Strategy F).

Is the harvest of nontimber forest products sustainable?

Non-wood forest products such as wild edible mushrooms, floral greens, Christmas greens, ornamentals, and medicinal plants play an important role in the lives and livelihoods of many Oregonians. In spite of the importance of these products to individuals and local economies, we are only beginning to gather information statewide about the availability, growth, removal, and sustainability of nontimber forest products in Oregon.

What are the key interactions of this strategy with other strategies?

Maintaining and enhancing the productive capacity of Oregon's forests will directly affect the success of other forest policies. Here are some examples of these interactions:

- Avoiding losses of forestland and managing human population pressures on remaining forestland can help to minimize the fragmentation of wildlife habitat.

- Maintaining sustainable levels of timber and other commodity outputs in Oregon could decrease commodity production pressures elsewhere in the world, where there may be comparatively more serious environmental impacts.
- Forest health problems, catastrophic fire, non-native pests, and pollution impair the productive capacity of forest ecosystems and lower sustainable resource outputs.
- Livestock grazing combined with timber management may be essential for keeping less productive private forestlands economically viable.
- Unless private landowners can derive value from managing forestlands, they may convert their lands to a non-forest use.
- Conversion of forestland to other land uses reduces the amount of forested watersheds; soil and water resources are usually more difficult to protect on lands in non-forest uses.
- The productive capacity of forests affects how much carbon dioxide can be removed from the atmosphere and stored in forest vegetation.

What are potential indicators to measure progress toward accomplishing this Strategy?

1. Area of forestland available for timber production
2. Growing stock of both merchantable and non-merchantable timber
3. Annual removal of wood products compared to the volume determined to be sustainable
4. Annual removal of nontimber forest products compared to the level determined to be sustainable

Background on Strategy D:

Protect, maintain, and enhance soil and water resources of Oregon's forests

Why is protecting, maintaining, and enhancing soil and water resources important?

Soil and water are basic elements of forest productivity. Forest soils are also an important part of the regulation of surface and ground-water flow. The interaction of soil and water plays an important role in the health of the streams and rivers flowing through Oregon's forests. Clean water is critical to our quality of life. More than half of Oregon's population depends on water supplies that originate on or are protected in part by forestlands. Oregonians also depend on high-quality water for fisheries, industry, recreation, and agriculture.

What do we know about Oregon's forest soil and water resources?

Water quality from forest streams is good

We have a relatively poor understanding of how current water quality conditions on forestlands compare to those of presettlement times. In particular, we lack data on the presettlement range of variability, both spatial and temporal, of natural disturbances such as fire, insect and disease infestations, windstorms, and floods. However, the recent *Oregon*

State of the Environment Report found that water quality and the condition of riparian (streamside) vegetation on forestlands has improved with increasing regulation of forest practices. The report concluded



A pipe-arch culvert used on a tributary of Clear Creek eight miles south of Estacada is one example of responsible riparian management under the Oregon Plan for Salmon and Watersheds. The landowner is Port Blakely Tree Farm.

that water quality on forestland remains good and is generally better than that found on land devoted to other uses.

Rates of natural soil erosion are highly variable

Forest soils and water have been well studied, but there are little comprehensive data with which to assess the condition and trends of soil and water resources across large areas of forestland and over time. Soils in unmanaged forests erode and deposit sediments into streams at varying rates depending on soil type, topography, vegetation cover, and the amount of rainfall received.

Sediment enters water from soil-surface erosion, channel erosion, and mass soil movements such as landslides and debris flows. These inputs are both chronic (relatively steady and continuous over time) or episodic (characterized by occasional sudden pulses). These erosion and sedimentation processes are functions of the disturbance regime—the spatial and temporal pattern of occurrence of wildfires, floods, and windstorms—that characterizes the forest.

Landslides are a major source of natural soil erosion in Pacific Northwest forests west of the Cascade Mountains. Undisturbed forest soils in western

Oregon have a high capacity to absorb rain—up to three feet per hour. Surface erosion is usually not a major source of sediment in these forests. In eastern Oregon, natural surface erosion is the most significant source of sediment in streams. Erosion can be particularly severe after wildfire or heavy rain.

Many of Oregon's forest soils are highly productive

Some of the most productive tree-growing soils in the world are located in parts of western Oregon. Levels of organic soil matter are relatively high in most western Oregon forests. The cycling and

Photo by Keith Baldwin, ODF

maintenance of organic matter in the forest influences the productivity and water-retention capabilities of the soil. Since the 1960s, fertilization and stand manipulation studies have produced localized data on major soil nutrients and organic matter. Overall organic carbon levels are higher in western Oregon than in eastern Oregon. Most Pacific Northwest forests are nitrogen-limited, so fertilizing with nitrogen, or nitrogen and phosphorous, enhances productivity, decomposition, and nutrient recycling.

What human activities on Oregon's forestlands affect soil and water resources?

A variety of activities occurring on forestlands, including forest management (timber harvesting and road construction and use), fire suppression, recreation, and livestock grazing, can affect soil and water resources. We do not have enough long-term data to tell us whether soil and water resources have been significantly changed in areas actively managed for timber production or areas in which wildfire has been suppressed. Long-term monitoring of the physical and biological characteristics of forests could provide a stronger foundation for understanding both human and natural-caused changes in forest soils and water. In general, we know more about the effects of forest practices on water quality than on soils and forest productivity.

For example, we know that natural disturbances that trigger large erosion events can produce important changes in

aquatic conditions. These episodic changes are critical in maintaining aquatic habitat over time. Similarly, we know that maintaining organic matter in forest soils is critical to their productivity and water-holding capability. This knowledge and other findings have prompted periodic upgrades of state forest practice rules. Following are observations on how forest management, road construction, and fire suppression affect soil and water resources in the forest.

Forest management and road systems

Many studies have shown that timber management at individual sites can increase erosion in the short term. We know less about how timber management affects soil and water over time and at a landscape scale. Roads used for log hauling and recreational use have been found to be the primary source of stream sediment from forest management activities in the western United States. Roads characterized by high surface erosion or failure of the road fill, and located near streams, are those most likely to cause erosion problems. Research has also found that best management practices can be effective in reducing potential impacts of forest management and road systems.

Forest management and landslides

The effect of forest management on the occurrence of landslides is another major concern. After two large storm and flood events of 1996, a

major ground-based study was undertaken in western Oregon to evaluate the relationship between forest practices and shallow, rapidly moving landslides. The study was the largest to date in the Pacific Northwest to collect detailed data about landslides on the ground and compare them with data from aerial photos. It is also the first study whose findings reflect current management practices on different forestland ownerships in Oregon, and the only one so far to collect detailed information on forest stands of intermediate age, 20 to 100 years old.

Because it is based on an inventory following individual storm events, the study has several limitations. Nonetheless, its findings suggest that, while timber harvesting does have an influence on shallow, rapid landslides, these landslides are endemic in unmanaged forests. They also suggest that effects from timber harvesting may only impact the timing of landslide-occurrence, rather than the absolute number of landslides that occur over space and time. The study's key conclusions:

- There is significant landslide risk on very steep slopes regardless of forest age, especially in certain geological formations in which major storms and landslide processes are the dominant means by which the landscape is shaped.
- Higher landslide densities and erosion volumes were found in stands that had been harvested in the

previous nine years than in forests older than 100 years, in three out of four study areas monitored by the Department of Forestry for storm effects. However, areas with forest between the ages of 30 and 100 typically had lower landslide densities and erosion volumes than were found in the mature forest stands.

- Landslides from recently harvested and older forests had similar dimensions, including depth, initial volume, and debris flow volume.
- Timber harvesting can affect the occurrence of shallow, rapidly moving landslides on steep slopes with a high inherent risk of landslides.

Forest management and soil disturbance

Little quantitative work is available to analyze soil disturbance at a watershed or landscape scale. We know that at the site level, soil disturbance, especially compaction, can reduce forest growth and increase soil erosion. Logging practices can cause compaction as heavy equipment and logs are moved across the forest floor. Oregon's forest practice rules require operators to reduce soil disturbance during and after logging operations. Using cable yarding on steeper slopes, for example,

can significantly reduce the impact of timber harvest. Reforestation is also required



Maintaining trees and other vegetation along streams minimizes or eliminates increases in stream temperature and provides a source of large wood which often is needed to maintain aquatic habitat for fish.

ODF photo file

after timber harvest to ensure that trees promptly reoccupy the land and help protect the soil.

Forest management and streams

We have a reasonably good understanding of the effect of forest management on peak flows (streamflows during relatively heavy rainfall events). Forest management can increase small and moderate peak flows (less than or equal to two-year floods) in smaller watersheds; however, the majority of research indicates that large peaks (greater than two-year floods) are not affected by forest management in either small or large watersheds.

Increases in stream temperatures from forest management were a concern in the days when logging was allowed down to the edges of streams. For more than three

decades, though, forest operators have been required to leave buffer strips of trees and other vegetation along most streams. Maintaining riparian vegetation minimizes or eliminates increases in stream temperature in the years immediately after forest harvesting. At a landscape scale across Oregon, younger, denser forests cover much forestland. In riparian areas, those areas directly adjacent to streams, younger, denser forests provide high levels of shade that can result in relatively cool

stream temperatures. The current distribution of forest ages across the landscape is different from historical conditions, where mature and old-growth forests were more common but generally did not produce the high shade levels associated with younger, denser forests. It is unknown how this difference might be affecting stream temperature dynamics at different spatial and temporal scales.

Maintaining vegetation cover in riparian areas also helps protect aquatic habitat by preventing adverse levels of sediment from entering the stream. In addition, we know that large pieces of wood in forest streams are essential for high-quality aquatic habitat. Trees and rootwads near the stream are more likely to fall in and produce high-quality aquatic habitat than are trees farther away. Between 70 and 99 percent of

large wood in forest streams comes from within 50 to 100 feet, and most of the “key pieces”—the largest ones—come from closer than 50 feet. Significant contributions of large wood can also be delivered to streams by shallow, rapid landslides originating in upland or headwall areas.

Fire suppression

Efforts to protect and manage water and soil resources from fire must take into account the dynamic nature of forests. Over the long term, wildfires are inevitable. They cause significant changes in sediment deposition and streamflow, altering the condition of forest soils and water at the watershed or even the landscape scale. These periodic, long-term natural disturbances are critical in maintaining the forest’s aquatic habitat features over time. Fire suppression may reduce the risk of harm to water quality in the short term, but fire suppression without active management, as noted in Strategy F, will ultimately result in unnaturally intense fires that cause greater damage to soil and water.

Data needs

At the October 2001 symposium, “A Landmark Assessment of Oregon’s Forest Sustainability,” called by the Board of Forestry to review the current state of scientific data about forests and forest management, several scientists observed that the existing literature on

“I think there is an opportunity—maybe a necessity—to demonstrate that current and future forest practices are not going to be creating adverse impacts. It’s really a credibility question. To address this, we need to upgrade the research knowledge base to bring us into the next century. We’re really running off results of studies that took place 25 and 30 years ago, when the forest practices and society’s view of these systems were just incredibly different. So an upgrading of our understanding is really very important.”

— Robert Beschta, professor emeritus,
College of Forestry,
Oregon State University

the impacts of forest practices on soil and water is outdated. Most of the watershed data available today comes from research carried out in the ‘50s and ‘60s, before Oregon enacted any comprehensive

forest practice law. The timber harvested during that time consisted mostly of big, old trees. The machines were large to match the timber, the road system had to be built to handle heavy logs and machines, and, relative to current practices, best management practices were poor. Now we are entering the fourth decade of forest practice regulations. Trees are smaller and more uniform, and the equipment is much smaller and uses, for the most part, an existing road system. The scientists strongly recom-

mended that new research focused on harvest impacts under current practices should be a high priority for the Board of Forestry and the state (Figure 10).

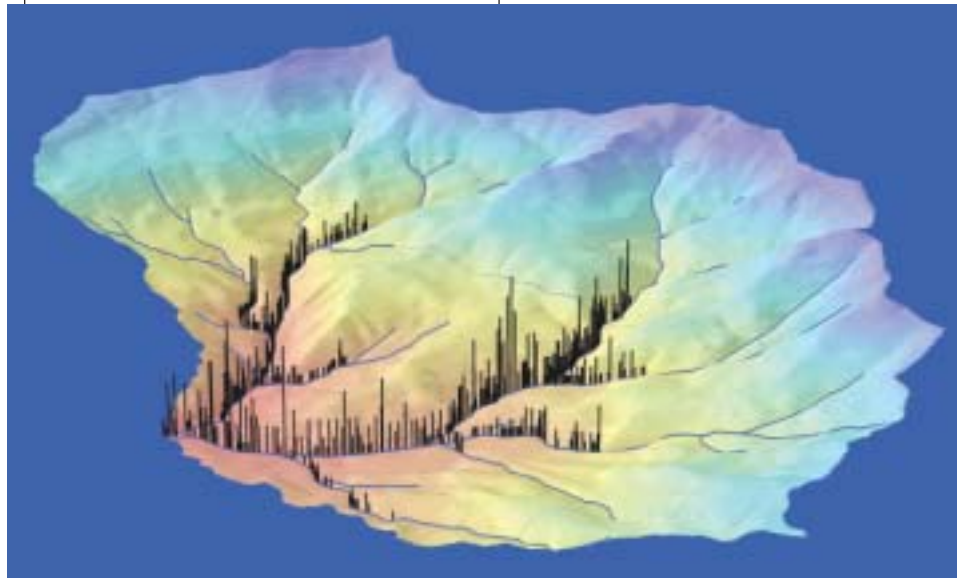


Figure 10. Distribution and relative abundance of coastal cutthroat trout in the North and South Forks of Hinkle Creek in the Umpqua River Basin. This is an example of watershed-scale data being generated through the cooperative Hinkle Creek Paired Watershed Study and Demonstration Area Project (Source: Gresswell, R.E., et.al., 2003).

Relatively little comprehensive monitoring is being done on the condition of soil and water resources. Protocols have been developed to measure some aspects of soil and water conditions, but there is no system that can generate comprehensive information on multiple questions on a broad landscape scale. Collaboration among forestry scientists, government agencies, and private organizations will be a critical in developing a cost-effective monitoring and research system .

side of cities with their own forestry ordinances. State policy designates the Forest Practices Act as the mechanism for water quality protection and gives the Board of Forestry authority, in coordi-

things, timely reforestation to stabilize soils after a forest harvesting operation. They also require operators to minimize the amount of soil and logging debris entering waterways, and to take particular care in harvesting and road building to minimize disturbance to the ground, especially on steep slopes.

“Mimicking disturbance regimes is how you move into the future with regard to protecting riparian resources along major rivers. We need to be thinking about the dynamic disturbance regimes that created these forests and their riparian systems, rather than locking up a place or a thing at this time.”

— Robert Beschta, professor emeritus, College of Forestry, Oregon State University

Operators must maintain buffer strips of trees and other vegetation within a certain distance of most streams to promote mature-forest conditions in the riparian zone, to help keep the water cool, and to help

What is being done to protect soil and water quality?

State and federal protection measures

The Oregon Forest Practices Act was enacted in 1971 to regulate forest practices for the protection of all resources, including soil and water, on non-federal forestlands out-

nation with the Environmental Quality Commission, to establish best management practices to ensure that water quality is protected.

The forest practice law addresses the protection of soil resources through a number of regulations. These require, among many other

keep sediment from entering the stream. The forest practice rules also restrict the application of chemical herbicides and fertilizers near forest streams.

On federal forestlands, the regional Northwest Forest Plan and the plans of individual national forests and Bureau of Land Management forests are

Collaborative efforts by state and federal agencies, private landowners, private nonindustrial forestland owners, and others have been a hallmark of the success of the Oregon Plan. Examples of restoration work include surveys of forest roads, culvert and fish passage improvements, and life-cycle monitoring for coho salmon and steelhead in coastal watersheds.

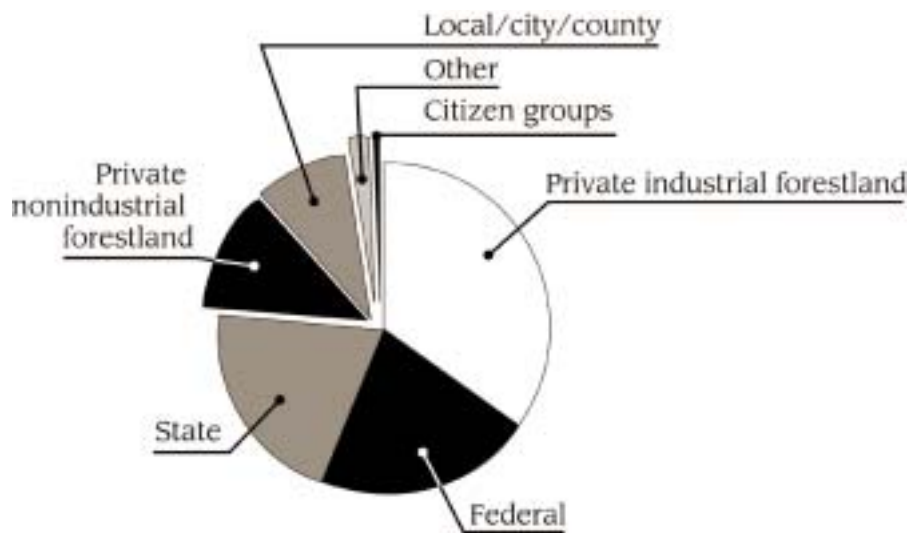


Figure 11. Restoration investments by land ownership, 1997-2001 (source: Oregon Watershed Enhancement Board).

Figure 12. Improving habitat in forest streams
(Source: Oregon Watershed Enhancement Board)

The more than \$70 million spent by private landowners and the state since the Oregon Plan began in 1997 has resulted in thousands of miles of roads surveyed, improved, or vacated. Fish passage has been enhanced by culvert improvements and the placement of instream structures.

	Private Forest Landowners	State Forests
Years	2000-2002	2000-2002
Miles of road surveyed	2,333	83
Miles of road vacated, closed or relocated	217	37
Miles of road improvements	1,042	392
Number of peak flow improvements	3,298	546
Number of surface drainage improvements	7,402	1,221
Number of stream crossings and culverts	502	60
Instream wood placement projects	125	32

the primary mechanisms for ensuring soil and water quality protection consistent with the federal Clean Water Act.

Measures under the Oregon Plan for Salmon and Watersheds and other voluntary efforts

Many forest roads built before forest practice regulation pose a risk to water quality from sediment and soil erosion. Industrial forest landowners and state forest managers are implementing a voluntary program called the “Road Hazard Identification and Risk Reduction Project” to identify and address sediment risks from roads. The program identifies the most troublesome

roads so that landowners can take action to reduce the amount of sediment they produce. Road repairs conducted as part of this project improve fish passage, reduce the potential for washouts and landslides, and reduce the delivery of surface erosion to streams.

“There is a huge amount of voluntary work going on that’s not driven by incentives, not driven by economics, but driven by people wanting to do what’s right.”

— Bill Arsenault, Committee for Family Forestlands member and family forest landowner

Individual forest landowners are taking other initiatives beyond what the law requires,

such as voluntarily retaining additional trees along streams (Figures 11 and 12). Finally, incentive programs such as the Conservation Reserve Enhancement Program support efforts to establish riparian forests on agricultural lands.

What are the major issues surrounding soil and water quality?

Because of a belief that forest management inevitably harms watershed health, management is often restricted in watersheds that provide drinking water. Such restrictions can lead to unintended and adverse consequences. The ability to actively manage forested watersheds, including those that supply drinking water, is often critical in maintaining both healthy forests and high-quality watersheds. To sustain the health of our forests and watersheds in the future, we must increase the ability of public forest managers, private landowners, and communities to address forest-related water issues and to manage, protect, and enhance forests for water supply, water quality, and watershed health.

Oregon has as yet no comprehensive riparian or stream corridor management policy or program. The various state programs that influence the management and use of riparian areas were created to achieve a variety of objectives, and their efforts today are not

always well coordinated. In order to achieve water quality and aquatic habitat objectives

across Oregon, riparian areas will need to be protected and enhanced not only on forestlands but on other lands as well.

Because riparian protection standards on forestlands are generally more protective than those covering other land uses, the policy of ORS 527.714 becomes important in considering future changes to riparian protection policy on forestlands. ORS 527.714 requires that any benefits achieved by adopting more protective riparian standards through regulation be in proportion to the degree that the existing practices of forest landowners, as a whole, are contributing to the overall resource concern that the standards are intended to address.

What are the key interactions of this strategy with other strategies?

Protecting, maintaining, and enhancing soil and water resources affects, and is affected by, other strategies and

policies for managing Oregon's forests. Here are some examples of these interactions:

- Forest soils, riparian areas, and aquatic areas provide habitat for diverse plant and animal species. Productive soils and functioning waterways are a basic foundation for providing native plant and animal habitats.
- Loss of forestland to other land uses directly reduces the amount of forested watersheds and potentially increases the intensity of management on remaining forests.
- Resource loss from fire, insects, and disease can cause a temporary change in sediment and stream-flow dynamics at a watershed scale.
- Changes in forest health that influence the types of tree and plant species in and around riparian areas, such as invasions of non-native plant species, can lead to changes in the riparian functions that influence water quality and aquatic habitat.

- Forest soils can store significant amounts of carbon, and forest practices may potentially affect this storage capability.

What are potential indicators to measure progress toward accomplishing this strategy?

1. Area and percent of forestland with significant soil erosion
2. Percent of water bodies in forest areas and other land uses with significant variance of biological diversity from the historic range
3. Percent of forest waterways with significant deviations from normal in pH, levels of dissolved oxygen, levels of chemicals, sedimentation, or temperature

Background on Strategy E:

Contribute to the conservation of diverse native plant and animal populations and their habitats in Oregon's forests

What do we mean by “diverse native plant and animal populations and their habitats?”

The scientific term for this concept is “biological diversity,” which means having various kinds and types of living organisms. Managing for biological diversity requires maintaining a diversity of habitats and ecological processes at various spatial scales, from entire landscapes to specific localized habitats (Figure 13). It also includes understanding individual species populations and the genetic diversity of



Photo courtesy of City of Eugene Parks and Open Space Division

This oak savanna near Eugene is one forest habitat type that receives little attention under Oregon's plant and animal conservation policies. Meanwhile, vast areas of other forest habitat types have been set aside in federal reserves.

these species. The concept of biological diversity is necessarily very broad and therefore difficult to measure directly.

Why is the conservation of native forest plants and animals and their habitats important?

Oregonians value native forest plants and animals for the economic, scientific, educational, cultural, recreational, and aesthetic values that they provide. Maintaining healthy forest habitat and healthy native plant and animal communities is essential to economic vitality and environmental quality of life. In addition, the federal Endangered

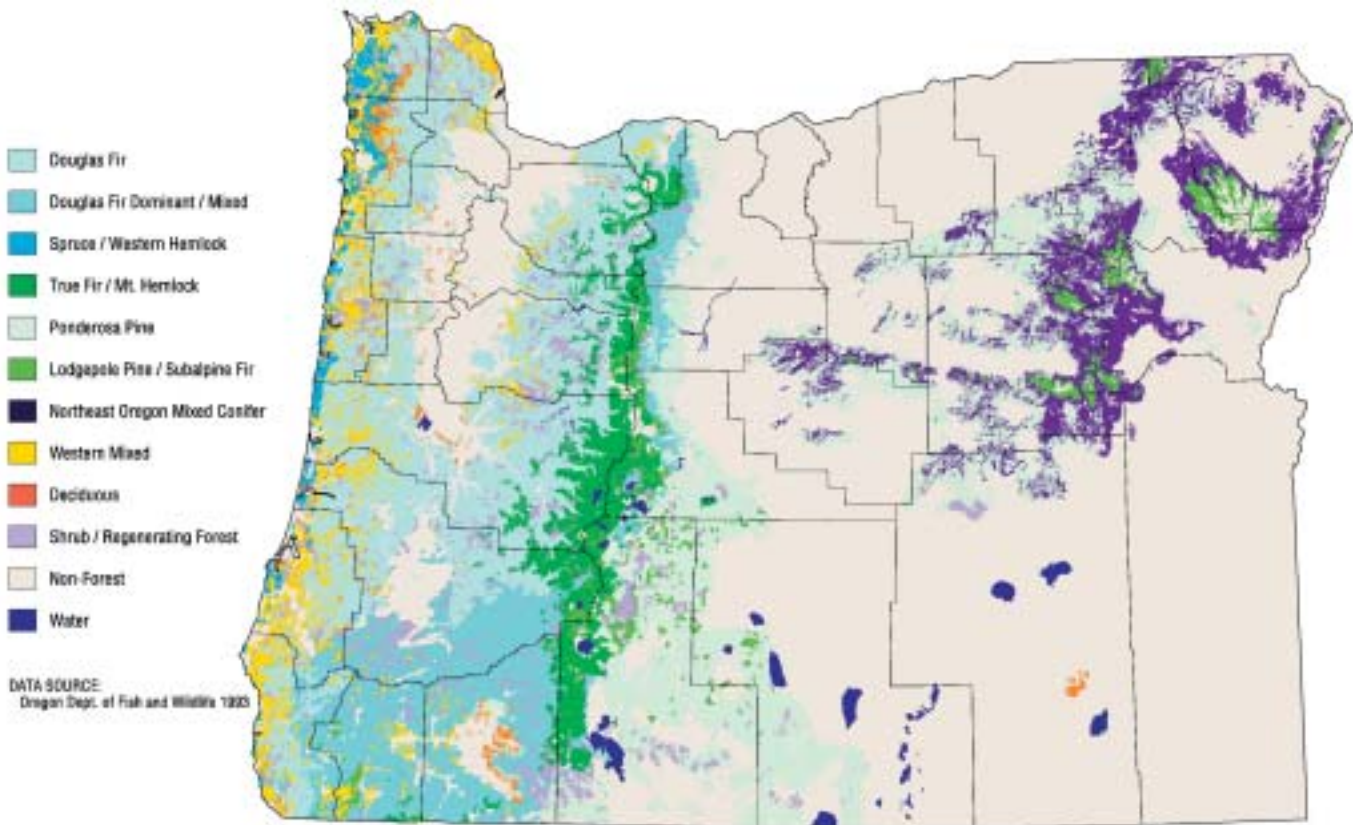


Figure 13 Oregon forest types

Species Act and other federal and state regulations require biological resource issues to be addressed.

Human activities can reduce, maintain, or enhance biological diversity. Both natural disturbances and human actions can affect biological diversity and need to be considered collectively to assess whether native plant and animal populations and their habitats are being adequately protected, maintained, and enhanced in Oregon's forests.

What characteristics of Oregon's forests affect native plants and animals and their habitats?

Stand age and structural composition are key forest characteristics that affect biological diversity. Since some plants and animals prefer young-forest conditions and others prefer older-forest conditions, a healthy, diverse forest landscape will be a mosaic of many different stand ages and structural components of native forest plants at appropriate scales.

Natural disturbances such as fire, wind, floods, landslides, insects, and diseases frequently alter these characteristics. Natural disturbance sometimes results in the conversion of older-forest stages to younger-forest stages, often with some remaining older-forest elements such as dead standing trees (snags) and fallen trees and logs (down wood) still present. These disturbances are vital processes of ecosystem renewal, creating pulses of

nutrients and reorganizing ecosystem structures and processes.

"I know that we don't want to be species-specific in protecting wildlife, but at the same time, if we're not looking at some of the species and what they actually need, then we also could be asking people to do a lot with almost no gain or measurable objectives."

— Sybil Ackerman,
conservation director,
Audubon Society of Portland

The scale at which biological diversity is assessed is important. Some elements of biological diversity are best understood on a larger scale, that of watershed, basin, or region. The amount, size, and location of plant communities and the diversity of forest successional stages are important large-scale factors affecting biological diversity. The condition of plant communities across the landscape can be an index to the condition of individual species within them. For example, the abundance and vigor of certain plant communities can give better clues about the abundance and vigor of lichens, fungi, and invertebrates than can smaller-scale studies of individual species. Similarly, wildlife habitat types, areas of the landscape characterized by particular vegetation patterns, are used to determine the amount, diversity, and condition of wildlife habitat at these large scales.

Smaller scales are better for measuring some characteristics. Individual forest stands or even smaller sites such as

patches of streamside vegetation, shrub communities, snags, wood on the forest floor, cavities in dead trees, and hardwood trees are key fine-scale habitat elements. In addition, some wildlife species need special habitat elements such as springs, rock outcrops, caves (bats, for example), and talus slopes (mountain goats).

What do we know about native Oregon forest plants and animals and their habitats?

The following list summarizes some key information about the current status of native forest plants and animals and their habitats in Oregon:

1. Because of the history of economic benefits derived from sustainably managing forests for commercial uses, combined with land use planning and forest practice laws, Oregon has been very successful in maintaining its forest land base.
2. The number of large, older trees in Oregon's forests has been decreasing, but changes, primarily in federal land management policies, could cause it to increase significantly in the future. For example, computer modeling studies suggest that the amount of older forests (200 years or older) in the Oregon Coast Range probably varied from approximately 24 percent to 73 percent coverage of the landscape prior to European settlement. Current old-growth levels

- are at about five percent; late-successional forests (80 to 200 years old) cover about 11 percent of the Coast Range. It is conceivable that coverage of old-growth forests in the Coast Range could return to presettlement levels as federal forest stands mature under existing management plans.
3. Oregon has lost more than 50 percent of its historical bottomland hardwood forests from conversion to agriculture, urbanization, and invasive exotic plants.
 4. Restrictions or prohibitions on timber harvesting and other human activities currently exist on approximately one-third of Oregon's 28 million acres of forest.
 5. Timber harvesting and fire suppression are altering forest structural diversity and stand age classes in different ways than would occur through natural disturbances such as wind, fire, and disease.
 6. Roughly 77 percent of Oregon's forestland is at risk of losing key ecosystem components from uncharacteristic wildfire. Thirty-five percent is at high risk, while 42 percent is at moderate risk. Forests at risk include areas of federal forestland allocated to reserves for protection of ecological values, such as late-successional reserves.

7. Forest management in areas of western Oregon may be reducing the amount of young-forest types (successional stages) containing shrub communities, remnant snags, and down wood, which are important for some wildlife species.
8. Management activities have had a negative effect on certain native forest-dependent plants and animals and a positive effect on others.
9. Invasive non-native plants are changing Oregon forestlands, sometimes irreversibly damaging native plant and animal populations.
10. Oregon does not have adequate information regarding wildlife population trends and changes in the geographic ranges of wildlife species.



How do current government policies affect Oregon's native forest plants and animals and their habitats?

Although government policies affect forest plants and animals in many ways, Oregon does not have an integrated set of policies to address this topic across all land uses. Individual agencies address individual aspects of plant and animal population and habitat conservation, but Oregon has no comprehensive policy to ensure that biological diversity goals are being met through the combined management objectives of Oregon's public and private forest landowners.

In 1993, the Oregon Department of Fish and Wildlife published the first statewide *Oregon Wildlife Diversity Plan*. The goal of the plan is to maintain Oregon's wildlife diversity by protecting and enhancing populations and habitats of native wildlife at self-sustaining levels throughout natural geographic ranges in Oregon. This plan is being implemented through the agency's Wildlife Diversity Program; however, budget reductions have greatly reduced the capacity of the agency to implement the program.

Oregon's land-use planning laws, particularly Goal 5,¹⁵ provide processes for local governments to address how some biological resources are protected from development, but protection policies

¹⁵ Goal 5 is one of 19 statewide land-use planning goals. It addresses the protection of resources such as wetlands, riparian (streamside) corridors, wildlife habitats, open spaces, and scenic and historic areas.

differ for forest, agricultural, and developed lands. These policies are not coordinated or based on a common, comprehensive set of biological data.¹⁶ Even on forestlands, policies vary widely, from reserving areas from further human disturbance, to active management that retains desired proportions of forest structures over time at a landscape or ownership scale, to protection of unique individual sites such as threatened and endangered species habitat and streamside (riparian) areas, to mandating the retention of specific habitat structures and avoiding harm to certain plants and animals.

The Board of Forestry has an important role in contributing to the conservation of diverse native forest plants and animals and their habitats. Private forest landowners are required to protect certain habitat elements by complying with the Oregon Forest Practices Act, which is the tool for ensuring that significant Goal 5 resources are protected on forestlands. The Board of Forestry adopts forest practice rules to ensure that the “overall maintenance” of fish and wildlife is provided, while also providing specific protection to certain designated fish and wildlife habitat features.¹⁷

The board also plays a role through its oversight of



Photo by Mike McMurray

state-managed forests. In 2001, the board completed the six-year public process of revising the Northwest Oregon State Forests Management Plan, which provides management direction for more than 615,000 acres of state forestland in northwestern Oregon, located in 12 counties. The plan uses an approach called structure-based management, which is designed to produce and maintain an array of forest stand structures across the landscape

“From a sustainability standpoint, you can argue that these different approaches to biodiversity really are a way of spreading risk. We don’t have all the answers. No one owner has all the answers of how to do this. This mix of ownerships I think is a wonderful experiment. If we follow up with monitoring and evaluation, it’s really a great opportunity to learn about the effects of different forest management practices.”

— Thomas Spies, research forester,
Pacific Northwest Research
Station, USDA Forest Service

in a functional arrangement that provides environmental, economic, and social benefits. These include not only habitat for native plants and animals, but also sustainable timber harvests and local government revenue, a landscape that contributes to healthy aquatic systems, and a forest that provides for diverse recreational opportunities. Similar management plans are in place for

Oregon’s other state-managed forests.

Different forest ownerships can play different roles in providing a wide range of plant and animal habitat conditions. Within the regulatory limits of the Forest Practices Act, private lands are managed to meet individual landowner objectives, which often means their emphasis is on timber production (wood production forests). Most forests currently managed specifically for species conservation (reserved forests) are in reserves on federal forestland. Thus most older forest structures are on federal land, while mostly young and mid-aged forests are on private land. State forests are managed to provide a range of stand ages and structures, in part to meet biological diversity objectives (multiple-resource forests). The variety of forest types is expected to enhance native plant and animal habitat, but this expectation is not proven,

¹⁶ Two programs, *the Oregon Biodiversity Project*, published by Defenders of Wildlife, and the *Oregon Gap Analysis*, conducted by the Oregon Natural Heritage Program, are major steps toward this goal.

¹⁷ ORS 527.710.

because we have as yet no complete assessment of the conditions and trends of native plants and animals and their habitat.

Restrictions or prohibitions on timber harvesting and other human activities currently exist on approximately one-third of Oregon's 28 million acres of forest. Many of those acres are in federal reserves designed to protect biological diversity and water quality. These federal reserves are concentrated in three of the 20 habitat types in Oregon and are primarily located along the western slopes of the Cascade Mountains (Figure 14). Their location is dic-

"I worry about discussions that lead to a public perception that there is a lot wrong out in the forests without knowing that is the case. We should be careful about rushing to solutions when we are still in an assessment stage. Even if we believe some things are wrong, we shouldn't jump on every issue and assume every issue has a problem. If we move too quickly, without completing adequate assessments, collaborators will step away from each other, and we'll lose public support. Though we need to recognize the problems that do exist, moving too quickly, before adequate assessments are completed, will cause potential collaborators to step away from each other and will further erode public support."

-- Jennifer Phillippi, treasurer,
Rough & Ready Lumber Co. and
president, Perpetua Forests Co.

tated by federal ownership and may not be the highest-priority areas for the conservation of forest plant and animals. As a result, some habitat types may be over-represented and others may be under-represented in the current system of reserves and other protection and conservation strategies. In addition, reserve strategies currently do not address the potential for natural disturbances, through which Oregon's forests have evolved and to which they are adapted.

Environmental regulations also have an influence on the conservation of forest plants and ani-

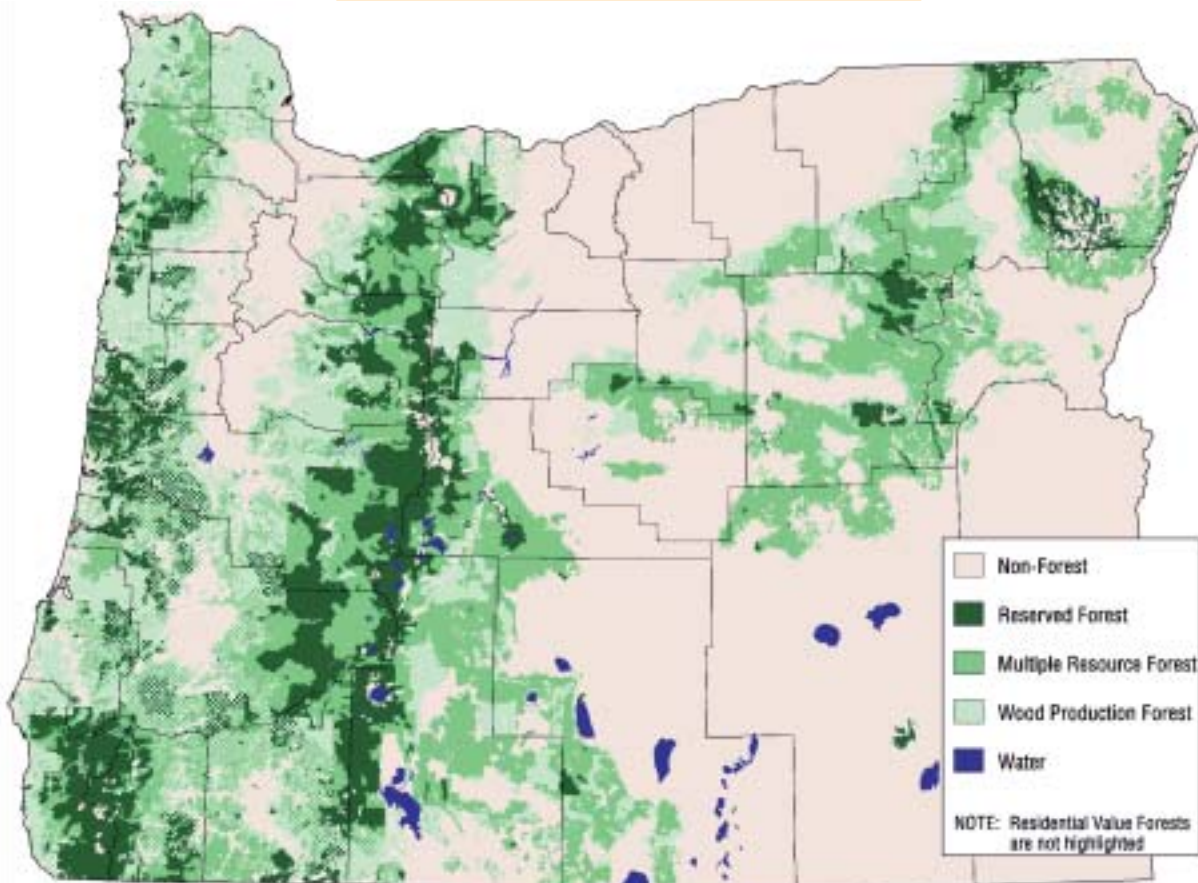


Figure 14. Habitat protection on Oregon's forestlands.

mals. Sometimes these regulations have unintended effects. For example, the federal Endangered Species Act is intended to provide a framework to help people to identify species that are in danger of becoming extinct, understand why that is happening, and provide mechanisms to protect and enhance such species populations. However, if a forest landowner creates habitat suitable for threatened or endangered species, and then such a species occupies the site, Endangered Species Act regulations may severely restrict future economic use of the forestland without compensation to the landowner. This risk may create a strong economic disincentive to create or maintain such habitat and an incentive to change the land use.

Oregon needs to conduct a comprehensive, scientifically and politically accepted assessment of native forest plant and animal population and habitat conditions, trends, and associated risks across all land uses. The assessment would increase our knowledge of the dynamics of habitat ranges and population status of Oregon plant and animal species and help policymakers evaluate alternative strategies to manage native plant and animal species and their habitats. Such a statewide assessment will be a significant technical, financial, and political challenge. A focus on vascular plant species and vertebrate animal species would make the assessment more feasible.

Climate change, invasive

plants, and population growth make it impossible to manage Oregon's forests as they existed before European settlement, even if this were a desired public policy. But Oregonians can better understand the biological diversity of all of Oregon's lands, and we can develop policies that balance statewide goals and priorities for the protection, maintenance, and enhancement of ecosystems and plant and animal species with other environmental, economic, and social needs.

What are the key interactions of this strategy with other strategies?

- Any loss of forestland to other land uses directly reduces the amount of available plant and wildlife habitat and potentially increases the intensity of management on remaining forests. Forests managed for wood production provide many more plant and wildlife benefits than most forestlands converted to non-forest uses.
- Under a continuation of current policies on federal and private lands, the amount of older forests in Oregon will increase from current levels. This increase will occur almost entirely on federal lands. At the same time, private forestlands will tend to remain in younger age classes as a result of timber management.
- Many of the current federal

forest reserves, particularly in eastern and southwestern Oregon, are in areas where the natural fire regimes have been moderately or severely altered. Some forests and wildlife habitats within these reserves are in jeopardy of uncharacteristic stand-replacement fires.

- Invasive non-native plants threaten the native plant and animal diversity of Oregon's forests.
- Long-term investments in forest resources are needed to maintain abundant fish and wildlife populations, biologically rich forests, and the significant social and economic benefits they provide. Clear and comprehensive plant and animal conservation policies that equitably address all land uses can provide greater certainty for forest landowners when making investment decisions.
- Changes in global climate may affect the viability and distribution of native Oregon plant and animal species.

What are potential indicators to measure progress toward accomplishing this strategy?

1. Forest area by ecological type
2. Area of forest types by successional stage
3. Area by forest type in protected area categories
4. Status and population levels of rare, sensitive, threatened, or endangered native plants and animals

Background on Strategy F:

Protect, maintain, and enhance the health of Oregon's forest ecosystems, watersheds, and airsheds within a context of natural disturbance and active management

What is a healthy forest?

Forest health is a social value based on both public perception and scientific information. We define a healthy, vital forest landscape as one that maintains its functions, diversity, and resiliency within the context of natural disturbances and is capable of providing people with the array of values, uses, and products desired now and in the future. Forests are “unhealthy” when potential disturbances, such as fire or pest outbreaks, are unusually frequent, severe, or widespread and when the desired outputs such as wood fiber, special forest products, and recreational opportunities cannot be provided or sustained. We view healthy forests as preferable to unhealthy ones because they are resilient and because they are capable of providing the goods, values, services and habitat upon which humans and plant and animal species depend.

Perceptions about forest health have evolved from a focus on preventing tree death from insects, disease, or wildfire to a concept of “forest ecosystem health” that ties together physical, terrestrial, aquatic, and human aspects of the landscape. The ecosystem concept also recognizes that



Photo by Mike McMurray

Today, many forests in Oregon are more susceptible to catastrophic fire and insect and disease problems than those that existed before European settlement.

forests are dynamic and that disturbance is an important element in maintaining desired forest conditions. In this document, policies for protecting, maintaining, and enhancing the health of forest aquatic and riparian systems are more thoroughly discussed under Strategy D.

What is known about major disturbances affecting forest health?

Oregon's forests are shaped by natural disturbance in the form of fire, storms, climate change, wildlife, volcanic activity, insect out-

breaks, and diseases. Prior to European settlement, natural disturbances created a range of forest types, age classes, and structures across the landscape. Native Americans regularly set fire to assist in hunting game and to produce certain edible vegetation, and for other reasons. It has been estimated that fires burned approximately 790,000 acres annually; however, we have no estimate of the amount of presettlement acreage affected by insect outbreaks, diseases, and storm damage. It is known that disturbances such as windstorms or insect and disease outbreaks often set the stage for large-scale wildfires.

European settlement changed the pattern of disturbances on Oregon's forest landscapes. Most natural disturbances were seen as undesirable because they detracted from settlers' uses of and products from the forest. New sets of human-caused disturbances were added to the mix, and the natural disturbance pattern was greatly modified. Among the changes introduced by European settlement were suppression of wildfire; elimination of Native American burning; introduction of inva-

sive non-native plant and animal species; land management activities such as live-stock grazing, timber harvest, land clearing, and burning for agriculture and urban use; air pollution; and road building. The following passages discuss some of the major natural and human-caused disturbances affecting Oregon's forests.

Climatic and geological disturbance

Infrequent climatic and geological disturbance provides an important context for forest health. Short- and long-term climatic cycles influence

the frequency and severity of disturbances such as fire and windstorms. Climatic changes are usually relatively slow, while geological events can be sudden and cataclysmic. The vegetation types now covering Oregon are relatively recent, having occupied Oregon since the end of the most recent glacial period (13,000 years before the present). During previous warmer climatic periods, species such as redwood spread much farther north from where they now exist. Cataclysmic events such as lava flows and the Lake Missoula floods have modified soils and vegetation in signifi-

cant ways. For example, Willamette Valley ponderosa pine may be a product of the Lake Missoula floods.

Fire

The range of natural fire regimes in Oregon reflects current climatic, vegetative, and geological conditions. In moister regions, the return interval between wildfires (the fire frequency) may be 200 years or more, and the fires tend to be large, stand-replacing events. In drier regions, fire may come as frequently as every 10 to 15 years, often burning with low intensity, but not always; fires in some stand

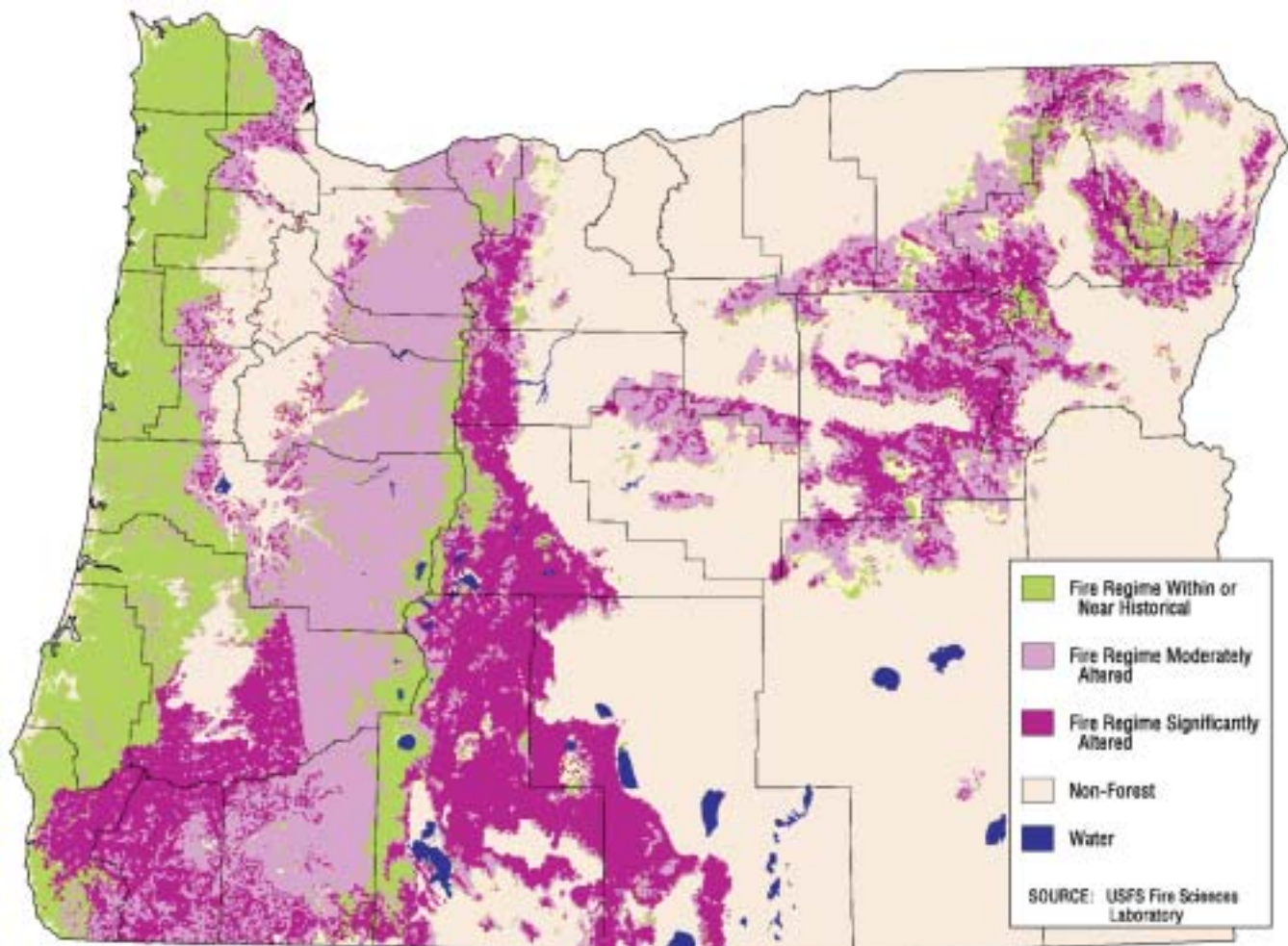


Figure 15. Current fire condition classes.

types (for example, lodgepole pine) are more often stand-replacing events. Much of Oregon's forest in the drier regions is characterized by fire return intervals of 35 to 100 years, and by a range of fire intensities.

During the 20th century, the suppression and prevention of wildfire became an important role of government for the purpose of protecting property and conserving existing forest values. Fire prevention and suppression changed the nature of forest structure and wildlife habitat across fairly significant portions of the forest. However, beginning in the 1960s, landowners, governments, and the scientific community began to recognize that attempting to prevent and suppress all forms of natural disturbance, particularly fire, was changing tree stocking levels, forest species composition, and fuel loading on many forests.

Today, almost a century of fire suppression in Oregon, coupled with reduced vegetation management on federal lands in recent years, has produced forests that are, across the landscape, more susceptible to catastrophic fire and insect and disease problems than those that existed before European settlement. Fire prevention and suppression without vegetation management to remove fuels will result in more uncharacteristic stand-replacing wildfires, particularly in eastern and southwestern Oregon. These

wildfires will be more difficult and expensive to control (Figure 15).

Insects and disease

Outbreaks of native forest insects such as the Douglas-fir tussock moth or western spruce budworm get relatively more public interest than forest diseases, though diseases kill or damage more trees and thus have a more significant effect on timber management. The aggressive fire-suppression

“The management approach currently being applied across our nation’s western federal forests is unlikely to be sustainable in the long run. If we continue the current passive management approach, forest health conditions can be expected to deteriorate, and forests will continue to be subject to high-severity wildfires, with accompanying damage to watersheds, fish and wildlife habitat, homes, and communities.”

— Stephen Fitzgerald,
associate professor,
College of Forestry,
Oregon State University

policy has created conditions that favor increased insect and disease outbreaks. Overstocked stands grow less vigorously and become increasingly susceptible to pest infestations. Changes in species composition from fire suppression also make stands more susceptible to root diseases and stem decays. Increased tree death from insect and disease infestations and other agents over the last two decades has increased the potential for catastrophic, stand-replacing fires.

Timber management

Most private forests and some public lands have been intensively managed for timber for decades. On these lands, harvesting is now the most frequent disturbance event. In addition to harvesting trees and modifying vegetative succession, timber harvest and road-building can, in some instances, affect the timing, frequency, and intensity of disturbance events such as shallow, rapid landslides (see Strategy D).

Forest roads, power lines, and rights-of-way also change disturbance patterns by allowing access to the forests, which can result in more human-caused wildfire ignitions and increase the spread of exotic plants. However, roads provide necessary access to forests for fire suppression or restoration-oriented management activities.

Stands with a mix of species that approximates the composition of native forests are usually more resilient to insects and diseases than single-species stands. Stands with species that are not genetically well adapted to the site or to the local climate are also more susceptible to insect and disease outbreaks.

In western Oregon, coastal clearcuts often have been replanted with Douglas-fir on sites previously stocked with western hemlock and Sitka spruce. This has resulted in a severe problem with Swiss needle cast disease. Native root diseases also spread in areas

planted to poorly adapted species. Planting root disease-resistant or -tolerant species and using local seed sources can reduce insect and disease damage and also contribute to native plant and animal habitat. Surveys show that landowners are beginning to plant a mix of tree species better adapted to local sites.

In eastern Oregon, intense fire suppression and the harvesting of larger, higher-value ponderosa pine and western larch over the last century have changed forest conditions significantly from those that existed in the 1800s. Some stands are now dominated by densely stocked, and generally smaller, shade-tolerant true firs and Douglas-firs, which are less fire-resistant and more susceptible to root diseases and stem decays than ponderosa pine and western larch. This shift in species composition and stand structure has increased tree death and caused heavy accumulations of highly fire-prone vegetation. The resulting insect epidemics and wildfire, along with timber harvesting, have led to dramatic declines in standing timber volumes on affected private lands, and possibly to increases in understocked areas in what were previously productive forest stands. Other forested areas remain highly overstocked.



Photo by Mike McMuray

Scotch broom is rapidly spreading throughout western Oregon forest and agricultural lands. In the future, invasive non-native plants, animals, and diseases may become the dominant threat to Oregon's native forest plants and animals.

animals and to provide an additional economic incentive to retain low-productivity private forestlands in forest use. However, intensive, poorly managed livestock grazing dating back to the late 1800s has eroded streambank cover, increased the encroachment of juniper forest into rangelands, and contributed to the spread of invasive non-native plants.

Wildlife and livestock management

Native animals such as deer, elk, and beaver can be natural disturbance agents in some areas of the forest. Usually such disturbances are minor or localized, but that is not always the case. Today in the northeastern United States, foraging by unusually high deer populations is altering the plant species composition of the region's forests in undesired ways.

Livestock grazing can be managed to emulate disturbances from foraging by native

Land conversion

While management for timber or grazing may modify natural disturbance regimes, land conversion for urban and agricultural uses is the ultimate disturbance, because the site no longer returns to forest. The amount of forestland conversion was significant during settlement, but Oregon's land-use system now limits such changes (see Strategy C).

Invasive non-native species

In the last century, the introduction of non-native pathogens, plants, and insects has impaired forest health in Oregon. White pine blister rust, for example, has virtually eliminated western white pine from areas in the Coast Range and Cascades. Insect and disease introductions during the last century that have had significant impacts on the forest ecosystem also include Port-Orford-cedar root disease and balsam woolly adelgid. Eradicate-

“Probably the biggest overriding threat to our forests from a forest health standpoint is the introduction of non-native organisms. The irony of the situation is that while we in the forest community have the most to lose with such an occurrence, we have not been as actively involved as we should in seeking possible solutions or preventing these kinds of introductions.”

— Alan Kanaskie, forest pathologist, Oregon Department of Forestry

ing an established population of European gypsy moth during the 1980s required an effort costing millions of dollars.

The recent detection of sudden oak death disease in southwestern Oregon exposes a new threat to several important tree and shrub species. The introduction and spread of invasive plants like Scotch broom, gorse, English ivy, and Himalayan blackberry to forestland poses an indirect threat. These non-native plants typically reduce native-plant diversity on a site and prevent or delay the regeneration of trees.

Increased commerce, a mild climate, and a continuous influx of people make western Oregon particularly vulnerable to the introduction and establishment of exotic insects, pathogens, and plants. Increasing levels of international and interstate trade in logs and wood products, in particular, make it likely that new pests will be introduced in the future. The introduction of exotic insects and diseases is increasingly becoming a serious threat to the health and vitality of forest ecosystems.

The first lines of defense against non-native species are programs to detect, monitor, and eradicate them and prevent further introductions. When exotic plant diseases become established, breeding programs for disease resistance may become critical to the survival of native tree species.

Air pollution

Urban and suburban development to accommodate Oregon's growing population will continue to be a threat to the state's air quality. Visibility and air quality in forest areas is degraded not only by prescribed fires and wildfires but also by air pollution from factories, vehicles, woodstoves, agricultural burning, and other non-forest-related sources. Prescribed fire can be used to achieve desired future conditions in many of the state's forest types. However, for it to be successful, very large acreages need to be burned annually, particularly in eastern and southwestern Oregon. It may be increasingly difficult in the future to make this strategy available to forest landowners and also meet air-quality requirements for urban, rural, and forest areas.

Air-pollution damage to vegetation is an important indicator of forest ecosystem health, but one that has so far had little impact here. Oregon has only recently documented air-pollution impacts to sensitive lichen species downwind of major urban areas. Because of a relatively small urban industrial sector in the region and dominant marine air currents passing over Oregon from the west, our forests have had little exposure to airborne pollutants, compared to other areas of the country and the world. However, air-pollution effects on forest vegetation will probably increase with Oregon's popu-

lation and may also result from increasing industrial emissions originating in other parts of the world.

How do current government policies affect the strategy of protecting, maintaining, and enhancing forest ecosystem health?

The Oregon Department of Forestry was established in 1911 because of the need to suppress wildfires, which threatened public safety, timber values, and private property. Wildfire suppression on forestlands is still an important mandate for the agency today, as it is for the federal land management agencies and every state forestry agency in the West. In the past, the objectives of forest landowners and government policies alike focused on limiting damage to timber values from natural disturbance agents such as fire and native pests. Today, management objectives on most federal lands no longer emphasize timber values. Today we also understand that forest ecosystems must be managed in the context of the natural disturbance events to which they are well adapted.

Oregonians continue to expect the department to carry out its aggressive protection of private property from fire. This is mandated by law and paid for by both the State General Fund and forest landowners. At the same time, the department is being increasingly challenged to take part in emerging state and

national policy initiatives that call for reintroduction of fire to restore forest ecosystem health.

There is strong agreement among foresters, forest scientists, and most Oregonians that hazardous fuel conditions need to be more actively managed so that fire-dependent forest ecosystems can better meet our environmental, economic, and social needs. Additionally, there are broad areas of social agreement about how to enhance ecosystem health in the forests of eastern Oregon. Oregon's *An 11-Point Strategy*

For Restoring Eastern Oregon Forests, Watersheds And Communities, 2001 provides a clear outline of how government agencies, other landowners, and rural communities can work together to achieve this goal. This approach has been applied at a landscape scale in the three-million-acre Blue Mountains Demonstration Area project. The project focuses generally on watershed management and specifically on reduction of fuels by reducing tree densities across the landscape.

Prescribed fire can be used to achieve desired future

forest conditions. However, very large acreages need to be burned annually. The costs associated with controlled burning are high, and considerable controversy surrounds prescribed fire because of the risk that fires will escape and burn onto other ownerships, and because of air-quality problems associated with smoke. The technique remains especially controversial in the aftermath of property damage caused by an escaped prescribed fire near Los Alamos, New Mexico, in 2000.

Silviculture is another

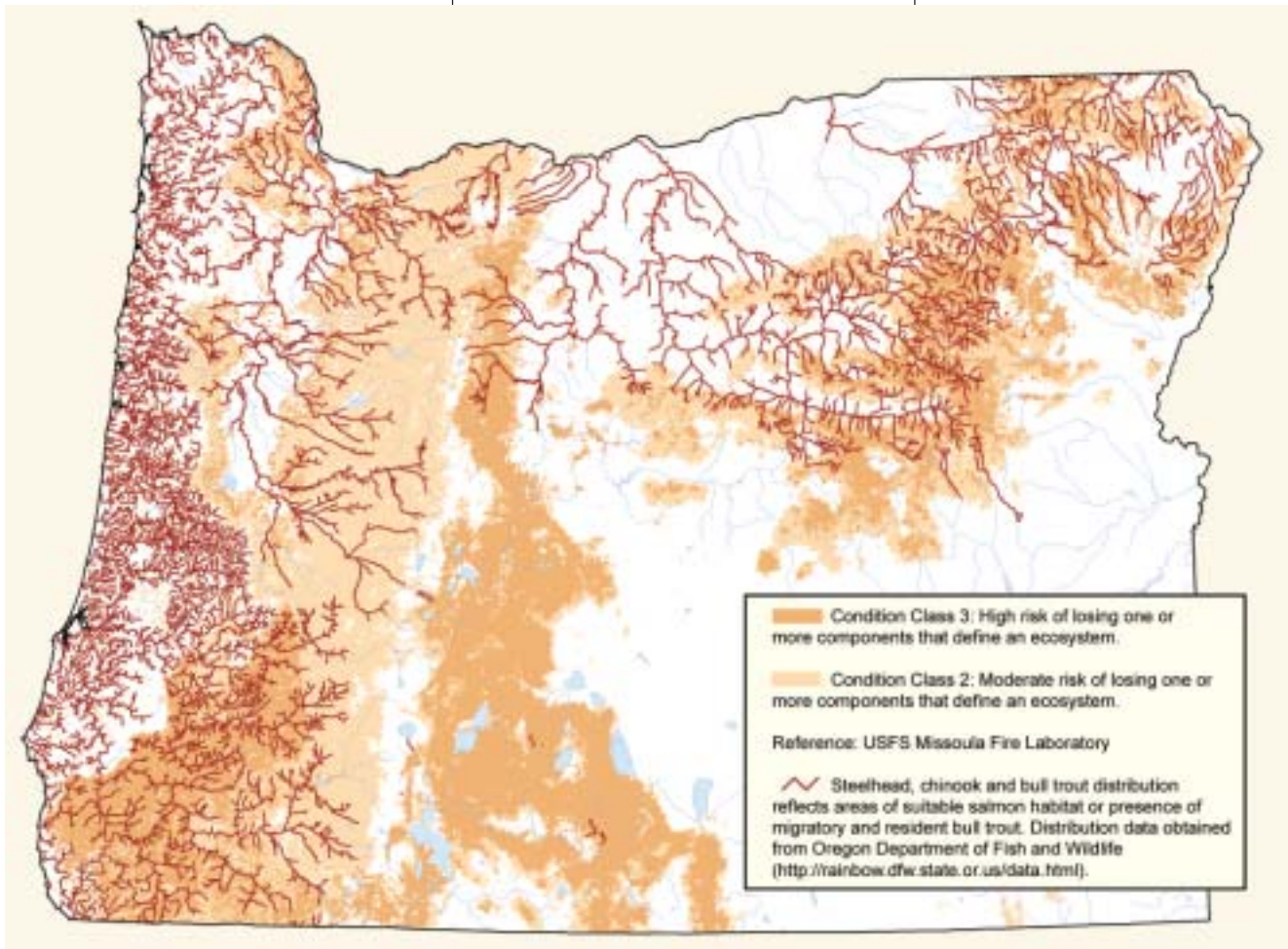


Figure 16. High and moderate fire risk areas and current distribution of steelhead, chinook salmon, and bull trout. (Source: Mealey, S.P. and J.W. Thomas in Fitzgerald, 2002)

pathway to achieving forest health goals. Combinations of tree thinning and prescribed fire can be designed to reduce fuels and wildfire risk on a site-specific basis. These combined treatments may often be the best choice if both short- and long-term risks to forest resources are evaluated and managed. However, lack of public trust, increased procedural workloads, and legal challenges have resulted in ongoing analysis and decision-making backlogs. For example, for most Forest Service project analyses with any commercial timber component, normal procedural requirements alone take an average of four years to complete.

Conflicting government policies and processes are major reasons why needed fuel-management work is not getting done. While the federal Endangered Species Act is a valuable tool for protecting imperiled forest species, it has an inherent bias favoring reduction of short-term adverse effects. Long-term habitat degradation from landscape-scale changes in forest conditions—such as wholesale changes in historic wildfire regimes in fire-dependent forests—are often discounted in the analysis of forest management projects. While the National Fire Plan calls for aggressive fuel reduction on federal lands, public controversy, lack of funds and staff, and substantial environmental analysis requirements

have led to far less treatment than anticipated (Figure 16).

Under current federal fire-suppression policy, homes in the wildland-urban interface receive fire-suppression priority, even though most homes are insured and homeowners can take action on their own lands to mitigate the fire hazards and risk to their homes. Private forestlands managed for timber and other values are usually not insured, and managed forests are at high risk from wildfire spreading from federal lands. Thus wildfire originating on or spreading through federal lands presents underappreciated yet significant risks to private forest management investments. Future wildfire policies should better balance the risks to private forestlands with risks to homes and other structures in the interface. For example, when a decision must be made whether to allocate wildfire-suppression resources to protect \$1 million in uninsured private timber or to protect an insured structure with a replacement value of \$100,000, the limited firefighting resources should be allocated first to the protection of timber values.

While the Oregon Department of Forestry has clear statutory authority in fire suppression on forestlands, the law prescribes a less clear role for the agency in fuels management. It is clear that fuels management is key to reducing fire risk and hazards in the urban-forest interface.

However, Oregon laws that make landowners and forest operators liable for escaped fire and that impose smoke management restrictions discourage prescribed burning on private lands. In recent years, federal money has been available to help private landowners reduce fuel loads in specific areas. The areas targeted by this incentive program are forests that are at high risk from wildfire and that have homes nearby.

Maintaining and enhancing visibility in wilderness areas and in national parks (Class I Visibility Areas) is a state and national goal under the federal Clean Air Act. Visitors to Oregon's Class I Visibility Areas experience some of the best visibility in the country, and the Oregon Smoke Management Program has been instrumental in making that happen. Regional haze-reduction goals have also been established under the Clean Air Act. Continued implementation of the Smoke Management Program will be essential in ensuring those goals are met.

Anticipated increases in prescribed-fire treatments on federal lands through the National Fire Plan and the Western Governors' 10-Year Comprehensive Strategy will present further challenges in meeting the public's desire for smoke-free air. This work will require better coordination and monitoring, more sophisticated forecasting, and increased public education. Greater public acceptance of

alternatives to burning, including mechanical treatments, may offer the best opportunity to reduce smoke emissions.

Oregonians have many different views on how the state's forests should be managed, and so their views on the potential forest health risks and effects from natural and human-caused disturbances are also very diverse. However, we all must understand there are no islands of forest big enough in Oregon to isolate the effects of our choices related to fire, fuels management, invasive plants and animals, and air quality.

In the past, the objectives of both Oregon forest landowners and government policies focused on limiting the damage from natural disturbance agents such as fire and native pests. Today we understand that forest ecosystems in Oregon are well adapted to natural disturbance events and can absorb and recover from them much more quickly and completely than they can from the effects of exotic pests or pollution. Future Oregon forest policies must take the initiative in monitoring and responding to these new, under-appreciated but significant threats to forest ecosystem health and vitality.

What are the key interactions of this strategy with other strategies?

Protecting, maintaining, and enhancing forest health and vitality affects, and is affected by, other strategies and policies for managing Oregon's forests. Here are some examples of these interactions:

- Introductions of non-native plants and animals often reduce the diversity of native plants and animals.
- Carbon emissions from forest fires are not preventable, but the increased use of prescribed fire on federal lands may result in decreased carbon emissions by preventing much larger emissions from catastrophic fires.
- Large-scale controlled burning on federal lands to thin dense forests and reduce fuels may degrade air quality in areas of eastern and southwestern Oregon.
- Limiting opportunities for prescribed burning because of air-quality concerns may affect the timely reforestation of forestlands after timber harvesting and may result in the increased use of herbicides on some sites.

- Implementing Oregon's *An 11-Point Strategy For Restoring Eastern Oregon Forests, Watersheds And Communities, 2001* and other fuel-reduction programs should result in economic benefits to local communities.
- Promoting Oregon's self-sufficiency in wood products could reduce the need to import raw wood and thus lower the risk of introducing invasive non-native species.
- Establishment of invasive non-native species could lead to quarantines and the loss of important markets for Oregon's forest products and other plant industries (e.g., nurseries).

What are potential indicators to measure progress toward accomplishing this strategy?

Area and percent of forest affected by processes or agents beyond the range of historical variation (for example, areas of forest in which fire condition classes are different from those of presettlement times)

Background on Strategy G:

Enhance carbon storage in Oregon's forests and forest products

What is global climate change?

Carbon dioxide is one of the gases found naturally in the earth's atmosphere. It is widely accepted and well documented that atmospheric levels of carbon dioxide have increased dramatically over the past 100 years. The increased level of carbon dioxide in the atmosphere acts much like a greenhouse, allowing sunlight in and trapping its heat so as to keep the air warm. Other gases in the atmosphere, such as methane and nitrous oxide, have the same effect. These gases are referred to collectively as greenhouse gases.

Studies have shown a strong relationship over the past 100 million years between the levels of atmospheric greenhouse gases and the earth's temperature. Many scientists believe the greenhouse effect from increased levels of atmospheric carbon dioxide is increasing the earth's average temperature to the point of undesirably changing the earth's climate—a phenomenon referred to as “global warming” or “global climate change.”

Many scientists, policy-makers, and others believe that climate change from increasing atmospheric levels of greenhouse gases needs to



Carbon storage, Oregon style.

be addressed by reducing or offsetting human-induced sources of greenhouse gases, in particular carbon dioxide. Proponents for taking action feel that doing nothing is too risky, and that inaction forecloses opportunities to achieve other benefits such as conserving energy, developing alternatives to fossil fuels, and placing greater emphasis on maintaining healthy, productive forests to mitigate carbon dioxide emissions. Others question whether climate change from increased levels of carbon dioxide is occurring, and if it is, whether humans are causing the changes and whether society needs to be concerned.

How does carbon move from the atmosphere to plants and back again?

All plants use energy from the sun's light to make their own food in a process called photosynthesis. During photosynthesis, carbon dioxide absorbed through leaves is broken down by the sun's energy and combined with hydrogen from water to make sugars that plants live on. This process releases oxygen into the air. The carbon in the sugars is stored as biomass in the plant's leaves, branches, trunk, and roots.

Plants break down the sugars into energy. This process, called respiration, releases carbon dioxide back into the air. Plants use much more carbon dioxide in making their food and storing it as biomass than they release during respiration. The remainder of the carbon is stored in their tissues. The process of removing carbon dioxide from the atmosphere, breaking it down into carbon, and storing the carbon in living and dead plant tissues and as organic material in the soil is called carbon sequestration. The carbon returns to the atmosphere as carbon dioxide when plants die, decompose, or burn. When trees are harvested and manu-

Photo by Mike McMurray

factured, carbon continues to be stored in lumber and other wood products until they decompose. Collectively, these processes are called the carbon cycle.

People, in their use of the earth's resources, are very much a part of the carbon cycle (Figure 17). For example, when we burn fossil fuels such as coal and natural gas to produce electricity or run our automobiles on gasoline, carbon dioxide is emitted as waste into the atmosphere. Similarly, clearing forestland for other uses not only reduces the area where carbon sequestration and storage can occur, but the clearing itself (i.e., removing stumps and disposing of slash) also releases stored carbon back into the atmosphere as carbon dioxide.

“The Pacific Northwest, and western Oregon in particular, is a great place to store carbon because the forests here can be long-lived. These forests are very productive, and they store a lot of material in soil and in detritus — that is, dead stuff. We have done studies where we’ve gone out to different old-growth forests and tallied the total amount of carbon stored in them. These are very large stores, some of the largest you can find on earth.”

— Mark Harmon, professor,
College of Forestry,
Oregon State University

discussing the effects of forests and forest management on carbon storage.

The carbon cycle occurs at various scales—individual trees and plants, forest stands, and landscapes containing many forest stands. The plants themselves are a pool of stored carbon. At the stand scale, the age, species composition, and forest structure define the types of carbon pools present. Young conifer forests are very productive and grow rapidly. The pool of stored carbon in young forests is modest in size, but it increases rapidly, and it is made up mostly of the living trees themselves. An older forest containing trees of different ages, sizes, and species is still sequestering and storing carbon. The rate at which carbon is being

How do forests and forest management affect the carbon cycle?

The role of forests in the global carbon cycle and the use of forests to offset increases in atmospheric carbon dioxide have been widely discussed. It is very important to keep scale in mind when

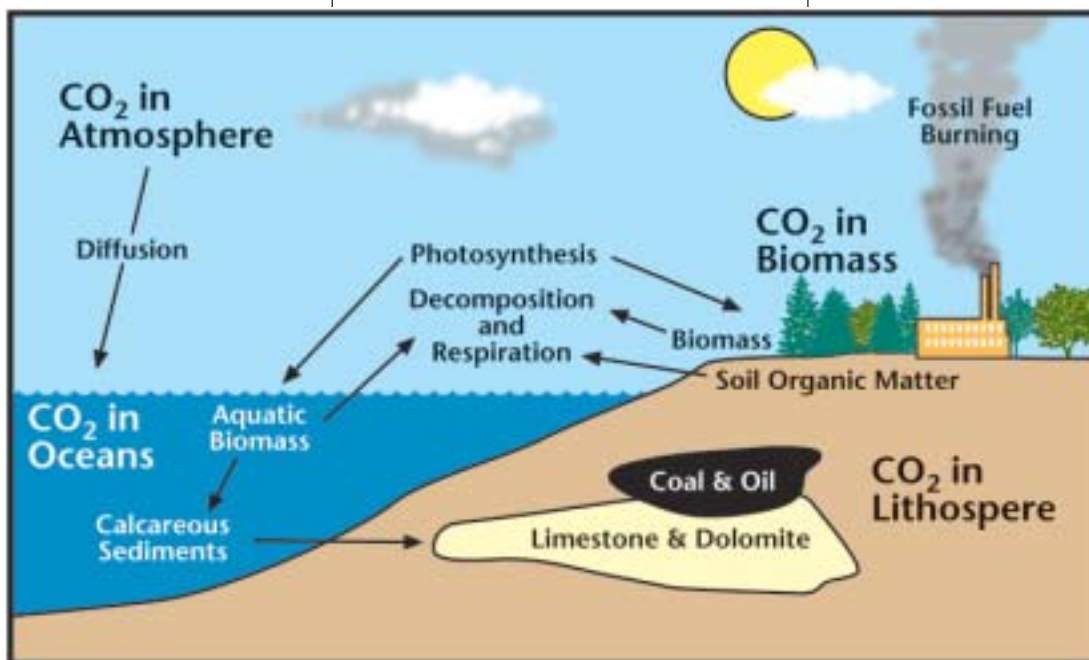


Figure 17. The global carbon cycle. Arrows indicate emissions (upward arrows) and sequestration (downward arrows).

stored (amount per unit of biomass) is lower than in a young forest, but there is more biomass present in an older forest. In addition to live-tree biomass, older forests contain other carbon pools: dead trees, leaf litter, duff, and organic material in the soil. The distribution of forest stands with respect to age, species composition, size, and structure is what determines the amount of carbon stored at landscape scales.

The size, frequency, and severity of natural disturbances such as floods, wildfire, wind, and insect and disease infestations greatly influence the carbon cycle at all scales.

Losses of large expanses of forests to wildfires, insects, or diseases release carbon dioxide back into the atmosphere, either directly through combustion, or indirectly through increased decomposition.

However, apparently catastrophic events do not necessarily have a net negative effect on stored carbon. The severity of forest losses can vary over the affected area, and stored carbon may be transferred from the living biomass pool to standing dead and down trees, rather than being released back into the atmosphere. Rapid regrowth of vegetation further offsets carbon losses from natural disturbances as the growing plants sequester carbon dioxide from the air.

Forest management influences the carbon cycle. Site preparation and timber harvest create logging slash and disturb down wood, leaf litter, duff, and other organic material in the soil. This results in increased decomposition, which releases stored carbon into the atmosphere as carbon dioxide. However, these effects are temporary if the subsequent forest is well stocked and managed to ensure its long-term health

hazardous fuels, timber harvest, thinning, and prescribed fire, or combinations of these measures. While these actions may lead to reduced levels of stored carbon on the acres treated at the stand level, they maintain and enhance the overall carbon storage of the forested landscape by reducing the risk of wildfire and pests and by reducing the size and severity of loss when fire or pest outbreaks occur.

There is tremendous opportunity to increase the carbon storage ability of Oregon's forests. Planting trees along city streets and neighborhoods, converting marginal agricultural and pasture land back into forests, extending forest rotations, reducing stand density and wildfire fuels, and increasing the size and complexity of forest structures, all would increase carbon storage in forests.

Encouraging people to use wood products instead of cement and steel (which emit more carbon dioxide during their manufacture) and discouraging the conversion of forestland to non-forest uses are perhaps the most important actions Oregon can take to increase carbon storage. In summary, we can make big gains in carbon storage by simply increasing the amount of land in forest and using renewable and recyclable wood materials.



Photo by Mike McMurray

Another form of carbon storage Oregon is well-suited to provide is the use and reuse of wood products. This also avoids higher levels of carbon dioxide emissions from the manufacture of substitutes like concrete, steel, and plastic.

and productivity. Also, the utilization of harvested timber for wood products transfers stored carbon from the forest to homes, buildings, and furniture and continues the carbon storage benefits beyond the timber harvest rotation.

Carbon releases from natural disturbances can be minimized by reducing the risk of loss through management actions that maintain the forest's health and productivity, such as reduction of

What kinds of policies encourage forest landowners to maintain and increase the contribution of their forestlands to global carbon storage?

Oregon has a strong history of promoting policies that encourage the productive management of forestlands for the full array of environmental, economic, and social values people want from forests. While these policies have not explicitly recognized the benefits forests provide to carbon storage, they nonetheless have maintained the positive role Oregon's forests play in the carbon cycle by encouraging the management of forestland.

Through the Forest Practices Act, the State of Oregon encourages economically efficient forest practices that ensure the continuous growing and harvesting of forests consistent with the protection of soil, air, water, fish and wildlife, and scenic resources. The law specifically ensures the renewability of the forest by requiring that all areas harvested for commercial timber be promptly reforested to new "free-to-grow" stands. While the benefits of carbon sequestration were not explicitly recognized at the time of the law's development, this reforestation requirement ensures that Oregon's state, private, county, and municipal forests contribute positively to the carbon cycle. Oregon is also a leader in protecting produc-

tive forestland from being converted to non-forest uses such as urban and rural residential development. Over the period 1973-2000, only two percent of Oregon's non-federal wildland forest and seven percent of western Oregon's non-federal mixed agricultural-forest acreage was lost to development (see Strategy C).

"[On the subject of carbon offsets,] prices per ton of carbon stored are running between about \$5 and up to \$30 per ton. We're really talking about a multi-billion-dollar potential stream of revenue. It could be a way to pay for a lot of conservation easements and pay for things like riparian buffers and other changes in forest practices that would increase storage of carbon."

— Mark Harmon, professor,
College of Forestry,
Oregon State University

In the early 1990s Oregon's two major power suppliers, PacifiCorp and Portland General Electric, both began using trees and forests as a means to offset carbon dioxide emissions. By the mid-1990s, Oregon's policy link between carbon dioxide emissions and forests was established by the Oregon Energy Facility Siting Council's "best of batch" site license competition. The competition was intended to encourage power providers to find creative ways to reduce carbon dioxide emissions. The Klamath Cogeneration Project won the competition by demonstrating the lowest net carbon dioxide emission level through efficiency, co-genera-

tion, and specific offset projects, including the investment of \$1.5 million into Oregon's Forest Resource Trust. The Forest Resource Trust is a state incentive program that finances efforts to convert marginal agricultural, pasture, and brush land on nonindustrial private forestlands to healthy, productive forest. The Klamath project investment in the trust is expected to offset 1.16 million metric tons of atmospheric carbon dioxide by restoring forests on 2,400 acres over a 100-year period.

Based on these efforts, Oregon became a recognized leader in developing energy policies directed at reducing human-induced carbon dioxide emissions from the burning of fossil fuels. In 1997, the Oregon Legislature adopted a carbon dioxide emission standard for new power-generating facilities. Besides promoting efficiency, energy conservation, and cogeneration, the law allowed new power plants to fund specific offset projects including those involving forests. The Climate Trust, a nongovernmental organization, was set up to disseminate funds for eligible offset projects under the law's monetary path provision. In effect, power companies pay in advance for their carbon dioxide emissions by funding The Climate Trust—leaving the Climate Trust with the task of finding projects that will offset their carbon dioxide emissions. The Climate Trust has

awarded several offset project grants, including two involving forests.

In 2001, the Oregon Legislature passed a law that established forestry carbon offsets as a marketable commodity. The law authorizes the state forester to sell carbon offsets on behalf of landowners to energy companies, power plants, or other businesses wishing to mitigate the effects of their carbon dioxide emissions. The innovative law¹⁸ anticipates that forest landowners who invest in forest management to improve the carbon-storage capability of their forestlands can get a return on this investment.

What are the key interactions of this strategy with other strategies?

Enhancing carbon storage in Oregon's forests affects, and is affected by, other strategies and policies for manag-

ing Oregon's forests. Here are some examples of these interactions:

- The productive capacity of forests defines how much carbon dioxide can be removed from the atmosphere through sequestration and storage. Conversion of forestland to other uses directly reduces carbon storage in Oregon's forests.
- Forests in poor health and in decline can be net sources of carbon dioxide released back into the atmosphere.
- Managing fuel and stocking levels stabilizes and maintains carbon stores in forested landscapes by helping to ensure that wildfires do not destroy those essential components that define the forest ecosystem.

- Soils are important carbon pools, and many practices that prevent erosion and protect and conserve forest soils serve to maintain and enhance the carbon pools found in leaf litter, duff, humus, and other organic material.

What are potential indicators to measure progress toward accomplishing this strategy?

1. Amount of stored carbon in forests and forest products
2. Number of verifiable projects to offset carbon dioxide emissions by restoring or enhancing forests

¹⁸ ORS 526.780-789.

Conclusion

The 2003 Forestry Program for Oregon is intended to engage Oregonians in an ongoing conversation about how best to manage Oregon's forests to meet our present and future environmental, economic, and social needs. While the meaning of the concept of "sustainability" has evolved with time, sustainability has remained a consistent theme for the Board of Forestry since the publication of the first *Forestry Program for Oregon* in 1977.

As we plan for the future, we ask citizens to consider the advantages we share as Oregonians:

- Oregon is blessed with rich and diverse natural resources, with 90 percent of the state's historic forestland still in forest use and a diverse ownership base.
- Oregonians have the knowledge and commitment to care for these resources.
- Oregonians understand that forest resources and related businesses are vital to Oregon's future.
- Oregon's forest resources remain the economic foundation of many rural communities and, carefully managed, these resources hold great potential for creating family-wage jobs in rural areas.

- The productivity of Oregon's forest resources is high, and the state has the potential to increase its contribution to meeting growing national and global needs.
- Oregon is a pioneer in scientific innovation, technological developments, forestry research, and forest practices monitoring.
- Oregon has a strong legal framework, built on our land-use planning laws, the Forest Practices Act, the Oregon Plan for Salmon and Watersheds, the Sustainability Act, and the Conservation Incentives Act.
- Oregon is fortunate to have forward-thinking institutions such as the Oregon Forest Resources Institute, the Institute for Natural Resources, and the Oregon State University Forest Research Laboratory.
- Oregon's reputation for sound forest management can leverage international consumer preferences for Oregon forest products.

Nature has given us a tremendous advantage. We must use it responsibly to build our economy, enhance our environment, and ensure that economic recovery reaches every community.

Oregon is a progressive leader in forest management. By firmly incorporating sustainable forestry concepts into state policies, we will continue to be an example to other states and even to other nations. We will continue to test and use the tools provided by the criteria-and-indicators framework, and we will better engage all forest landowners, interest groups, and the general public in a constructive conversation.

Our goal through this conversation will be to create new alliances among diverse environmental, economic, and social interests, increase everyone's appreciation of the multiple values of Oregon's public and private forestlands, and promote a broader consensus on the future direction of Oregon forest policies. We hope that, through this process, society as a whole may also come to understand better what sustainability means in all areas of life and what every citizen and consumer will need to do to achieve it.

Our next tasks in this process are:

Increase public awareness. Results of public-opinion surveys and focus groups indicate that, while many Oregonians have strong opinions about the management of Oregon's forests, those opin-

ions are often based on outdated, incomplete, or inaccurate information. Sometimes these opinions are inconsistent with these same Oregonians' behaviors as consumers. The board and the department will assist the public in becoming more knowledgeable about current forestry issues and about the science, strategies, and actions contained in the *2003 Forestry Program for Oregon* to promote sustainable management of Oregon's forests.

Conduct strategic planning for the Department of Forestry.

The department is developing a long-range strategic plan that will serve as a companion document to the *2003 Forestry Program for Oregon*. Looking at the same eight-year planning horizon, the agency strategic plan will describe the specific steps the agency's programs will take to carry out the Board of Forestry's strategies and actions. Where actions are needed by other agencies, organizations, or individuals, the plan will describe how the department will work with these other parties to further the board's strategies. Depart-

ment of Forestry programs will contain outcome-based performance measures to evaluate progress in implementing the agency strategic plan and linking it to the department's budgeting, quality improvement, and employee appraisal processes.

Develop core indicators of sustainable forest management.

Under each of the *Forestry Program for Oregon* strategies, potential indicators are listed that could be used to measure progress toward achieving the goals of that strategy. These indicators are a subset of 67 internationally recognized indicators. Consensus is needed within the Oregon forestry community on whether these are the appropriate indicators to use to evaluate Oregon's performance. Once they are finalized, these "core" indicators can be used to focus monitoring, assessments, and research, so that Oregon can more clearly tell its own citizens and the rest of the world the story of how well our forests are being managed. In particular, private landowners and federal land management agencies will need to work in

partnership with the State of Oregon to reach agreement on the indicators and on the methods that will be used to collect and share data about them. Over time, the Board of Forestry and others will use the information collected for the core indicators to establish quantifiable policy targets and then measure and report on progress towards those targets.

The *2003 Forestry Program for Oregon* will serve as the foundation for Board of Forestry policy deliberations and Department of Forestry strategic planning over the next several years. The board and the Department of Forestry are committed to implementing the strategies and actions outlined in this document, in combination with monitoring and evaluation to adjust our course as necessary.

Continued public involvement will also be needed for these strategies and actions to be successful. Please become involved in this ongoing discussion. Oregon needs to hear from you!

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Appendix: A comparison of the 2003 Forestry Program for Oregon strategies with internationally recognized criteria for the conservation and sustainable management of temperate and boreal forests

<p>In 1992, at the United Nations Conference on the Environment and Development held in Rio de Janeiro, the United States committed itself to forest sustainability. In 1994, the United States participated in the Working Group on Criteria and Indicators for the Conservation and Sustainable Management¹⁹ of Temperate and Boreal Forests (known as the Montreal Process group). The working group was charged with developing internationally recognized criteria and indicators for the conservation and sustainable management of temperate and boreal forests at the national level. The United States was a signatory, along with 11 other nations, to the <i>Montreal Process Santiago Declaration</i> in 1995.²⁰ This group of countries represents more than 90 percent of the world's temperate and boreal forests, 60 percent of all the world's forests, 45 percent of the world's trade in wood and wood products, and 35 percent of the world's population. The <i>Santiago Declaration</i> established</p>	<p>seven criteria and 67 indicators of sustainable forest management for use by policy-makers, forest managers, and the general public.</p> <p>A "criterion" is defined as a category or process by which sustainable management may be assessed. An "indicator" is defined as a measure (or measurement) of an aspect of a criterion.</p> <p>The seven criteria are:</p> <ol style="list-style-type: none"> 1. Conservation of biological diversity 2. Maintenance of productive capacity of forest ecosystems 3. Maintenance of forest ecosystem health and vitality 4. Conservation and maintenance of soil and water resources 5. Maintenance of forest's contribution to global carbon cycles 6. Maintenance and enhancement of long-term multiple social and eco- 	<p>conomic benefits to meet the needs of societies</p> <ol style="list-style-type: none"> 7. Legal, institutional, and economic framework for forest conservation and sustainable management <p>The criteria and indicators are not legally binding on any of the participating countries and are intended to serve only as guidelines. In 2003, the United States published a report on the conditions and trends of the nation's forest resources using the criteria and indicators as an organizing framework.²¹ The National Association of State Foresters has produced an online publication titled <i>Principles and Guidelines for a Well-managed Forest</i>. These principles and guidelines are also built on the Montreal Process criteria.²²</p> <p>The Board of Forestry has endorsed the use of this internationally recognized criteria and indicator framework as a tool to respond to legislative direction to assess and report on the cumulative effects of forest practices. In 2000,</p>
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¹⁹ The Montreal Process refers to both "conservation" and "sustainable management." In the context of the *Forestry Program for Oregon*, these terms have similar definitions. "Conservation" means forest management with the objective of sustaining forest productivity in perpetuity while providing for human use compatible with sustainability of forest resources (based on Society of American Foresters definition).

²⁰ The other signatory nations are Argentina, Australia, Canada, Chile, China, Japan, Republic of Korea, Mexico, New Zealand, the Russian Federation, and Uruguay.

²¹ More information about the Montreal Process Criteria and Indicators can be found at http://www.mpci.org/home_e.html. More information on the 2003 United States report can be found at <http://www2.srs.fs.fed.us/2003/2003.htm>.

²² <http://www.stateforesters.org/positions/P&G2003.htm>.

<p>Oregon became the first state in the nation to publish a “first approximation report” to assess the status and trends of the state’s forest resources as measured against the Montreal Process criteria and indicators. In <i>Oregon’s First Approximation Report for Forest Sustainability</i>, the indicators are presented not as a set of thresholds that must be met to achieve sustainability, but rather as a set of agreed-upon topics on which to base forest policy dialogues. The report provided a snapshot of Oregon’s forests at that point</p>	<p>in time, based on available data, and a starting point for discussions about future forest sustainability.</p> <p>The seven strategies listed in the <i>2003 Forestry Program for Oregon</i> are directly related to the Montreal Process criteria (see below).</p> <p>Within the background text for each <i>Forestry Program for Oregon</i> strategy, selected indicators have been listed as potential tools the Board of Forestry and the public can use to mea-</p>	<p>sure Oregon’s progress in achieving that strategy. Further technical and policy discussion is needed to reach a consensus on which indicators should be used for this purpose and how data will be collected to measure performance.</p>
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2003 Forestry Program for Oregon Strategies	Comparable Montreal Process Criteria
Strategy A. Promote a sound legal system, effective and adequately funded government, leading-edge research, and sound economic policies	Criterion 7. Legal and institutional framework for forest conservation and sustainable management
Strategy B. Ensure that Oregon’s forests provide diverse social and economic outputs and benefits valued by the public in a fair, balanced, and efficient manner	Criterion 6. Maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies
Strategy C. Maintain and enhance the productive capacity of Oregon’s forests to improve the economic well-being of Oregon’s communities	Criterion 2. Maintenance of productive capacity of forest ecosystems
Strategy D. Protect, maintain, and enhance the soil and water resources of Oregon’s forests	Criterion 4. Conservation and maintenance of soil and water resources
Strategy E. Contribute to the conservation of diverse native plant and animal populations and their habitats in Oregon’s forests	Criterion 1. Conservation of biological diversity
Strategy F. Protect, maintain, and enhance the health of Oregon’s forest ecosystems, watersheds, and airsheds within a context of natural disturbance and active management	Criterion 3. Maintenance of forest ecosystem health and vitality
Strategy G. Enhance carbon storage in Oregon’s forests and forest products	Criterion 5. Maintenance of forest’s contribution to global carbon cycles

Glossary


For the purpose of the *2003 Forestry Program for Oregon*, the Board of Forestry uses the following key definitions:

Active management	means the application of practices through planning and design, over time and across the landscape, to achieve site-specific forest resource goals. Active management uses an integrated, science-based approach that promotes the compatibility of most forest uses and resources over time and across the landscape. "Active management" should not be equated with "intensive timber management." Instead, it refers to taking proactive steps to achieve whatever management objectives have been established for a forest site. [Based on OAR 629-035-000 (1).]
Aggressive fire suppression	means the proactive and immediate application of activities necessary to extinguish undesired forest fires, beginning with fire detection and continuing until fires are completely controlled and extinguished.
Best management practices	means a combination of practices that are determined to be the most effective and practical means (considering current technology, economics, and institutional frameworks) of meeting water quality and other environmental quality goals.
Biological diversity	means the presence of various kinds and types of living organisms. Managing for biological diversity requires maintaining a diversity of habitats and ecological processes at various spatial scales, from entire landscapes to specific localized habitats. It also includes understanding populations of individual species and the genetic diversity of these species.
Conservation	means management of a renewable natural resource with the objective of sustaining its productivity in perpetuity while providing for sustainable human uses.
Ecosystem	means a spatially defined, relatively homogenous area that includes all interacting organisms and components of the abiotic environment within its boundaries.

Enhance	means to make greater in value.
Forest health	means a healthy, vital forest landscape that maintains its functions, diversity, and resiliency within the context of natural disturbances and that is capable of providing people with the array of values, uses, and products desired now and in the future. Forests are “unhealthy” when potential disturbances, such as fire or pest outbreaks, are unusually frequent, severe, or widespread and when the desired outputs such as wood fiber, special forest products, and recreational opportunities cannot be provided or sustained.
Maintain	means to keep in an existing state.
Protect	means to cover or shield from injury or destruction.
Sustainable forest management	means forest resources are used, developed, and protected at a rate and in a manner that enables people to meet their current environmental, economic, and social needs, and also provides that future generations can meet their own needs. [Based on ORS 184.421.]

For more information about the Board of Forestry or about the *Forestry Program for Oregon*, please write to Oregon Board of Forestry c/o the Oregon Department of Forestry at 2600 State Street, Salem OR, 97310.

You may also reach us by calling: 503.945.7200, or by visiting the Board of Forestry website at www.oregonforestry.org



“The center of gravity must rest with people who see not only that the West can attract and keep good workers and good businesses by protecting the environment and enhancing the health of its ecosystems, but also that such protection and enhancement is itself a globally significant economic activity. Every part of the world—and indeed the world itself—will be increasingly challenged in the coming decades by the necessity to figure out how human communities can thrive within sustainable and thriving ecosystems. The more pressing this challenge becomes, the more urgently the world will look for lessons and leadership from those places that have come closest to meeting that challenge. No place on earth is better positioned than the American West to serve as the world’s classroom in sustainability. And the world will be willing to pay a good price for a good education if the West can coalesce around a regional strategy that puts this activity at the center of its global economic positioning.”

—Daniel Kemmis, *This Sovereign Land*