


EVERGREEN



September/October • 1996

- **Montana: Paradise Lost or Paradise Found?**
- **Federal Columbia Basin Proposal Due**
- **Oregon Celebrates 25 Years of Forest Stewardship**
- **Special Montana Forest Facts Section Inside**



The Evergreen Foundation exists for only two reasons: to help restore public confidence in forestry and to help advance public understanding and support for science-based forest policies and practices.

To these ends, we publish *Evergreen*, a scholarly journal designed to keep foundation members and others abreast of issues and events impacting forestry, forest communities and the forest products industry.

In our research and publishing activities, we work with forest scientists, wildlife biologists, historians, economists, policy analysts, school teachers, the news media, loggers, ordinary citizens, conservationists, elected officials, representatives of business and industry, and state and federal agencies responsible for managing and protecting the nation's public and privately owned forest resources.

Evergreen was founded in Oregon in 1986, and the foundation was incorporated in 1989 under Internal Revenue Service 501 © (3) guidelines which govern the conduct of the nation's non-profit, tax-exempt, charitable organizations. We do not lobby or litigate. Forestry education is our only business, and in our outreach we are pledged to work with any individual or group that shares our belief in the power of forestry.

Support for the foundation comes from members and other non-profit organizations that support a forestry education program like ours. We offer a variety of memberships including: Individual, \$18 per year. Sustaining, \$25 per year. Corporate, \$100 per year. Patron, \$500 per year. Life, \$1,000 per year.

For more information concerning membership or the educational work we do, please write us at: The Evergreen Foundation, 5000 Cirrus Drive, Suite 201, Medford, Oregon, 97504. Telephone (541) 773-2247. Fax (541) 772-2882.

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A wide river flows through a lush, green forested landscape. The water is dark and reflects the surrounding trees and the clear blue sky above. The forest consists of tall evergreen trees and dense undergrowth. The sky is a solid, clear blue, occupying the upper half of the image.

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The Federal government's new mega-plan for protecting intermountain and northern region forest resources is ready for public review and comment. This is the largest planning effort of its kind ever undertaken by the U.S. government

Cover photograph: The Swan River, near Fatty Creek, about an hour southeast of Kalispell, Montana.

Page 2-3 photograph: The Swan River, further downstream from the cover photo.
(Jim Petersen photographs. Unless otherwise indicated all Evergreen photographs are his)

In This ISSUE

“Where physical vastness in land and resources is an accepted fact, people are likely to be prodigal in measuring the size of their enterprises... Little avarice or scheming is involved... Montanans are merely so accustomed to vastness that anything less than huge seems trivial to them.

The compulsion to be big is solidly rooted in the state’s history, with its traditions of big fur companies, big cattle and sheep outfits, and big mining operations... Here day-laborers could become owners, and owners could become wealthy. To gain wealth in the new empire (Montanans liked the word) became the hope of everyone. The prime requirement was to ‘get in on the ground floor.’”

- *The WPA Guide To 1930s Montana*, compiled by the Federal Writers’ Project of the Work Projects Administration, 1939

In this issue, we write about forests and forestry in Montana. Here are our main points, summarized for those who do not have time to read *Evergreen* in one sitting.

- Montana’s fire-dependent forests are dying, for the same reasons they are dying all over the West. The situation is not yet as bad as it is in other western states, but it has already sparked bitter debate between timber-starved communities who want to harvest dead and dying timber, and environmentalists who oppose harvesting, and say the so-called “forest health” debate is nothing more than an industry-contrived scheme to boost declining national forest harvest levels.
- In the hope of reducing the growing risk of catastrophic fire, Forest Service scientists are conducting a series of harvesting experiments in western



Forest setting - Plum Creek Timber Company land in northwest Montana. In the distance, exacting rows define a genetic tree improvement plot.

Montana’s Bitterroot Valley. The aim is to devise a long-term strategy for returning controlled fire to these fire-dependent ecosystems. Results are encouraging.

- Forests cover one-fourth of Montana’s land base, about 22.5 million acres, mostly west of the Continental Divide. Almost 97% of what was forested in the early 1600s is still forested today.
- The future of forestry in Montana is closely linked to the future of the national forest timber sale program. Three-fourths of all forestland in Montana is publicly owned, and 60% of unreserved timberland – about 11.4 million acres – lies within national forests which hold 69% of all sawtimber in Montana.
- 1993 and 1994 harvest levels were down about 25%, due mostly to a 50% decline in national forest harvest levels, a result of timber sale appeals, lawsuits and habitat protection decisions made necessary by the Endangered Species Act.
- Harvesting on industrial lands is also declining. Most of industry’s old growth

reserves have been liquidated, and new plantations still have some growing to do before they are ready for harvest. Industry owns 8.4% of Montana’s timberland base, and 7% of the state’s sawtimber.

- Between 1988 and 1993, harvesting on non-industrial private lands increased 60%, a result of soaring log prices, precipitated by harvest declines on federal and industrial lands. Non-industrial lands account for 19.8% of all timberland in Montana, and hold 16% of all sawtimber.
- Forest products manufacturers and loggers have made significant investments in new technologies designed to handle smaller, lower quality logs. Milling has become more labor intensive, while logging has become less labor intensive.
- Montana’s timber industry employs about 11,000 workers, mostly in western Montana counties. Lincoln, Flathead, Sanders and Missoula counties are the state’s leading forest products manufacturers.

Statewide, timber accounts

for 15% of basic industry labor income and 10% of basic employment.

- Most Montanans still support the timber industry, and efforts are underway to create local citizen coalitions representing diverse points of view. Such groups are seen as a way of assisting the Forest Service with thorny management decisions, thereby fending off attacks by national environmental groups that have no vested interest in Montana’s timber communities.

Outside of Alaska, there is no other United State quite like Montana. *Out here*, under the Big Sky, magnificent snow-capped peaks are shouldered by high mountain valleys, some more than a hundred miles long. *Out here*, on starry nights, earth and sky come together in a great arc that stretches from horizon to horizon. *Out here*, where Indian cultures flourished more than 10,000 years ago,

endless blue sage plateaus race eastward to join the Great Plains. *Out here*, where the first fortunes were made in mining and railroading, the big money today is in cattle, wheat, timber and tourism. *Out here*, where hard work is still a virtue, and “beautiful” is a word still reserved for scenery, not people, it is possible to commune with an America long gone from the rest of the country.

The author, William Kittredge, pegged it about as well as anyone ever has in his Foreword to a reprinted version of the 1939 WPA *Guide To 1930s Montana*.

“These are stories from a time when a lot of people in Montana thought of themselves as sort of huge on the earth,” he wrote. “They liked to feel that they weren’t always fair or real pretty but that they were taking big steps as they chased around heaven.”

As we suggest in the title of our cover story—**Montana: Paradise Lost or Paradise Found**—Montana may no longer be the heaven it once was, but it is still a pretty spectacular place, and big steps are still possible here because majority political power still resides in rural timber, farming and ranching communities. Here, loggers, farmers and ranchers have not

been disenfranchised at the ballot box by urban voters as is the case in Oregon, Washington and California.

True, the press of environmental issues is as much a force to be reckoned with here as it is anywhere in the West. What is different here is the fact there is still strong, broad-based support for the timber industry, something not found in West Coast urban centers where culturally distant voters often side with environmental interests, thereby dividing the loyalties of their state’s congressional delegations

In Montana, as in other western states, national forest timber harvest levels are plummeting, a result of timber sale appeals and litigation, the long shadow of the Endangered Species Act, the ever-present quest for more designated wilderness areas, and the Sierra Club-led drive to run the timber industry out of the West’s national forests.

The forest health issue is not as big here as it is in southwest Idaho, or eastern Oregon and Washington, but it soon will be; for here too, forests are in big trouble; especially national forests, where the 85-year-long chain of events is the same as it is in fire-dependent forests across the West: exclusion of fire, combined with early-day

logging and land clearing practices, which removed too many fire-resistant ponderosa pine, leaving precious little natural seed source, allowing the invasion of shade-tolerant fir, the subsequent geometric expansion of insects and disease, and the predictable onset of catastrophic wildfire.

Although the solution to the West’s forest health problem lies well beyond Montana’s political reach, some of the Forest Service’s most far-reaching research in ecosystem forestry is currently underway in the Bitterroot Valley in western Montana. These experiments have significant implications for Montana’s timber industry because they seem to indicate that the national forest timber harvest program in the Inter-mountain region may soon consist mainly of repeated, large scale thinnings designed to reduce timber stand density, and thus the risk of wildfire. By eliminating large amounts of fire-sensitive fir, scientists hope to stimulate growth and natural reseedling of fire-dependent ponderosa pine and western larch, species that dominated this region for eons before Congress put the Forest Service in the fire fighting business in 1911. It is impossible



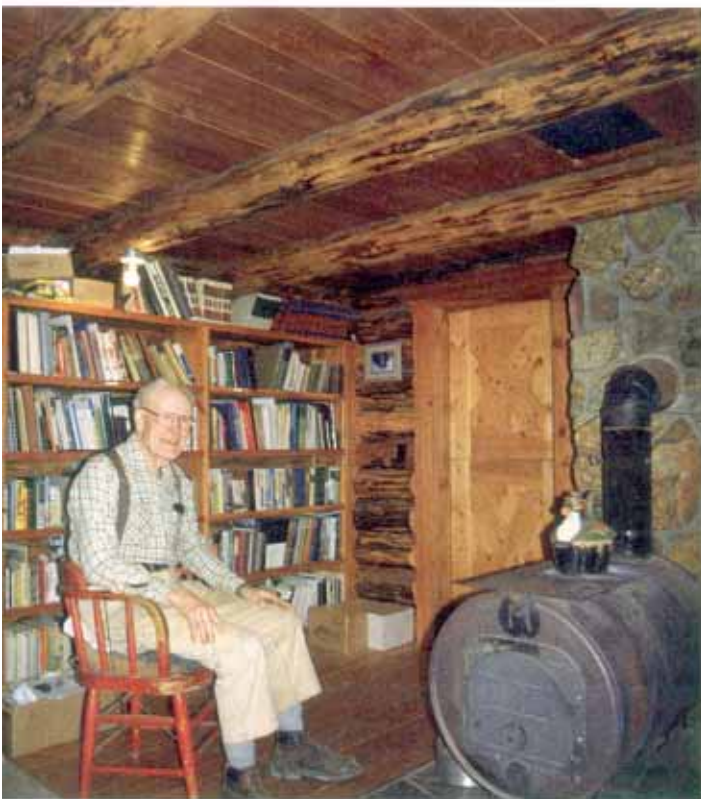
Vintage Montana - The Madison Range in southwest Montana. Some say this unspoiled land is on a collision course with those who are loving it to death. (Wayne Sheer photograph, courtesy Travel Montana, Department of Commerce)



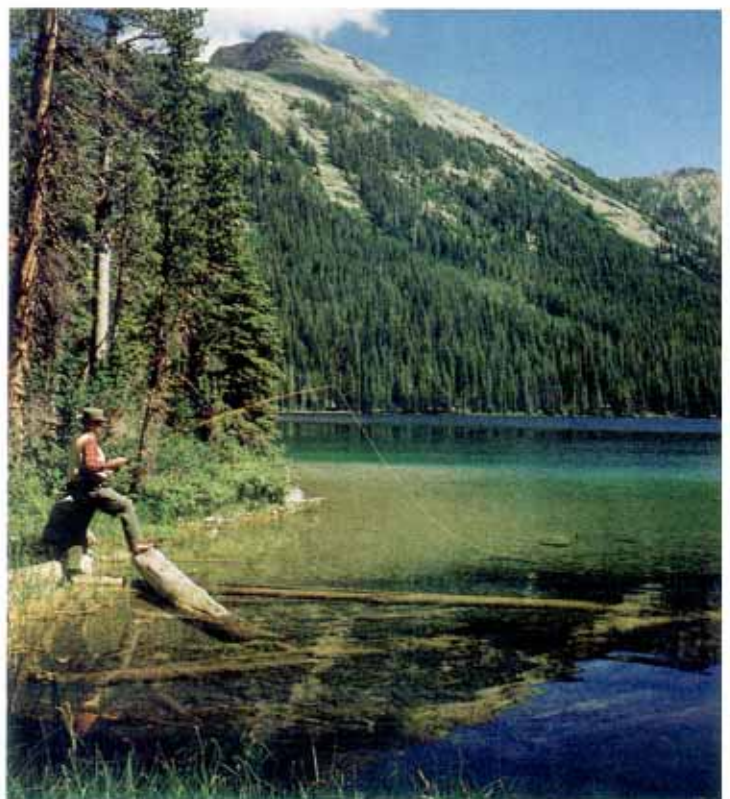
The past as future - Dr. Steve Arno, resting on an old ponderosa pine stump not far from Stevensville, Montana. In this issue, we tell you what Dr. Arno is trying to do to bring back the big ponderosas that once dominated western Montana's lower elevation forests.



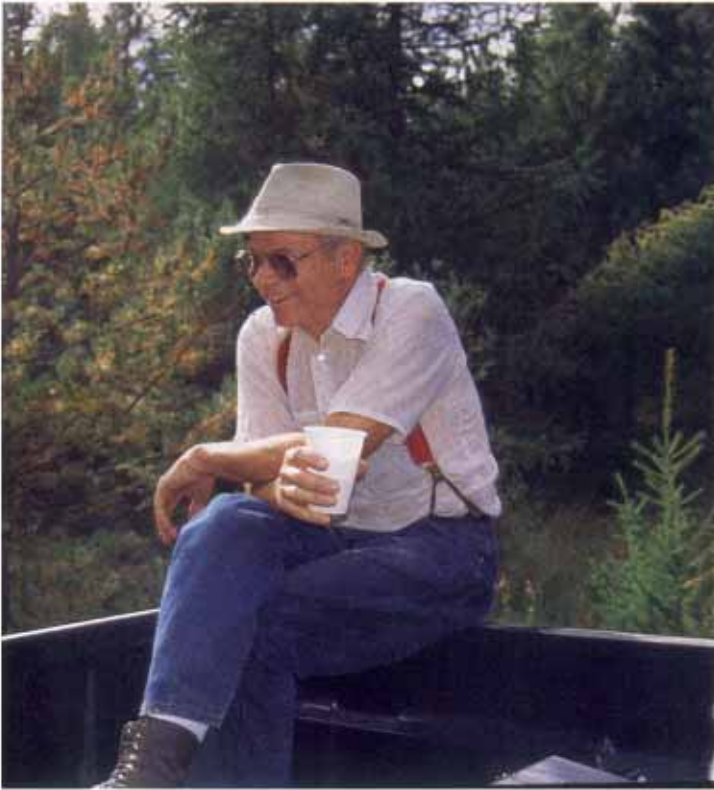
Paradise lost - Deadly stand-replacing fires like the 1988 Red Bench Fire are increasingly common in western Montana. In this issue, we explain why. You will think you are back in Idaho, or anywhere else in the West where big fires are incinerating once beautiful forests. (USFS photograph)



The face of wisdom - Bud Moore in his log cabin office near Condon, Montana. We first interviewed him a year ago for, *Evergreen: The West Is Burning Up*, Winter 1994–1995. Most seeking wisdom in Montana's forests eventually find their way to his doorstep, so it is not surprising that he is a main character in this issue.



Paradise found - Johnson Lake in the Anaconda-Pintlar Mountains in southwest Montana. Not much has changed here since this photograph was taken in 1961, but the increasing risk of catastrophic fire now looms large in all of Montana's forests, threatening the timeless beauty of scenes like this. (USFS photograph)



To see the future, see the past - For more than 30 years, Russ Hudson and two of his colleagues managed more than 200,000 acres of industrial forestland in northwest Montana. Their story bridges the gap between plantation forestry and experiments the Forest Service's Dr. Steve Arno is conducting in the Bitterroot Valley.

to gauge the impact ecosystem forestry will have on harvesting but our sense is that wide public acceptance would lead to a modest increase in current harvest activity.

As is our custom, this issue includes a special forest facts section titled, "A Quick Reference Guide to Forests and Forestry in Montana." It is a compendium of information gleaned from several prestigious publications, all of them available from public sources. Should you wish a free copy of this section *only*, please contact the Montana Wood Products Association in Helena (406) 443-1566.

Elsewhere in this issue you will find an eight-page section describing one of the most important planning documents in the history of federal forest and range land management planning. (See "**Interior Columbia Basin Plans Near Completion, Government Seeks Public Comment**," Pages 55-57) Actually, the proposal includes *two* draft environmental impact statements, plus a scientific assessment of ecosystems that make up the Columbia Basin. At this writing, we do not know the exact date these documents will be released for public review and comment, but we expect it will occur sometime before year end. A 90-day comment period is anticipated. We suggest you call your local Forest Service office for more information.

We first wrote about deficiencies in the Upper Columbia planning effort more than a year ago. (See "A View From Walla Walla," *Evergreen: The West Is Burning Up*, Winter, 1994-1995) The about-to-be-released drafts are an improvement over what we saw then, but our sources tell us more work is needed before this mega-plan is unleashed on a region so dependent on federal forest and range land.

Also in this issue you will find a short article commemorating the 25th anniversary of the Oregon Forest Practices Act, and a

companion piece about a southern Oregon timber sale called Ferris Lane. The interplay between these two stories suggests there is still hope for a peaceful settlement of Oregon's bitterly fought Forest Wars. Meanwhile, the battlefield has been divided into still smaller pieces, this time by the Sierra Club's vote to fight for an all out ban on timber harvesting in national forests. How this vote will play on the Beltway – only 10% of the members voted – is anyone's guess, but there is growing unrest in the environmental industry. Many local environmental groups would like to put ecosystem forestry to work in their dead and dying forests, but the national leadership has painted itself into a corner by its insistence that no restoration work occur, even in dead and dying forests, and especially after they have burned.

There are many we need to thank for their help in putting this issue together. Among them: Paul Uiken of the Montana Loggers Association, who helped us scout photo locations and



Going on faith - Look closely at the hand-lettered message written on the engine hood of this logging truck photographed at an intersection in Kalispell, Montana. It reads, "Going on faith." It is doubtful there are three other words in the English language that better describe the mood or determination of Montana's beleaguered logging industry.

explained logging in Montana to us; and Laird Robinson, who works in the Forest Service's Northern Region office and helped us shape our story. Laird has helped many decipher the Forest Service, including a most notable Montanan, Norman Maclean, who wrote *Young Men and Fire*, and earlier, *A River Runs Through It*.

Others in the Forest Service we want to thank include Dr. Steve Arno, an energetic scientist who is one of the agency's most knowledgeable fire ecologists. He spent an entire day in the woods with us, carefully explaining the roles thinning and prescribed fire are playing in some of the most impressive field tests we've ever seen. Also, our old friend, Jud Moore, who works in public affairs in the Northern Region office and was again invaluable in the search for historic Forest Service photographs. And finally, Hal Salwasser, Northern Region Regional Forester, who was kind enough to meet with us on two occasions, including an early morning breakfast.

Thanks are also owed to Russ Hudson, Gene Yahvah and John McBride, who also spent a day in the woods with us. Their collective knowledge of forests and forestry spans more than one hundred years, most of it spent working together on industrial forestland in northwest Montana, where they pioneered forestry

techniques now being tested again on national forestland by Dr. Arno.

We also want to thank three men who prove that, in Montana, loggers come in all sizes and shapes: Rick Smith, whose \$2 million investment in state-of-the-art logging systems speaks volumes for his faith in the future; Jim Lotan, a retired forest scientist turned horse logger, who shared his insights on the expanding role alternative logging systems are playing on non-industrial private forest land; and Bob Love, who calls himself "an environmental logger," and wanted us to know it is possible to log without tearing up the forest. He is right. We saw many fine logging jobs in western Montana, including two of his.

We also want to acknowledge several fine books and articles we reviewed in the course of researching this issue: *The Last Best Place: A Montana Anthology*, edited by William Kittredge and Annick Smith; *Montana: A History of Two Centuries*, by Michael Malone, Richard Roeder and William Lang; *The WPA Guide To 1930s Montana*, by the Federal Writer's Project of the Work Projects Administration; *Forest Health and Ecological Integrity in the Northern Rockies*, by Edward Monnig and James Byler; *Seventy Years of Vegetative Change in a Managed Ponderosa Pine Forest in Western Montana*, by George

Gruell, Wyman Schmidt, Stephen Arno and William Reich; *Age-Class Structure of Old Growth Ponderosa Pine/Douglas-Fir Stands and Its Relationship to Fire History*, by Stephen Arno, Joe Scott and Michael Hartwell; *A Pictorial History of the U.S. Forest Service, 1891-1945, Northern Region*, by Richard Guth and Stan Cohen; *Outlook*, a quarterly publication of the University of Montana Bureau of Business and Economic Research; and *Montana's Forest Products Industry: A descriptive analysis, 1969-1994*, by Charles Keegan, Daniel Wichman, Lorin Hearst, Paul Polzin and Dwane Van Hooser, University of Montana Bureau of Business and Economic Research.

Finally, I want to thank Jack Canavan, a fishing pal who has compassed me through life's storms for almost 30 years. He kindly read all 140 pages of this issue in manuscript form, because I needed a real Montanan to tell me if the real Montana is in these stories. He says it is, and that is good enough for me.

Our tour of American forests continues: on to Washington state, then Tennessee, where we begin our year-long study of forests and forestry east of the Mississippi. Write us if we can be of service.

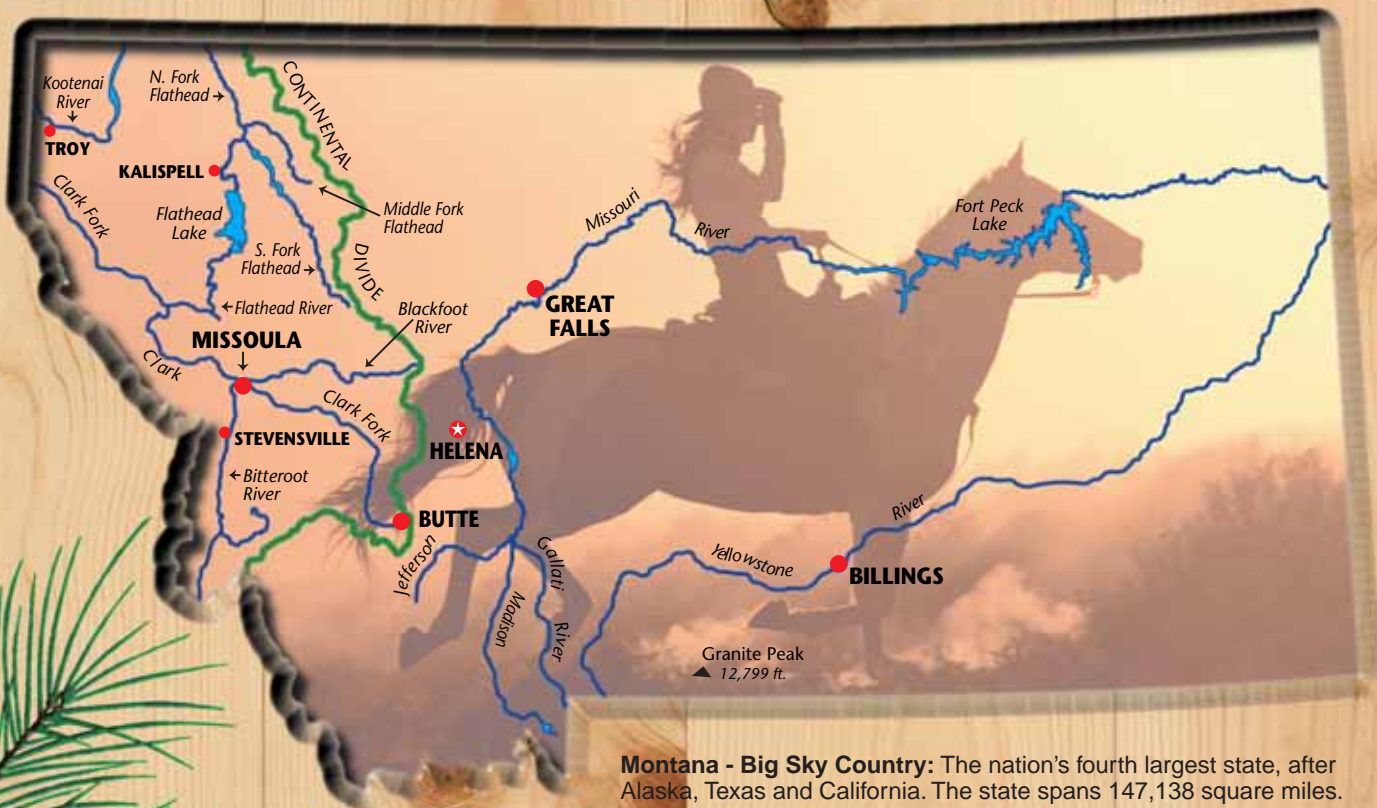
- Jim Petersen



Entering Montana - Here we are on 6,800-foot Monida summit last April. Monida is on Interstate 15 about an hour south of Dillon, Montana. It is one of six primary border crossings that link Idaho and Montana. In the foreground, Jim's wife Kathleen, and their two dogs, Josh and Foobie.

A Quick Reference Guide To Forests And Forestry In

Montana



Montana - Big Sky Country: The nation's fourth largest state, after Alaska, Texas and California. The state spans 147,138 square miles. 856,000 people live here, about 5.8 per square mile. Landmarks of interest include the Continental Divide, which divides Montana into two pieces, each one larger than several other states. Major rivers east of the Divide include the Madison, Jefferson, Missouri, Gallatin and Yellowstone; and west of the Divide, the Clark Fork, Blackfoot, Bitterroot, Flathead and Kootenai. Also Flathead Lake, the largest freshwater lake west of the Mississippi. Troy, the lowest point in Montana and Granite Peak, the highest point; Helena, the state capital; Stevensville, Montana's first permanent white settlement, established in 1841; Billings, the state's largest city. The word "Montana" is Spanish, and means "mountain."

Part One: The basics

State flower: bitterroot. There are more than 2,000 plant species in Montana.

State capital: Helena

State flag: In 1905, Montana adopted as its official flag, the flag of the First Regiment of Montana Infantry, which fought with distinction in the Philippines.



Credit: Travel Montana

Largest city: Billings, known for its oil, wheat and cattle industries

Major industries: Agricultural **crops**, including wheat, barley, corn, hay, cherries and sugar beets; **livestock**, including beef and dairy cattle, hogs and sheep; **mining**, including coal, copper, gold and silver; **timber**, including lumber, plywood, log home manufacturing, pulp, paper, particleboard and medium density fiberboard; **tourism** including hunting, fishing, hiking, golf, boating, touring, skiing, snowmobiling; **government**, including several state and federal land and resource management agencies.

State motto: "Oro y Plata," meaning "gold and silver" in Spanish

State tree: ponderosa pine



State bird: western meadowlark



Credit: Western Birds: Peterson Field Guides, Roger Tory Peterson, Houghton Mifflin Company, Boston

State animal: grizzly bear



Photo credit: Alan and Sandy Carey, Bozeman, Montana

State fish: cutthroat trout



State grass: bluebunch wheatgrass

State rock: agate and sapphire gemstones

Threatened and endangered species:

Seven Montana animals are classified as **endangered**, and five animals and plants are classified as **threatened**.

Endangered species include the **black-footed ferret**, the rarest mammal in North America, there are perhaps eight in Montana; **whooping crane**, two were seen near Fort Peck in 1994; **American peregrine falcon**, 16 nesting pairs were counted in Montana last year; **gray wolf**, now the subject of a controversial recovery plan. More than 60 are known to live in northwest Montana, and more are being introduced to Yellowstone National Park in southwest Montana. **Least tern** (interior population), once inhabited

every major river system in the midwest. Montana is on the western edge of its range. In 1994, 51 breeding pairs in central and eastern Montana produced 81 young. **White sturgeon** (Kootenai River population), a victim of hydroelectric development. A single adult was observed in the Kootenai in 1990 and 1992. The Kootenai Tribe of Idaho breeds them in captivity, and to date 205 juveniles from wild stock have been released into the Kootenai. **Pallid sturgeon**, its historic range included the Mississippi, Missouri, Platte, Kansas and Yellowstone rivers. River development is thought to be the main reason for their decline. In Montana, less than 100 survive in the Missouri River above Fort Peck Dam.

Threatened species include the **bald eagle**, between 166 and 200 breeding pairs line in Montana, well above the down-listing goal of 99 pairs established by the U.S. Fish & Wildlife Service in its 1986 recovery plan. **Piping plover**, a two-ounce shore bird, there are 62 breeding pairs in Montana. They live mainly in the Medicine Lake National Wildlife Refuge, and prefer unvegetated sand-pebble areas. **Grizzly bear**, perhaps 1,000 live in Montana, more than are found in any other state in the lower 48. About 350 live in northwest Montana, mainly in Glacier National Park, and another 250 live in and around Yellowstone National Park in southwest Montana. The **water howellia**, a small aquatic plant found in 101 wetlands in Washington, Idaho and Montana. In Montana, they grow mainly in the Swan Valley, in the Nature Conservancy's Oxbow Preserve and on land owned by Plum Creek Timber Company. The **Ute ladies'-tresses**, a member of the orchid family that lives mainly in Colorado and Utah. A single population, consisting of less than 100 flowering stems, was found in a Jefferson County wetland in 1994.

Became a territory: May 26, 1864, under the Organic Act.

Became a state: November 8, 1889. The state constitution is prefaced by the Magna Carta, the Declaration of Independence, the Articles of Confederation, the U.S. Constitution, and Organic and Enabling Acts.

Size: Montana spans 147,138 square miles, making it the fourth largest state after Alaska, Texas and California.

Dimensions: About 570 miles, east to west, by about 315 miles, north to south.

The entire Northeast - Maine, New York, Vermont, New Hampshire, Connecticut, Massachusetts and Rhode Island - would fit inside Montana's borders, with enough room left over for a second State of Maine.

Population: More than 856,000, according to the 1994 census bureau estimate; about half the population of metropolitan Seattle, slightly more than 5.8 people per square mile.

Total land area: 93,048,000 acres. Two-thirds of the state lies east of the Continental Divide, the main spine of the Rockies, which meanders in a broken pattern from Glacier National Park in northwest Montana southeast through Yellowstone National Park and on to Wyoming. Eastern Montana is characterized by a network of valleys and isolated groups of mountains. The western third of the state is more mountainous, and contains most of the state's forests. Its mountain ranges lie parallel on a northwest-southeast axis.

Total water area: 1,100,000 acres

Largest lake: Flathead, in northwest Montana, the largest freshwater lake west of the Mississippi, about 30 miles long and 10 miles wide, formed by glaciers; average depth, 220 feet; fed primarily by the three forks of the Flathead River.

Major rivers: The Yellowstone and Missouri are the major rivers east of the Continental Divide. The Missouri is the larger, formed by the confluence of the Madison, Jefferson and Gallatin rivers, at Three Forks, Montana. Rivers east of the divide eventually reach the Gulf of Mexico, via the Missouri and Mississippi rivers, or Canada's Hudson Bay, via the St. Mary and Saskatchewan rivers. West of the Continental Divide, the Clark Fork of the Columbia is the major river. From its beginnings in the Butte-Anaconda area, it runs northwest to Clark Fork, Idaho, where it flows into Lake Pend Orielle, enroute to the Columbia River and, eventually, the Pacific Ocean. Major Clark Fork tributaries are the Blackfoot, Bitterroot and Flathead rivers.

Highest peak: Granite Peak, near the southern boundary with Wyoming, elevation, 12,799 feet. Almost half the state rises about 5,000 feet. The mean elevation is 3,400 feet.

Lowest point: Troy, a logging town near the Idaho-Montana border in the northwest corner of the state, 1,892 feet above sea level.

Highest recorded temperature: 117 degrees, at Glendive, a farming community in eastern Montana, July 20, 1893.

Lowest recorded temperature: minus 70 degrees, at Rogers Pass on the Continental Divide west of Helena, winter, 1954; the lowest temperature ever recorded in the contiguous United States. Mean annual temperature, 42.6 degrees.

Average annual precipitation: 15.48 inches. Rain and snowfall are heaviest west of the Continental Divide. The mountains block the eastward advance of moisture-laden Pacific Ocean weather patterns. Snowfall averages 120 inches in timber-rich Mineral and Sanders counties, on the Idaho-Montana border.

Highlights in geologic history: Evidence of Montana's turbulent geologic past can be seen across the state, but is most visible in the rocky reaches of Glacier National Park in northwest Montana. Western Montana's mountains were formed about 60 million years ago by massive shifts in the earth's surface. Ancient seas rose and fell. At various times, the entire state was at the bottom of an arm of the Pacific Ocean. Great swamps formed east of the Divide, where today vast coal and oil deposits are found. As the seas receded, dinosaurs roamed the plains east of the Rockies. Here, paleontologists have unearthed some of the world's most important, most impressive fossils. During the Pleistocene era, beginning about two million years ago, four great ice sheets formed in Canada moved across northern Montana east of the Divide. By the sheer force of their 10,000-foot thickness, they leveled the plains, filled in valleys and created new river and stream courses. West of the Divide, piedmont glaciers carved out many lake beds, including Flathead Lake and prehistoric Lake Missoula.

Prehistoric Lake Missoula: Some 18,000 years ago, all of western Montana's valleys were flooded to a depth of about 800 feet by 30,000 square mile Lake Missoula, a prehistoric invention of receding glaciers. The lake was held in place by an ice jam that blocked a

narrow canyon near present-day Cabinet Gorge Dam and Heron, Montana. When the jam burst, the lake drained in a matter of days in what scientists believe was one of the two greatest floods in geologic history. Near Richland, Washington floodwaters were 800 feet deep, and at Portland, Oregon, 400 feet deep. The flood is thought to have carved the Columbia River channel as it exists today. In eastern Montana, glaciers also blocked the Missouri River which then drained into the Arctic Ocean north of Hudson Bay, forcing the river to cut a new channel east and south to the Mississippi.

Earliest residents: Recent archeological discoveries indicate Asiatic peoples crossed the Bering Sea 15,000 to 20,000 years ago on a land bridge that connected Russia to Alaska. Eventually, they worked their way south into eastern Montana, and on into the American Southwest, probably in pursuit of large Pleistocene mammals and early bison. Evidence found in the Yellowstone River Valley, and dated to 13,000 years ago, suggests they lived in groups of a dozen or more, hunted with spears and moved 50 to 100 times a year within a hundred-mile range.

Earliest white settlers: In 1742, the French trader, Pierre Gaultier, Sieur de Varennes de la Verendrye, sent his sons on an expedition across the Dakota plains. In January 1743, they reported seeing "shining mountains" west of their advance. It is thought they were looking at the Big Horn Mountains of Wyoming and southern Montana. They were the last white men to see Montana until the spring of 1805, when the Lewis and Clark expedition reached the state. Trappers, traders, and prospectors followed, and later, railroaders, farmers, ranchers and lumbermen. When the first official Montana census was taken in 1870, about 20,500 non-Indians were counted. Between 1880 and 1890, the state's population increased 365 percent. By 1910, it stood at 376,053, and by 1920 it had risen to 548,889, but a 1918 state publication boasted the population was about 769,000, only a few thousand less than the 1990 census.

First town: The first permanent Euro-American settlement in Montana was established at Stevensville in 1841. The state's first sawmill was constructed in Stevensville.



Montana's forests contain 27 tree species, including 17 conifers, and 10 hardwoods. **Conifers** (softwoods) include ponderosa pine, western larch, lodgepole, Douglas-fir, grand fir, subalpine fir, Utah juniper, Rocky Mountain juniper, subalpine larch, Engelmann spruce, white spruce, whitebark pine, limber pine, western white pine, western redcedar, western hemlock and mountain hemlock. **Broadleaf deciduous** (hardwoods) include boxelder, paper birch, green ash, balsam poplar, eastern cottonwood, black cottonwood, quaking aspen, cascara buckthorn, peachleaf willow and American elm. Deciduous trees lose their leaves every fall. Larch is a deciduous conifer, as it loses its needles every fall.

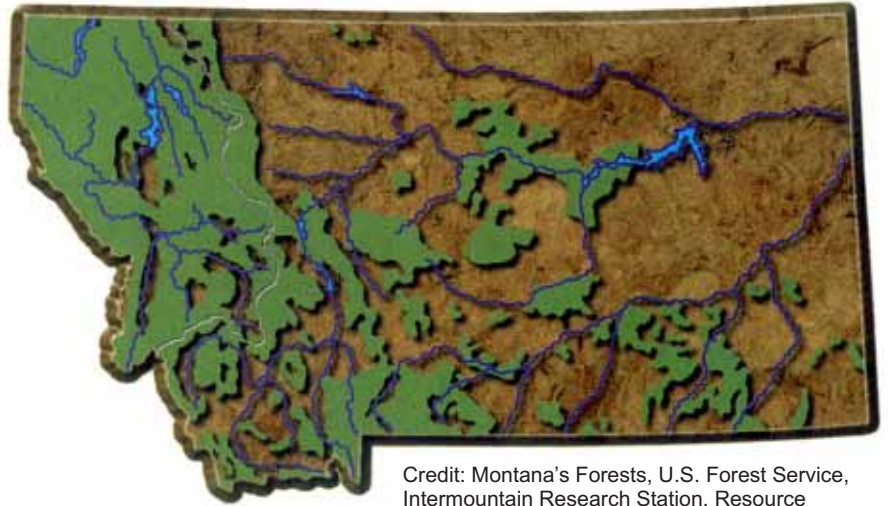
The Role of Fire in Montana's Forests

Of all the natural forces that influence the character and structure of Montana's forests, fire is the most important. Before fire suppression efforts began in 1911, fire was the primary natural disturbance factor in intermountain forests, including Montana.

Forests change through a process called *plant succession*, whereby one plant species is replaced by another. Furthermore, *disturbance* also facilitates change. As an agent of change, or disturbance, fire creates or maintains open spaces which are occupied at different times by different plants, depending on available sunlight and growing space.

Some plants and trees require more sunlight, and thus more open space than others. These are said to be *shade intolerant*, meaning they require full sunlight to grow. Such species are also called *early successional species* because they are the first to occupy an opening in the forest – an opening created by wildfire,

Distribution of forests in Montana



Credit: Montana's Forests, U.S. Forest Service, Intermountain Research Station, Resource Bulletin INT-38, November 1985

wind, disease or harvesting. Timber harvesting can mimic the area's historic patterns of natural disturbance.

The opening exposes the forest floor to full sunlight, providing an opportunity for shade intolerant, early successional plant species – including ponderosa pine, western larch and lodgepole pine – to re-colonize the opening. But as the years pass and these shade intolerant plants grow taller, they fill in the opening, blocking the sun's rays. Gradually, shade tolerant, *late succession* plants – including firs and hemlocks – spread through the understory, eventually replacing early succession species. Ironically, in the Intermountain and Northern regions, many prized old growth forests are dominated by long-lived early succession plant species, especially ponderosa and western larch.

There are many different definitions of "old growth," and indeed the term is more often used by foresters to describe structural conditions associated with older forests than to describe age itself. In fact, some trees, such as lodgepole pine, are considered old at 100 years, while others, including ponderosa and larch, can live 300 to 400 years, sometimes longer.

All trees die eventually, and when old growth forests die in fires, nature starts over, usually with bare ground. There, in full sunlight, the forest life cycle starts anew with shade intolerant, early successional plants and trees. On the other hand, if fire is not involved and the old trees simply die where they stand, the dense undergrowth that follows often prevents shade intolerant trees from reseeding themselves. Thus, where perpetuating shade intolerant species is concerned, fire performs a valuable reforestation function disease cannot perform by itself.

In the absence of a natural agent of change – in this case fire – Montana's forests have changed in ways nature never intended. Shade-tolerant fir species now overcrowd once open growing sites dominated by fire-resistant, shade intolerant ponderosa pine and western



larch. The resulting timber stands are much too dense for the growing capacity of the land they occupy. Insects and disease infestations are common, setting the stage for catastrophic wildfires, which are quite unlike the lighter, more frequent ground fires that dominated this landscape before white settlement began. The situation is especially critical in the Bitterroot Valley south of Missoula, the Clark Fork Valley northwest of Missoula and on the Kootenai and Flathead National Forests in Montana's northwest corner.

Opinion is divided concerning what to do about dead and dying forests. In Montana's timber communities, there is widespread public support for harvesting dead and dying timber before it burns in intense wildfires. But many environmentalists oppose such harvesting, and believe the "forest health issue" was contrived by timber companies interested only in boosting national forest harvest levels.

The Role of Climate in Montana's Forests

Climate is also a significant natural force in Montana forests. West of the Continental Divide, forests are cooler and more moist, a result of the influence of Pacific Coast weather patterns. Firs, lodgepole, larch and hemlock are the dominant tree species. East of the Divide, the species composition is different, in part a result of continental climatic conditions. Forests are drier, hotter and more open. Ponderosa pine is the dominant tree species. Eventually, eastern Montana forests give way to range land, in much the same manner as they do in parts of eastern Oregon and Washington.

Major Forest Zones in Montana



Credit: Montana's Forests, by Alan Green, Renee O'Brien and James Schaefer, U.S. Forest Service, Intermountain Research Station, INT-38, November 1985.

There are five major forest zones in Montana, shown here as they progress from warm-dry (at left in chart above) to cool-moist, and finally, cold-subalpine sites (at right).

Conifer Forest Types

Within Montana's five forest zones, the following conifers are most abundant: **Douglas-fir**, 6.38 million acres; **lodgepole pine**, 4.14 million acres; **ponderosa pine**, 3.01 million acres; **spruce-fir**, 1.55 million acres; **western larch**, 945,633 acres. These species are discussed below. Also note the nearby forest type chart.



Interior Douglas-fir

Interior Douglas-fir is the most widely distributed conifer growing in Montana, covering some 6.3 million acres, including more than 4.9 million acres of saw-timber. Interior Douglas-fir is ecologically and genetically different from large, fast growing Douglas-fir that grows from the Cascades west. For example, unlike its westside cousin, Interior Douglas-fir is not a large, long-lived, fire-dependant tree, as are ponderosa pine and western larch, which are both long-lived and

fire-dependant. Lodgepole pine is also fire-dependant but does not live as long and is not fire-resistant.

Few American tree species grow under more diverse climatic conditions than does Douglas-fir. It is the most widely distributed western tree, and ranges from the northern

British Columbia to Mexico and from the Pacific coast to the mountains of west Texas.

The tree is something of a botanical puzzle, as it bears a strong resemblance to spruce and fir, as well as hemlock and yew. Coastal Douglas-fir was first discovered by Scottish physician and naturalist, Archibald Menzies, on the west side of Vancouver Island in 1791, and later re-discovered by David Douglas, for whom it is named. Botanists first classified it as a pine, and it gained the common name "Oregon pine." But the tree does not bear needles in clusters like pines, nor does it have pine-like cones. Instead, its cones look more like spruce cones, which helps explain why naturalist, John Muir, called it "Douglas Spruce."

Douglas-fir wood is usually yellowish to light red, with a narrow band of white sapwood. Because it is very strong for its weight, resists decay and is easily worked with hand tools, it is enormously popular among homebuilders and wood craftsmen. It also makes a fine ornamental shrub and a festive looking Christmas tree.



Lodgepole Pine

Lodgepole is abundant in the northern Rockies. There are about 4.1 million acres of lodgepole in Montana, divided evenly between forests east and west of the Continental Divide. The tree is found in the Douglas-fir, temperate spruce-fir and subalpine spruce-fir zones. It commonly grows 60-80 feet tall, and matures in 80 to 100 years.

Fire is both a friend and mortal enemy of lodgepole. Its bark is too thin to provide adequate insulation against the heat of fire, but its seed-filled cones open easily in the presence of heat from either fire or

hot summer sun. The seedlings grow prolifically in bare soil, and the resulting stand often includes several thousand stems per acre.

The wood is hard, somewhat brittle and straight-grained. Standing dead lodgepole is a favorite among log home manufacturers, but is also used for railroad ties, construction lumber, fence and corral poles and firewood. The tree takes its name from the fact Indians used lodgepole shafts to construct their teepees and lodges. They also used the inner bark in baskets, and as a food source.



Ponderosa Pine

Ponderosa is one of the most important timber trees in the western U.S., and is an important forest type in Montana, where about three million acres grow, on both sides of the Continental Divide. The variety found in western Montana is taller than the variety found in eastern Montana, where it is the primary upland tree species, and grows in groups or "islands" of trees on the western Great Plains. In the more mountainous environs of western Montana, it is found in more or less pure stands that occupy its own

zone, though it also grows in mixed species stands with Douglas-fir.

There are not as many ponderosa stands in Montana today as there were before white settlement began, a result of two factors: early-day harvesting, which favored ponderosa, leaving too few large trees behind to provide an adequate natural seed source; and the nation's long-standing policy of excluding (fighting) forest fires, a policy that works against ponderosa, which is fire resistant, and needs fire to reduce competition from fire-sensitive, shade tolerant species, primarily grand and Douglas-fir, which have over-run much of the original ponderosa range.

Ponderosas are huge trees, sometimes reaching 230 feet tall on trunks six to eight feet in diameter. Their thick bark insulates them against most ground fires, and they live 350 to 500 years. Other than large fires, their only enemies are bark beetles or mistletoe, and even here the tree exhibits remarkable resistance. Until the trees are 80 to 100 years old, its bark is dark brown to black, and fairly smooth. Older trees are easily recognized for their cinnamon-brown to orange-brown bark, which feature papery layers of irregularly divided scales. The ponderosa's trademark needles are narrow and up to a six inches long. Bound together on a single stem, they look like clusters of broom straws, and in fact make fine campground brooms.

The wood is used in general construction, interior finish work, boxing and crating, but is not strong enough for heavy construction use. The wood is pale brown to nearly white, straight-grained and easily worked. It is harder and stronger than eastern white pine and, for many purposes, compares favorably with cypress, the spruces and Douglas-fir. It is used in structural applications, door and window frames, moldings, matches and pattern stock. It is easily painted or varnished, and is a favorite among wood carvers.

The Lewis and Clark expedition reported seeing ponderosa along the Missouri River in 1804, and David Douglas, the Scottish botanist, reported seeing it along the Spokane River in eastern Washington in 1826. He suggested the name "ponderosa," after the tree's ponderous bulk.



True Firs

Montana's true fir zone spans about 1.55 million acres. **Grand fir** and **subalpine fir** are the most wide-spread species in this zone, but subalpine fir is far more wide-spread than Grand fir, which grows mostly near valley bottoms in the western portions of the Lolo and Bitterroot National Forests. Grand fir is less prominent in the northern half of the Flathead Valley, though it does grow near Bigfork and around Thompson Falls, southwest of Flathead lake.

Unlike many other Northwest trees, **Grand fir** becomes more abundant east of the Cascades in the moist mountain ranges of southern British Columbia, eastern Oregon and Washington, southwest and northern Idaho and western Montana. Extensive forests dominated by grand firs three to five feet thick cover moist mountainsides in Idaho's Nez Perce and Clearwater National Forests at elevations between 2000 and 6000 feet.

Grand fir can quickly colonize a forest opening created by wildfire or timber harvesting. It is both shade tolerant and fire sensitive, characteristics that have enabled it to greatly expand its range since 1911 when Congress put the U.S. Forest Service in the fire fighting business. Since then, it has taken over dryer, more open forests where wildfires were frequent, and ponderosa pine and western larch were the dominant species.

Unfortunately, grand fir is also more susceptible to insects and diseases than are most other western conifers, and its

vulnerabilities have been magnified many times during the drought that has plagued western forests for the last decade. The worst of the West's forest health problem is found in areas that have been overtaken by grand fir in this century.

Grand fir is often confused with ecologically similar white fir, which is native to southern Oregon and northern California. White fir needles are gray-bluish, while grand fir needles are shiny dark green. Hybrids have developed in eastern Oregon and southwest Idaho, blurring the distinction between the two trees. Both trees are favorites with Christmas tree hunters who favor their symmetry. Fresh-cut, their pleasant aroma will fill a holiday house in a matter of hours. Many northwest communities maintain living grand or white fir Christmas trees a hundred or more feet tall.

In Montana, Grand-fir is not an important commercial species, as it is in Oregon, Idaho and Washington. The wood is lightweight, and not particularly strong in a structural sense, but it is ideal for pulping, and makes a fine wall stud.

Subalpine fir is by far the most widespread true fir in the Pacific Northwest. Alpine and subalpine fir are the same species. Both trees have tops shaped like cathedral spires, and both inhabit timberline meadows from the Yukon Territory south through the Pacific Northwest, western Montana, New Mexico and Arizona. Its branches are exceedingly stiff, well suited for survival in heavy snow environs; but unlike most conifers, it is limbed to the ground, where lower limbs are covered by heavy snow pack, protecting the tree from sub-zero winds.

Subalpine fir's superior ability to regenerate under a variety of conditions is critical to its success, since it has many weaknesses and is generally short-lived, seldom surviving more than 250 years. Mature trees 200 years old may be anywhere from one to 140 feet tall, depending on where it grows. Its thin, resinous bark and habit of retaining combustible lower limbs almost always assures its destruction by fire.

The wood is invariably knotty and often defective. It produces small logs used mostly as wood pulp.



Western Larch

About half the nation's western larch grows in Montana, some 945,000 acres. It grows west of the Continental Divide, in the Douglas-fir, cedar-hemlock, and temperate fir-spruce zones. Larch is one of only two American conifers that sheds its needles in the fall. The other is southern cypress, which grows mainly east of the Mississippi River. Of nine larch species in the world, three live in North America.

Western larch is the largest of the larches, and attains its greatest size in Montana, where it occasionally reaches 200 feet tall. Trees

16-20 inches in diameter may be anywhere from 80 to 400 years old. A few live 600 to 700 years. Mature trees have deeply

furrowed, dull, reddish cinnamon-brown bark composed of innumerable overlapping rounded plates broken to form a zigzag pattern of many imperfect diamonds.

Larch is fire-resistant, meaning it tolerates fires that would kill many other conifers with thinner bark. Natural reproduction is helped by fire because its seedlings grow best in full sunlight. As such, lodgepole is its chief competitor.

Larch wood is hard, fine-grained, quite strong and heavy. It is remarkably durable in contact with soil, works well with tools, and is used in a wide range of construction applications. It is a key species for Montana's plywood manufacturing industry.

David Douglas, the Scottish botanist, first observed and described western larch in northeast Washington in April 1826.



Engelmann spruce

Even among those who don't know them by name, Engelmann spruce trees are a favorite. They dominate moist growing sites high in the mountains east of the Cascade Range, where they frequently tower above all other trees.

Engelmann spruce does not tolerate the oceanic climate favored by Sitka spruce, so it seldom grows west of the Cascade Range, though a few small groves have been located in recent years.

The tree is easily recognized from a distance by its tall,

narrow crown with thousands of tassel-like branchlets hanging down from the main limbs. Its distinctive bark is very thin, with a dark purplish or reddish tinge, and its loose scales flake off easily. Like all North American spruces, it has stout, prickly needles, which make it a favorite among gardeners desiring almost impenetrable evergreen hedges. Engelmann needles are four-sided, a characteristic that can be detected by rolling a needle between one's fingers.

Old growth Engelmann spruce typically grows 120 to 140 feet tall on trunks three feet thick. Judging from ring counts, the tree grows slowly but steadily for 400 to 500 years, before it surrenders to wind, fire, spruce beetles, or lightning, which can literally blast the tree to smithereens.

Because of its dense limb structure, Engelmann spruce is quite susceptible to fire, except where it grows in moisture-laden creek bottoms. Along streams, its root structure provides hiding cover for fish, and its overhead canopy provides both shade and cover for moose which feed for long periods in creek bottoms.

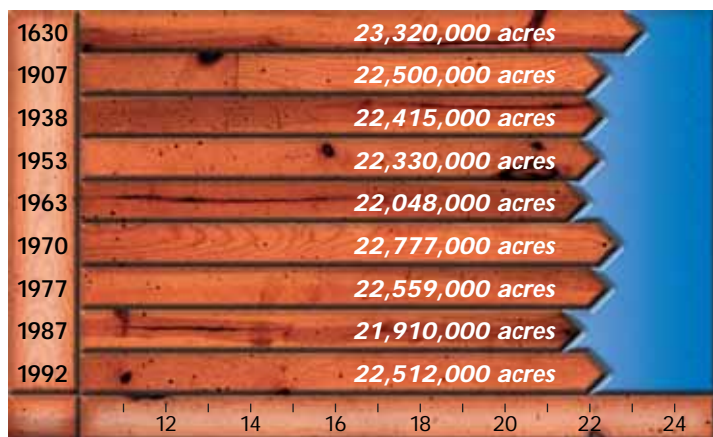
Engelmann spruce wood is creamy white, light-weight, stiff and moderately strong. It is used for many of the same purposes as Sitka spruce, and is popular with fine woodworkers, papermakers, and food container manufacturers, who note the wood is odorless and almost pitch-free. It is also enjoying increasing popularity among Montana's log home manufacturers.

Part Three: Forest Statistics

Forests cover about one-fourth of Montana's land area, some 22.5 million acres, or about one-fourth of the state's total land area. This 22.5 million acre land base is divided about equally between forests east and west of the Continental Divide. Because of the influence of moist air masses that flow in from the Pacific ocean, forests west of the Divide contain many more tree species than are found in forests in eastern Montana. Ponderosa pine dominates "the east side," but "west side" forests include larch, lodgepole, Douglas-fir, grand fir, spruce, western hemlock and western redcedar.

About 96.5% of what was forested in the early 1600s is still forested today. The chart below tracks changes in the size of the state's forested landscape, from 1630 to present day. Changes reflect the influence of several natural and human factors, including forest fires and disease infestations, timber harvesting, community settlement and expansion, plus some changes in how forestland is classified. For example, the definition of what constitutes "forestland" has been revised several times since the U.S. Forest Service began monitoring public and private forestland conditions in the early 1950s.

Forestland 1630 - 1992



Credit: Montana's Forest Resources, USFS, Resource Bulletin INT-81, 1993

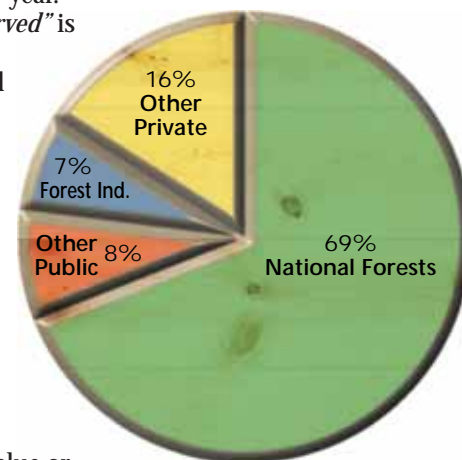
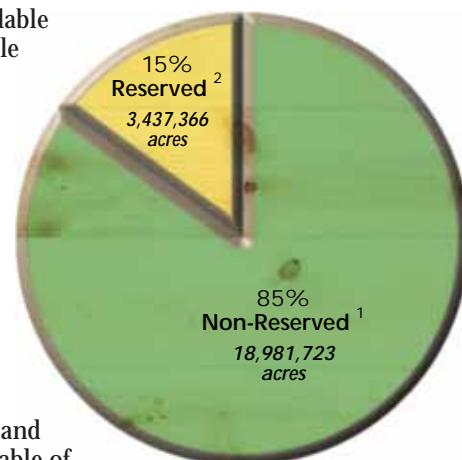
Montana's 22.5 million-acre forestland base includes 22.4 million acres of timberland. 85% of Montana's timberland base is held in unreserved classifications, meaning it is available for harvest, and about 60% of unreserved timber – some 11.4 million acres – is held in national forests.

"Timberland, non-reserved"

is defined as land available for harvest, and capable of growing at least 20 cubic feet of wood per acre per year.

Montana west of the Continental Divide contains some of the most productive forestland in the nation. More than 40% has the potential to produce more than 85 cubic feet per acre per year, and more than 60% is capable of growing between 50 and 119 cubic feet per acre per year.

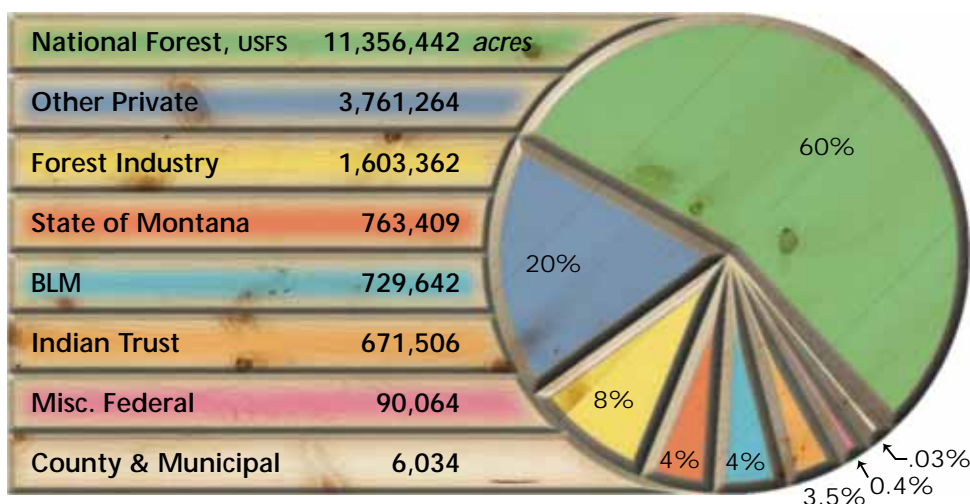
"Timberland, reserved" is forestland that would otherwise be classified as timberland, except that it has been withdrawn from timber utilization by statute or administrative regulation. It is most likely located within wilderness areas or national parks, and is prized for its natural beauty, recreational value or historic importance.



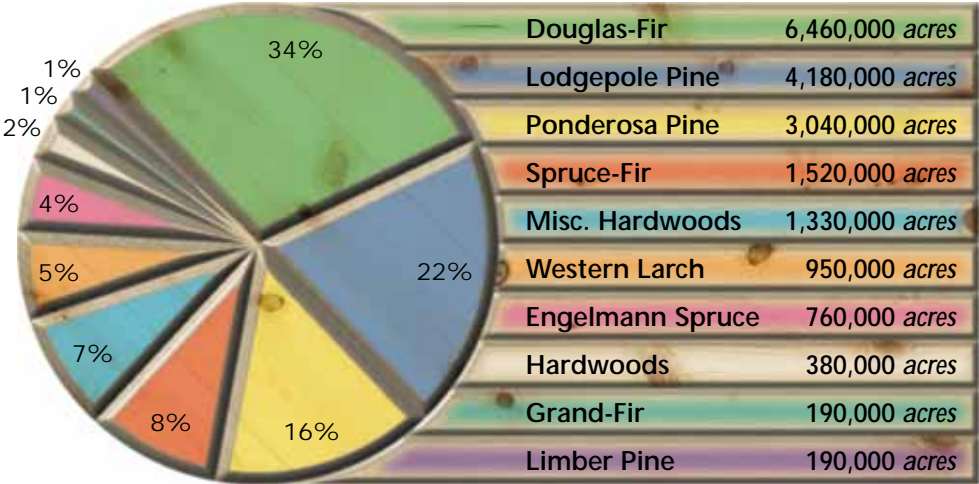
National forests hold 69% of sawtimber volume in Montana. The chart above illustrates sawtimber ownership.

Commercial Timberland Ownership

Montana's 18,981,723 acres of non-reserved commercial timberland is divided between public and private ownerships. The public owns 12,945,591 acres, and another 6,036,132 are privately owned. Ownerships are illustrated at right.



Distribution of forest types on unreserved timberland



Credit: Montana's Forest Resources, USFS, Resource Bulletin, INT-81, 1993

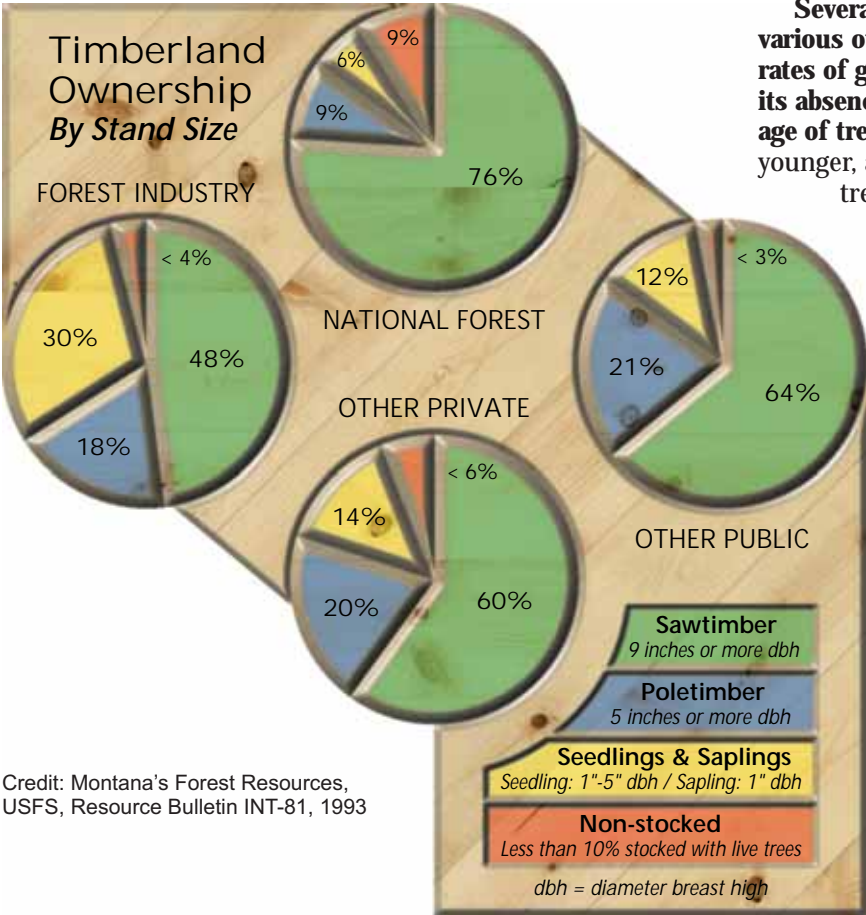
Conifers occupy about 98% of Montana's unreserved timberland base, and Douglas-fir dominates 34% of the unreserved timberland base. Douglas-fir, lodgepole and ponderosa pine occupy 72% of unreserved timber land, some 13.5 million acres. The chart at left illustrates forest types on unreserved timberland.

Montana's unreserved timberland base includes trees of every stand-size classification. Just over 13 million acres, or 69% of the state's timberland is in sawtimber, meaning trees 9 inches or more dbh (diameter breast high) In 1989, net sawtimber volume totaled 90.9 billion board feet. Over half of all sawtimber volume is in trees less than 15 inches dbh, and 74% is in trees less than 19 inches dbh. The chart below illustrates ownership by stand-size.

Net softwood growing stock volume on Montana commercial timberlands exceeds 31.6 billion cubic feet, measured in trees five inches in diameter breast high or larger. How much is 31.6 billion cubic feet? If it were all in one log, the log would be 50 feet in diameter and more than 2,500 miles long. It would stretch from Missoula to Miami, Florida, and then about 300 miles east across the Atlantic Ocean.

Several factors influence the amount of timber held in various ownerships. Among them: landowner objectives, rates of growth and harvest, land productivity, wildfire or its absence, the presence of insects or disease, and the age of trees. Trees grow more rapidly when they are younger, and Montana's private forests hold many young trees, a direct result of the liquidation of old growth inventories, and increasing growth in newer plantations.

In 1988, total timber growth on all Montana ownerships was estimated to be near 857 million cubic feet, but losses due to mortality from insects, diseases and wildfire totaled more than 199 million cubic feet, so net growth – growth minus mortality – totaled 658 million cubic feet, a 2.1 percent increase in growing stock volume. Douglas-fir accounted for about one-third of total net cubic-foot growth.



Credit: Montana's Forest Resources, USFS, Resource Bulletin INT-81, 1993

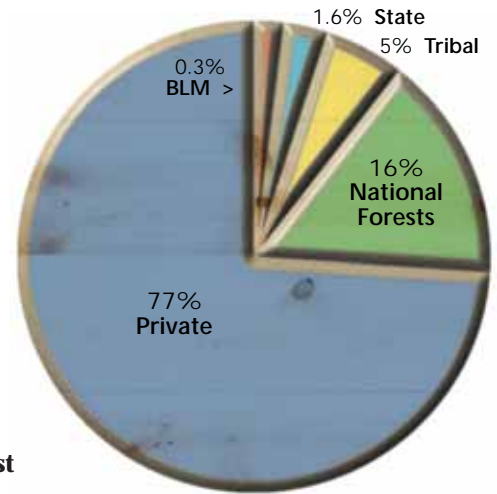


The state's timber industry is concentrated in western Montana, where 75% of the harvest occurred in 1993; and even more so in four northwest Montana counties: Flathead, Lake, Lincoln and Sanders, where more than half the total 1993 harvest occurred. But the harvest level in northwest Montana has dropped almost 30% since 1976, from 720 million board feet

to 519 million board feet in 1993. The decline is attributed to reductions in federal and industrial landowner harvest levels. The chart lower left tracks percent of total harvest by county for selected years.

SPECIES	SAWLOGS	VENEER	PULP	OTHER	% OF TOTAL
Douglas-Fir	23.7	54.9	19.7	12.5	28.7
Lodgepole	31.0	1.0	15.8	71.3	26.3
Ponderosa	22.5	2.2	37.4	0.9	19.1
Larch	6.9	35.1	8.5	0.7	11.6
Spruce	7.1	1.7	5.7	13.5	6.2
True Firs	6.1	3.3	7.2	0.1	5.5
Red Cedar	1.4	0.0	0.0	0.6	1.1
White Pine	1.0	0.1	0.0	0.5	0.8
Hemlock	0.3	0.7	0.7	0.09	0.6
Other	0.008	0.0	0.0	0.0	0.008
Million Board Feet	786.259	169.525	25.973	19.472	1001.229

Percent of harvest by forestland ownership, 1995



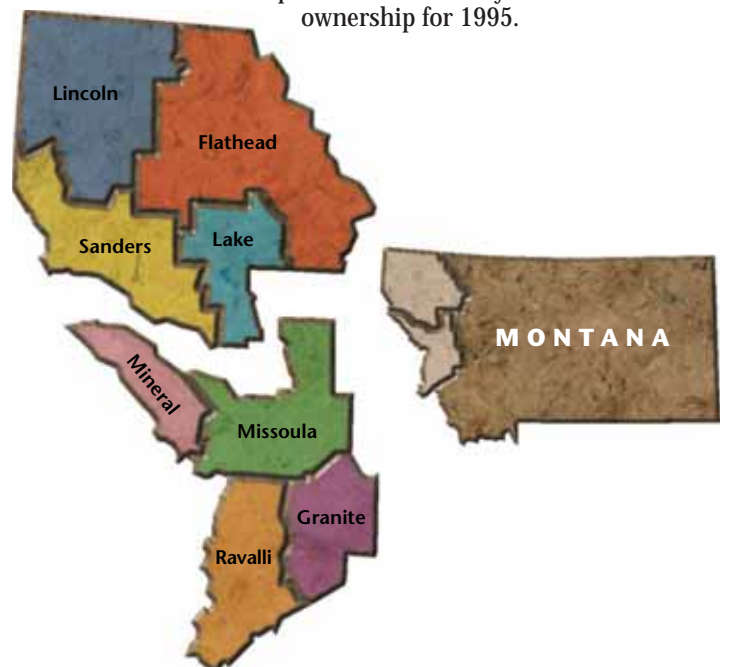
In 1993, Douglas-fir and lodgepole pine accounted for 55% of timber harvested in Montana. When ponderosa pine is added, the three species accounted for almost 75% of Montana's total harvest. Most of what was harvested was used to make lumber and plywood. The chart above illustrates harvest by species, product and percent of total harvest

As national forest harvest levels have declined, harvest levels have increased on non-industrial private (NIP) ownerships. Between 1988 and 1993, NIP harvesting increased 60%, a clear indication Montana's small woodland owners took advantage of a four-fold increase in log prices, brought on by strong demand for lumber and wood products and declining federal harvest levels. The chart above tracks percent of harvest by forestland ownership for 1995.

Timber products harvested by county, 1976, 1981, 1988, and 1993

County	1976	1981	1988	1993
Flathead	(232) 20%	(245) 24%	(255) 21%	(150) 15%
Lake	(42) 4%	(28) 3%	(53) 4%	(53) 5%
Lincoln	293) 25%	(267) 26%	(324) 26%	(208) 21%
Sanders	(153) 13%	(93) 9%	(93) 8%	(107) 11%
Northwest totals	(720) 62%	(632) 61%	(725) 59%	(519) 52%
Granite	(25) 2%	(23) 2%	(29) 2%	(21) 2%
Mineral	(50) 4%	(45) 4%	(40) 3%	(32) 3%
Missoula	(146) 13%	(120) 12%	(141) 11%	(136) 14%
Ravalli	(35) 3%	(41) 4%	(36) 3%	(40) 4%
Western totals	(256) 22%	(229) 22%	(246) 20%	(229) 23%
TOTAL	(976) 84%	(861) 83%	(971) 79%	(748) 75%

Other Montana counties now account for 25% of total product harvest, compared with 16% of the total for 1976.



Forest products manufacturers in western Montana get more than 35% of their sawtimber from public forestlands, while manufacturers east of the Continental Divide get most of their timber from private forest landowners.

The chart at right tracks 1993 harvest source by county and forest landowner.

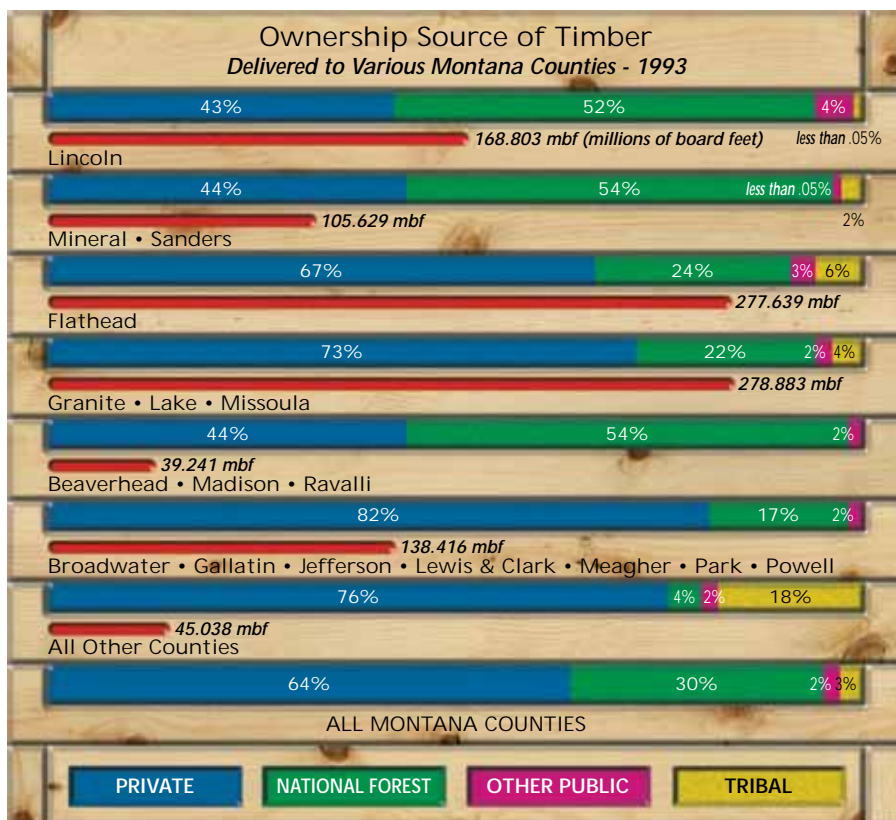
Montana's timber harvest in 1993 and 1994 was about 25% below the average annual harvest for the last half of the 1980s. The major factor behind this decline was an approximate 50% decline in national forest harvest levels, a result of regulatory constraints linked to the federal Endangered Species Act, declining Forest Service budgets and timber sale appeals and timber sale litigation, both sponsored by environmental groups.

Harvesting levels in Montana – and elsewhere in the West – have always mirrored the overall health of the nation's economy. When the nation's economy is troubled, usually as a result of joblessness or high interest rates, harvesting declines, a result of declining demand for housing or other wood-based products.

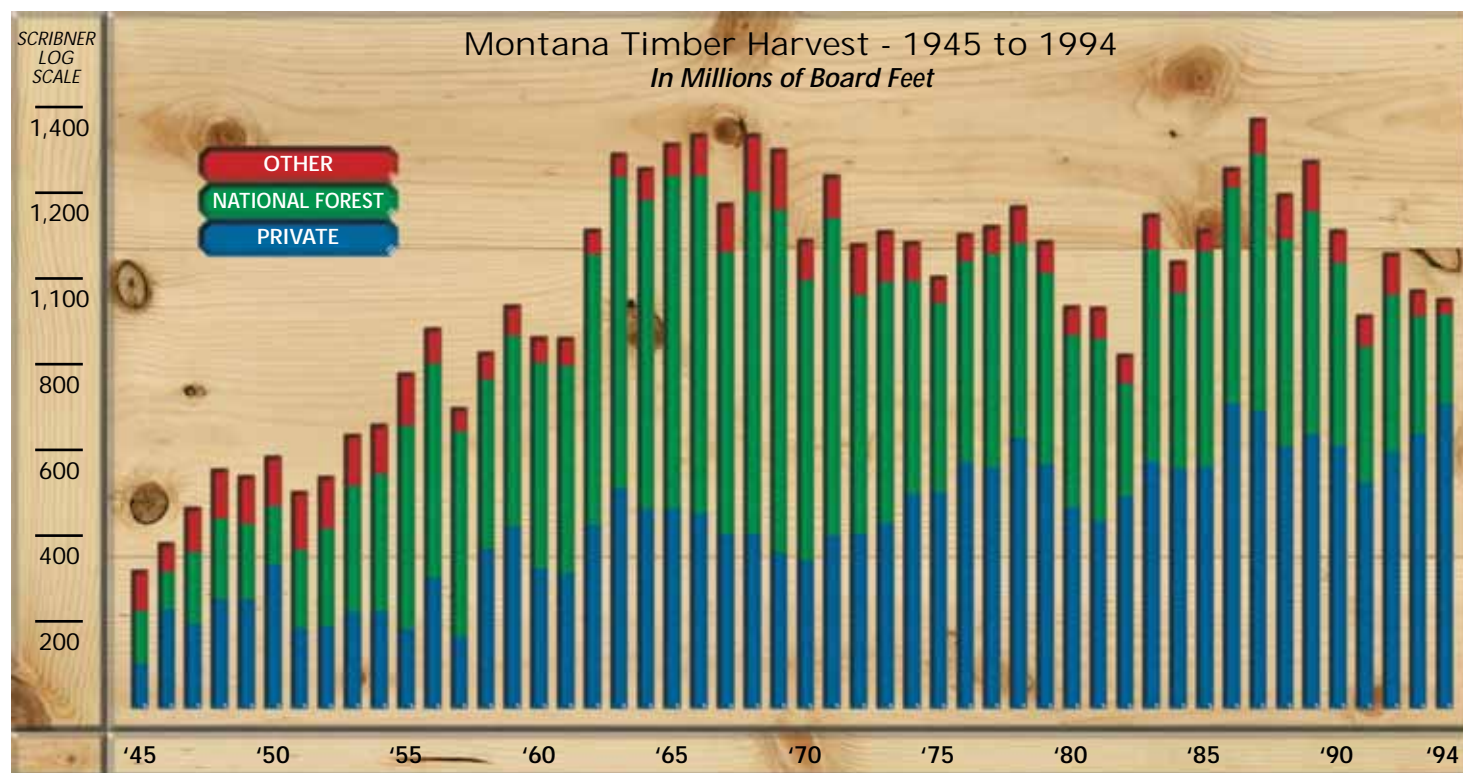
But recent declines in federal harvest levels are politically driven, and run counter to the nation's robust economy, and to predictions global demand for wood fiber will *double* in the first half of the coming century.

The chart below tracks timber harvesting in Montana from 1945 through 1994. Note how harvest levels plummeted in the 1980s, a result of the worst national recession since the Great Depression. Note, too, the post-World War II and Korean War housing booms.

Montana's 1994 harvest - 957 million board feet - is about 20% lower than the 1.2 billion board feet harvested in 1988, and reflects



the aforementioned 50% decline in national forest harvest levels, measured from the last half of the 1980s. Absent a change in federal timber policy, national forest harvest levels will probably continue to decline, a result of timber sale appeals, litigation, endangered species protection and the cumulative effects of past harvesting.



Credit: Montana's Forest Products Industry, A descriptive analysis, 1969-1994, Bureau of Business and Economic Research, University of Montana, 1995

Part Five: Harvesting Regulations

Many people believe loggers can harvest timber whenever and wherever they desire, without regard for the environment. This is not true. Both state and federal regulations limit when, where and how logging operations are conducted.

Among the most important federal laws: the National Environmental Policy Act, the National Forest Management Act, the Clean Water Act, the Clean Air Act and the Endangered Species Act.

State laws vary widely. For example, Montana does not have a forest practices act that offers a direct comparison with forest practices acts that regulate management activity on private forestlands in Oregon, Washington and California.

In Montana, lawmakers chose a less formal two-step approach similar to one taken by their counterparts in Idaho. First, they worked with forest landowners to create forest stewardship guidelines called "Best Management Practices." Second, they ratified state laws that protect both water quality and fish and wildlife habitat. Though newer and less formal than regulatory processes in Oregon, Washington and California, Montana's approach is producing similar environmental benefits.

Best Management Practices

Montana's Best Management Practices are explained in a beautifully illustrated 32-page booklet developed by the Montana Department of State Lands. In well defined sections, it discusses the impacts of roads and road construction, *how* to design low impact timber harvest, and *why* protecting water quality and streamside fish and wildlife habitat is so important. The booklet is must reading for anyone interested in the on-the-ground interface between logging, forestry and environmental regulation.

Although the regulations described in the booklet apply to all Montana forest landowners, the booklet is designed primarily to serve the information needs of smaller private forest landowners unable to afford the cost of employing foresters, wildlife biologists and other specialists that work for public land management agencies and large industrial forest landowners.

Road Design, Construction and Maintenance

Forest road construction standards have been upgraded significantly since the early 1980s, a result of numerous scientific studies which demonstrated that poorly designed roads were a major source of stream sedimentation.

During spring runoff, poorly designed roads, or roads built in the wrong places, can act as man-made streams, carrying excessive amounts of sediment into rivers, streams and lakes. Where sediment settles back to the bottom, it can plug spaces between rocks and pebbles where fish have laid their eggs, suffocating unborn fry.

Imagine the potential scale of this problem in a state the size of Montana, where more than 11,000 individuals own more than three million acres of forestland, mostly roaded. Then add the thousands of miles of roads that provide Montanans with easy access to their national forests. Now you can see how poorly constructed or maintained roads

might be a problem. BMP guidelines provide landowners with science-based knowledge they can use to locate, design, construct and maintain roads, bridges and culverts that minimize the risk of erosion.

Streamside Management Regulations

At least 11 western Montana communities get their drinking water from forest watersheds, so there is great public interest in maintaining the purity of groundwater stored in forest drainages. For this reason, *and to protect streamside fish and wildlife habitat*, strict rules limit harvest activity in designated "streamside management zones." Montana's Streamside Management Zone Law prohibits activities that pose a threat to water quality, soils, or fish and wildlife habitat. Among them: broadcast burning; operation of wheeled or tracked vehicles, except on established roads; clearcutting; road construction, except when necessary to cross a stream or wetland; storage, use or disposal of hazardous wastes in a manner that pollutes streams, lakes or wetlands; or dumping gravel, dirt, rocks or logging slash into streams, wetlands or watercourses.

By definition, streamside management zones, or SMZs, are mandated 50-foot buffers on *both sides* of protected streams. An SMZ can never be narrower than 50 feet on one side of a stream, but it can be wider if there is a need to protect an adjacent wetland, marsh or bog. SMZ width is automatically increased to 100 feet if the streamside slope is greater than 35 percent.

Soils found along streams provide ample evidence of their own need for protection. Here, beneath lush plant growth, the soil consists of layers of decomposing plant matter, plus live roots put down by small plants as well as trees. These layers of living and dead plant tissue act like a sponge, collecting water during spring runoff, then releasing it into the stream during subsequent dryer summer months.

Heavy machinery can damage these soil layers, impairing their ability to collect and store water. Careless timber harvesting can also damage soils, especially if streambank trees are removed. Thus, the need for strict controls on the kinds of harvesting permitted in SMZs, even on private forestland.

SMZs are *not* no-harvest areas, but trees selected for harvest can only be removed by machines capable of reaching into the zone, without actually entering it, or by the use of cables. And as noted earlier, clearcutting is forbidden in SMZs, and at least 50 percent of trees 8 inches in diameter or larger must be left in *each* 100-foot stream segment, on *each* side of the stream, to protect water quality, fish and wildlife habitat and soils.

Stream Classifications

Montana uses the same **Class 1, 2 and 3** stream classification system used in other Pacific Northwest states. Under this system Class 1 streams are afforded the most protection. Within Class 1 SMZs, at least 50 percent of all trees 8 inches in diameter, or larger, must be retained to protect soils and provide thermal and hiding cover for fish and wildlife. Here are the basics of the three classifications.

Class 1 stream segments: Support fish; or do not support fish but flow at least six months of the year, and contribute surface flow to another stream, lake, reservoir or pond covering an area greater than one-tenth of an acre.

Class 2 stream segments: Do not support fish, but *do* contribute flow to another stream, lake, reservoir or pond covering at least one-tenth of an acre; and flow for less than six months; or do not contribute surface flow to another stream,

lake, reservoir or pond, but do flow at least six months of the year.

Class 3 stream segments: Have no fish, rarely contribute surface flow to another body of water and normally do not flow more than six months of the year.

Timber Harvesting and BMPs

Montana's BMP guidebook also includes a section explaining how to design a harvest plan that fits both terrain and tree species. Emphasis is placed on minimizing erosion on haul roads and log skidding trails. Terrain dictates which logging systems work best, so the booklet also includes a detailed discussion of suitable systems. Steeper hillsides are best logged with "skyline" systems that suspend logs above the ground, minimizing soil disturbance and erosion. Tractors and bulldozers work better on flatter ground where soils are less likely to erode.

BMP Audits

Although Montana Best Management Practices are voluntary, compliance is audited by Montana Department of Natural Resources and Conservation. On site inspections are conducted by interdisciplinary teams that include a fisheries biologist, a forester, a hydrologist, a representative of an environmental group, a road engineer and a soils scientist.

The most recent audits, completed in 1994, revealed BMPs were adequately applied 91 percent of the time, with an effectiveness rating of 93 percent. This means that 93 percent of logging activities – such as road building and log skidding – employed practices which adequately protected water quality.

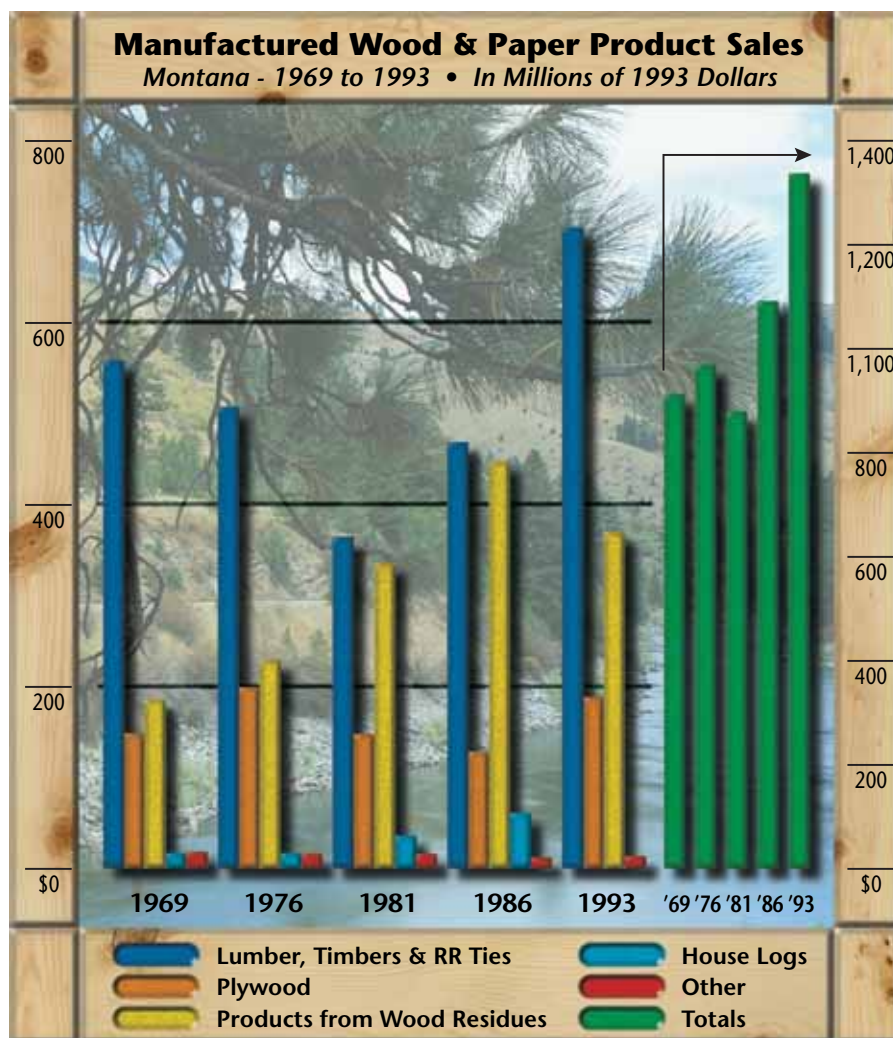
In 1994, the rate of compliance with BMPs was highest on privately owned industrial timber lands. A slightly lower rate was recorded on state trust lands, but state lands matched the 97 percent effectiveness rating recorded on industrial lands. The effectiveness ratings for federal and non-industrial private lands were 89 and 90 percent, respectively.

The 1994 report reflects significant improvement since 1988, when the first audits were completed. The 1990 audit reported 78 percent compliance with BMPs, and an 80 percent effectiveness rating. Moreover, the average number of departures from BMP application declined from nine per audit in 1990 to 3.9 in 1994, a fact widely attributed to the Montana Loggers Association's Accredited Logging Professional Program, a voluntary program designed to help landowners do a better job of complying with Best Management Practices. Since 1989, when BMPs were adopted, hundreds of loggers and foresters have participated in MLA-sponsored workshops and field exercises.



- **1993 forest product sales were \$1.336 billion, up 15% from 1987.** During the period lumber sales account for more than half of all product sales. Log home sales increased 60% since 1988 and 270% since 1981, due to the rapidly growing popularity of log homes, especially larger log homes purchased by homeowners who perceive log structures are somehow more natural than conventional wood-frame houses. Below is a chart that tracks sales by product for selected years. Lower sales in the early 1980s reflect the worst national recession since the Great Depression.

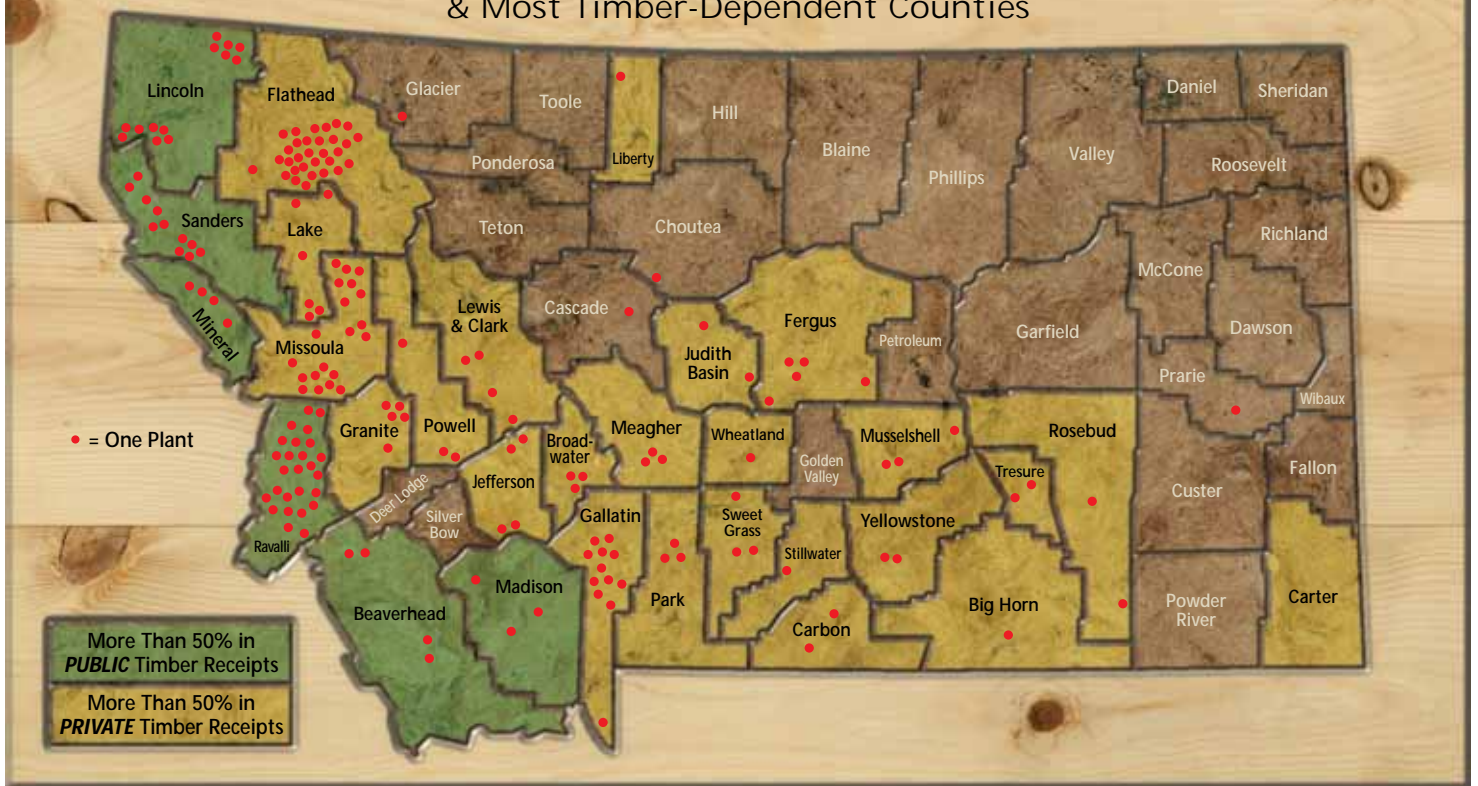
- **In 1993, Montana sawmills produced 1.367 billion board feet of lumber, more than 4% of total U.S. softwood output, and about 3% of U.S. consumption.** Plywood plants produced 687 million square feet of 3/8-inch basis plywood, 3% of U.S. structural panel production.



Credit: Montana's Forest Products Industry, A descriptive analysis, 1969-1994, Bureau of Business and Economic Research, University of Montana, 1995

(1) Wood residues include chips, sawdust, shavings, trimmings, edgings, bark and peeler cores. Products made from wood residues include kraft pulp and paper, wood pellets, electric energy and particleboard and medium-density fiberboard, which are now two of Montana's most important forest products.

Primary Forest Products Manufacturing Facilities & Most Timber-Dependent Counties



Credit: Montana's Forest Products Industry, A descriptive analysis, 1969-1994, Bureau of Business and Economic Research, University of Montana, 1995

• **There were 192 primary products facilities operating in Montana in 1993.** Of these, 159 were located in counties in west and southwest Montana. The map above shows the location of primary forest products manufacturing facilities statewide.

• **Manufacturing facilities operating in Montana in 1993 are as follows:** 86 sawmills, 4 plywood plants, 1 medium-density fiberboard plant, 1 particleboard plant, 1 pulp and paper mill, 59 log house and log home plants, 31 post and pole plants, 2 cedar products plants, 1 utility pole plant, 5 wood pellet plants and 1 wood-fired electric generating facility.

• **Major markets for Montana forests products include the North Central States, the Far West and the Intermountain region, including Montana.** The percent of total shipments by regional destination is indicated for selective years in the lower left table.

• **Between 1988 and 1993, federal harvest levels declined 50% in Montana, leading to a 25% loss in wood products manufacturing capacity.** Even so, the state gained 13 new wood product manufacturing plants during the same period, and employment has remained relatively stable for the past three years. Among the contributing factors:

- ◆ 69% growth in the log home manufacturing sector between 1988 and 1993, stimulated by homebuyers who see log homes as a way to get "back to nature."
- ◆ Timber stumpage and finished wood product prices rose sharply, (See Footnote 1, p. 23) providing incentives to (1) maximize wood recovery through use of more labor intensive manufacturing processes and (2) use lower quality timber (See Footnote 2, p. 23) , which requires more labor to harvest and process.
- ◆ Changes in log flows, which made Montana a net importer of logs purchased in other states and Canada.
- ◆ Environmental and social concerns for the visual and biological impact of logging, leading to development of more labor intensive logging practices.

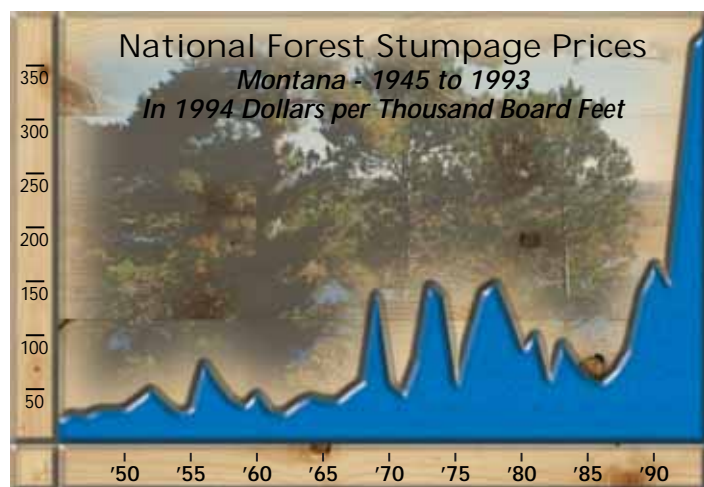
Major markets for Montana wood products

Regional destination	Percent by year			
	1976	1981	1988	1993
1. Montana	10	7	5	10
2. Far West	15	22	17	15
3. Rocky Mountain	12	14	11	15
4. North Central	40	34	40	37
5. South	9	10	10	11
6. Northeast	7	6	7	6
7. Export	2	3	9	6
8. Unkown	5	4	1	0

Credit, Montana's Forest Products Industry, A descriptive analysis, 1969-1994, Bureau of Business and Economic Research, University of Montana, 1995

Footnote 1: The chart below tracks Montana national forest stumpage prices from 1945 through 1993. It illustrates the impact log prices have on lumber and wood product prices. Log prices go up for only one reason: demand for logs exceeds available supply. This can occur because of strong product markets, or because available supply has been artificially constrained by environmental regulations. When log prices go up, prices for finished products also trend upward. Manufacturers also work harder to utilize low quality fiber simply because there is a market for it. Better consumer markets or log shortages also stimulate more competitive bidding for logs sought by pulp/paper and lumber/panel manufacturers, causing log and finished product prices to spiral upward.

Footnote 2: Many people mistakenly believe small logs require more labor intensive manufacturing processes than do larger logs. Actually, small log manufacturing is less labor intensive, because their uniformity lends itself to automated manufacturing processes. Log quality is what determines labor intensity. As a general rule, poor quality logs require more processing than do higher quality logs.



Credit: Montana's Forest Products Industry, A descriptive analysis, 1969-1994, Bureau of Business and Economic Research, University of Montana, 1995

- Forest industry employment in Montana peaked at 13,500 in 1978.** By 1982, recession-related market forces had driven it below 10,000; but by 1989 improving consumer markets had pushed it back to 11,986. Since then, employment has been in slow decline, a result of mill closures forced by the precipitous decline in federal timber harvesting. Currently, about 11,000 Montanans hold logging and milling jobs.

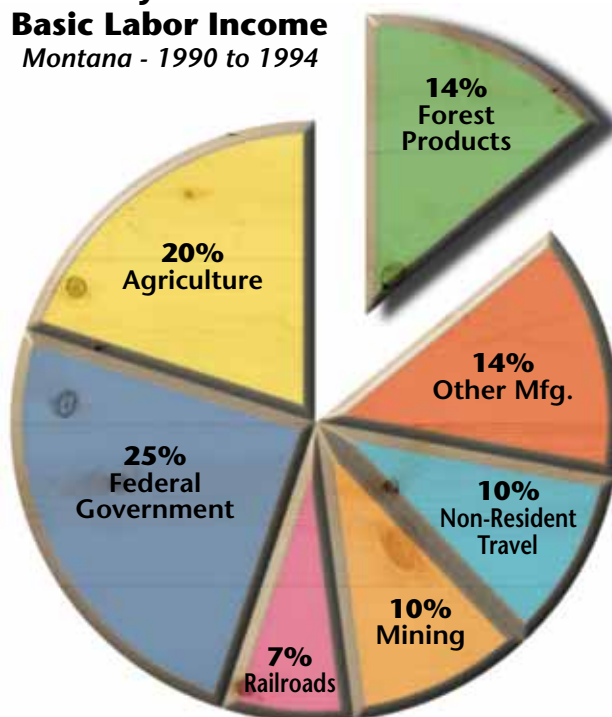
Future employment stability depend largely on hoped-for increases in the national forest timber sale program, which in turn hinge on wide public acceptance of Forest Service plans for using silvicultural thinning techniques to restore more natural forest conditions in Montana's national forests.

Montana's non-industrial private lands will also contribute to more stable employment in logging and milling sectors, but only so long as log prices remain high. Woodland owners tend to withhold their timber when log prices decline.

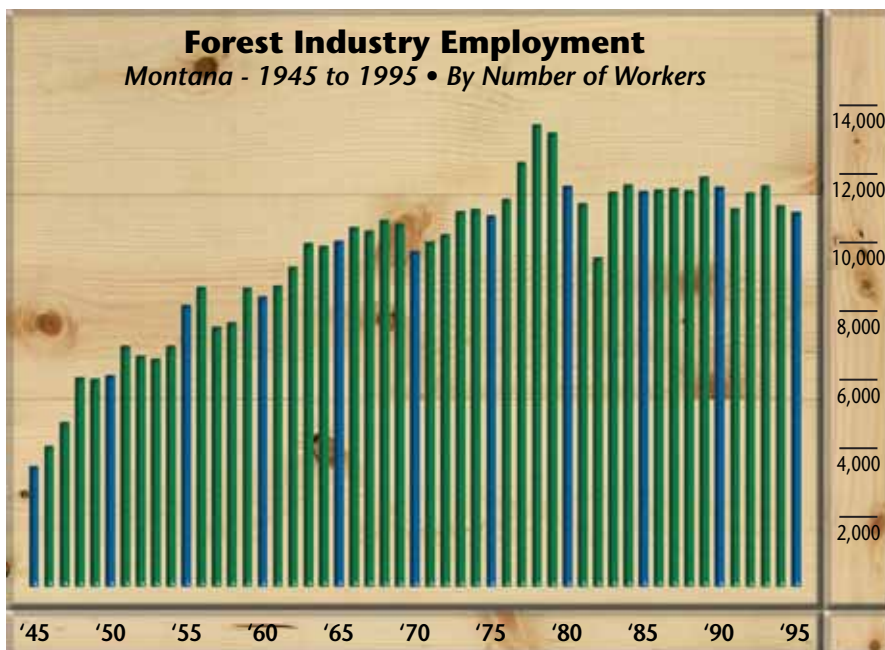
The chart at right tracks forest industry employment in Montana from 1945 to 1995.

- Between 1990 and 1995, Montana's forest products industry accounted for 15% of basic industry labor income and 10% of the state's basic employment.** The chart nearby illustrates shares of basic labor income for the state's major industries. Forest products manufacturing ranks third, after the federal government and agriculture.

Industry Shares of Basic Labor Income
Montana - 1990 to 1994



Credit: Montana's Forest Resources, A descriptive analysis, 1969-1994, Bureau of Business and Economic Research, University of Montana, 1995



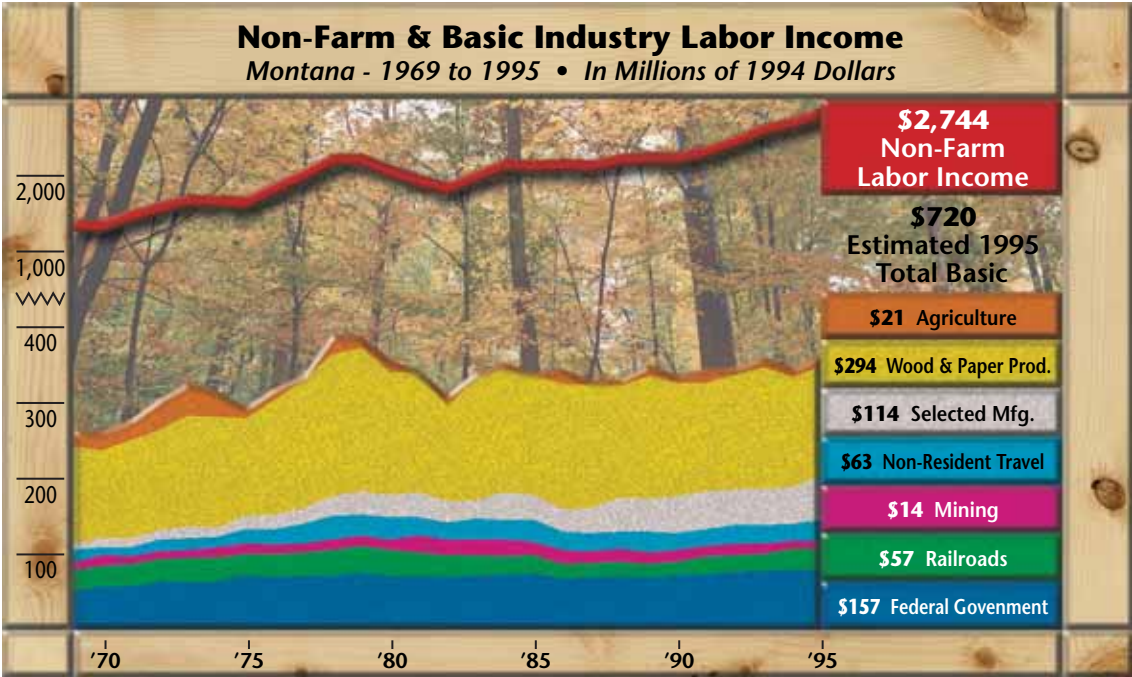
Credit: Montana's Forest Products Industry, A descriptive analysis, 1969-1994, Bureau of Business and Economic Research, University of Montana, 1995. Montana Forest Industry Employment, 1945-1995

- **More than 80% of forest industry labor income and employment is concentrated in western Montana counties.** Logging, trucking and milling are the major component in most communities in Flathead, Lincoln, Lake and Sanders, Granite, Mineral, Missoula, Powell and Ravalli counties. Although mill closures have been concentrated in these counties, the forest products industry still accounts for 41% of basic labor income. The chart nearby tracks income in western Montana, 1969 through 1995.

- **Thirty-four Montana counties receive a share of the revenue derived from the harvest of timber held in Montana national forests.** Fiscal 1995 receipts totaled \$10, 555,715. Receipts represent 25% of the total dollar value of timber harvested from national forests in Montana. By law, counties must divide receipts equally between their county school and road budgets. The federal government does not pay property taxes to counties in which its national forestlands are located so, in principle,

harvest receipts are payments in lieu of property taxes. Receipts vary from year to year as a function of the amount of timber harvested; but the trend is downward, as the federal government de-emphasizes harvesting and timber management in national forests. Smaller portions of total receipts come from fees collected for grazing, mineral development, recreation and land use.

The table below tracks total receipts for the last six years, plus receipts to the five western Montana counties that receive the most money.



Credit: Montana's Forest Products Industry, A descriptive analysis, 1969-1994, Bureau of Business and Economic Research, University of Montana, 1995

- **Timber harvesting and mineral leases on Montana state trust lands also generate income for schools across the state.** Over the past five years, trust land management activities have returned an average \$26.3 million per year to school trusts. These lands span more than 6.3 million acres, and include 5.8 million acres granted to the state by Congress, for school support, in 1889. The Department of State Lands manages timber, surface and mineral resources on these lands, for the sole benefit of the common schools and endowed institutions of Montana. Acreage allocations are listed in the table below.

Land Ownership of Endowed Institutions		
Grant	Surface Acreage	Mineral Acreage
Common school	4,621,158	5,658,841
University of Montana	18,556	33,754
Montana State University	94,838	124,877
Mont. College, Mineral Science, Tech.	59,507	86,250
State Normal School	63,455	88,102
School for Deaf and Blind	36,614	41,211
State Reform School	68,837	78,810
Public Buildings	186,350	231,390
Total	5,149,315	6,343,235

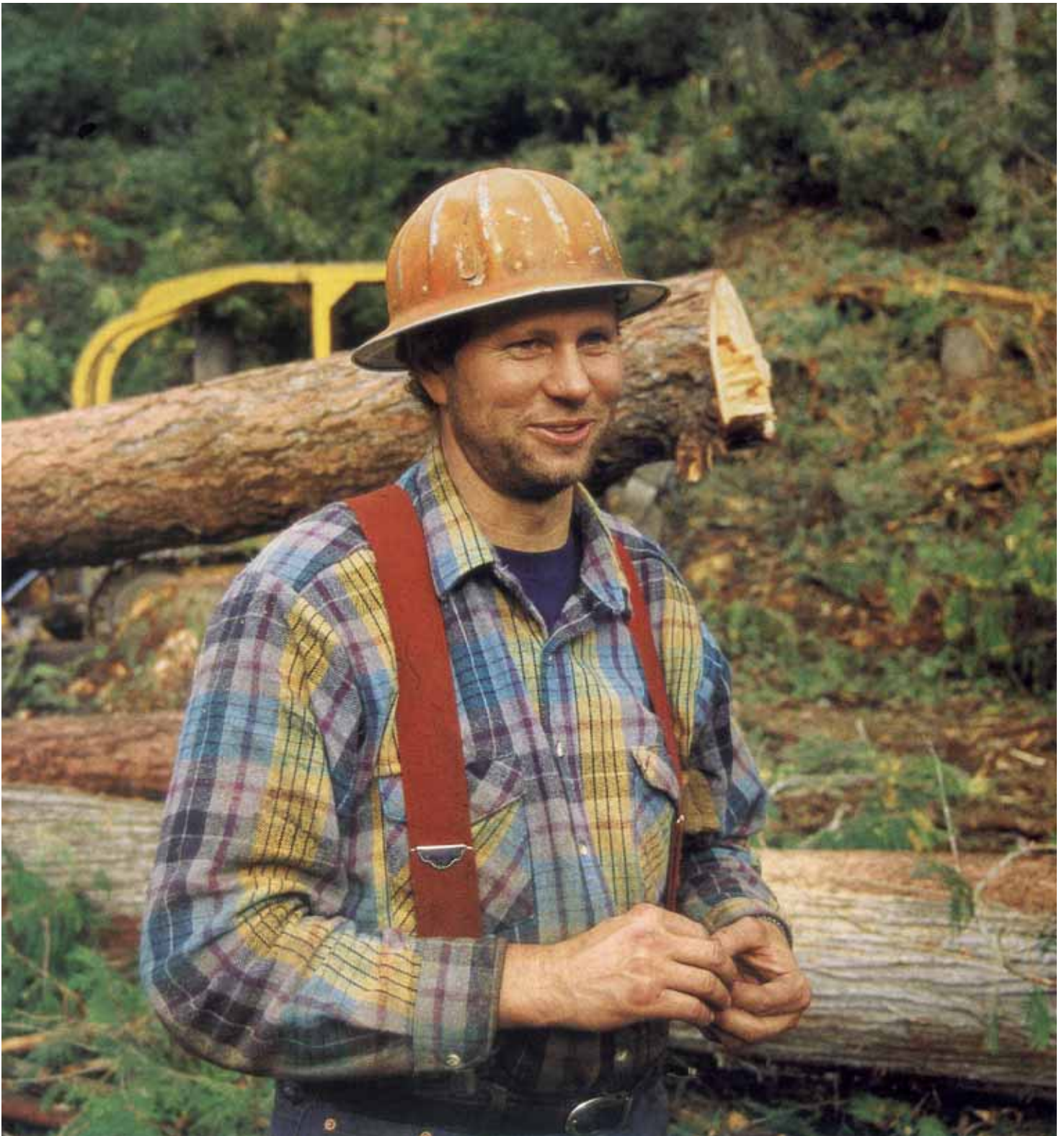
Credit: Data from reports by the Montana Association of Counties

Harvest Receipts Paid to Counties (In millions of dollars)						
Year	Total	Lincoln	Sanders	Flathead	Mineral	Missoula
1995	\$10.55	\$4.52	\$1.29	\$.983	\$.455	\$.452
1994	\$14.48	\$6.12	\$1.86	\$.839	\$1.28	\$1.08
1993	\$13.85	\$6.72	\$1.45	\$1.62	\$.868	\$.831
1992	\$11.83	\$5.41	\$1.59	\$1.35	\$.537	\$.545
1991	\$ 9.00	\$4.51	\$1.05	\$.966	\$.334	\$.349
1990	\$11.14	\$4.93	\$1.37	\$1.03	\$.679	\$.630

Credit: Data from reports prepared by the Montana Association of Counties

- **Montana forest industry workers are well paid, earning an average \$33,258 per year, well above statewide average annual labor income per worker, which stands at \$20,500.** Petroleum refinery workers top the wage scale in Montana, earning an average \$71,000 a year. The chart nearby tracks wages for selected industries.

Annual Wages Paid by Selected Industries			
Petroleum	\$71,017	Construction	\$25,242
Metal mining	\$51,316	Professional services	\$21,625
Smelting	\$42,349	Agriculture	\$14,144
Federal, civilian	\$38,522	Retail	\$13,857
Wood and paper	\$33,258	Hotels, lodges	\$12,892



Facing an uncertain future - Loggers are the first link in a chain of events that provide the nation's consumers with an abundance of wood and paper products. Pictured here is a typical logger. His name is Ron Meeks, and he is a Montana logger; but he could just as easily be from Oregon or Maine or Georgia or Minnesota. His company is small, and those who work for him are veteran loggers, able to meet the toughest challenges, including increasingly complex state and federal regulations which govern their every move in the woods. Many people mistakenly believe loggers can cut timber whenever and wherever they want. In fact, few industries are more heavily regulated than the logging industry. Mr. Meeks is a graduate of the Montana Logging Association's Accredited Logging Professional (ALP) program, discussed in our cover story, which begins on the next page. As you will learn, loggers face an uncertain future in Montana's forests, a result of declining federal harvest levels and new environmental values brought to Montana by urbanites fleeing overcrowded cities. Most know little about the state's forests, or its forest products industry, which they distrust. Mr. Meeks' hometown, Florence, was once a small logging town in the Bitterroot Valley south of Missoula. Now it is a bustling bedroom community inhabited by transplants, many of whom live in expensive log homes. Among native Montanans, the irony has not gone unnoticed.

A scenic view of a lake with mountains in the background and hikers in the foreground. The title is in large, bold, red and blue letters. The text is in a serif font, with the first line in red and the rest in blue. The background shows a calm lake reflecting the sky, with a large, snow-capped mountain peak in the distance. In the foreground, two hikers are standing on a rocky ledge, looking out over the lake. The hiker on the left is wearing a yellow shirt and shorts, and the hiker on the right is wearing a red shirt and shorts. They are both carrying backpacks. The scene is framed by evergreen trees on the right side.

Montana: **Paradise Lost** **or Paradise Found?**

They call it the last best place.
In many ways, it is.
But there is trouble in paradise.
Montana is on a collision course,
if not with itself,
then certainly with the outside world.
This is a story about Montanans
who are trying to save their homeland
while saving themselves.

Alpine jewel - Holland Lake in the Swan Range,
southeast of Kalispell, Montana
(G. Wunderwald photograph, courtesy Travel Montana)

"It was in 1943 that fire was first advocated as a way to rejuvenate forests in the national parks" - by George McDougall, an assistant park naturalist, who was known for having said, "Nature doesn't get enough respect." Although ample evidence indicated that fire was beneficial, and even necessary to a wilderness setting, and although ancient cultures, American Indians and early settlers, had no compunction about making use of fire for farming or hunting, the Park Service, like the Forest Service and the country at large, associated such practices with "bad habits and loose morals," in the words of Bernhard Fernow, a nineteenth-century forester. During the Second World War, posters of an Uncle-Sam-like forest ranger proclaimed that fire control was tantamount to our national defense, and a religious zealot named H.N. Wheeler equated fire control with devotion to God. Walt Disney's "Bambi," in which the fawn and his father are chased almost to their demise by a raging forest fire, inspired Smokey Bear after the war. And Smokey Bear, saying, in a deep, sonorous voice, "Remember, only you can prevent forest fires," became one of the most successful advertising campaigns of all time. By the nineteen-sixties, when more and more forest ecologists had begun to challenge the largely undisputed notion that fire was inherently evil, Smokey Bear was considered the most popular symbol in the country, according to a national advertising-research report and, like Santa Claus, he had his own ZIP Code."

- Thomas Hackett, "A Reporter At Large," New Yorker, October 1989

Montana's forests were forged in fire. For thousands of years, it shaped and reshaped this vast and beautiful land, writing its own history in scars left on huge, thick-barked ponderosa pines that dominated tall grass meadows and lowland forests.

They were mostly ground fires, low intensity blazes that kept the forest floor clear of debris and competing vegetation, leaving ponderosa in uncontested control of a forty-million-acre domain that stretched from Montana south to Arizona and west to California's Sierra Nevada mountains.

Stand-replacing fires, conflagrations that incinerated everything in their path, were virtually unknown in open ponderosa stands. With so many low-intensity fires creeping across an ever changing land-

scape at five to twenty-five year intervals, there simply wasn't enough fuel to start a high intensity fire.

What lightning did not ignite was set ablaze by Indians who routinely used fire to clear away undergrowth, usually to stimulate growth in grasses and forbs, important food sources for game animals, especially deer, elk and bighorn sheep.

Since the last Ice Age, fire has been the primary agent for change in Montana's forests, often working in concert with other agents, particularly insects and diseases that zero in on trees that have been weakened by age, drought or other insects, diseases or fires. In these forests, only the strong survive, a reminder to forest health philosophers that the entire debate can be reduced to only four words.

By itself, random fire is a poor architect. But when frequency, pattern and intensity are added to randomness, fire becomes an artist, sketching forests in its own image. Where fires burn frequently, close to the ground, without generating searing heat, the image is of a landscape that is often as much a meadow as it is a forest. There are not as many trees here as there are in forests where fires burn less often with greater intensity.

The trees you find in forests where fires burn frequently tend to be both fire resistant and shade intolerant, meaning they grow best in open spaces kept open by fire or some other natural or human disturbance. The greatest of these trees is ponderosa followed closely by western larch. For thousands of years, they dominated western Montana's forests.

Ecological meltdown

Everything changed about a hundred years ago. The government drove the Indians onto reservations, and Native fire died out; then early-day loggers cut down too many big ponderosas, leaving precious little natural seed source; and finally, in 1911, Congress reluctantly put the Forest Service in the fire fighting business, quelling the national outcry that followed the 1910 fire. In two terrifying days and nights, it burned across three million acres of virgin timberland in northern Idaho and western Montana. In some places, the trees have never grown back.

Without fire to keep its growing spaces open, and with too few seed trees left, ponderosa began to give ground to interior Douglas-fir. Unlike sun-loving ponderosa, or coast Douglas-fir for that matter, interior fir grows prolifically in its own shadow. In the years after 1911, it blanketed once open landscapes that had been

dominated by pine and guarded by fire for thousands of years. In some areas, as many as 800 fir trees now crowd onto single acres once occupied by no more than 20 or 25 ponderosas. Jammed together in places where they should not be, they compete to the death for soil nutrients and moisture. Their corpses now fuel some of the largest wildfires in western history.

In many ways, the story here is the same as it is in eastern Oregon and Washington, where big fires are burning more often with deadly results. These are not the gentle underburns that once kept Northern Rockies forests healthy. They are blow-torches, capable of overtaking birds in flight. The heat they radiate can melt soil, or create winds capable of uprooting hundred-foot-tall trees.

The public outcry over dead and dying forests in eastern Oregon and Washington is yet to be heard in Montana, mostly because forests here are still green, a fact that camouflages their plight. But in the next ten years, millions of acres of Montana green may turn brown, revealing the timeless march of insects and diseases that prey on forests under stress. Fire will likely follow.

"Excluding fire" is a seemingly benign phrase used by foresters to describe the federal government's fateful 1911 decision to make putting out forest fires the law of the land. What is missing from this phrase is the fact that wildfire is as natural as wind or rain; and what was unknown in 1911 was that wildfire had been *the* force for perpetuating Northern Rockies' forest ecosystems for thousands of years.

"Excluding fire" gives no hint of the ecological meltdown that follows in fire dependent ecosystems turned fire sensitive, to say nothing of the disaster now looming here. But there is not a forester in Montana today who does not understand what is happening. Nor is there anyone who believes even a bear with his own ZIP code can stop these fires. What remains to be seen is whether fire and public policy—opposing forces for most of this century—can now be harnessed in time to pull Montana's forests back from the brink of ecological collapse.

"On a lodgepole pine tree in a northwest Montana forest, a small beetle begins to burrow through the bark. The beetle, about twice the length of the letter "I", rivals the biblical David in its choice of targets. The beetle has picked one of the largest pines in the stand, a tree that has stood against the wind and weight of snow for 120 years. This is old growth in the world of lodgepole.

As the burrowing continues, the tree begins its defense. Resin oozes from the bark. If the tree is healthy, if it has not been stressed by drought, competition, or repeated attack, its resin will wash the beetle out. If the tree is weak, the beetle will penetrate the bark in several hours. There she will emit a pheromone, a chemical signal, that alerts other females and males that a weakened tree can be overcome. Galleries are carved beneath the bark, and eggs are laid. Well before the beetles emerge the following year, the tree is effectively dead.

The record of beetles preserved in amber, the crystallized resin of trees, shows that this battle between host and insect has been ongoing for thousands of years. Within the last one hundred years in this country we have institutionalized the concept of forest management. Our challenge is to integrate this forest management with functioning ecosystems that have been self-sustaining for millennia."

- Forest Health and Ecological Integrity in the Northern Rockies, Edward Monig and James Byler, USFS, Northern Region, 1992



Threatened species - There are about 1,000 grizzly bears in Montana. Canada has another 22,000, and Alaska another 30,000. They have been on the U.S. Fish & Wildlife Service threatened species list since 1975, so protecting their habitat is a major forest issue. The Montana Department of Fish, Wildlife & Parks is trying to convince the federal government the Endangered Species Act needs more flexibility.

A good many Forest Service paths lead to Steve Arno's doorway. Few inside the venerable agency know more about fire, or are more committed to building public support for returning fire to forests in the Intermountain West. It is a daunting task, given the persuasive powers of the bear with his own ZIP code.

Dr. Arno is a fire ecologist at the Intermountain Fire Sciences Laboratory in Missoula, Montana. He is also a prolific writer, so most of what he has learned about fire is revealed in a long-running series of research papers describing the historic role fire played in the Intermountain region, and steps he thinks are necessary to reintroduce more or less natural fire to fire-dependent ecosystems that, in some instances, have not burned since 1910.

Down the hallway from his office stands long dead proof of the validity of his

quest – a four-foot-wide, four-inch-thick elongated cross-section of a ponderosa pine bearing fire scars that date back to 1523, almost a hundred years before the Pilgrims landed at Plymouth Rock. The cross-section was cut from a stump discovered a few years ago on a heavily-timbered mountainside overlooking western Montana's Clark Fork Valley. Judging from the evidence, it lived about 600 years before falling to a woodsman's ax in 1919. Most likely, it was already dead. But its long life is told in ring counts punctuated by the charcoal etchings of 13 fires hot enough to scar its outer bark layer.

The Forest Service has turned the cross-section into a traveling exhibit designed to build public support for fire. Standing before it, I find myself recounting the parallel histories of this tree and western civilization. At its core, long-ago hardened cellulose tissue laid up 200 years

before Columbus set sail for the New World. Great sages of the day believed the earth was flat, and that if you sailed too far you would plunge off the edge. Into what no one knew.

Using my index finger, I trace the history of America.

"There is the fire of 1777," I report to myself. "The Declaration of Independence was signed the year before. There, too, is the fire of 1849, the year gold was discovered in California. And there is the 1869 fire, so close after Lincoln and the Civil War, and all that would follow. And there is the last fire. 1889."

Living trees like this carcass are increasingly rare in the wilds of western Montana, a fact that haunts Dr. Arno, who says their disappearance points the way to a forest in trouble.

"Overstocking is the underlying problem," he declares. "We have far too many trees competing for growing space, soil nutrients and moisture.

Gradually reintroducing fire to these ecosystems will help restore more natural conditions, which will in turn help ponderosa and western larch regain footholds, but our more immediate need is to reduce the increasing risk of catastrophic fire by first reducing stand density."

Environmentalists like the idea of reintroducing natural

fire to forests in the Northern Rockies, but most oppose "reducing stand density," a three-word phrase they believe is code for an industry-contrived plan to use sick forests as a pawn to boost declining national forest harvest levels. But Dr. Arno is anything but an industry advocate, though he concedes he has no patience with those who "rhapsodize about nature but have absolutely no idea what is happening in these forests."

"Letting nature take its course in these forests implies a willingness to accept the consequences of catastrophic fire," he declares. "I am unwilling to accept the ecological consequences of huge, unnatural fires. We can't restore the forests that were here a hundred and fifty years ago, but we can restore the natural processes that created them, and that is what we are trying to do in our research work."

On heavily timbered, low elevation

slopes in the Bitterroot Valley south of Missoula, Dr. Arno and his colleagues are experimenting with different combinations of fire and thinning, fine tuning an ecosystem management approach on which rests the future of forestry in the Intermountain West. Their experiments are part of a larger undertaking, known locally as the Bitterroot Ecosystem Management Research Project, a first-of-its-kind joint venture between the Forest Service's Intermountain Research Station, the University of Montana School of Forestry and the Bitterroot and Lolo National Forests. The objective: develop a long-sought system for predicting forestry's economic and environmental impacts.

The Bitterroot Valley is the perfect place for such a monumental undertaking, in part because it is filling up fast, mostly with out-of-staters who, in the plain-spoken words of one local logger, "live in big, fancy log homes but oppose logging."

It is unlikely most who have moved here know this valley was clearcut in the 1920s. To them, the forest that grew back looks natural, but, in fact, it looks nothing like the forest revealed in old black and white photographs taken in the area before logging began. *Those* photos, taken near Lick Creek in 1909, are of towering, ponderosas with grass beneath them. (See photograph, Page 40)

A watch wound too tight

Today, much of the Bitterroot looks more like a jungle than the park-like 1909 setting. The big, old ponderosa is all but gone, the invading fir is dying, disease is rampant, the fire next time promises to be a colossus, and there is no public agreement on what should be done to avert calamity. All in all, it is a perfect laboratory for Dr. Arno's work. If he is successful here, under the watchful eyes of so many skeptics, he can be successful anywhere.

"Our objective is to break the choke hold fir has on these forests as a result of long years of excluding fire," he explains. "Thinning and reintroducing fire will help restart ecological processes that were



Another threatened species - Montana logger, Ron Meeks, is also a threatened species, but there are no federal laws which protect him from a precipitous decline in national forest timber harvesting in the Northern Region. There are now more grizzlies in Montana than there are loggers, but Mr. Meeks is hopeful. Montana is a big state, and most who live here believe there is room here for both grizzlies and loggers.

present when ponderosa and western larch dominated this area, before Euro-American settlement began."

The first step is what foresters call "thinning from below." Dense stands of stagnant, small-diameter fir are harvested, creating openings around shade intolerant ponderosa and western larch. Reducing stand density reduces the risk of catastrophic fire.

Now the paradox. Once thinned, small control fires are set in the harvest area, to further reduce the risk of uncontrolled wildfire. Reintroducing fire also stimulates rebirth of natural grasses and forbs long ago choked out by fir thickets.

The difference between the destructive power of an uncontrolled wildfire and the more therapeutic value of a controlled burn is perhaps best measured in terms of heat generated. The fire-line intensity of a crown fire usually exceeds 1,000 BTUs per foot per second; but if thinned before

wildfire strikes, a controlled burn would pass through the same area at less than 100 BTUs per foot per second.

By themselves, fire and thinning seem to be of limited long term value. Thinning without then reintroducing fire often makes a bad situation worse, encouraging even more aggressive regrowth in thin-barked fir saplings fire could easily kill. And reintroducing fire without first thinning poses enormous ecological risks, especially in overstressed forests already pushed to the brink by insects and disease. Put thinning and fire together and you have a two-step process that is akin to slowly releasing the tension on a watch mainspring that has been wound too tight.

"Fire is a natural agent of stress, thinning is not," explains Dr. Arno. "That's why it often makes more sense to thin diseased forests before reintroducing fire. Thinning reduces the stress level, making it easier for the forest to tolerate reintroduced fire."

Thinning and tree removal also reduce the "fuel loading level" —the amount of dead combustible material on site— thereby also reducing the otherwise high risk of "escape," another not very vivid term that

tries, but fails, to describe what happens when control fires get away from those who have intentionally set them.

Repeated thinnings and burnings, spaced over a decade or two, are necessary to restart long dormant ecological processes. But the benefits of Dr. Arno's field trials are often visible within two or three growing seasons. Given sufficient growing space, pine and larch respond in kind, offering up glimpses of forests of old. Over time, these stands of even-aged fir will give ground to multi-aged stands of ponderosa, larch, lodgepole and fir, restoring lost natural resiliency and biological diversity.

"We know how to do this, and we know it works," Dr. Arno says of his experiments with fire and thinning. "What we're engaged in is an examination of techniques that will produce the best results under a wide variety of forest conditions."

Small logs, high costs

It takes a day to see all of his experiments. They lay side by side on slopes overlooking the Bitterroot: horse logging is going on downhill from a unit that was logged with a crawler tractor, and will soon be burned. Next door is a unit logged with a farm tractor. It, too, will be burned. Nearby, fire will be used by itself, and next to it a rubber-tired skidder was paired up with fire.

What is remarkable about these harvest units is that none of them looks like a battleground. To be sure, the harvest is plainly visible, but none of the lasting scars often associated with logging are apparent here.

“Good planning and skilled loggers are the keys to success,” Dr. Arno declares. True enough, but no less important to the success of this venture is the skyrocketing price of logs. Sawmills long dependent on now declining federal harvest levels have demonstrated a willingness to pay top dollar for even the smallest logs. Dr. Arno is hoping prices stay high because he, too, is feeling the pinch.

“This project *has* to pay its own way,” Dr. Arno says of his harvest experiments, which cost substantially more than do conventional logging methods. “Forest Service budgets are declining. If we can’t recover our costs by selling these logs to sawmills, we’re out of business.”

The fact that ecosystem logging seems synonymous with small logs and high operating costs adds to the challenge facing Dr. Arno. Costly environmental analyses can help push sale preparation costs beyond the value of the logs, especially in smaller, lower quality timber that typifies stagnant, overly dense stands that need thinning the most.

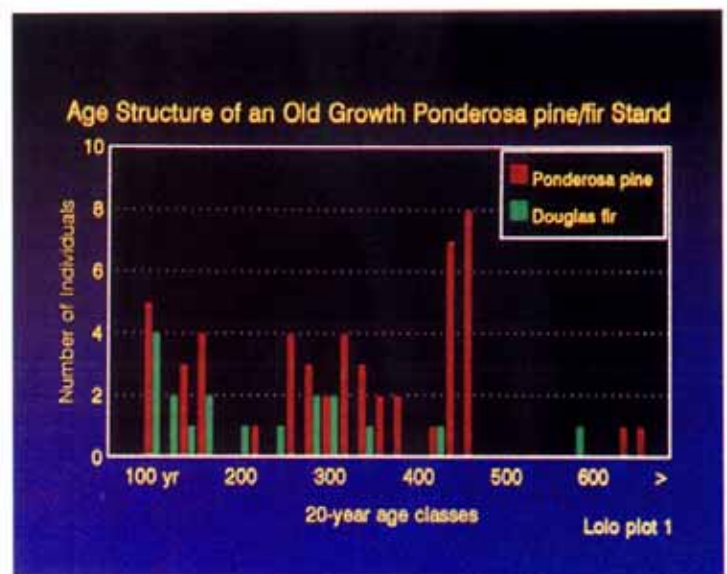
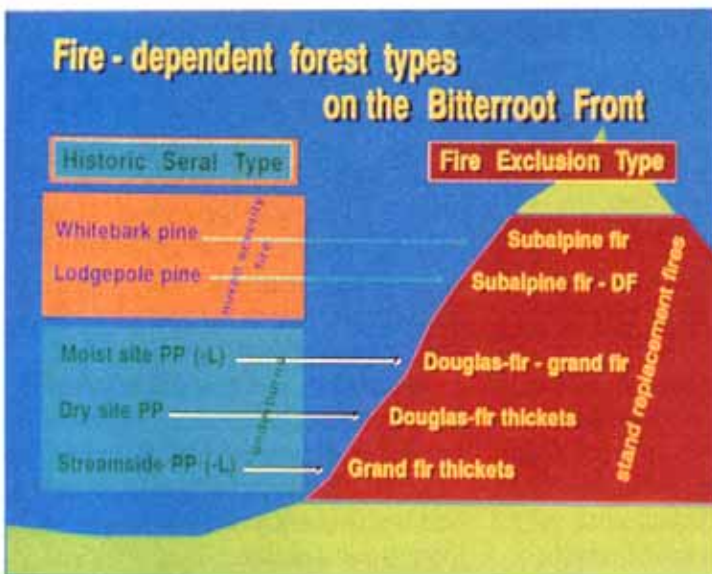
“It is a problem,” Dr. Arno concedes, while casting a wishful eye in the direction of a new tier of small, custom-milling operations gathering momentum in the Bitterroot Valley. We are told *they* would buy these trees if they could, but the Forest Service’s Byzantine bureaucracy works more like a corporate farm – with a “bigger is more efficient” mind-set – and is not geared toward selling small trees to small operators, even when selling small trees might actually help save big trees.

But these diseased forests are much more than ramshackle assemblies of dead and dying junk wood with little or no commercial value. Big trees are also dying from root rot, bud worm and mistletoe, a parasitic plant that grows in the sap layer, robbing its victims of nutrients. Birds carry its sticky seeds from tree to tree, spreading the parasite wherever they fly. Mistletoe was less common in more open, native forests, where it was easily killed by fire; but in the absence of fire, it thrives in overly dense fir stands.

Dr. Arno believes there are too many large, old fir in western Montana’s forests, and he is a gentle advocate for their harvest. “Saving large old fir as a seed source is saving seed for the wrong species,” he explains. “We can harvest many of these large, old firs without threatening the species. It is a necessary step in the process of restoring native ponderosa and larch.”

Necessary, but probably politically unpopular at the moment.

“Someday, there will be a better fit between ecosystem management and the



The impact of excluding wildfire - These two charts tell a powerful story about what has happened in Montana forests in this century. Forest fires have been shaping and re-shaping Montana forests since the last Ice Age, some 10,000 years ago. But the deadly 1910 fire – which burned across three million acres of Idaho and Montana timberland in just two days – so outraged the public Congress was forced to put the Forest Service in the fire fighting business. As the chart on the left indicates, excluding wildfire allowed overly dense stands of subalpine, grand and Douglas-fir to invade mountainous meadows and savannas once dominated by more open stands of whitebark, lodgepole, and ponderosa pine. The result has been deadly. Insects, disease and fire are now the dominant forces in forests that have grown much too dense for the growing capacity of the land they occupy. The chart on the right is a good graphic representation of what old growth forests looked like in the Bitterroot Valley before fire was excluded. At the 5,000-foot level, ponderosa pine dominated uneven-aged stands that also included a small Douglas-fir component. Today, fir dominates, creating a whole new set of forest values, and questions about what to do next. Do we re-introduce fire as a first step in restoring ponderosa across its historic range? It would have a dramatic impact on wildlife species that are dependent on shade tolerant, fir-dominated forests. The resulting pine-dominated stands would also look much different than do present-day forests. Perhaps we should try a less dramatic approach, one that would reduce the ever increasing risk of catastrophic fire, while providing a wider variety of wildlife habitats. (Charts courtesy Dr. Steve Arno, US Forest Service, Intermountain Fire Sciences Laboratory, Missoula, Montana)

forest products industry here in Montana,” he says. “We know it is good for the long-term health of both the forest and the forest products industry, but first we have to figure out how to make our experiments affordable on a commercial scale. If we fail, we will lose these forest resources, and much of the industry they support.”

But building acceptance for this kind of experimentation has not been easy for Dr. Arno or his colleagues. Among many younger Forest Service employees, charged with administering what is left of the Forest Service’s Montana timber sale program, there is a not-so-secret belief it is long past time for the agency to break with its timber dominant past. Here, we are dealing with specialists, many of whom lack the big picture perspective needed to understand how harvesting and ecosystem management fit together.

“The arithmetic here is pretty simple,” says Dr. Arno. “After almost a century of intentionally excluding fire from Inter-

mountain forests, wildfire is again gaining the upper hand. To regain control, we need to treat overstocked dead and dying timber stands that are fueling these fires. Thinning and controlled use of fire are the tools needed to restore natural processes that were present in forests that were here before we excluded fire. If we as a society decide not to use these tools, catastrophic fires will destroy the very forests we all love and are trying to save.”

“We had a helluva opportunity no one else will ever have. We got to work a big piece of ground no one else had ever worked. We worked in big trees and used lots of fire. We were constantly thinning our stands, leaving the best trees behind as a natural seed source. By today’s standard, you would call what we were doing ecosystem management.”

- Russ Hudson, retired forester,
Libby, Montana

To see the future, see the past. And to see what Dr. Steve Arno’s Bitterroot Valley experiments will probably look like in the year 2040, drive four hours north into the vastness that is the far northwest corner of northwest Montana. There you will find a living laboratory, a privately owned industrial forest where what we now call ecosystem management was first practiced almost fifty years ago.

Today, this forest belongs to Seattle-based Plum Creek Timber Company, but it was the original owner, the old J. Neils Lumber Company, that set this forest on a path into history.

Russ Hudson worked in this forest for 33 years, from 1957 until his retirement in 1990. Judging from his storehouse of fond memories, they were the best years of his life.

“We were the first foresters to work this forest,” recalls Mr. Hudson, who is a member of the Evergreen Foundation. “Everything was new. There were no



Rained out - Kalispell logger, Rick Smith, has close to \$2 million invested in high technology logging systems he believes can work efficiently in environmentally sensitive areas. But unusually heavy spring rains turned most of Montana’s logging roads into slippery bogs unable to support the weight of his equipment. Even so, Mr. Smith is luckier than many other loggers because he logs mainly on private land owned by Plum Creek Timber company. Most Montana loggers are dependent on the vagaries of federal timber, but national forest harvest levels have plummeted, a result of timber sale appeals, lawsuits, compliance with the Endangered Species Act and a public perception the Forest Service has placed too much emphasis on timber production at the expense of non-commodity forest resources.

other tracks to follow. We blazed our own trails, literally and figuratively.”

The “we” in this case includes two others: Gene Yahvah and John McBride. Mr. Yahvah went to work for J. Neils in 1950 and Mr. McBride followed in 1952. Between the three of them, they spent more than a hundred years working the same piece of ground together. By any measure you care to apply, theirs is a one-in-a-million story.

The old J. Neils forest, which later became part of St. Regis Paper Company, and still later Champion International, spans more than 200,000 acres, and includes some of the most productive forestland in Montana. It was made even more productive by three young foresters who were first careful observers of nature.

“Let’s be clear on the fact we were in the plantation forestry business from the beginning,” Mr. Hudson explains. “But

early on we observed that wildfire had played a very important role in natural forest regeneration in northwest Montana. In our thinning and stand tending work, we tried to replicate historic fire patterns.”

The results are remarkable, and prove that even in plantation forests, there can be remarkable diversity, not only in timber stand structure, but also in the ages and species of trees. Here you find it all: even-aged stands of ponderosa pine or western larch or ponderosa *and* larch; un-even-aged stands of pine or larch or both; mixed species stands that include pine, larch and fir; or stands with as many as a half-a-dozen different age classes, all products of a carefully applied blend of controlled fire and constant thinning. (See photographs, Pages 41- 43)

Mr. Hudson credits the Forest Service with helping J. Neils perfect its use of fire in combination with thinning.

“In the fifties, we met some Forest Service scientists who were interested in burning,” he recalls. “The Forest Service wasn’t much interested in their research, so they spent a lot of time helping us perfect their techniques on our land.”

There is a lot more to burning than lighting fires in the woods. Weather patterns, terrain, soil type, the amount and type of woody material to be burned, and the timber stand management strategy itself all influence when, where and how fire is used. “Burning cool,” is the key, meaning the fire is not allowed to reach the intensity associated with hot fires, which can destroy soil structure, or even vaporize soil nutrients. But when Mr. Hudson and his colleagues started, there were no textbooks explaining the use of fire, or its benefits. Today, there are many such books.

“We learned by doing,” he recalls.

Prescribed fire – fire intentionally set



Uncertain future - The largest remaining forest products manufacturing company in Montana is Seattle-based Plum Creek, which is also the largest industrial forest landowner in Montana. In its Rocky Mountain region, the company gets about 65 percent of its timber from its own lands. The remaining 35 percent comes from state, federal and tribal, and non-industrial private lands. Region manager, Mike Covey, is not optimistic about the future of harvesting on federal lands. He predicts several national forests in Montana may simply cease harvesting. Among them: the Beaverhead, Helena, Gallatin and Lewis and Clark forests, which all include prime recreation areas. Mr. Covey is shown here at Plum Creek’s Columbia Falls operation, which employs about 900 Flathead Valley residents. Behind the log decks is the company’s state-of-the-art medium density fiberboard plant.

for a specific purpose – quickly emerged as the best way to stimulate seedling growth in harvested areas. The *heat* of fire converts soil nutrients – nitrogen, phosphorous and potassium – to a more soluble form quickly absorbed by young roots. These nutrients are most abundant in small woody debris, which is easily consumed by low intensity fire.

“Seed tree harvest” was the preferred harvest method on company lands. Here, the six or eight best big trees – usually ponderosa pine or western larch – were left standing to naturally reseed openings created by the removal of other mature trees. Trees of this quality could easily reseed a 200-acre site in three or four years. Fire helped, speeding nutrient return to the soil.

Clearcutting was a last resort, a tool Mr. Hudson used perhaps 20 percent of the time, and only when there were not enough big trees to support natural

regeneration of a harvested site. Here, fire played an additional role, reducing large amounts of logging debris, paving the way for planting crews.

But for all of its value as a reforestation tool, fire proved to be wholly unsatisfactory when used by itself as a thinning tool. This may seem surprising, given the role fire played in pre-settlement forests, but as Mr. Hudson noted, “nature is not in the tree growing business, and does not have to make a profit to sustain itself.”

Nor does nature have to concern itself with the economic or environmental consequences of its own excesses.

“Loss of control is always a risk when fire is used as a silvicultural tool,” Mr. Hudson explains. “The risk is particularly acute in young plantations because the bark on young trees is too thin to provide adequate protection from the heat generated by an out of control fire. Years of work and millions of dollars in invest-

ment capital can go up in flames in a matter of minutes. We chose to thin with chain saws because we could control precisely where they went and what was thinned.”

Their careful use of prescribed fire is told in what you do *not* see in forests managed by Mr. Hudson and his colleagues; and what you do not see is evidence of great heat, proving their mastery of fire’s many benefits. What was burned quickly recovered, meaning little or no soil damage. Such is not the case with large, uncontrolled wildfires that often leave scars that are visible for a century or more. Along the Idaho-Montana border the 1910 fire cooked the soil so badly that trees have never returned.

Money in the bank

Prescribed fire and repeated thinnings were not the only stand tending tools St.



Back to nature - Between 1988 and 1993, new log home sales in Montana increased 69 percent, \$61 million. Log homes are especially among two groups: transplants from the nation's metropolitan areas, and affluent out-of-staters who are building vacation homes in Montana. Both buyers share a desire to get “back to nature,” and they view log home ownership as an outward symbol of their quest for a more “natural” lifestyle. Ironically, many of these same buyers are among the first to question timber harvesting from Montana’s forests. Lodgepole is a preferred species among log home manufacturers, but because national forest harvest levels are plummeting in Montana, the state’s log home manufacturers have turned to provincial forests in Alberta and British Columbia. There were 59 log home manufacturers in Montana in 1993, compared with 19 in 1976.

Regis used to improve its lands in northwest Montana. For years, Mr. Hudson and his colleagues were deeply involved in the Inland Empire Tree Improvement Cooperative, a research partnership involving state and federal agencies, three of the region's universities, two Indian tribes and eight industrial forest landowners. The scientific payoffs have been huge, and include blister rust resistant white pine seedlings, plus advancements in seed tree research involving the region's most important commercial species - ponderosa and lodgepole pine, western larch and Douglas and grand fir. St. Regis was quick to apply results of the cooperative's research, especially work concerning fast growing seed trees that display a natural resistance to disease.

"In our harvesting, we always left the best trees behind for seed stock," Mr. Hudson reminds us. "It made good sense because it added to the strength and diversity of the gene pool present on our lands. A good gene pool is money in the bank."

Just about every cutting pattern known to forestry was applied in this northwest Montana forest: seed tree units discussed earlier; shelterwood or selection harvest units, which favor trees of varying ages and sizes, depending on landowner objective; partial cuts, simplified versions of the shelterwood theme; and clearcuts, also called regeneration harvests, which allow a forester to start over with bare ground.

Perhaps more than anything else, the successful use of so many different harvesting strategies underscores the fact that Mr. Hudson and his colleagues were, indeed, very careful observers of natural processes at work on their land.

"You could walk from one gully to the next and see how what had worked over there might not work as well over here without some modification," he recalls. "Put simply, one-size-fits-all, cookie-cutter management strategies, which have been a congressional obsession for years, don't work very well."

No matter the harvesting technique selected by Mr. Hudson and his colleagues, the next step was always the same: replant as quickly as possible, usually within a matter of months, weather permitting. The old St. Regis nursery operation always staged several years ahead of company loggers, ensuring a generous supply of top quality seedlings ready for transplanting.

Patience also seems to have contrib-

uted to their success, a fact that speaks powerfully for the J. Neils-St. Regis conservation ethic.

"When you are trying to grow ponderosa and larch commercially, there is a tendency to want to push fir out of the way too quickly," Mr. Hudson explains. "But fir is shade tolerant and very competitive. If you try to condense your

thinnings, you end up with more fir and less pine and larch. The Forest Service would do well to remember this in their own experimenting in the Bitterroot Valley."

It was heaven

Mr. Hudson and messieurs Yahvah and McBride still live in Libby, and remain



A lighter touch - Seventy-eight year-old Bud Moore stands beside a log deck on his property near Condon, Montana. Mr. Moore, an Evergreen Foundation member, owns a portable sawing carriage, which he uses to mill his own logs, mostly for people living in the Swan Valley southeast of Kalispell. He also does his own logging, using a farm tractor; and he is a fervent believer in what he calls "light touch logging," which he says fits nicely with ecosystem management principles he believes all forest landowners should embrace. Mr. Moore worked for the Forest Service for 40 years before retiring 20 years ago. He was chief of fire management for the Northern Region for many years, and is principal architect of the Forest Service's wilderness fire management policy. In *Young Men and Fire* his old friend and neighbor, the late Norman Maclean, called him one of the Forest Service's "two greatest fire experts."

close friends. Occasionally, they still work together, as they did three years ago after the Sierra Club published its picture book, *Clearcut- The Tragedy of Industrial Forestry*. The book included photographs of the Houghton Creek area, taken on what was then Champion International land southeast of Libby. According to *Clearcut's* authors, Champion had

clearcut the site; but in fact, what was photographed was the aftermath of a 12,000-acre wildfire, caused by a lightning strike in August 1984. The company lost 25 million feet of timber, salvaged what it could, and planted two and one-half million new trees – facts not mentioned in the Sierra Club book.

"Clearcut made me mad as hell,"

declares the normally mild-mannered Mr. Yahvah, who was responsible for company lands in the Houghton Creek area for many years. Though he does not say so, he spent almost 40 sleepless hours fighting the blaze, and was so deeply upset by its devastating aftermath that he was unable to talk about it for a long time.

"Houghton Creek was a beautiful plantation with enormous promise," he recalls. "Some of what burned had never been logged, and what had been logged had been replanted. Moreover, only a small portion of what was logged was clearcut. We used a variety of harvesting regimes, just as we did on all company lands."

New York Times correspondent, Andrew Malcom, wrote about Mr. Yahvah and the Houghton Creek Fire in a *Times* article published in February 1985.

"The fire consumed many areas on which Mr. Yahvah's crews had lavished thousands of hours over the years, thinning and lightly burning to provide maximum moisture and sun for the fastest-growing trees," he wrote. "One stately stand of trees, which Mr. Yahvah helped thin in 1964 when he was 35 years old, would have been harvested when he was nearing 80. Instead, these trees, which had been growing since before President Harding's time, died in a heat so intense that it split boulders. 'When I saw that mountainside,' recalls Mr. Yahvah, 'I almost cried'."

True to his creed, Mr. Yahvah made certain that even in salvage, the best remaining trees—all mortally wounded—were left behind to produce one last seed crop. Today, their offspring rise from the ashes, and are part of a crop of trees that will be thinned for the first time in 2016.

"We had a lot of fun working together," Mr. Hudson says of the years the trio worked for J. Neil, then St. Regis and finally Champion International. "We knew we were making a contribution to the forest and to our community, and we suspected we might even be making forest history. No one can take any of it away from us. It was heaven."

"Successfully salvaging dead and dying timber is both a golden opportunity and a huge acid test for the Forest Service, maybe the biggest test we've ever faced. If we are successful, if we can meet our salvage targets – targets both the Congress and the Administra-



Marching to a different drummer - Montana loggers come in all sizes, shapes and persuasions. Bob Love, who fell timber for big logging companies for more than 20 years, now calls himself "an environmental logger," and by all counts, that is exactly what he has become, much to the consternation of former colleagues who resent his criticism of "production loggers." Mr. Love now works for small landowners for whom commercial harvesting is not a priority. Mainly, they want to thin their forests to reduce the risk of fire, or create more open, park-like settings. He is pictured here in a stand he thinned for entertainer, Jim Nabors. Mr. Love is a director of the Flathead Chapter of the Montana Wilderness Association, a fact he says has stimulated many interesting conversations with fellow members who oppose logging. He is also an admirer of Bud Moore, pictured on the facing page.

tion expect us to meet—if we can meet these targets in a cost-effective manner while protecting environmental values many people believe are more important than the timber resource - if we can do all these things in one motion, it will do much to restore public confidence in the Forest Service, and in forestry itself.”

- Hal Salwasser, Regional Forester,
Region 1, U.S. Forest Service

Region 1—the Northern Region—is the second largest cluster of national forests in the entire national forest system. It includes 15 forests and spans 25,375,333 acres, mostly in Montana, with some spill over into northern Idaho. Only Region 4—the Intermountain Region—is larger. It includes 18 forests and spans 31,903,934 acres, mostly in Idaho. Perhaps then it is fitting that the biggest—and arguably best—forestry decision ever made by a United States

Congress was made here. The decision—made in the aftermath of the three million acre 1910 fire—was to put the Forest Service in the fire fighting business, rather than allow wildfires to continue ravaging forests then considered central to the federal government’s desire to encourage western settlement.

The Forest Service was only five years old in 1910, and ill-equipped to deal with such an enormous fire. In two terrifying days and nights, enough virgin timber fell to fire and hurricane-force winds to fill a freight train 2,400 miles long. Eighty-six people died, most burned beyond recognition. A nation watched in horror. The carnage sent Gifford Pinchot, the first chief of the Forest Service, on a very public tirade against a tight-fisted Congress that had refused him the funding he wanted. He vented his anger in an interview with a reporter from *Everybody’s Magazine*: “It is all loss, dead irretrievable loss, due to the pique, the

bias, the bullheadedness of a knot of men who have sulked and planted their hulks in the way of appropriations for the protection and improvement of these national forests.” (See “A Clash Of Titans,” *Evergreen: The West Is Burning Up*, Winter, 1994-1995)

Fighting the 1910 fire proved to be a hopeless task. Blessed early winter snows eventually put it out. But the conflagration was to forge monumental resolve in the mind of one man who would go on to become one of the Forest Service’s greatest leaders. His name was William Buckhout Greeley.

W.B. Greeley was the first District Forester in District One, which now forms portions of the Northern, Intermountain and Rocky Mountain regions. From a tiny office in downtown Missoula, he commanded 41 million acres of forest and range land, stretching from South Dakota west across Montana and northern Idaho, into eastern Washington. The



The impact of technology - This machine is called a processor. It de-limbs harvested trees, cuts them into exact log lengths, then stacks them in piles for later pickup by another machine. In Montana, and elsewhere in the West, production logging is becoming a more mechanized, less labor intensive business. But the smaller-diameter trees these machines are designed to handle are indirectly responsible for new job formation in sawmills built especially to turn small logs into value added products that require more processing than does conventional lumber. Examples include medium density fiberboard and laminated veneer lumber, value added products made from high quality, small diameter logs. This photograph was taken on private forestland southwest of Missoula. The logger who runs it is college educated, and computer trained.

1910 fire was his to put out. By definition, he failed; but he went on to become the third Chief of the Forest Service, having convinced Congress “running smoke out of the woods” was the first step in encouraging long-term private investment in the nation’s forests. No other decision so altered the nation’s forest landscape, or more profoundly influenced the course of forest development in America.

The ranger in charge

Eighty-eight years have come and gone since Bill Greeley stepped off the train in Missoula. In some ways, not much has changed. Public scrutiny is as intense as it ever was in the Northern Region, and fire is still a problem. Even so, Mr. Greeley would not recognize the world before him. Public interest no longer lies in forest development, but in restoring more natural forest conditions; and the problem with fire is not that there are too many, but that there are seemingly too few.

The ranger in charge is every bit the visionary Mr. Greeley was, and like his predecessor, he is a gifted communicator who seems to be at his best in the line of fire. His name is Hal Salwasser. He is the Regional Forester.

Mr. Salwasser is a forest ecologist by training. He stepped into the limelight about six years ago when he was named the Forest Service’s first Director of New Perspectives. From his post in Washington, D.C. he wrote a series of impressive articles aimed at defining “new perspectives,” a Forest Service term given to “new forestry,” which University of Washington forest ecologist, Dr. Jerry Franklin, had already defined as “a kinder and gentler forestry.”

Mr. Salwasser’s writings reveal a person uniquely qualified to be Region 1 Regional Forester. He has a reputation for being a brilliant strategic thinker who is both politically astute and passionate about his work. Moreover, he is keenly

aware of the global consequences of U.S. environmental policy, a fact pointedly made in a 1991 paper he wrote questioning the value of forest policies that have shifted the nation’s burgeoning demand for wood onto the backs of third-world countries where harvesting is unregulated.

“It is *not* unethical to grow and cut trees in ways that leave soils, waters and ecosystems in healthy condition for the future,” he wrote. “What *is* environmentally unethical and globally irresponsible is to use amounts of wood that we are not willing to produce as prudent land stewards, or to think that we can get by with substitutes for wood that use far more energy to produce and are not as recyclable or biodegradable as wood.”

And then, as only he can, Mr. Salwasser asks us to consider the larger question now facing an America that must import wood because it lacks the political will to grow all that it is consuming: “What good will it do to conserve biodiversity in our



The past as prologue - Horse logging is making a comeback in Montana, for some of the same reasons log homes are enjoying a resurgence in popularity. For many, horses symbolize the romance of the pre-industrial era, but as any horse logger will readily admit, working a big woods team requires skill and great patience. Even so, there are emerging opportunities for experienced horse loggers, especially those who have teamed up with silviculturists who are marketing their skills to small, private forest landowners. Frequently, their lands border streams or rivers where special logging restrictions are enforced, and knowing which trees can be harvested, and which to leave behind, requires a working knowledge of both forests and harvest regulations. Horses can’t keep up with machines, but they do well in sensitive environments because they do less damage to soil and vegetation.

own backyard forests if our society merely depletes the same in someone else's forests to satisfy our wants and needs?"

"The ultimate challenges may not be what we think they are: old growth, jobs, spotted owls, roadless areas, endangered species or even biodiversity," he wrote. "These are important issues we must address, but they are only symptoms of the real challenges: human population growth, consumption and pollution. The real challenge is not to see whether biocentrism can overcome homocentrism as the paradigm of the 1990s, but to develop a new and more useful paradigm: ecocentrism, where people and nature are seen as interdependent parts of the whole."

A realtor runs through it

The Montana that lays beyond Mr. Salwasser's office is a much different place than it was in Mr. Greeley's day. Among newcomers, it is still Paradise Found, but among those who have watched one subdivision after another fill up the Bitterroot, Flathead and Gallatin valleys, it is Paradise Lost. The locals say they are bracing themselves for the sequel to *A River Runs Through It*, Robert Redford's 1992 film based on the late Norman Maclean's best selling book. It will be called *A Realtor Runs Through It*. And in fact, more than 1,000 prospective real estate agents took the state's licensing exam in 1993. Many who come here on vacation never leave. Such is the magnetic power of this vast and beautiful land.

Technology is the force behind the population explosion now reverberating through Montana's river valleys. Fax machines, high speed modems and the worldwide web now link far flung business empires to owners who are the new Montanans. Most could not care less what the state has stood for, or believes in. They have come here believing Montana will now magically reshape itself in their image. When pigs fly.

The environmental movement has had a field day here since the early 1970s when Arnold Bolle, former Dean of the University of Montana School of Forestry, released his controversial "Bolle Report," lambasting Forest Service clearcutting practices on the Bitterroot National Forest. Since then, Northern Region regional foresters have all lived with microscopic scrutiny. There has been intense pressure to forsake timber harvesting for tourist development; and, indeed, tourism has been big

business in Montana for many years. Glacier and Yellowstone National Parks are the big attractions, especially among affluent travelers.

But tourism has lost some of its luster, at least among many environmentalists who now see it as yet another scourge on the land. Environmental writer, Perri Knize, described the fallout in an article published in *Conde Nast Traveler* a couple of years back. "The environmentalists thought tourism would be the salvation of Montana," recalls Sanna Kiesling, the former

lobbyist for the Montana Environmental Information Center. "Now they're saying, 'Just give me a good, clean mine'."

Most Montanans are less judgmental. There is willingness to live and let live, joined to a long-held belief the state is big enough to accommodate just about any industry able to offer steady employment. Agriculture, timber, mining and tourism have peacefully coexisted for many years, and recent attempts by environmentalists to play one against the other have been largely unsuccessful. Attempts to turn Montanans against their timber industry



have also failed. Public support for logging remains strong, though most Montanans now also voice strong support for protecting fish and wildlife habitat, as well as the enormous beauty of their state's national forests.

A new Forest Service role

But Montana's national forests *are* of national interest, a fact that has contributed significantly to a precipitous decline in harvest levels, a huge increase in the number of lawsuits and timber sale appeals filed by environmental

lawyers, and a raging debate over what to do about forests that are dying and burning up in big forest fires that are, themselves, the result of a lack of smaller, more frequent, low intensity fires. Lined up on one side are timber-starved communities that believe dead and dying forests should be harvested *before* they burn up in big fires; and on the other side, environmentalists who believe fires should be allowed to run wild again, and see the so-called "forest health" debate as nothing more than an industry scheme to force increased national forest harvest

levels. Hal Salwasser is the man in the middle, and by all counts, he is having the time of his life.

"The Forest Service is headed back to its roots," he declares with trademark enthusiasm. "We are re-building strong ties to local communities, re-emphasizing multiple use and multiple values, based on better science than we've ever had."

Clearly, Mr. Salwasser does not share the gloom and doom perspective held by many Forest Service veterans who candidly admit they are only marking time until their retirements. Still, he concedes there is deep anger in Montana timber communities, where many feel the Forest Service has betrayed relationships established years ago, when the federal government used its timber-rich national forests to lure private investment to then remote western outposts. Small second and third generation family-owned sawmills have been particularly hard hit by the recent 50% decline in national forest harvest levels. It is not something Mr. Salwasser takes lightly.

"My greatest fear is for a further politicization of the decision making process," he says, steering the conversation toward his vision of a new era in which the Forest Service will shed its leadership role in favor of a consulting role, providing scientific expertise to diverse community groups that will have more, not less, to say about how nearby national forests should be managed. Presumably, such a metamorphosis would return long sought economic stability to timber communities held hostage by the Forest Service's inability to put together a forest management plan national environmental coalitions will support.

"We need to work more closely with affected communities," Mr. Salwasser declares. "It should be our role to provide citizen groups the best information available concerning forest management alternatives, and alternate economic and environmental consequences. Given good information, I believe they will make environmentally sound decisions."

Unless something can be done to ease the flood of lawsuits filed by environmental lawyers, it is hard to see how injecting greater diversity into local citizen groups will cause the warring factions to lay down their arms. But Mr. Salwasser is



Mirror image - Loon Lake, southeast of Libby, Montana, provides a mirror image of timber country. This area is a favorite with hunters, fisherman and campers.

hopeful the coalitions will be diverse enough to account for most environmental concerns, making court action unnecessary.

"If these groups can reconcile the wide-ranging concerns of local economic and environmental interests, outside political forces with no stake in the affected forest community will find it far more difficult to intervene," he concludes.

Bill Greeley mounted a similar argument in 1911, declaring that the best way to protect forests rested in first securing industry's commitment to conservation, working through partnerships pledged to fighting forest fires. His argument cost him his long-time friendship with Gifford Pinchot, who always believed the best way to protect forests was to first regulate the timber industry. In the end, Congress sided with Greeley, who went on to become Chief of the Forest Service.

The Forest Service has a lot riding on its ability to nurture new, community-based constituencies with sufficient diversity to overcome the considerable political strength of Washington-D.C.-based environmental groups known to have easy access to the White House, and to Vice President Al Gore, who is rumored to have taken a personal interest in daily Forest Service operations.

The transition is underway

Meanwhile, Mr. Salwasser is trying to deal with the more immediate ecological consequences of forests that are slowly falling apart, to the detriment of those living in Paradise Lost, as well as those living in Paradise Found. The situation is not yet as critical as it is in eastern Oregon and Washington, or southwest Idaho, but it soon will be if something isn't done. Again, Mr. Salwasser provides the vision.

"The public needs to understand that doing nothing about dead and dying forests will likely have ecological consequences that are worse than the actions that are proposed," he explains. "The risk of catastrophic fire is particularly acute in lower and mid-elevation forests that are frequented by both people and wildlife."

The action that is proposed includes a combination of thinning in overly dense timber stands that are at risk from disease and wildfire, and reintroduction of prescribed burns, an equally important step in restarting natural processes considered essential in fire-dependent ecosystems. All of this will take years to materialize, but the transition Mr. Salwasser first envisioned when he was the agency's Director of New Perspectives is already underway.

"In the past our management was focused at the timber stand level," he explains. "We typically managed 40 to 60



Lick Creek 1909 - This 1909 photograph of Lick Creek shows what forests near Hamilton, Montana looked like before Congress put the Forest Service in the fire fighting business in 1911. The first large ponderosa pine timber sale in the Northern Region began near here in 1906. This photograph shows what lower-elevation, pre-settlement forests looked like in western Montana. They were park-like timber stands dominated by large ponderosa pines, with grass growing beneath them. Frequent ground fires, started by lightning or by Indians, kept these forests open, insuring that fire-sensitive fir did not take over. Indians used fire to stimulate growth in grasses and forbs, which then attracted game animals. Early-day harvesting methods, which favored big ponderosa, also contributed to fir's later dominance. Too few large ponderosas were left to serve as natural seed sources. This, coupled with exclusion of wildfire, allowed fir to overtake pine. (USFS photograph)

acre plots of forest that were assumed to be fairly uniform in composition and structure. Under an ecosystem management approach we are stepping back and looking at larger landscapes, entire watersheds."

Where the rubber meets the road, this new approach will more closely mimic mixed severity or non-lethal fires, where larger trees and fire resistant species survived and thickets were thinned. What this means is that there will be fewer, larger harvest units in some areas and smaller, patchy units in other areas. Thinnings will take the place of more traditional timber sales, and the trees that are harvested will be smaller. Even so, Mr. Salwasser concedes the Forest Service "cannot maintain a timber program based on six-inch logs cut to three and a half-inch tops."

Perhaps then it is fortunate western Montana's diseased forests include many

that occurred in fire regimes present in Montana before we excluded fire."

Products of public decisions

Region-wide, the still unfolding program, with all of its political uncertainties, will probably produce a harvest of between 500 and 700 million board feet annually, well below historic levels, but still more than is currently being sold to mills in Montana and northern Idaho. Much depends on whether the diverse community alliances Mr. Salwasser envisions actually come together. It is too early to predict the outcome, but on one point, Mr. Salwasser is crystal clear: recreating presettlement forest conditions is not in the cards, is not what new forestry is all about.

"Recreating the forests that were here a hundred years ago is not pos-

not be the result of random acts of nature. They will be products of management-related decisions the public makes now. I know of no other way for the nation to get the things it wants from its national forests."

"The federal government is ill-equipped to resolve deep conflicts over natural resource use. New approaches, like ecosystem management, have not been designed to tackle this core problem. It's up to the public to change the dynamic. We need to build diverse coalitions with common goals. With common goals in mind, it is possible to create a land management plan with broad constituent support. The federal role in this process is to provide technical support."

- Seth Diamond, wildlife biologist,
Intermountain Forest Industry
Association



large firs infected with mistletoe, root rot and spruce budworm. When markets are good, these big trees attract timber buyers that might otherwise ignore a small-tree salvage sale.

"Congress has made it clear timber production is part of our job, so quite fundamentally, if we are adopting an ecosystem management philosophy, timber harvest must still be part of the package," Mr. Salwasser explains. "But we will make our harvesting decisions on a landscape or watershed scale, and we will work to replicate the *rate* of disturbance

sible," he explains. "Society would not tolerate the frequency or magnitude of fires it took to create those forests. Nor could those forests produce the goods and services the public now demands. Moreover, many publicly valued plant and animal species found in abundance in today's forests were not here in such numbers when fires were common. I do not believe the public would stand by while they are consumed by wildfire. What we know about presettlement forests can certainly guide us in our decision-making, but future forests will

Lick Creek today - These photographs show what much of the Lick Creek area looks like today. The photo on the left is of an overly dense 80-year-old stand of dead and dying fir trees. If nothing is done here, this forest may burn in a severe wildfire. The middle photograph was taken about 100 feet away, and shows what thinning can do. The work was done by Dr. Steve Arno's son, Matt, a young logger pursuing an advanced forestry degree at the University of Montana. There were about 450 trees to the acre before thinning began; now there are about 200, still more than the 25-50 large ponderosas that dominated this site before wildfire was excluded. The site will be thinned again in about five years, and the best trees will be left behind as a natural seed source. The stand on the right is adjacent to Matt's thinning job. It was harvested a few years ago and is already taking on some of the characteristics of the 1909 Lick Creek photograph.

If the Forest Service is successful in creating new, politically powerful constituencies it can take to the bank, it will be because of the efforts of people like Seth Diamond, a former Forest Service wildlife biologist who is now manager of wildlife programs for the Intermountain Forest Industry Association.

Mr. Diamond's reputation is that of a bridge builder and peace maker, and by all counts, he is very good at it. Among his more notable accomplishments, a landmark joint venture involving his organization, the National Wildlife Federation, Defenders of Wildlife and the Montana Logging Association.

The group, which calls itself Flathead Common Ground, has laid out a plan for restoring more natural forest conditions on 75,000 acres of the Flathead National Forest that lies between Hungry Horse Reservoir, the Great Bear Wilderness and Glacier National Park.

"We are at a crossroads in Montana," explains Mr. Diamond. "We can continue down the path of polarization and litigation or we can build new, more diverse grass-roots coalitions able to develop scientifically sound, economically responsible plans for managing forests and wildlife."

The Hungry Horse area is not what it once was, and given the presence of mighty Hungry Horse Dam, constructed in the late 1940s, there is no chance for re-creating what was here when the South Fork of the Flathead River ran free. But there is a hope that thinning overstocked timber stands, restoring white pine and larch, and reintroducing fire will help restore habitat conditions important to three of Montana's most cherished species: grizzly bears, west slope cutthroat trout and bull trout. It is, to say the very least, an ambitious undertaking, but Mr. Diamond is unfazed.

"Issues and events that have the power to divide people also have the power to bring them together," he says quietly. "Our main objective on the Flathead is to use harvesting as a tool for improving the mix of wildlife habitats."

It is easier said than done, though Mr. Diamond insists there is an enormous amount of common ground shared by industrial landowners and environmentalists concerned about the health and sustainability of western forests. "Where we find common ground, we plow deep," he declares.

Indeed he does. Witness a series of grizzly bear recovery agreements involving forest products companies, environmental groups and the federal government. Here, too, Mr. Diamond's fingerprints are present, though he gives most of the credit to others who worked behind the scenes to bring this most unlikely coalition together.



Experimental forest - This Lick Creek area photograph was taken on Forest Service ground in an area where Dr. Steve Arno and his colleagues are doing a series of harvesting experiments comparing the environmental attributes of horses, farm tractors, rubber-tired skidders and crawler tractors. The more open, ponderosa-dominated area in the foreground compares favorably with the 1909 Lick Creek photograph on Page 40. Note the density of the fir-dominated stand in the background. No thinning has occurred here, and there are too many trees for the growing capacity of this dry site. Once it is thinned, it will begin to look more like the foreground. Pine will again dominate.

Part of the solution

Grizzlies are a powerful symbol of a West that is rapidly vanishing. They were listed as a threatened species in the lower 48 states in 1975. Today, perhaps a thousand of them live in Montana, and there is great interest in furthering their recovery in Idaho and Montana wilderness areas. But grizzly reintroduction is controversial, especially in logging communities where there remains a fear that, once bears are reintroduced, protecting them under the Endangered Species Act could provide the federal government with an excuse to further reduce already plummeting national forest harvest levels. But if the agreement Mr. Diamond helped develop holds, that probably won't happen.

"We see an opportunity to create a new model for endangered species conflict resolution," he explains. "The idea is to give impacted communities an ownership stake in the recovery plan. If

they can be made to believe they are still in control of their own economic destiny they will support recovery efforts, rather than oppose them."

It is a tall order given the history of collapsed agreements between industry and environmental groups. But pragmatism may rule the day; even industry skeptics concede the grizzly is on its way back, one way or the other.

"We can be part of the problem, or part of the solution," Mr. Diamond says. "I want us to be part of the solution."

Industry's contribution to grizzly recovery has not gone unnoticed. Environmental lawyer, Tom France, who is the National Wildlife Federation's representative in the northern Rockies, credits industry and its work force with convincing Idaho and Montana legislators the plan can work. It has not been an easy sell, and in fact some elected officials are still not convinced.

"We can control change or change will

hold more centrist perspectives where forests are concerned."

Editor's note: Seth Diamond, 33, died in an airplane crash July 26 near Libby, Montana, where he was participating in an aerial survey of dead and dying lodgepole timber stands in the Cabinet Range. An Intermountain Forest Industry Association colleague, Ken Kohli, 35, was also killed in the crash, as was their pilot, Al Hall. All three will be sorely missed by their friends and co-workers. Our heartfelt sympathies go out to their families.

"Yes, I believe logging can be done in a way that is publicly acceptable, with a lighter touch on the land; and I have made a huge capital investment in my belief we will have an opportunity to prove the point."

- Rick Smith, logger, Kalispell, Montana



Powerful comparisons - Jane Smith, who works in public affairs on the Bitterroot Ecosystem Management Research Project, holds a diseased 20-plus-year-old ponderosa pine seedling pulled from the ground beneath the big trees pictured on page 41. This seedling is infected with commandra rust, which kills by girdling. If it lives another 20 years, it may grow six feet tall before it dies. Now compare the diseased seedling with the large trunk of 90-year-old ponderosas in the center photograph. It was taken on Larry Creek, a few miles from Lick Creek. Now compare the big ponderosas with the overgrown grand fir thicket on the right. This thicket is about a hundred yards upstream from the center photograph, and is being experimentally thinned. The hope here is to restore big pines.



control us," Mr. Diamond says in his well known matter-of-fact style. "By seizing the opportunity to help develop a grizzly recovery plan, or a forest restoration strategy, we can bring together diverse interest groups and put affected communities in leadership roles. This helps to isolate those who feed on conflict and litigation, marginalizing their political power base. In time, their actions will become socially unacceptable, providing leadership opportunities for those who



The distance between Rick Smith's office, and offices occupied by Steve Arno, Hal Salwasser and Seth Diamond, is probably best measured in light years.

Mr. Smith's office is in his pickup. Office hours begin before daylight, and on most days, he does not get home until long past dark. Such is the life of a Montana logger.

Out here, in the deep woods of western Montana, theory, hope and reality will come face to face. Out here,

the big ideas being bantered about by Messieurs Arno, Salwasser, and Diamond will be tested in the only way they can be tested: on the ground. The significance of this moment in time is not lost on Mr. Smith.

"I have close to \$2 million invested in logging equipment I believe can do the job that needs doing in the woods today," he says quietly. "These are specially designed machines, able to work efficiently in environmentally sensitive areas, along streams and where soils are particularly sensitive."

Mr. Smith grew up in a logging family. His father, Clyde, is something of a legend in northwest Montana. But where the father employed 15 men, the son needs only six to produce the same daily harvest. Such is the impact of more automated, more sophisticated logging systems designed to meet the cost and quality control needs of today's forest-

land managers. And Mr. Smith is well versed where cost and quality control are concerned. He holds a degree in industrial engineering from Montana State University and is a firm believer in what he calls "the absolute necessity" of training loggers.

"Before you stick a man in the cab of a \$300,000 harvester, you better know that he knows what he is doing," he declares.

To encourage others to follow his lead, Mr. Smith helped develop the widely heralded Accredited Logging Professional Program pioneered by Montana Logging Association, the state's largest timber industry group. The continuing education program is strictly voluntary, and participants earn only modest certificates of completion; but it has linked MLA to several politically influential groups that rarely associate with loggers. Among them: the Montana State University Extension Forestry Department.

found just about everywhere in western Montana forests. Put simply, ALP teaches loggers how to log, how to put together a logging operation that minimizes its impact on soils, water quality and fish and wildlife habitat.

"Most people think loggers go out and cut down trees wherever they want, without regard for environmental impacts," Mr. Smith explains. "Those days are long gone. Today's logger lives with regulation, or he does not log for long before the law catches up with him."

The regulatory climate has grown increasingly complex, but Mr. Smith believes most loggers recognize the public value in regulation. "If it gives the public a higher level of confidence in the work we do, then it's worth it," he says. "More than anything else, we need a stable operating climate, with a predictable timber supply.

Unfortunately, it will probably be



Clear choice - These two photographs portray clear public choices. On the left, a dead stand of lodgepole pine in western Montana. Had it been harvested, it would have made good lumber, but it was instead destroyed by mountain pine beetles. In the center, dead lodgepole pine explodes in flames during the 1988 Yellowstone fire. On the right, a 35-year-old lodgepole stand near Condon, Montana. It has been thinned, creating an open park-like setting. Lodgepole rarely lives more than a hundred years, and insects and disease are common in 80-year-old stands. Eventually, fire will claim what remains. Fortunately, lodgepole is a prolific natural re-seeder, so a new stand is virtually certain to follow what is harvested or killed by fire. (Peter Koch photographs)

"It's important for loggers to understand how public values have changed, and it's equally important for the public to understand how loggers have changed," says Mr. Smith. "We have many of the same environmental concerns city dwellers have, but most folks don't learn this until they first learn to respect one another's point of view."

The ALP program is often the first formal training received by loggers who get their starts as teenagers cutting firewood in dead lodgepole timber stands

some time before stability returns to Montana's forests products industry, especially where timber supply is concerned. Meanwhile, Mr. Smith is one of a lucky few. He logs mainly for Plum Creek Timber Company, Montana's largest industrial forest landowner, and is thus somewhat insulated from the crisis that has befallen loggers who make their living harvesting national forest timber.

"My family is luckier than many," he concedes. "In some households, hope is about all there is left."

"This may be our last real opportunity to alter the course of events that have had a very negative impact on the West's timber communities. We need to bring this proposal back down to the national forest level, and we need to make the most of it."

— Bruce Vincent, former logger and grass roots organizer, Libby, Montana

Montana's loggers have a powerful advocate in Bruce Vincent, a former Libby logger who moved out of the family business several years ago when it became apparent the operation was too small to support the entire Vincent clan. Today, he makes his living as a grass roots organizer and is considered one of the most electrifying public speakers in industry history. (See "A Logger's Story," *Evergreen: The New Loggers*, July 1994) He is also president of the Alliance For

America, a national grass-roots coalition of timber, mining, ranching, farming and fishing interests.

Of late, Mr. Vincent has been preoccupied by the Interior Columbia Basin Ecosystem Management Project, a heady, 75-million-acre federal planning effort reminiscent of the early days of spotted owl planning. If all goes according to plan, the project's draft environmental impact statement will be released for public comment by year end. Mr. Vincent believes it has profound implications for timber supply in Intermountain national forests, but what worries him most about the leviathan planning effort is that people living in the region's logging communities do not seem to recognize its long-term significance. (Please see **Interior Columbia Plans Near Completion, Government Seeks Public Comment**, Page 55)

"There is nothing inherently wrong with large scale planning, so long as local



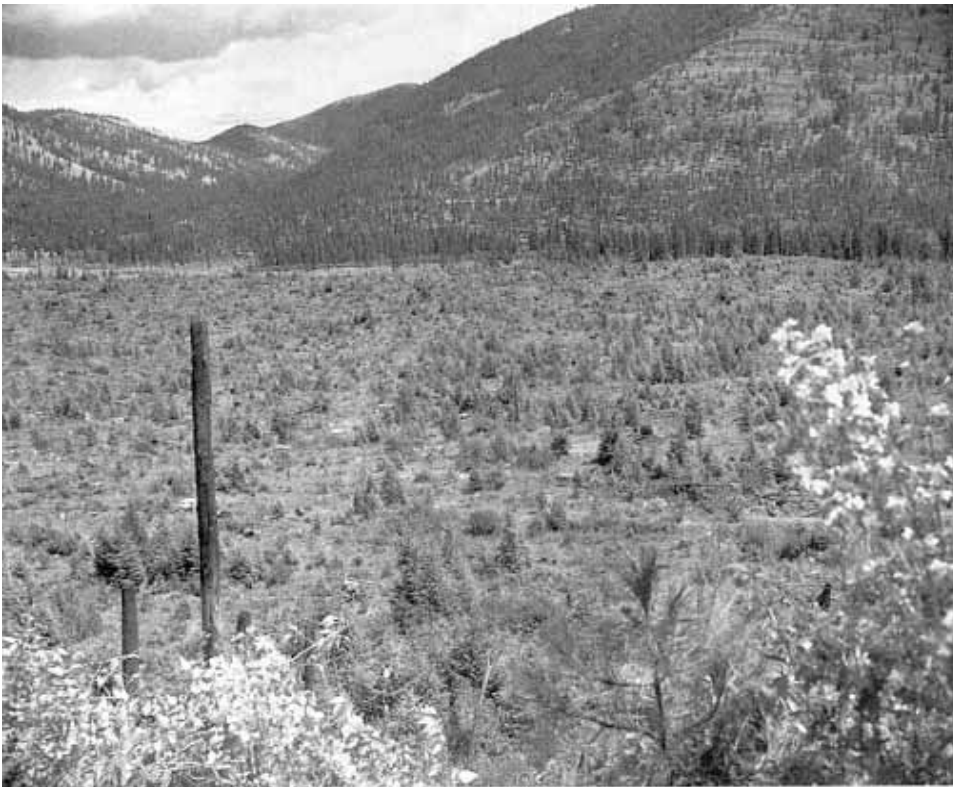
Last chance: Former Montana logger, Bruce Vincent, now a national grass -roots organizer, believes the Upper Columbia Draft Environmental Impact Statement may provide the West's timber communities with their last real opportunity to undo

some of the economic damage done to the logging industry over the last decade.

people have a say in the process," he says. "But I can't find even anyone in the Forest Service who can explain to me *how* this plan fits within our current legal framework, or *what role* individual national forests will play in its implementation. I'm told local national forest staffs have not been involved in this planning effort,



Clearcutting replicates wildfire - Clearcutting replicates a wildfire pattern typical of lodgepole forests. You can see the result in the foreground. An 80-year-old lodgepole stand has been clearcut to make way for a new forest. In the background, a young stand of lodgepole, which will be thinned at about age 30, when it is about the size of the stand on Page 44. To the left and right of the clearcut are lodgepole stands a bit smaller than what was harvested. Clearcutting is the preferred method of regenerating climax or persistent lodgepole pine because it replicates the stand-replacing fires that commonly claim old lodgepole stands. Lodgepole is widespread in Montana, but it is often the climax species at higher elevations. More lodgepole grows in Montana than in any other area in the U.S. (Peter Koch photograph).



The power of forestry -These photographs, taken on Brush Creek near Libby, Montana, help illustrate the power of forestry. The black and white was taken by Gene Yahvah on July 6, 1977. Jim Petersen took the color version from the same photo point last August. Mr. Yahvah managed this and other nearby tracts for more than 30 years - first for the old J. Neils Lumber Company, and later St. Regis Paper Company, and Champion International. St. Regis Paper's stand tending and reforestation practices remain among the most innovative ever employed on private industrial forest- land in the West. Where possible, natural regeneration was always encouraged, though St. Regis also maintained a sophisticated nursery next to its sawmill at Libby and was considered a leader in genetic tree improvement. St. Regis sold its Montana holdings to Champion International in 1984, and Champion sold to Plum Creek in 1993.

which is a significant departure from the way forest planning has been done. My concern is that too many big decisions have already been made, without adequate input from affected communities." Perhaps *because* the Forest Service is unable to answer Mr. Vincent's questions, he has filled in a few important blanks for himself.

"I am convinced this is *the* plan on which all future Intermountain federal forest management decision making will be based," he says. "That makes this plan more important than *all* of the national forest plans done in the 1980s. If I am right, all future national forest planning will be little more than a reaction to some very big land management decisions made in this document."

Mr. Vincent hopes to use the coming public comment period to again focus public scrutiny on the need to thin dead and dying forests across the Intermountain region. "Every public opinion survey I've seen says there is overwhelming support for thinning these forests, rather than allowing them to burn up in big fires. We need to make certain the Upper Columbia plan deals aggressively with insects, diseases and fires that are running rampant through our national forests."

Also of concern to Mr. Vincent, the federal government's iron-fisted preference for one-size-fits-all regulations that are easily administered from Washington, D.C., but rarely mesh with actual forest conditions.

"This plan must recognize ecological differences present in Intermountain forests, and it must return decision making power to the local level," he declares. "Otherwise, it will fail both our forests and our forest communities."

If necessary, Mr. Vincent believes affected timber communities should write their own alternatives to the Upper Columbia plan. If nothing else, he says, the exercise will bring home the impacts of what has been mostly a federal planning effort involving government employees who will not suffer the consequences of their recommendations.

"This may be our last real opportunity to alter the course of events that have had a very negative impact on the West's timber communities," he says. "We need to bring this proposal back down to the national forest level, and we need to make the most of it."

"The Gallatin, Beaverhead, Lewis & Clark and Helena national forests are lost. The public sees other values there it

considers more important than timber. We need to focus our efforts on the Clearwater, Kootenai, Nez Perce and Lolo national forests. These forests have tremendous timber growing potential, and there is still a chance the public will want them used partly for this purpose.”

- Mike Covey, manager, Rocky Mountain Region, Plum Creek Timber Company

In 1993, Plum Creek Timber Company plunked down \$260 million for 800,000 acres of western Montana timber land then owned by Champion International. With the stroke of a pen, the Seattle-based limited partnership became Montana's largest landowner, inheriting land and a mantle once worn by the Anaconda Mining Company. Where Anaconda is concerned Montanans fall into two categories: those who believe the long dead industrial giant was a benevolent dictator and those who believe it was the reincarnation of the Devil himself.

Plum Creek is neither, but that has not made it any easier for the company to explain its presence in Montana; and it has not helped that the *Wall Street Journal* called Plum Creek “the Darth Vader of the timber industry” in a 1994 story about its harvest practices in western Washington.

“We hope to be judged by our actions, not our words, and certainly not by the actions or words of others,” says Rocky Mountain Region Manager, Mike Covey, who concedes the *Journal* story still haunts him.

To be sure, Mr. Covey is not Darth Vader. For that matter, he is not even cut from corporate cloth. He is the son of a retired Forest Service supervisor, and confesses he frequently finds himself at odds with industry spokespersons who “make a full-time job out of running down the Forest Service.”

“There are a lot of great people in the Forest Service who work very hard but never get credit for a job well done,” he laments. “It must be very frustrating for them.” Mr. Covey is also no stranger to frustration. He is responsible for logging and reforestation operations on 1.7 million acres of company forestland in Idaho, Montana and eastern Washington, a fact that keeps him very much in the media spotlight.

But of late, the press has been quite complimentary of Plum Creek's considerable involvement in grizzly bear habitat recovery work. For better or worse, the



Thirty years of growth - These photographs, taken on Plum Creek land southeast of Libby, show how profoundly a forest can change in just 30 years. The black and white photograph was taken July 7, 1965 by Gene Yahvah. Jim Petersen took the color photograph last August near the old photo point. The road crossing the old clearcut has been obliterated by trees that are now more than 50 feet tall. This area is a ridgeline away from the Houghton Creek basin, which was also Mr. Yahvah's responsibility. In 1984, the basin was leveled by a 12,000-acre wildfire. Nine years later, it was back in the news, when it was featured in *Clearcut: The Tragedy of Industrial Forestry*, a Sierra Club/Earth Island Press book. Apparently, their photographer was unable to tell the difference between the aftermath of wildfire and a replanted burn covered by waist-high saplings. After the fire, Champion International planted 2.5 million fir, pine and larch seedlings at Houghton Creek. Another 1,500 acres were re-seeded, and more than 25 million board feet of fire-killed timber were salvaged.



Thinning for the best trees - Gene Yahvah took this sequence of photographs to record the results of a partial cut in which the best trees were left behind as a natural seed source. The top photograph was shot in September 1964, after the thinning was completed. He returned in June 1977 to shoot the middle photograph. Note how thinning stimulated tree growth. When he returned in August 1989, he found his old viewpoint blocked by the wall of trees you see in the third photograph. This site is ready for thinning again. Harvesting experiments the Forest Service is now conducting in the Bitterroot Valley south of Missoula, Montana (see photographs on Pages 41 and 43) bear a remarkable similarity to work Mr. Yahvah and his colleagues did on Ariaina Creek more than 30 years ago, a fact confirmed by Dr. Steve Arno, one of the architects of the Bitterroot Ecosystem Management Research Project.

company is the largest private owner of occupied grizzly bear habitat in the United States. Mr. Covey sees the presence of grizzlies on company lands as a major opportunity to help increase the bear's population and range.

"If we can demonstrate that grizzlies do well in managed industrial forests, it may have a positive influence on bear management policies on public lands," he says. "That would be good news for both bears and people."

Company lands provide about 65 percent of the timber consumed by Plum Creek facilities in western Montana—sawmill and plywood manufacturing facilities at Columbia Falls, Evergreen, Fortine and Pablo, and a medium-density fiberboard plant at Columbia Falls. The remaining 35 percent comes from other sources, including non-industrial private tracts, tribal lands, and state and national forests.

Mr. Covey will not say how much is purchased from the Forest Service, but it is sufficient to cause Plum Creek to be concerned about plummeting national forest harvest levels. In his own mind, he has already written off forests he believes will be managed as parks, but he remains hopeful other "working" forests—the Kootenai, Nez Perce, Clearwater and Lolo—can still produce timber for harvest.

"We need to focus our efforts in forests where there is still a chance for respectable timber sale programs," he says. "There is no point in squandering political capital in forests that are destined to be managed like parks."

He is not certain what the future holds for the Flathead National Forest, which lies closest to the company's northwest Montana operation, and is the largest national forest in the Northern Region. Much of the Flathead lies adjacent to Glacier National Park, arguably the most beautiful of America's national parks. The National Park Service would no doubt be overjoyed if the Forest Service scuttled what little remains of its Flathead timber sale program.

"We have gone from a harvest of 100 million board feet annually to a harvest of four or five million feet annually," he reveals. "With salvage, we may get 20 to 25 million feet. What happens in the long haul depends on the successful emergence of community groups interested in supporting habitat and forest restoration projects requiring large scale thinning work. It is too soon to tell what will happen."

Meanwhile, the company is proceeding with its manufacturing retrofit, and implementing what it calls "environmental forestry" on its lands in the Rocky Mountain region. Mr. Covey explains.

"We are transitioning to uneven-aged forestry, moving away from clearcutting, which we don't believe mimics historic fire patterns in either time or scale. Our footprints will be less visible on our own lands, and we hope to encourage more natural regeneration, for economic as well as environmental reasons. We are trying to change in ways we believe the public wants us to change, while remaining profitable and loyal to our work force. It is challenging, to say the very least."

"When you have a feel for the land, some forests look at you and say 'Leave me alone.' Others say, 'Use me for the wood I can grow.'"

- Bud Moore, from "A Conversation with Dr. William 'Bud' Moore," *Evergreen: The West Is Burning Up*, Winter, 1994-95

There is something comforting about sitting next to Bud Moore's wood stove. Outside, it is early spring in Montana's Swan Valley, and it can't decide if it wants to rain or snow; but in here

beside the fire, the seasons do not matter.

I have come here because I need a woodsman's perspective on why some of Montana's forests are falling apart, what can be done about it. Bud has spent most of his life in forests. Now 78, he is the finest woodsman I have ever known.

The dictionary defines a woodsman as one who is skilled in the arts of the woods, such as "hunting, trapping, lumbering and cultivating trees." Bud is all of these things, and more. He worked for the Forest Service for 40 years, and was Chief of Fire Management in the Northern Region for six years. He knows this region like the back of his hand. A few years ago, the University of Montana presented him with an honorary Ph.D. in forestry. Not bad for one who never went to college.

I am not the first person to come here seeking wisdom. Just yesterday the Deputy Chief of the Forest Service sat beside this same fire. Tomorrow it will be someone else's turn to sit and listen and learn. What a pleasure it is.

This is the first time Bud and I have met in person, though we have talked for long hours by telephone. I first interviewed him in November 1994, for an

Evergreen story about what big fires are doing to forests in the West. During the interview he revealed he had recently joined our Foundation.

Bud lives near Condon, not far from the headwaters of the Swan River. The river bisects the Swan Valley, which is one of the most beautiful places in all of Montana. It was carved by glaciers 10,000 years ago. Where they disgorged rocks and sediment, the soil is deep and rich. Small wonder then that the forests that grow here today are so beautiful and so plentiful.

After he retired from the Forest Service, Bud and his wife, Janet, built a splendid two-story log home here on property purchased years ago. Bud cut the timber, hewed the logs and did most of the lay-up work himself. Next to the house is a smaller log structure with an upstairs bedroom and a downstairs office where we are now seated. Across from the office is a shop complete with blacksmith's forge; and behind it there is a garden fenced to keep the deer out. Below the office is a small portable sawmill, and parked beside the mill is the farm tractor Bud uses in his logging operation.

Yes, 78-year-old Bud Moore logs and operates his own sawmill. Mostly he logs

for himself and his neighbors, carefully selecting trees that have lived out their days. Their transformation to timber creates open spaces for new trees, sired from wind blown seed that fell back to earth where the wind stopped.

In the parlance of the day, Bud sells his lumber "mill-direct." It is as straight and true as any you will find, and many are the builders who prize his 2 by 6s, 2 by 8s and 2 by 10s. Here, a two-inch thick board is two inches thick, not one and nine-sixteenths as is customary in lumber yards today.

We are seated across from one another, with the crackling wood stove between us. Carefully, I lay out the three-part question I've come to ask: *"Can conventional logging systems, which are large, be adapted for use in forests where light touch ecosystem management principles are being applied and lower impact machines, like farm tractors and horses might be more appropriate; are thinning and fire the best tools for reducing stand density in ailing Intermountain forests; and how can we empower timber communities that have so much to gain or lose in the public stampede to embrace ecosystem forestry?"*



Missoula bound - A log truck rumbles past its next load, stacked neatly at roadside.

I quickly learn the first part of my question is more easily answered than are parts two and three.

"Yes, it is certainly possible to use conventional logging systems where ecosystems principles are applied," he begins. "The visual and environmental impacts associated with logging are not simply the result of inappropriate equipment or a lack of logger know-how. Landowner objectives determine how logging is done, and these objectives are almost always driven by cost and market considerations. Personally, I think most landowners *want* to do what's best for the land, especially if they are in the business of growing and harvesting timber. But we have a big educational job to do where ecosystem forestry is concerned because its principles and advantages are not well understood. Ecosystem management won't settle any arguments about how public lands should be managed, but it will provide the public with many intermediate options not currently available. Forestry can be customized to fit site specific problems and opportunities, so the public will no longer have to think in all or nothing terms."

Part 2 of my question: *Are thinning and fire the best tools for reducing stand density in ailing Intermountain forests?*

"It's important that we return fire to these ecosystems," he begins. "Before fire was excluded, it was a frequent visitor here, and it kept forests from becoming overgrown thickets. But returning fire will not be easy, for several reasons, including the risk associated with its presence. Where the risk is highest, in low elevation forests and near communities, thinning is a more appropriate tool."

But the problem does not end with risk, or with thinning to reduce risk before fire is reintroduced, or with the health risks associated with smoky air. Even more challenging is the clear need to protect forests that have grown up *because* there was no fire to impede their expansion. Here

the public will perfect its balancing act.

"All this talk about allowing fires to run wild again ignores a very important fact about today's forests," he explains. "These forests provide significant habitat for many wildlife species the public treasures, including elk, grizzly bears, white-tail deer, mountain lions, raptors and a number of song birds. If we move too far in the direction of the more open, pine-dominated stands that once grew here, we will eliminate a lot of habitat that has been created by the *absence* of fire. If we lose this habitat, we will also lose the species depending on it. In its rush to embrace more natural forests, I don't believe the public has considered this side of the equation."

Now to Part 3 of my question, the part I know Bud has been thinking of for maybe ten years, the hard part: *How can we empower timber communities that have so much to gain or lose in the public stampede to embrace ecosystem forestry?*

"We have a big job to do here," he says after a long silence. "The public is very skeptical where forestry is concerned. For too long now, forest management has been synonymous with timber cutting. What is not understood is that where forestry is concerned the decision made

might be a decision *not* to cut timber, but to wait for a later time when the trees are larger or some other forest value is no longer present or needed."

Decisions made. "But how are decisions made in a world that can be brought to a standstill by one dissenter with a 32-cent stamp?"

"Better up front planning involving community-based groups representing more diverse points of view would help a great deal, and would certainly make the Forest Service's job a lot less controversial," he says. And now the "I" in this conversation becomes a "we" and an "us" as Bud Moore rejoins the United States Forest Service, because this is a question best answered by one who has walked in Forest Service shoes.

"For a long time, we made our own decisions without much regard for public sentiment or concern," he recalls. "I know because I was part of that era, and I don't think it ever occurred to any of us that we were doing anything other than what the public wanted, or what was best for the forest. But we failed to change when public values changed. We simply forged ahead in the belief we knew best. In retrospect, our approach was overly simplistic. We moved ahead a timber sale at a time, a recreation area at a time, a soils map at a time, a big game winter range at a time, a road at a time, without ever considering the fact these pieces are all part of a larger whole. By the time I retired, we had lost touch with many of our strongest supporters. It will take time for us to regain the public's confidence and to rebuild the support base we once had. The public will judge us by our actions."

So there you have it. Words of wisdom from a 78-year-old woodsman who has forgotten more about forests than you or I will probably ever know. We depart the warmth of his fire, and then Montana, his words of hope fresh in our minds.

"All of the parts of these old fire-dependent ecosystems are still with us—the grizzlies, the big old ponderosas and the wolves. Time is still on our side. Our challenge is to find ways to produce timber in the midst of all this glory, keeping all the parts whole. Ecosystem management lights the way." ■



Time is on our side - The Swan River, near Fatty Creek, about an hour southeast of Kalispell, Montana.

The Lower Thompson Creek TIMBER SALE

Below are photographs of the Lower Thompson Creek Timber Sale on Bureau of Land Management land in the Applegate Valley southwest of Medford, Oregon.

On a sunny afternoon last March, local residents, including environmentalists, inspected the harvest aftermath. They applauded what they saw.

The objective of this timber sale was to thin an overly dense stand of fir that had become a threat to itself. Without thinning, it would probably soon burn in one of southern Oregon's all too frequent forest fires. Now it may grow for another hundred years or more. Another thinning is planned in about 25 years, to further reduce competition between larger trees that were saved to promote natural regeneration.

It took a long time for people living in the Applegate Valley to come to terms with the necessity of thinning, but to their credit they set aside whatever fears they had, allowing the BLM to proceed with the sale, which was a year-and-a-half in planning.

Lower Thompson is part of the Applegate Adaptive Management Area, an 8,000 acre BLM project designed to gradually restore more natural forest conditions to the area. In all, perhaps 20 million board feet of timber will be harvested.

There is a hope tree vigor can be improved by thinning at risk timber stands that often include 700 to 1,000 trees to the acre. Fire ecologists believe there may have been no more than 25 to 50 trees per acre growing here when the first white settlers arrived in the 1850s.

Where possible, silviculturists want to encourage ponderosa pine to retake areas slowly lost to fir after fire was excluded more than 80 years ago.

The big national environmental coalitions based in Washington, D.C. oppose federal involvement in projects like Lower Thompson because they don't want to share their immense political power with anyone else, especially local environmentalists interested in working with timber groups with whom they share a concern for reducing the risk of catastrophic fire on federal lands across the West.

Given the Sierra Club's recent decision to oppose *all federal timber sales* the public is left to wonder which is the wiser course: catastrophic fire, or thinnings like Lower Thompson that give new life to forests at risk.



Walking into the future - Applegate Valley residents entering the Lower Thompson Creek timber sale area. They applauded what they saw.



Before thinning - Lower Thompson before thinning; 700 to 1,000 trees per acre, just waiting to burn.



After thinning - The hope is that thinning will restore lost tree vigor, adding a hundred or more years to the life of a forest currently at risk.

The First 25 Years

By Jim Petersen

The Oregon Forest Practices Act turns 25 this summer.

I doubt many Oregonians have ever heard of the Act, though they probably do have some vague understanding of the fact forestry is “regulated” in Oregon.

It’s unfortunate more Oregonians don’t understand the significance of *their* Forest Practices Act. I italicize the word “*their*” because the Forest Practices Act is very much a citizen’s law, the codified result of a groundswell of environmental concern that – if anything – resonates more loudly through Oregon’s forests today than it did when the Act was ratified in 1971.

The Act was the first such law ever passed in the United States. It broke new legal ground, establishing the state’s authority to protect *public domain* forest resources, *even when they are present on private land*.

More specifically, the Oregon law set legally enforceable standards for reforestation, road construction, timber harvesting, the use of chemicals in forests, and disposal of logging slash – all in the name of protecting air, water, soil, fish and wildlife on private forest- land.

You may be surprised to learn Oregon’s major forest landowners did not put up much of a fight. The winds of change were blowing strong in Oregon by the late 1960s, and it is likely some companies recognized what was actually a *resurgence* of public discontent. In the 1930s there had been considerable public pressure for *federal regulation* of private forestlands. To fend off the

threat, Oregon forest landowners wrote their own law, the 1941 Oregon Forest Conservation Act, which established rudimentary reforestation and harvesting standards. But by the late 1960s, the 1941 law could no longer account for the environmental concerns of an increasingly restless public worried about clean air, clean water, fish and wildlife. New, higher standards of accountability were needed.

Flexibility has been a key ingredient

The Act profoundly changed the way private landowners practice forestry in Oregon, and change is *still* occurring. What passed for good forestry in 1971 – *and was publicly acceptable* – would today get you thrown in jail, or tried and convicted on the front page, or both.

The *fact* that Oregon’s private forest landowners have been willing to allow public regulation of their management activities has done much to restore citizen confidence in forestry, but legally enforceable standards are *not* the only reason for the Act’s great success. Equally important has been its *flexibility*, a feature that distinguishes it from most environmental regulations.

The chain of command is not long or complex. Day-to-day regulating is done by the Oregon Department of Forestry, which answers to the Oregon Board of Forestry, which answers to Oregon’s citizens. No one is more than a phone call away.

From the beginning, the Depart-

ment, the Board and the industry have understood *and respected* the delicate nature of their partnership. And although the press of environmental activism has made for a far more formal relationship than existed in 1971, there is still a shared belief the Act works because the parties to this contract all work very hard not to overstep the invisible line that separates Constitutionally guaranteed private property rights from legal accountability for publicly owned natural resources.

Oregon’s longest running public forum

There is also a strong commitment to preserving flexibility in on-the-ground interpretation of rules and regulations embodied in the Act, and there is a recognition forestry does not lend itself to one-size-fits-all regulation by command and control bureaucracies that rule from afar.

Because the Act remains a flexible document, regulators and the regulated have thus far been able to accommodate the public’s increasingly strong desire to play a role in how Oregon’s privately owned forests are managed. Since 1971, the Forest Practices Act has undergone major revision *nine times*, a fact that lends credence to the idea that it is the embodiment of the longest running public forum in the state’s history. Twenty-five years and counting.

Recently, a friend of mine told me she thought the Act was at least as important as the Oregon Bottle Bill, which thrust the state into the nation’s environmental

limelight in the 1970s. She may be right. Oregon *was* first in both arenas. Moreover the Forest Practices Act remains a model for other states *and countries* seeking ways to protect their forests from uncontrolled or undesirable development. Among its imitators, the Washington, California and Idaho forest practices acts.

I have always thought the real genius of the Oregon Act lies in the fact that it *institutionalized* a major industry by first establishing regulatory linkage between the conduct of private business and the protection of public property. The law recognizes that growing and harvesting timber is *a legitimate business enterprise in Oregon*, but it says if you are going to be in this business, you are *legally responsible for the safety of publicly owned forest resources* present on your land. Put simply, it establishes the ground rules for a legally-binding partnership between the State of Oregon and one of its major industries. And like all successful partnerships, this one has changed to accommodate changing times. Where once there were only loosely interpreted reforestation guidelines, there is today a body of regulations that reflects both public desire and the limits of science.

Pretend you own timber in Oregon

The Act's requirements are fairly straightforward, but to understand their real significance, pretend for a moment that you own 80 acres of bottom land timber. It was cutover land when you bought it thirty-some years ago, and you never dreamed it would be a forest again. But today the trees are over fifty feet tall, and thanks to soaring log prices, they are worth a lot of money. If you cut them now, you might even be able to retire early.

Here is what the Oregon Forest Practices Act requires of you:

First, you must submit a written harvest plan to the Oregon Department of Forestry. Why, you ask? Because when, where and how you harvest your timber is carefully controlled by the State. The same goes for when, where



Protecting public resources - The Oregon Forest Practices Act protects publicly owned forest resources - air, water, soil, and fish and wildlife and their environs - even when these resources are present on privately owned forestland.

and how you construct and maintain your logging roads.

If spotted owls or any other threatened or endangered species are found in your forest, you can probably forget about harvesting your timber, or at least most of it. Oregon appreciates your commitment to habitat conservation, but thanks is all you will get.

Hire a reputable consulting forester

But let's assume you get lucky. No threatened or endangered species are found. You would still be very wise to hire a reputable consulting forester, someone who knows the Oregon Forest Practices Act inside and out.

Consulting forester or not, you are *not* permitted to harvest *all* of your timber, no matter how valuable it is or how much you need the money. The Act requires that you leave some trees - both live and dead - as habitat for birds and small mammals.

Also, you are required to leave

a good number of conifers along any streams that cross your land, even if these streams run dry during summer months. Leaving trees helps prevent erosion, while protecting water quality and fish and wildlife habitat. The same no-harvest restrictions apply to adjacent wetlands, ponds and lakes.

After your consulting forester decides what cannot be harvested, he or she will probably spray paint an "X" on the trees you can legally harvest. Whoever cuts your timber will be looking for Xs. So will the State.

Everything you intend to do must be described in detail in your harvest plan, which must be approved by the State before you can proceed. The State will take an extra hard look at your plans for harvesting in sensitive areas, especially stream corridors. A state forest practices forester will probably inspect your site before approving your plan.

Next to hiring a reputable forester, the most important piece of advice I can give you is to hire a reputable logger, someone the state forest practices foresters know and respect. There are some scary people running around in the woods today, pretending to be loggers. Stay away from them.

Once your plan is approved you can begin harvesting. Pray for good weather, because if it rains too much the State will shut you down to prevent soil compaction and erosion. But don't pray too hard, because if it gets too dry in the woods, the state will shut you down to prevent forest fires. All this may seem like bureaucratic overkill, but these precautions are in your best interest. Forest fires are expensive outings. The last thing you need is a six-figure bill from the State.

But let's assume the best of all possible worlds: good weather, an uneventful harvest, and a good log market. You make enough to pay your consulting forester, your logger, your road builder and the state harvest tax. And lo and behold, there is enough left to pay off your mortgage.

You have a forest to replant

Not so fast. There is still work to do. You have logging slash to dispose of and



The value of flexibility - Oregon's Forest Practices Act is a flexible body of regulations, more easily changed than most environmental laws. To accommodate advancements in science, and public interest in forestry, the state legislature has changed the Act nine times since it was ratified in 1971. Here is a good example of the kinds of changes that have been made. For years, loggers were legally required to remove all logging-related debris from streams because biologists felt such debris impeded fish passage. Then it was discovered large woody debris is good for streams and fish. Now private landowners are putting logs back in streams, with help from the Oregon Department of Fish & Wildlife. Here is one such restored site, on Stimson Lumber Company land in northwest Oregon.

a forest to replant. Air quality regulations limit the number of days you can legally burn, and there is a burn planning and permitting process to navigate. Call your consulting forester. He or she can also supervise the replanting, which is usually done by companies that specialize in such work.

Oregon's reforestation requirement is quite specific, especially if you have clearcut your forest: the reforestation work must begin within 12 months of harvest and be completed within two planting seasons. Within five growing seasons, the State must certify that at least 200 "free-to-grow" trees are growing on each acre you harvested.

If your replanted forest does not meet this standard, you have to plant it again, and again, and again, if necessary. There are *no excuses*, so it is a good idea to ask your consulting forester about probable reforestation success *before you harvest*.

It may not be perfect, but...

Most of Oregon's small woodland owners are honest people, which is why compliance with the Forest Practices Act is well above 90 percent. But there are a few bad apples in every barrel, so let's say you have no intention of replanting after you harvest. No problem. The State will

do it for you, then send you the bill. If you don't pay it, a lien is placed on your property, and if you don't satisfy the lien, the state sells the land at public auction. So far as I know, this has never happened in Oregon, but there is a first time for everything.

If you don't remember anything else about the Oregon Forest Practices Act, remember this: 25,000 Oregon forest landowners live by it, every day of their lives. It may not be perfect, but for the last 25 years, it has provided a stable regulatory climate, benefiting both public and landowner interests. And its very public evolution is a constant reminder of the fact *states* are a lot better at establishing and maintaining *efficient* and *productive* regulatory relationships than is the federal government, which still insists on impossible to understand, command and control bureaucracies that enforce one-size-fits-all, cookie cutter regulations doomed to eventual failure. *Witness the federal government's inability to do anything proactive about millions of acres of public forestland in the West that are dead or dying or burning up in huge forest fires.*

Do yourself a favor

A closing thought. If you are lucky enough to actually *be* a small woodland

owner in Oregon, you need to know you are an increasingly important source of raw material for state's timber-starved mills. One of them may have already asked if your timber is for sale. Most of these companies are run by honest, hardworking people who are trying to stay alive in an increasingly brutal business climate. But do yourself a favor before you sell your timber to the highest bidder. Get some professional advice. The State and the Oregon Small Woodlands Association both provide free technical and educational assistance, not only about compliance with the Forest Practice Act, but also about how to increase the *value* of your forest. Proper thinning and stand tending work can turn a seeming jungle into a park-like setting. Ask for a referral to a professional forester in your area who is a member of the Society of American Foresters. It is a badge of honor worn by most people who make their living managing forests for others.

Your children and grandchildren, and their children and grandchildren will thank you for setting them up in a business that makes a mighty and unheralded contribution to the nation's economic and environmental well being: the business of growing, harvesting and caring for the nation's privately owned forests. ■

Interior Columbia Basin Plans Near Completion, Government Seeks Public Comment

Editor's note: We first interviewed Tom Goodall in the fall of 1994 (See "The View From Walla Walla, *Evergreen: The West Is Burning Up*, Winter, 1994-1995). He is Assistant Region Timberlands Manager for Boise Cascade Corporation's Northeast Oregon Region. Mr. Goodall is also a member of a team of scientists and forest managers assembled by Boise Cascade to provide technical input to the Interior Columbia Basin Ecosystem Management Project (ICBEMP), a massive federal forest and range land management project initiated by the Clinton Administration under the auspices of the President's Northwest Forest Plan.

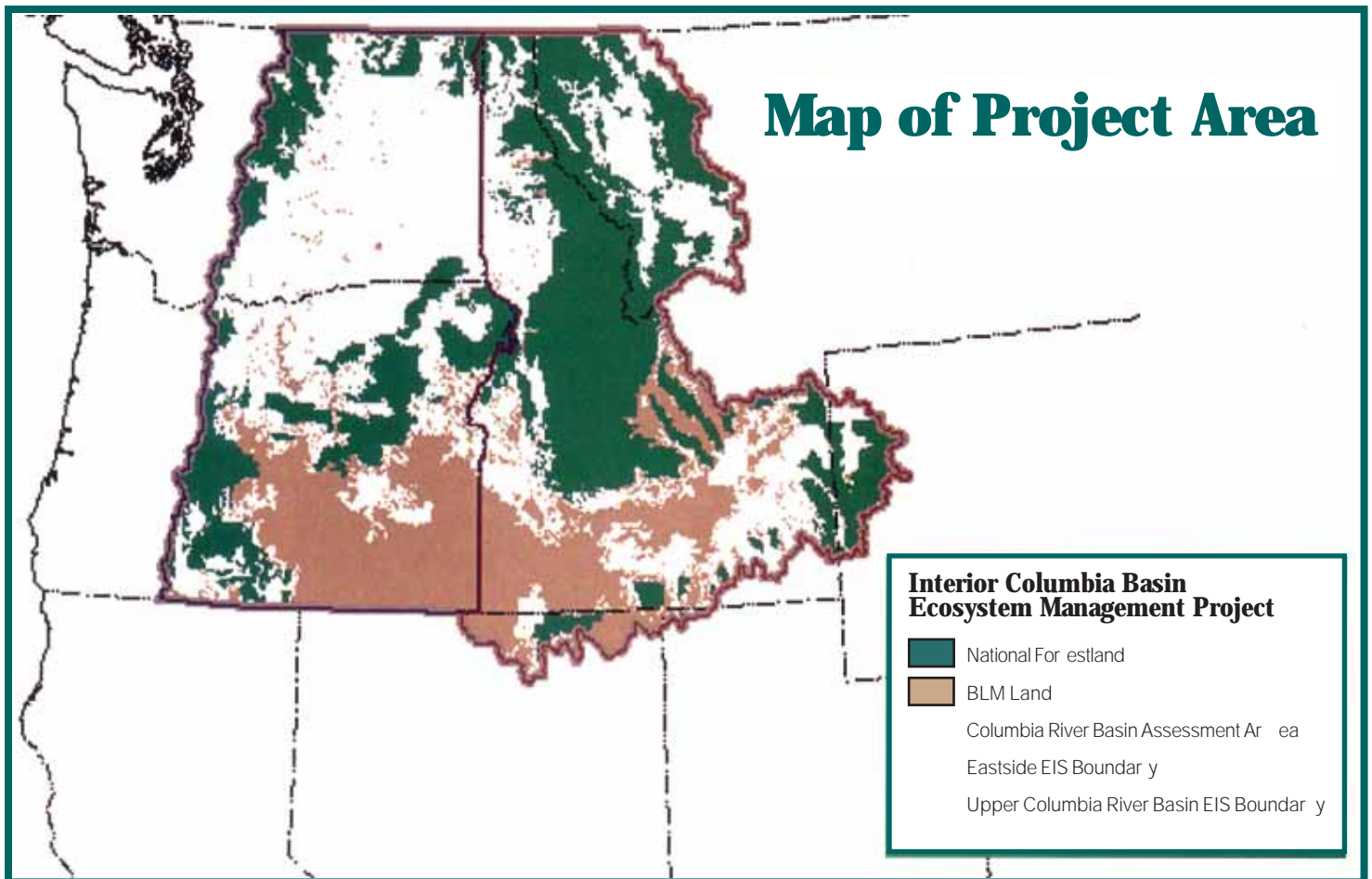
The subject of our 1994 interview was

the same as the subject of this new interview: the status of the planning effort and the state of forests in the planning area. This interview differs only in the fact that the original planning region has been expanded to include about 75-million federally-owned acres, located principally in Oregon, Washington, Idaho and Montana. The expansion makes this planning effort larger than the President's Northwest Forest Plan, a work in progress by the Federal Ecosystem Management Assessment Team.

The original objective was to produce a single draft environmental impact statement covering the smaller Eastside Columbia Basin, which included eastern Oregon and Washington. That objective

included a Scientific Assessment of ecosystem conditions within the Interior Columbia Basin. In the fall of 1994 decision was made to expand the project to include two environmental impact statements, the first covering the original Eastside planning area, and a second covering the Upper Columbia Basin, which includes Idaho and parts of Montana, Utah, Wyoming and Nevada. Federal agencies involved in these planning efforts include the U.S. Forest Service, the Bureau of Land Management, the U.S. Fish & Wildlife Service, National Marine Fisheries Service and the Environmental Protection Agency.

Mr. Goodall is joined in this interview by Steve Mader and Tom Haislip, who are



The Interior Columbia Basin Ecosystem Management Project encompasses an area running from the east side of the Cascade Range in Washington and Oregon, throughout Idaho, and as far east as Jackson Hole, Wyoming. It includes 36 National Forests and 14 BLM Districts.



Active management uses thinning, selective harvesting and prescribed burning to restore forest health, reduce the risk of catastrophic wildfire, and generating a wide range of forest uses, including fish and wildlife habitat and wood products for human needs.

also members of the scientific team assembled by Boise Cascade Corporation. Both are scientists employed by CH2M Hill, an environmental engineering firm based in Corvallis, Oregon.

The ICBEMP planning process is nearing completion of the first phase, the release of the Draft Environmental Impact Statements and draft proposals are expected to be released for public comment toward the end of this year.

With this in mind, we asked Messieurs Goodall, Mader and Haislip for their impressions of draft documents. Recent versions have also been circulated to certain entities including counties, states, tribes, Resource Advisory Councils and Province Advisory Committees in the region.

Our questions revolve around two central themes: do the draft environmental impact statements include proposals for dealing aggressively with dead and dying forests in eastern Oregon and Washington, southwest Idaho and western Montana; and do the proposals accurately assess economic impacts in timber communities already hard-hit by a precipitous decline in harvest levels on national forests included in the planning effort.

We can report that both draft

environmental impact statements include some alternatives that do address the need for silvicultural treatment of the region's dead and dying forests, but at inadequate levels of activity. Unfortunately, neither draft displays a clear understanding of the economic impacts of declining federal harvest levels, or the economic opportunities inherent in a large-scale forest restoration strategy. Also, it is important to understand aggressive treatment of the region's diseased forests – using best available science – is still largely a political question to be resolved in Congress. Environmental groups are likely to oppose aggressive treatment, as it is their view the region's forests should be left to nature, without regard to the ecological impacts of increasingly frequent catastrophic fires.

Apart from these considerations, readers should know that the Interior Columbia Basin Ecosystem Management strategy represents the state-of-the-art where ecosystem management is concerned. In principle, ecosystem management integrates ecological, economic and social conditions present within a management area, or ecosystem. Usually, these ecosystems include an entire watershed, or other physically

dominant geographic features.

Where ecosystem management principles are applied, this integration insures continued protection and production of publicly-valued goods and services: clean air and water, abundant fish and wildlife, healthy forests, diverse recreation and stable, adequate timber supplies.

Many land managers view ecosystem management as a key to resolving three very thorny problems present in national forests across the West: frivolous timber sale appeals, judicial gridlock and contradictory environmental regulations promulgated by competing federal agencies – all contributing factors in the declining health of the region's diseased forests.

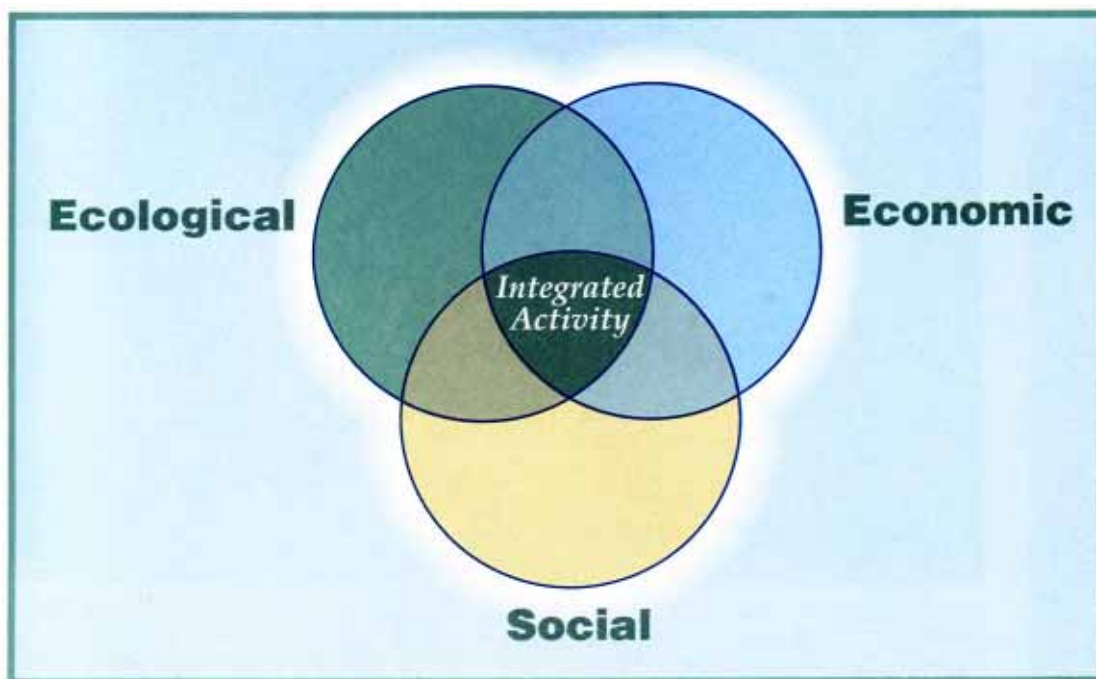
Among competing regulations, none have proven more onerous than PACFISH, INFISH and so-called "eastside screens," all guidelines intended to prevent streamside fish habitat degradation. Unfortunately, these guidelines have become rigid requirements, severely limiting options for managing the region's diverse forest landscape, thereby undermining the most fundamental of all ecosystem management principles: manage to protect or enhance site-specific natural conditions. ■

National Forests and BLM Districts Included in the Eastside EIS

STATE	NATIONAL FOREST OR BLM DISTRICT
Oregon	Burns BLM District Columbia River Gorge Natl. Scenic Area (FS) Crooked River National Grassland Deschutes National Forest ² Fremont National Forest Lakeview BLM District Malheur National Forest Medford BLM District Mount Hood National Forest Ochoco National Forest Prineville BLM District Umatilla National Forest Vale BLM District Wallowa-Whitman National Forest ³ Winema National Forest
Washington	Columbia River Gorge Natl. Scenic Area (FS) Colville National Forest Gifford Pinchot National Forest Okanogan National Forest Spokane BLM District Umatilla National Forest Wenatchee National Forest
Idaho	Nez Perce National Forest Payette National Forest
<p><i>Abbreviations used in this table:</i> BLM = Bureau of Land Management EIS = Environmental Impact Statement FS = Forest Service</p> <p>² Newberry Crater National Volcanic Monument acres included. ³ Hells Canyon National Recreation Area acres included.</p>	

National Forests and BLM Districts Included in the UCRB EIS

STATE	NATIONAL FOREST OR BLM DISTRICT
Idaho	Bitterroot National Forest Boise National Forest Caribou National Forest Challis National Forest Clearwater National Forest Curlew National Grassland Idaho Panhandle National Forest Kootenai National Forest Nez Perce National Forest Payette National Forest Salmon National Forest Sawtooth National Forest Lower Snake River District (BLM) Upper Snake River Districts (BLM) Upper Columbia-Salmon Clearwater Districts (BLM)
Montana	Bitterroot National Forest Deerlodge National Forest Flathead National Forest Helena National Forest Idaho Panhandle National Forests Kootenai National Forest Lolo National Forest Butte District (BLM)
Nevada	Humboldt National Forest Elko District & Winnemucca District (BLM) Lower Snake River District (BLM)
Utah	Sawtooth National Forest Salt Lake District (BLM)
Wyoming	Caribou National Forest Rock Springs District (BLM)



Ecosystem Management Concepts

Three circles can be used to represent the major components that must be integrated through ecosystem management — ecological, economic, and social. Ecosystem management occurs where the circles overlap. Successful ecosystem management safeguards long-term ecological sustainability by preserving the vital connections between land, water, wildlife, vegetation and human beings.

Forest Health in the Inland West

A major impetus behind the Interior Columbia Basin Ecosystem Management Project has been the growing awareness and concern about declining forest health conditions in the Inland West. And a major test of the Project's effectiveness in carrying out its mandate will be the degree to which it recognizes the seriousness of the forest health problem and implements restoration steps that are adequate to remedy it.

The scientific methods needed to mitigate these forest health problems are known today but are not being applied on federal forestlands rapidly enough to meet the urgency of the situation.

President Clinton's directive to the Forest Service and the BLM cited the Eastside Forest Ecosystem Health Assessment conducted by a team of scientists led by Dr. Richard Everett as a basis for developing an ecosystem management strategy. Other recent studies and reports that have documented forest health conditions on the eastside of the Cascade Mountains include *Assessing Forest Ecosystem Health in the Inland West*, published by the Forest Policy Center of American Forests, the *Blue Mountains Ecosystem Restoration Strategy*, written by four national forest supervisors, *Forest Health and Timber Harvest on National Forests in the Blue Mountains of Oregon: A Report to Governor Kitzhaber*, and *Forest Health Conditions in Idaho* by the University of Idaho Policy Analysis Group. Most recently, the Oregon Department of Forestry issued a forest health alert calling attention to the significant forest health and wildfire risk that exists on the forestlands in eastern, southern, and central Oregon.

These studies have concluded that poor health is widespread and hazardous conditions are building in the forests of the Inland West, and that restorative, remedial or preventive treatment is

urgently and immediately needed, particularly on federal lands. A century of wildfire suppression and other management practices of the past have left us with stressed forests overcrowded with small trees that are subject to insect and disease infestations. Hazardous fuel conditions have developed that are resulting in devastating forest fires with increasing frequency.

The increases in fire, insect and disease activity are symptoms of the deteriorating forest health conditions. Without timely management intervention, the region is threatened by major ecological setbacks—pest epidemics and uncontrollable wildfires—that will damage the resource base far into the 21st century, reducing long-term timber supplies, threatening private lands and resources, endangering fish and wildlife, and jeopardizing outdoor recreation values.

The scientific methods needed to mitigate these forest health problems are known today but are not being applied on federal forestlands rapidly enough to meet the urgency of the situation.

Silvicultural tools such as thinning to reduce stand density, selective harvesting to create a healthier mix of tree species and age and size classes, in conjunction with controlled burning to decrease fuel loads, have been shown to be effective in restoring diseased forests to a more fire-resistant and resilient condition. But the current legislative and procedural requirements faced by federal land management agencies impose time delays that, when combined with opposition to timber harvesting by certain interest groups, prevent timely management, expose major forest areas to needless loss and damage, and impose large costs on both local and national economies.

A major challenge facing the federal government's ecosystem management project is to ensure that each of the proposed management alternatives in the Draft Environmental Impact Statements adequately addresses forest health problems in the Inland West so that threats to the resource values associated with federal lands can be reduced and desired and feasible future conditions are achieved. ■



Under the passive management approach, virtually no human intervention occurs, and the risks of catastrophic events associated with current unhealthy forest conditions remain unchecked. Passive management could result in the outbreak of abnormally large wildfires which threaten habitat, wildlife and human communities.

The Interview: Tom Goodall, Steve Mader, and Tom Haislip are members of a team of scientists and forest managers assembled by Boise Cascade Corporation to provide technical input to the ICBEMP as it develops its reports. Tom Goodall is Assistant Region Timberlands Manager for Boise Cascade Corporation's Northeast Oregon Region. Steve Mader and Tom Haislip are scientists with the environmental consulting firm CH2M HILL. All three have been actively involved with the ecosystem management project since its inception two and one half years ago. Their involvement has included attendance at all public meetings, providing technical comments on preliminary reports and other government documents, peer reviewing certain scientific assessments, and commenting on preliminary EIS drafts.

In its Winter 1994-1995 issue, *Evergreen* interviewed Mr. Goodall as the ICBEMP neared the end of its first year of work. In that interview we focused on how the new emphasis on ecosystem management was changing the approach to federal land management, and we asked for his assessment of how well the ICBEMP was progressing towards its stated goals.

Now that the ecosystem assessment and evaluation of planning alternatives by the federal science teams in Walla Walla and Boise is largely completed, we thought it would be instructive to ask Mr. Goodall and two of his associates on the project for their views on how well the project has accomplished what it set out to do.

Evergreen: The Interior Columbia Basin Ecosystem Management Project is now almost three years old, and appears to be nearing completion toward the end of this year. In your view, is the project reaching its goal?

TG: It's still too early to tell, though we have seen a continuous improvement in the quality of the preliminary draft EISs since they were first circulated for review

often assuming that human activities and needs are at odds with ecological values. This bias not only discourages aggressive use of the active management tools such as thinning and selection harvesting that can be used to deal with the forest health problem, but also diminishes the importance of the needs that people and communities have from their National Forests. And so it works against the

management project, we developed a risk rating system that allows us to identify the extent of the health hazards in the forests and the types of forest at greatest risk. In our analysis of the four Blue Mountains National Forests we found that high risk forests ranged from 10 to 22 percent of all federal forests. When high and medium risk areas are combined, it appears that 59 to 72 percent of Blue Mountains National Forests would benefit from treatments to restore or maintain forest health. The estimates would have been even higher if we had incorporated tree mortality data and several years of insect and disease conditions reports into the rating system.

TH: Restoring and maintaining forest health is central and fundamental to the concept of ecosystem management. Forest health affects all the values we derive from our national forests: it affects wildlife, habitat, fisheries, recreation, grazing, timber outputs, and aesthetics. If we want ecosystem management to succeed in yielding a sustainable range of

The Project represents our best hope of ending the regulatory and judicial gridlock that prevents local forest planners from implementing on-the-ground management programs that can deal with the forest health problem and provide the other values that the public wants from federal lands.

Tom Goodall

last October. On the plus side, the extent of the forest health problem, which is one of the primary factors behind the Project, has been recognized in the assessment of conditions, though it hasn't been given the prominence that the severity of the problem requires. And the very fact that such a broad-scale planning effort is being attempted is a positive step. The Project represents our best hope of ending the regulatory and judicial gridlock that prevents local forest planners from implementing on-the-ground management programs that can deal with the forest health problem and provide the other values that the public wants from federal lands.

On the other hand there is concern that, while the Project does recognize the forest health problem, it does *not* propose management activity levels that are *adequate* to deal with it. And there are other concerns, the primary one being that the Project is not being true to one of the goals of ecosystem management, which is that resource planning efforts should strive for an integration of ecological, social, and economic values. The Project displays a consistent bias against the place of humans on the landscape,

Project's own stated goals. But they're only at the preliminary state of the draft environmental impact statements, and I'm hopeful that the management team will insure that these deficiencies are corrected in the final versions.

Evergreen: How serious is the forest health problem, and what needs to be done to solve it?

SM: Today's conditions in many interior forests allow normal processes such as wildfires to become catastrophic events. Unless the composition and pattern of forests can be improved, these atypical disturbances seem certain to continue. On the Boise National Forest in Idaho, for example, wildfire consumed an average of 3,000 acres per year from 1955 to 1985. From 1985 to 1992, the average annual wildfire acreage jumped to 56,000, including large-area, intense, stand-replacing wildfires in ponderosa pine forests. This represents a major shift from the type of fire regime these forests experienced before decades of fire suppression. These fires of increasing size, power, and destructive capability are no longer "natural" events.

As part of our work on the ecosystem



these values, we must aggressively address forest health problems.

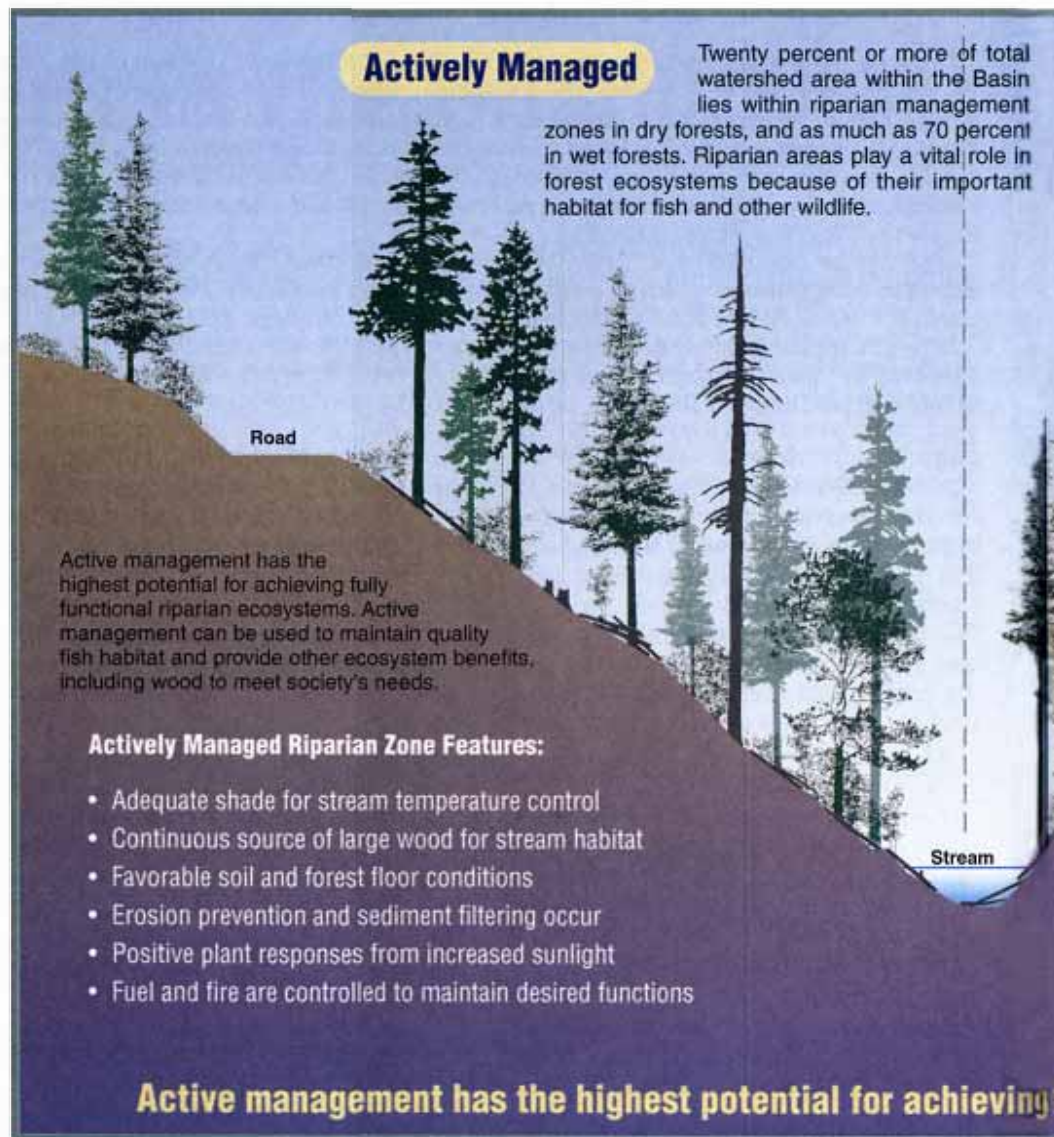
One of the important tools in restoring forest health is selection harvesting, which includes large and small trees. Yet ironically, the levels of selection harvest proposed in each of the six "action" management alternatives described in the draft environmental impact statements show substantial *reductions* from past levels, in spite of the fact that *increases* are needed if restoration of forest health is to occur. Initial analysis for the Blue Mountains, indicated proposed reductions from 27 to 99 percent of existing forest management plans. This translates to roughly 60 to 23,000 acres per year of forestland managed for timber harvest.

A study completed in 1993 by the supervisors of the four Blue Mountains National Forests estimates some 3,100,000 acres or over half the forests are "out of ecological balance." While the Project has not yet provided an analysis of risk in this area, preliminary findings indicate a similar number of acres. Comparing the low rates of harvest with the large area in need of treatment suggests restoration of forest and ecosystem health is not receiving the priority and level of activity it requires to succeed.

Evergreen: How are these proposed reductions in timber harvesting likely to affect the economies of timber-dependent communities?

TG: Unfortunately, the Project offers a weak analysis of the social and economic impacts which will occur as a result of reduced timber harvesting. This is one example of its bias against people. There has been a reduction in the number of communities classified as timber-dependent by applying the dependency criteria to today's gridlock situation when federal timber supplies are low and, by definition, fewer communities are able to get federal timber. Rather than masking the impacts of the reduced harvest levels by eliminating communities from its calculations, the Project should be attempting to identify more accurately all local impacts. A more accurate analysis of impacts would result if all of the communities identified as timber-dependent during the last major forest planning effort continued to be considered timber-dependent.

SM: The data to gauge these economic impacts exist. The Idaho State Legislature recently released a study by two



University of Idaho economists of the effects of changing federal timber policies on rural communities in northcentral Idaho. The study predicts that declining timber sales from national forests will have severe economic impacts on that area – closing six of the area's nine sawmills, eliminating 2,900 timber and timber-related jobs, and threatening local governments with budget deficits. County governments and school districts in the study area face as much as a 65% *reduction* in their share of revenue from federal timber sales. The study found that alternative sources of economic growth in the region, such as tourism, would have to *quadruple* by the year 2000 to replace the earnings lost from mill closures.

Another recent study prepared by Dr. Robert Lee for the Institute for Resources In Society at the University of Washington analyzed the potential for small businesses to revitalize rural communities. These communities have

suffered economic losses from the reductions in wood processing resulting from President Clinton's Northwest Forest Plan. The study found, among other conclusions, that family wage jobs in the wood products industry have been only partially replaced by sub-family wage jobs largely in the service sector, and that restoration work, along with associated retraining for new occupations, is doing very little to substitute for the loss of wood product jobs and income. These lessons suggest that the Project should proceed cautiously before proposing policies that undermine the communities that depend on federal forests.

Evergreen: What about the gridlock? As we understand it, one of the potential benefits of the ecosystem management project is to resolve the regulatory gridlock that prevents local resource managers from implementing their plans. Does it seem likely that we will see

Passively Managed



logging had saved the burn area from further degradation. These competing regulatory agencies should be advising, not controlling, the federal land management agencies.

TH: The gridlock results largely from two kinds of problems. The first problem has to do with something called cumulative effects analysis, which is required of all land use projects in National Forests and BLM Resource Areas under the National Environmental Policy Act. Before a project such as a timber sale or construction of a campground can be carried out, it is subject to review by various government regulatory agencies, such as the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the Environmental Protection Agency. These agencies want to know what other land use projects currently under way or completed in the past or proposed for the future might also impact the area in question. They want to be able to assess the cumulative impacts of multiple projects before giving

approval to a specific project.

TG: We are hoping that the Project will provide sufficient information to satisfy concerns about land use plans across the Basin so the regulatory agencies will have the overview they need to make timely decisions on individual project plans in the National Forests, and that

effects at the broad scale. But there are other Project documents which we've not yet seen, including the Scientific Assessment for Ecosystem Management in the Basin, and we're hoping the information will be contained in them.

Evergreen: You mentioned two problems that are contributing to the gridlock. What's the second one?

TG: The second problem contributing to the gridlock involves the application of interim management regulations to streamside areas across the Basin. These regulations, which include PACFISH, INFISH, and a set of guidelines known as the "eastside screens," establish wide buffer strips along streams where management is seldom allowed. These administrative rules were intended to be temporary, imposed to protect streamside areas until the Project's assessment of conditions in the Basin had been completed and long term management strategies had been devised. But in at least four of the six action alternatives being considered by the Project, PACFISH is replaced with a new set of interim strategies that are, in reality, as or more restrictive than PACFISH.

Evergreen: What's wrong with the PACFISH approach?

SM: PACFISH has been interpreted in a way that is overly restrictive. It creates administrative barriers based on the mistaken assumption that management activities pose unacceptable risks to streamside habitat and the wildlife and fisheries that depend upon that habitat. *But a far greater risk* to streamside areas is posed by wildfires. Many streamside areas contain densely overcrowded stands of trees, and pose high risks to fish habitat from fire, yet PACFISH sets these areas aside as protected buffer

an end to the stalemate as a result of the work done by the Project?

TG: I certainly hope so, but here again the outcome is uncertain. We have been disappointed by signs of non-cooperation from competing federal regulatory agencies such as the National Marine Fisheries Service, the U.S. Fish and Wildlife Service and the Environmental Protection Agency. Project leaders have made concerted efforts to enlist these regulatory agencies in the planning process, but the agencies have insisted on applying their own narrowly-focused management standards to streamside areas, despite the fact that studies have indicated that active management approaches may actually reduce catastrophic risks and environmental impacts on endangered species. For example, a Forest Service study conducted on the Boise National Forest following the 1992 Foothills fire found that there were no adverse effects to the watershed as a result of salvage logging and that the salvage

Streamside areas also burn, and the results are often catastrophic. Entire watersheds have been devastated in recent years by unnatural wildfires on the Boise, Payette, Shoshone, Kootenai, and Wallowa-Whitman, and other National Forests

the plans will have a strong enough science base to withstand the appeals process that delays or in some cases prevents needed management activities. But it is not clear at this time if this information will be included. The draft environmental impact statements do not contain an assessment of cumulative

zones. The wildfires that will inevitably result from untreated fire hazards in eastside forests do not stop at 100 or 300 or 600 feet from streams. Streamside areas also burn, and the results are often catastrophic. Entire watersheds have been devastated in recent years by unnatural wildfires on the Boise, Payette,

Shoshone, Kootenai, and Wallowa-Whitman, and other National Forests. An example of a watershed and stream system devastated by intense wildfire is provided by the Tanner Gulch Fire of 1989 in the Wallowa-Whitman National Forest. This fire burned 5,000 acres within a small tributary stream basin, killing all the fish in a 36-mile stretch of the upper Grande Ronde River. The endangered spring Chinook salmon population, including all Chinook fry from the previous 1988 spawning season and an estimated 50 percent of the fingerlings from the 1987 spawning season, were killed.

According to our analysis, the Project proposes to set aside a larger amount of riparian zone than PACFISH, comprising at least 20 percent of the total forested area within the Basin. *If the riparian management standards established by*

practices that have been established by the Project. What kinds of mechanisms have been set up to provide linkages between the Project and the local forest plan amendment process?

TH: We are concerned that these linkages have not yet been established. The Project has not established a process for transferring its management recommendations to the various federal administrative units that will have responsibility for amending local forest plans: the National Forests, the BLM Districts, and the Forest Service Regions. Local managers are now conducting minimal conservation programs while waiting for guidance and support on how to move ahead with active management strategies. There needs to be coordination among the different planning agencies if we are to have successful plans. The timely implementation of

measuring the social and economic impacts on timber-dependent communities of the proposed reductions in harvest volumes. Then there are the signs that bureaucratic infighting and turf wars among agencies are continuing produce gridlock. Lastly, as Tom Haislip just mentioned, we haven't yet seen any evidence of coordination among planning agencies to ensure that the broad-scale planning effort is implemented consistently at the local level.

Evergreen: Do you believe these problems can be overcome by the Project management?

TG: Yes. We still believe the Project has the potential to restore our federal lands to health if it adopts management plans that are based on sound science and not on political factors. A great deal of agency time, financial resources, and public involvement has gone into bringing the Project to its current form. We need a comprehensive plan to break the paralysis that prevents local managers from dealing effectively with the serious forest health problems in our region. As it now stands, the ecosystem management project has defects, but it is becoming more solution-oriented. We feel that if the Project management team is willing to make the necessary revisions, the Project can meet the purpose for which it was established. And we are guardedly optimistic that those changes can be made before it is released to the public. ■



Tom Goodall



Steve Mader



Tom Haislip

the Project do not allow wildfire hazards to be effectively managed within entire watersheds, including the streamside areas, watersheds and streamside areas will burn with devastating effects. The Forest Service and the BLM will be unable to take the necessary management actions within streamside areas unless their management responsibilities are reaffirmed and riparian objectives better defined. The Project needs to promote and support the expertise of local managers within management agencies and provide them with management options required in view of local risks and the trade-offs of action versus inaction. It needs to support decisions based on local knowledge and not encourage management standards arrived at through political compromise rather than scientific understanding.

Evergreen: Once the Project is completed, local forest supervisors will face the task of amending their National Forest Plans in accordance with the ecosystem management principles and

flexible on-the-ground management activities needed to restore forest health and provide long term economic and social stability to our communities depends on it.

Evergreen: A lot is at stake on the success of the federal government's ecosystem management project. But it sounds as though some of the major problems it is intended to solve have not been adequately addressed. What do you think are the main problems that still need to be resolved?

TG: My biggest concern is that the Project does not adequately address the risk of catastrophic wildfire. Wildfire jeopardizes all the values we associate with our federal forests, and poses threats to communities in and around them as well. I am also troubled that the Project appears to underestimate the seriousness of the forest health problem by not recommending the aggressive active management practices that are needed to accomplish restoration. I think the Project could do a better job of

Editor's Note:

Draft EISs for the Interior Columbia Basin Ecosystem Management Project are expected to be released the end of this year for a 90-120 day public comment period. Citizens who have an interest and a stake in the management recommendations contained in the Draft EISs should review the documents and submit comments to the Project leaders. Copies of the Project documents will be available from:

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Walla Walla, WA 99362

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Ecosystem Management Project
304 N. 8th Street Room 246
Boise, ID 83702



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15 minutes

30 minutes

60 minutes

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***He who plants trees loves others
besides himself.***

- English proverb

Conservationist, Tom Wynne, stands among eight-year-old Douglas-fir trees growing on his Tree Farm west of Olympia, Washington. We feature Mr. Wynne and other Washington state Tree Farmers in our January, 1997 issue of *Evergreen*. Our in-depth report focuses on the unexpected and undesirable impacts state and federal environmental regulations are having on non-industrial private forest landowners. Other stories in the issue emanate from California, Idaho, Alaska and Oregon. (Jim Petersen photograph)

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