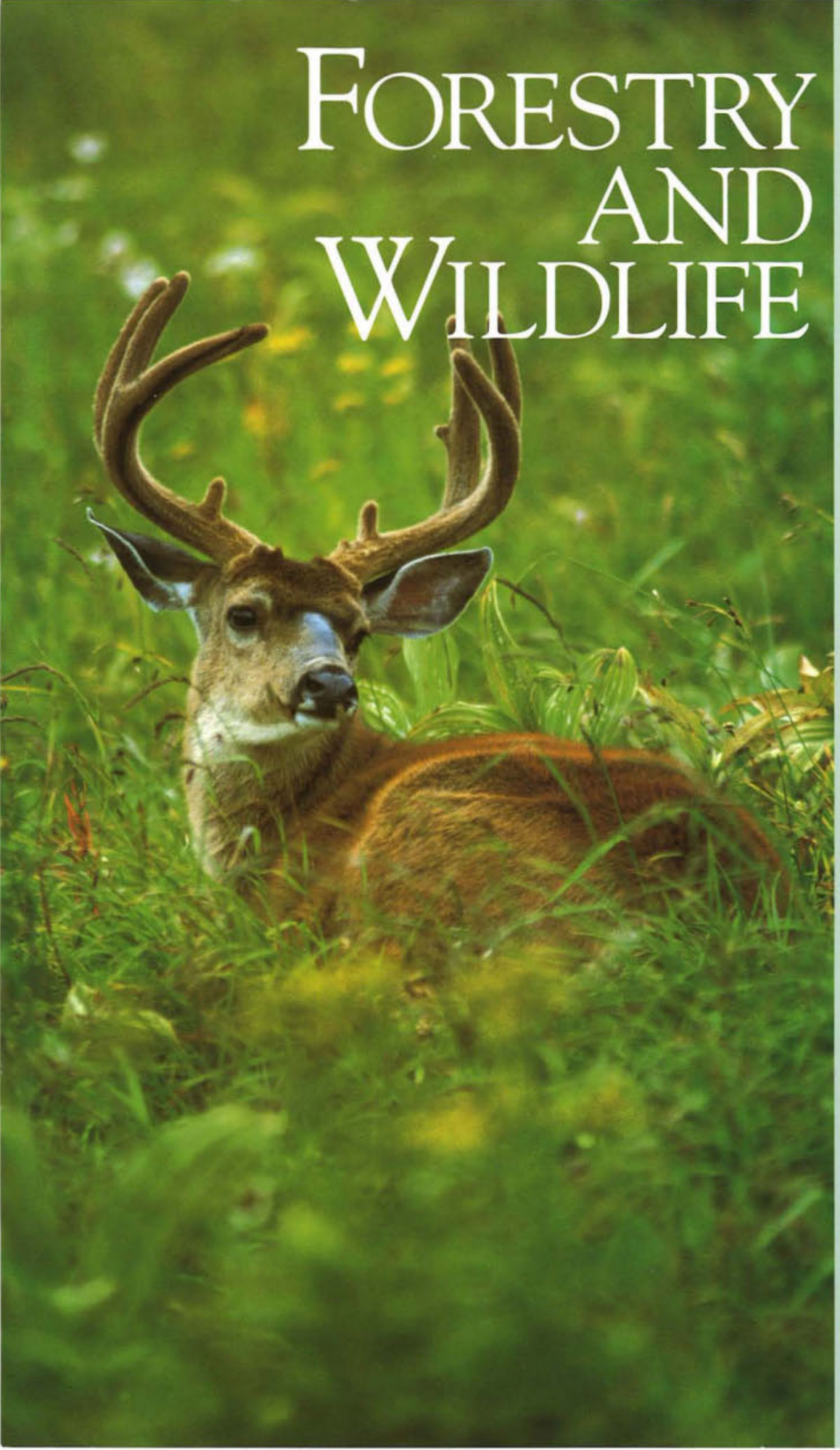
FORESTRY AND WILDLIFE

Oregonians Working Together To Manage Environmental Change



A Special Report From The Oregon Forest Resources Institute

This is the second in a series of special reports by the Oregon Forest Resources Institute to explore the complex and sometimes contentious issues related to forest practices and management. These reports are intended to provide a background and context for better understanding topical forestry issues and ultimately raising the level of public discourse.

Throughout Oregon's natural history, disturbances like fires, landslides, earthquakes, windstorms, volcanic eruptions, climate changes, and disease have rendered dramatic changes in the forest landscape and profoundly affected wildlife and its habitat. More recently, human activity in the form of agriculture, forest harvest, dam construction and urban growth have joined the list.

Advances in science and our understanding of natural systems have informed, and when appropriate, altered forest management techniques. This report examines current forest practices in Oregon that provide or protect wildlife habitat, as well as the implications of new research. Ensuring the compatibility of wildlife and responsible forest management is important to Oregon's future and our way of life.

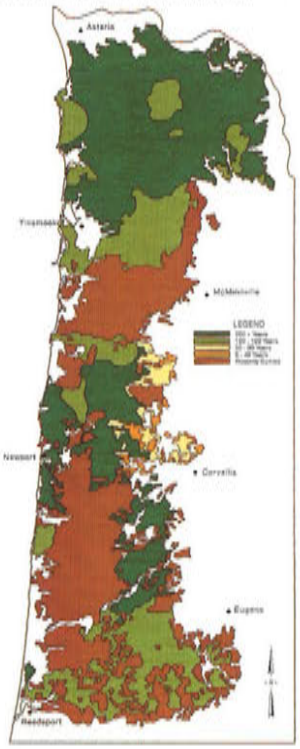
A New Vision Of Nature: The Implications For Forestry

On the threshhold of the new millennium, a monumental shift in scientific thought has called into question one of the foundations of our understanding of our world — that nature, if left alone, will return to some ideal state of balance. Many ecologists have abandoned the concept of nature as a "steady state" in favor of a belief that nature itself is in a constant condition of disturbance and fluctuation. Change and turmoil, more than constancy and balance, are the rule rather than the exception.

A New York Times article in 1990 called attention to the movement: "In a revision that has far-reaching implications for the way humans see the natural world and their role in it, many scientists are forsaking one of the most deeply embedded concepts of ecology: the balance of nature." The trend is now working its way from academe to the mainstream of American life, including the practice of forestry.

1850 Coast Range: A Dynamic Forest

EVEN BEFORE TIMBER HARVESTING, OREGON FORESTS WERE NOT ALL OLD GROWTH, BECAUSE FIRE, WIND, AND OTHER DISTURBANCES (BOTH NATURAL AND HUMAN) HAVE ALWAYS BEEN PART OF THEIR HISTORY. IN THIS MAP OF OREGON'S COAST RANGE IN 1850, THE "RECENTLY BURNED" CATEGORY ACCOUNTS FOR MORE THAN A THIRD OF THE AREA.



Source: Bureau of Land Management

Dr. Chadwick Oliver, professor of forest ecology at the University of Washington, sees us in the middle of a massive "paradigm shift," from what he calls the steady-state to the dynamic theory of nature. Such shifts, he says, take a generation. "Scientists and ecologists have known this for a decade already," he says, "but it takes time to change the basic notions most people have lived with all their lives."

What This Means for Forests and Wildlife

Although not obvious at first, this shift in thought has major implications for the role of forest management in maintaining a healthy, diverse wildlife community. Scientists and foresters have understood for a while that forests are not static. Natural processes make them susceptible to insect infestation or fire, for example, and the cycle begins again. In a recent journal article, Dr. Gordon Reeves, biologist with the USDA Forest Service Pacific Northwest Research Station, said, "In the Pacific Northwest, terrestrial ecosystems are very dynamic in space and time as a result of natural disturbances such as wind and fire." He went

George Brown
DEAN, COLLEGE OF FORESTRY
OREGON STATE UNIVERSITY
CORVALLIS

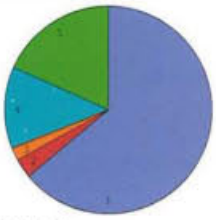
Oregon has become a state where progressive forestry is taking place, says George Brown, who has been involved in forestry research and issues since he joined the OSU faculty in 1966. He sees the College of Forestry role as one of fostering first-rate research that becomes a valuable tool for policymakers. Brown sees bringing other voices into the dialogue as a positive way of maintaining Oregon's leadership in the field. "I'm convinced that if we manage in a prudent way within Forest Practices Act guidelines," he said, "we'll be able to keep a healthy mix of forest structures and not drive wildlife species to extinction, particularly if the federal system promotes old growth as part of the mix."

James Rochelle
WILDLIFE BIOLOGIST AND ENVIRONMENTAL FORESTRY CONSULTANT
OLYMPIA

In his nearly three decades as a wildlife biologist, Jim Rochelle has seen many advances in our scientific understanding of forestry and its effects on wildlife. "We've learned a great deal about how wildlife responds to changes in the forest," he said, "and I'm encouraged because I think we can do the things we need to do to protect wildlife and still have an economically viable forest industry." Rochelle is coordinating a scientific conference on fragmentation – the potential impact of reduced size and connectivity of forest stands – this fall in Portland.

WHO OWNS OREGON'S FORESTS?

SINCE NEARLY 60 PERCENT OF OREGON FORESTS ARE FEDERALLY OWNED, THEIR USE HAS A MAJOR IMPACT ON WILDLIFE. BECAUSE FEDERAL HARVESTING HAS BEEN VERY LIMITED, SINCE 1992, THE 42 PERCENT IN PRIVATE OWNERSHIP HAS BEEN MORE ACTIVELY MANAGED, RESULTING IN A WIDE RANGE OF HABITAT CONDITIONS.



1. Federal 58%
2. State 3%
3. Other Public 2%
4. Non-industrial Private 16%
5. Forest Industry 21%

on to state that "if resources are to be sustained, the dynamic nature of ecosystems and the need to maintain the diversity of ecosystem states must be recognized. Attempts to view and manage systems and resources in a static context may increase the rate of extinction of some organisms."

Many conservation groups are aware of the new paradigm. Sara Vickerman, who directs the West Coast Office of Defenders of Wildlife in Portland, says the concept of establishing large reserves free of human interference as a primary focus for conservation is being rethought, perhaps for more pragmatic reasons. "There will never be enough reserves, political support, or financial resources to acquire enough land to support all elements of biodiversity," she says. There is general agreement among scientists, conservationists, and foresters that, while undisturbed reserves are necessary and valuable, "working landscapes" also support many critical elements of biological diversity. "What we need," says Vickerman, "is a long-term, holistic, and inclusive approach that ensures the sustainability of forest resources."

Wildlife in the Forest Environment

In Oregon, about 300 species of native vertebrates use some sort of forest cover for breeding, but forest habitat is not uniform. Disturbance over time has produced a mosaic of forest age classes, each with unique habitat features. While some species thrive in the habitat provided by younger stands or clearings, others need features like snags and downed wood provided by older forests.

As forests go through natural cycles of growth, death, and regeneration, species may inhabit or be absent from a given area partly in response to natural changes in the structure of trees and other forest vegetation. The same occurs when forest stands are managed by humans. Several comprehensive scientific studies in Oregon have demonstrated that timber harvesting decreases the abundance of some species but increases others. What is emerging, then, is a picture of a wildlife community associated with diverse forest habitats that offer the structural characteristics they need for feeding, breeding, and shelter regardless of the stand's age.

The new view of a dynamic and fluctuating landscape suggests looking at forest management in new and creative ways. Forest experts have learned that thinning, planting, and other adaptive harvest practices can promote the development of structural characteristics associated with a variety of habitats, including old growth. As a result, the potential of actively managing large areas of land for the benefit of wildlife and timber production is becoming a reality. It is even possible to create habitat for sensitive species like the spotted owl. "We've done it already," says Cheryl Gruenthal,

a wildlife biologist with Boise Cascade in southern Oregon. "We learned that we were accidentally creating spotted owl habitat years ago during harvests back in the sixties where we'd left trees behind, and now we have spotted owls there."

Sara Vickerman, however, recognizes the importance of of keeping a perspective. For example, conservation strategies that manage exclusively for the needs of a single species (salmon, owls, etc.) can be at the expense of other species with different habitat needs. "There is a lot of room for experimenting with previously harvested land to see if we can create certain habitat structure and other desired features," she said. "However, the notion that every acre must be manipulated somehow to meet human goals makes conservationists and many scientists very nervous, because we know so little about natural processes and are still quite clumsy at managing them."

Toward A Managed Landscape

In Oregon there are a number of efforts presently underway to increase our understanding of our wildlife community and forests, and explore the implications of advances in scientific research on current forest practices.

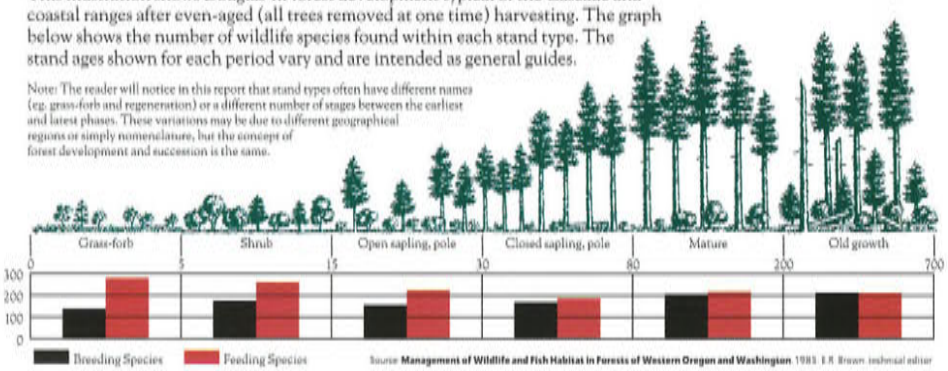
A group of Oregonians is at work today in the research laboratories, in the field, in the government, and in the private sector to help ensure a healthy and diverse wildlife population and the economic benefits of a viable forest products industry. Scientists at the College of Forestry at Oregon State University are studying wildlife and its relation to forest types in coastal Oregon. Biologists at the Oregon Department of Fish and Wildlife are conducting a massive inventory of wildlife species and their habitat requirements. Defenders of Wildlife has worked with many diverse partners to conduct the Oregon Biodiversity Project and develop a statewide strategy for conserving Oregon's biological resources.

The Oregon Department of Forestry (ODF) is putting together a major management plan for the Tillamook and other northwest state forests utilizing the principles of structure based management. For their part, private forest landowners have provided funding support to much of this work, conducted their own *(continued on page 4)*

Forest Succession Creates Varied Wildlife Habitat

This illustration shows Douglas-fir forest development typical of the Cascade and coastal ranges after even-aged (all trees removed at one time) harvesting. The graph below shows the number of wildlife species found within each stand type. The stand ages shown for each period vary and are intended as general guides.

Note: The reader will notice in this report that stand types often have different names (eg. grass-forb and regeneration) or a different number of stages between the earliest and latest phases. These variations may be due to different geographical regions or simply nomenclature, but the concept of forest development and succession is the same.



Source: **Management of Wildlife and Fish Habitat in Forests of Western Oregon and Washington**, 1985. E.R. Brown, technical editor

Sara Vickerman
DIRECTOR, WEST COAST OFFICE, DEFENDERS OF WILDLIFE
PORTLAND

Sara Vickerman was a key force in the conception of the Oregon Biodiversity Project, a collaborative public/private partnership for developing a statewide strategy for conserving the state's biological resources. Launched in 1994, the project looks at ecological conditions across the landscape, and acknowledges the importance of private as well as public lands to wildlife habitat and diversity. "To protect native biodiversity," she said, "we need to create stewardship incentives to improve forest management and keep commercial forest land from being converted to other uses that result in more extensive development and permanent deforestation."

Different Forest Types Attract Different Species

Young Open Stands

This condition occurs within a short time (two to ten years) after a disturbance like wind, fire, or clearcutting that has removed most of the larger trees. This early stage of the regenerative process is characterized by tree seedlings or saplings along with a variety of herbs and shrubs. The site attracts wildlife species that prefer the openness and associated vegetation. The animals listed below are some of the species associated with this type of habitat.

CLOSELY ASSOCIATED:

Striped skunk
Badger
Common nighthawk
Western bluebird
American goldfinch
Creeping vole
Chipping sparrow
Northern pocket gopher
Mountain beaver
Deer mouse
Dusky flycatcher
Western jumping mouse
MacGillivray's warbler
Fox sparrow
Lazulli bunting
Spotted towhee

GENERALLY ASSOCIATED:

Black bear
Red fox
Black-tailed deer
Song sparrow
Dark-eyed junco
American robin
Ensatina salamander
Long-eared bat
Common garter snake
Rubber boa
Roosevelt elk
Coyote
Raccoon
Cougar
Bobcat
Northern alligator lizard

Middle Age Stands

This forest structure occurs after young stands have grown trees to a point where natural crowding or thinning results in the elimination of smaller and weaker trees, and the forest canopy has opened up enough to allow the reestablishment of ground vegetation and the beginning of an understory. Many species use this type of structure, though none exclusively. The animals listed below are some of the species that gravitate to this this type of habitat.

GENERALLY ASSOCIATED:

Snowshoe hare
Ruffed grouse
Sharp-shinned hawk
Townsend warbler
Band-tailed pigeon
Black-throated gray warbler
Bushy-tailed woodrat
Swainson's thrush
Gray jay
Douglas squirrel
Cooper's hawk
Long-tailed weasel
Marten
Black-tailed deer
Chestnut-backed chickadee
Pacific-slope flycatcher
Red-breasted nuthatch
Hermit warbler
Wilson's warbler
Ensatina salamander
Common garter snake
Rubber boa
Pacific tree frog
Winter wren
Roosevelt elk
Coyote
Raccoon
Cougar
Bobcat
Northern alligator lizard
Long-toed salamander

Technical Advisors: Thomas O'Neil, Oregon Department of Fish and Wildlife; John Hayes, Oregon State University; James Rochelle, Rochelle Environmental Forestry Consulting

Older Forest Stands

This structure is distinguished by larger trees, a more varied and complex canopy, and a more highly developed understory. Larger amounts of downed wood and snags also attract certain species of wildlife. When a disturbance occurs, the area reverts to the young stand phase and the process begins again. The following species, among others, use this type of habitat.

CLOSELY ASSOCIATED:

Marbled murrelet
Varied thrush
Pileated woodpecker
Pygmy nuthatch
Vaux's swift
Spotted owl
Red tree vole
Northern goshawk
Northern flying squirrel
Oregon slender salamander
Cooper's hawk
Pine siskin
Hoary bat

GENERALLY ASSOCIATED:

Fisher
Marten
Black bear
Spotted skunk
Brown creeper
Myotis bats
Douglas squirrel
Red-breasted nuthatch
Chestnut-backed chickadee
Ensatina salamander
Pacific-slope flycatcher
Hermit warbler
Rubber boa
Pacific tree frog
Roosevelt elk
Coyote
Raccoon
Cougar
Bobcat
Northwestern garter snake
Winter wren
Black-tailed deer
Black-backed woodpecker

Young Open Stands


American goldfinch


Deer mouse


Rubber boa


Black bear


Pacific tree frog

Middle Age Stands


Long-tailed weasel


Roosevelt elk


Fox sparrow


Mountain bluebird


Long-toed salamander

Older Forest Stands


Hoary bat


Spotted owl


Marbled murrelet


Spotted towhee


Douglas squirrel

Wildlife In Forests

Research conducted in Oregon over the last decade or two has clearly shown a close relationship between forest structure and the types of wildlife that live there. The distinct types of stand structures shown here are three stages in the succession of forest development, selected to illustrate the variety of species associated with each. Forests are in a constant state of growth and change from the very open conditions that follow a major disturbance to the complexity of older forest structures. When disturbances occur, the cycle begins again. As a result, wildlife communities constantly change in response to changes in habitat. See the illustrations on page 6 for a more detailed look at various stand types.

The wildlife lists here are not comprehensive, but do illustrate the variety associated with different forest types. As is evident, some animals are generalists and will occur in more than one list, while others need specific forest structures to survive. Research has clearly shown the importance of snags and downed wood to habitat diversity, and some of the species listed in one category or another, like the western bluebird, for example, would not be there without the presence of snags.

What we learn from this research will help foresters manage forests in a way that will maximize their benefits to wildlife.

Definitions:

Closely Associated: *Species most abundant in this habitat or structural condition for part or all of their life history requirements. Identifying this association implies that to be viable the species has an essential need for this habitat or structural condition.*

Generally Associated: *A species exhibits a high degree of adaptability and may be supported by a number of habitats or structural conditions. In other words, the habitat or structural conditions play a supportive role in its viability.*

Harvest Practices: Managing For Wildlife

As the science of forestry moves toward a landscape managed for both timber production and wildlife habitat, harvest techniques and practices become important tools in creating the necessary diversity. Any change in forest conditions, whether natural or man-made, creates winners and losers in relation to wildlife. According to Dr. Fred Bunnell, director of the Centre for Applied Conservation Biology at the University of British Columbia, "the worst possible approach to maintain vertebrate diversity would be to manage every acre the same way or to have a large forest of a single age class."

The foldout on the overleaf shows three distinct types of forest habitat and the wildlife associated with each. Some people are surprised to learn that there are comparable numbers of wildlife species associated with young open stands and with old growth. Says Bunnell: "Some species do best in stands in which all or most trees have been removed; others do best in stands that are older. Some may require both. Many species are generalists and do well in stands spanning a wide range of ages or structures. In fact, stand age alone is a poor indicator of habitat for vertebrates."

Modern forestry takes advantage of new technologies to improve management techniques. Satellite imagery is used to develop maps, like that shown here, which portray characteristics such as stand structure, size, and species composition. This "snapshot," taken in 1994, shows that coniferous forests cover much of western Oregon. Hardwoods, shown in red, dominate southwestern interior and coastal valleys. Distributed across the landscape are a variety of stand types, ranging from recently harvested areas to large, multistory stands with the structural features of old growth. Satellite imagery provides data for modeling that will show the results of different management scenarios for decades into the future. Such information helps inform current management decisions to maintain harvests and habitat diversity for wildlife.

Harvest and Regeneration Tools

Forest managers need a variety of tools for harvesting and regenerating new forests in the landscape management system. Although the effects of fires and clearcuts, though similar, are not identical, clearcutting is the tool that best simulates very hot natural fires that remove all vegetation, giving portions of the forest a fresh start. Thinning, on the other hand, simulates cooler, fast-moving fires that kill only some of the trees. Some species like Douglas-fir grow optimally in full sunlight and handle disturbance, whether fire or clearcut, very well.

Many wildlife species thrive in the open areas created by clearcuts (see overleaf), like elk, deer, warblers, and goldfinches. Others do well in stands opened up by thinning. The ideal situation is to provide a healthy mix of forest structures to optimize habitat variety. "Older forest habitat is critical to a number of species, but even if it were possible, we wouldn't want the whole landscape to be in an old growth state," says wildlife ecologist John Hayes of Oregon State University.

Harvest techniques and requirements continually change as new research becomes available. For example, when OSU research in the mid-eighties found a value for wildlife in leaving some green trees, snags, and downed wood after clearcutting, the Oregon Forest Practices Act requirements were revised accordingly. Wildlife biologist Larry Irwin of the National Council for Air and Stream Improvement likens foresters to skilled doctors: "They need an array of tools for different conditions. Foresters must help create the mix of habitat that diverse species require."

on-the-ground research through industry biologists and foresters, and commissioned a major study on the consequences of forest management for Oregon wildlife.

COPE Program Studies Resource Management

Dean George Brown describes OSU's College of Forestry as a laboratory for natural resource policy. "We teach progressive forestry," he says, "but we're anything but an ivory tower. We are actively seeking answers to these complex public policy questions, and our faculty are working with policymakers on every issue." A case in point is the Coastal Oregon Productivity Enhancement (COPE) program, a twelve-year research project that provides resource managers and the public information on fish, timber, water, wildlife, and other natural resources.

According to COPE's director, Dr. Stephen Hobbs, a major focus is on wildlife and habitat relationships. "What we're learning is that we need a mosaic of different types of habitat," he says. "What we don't know is how much of each, and where and when, but we will in a few years through the use of new computer technology."

John Hayes, a professor of wildlife ecology at the College of Forestry, has been conducting COPE research, which includes studies of thinning and leaving snags and downed wood for wildlife. The results are very promising. According to Hayes, "Thinning can accelerate the growth of trees, promote the development of older forest structure, enhance wildlife habitat, and provide an economic return at the same time." Creating new snags and leaving downed wood after harvest also have great potential. Woodpeckers come in and make cavities for nests but don't use them all. "We have more cavities than woodpeckers," says Hayes, and a variety of other birds and animals like bats and flying squirrels utilize them.

John Hayes
ASSOCIATE PROFESSOR OF WILDLIFE ECOLOGY, OREGON STATE UNIVERSITY CORVALLIS

Wildlife ecologist John Hayes says it is important to recognize the complexity of forest habitat and its relationship to wildlife, and to avoid a rush to generalization. "It's not like a clear cut is a clear cut is a clear cut," he said. For example, clear cuts surrounded by more mature forest or clear cuts with a good deal of snags and downed wood will have somewhat different wildlife populations. Diversity of structural characteristics will ensure a diverse wildlife population, he said. Hayes, whose specialty is bats (bats make up more than 20 percent of mammal species in Oregon's Coast Range), has been heavily involved in COPE research on the relationship of forest management and wildlife.

The Importance of Snags

RESEARCH IN OREGON FORESTS POINTS UP THE IMPORTANCE OF SNAGS LIKE THOSE BELOW TO A NUMBER OF WILDLIFE SPECIES. MANY BIRDS USE CAVITIES FOR NESTS WITHOUT REGARD TO STAND AGE OR THE TYPE OF FOREST STAND WHERE SNAGS ARE PRESENT. BOTH SNAGS AND DOWNED WOOD CAN BE PROVIDED THROUGH HARVEST PRACTICES.

A Wildlife and Habitat Inventory

Across town on the outskirts of Corvallis at the Oregon Department of Fish and Wildlife, ecologist Thomas O'Neil works in a room humming with computer processors that aid him in identifying habitats by using wildlife communities that include nearly 750 species in Oregon and Washington, and then using satellite imagery to map their locations. "There's a tremendous amount we don't know about wildlife with respect to utilizing habitats," says O'Neil, "and knowing species requirements is the first step in developing a management plan." The project, Wildlife Habitats and Species Associations in Oregon and Washington, will provide a comprehensive database for researchers and policymakers.

Biologist Cheryl Gruenthal of Boise Cascade in Medford, says that O'Neil's work will be a bible for habitat management. "We do a lot of habitat suitability modeling

ourselves, including use of satellite imagery," she says, "but we don't want to rely solely on a Boise Cascade model."

Consequences of Forest Management

To help the forestry community conduct long range planning in providing for the needs of wildlife species, the Oregon Forest Resources Instutute asked Dr. Fred Bunnell, director of the Centre for Applied Conservation Biology at the University of British Columbia, to prepare a report on the effect of current management practices on wildlife. The report, Likely Consequences of Forest Management on Terrestrial, Forest Dwelling Vertebrates in Oregon, published in 1997, struck a hopeful note in finding "no evidence that current forest practices immediately threaten any terrestrial vertebrate species in Oregon." But it did stress the importance of retaining some portion of federal lands committed to sustaining late successional species as part of the mix.

As part of formulating the Western Oregon State Forests Habitat Conservation Plan, Oregon Department of Forestry experts conduct tours for members of a Public Interest Committee, which serves as a resource to the department in creating conservation strategies. This group toured the Coal Creek area of the Tillamook District in August, discussing Northern spotted owl strategies, marbled murrelet habitat structures, and structure based management as a backdrop to meetings held with ODF the next day.

Bunnell identified the need for additional research on the amounts, sizes, types, and distribution of trees to be retained during partial and clear cutting. Oregon law currently requires that some trees be retained after harvest, but questions remain about "how much is enough" to meet the needs of species dependent on large tree cavities and downed wood. The study also found that the method of tree removal — clearcutting, selective cutting, or other methods — is of far less importance to the quality of the habitat than what is retained and allowed to grow. Habitat characteristics are much more important than stand age, he said, and most features of older forests can be provided through management.

Bunnell also looked at forest fragmentation — reductions in the size and connectivity of stands that compose a forest, as is common in Midwest farmland. Although research has shown fragmentation to affect some wild species negatively in the Midwest and other areas, recent studies in Western forests managed for timber production have not documented comparable effects. A major conference on forest fragmentation is scheduled this fall in Portland. According to Dr. James Rochelle, a consulting wildlife biologist coordinating the conference, presentations will explore the scientific issues and define the research needed to guide future management actions.

Bunnell also sees the need for research in several additional areas, which in turn might improve forest practices. For example, we need to know more about the way Oregon's vertebrate fauna use riparian areas, especially amphibians. Bunnell, however,

Fred Bunnell
DIRECTOR, CENTRE FOR APPLIED CONSERVATION BIOLOGY
UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER, B.C.

Fred Bunnell, whose landmark 1997 study on the impact of forest practices on wildlife in Oregon, calls forestry "the most complex profession in the world." Most disciplines, he said, are relatively fixed in time and space, but forestry must deal with huge lead times and a whole range of sciences. "In addition, the forest practice goal posts are even wider now because they're charged with so many values," he said. His study found no evidence that terrestrial wildlife is immediately threatened in Oregon's forests, but did identify the need for more reseach in specific areas. "It's hard to look after every 'critter,' out there" he said, "because helping one often creates problems for another."

is careful to warn against "cookie cutter" prescriptive measures to address these problems. Solutions, he says, need to employ site specific knowledge to be effective.

The Concept of Structure Based Management

The realization that management practices can create desired structural characteristics with the potential to benefit wildlife led to the creation of a system to utilize that knowledge in a large-scale application. It was Chad Oliver at the University of Washington who developed the comprehensive structure based management system (also called the landscape management system, or LMS). The system first classifies areas of forest by their characteristics from very young stages to old forest (see illustrations at right). Recognizing that individual stands are in a constant state of change and growth over time and that there is an optimal mix that will best benefit wildlife and timber production, a complex computer program then processes vast amounts of information on a spatial and temporal scale.

The system lends itself perfectly to modeling and projecting what the landscape will look like in future decades, helping biologists plan for healthy wildlife habitat and giving foresters a means of determining the most efficient harvest patterns and techniques. It can also quickly show the implications of management decisions in specific areas over a period of time.

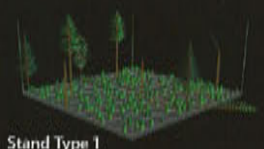
Oliver points out that the system is not intended to replace natural old growth

Chadwick Oliver
PROFESSOR OF SILVICULTURE AND FOREST ECOLOGY
UNIVERSITY OF WASHINGTON
SEATTLE

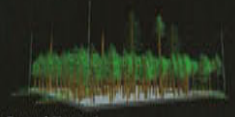
Recognizing our growing ability to create specific forest structures through active forest practices, Chad Oliver developed the system of structure based management, which the Oregon Department of Forestry is employing in its Northwest Oregon State Forests Management Plan. Oliver, whose system recognizes forest dynamics, feels it is important for the public to understand the dynamic character of nature. "People sometimes forget," says Oliver, "that for thousands of years, long before intensive harvesting began, natural disturbances kept forests from all being old growth. In fact, there would be fewer species alive today if there had once been nothing but old growth."

PLANNING A FOREST LANDSCAPE

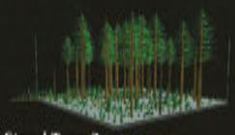
All forests are in a constant state of change and pass through a number of stages from the early open areas that follow a disturbance to older forest structure, which in turn will revert eventually to a regenerative stage to begin the cycle again. Each stage finds forest stands with specific structural characteristics that certain species of animals require for feeding and breeding. These structures evolve naturally, but we are also learning that forest management techniques can create desired wildlife habitat. The Oregon Department of Forestry plans to apply structure based management techniques to the Tillamook and other northwest state forests to produce a diverse mosaic of natural and managed forest stands that will enhance wildlife habitat and overall biodiversity. The five stages described here show the stand types that comprise the plan. See the center spread for wildlife associated with the different stand types.



Stand Type 1
REGENERATION
The earliest phase that follows a disturbance like wind damage, fire, or timber harvest. It is an open area occupied by tree seedlings or saplings (conifers or hardwood), and a variety of herbs and shrubs.

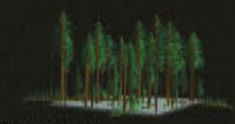


Stand Type 2
CLOSED SINGLE CANOPY
Trees fully occupy the site and form a single, main canopy layer. Because of the lack of light, there is little or no understory development.



Stand Type 3
UNDERSTORY
These stands have more diverse herb or shrub layers and trees larger than sapling size. Tree canopies vary from a single uniform layer to the variety created by multiple species

Stand Type 4
LAYERED
The vertical organization and structure of the living plant community are more complex than in Type 3. Vertical layering of herbs, shrubs, and tree crowns is extensive.



Stand Type 5
OLDER FOREST STRUCTURE
The final stage, characterized by large trees with two or more canopies, numerous snags and downed logs in various decay classes, multiple tree species, and diverse understory vegetation.

forests with younger forests that have old growth characteristics. "Where there are insufficient amounts of old growth — or any other structure — the structure in short supply would be maintained," he says, "preserved through active protection, and supplemented through forests of similar structures created through management."

The Tillamook and the New Forest Vision

All current research related to landscape management and wildlife habitat enhancement have come together in a comprehensive management plan for the northwestern Oregon state forests. Most notable is the Tillamook, which was destroyed in a series of fires a half century ago and after regeneration is now reaching maturity. The Oregon Department of Forestry is applying the theories of structure based management to produce a shifting mosaic of forest structures that, according to the plan draft, "maintains vigorous timber-producing stands, contributes to the diversity of plant communities and wildlife habitats, and enhances overall biodiversity throughout the forest."

ODF has great hopes that the plan marks the beginning of a new phase of forest management and provides baseline research for future improvements. Says State Forest Program Director Mike Bordelon, "Forest management, both active and passive, is experimental by nature, which is why we have included a strong monitoring and adaptive component in our Forest Management Plan. To approach a dynamic forest ecosystem like the Tillamook with a static, prescriptive strategy would be to ignore all the advances in forestry and wildlife science. Our plan is a working hypothesis, but it's based on good science. We're confident we can improve the distribution of listed and sensitive wildlife species — that if we build it (the habitat), they will come."

Toward Tomorrow's Forests

The new forest vision, then, sees large-scale management across the landscape to assure diversity and forest and wildlife health. Baseline research is being put into place to ensure a solid foundation for future policy decisions. OSU Forestry Dean George Brown feels confident of success not just because of good science, but because of the attitude of forest landowners. "These people are proud Oregonians," he said. "If I worry about anything, it's that the industry and small woodland owners won't be allowed to manage their forest lands and will be forced to back away and sell them off."

Sara Vickerman of Defenders of Wildlife shares Brown's concern about the erosion of the forest land base: "To protect native biodiversity, we need to create stewardship incentives to improve forest management and keep commercial forest land from being converted to other uses that result in more extensive development and permanent deforestation." Russ McKinley of Boise Cascade puts it another way: "Of all private land uses, forest land does the best job of protecting fish and wildlife habitat. Oregon is a wonderful state. Our acres of forest land have remained nearly constant for decades, and we want to make sure they'll be there in the decades to come."

Cheryl Gruenthal
WILDLIFE BIOLOGIST,
BOISE CASCADE
MEDFORD

Cheryl Gruenthal knew right away she was going to like being an industry biologist. Having worked for the USDA Forest Service and the Bureau of Land Management, she likes the way she is involved in the harvest planning process from the beginning. "I also discovered early on here that if I expressed a concern or made a suggestion," she said, "the response was instantaneous. I love being able to effect change and to see results quickly. Of course I am aware that my suggestions often have a cost and that we have to weigh cost and benefit, but if I make a good case for the wildlife benefits, my colleagues see the value."

OREGON FOREST
RESOURCES INSTITUTE

Rediscover Oregon's Forests

Oregon Forest Resources Institute
808 SW Third Avenue, Suite 480
Portland, Oregon 97204
(503) 229-6718
www.oregonforests.org info@ofri.com
Leslie Lehmann, Executive Director
Janis Collins, Communications Director
Max Bennett, Education Director

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