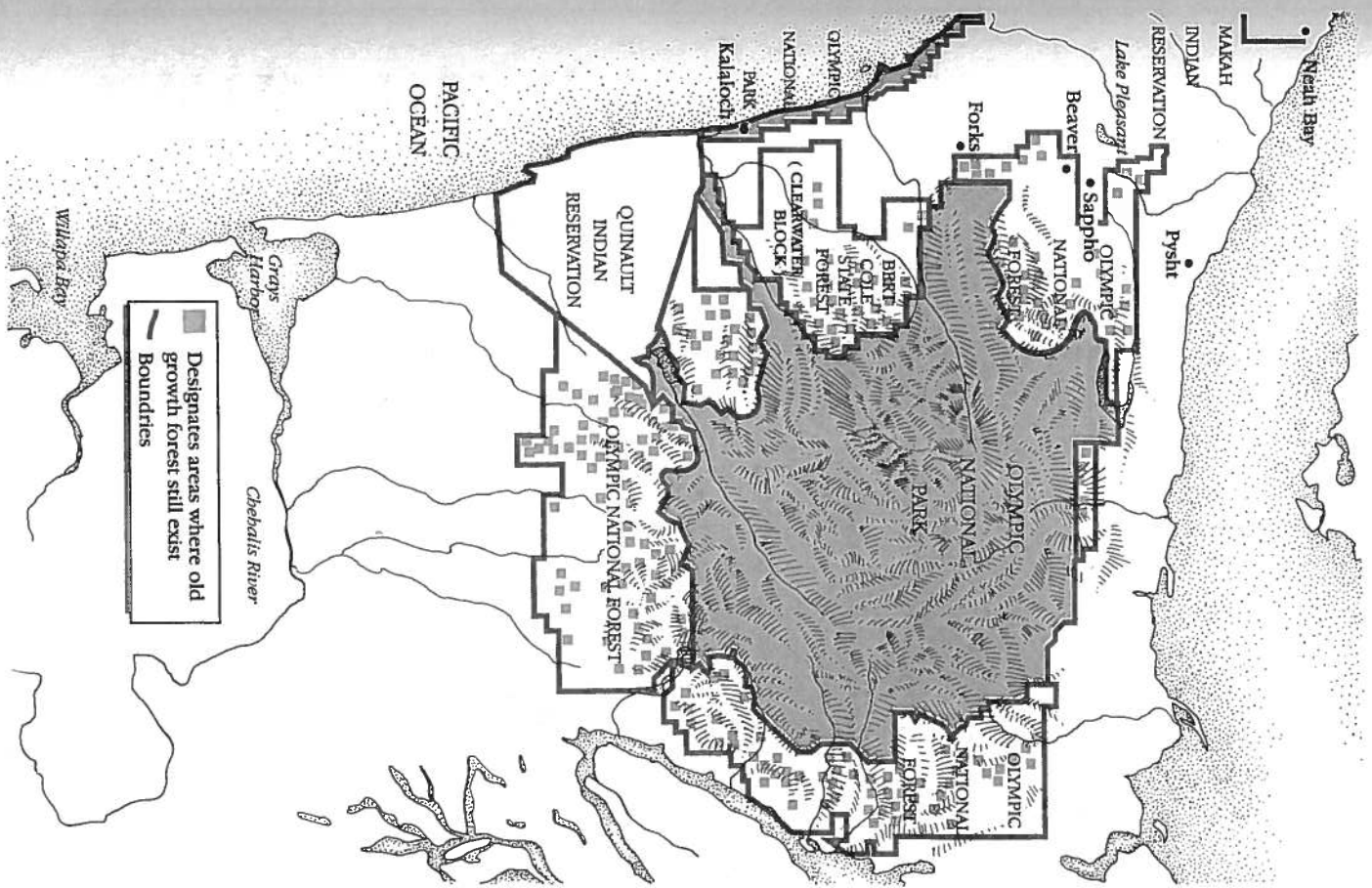
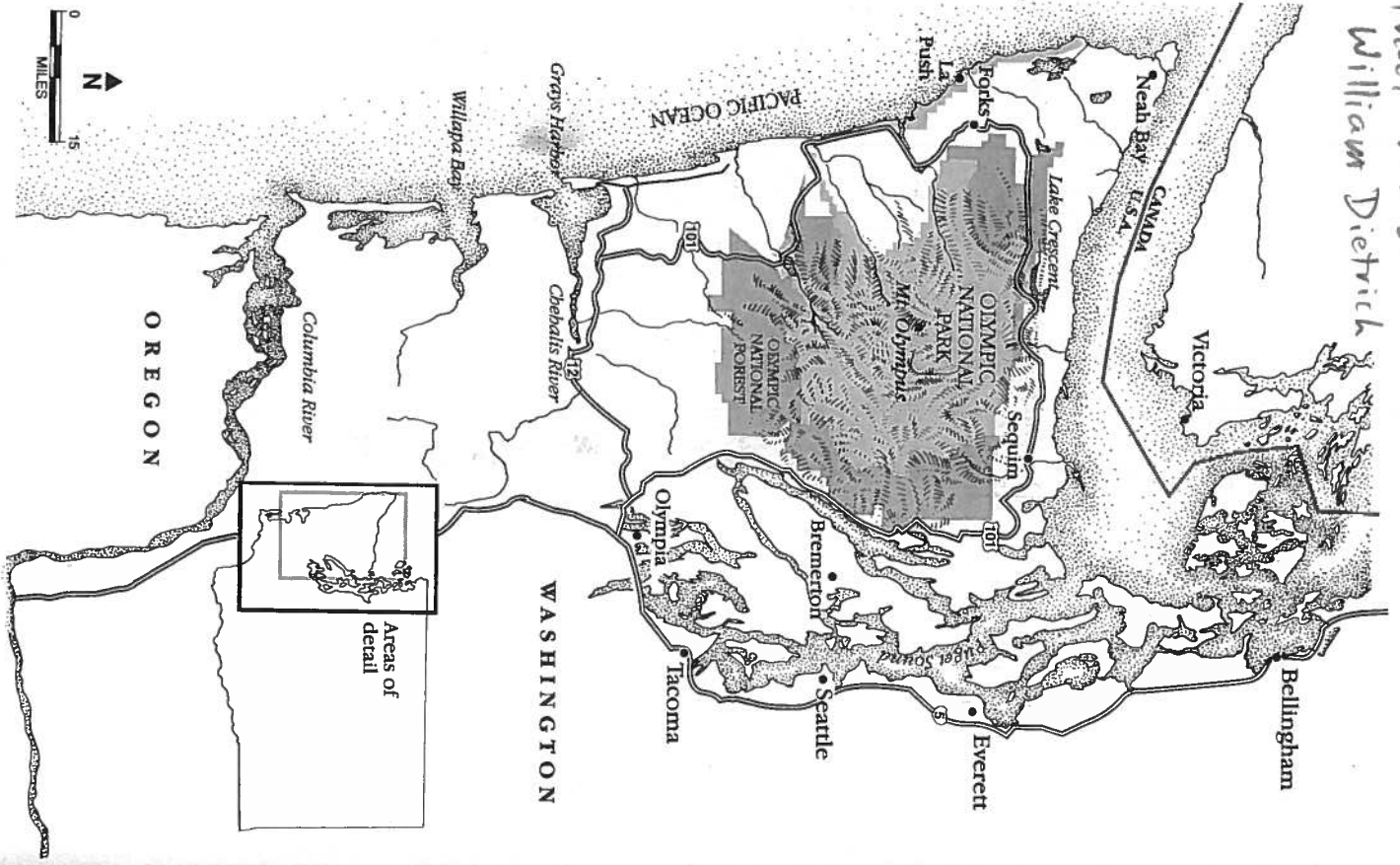


# Final Forest by William Dietrick



# INTRODUCTION

## THE LAST CORNER



If it were more ordinary country, less lovely and less hard, maybe the love and the outrage would not be so keen.

But there is a quality about the forested mountains of the Olympic Peninsula, that very northwestern corner of the continental United States, that gets a grip on the mind and heart.

The traditional assumption is that the Pacific Northwest's moody skies keep newcomers away, but I think it is partly the clouds that draw people to this corner: the way they brood over the mountain tops, or mist the base and seem to cut the Olympic range loose from its connection to the earth.

The Olympic Mountains form a ring on the Peninsula like a sawtooth wall. You can stand on the steep sidewalks of downtown Seattle—the skyscrapers next to streets where just a bit more than a century ago fat virgin timber was skidded down to the crude sawmills on Elliott Bay—and study the mountains for a reminder of what once must have been here. The metropolis sprawls nearly one hundred miles along Puget Sound. Its new urban dwellers look to the forested mountains for memory.

The Peninsula is best introduced from the deck of a Washington State ferry, the boat's metal vibrating underfoot and a brisk wind blowing across the prow of the vessel from the gray waters of Puget Sound. From there, America's fourth corner can look like a place more imagined than real. Sometimes you'll board the ferry to get closer to the mountains and a trick of the air will make them seem to recede out of reach.

In the ferry's fluorescent-lit, linoleum-tiled interior, tourists can study maps of the Olympic Peninsula. The more you study it, the

more remarkable the geography seems. It is the kind of improbable, compact landscape a child might draw for a fantasy kingdom.

I am reminded of a castle, with a moat. The Peninsula is about 6,200 square miles in size—about halfway between the size of Connecticut and Massachusetts—and is surrounded on three sides by water: almost four, if you want to count the Chehalis River to the south. Making up the saltwater portion of this castle moat is the Pacific Ocean to the west, the broad Strait of Juan de Fuca to the north, and the fiord of Hood Canal and its neighboring Puget Sound on the east. Its ramparts are the Olympic Mountains, and its central keep is glacier-clad Mount Olympus.

Most mountain ranges arrange themselves in a line, giving clues to the geologic forces underneath. The Olympics, sitting atop some of the most complicated plate tectonics in the western hemisphere, are a circular fortress, the interior of the range hidden by the outlying peaks. A proper castle would have an engineered symmetry of wall and tower, gate and courtyard. The Olympics are less tidy. Crests of rock and ice run hither and yon with no discernible logic. "There is no regularity about their formation, but jumbled up in the utmost confusion," Army Lieutenant Joseph P. O'Neil reported in 1885 after getting a glimpse of the range from a foothill after ten days thrashing through thick forest. O'Neil had hoped to lead the first party into the unexplored mountains. Unfortunately, his Indian guide deserted when told their destination, a mule toppled off a cliff and carried with it critical supplies, and a private got lost in the trees and disappeared, never to be found again. The country is still a bit like that.

The wildest ocean coastline left in the Lower Forty-eight is on this peninsula. So are the wettest valleys and some of the greatest weather extremes. Annual rainfall ranges from an estimated two hundred inches a year on the Peninsula's western mountain slopes to seventeen inches just thirty miles away in the mountains' rain shadow at Sequim. The climate difference between the dense rain forest and the wind-swept alpine ridges, just twenty miles apart, is similar to moving 1,500 miles northward toward the Pole. The mix produces some of the most varied ecology and biggest trees in the world. Down in the Queets River drainage is the world's largest Douglas fir. Up in the Quinalt is the world's largest western hemlock and yellow cedar. On the remote Bailey Range of the Olympics is the world's largest subalpine fir.

Of course the very biggest trees are probably gone, cut generations ago, logged when the stupendous nature of the forest was so corn-

monplace as to make it unremarkable. The present world's-record Douglas fir in total volume is 221 feet with its top broken off, but the tallest conifer ever found in the United States was a nineteenth-century fir measuring 385 feet before it was cut down. There is an historic photo of a fallen giant in Canada claimed to have exceeded 400 feet. The current record-holding western red cedar is twenty-one feet in diameter, but there is an 1899 newspaper photo of a cedar near Snoqualmie Falls, in what is now virtually a suburb of Seattle, that was forty feet in diameter.

The castle's battlements climb, ridge snaking up to crest, until they peak at grandly named Mount Olympus, 7,980 feet high, its jagged hump draped in ice. Rivers gush out of the heart of these mountains in radial fashion like the spokes of a wheel, and in several places glaciers push blue-green snouts of ice down toward the shadowy valleys.

There is aboriginal poetry in the names of the rivers the tribes gave: Elwha and Sol Duc, Hamma Hamma and Duckabush, Humptulips and Quillayute, Skokomish and Wynoochee. The romance of this landscape rubbed off on its pioneer explorers as well. There are names around the Peninsula worthy of a pirate's treasure map: Destruction Island, Octopus Mountain, Gray Wolf Pass, and Dead Man's Hill. And names to evoke the landscape: a Mount Olympus and an Enchanted Valley, a Hurricane Ridge and a Storm King mountain. When the clouds wrapped around Storm King, the settlers learned, wet weather was coming.

This impression of grandiose improbability is reinforced when one looks up from the ferry map and studies the mountains themselves. Depending on the air and its ability to magnify or color the light, the Olympics change. They loom large one day and fade another. When ocean weather fronts routinely lay a lid of cloud across the populated Puget Sound basin, the Olympics can disappear for weeks. When the weather clears and they rematerialize—particularly in winter, when covered in glistening white—the effect of their sugared skyline can be startling, as if adding a third dimension to a land flattened by those clouds.

Sometimes the Olympics stand up on the horizon with sobering solidity, every crag and crevice picked out by a morning sun with the precision of a dental drill. I remember one late-summer dawn from the ferry when the mountains towered over Puget Sound like cathedral buttresses, nearly snowless and hard as iron. A full moon hung above them like a communion wafer.

More common is their insubstantiality. From Seattle, cloud and light often turn the Olympics into a range of shifting blue shadow, the valleys seeming to lead back into an ethereal gloom as mysterious as the mouths of caverns. No one who sees them like that—crowned by interior storms and with a spectral allure—can argue the decision of British Captain John Meares to name the highest peak Olympus when he spotted it from the sea in 1788. "If that not be the home wherein dwell the Gods," he wrote, "it is beautiful enough to be."

Just over a century after Meares's naming, in the year 1889 when Washington became a state, the Olympic Mountains remained one of the last places in the nation that was unexplored. Seattle already had 40,000 people, and Tacoma 36,000. Just twenty-five miles away across Puget Sound was a range that remained unknown. Settlers had hacked out homesteads on the Peninsula's coast and penetrated a bit up its river valleys from the sea, but the interior had defied penetration. It was fortified with a forest as big and dense as anything ever seen. There were trees so big that a few eccentrics rooted hollow stumps and made a home there.

According to pioneer accounts, no Indians professed to have penetrated the interior. Their reluctance was attributed to fear of fierce natives, evil spirits, or past disasters. In 1888, Territorial Governor Eugene Semple penned an article advocating the Peninsula's exploration. "It is a land of mystery," he wrote, "awe-inspiring in its mighty constituents and wonder-making in its unknown expanse of canyon and ridge. . . . Red men and white men have gone all around this section, as bushmen go around a jungle in which a man-eating tiger is concealed, but the interior is incognito."

Semple cited Indian legends, which held that the interior of the Olympics was a large, temperate valley that had once been inhabited by a peaceful race. They were supposedly driven out by a catastrophic earthquake caused by Seato, chief of the evil spirits.

Newspapermen were even more imaginative. The *Seattle Press* reported on October 23, 1889, that the Indians believed a fierce tribe still occupied the interior. The writer added that the common theory of pioneers was that rivers on the interior slopes of the mountains fed a great lake hidden behind the visible peaks, which had a subterranean outlet to the ocean. A New York newspaper went further, postulating that the inhabitants of the center were cannibals.

That winter, the *Seattle Press* decided to sponsor a six-man exploring party to cross the Olympic Mountains as a publicity stunt. A group

was assembled, given a ton of supplies, Winchester repeating rifles, bandoleers of ammunition, and a ration of whiskey they drank up before going more than a few miles. They were landed in Port Angeles on the Peninsula's northern coast in December, the beginning of the heavy snow season. Despite the snow and the warnings of locals, they proceeded up the Elwha River, hoping to reach the interior valley when spring broke and fearing that if they did not set out a rumored rival exploring party would beat them to glory. Entering the range at its northeast corner, the Press Expedition emerged at the southwest in May 1890. It had taken them six months to travel about sixty miles as the crow flies. Their clothes were in tatters, virtually all their supplies were consumed or lost, and at one point they were so hungry that in two days they devoured a bear they had shot, greedily drinking cups of its melted grease. They found no cannibals and no broad valley, just rugged peaks and monstrously vegetated canyons.

"There is something much like exploring a dark rat hole in this following a stream in these woods, and enclosed by such hills as these," wrote Captain Charles Adams Barnes, an expedition member, of the Quinault River Valley. "One can only see a few yards in any direction near the ground, and overhead the foliage shuts out even the sky. One cannot get a sight of the mountains or hills. At long intervals on approaching the river the most that can be seen is just sufficient to enable one, by tracing the specks of light through the branches of the trees, to expect that the gap continues a little further in the given direction."

Barnes was struggling through one of the densest parts of America's final great forest, a wet coastal strip that extends more than 1,500 miles from the high redwoods of northern California to the thick Sitka spruce of southeast Alaska. California could boast the tallest and oldest groves. The redwoods routinely lived 2,000 years and some giant sequoia reached three millennia. Southern Oregon had the most varied ecology. Alaska displayed the most rugged, grandest terrain of peak and fiord. But temperature and rainfall combined in the coastal mountains of northwestern Oregon, southwestern Washington, and the west slope of the Olympics to produce the thickest, richest, most swiftly growing forest of all. By the time the Press Expedition struggled through the Olympic Mountains, loggers had been whittling at the edges of this conifer empire for two generations, and seemed to have scarcely made a mark.<sup>18</sup>

At first the trees simply proved daunting to the primitive technology

available. In 1850, British Captain Richard Hinderswell stopped at Olympic Peninsula's Discovery Bay to cut trees for masts and spars. One of the biggest problems confronting his ship's carpenter, William Bolton, was finding Douglas fir small enough to fit the specifications of two-foot-thick butts. It took the ship's crew and a band of hired Callam Indians four months to cut seventeen spars. The trees were so dense it was difficult to find room to let them fall over. It was even worse trying to move them to the water. Four-inch-thick hawsers snapped trying to drag the trees across the rough, log-strewn ground.

The forest's unbroken gloom could prove psychologically taxing as well. Charles Nordhoff wrote about the forest for *Harper's New Monthly Magazine* after a February 1874 visit to Astoria at the mouth of the Columbia River. He remarked on "the dreary continuity of shade. . . . It had, I confess, a gloomy, depressing influence. The fresh, lovely green of the evergreen foliage, the wonderful arrowy straightness of the trees, their picturesque attitude where they cover the headlands and reach down to the very water's edge, all did not make up for their weight upon my sensibilities."

The forest was an obstacle. "And off we bounded into the woods at the rate of three to four miles an hour," wrote Samuel Bowles of a stage journey through Washington Territory in 1865 that concluded a trek across the United States. "These are the finest forest we have yet met, the trees larger and taller and standing thicker; so thick and tall that the ground they occupy could not hold them cut and corded as wood; and the undergrowth of shrub and flower and vine and fern, almost tropical in its luxuriance and impenetrable for its closeness. Washington Territory must have more timber and ferns and blackberries and snakes to the square mile than any other state or territory of the Union. We occasionally strike a narrow prairie or threadlike valley; perhaps once in 10 miles a clearing of an acre or two, rugged and rough in its half-redemption from primitive forest; but for the most part it was a continuous ride through the forests, so unpeopled and untouched that the very spirit of Solitude reigned supreme, and made us feel its presence as never upon ocean or plain."

In such a place, logging became a necessary first step for progress. The vast virgin forest that had stretched from the Atlantic Seaboard to west of the Mississippi was mostly gone. After 250 years of pioneer settlement, this forest was the last great place to be conquered. The scale of the harvest was heroic. Here were trees as tall as thirty-story buildings and ten or fifteen feet in diameter. Many were growing before

Columbus arrived; some went back a thousand years. A single log could fill a logging truck and a family could picnic on its stump. An acre typically held five to seven times the amount of wood as an acre of Eastern white pine forest. Farmers could not simply yank out these stumps; rather, they dug a pit underneath and built fires that would eat for months, burning the tree's butt away from its roots. It was an outsized kind of place, and the challenge was to bring it down to human scale.

<sup>104</sup>"It was strangely like war," Northwest historian Murray Morgan wrote of the first logging of the Olympic Peninsula in his 1955 book, *The Last Wilderness*. "They attacked the forest as if it were an enemy to be pushed back from the beachheads, driven into the hills, broken into patches, and wiped out. Many operators thought they were not only making lumber but liberating the land from the trees, making room for the farmers. They advertised the cut-over areas for sale as farmland, and they found takers, for the price was low and the dream of a bit of land of one's own was almost universal. They were called stump ranchers, these hopeful people who came from everywhere to farm this new-won land. They grubbed at the great roots; they fought the encroaching salal and alder and huckleberry, and the spiky, insinuating, indestructible blackberry vines. They raised a few crops and gave up, nearly all of them, though many wasted as much as a lifetime trying to grow truck and grain on land that, it finally became clear, was meant only to grow trees."

<sup>105</sup>The homestead instinct failed in most of the great forest. The land went to either the government or the big timber companies. A 1913 report by the U.S. Bureau of Corporations indicated 70.7 percent of the private timberland in western Oregon was owned by only sixty-eight individuals.

<sup>106</sup>History came late to the Olympic Peninsula, however. Last to be explored, last to be farmed, last to be logged. Oh, there were trees there, wood in greater volume than any place on earth. "Taken as a whole this is the most heavily forested region in Washington and, with few exceptions, the most heavily forested region of the country," a 1902 government survey concluded of the western Peninsula. But out in the West End there were no harbors and few roads. Logging was scarcely feasible until the wood demands of World War I pushed a railroad out near the tiny farm hamlet of Forks, so-named because it was built on an Indian prairie about where the Calawah and the Bogachiel and the Sol Duc and the Quillayute Rivers all ran together.

The boom years of Forks—the years when the town's population would double and a man could get hired onto a logging crew just by standing on a street corner—would not come until the 1970s.

By that time, the wild and unruly forest of giant trees and silver snags and behemoth mossy logs and secret rot—the titanic Northwest wood that even farsighted timber tycoon Frederick Weyerhaeuser had once judged to be inexhaustible—was mostly gone. It had been replaced by a younger, trimmer, smaller, plainer industrial forest. Either that or wastelands of broken slash, so thick that new trees could not regrow. By that time, when Forks was booming, a debate had started on what was disappearing and what was taking its place.

The Olympic Peninsula was no stranger to this debate. Way back in 1897, President Grover Cleveland had taken the first step toward averting a feared “timber famine” by setting aside national timber reserves, including two-thirds of the Peninsula. Land use there has been contested ever since.

Responding to timber industry protests, President William McKinley reduced the size of Cleveland's Olympic reserve by a third. In 1909, President Theodore Roosevelt took the opposite tack again, setting aside the heart of the Olympic Range as a 620,000-acre National Monument. In 1915, President Woodrow Wilson cut the monument's size to 328,000 acres in hopes of spurring manganese prospecting to feed war industries. In 1935, a bill was introduced in Congress to create a 728,360-acre national park. Local residents, hoping to persuade President Franklin Roosevelt that such a park was too big, drove him halfway around the peninsula in 1937, from Lake Crescent in the north, through Forks, to Aberdeen and Hoquiam in the south. The drive was in large part through a tunnel of trees: so many trees that to many inhabitants the idea of setting such a great number aside was lunacy. If Roosevelt was impressed, it was not in the way his hosts had hoped. He completed his visit by announcing his support for the park. Additions would eventually swell its size to nearly a million acres.

The Olympic Peninsula thus developed into a microcosm of the land-use pattern throughout the Pacific Northwest that was to spark one of the bitterest ecological and economic debates in the nation's history. The lines between exploitation and preservation were drawn not just figuratively but literally, right across the Olympic map.

The Peninsula became in essence a donut: Olympic National Park, where logging is prohibited, is the donut hole, occupying the highest

mountains in the middle. Olympic National Forest, part of it wilderness and part open to logging, circles much of the park in a second ring. State and private lands, heavily cut, circles this national forest, and salt water in turn circles that. The more land that was set aside, the more frantically the timber industry cut. Unlike Solomon and the baby, Congress not only proposed cutting the forest in two, but allowed it. The best place to see the absurd juxtaposition of this dual desire is on the Olympic coastline. There, a mile-wide strip of old-growth spruce and cedar preserved as part of the national park follows the beaches, mist streaming off the breakers and hanging in the belt of trees like campfire smoke. The shore seems unchanged since the explorers coasted by. This primeval forest ends a mile eastward as if shaven with a razor, the timber industry ensuring that the belt will not widen. To the east everything is cut in a rolling panorama of stumps and shorter, regrowing trees.

By the 1980s, the Olympic “castle” looked besieged. Most of the grand virgin old growth that so awed and depressed the pioneers was gone in the foothills between the water and the mountains. Replacing it was patchwork mosaic, green and brown, of recent clearcuts and regrowing timber, most of it still too young to be harvested again. To the timber industry, the mosaic was proof that trees were indeed a renewable resource. But environmentalists had coined the term “ancient forest” for the virgin remnants, scattered in patches here and there like a shattered regiment. Most of the ancients that were left were bunched up near the park boundary like fugitives seeking refuge in the castle keep. The transformation of the landscape, most of it accomplished in less than fifty years, is remarkable.

Not a few are proud of the change. To their view a stagnant forest has been replaced with a growing one. Much of the nation is housed with their wood. When the housed say too much wood was cut, loggers perceive hypocrisy and betrayal.

Others see not just a changed landscape but a disappearing ecosystem. It is not just that the big trees are gone, but that they are being replaced with a human-designed forest that is smaller, simpler, more uniform, and absent many species. They perceive erosion and sterility.

I grew up camping and hiking in the Olympics, but I was introduced to the controversy truly when I became a newspaper reporter. In time, the arguments became familiar and it was clear there were merits to all sides. What remained mysterious to me was how so many good

people could love the forest so fiercely in such completely different ways. What experiences led people to take such competing views? And I was curious about just how the established view of the forest, promulgated by scientists and government, had seemed to shift so rapidly against logging.

That people see the forest differently is not entirely surprising. Just as the mountains can seem concrete at one time and insubstantial another, the forest can seem to mutate in mood and character. If it can be inspiring, it can also be overpowering, even suffocating. So thick and high are the trees that it can be difficult to see one hundred yards. It is easy to lose direction. Leaving established trails is only for the experienced, but so thick are the fallen logs and fecund underbrush that few are tempted. Cross-country travel in these forests can be a misery.

In appearance, the forest can indeed be majestic. When sunlight filters through the overhead canopy in shafts of illumination, the effect can be as inspiring as window-stained light in a Gothic cathedral.

More commonly there is cloud or fog, however, and the forest takes on a darker, brooding weight. In valley bottoms the very air seems to take on a green hue, and one has the sensation of being at the bottom of an aquarium.

Science has, unconsciously perhaps, reflected these different impressions. Forestry science developed to mold, defend, and justify the great harvest, and then more recently began to question it. The story of the struggle over America's final forest is in part the story of how science gave legitimacy to new points of view.

People have also brought new eyes into the forest, depending on where they came from and how they lived and what they cared for. The forest is the same, and yet different to each individual who looks at it. It is not uncommon for the landscape to inspire a mixture of fear and love and longing and greed.

Any big tree, for example, is a kind of time capsule, the accumulated biological memory of one hundred thousand days and nights, of snow and wind and rain. It is the rare person who remains unaffected by this aura of deep time, the wonder of things so big and so old. But trees are also mortal. They are inevitably dying in their core, succumbing to decay, ripe to be victimized by fire and storm. Each tree can be worth thousands of dollars, even tens of thousands, if harvested at its peak. To many who live in the dim woods, who work until their bodies ache, who sometimes see their friends and relatives killed by

this forest, and who see it grow back up in riotous rankness in the cold rain, it is madness to ignore this economic gift.

Yet it was not the trees themselves that finally brought this conflict to a political boil. It was of all things a bird, so rare that few in the Pacific Northwest have ever seen one, and so conveniently trusting in responding to human calls that it made it possible for scientists to count and quantify its decline. The northern spotted owl came to symbolize the struggle between conquering nature and worshipping it.

In 1885 Lieutenant O'Neil, having failed to penetrate the Olympic vastness but able to at least look into the mountains, their flanks cloaked in dark timber, proved prophetic. The day will come, he wrote, when people "will glory in their wealth and beauty."

Wealth and beauty. This book is a glimpse of those twin desires of the human heart, and of the struggle to constantly remake our troubled relationships to the ancient earth.

## 1

## THE CUTTER



It is six A.M. and still dark this late September morning when the loggers begin crowding into Jerry's saw shop. Although the fir and hemlock in back of the store are still just silhouettes against the fading stars, the town of Forks is awake and moving with men on their way to the woods. At this hour it is still too gloomy for a logger to read the twin yellow banners that hang over the street at either end of the half-mile-long business strip: THIS COMMUNITY SUPPORTS TIMBER, MEMBER SUPPORTS THIS COMMUNITY. But there is no need to. That banner expresses bedrock sentiment. Timber is what is making the darkness before dawn hum. Highway 101 that runs past the front of the logging supply store is a steady stream of commuting pickups, their headlights blowing through occasional pockets of fog. Of course five and six A.M. isn't even early. In midsummer, when the days are really long, a log truck driver can be up at two A.M. to eat breakfast and get first load.

The self-proclaimed "Logging Capital of the World," Forks is neither as rough nor raggedy-ass as it once was, just a plain little timber community with about 3,000 people, 120 inches of rain, and a chewed-up forest where conifers grow back like weeds. The people here call their part of the Olympic Peninsula, "The West End." The term signifies not only its location on the compass, but its sense of isolation and independence. "Forks against the world," is how the town's activists wryly put it. This is a community that proclaimed a "James Watt Appreciation Day" in 1983 when the controversial interior secretary was pushed into resignation by polls showing Americans opposed his policies three to one. That erected a cross topped by spotted owls. That posted reader-board signs with defiant messages that sometimes inked the tourists driving through: JUST SAY NO TO THE BIGGEST LAND GRAB IN HISTORY, for example.

Forks's identity is so tied to harvesting the forest around it that it has gained a notoriety for resisting proposals for change. There is a big fight now over the last old trees, so nonsensical to most people in this town that they can't quite believe the scrap has gotten as far as it has. It is as if there isn't already a huge Olympic National Park a few ridges away, locking up whole valleys of trees forever. It is as if out here, in this worked-over country, there is really that much to fight over. A veteran cutter like Larry Suslick, who has thirty years in the woods, sees a bit of irony in having this fight now, after most of the big trees are gone. "When I started here, this whole peninsula was one, vast, huge forest," he recalled. "They're too late. They're fighting over the few little trees they call old growth, and half don't even know what real old growth is."

Maybe so. But the woods are shutting down over an owl loggers claim to have ever seen. That may just be the beginning. There is also excitement about a sea bird, a marbled murrelet, so elusive it took scientists years to actually find a nest in the big old trees on the Peninsula to prove what they had long claimed must be there. There's the pleated woodpecker, which pecks at the insects that invade the dead and dying trees found in ancient forests. And Vaux's swift, called a chimney swift back East, which in this part of the country likes to nest in the hollow snags.

"Tweety birds"—that's what Jim Bleck of the state's Department of Natural Resources calls these symbols of this strange, disruptive debate. Every month, it seems, the biologists have some new idea of what to do for the tweety birds. Bleck figures state government in Washington is giving up \$40,000 in good timber for every acre of trees it leaves alongside streams; and \$45,000 to leave occasional snags and other wildlife habitat scattered on one hundred clearcut acres. "To me, that's a lot of money."

Bleck, who helps administer timber sales in the Forks area, doesn't necessarily disagree with the state's decisions. By and large, he approves the reforms that have swept over logging the past generation. But change is being heaped upon change. First the experts wanted logs hauled out of streams to clean them up. Now they want them left in, even *put* in, if you can believe that, to improve fish habitat. What will they want next week? "Scientists are fickle," he said. "They're like the wind, blowing every which way. They've got us chasing our tail."

One saw shop in Forks has already folded, and the owner of the last one, Jerry Leppell, just hopes he doesn't follow suit. Leppell figures



his business was worth half a million dollars a couple of years ago, when timber was riding high. Now, with every suburbanite and his cousin in America trying to rein in logging, he thinks he'd be lucky to have a buyer pay \$75,000 for the repair shop and store.

The saw shop is modern, but homey. There is a double-barreled wood stove made out of two fifty-five-gallon drums stacked on top each other, and a coffee pot, serve yourself. There is a Pepsi machine inside, Coke outside, take your pick. There is rough-sawn wood on the walls that sport mounted bison, deer, and bear heads. Under the main counter are posters that read, *ENDANGERED SPECIES*, picturing a trio of loggers, one of them a child. Back in the repair shop, where the carcasses of worn chainsaws are broken open to show their metal bones, there are more posters with scantily clad models touting the advantages of Stihl or Husqvarna chainsaws. A workaday chainsaw costs \$900 and the loggers who actually cut down the trees—known as cutters or fallers or bushelers—are expected to bring their own to the job. A good cutter will wear out two of them per year.

Half of Jerry's business is servicing these saws. There is a pile of logs outside the shop door, their tops slit with a hundred cuts from the testing of repaired machines. Inside are displayed the rugged items loggers need: different lengths of saw bars the chain revolves around (up to sixty inches long in memory of the biggest trees and the deepest cuts), extra chains, shovels, axes, and manis. There are the round silver mallets used by "shake rats" to split out bolts of cedar that will be sawn into shakes for American roofs. There are pipe wrenches for field repairs and come-alongs for winches, leather tool belts and bright plastic wedges pounded into a saw cut to help direct a tree's fall. The plastic is replacing the old steel variety because it is lighter. Still, a cutter can find himself lugging 60 or 70 pounds up and down the steep tree country.

All around the shop there are gas cans and engine lubricants and spray paints to mark trees due for cutting or survival. There are spools of thick steel cable and fine sharpening files for chainsaw teeth. There are the hobnail logging boots spelled "caulks" but pronounced "corks" that let loggers stride along the tops of wet logs without slipping into the dense underbrush below. There are gloves and rugged jeans and rain gear and rip-resistant pin-stripped shirts called "Hickorys" for their toughness, even though there is no hickory in these Pacific Northwest woods. There are sweatshirts emblazoned with sayings that reflect the tense undercurrent of economic fear:

MY FAMILY IS SUPPORTED BY TIMBER DOLLARS.  
SUPPORT YOUR LOCAL SPOTTED OWL: FROM A ROPE.  
IF WE'D KICKED THE SHIT OUT OF THE PRESERVATIONISTS, WE  
WOULDN'T HAVE THIS PROBLEM TODAY.

Russ Poppe, twenty-nine, ambles in: a tall, rangy, friendly looking man with a toothy smile and the spare, sneaky look of one who truly earns his keep. His workday clothes are typical, part of what almost seems a uniform in timber country: billed cap, dirt-stained jeans with the bottoms cut high, or staged off, to avoid catching branches and dirt, worn suspenders, a ragged flannel shirt, and the scuffed running shoes he drives to the logging site in so he won't pock the floor of his pickup with his caulks. If Poppe was to conform fully to the Forks stereotype he would have a snoose can and drive a Ford: back in the boom years of the 1970s you could buy a Ford in Forks's only auto dealership about as cheap as anywhere on earth, so everyone had Fords. Now you see Dodge and Chevy, even Mazda and Toyota.

The suspenders are usually deliberately dirty, a mark of hard work. Sometimes they sport a worn saying, such as a neutral FORKS logger or, more belligerently, SAVE A logger and SHOOT AN OWL. Suspenders out here are a necessity. Belts don't work in the woods: there is too much stooping and twisting and reaching and scrambling going on for it to make any sense to cinch yourself in at the waist.

Inside Jerry's there is the usual morning banter of men meeting briefly who have worked shoulder to shoulder on other crews, the words less important than the acknowledgment of each other's presence. The talk is barbed a bit by their uncertain future and the recognition of how controversial their work has become.

"Ready to kill more trees?" Russ jibes with one of the saw shop men.

Out in Russ's idling yellow pickup, Joe Helvey waits to go. He was able to sign on for work today because Russ's usual cutting partner has gone to Mexico for vacation. Cutters like to work in pairs: enough company for safety, not so much you get in each other's way. Once Russ had worked for Helvey, forty-five. Now, after Helvey's sawmill failed in Montana, the older man is back on the Pacific coast, getting work where he can.

A logger named Steve spots Joe Helvey and walks over to the pickup to say hello. Joe cranks down the window of the overheated cab to talk and let in the slight chill of early autumn. Steve joshes that Joe has signed on for a rough job. "Spoused to be scary," he relates.

"S'posed to be steep, and s'posed to be pretty rough," Helvey agrees. Poppe and Helvey are doing the cutting on a blown-down twenty-acre quadrangle of timber in the foothills of the Olympic Mountains. It is a startled, dangerous mess. The blowdown occurred after the U.S. Forest Service clearcut a fan-shaped bite of trees on the slope. Clearcutting—taking down every tree on a swathe of land—has been the practiced method of logging in this region for two generations. It is cheap, efficient, and leaves a clearing so barren that it gives the most desired tree to replant, Douglas fir, a chance to outgrow its shade-tolerant competitors. However, clearcutting also opens gaps in the forest as potentially calamitous to the neighboring ranks of shallow-rooted conifers as cracking the shield wall of a Roman legion. As the Northwest's forests have become increasingly fragmented by clearcutting, more and more miles of "edge" are exposed to the wind. In this case, the wind took a straight shot at the hillside from the restless North Pacific out on the horizon, striking the next draw full of trees and promptly knocking most of them over. Some had been growing two or three centuries. Now the government wants the downed trees salvaged before they decay, along with most of the survivors still standing. Just to complicate things, however, some of the biologists have spray-painted big blue W's on the bark of a few trees they want left for wildlife. Of course, what will happen to those wildlife trees or the next rank of unprotected trees, when the next big winter storm hits, no one professes to know.

Poppe had looked at the site in early summer and turned it down. The hillside is steep. The wind created a chaotic tangle of trunks and branches. The downed logs must be bucked, or cut into correct length, to fit on logging trucks and produce dimension lumber. Bucking can be even more hazardous than falling standing trees. When sawed into length, the downed logs have a tendency to lose their grip on the slope and careen downhill. The surviving trees must also come down. Some are half-rotten, and others hung up and leaning from the weight of fallen logs around them. The roots that exploded out of the ground in the storm created craters of dirt and broken sandstone, walled on one side by the upturned root ball. Other sections of the site are thick with sword fern, blackberry bramble, thistle, and fireweed.

Twice Poppe told the man who won the Forest Service bid for this mess, Rick Hurn, that he didn't want the job. Hurn persisted. It looked worse from the logging road on top than it really was, Hurn assured. He called several times, an indication he was having difficulty finding

a good cutter. Finally Poppe, afraid his refusal could cost him future jobs in what promised to be a lean winter, reluctantly agreed.

"For \$300 a day, a man will do just about anything," Steve jokes to Joe. The figure is a deliberate exaggeration—good cutters only earn half or a third that—but the meaning is clear. The woods are being locked up by the preservationists. A man can't afford to be too choosy. Take work where it comes.

"It's going to be a tough winter," says Steve.

Poppe emerges from the saw shop and we start up the Galawah River drainage, the brilliant stars fading now. He explains his trade. Poppe is a cutter, and thus at the top of the logger's pyramid in the way fighter pilots are atop the flier's pyramid. Of course falling trees are only the first part of logging. The logs then have to be dragged, or yarded, to a flat clearing called a landing, using steel cables pulled by massive engines. Then they must be trimmed of any branches, loaded on trucks, graded, and then taken to the mill. The chokers who go into the clearcuts to loop steel cables around the logs have one of the roughest and lowest-paying jobs. "Worst job in the world," said Bleck. "How'd you like to get up in the dark, at four or five in the morning, drive an hour, get out all stiff, look two thousand feet down the hill, and then scramble down there and start choking logs? If the sun ain't blazing, and if it ain't one hundred twenty degrees, it's pissing rain."

The truck drivers work some of the longest hours. The hook tenders, who set a network of supportive steel cables to brace the steel spar tower that is used to haul up the logs, need to have a common-sense judgment equal in calculation to an engineer's. The shovel operator who maneuvers the mechanical pincers that load the logs onto the truck sets the pace for the whole operation. The siderod that runs the show is a jack of all trades, supervisor and mechanic. But before any of them arrive at the logging site it is the cutters who go into the lonely woods. Theirs is the job that is the most dangerous, the most solitary, the most dramatic, and in some ways the most skilled.

There are a thousand ways to die in the woods, and everybody knows people who have. Lyle Nelson, the man who taught Poppe how to cut, was killed when a cedar tree dropped by a companion tipped the wrong way and fell on him. A cutter like Larry Suslick considers himself lucky after a quarter century in the woods with only a broken knee, torn muscles, and blows on the head and side from falling or rolling wood. He watched a lot of friends die; Forks can turn out for logger

funerals two or three times a year. "There was one final blow that made me decide to get out," Suslick recalled. "There was a guy working for me who got hit on the neck and paralyzed from the neck down. Looking at him, laying there in the woods, knowing there was nothing we could do for him . . . well, it was time to just physically back away from it." Suslick took a shop maintenance job with the state Department of Natural Resources.

The danger has been there as long as anyone can remember. One historical study concluded that between 1870 and 1910, the life expectancy of a man starting logging was on average only seven years. Safety has improved since then but even today, loggers figure there is a one in three chance they will be killed or seriously injured during a career in the woods.

There is almost a spookiness about the randomness of calamity in the forest. I talked a bit to a young logger named Dewey Rasmussen, his restless energy still burning in what had become a broken body. One of six sons of a man who worked for Weyerhaeuser, he was the only one to follow his father into logging.

Rasmussen's passion was to climb old-growth trees. He would strap metal spurs to his ankles and loop a climbing rope up to sixty feet long around the massive trunks. He hitched the rope upward as he climbed, using a chainsaw to cut branches out of his way. The purpose of his climbing was to attach a steel cable to the upper part of a tree. Tension could then be applied so that when the tree was cut, it would fall uphill instead of down, building less momentum and thus being less likely to crack or break when it hit the ground. A generation ago, trees were so plentiful and cheap around Forks that the expense of sending Rasmussen up a tree would have been unthinkable. But wood prices skyrocketed fivefold in the late 1980s and preserving the soundness of a log became cost effective.

It was a daredevil job, climbing up these giant beanstalks. The climbing rope has a steel center to help guard against accidentally sawing through it. Then there is the problem, one hundred feet up, of getting the thick cable that dangled from one hip around the thick trees. Rasmussen would tie heavy fishing weights onto the cable's end and begin swinging it in an increasing arc. When the weighted cable had enough momentum he would snap his arm to hurl it in a circle around the tree's girth. Aim was crucial. He had to take care that the whizzing end that whipped around the trunk came near enough to grab, but not so near it would hit the climber on the head. Rasmussen

loved this job: the heights, the danger, the skill. "I couldn't believe they were paying me to do it," he said. "It was a like a sport."

Rasmussen got so good he entered spar-climbing contests at summer logging shows. As an amateur he wasn't beaten for five years, and was considering turning professional. A good climber can earn \$25,000 or \$30,000 in prizes during a summer of logging exhibition shows around the United States. Dewey's arms and chest and stomach were so strong that he liked to grasp a metal pole on the stairway of his Forks home and hold himself out horizontally, like a flag.

But on May 9, 1989, an eight-foot-thick cedar no one had yet touched went over as Rasmussen's crew worked in the woods. There was no warning except the growl and squeal it made. Rasmussen was on the ground and scrambled too late. A few hundred tons of wood clipped him, breaking his back. The doctors in Port Angeles, who had seen this kind of thing too many times before, put steel rods in Rasmussen's back and pieced him back together enough so he could walk. His logging career was over.

The old energy is still there: Dewey and his wife Dana have converted some cabins into a small motel in Forks and his restless mind tackles other projects. He has drawn up plans for a commercially producible rocking horse. He has invented a mushroom-cleaning machine. But he wishes he were back in the woods. "I just like being outside," he said.

Given such dangers, one has to wonder what draws men to this job. Pope explains that the cutter is his own boss. There is no second-guessing, no nagging supervision. A cutter makes his own decisions at each tree, earning more if he calls it right, risking his life if he guesses wrong. Most of the time a cutter works alone, at his own pace, one man at one tree. All he has to answer for is how much wood he's laid down, how well, at the end of the day. He sights the tree, peering up its trunk to judge its curve and twist and lean. He looks for weak branches, called widow-makers, that could fall on him with the force of a hurled spear. He judges the rot that can cause a tree to kick or pivot prematurely when cut. A good cutter likes to boast he can fall a tree so accurately that it will hit precisely enough to drive a stake into the ground. But every tree is a bit of a mystery until it's cut. This danger, this challenge, is what makes men fall in love with a hard, dirty, dangerous job.

"It was exciting," recalled Suslick, a bit wistfully. "It took your all, and you had to be on the ball to survive."

Cutters also work the shortest hours, because the job is so exhausting and the misjudgment that comes from exhaustion can be so dangerous and expensive. Fall a log in the wrong spot—busting it across a stump, or sending it careening downhill—and you can drop its value by hundreds or even thousands of dollars.

Accordingly, the cutter eats a mammoth breakfast—"pancakes and eggs, pretty well every day," said Poppe—goes to work by daybreak, and doesn't pause for lunch, quitting by early afternoon.

The slope of fallen tree trunks they leave behind in six hours of work can look like a scene out of World War I. But to cutters, a sheaf of trees laid over carefully like scythed wheat, nestled in a matting of broken boughs, can be the signature of a peculiar, dying artistry.

We leave the main highway for a Forest Service road that winds up the Calawah River, and then leave that paved road for a gravel logging road winding up into these hills. Poppe explains the business end of his trade. He is an independent contractor who gets paid by how much of the tree he falls makes it to the mill. If the tree is so broken or rotten that it is left on the logging site, he earns nothing for falling it. If he turns some of the trees into splinters, wasting wood, he earns nothing for that, either. His usual pay is about \$15 per thousand board feet, though rates can run as low as \$10 and as high as \$40, depending on the site and wood prices and the hunger of the cutter. A board foot is a unit of wood a foot square and an inch thick and is the commonest form of quantification in forests that defy easy calculation. There are perhaps 13,000 board feet of framing lumber in an average house and 7,000 board feet of plywood or similar panels.

Cutters who fell on this kind of agreement are called "bushelers," and most prefer it because the harder and more skillfully they work, the more they get paid. There is justice in that. The idea of good pay for hard, honest work is the foundation of self-esteem in Forks. It is a place where productivity is tangible. It can be eyed from a logging landing. If a man doesn't want to work, or if he tries to skate by, he'll find himself by noontime walking back down the logging road, trying to hitch a ride with a log truck to town. From this \$15 a thousand, Poppe must pay for his help, his truck, his saw, his industrial insurance. "It's a pretty good living for a guy with no education," he said. But even in good times, it is not a way to get rich.

The logging road climbs in switchbacks through a mosaic of "man-aged" forest. The forest has been turned into patches, each patch of different height, marking when it was cut. A log truck driver named

Jimmy Albin will later take me up in his 1956 Piper Cub to see this pattern on its broadest scale: the thickly forested valleys of the national park, the raw clearcut ridgetops just outside the park boundary, and the rolling hills of green where millions of trees have been planted on earlier clearcuts and are coming back in a new kind of forest, the merit of which is bitterly debated.

A Pacific Northwest clearcut is one of the most startling manifestations of resource consumption in the world. A mature coastal conifer forest is like a dense, high-pile carpet of dark green. In the drier country of the mountainous West where the trees are less thick, logging is sometimes done selectively, with a quarter or third of the pines left behind to seed and shelter the next crop. This kind of selective logging has long been considered uneconomical in wetter country, where it is difficult to fall and snake individual trees out of a stand because of the closeness of the trunks and the abundant tangle of decaying logs on the ground. Once clearcutting was discovered to be economic, a host of scientific arguments were offered to justify its ruthless appearance. Yet it remains a visible shock. The forest looks not so much harvested as destroyed, so vivid is the contrast between the evergreen trees and the brown dirt and wood of a cut.

Earlier in the century there was almost no replanting and the clearcuts lingered for long, ugly years, bleeding dirt and growing up in brush and low-value alder. Today the ground is too valuable not to replant, and state and federal law requires it anyway. The timber industry and government set out about 2.3 billion seedlings across the United States each year, 170 million of them in Washington State alone. But still, there is a five- to ten-year period before the brown completely fuzzes with the new green. Even when it does, the forest looks funny. It is patchy, made up of clumps of trees growing on old clearcuts. Each clump is of uniform age and height, but the clumps together are of varied heights, stepping up and down, as if the forest had been assembled from different pieces. An industrial forest tends to have sounder wood, smaller trees, and less variety of wildlife. There is a curiously tidy, shrunken, and sterile feel about managed stands. Poppe's truck switchbacks up through this brave new national forest: the raw new clearcuts, young groves regrown from logging, scrawny places that are remnants of fire and wind, and surviving pockets of once-vast old-growth stands of virgin timber. There is towering Douglas fir, the most valued structural wood in the world; spruce, which once for ounce is the strongest wood in the world and was once used for

airplane frames; decay-resistant and long-lived cedar; and the ubiquitous hemlock, fast-seeding and fast-growing, once dismissed as worthless and now, in the shrunken forest, used for paper, lumber, and finish wood.

As striking as the clearcuts is the fecundity of the land. Time and again in Forks, people will point to former burns and clearcuts now with trees that are a hundred or more feet high. "Trees grow back," they point out, with just a touch of exasperation. Buy a backyard here and try to have them *not* grow back.

In the pale predawn light, which reduces the landscape to silhouettes, some of the clearcut stumps of the old-growth trees—deliberately blackened by fire set to consume excess debris and open the soil to planting—look like tombstones studding the hill of an old cemetery. It looks, this quiet early morning, a bit like a graveyard of giants.

It is old growth, the titanic virgin forest in this corner of the world, that captures the imagination. In a grove several centuries old the trees are like the pillars of a cool temple. The web of foliage overhead, shot through with sunlight, spangles the air with gold and green.

Ironically, it is old growth that captures the imagination of fallers as well. Their age and girth and the crash of their fall adds drama to a cutter's work. Their volume of wood makes them lucrative to cut. Above all, their value and unpredictability calls for skill. "I'd rather cut in old growth," said Joe Helvey in the pickup as he and Russ Poppe and I near the day's salvage site. "It's a lot more of a challenge. It's an accomplishment when you can lay it out and save it out to the berries at the end."

Regrown trees, called second growth, are more boring, he explains. Of uniform dimension and soundness, too frequently they fall over without challenge. On ground that is not too steep, trundling machines called fellerbunchers can snip off the smaller ones with giant scissors. Besides, the modest trees can prove exhausting. On a big tree, a faller can lay the weight of his fifteen- to twenty-pound chainsaw in the cut as the blade pivots, resting his arms. On smaller ones the cut goes too fast and the saw is held up by muscle power alone most of the day, turning arms leaden. It is monotonous, it is fast, it is hard, and it is too easy for the mind to slack off. That's the kind of situation where a man can get hurt. Get lax around any tree, and it can kill you.

We've climbed in the pickup far above the valley of the Callawah now. Fog hangs in the hollows of the landscape. Up high the air is

crystalline, sweet with the smell of the woods. It is a landscape constantly in transition, as heavily worked as an Iowa cornfield. As we pull to a stop the rising sun is lighting a clearcut opposite, across the deep canyon. The cut is big, at its widest perhaps a half-mile brown swathe across the green forest.

There's a story, possibly apocryphal, about President Jimmy Carter's flight across the foothills of southwest Washington to view the devastation caused by the eruption of Mount St. Helens. Peering down at the shaven hills, the president expressed horror at the destruction below him. State officials who were his guide had to gently explain that the helicopter had not reached the volcano blast area yet, that what Carter was seeing was clearcut logging.

This fresh clearcut exhibits some reform. It runs down the mountainside to a line of sheltering trees marking a stream on the canyon bottom.

I ask Poppe what he thinks about leaving those trees along the creek. A decade or two earlier they would have been cut, the stream bed torn, and the water exposed to heat and muddy in the sun. "I don't have any problem with that," Poppe said. "Leaving those trees is a good forest practice."

Other changes are also visible. These logs are not being dragged uphill to the waiting trucks, but are suspended from a steel cable stretched across the valley. Dangling like a gondola, they spare the ground.

The clearcut also seems tidier than those of a generation ago: almost everything of any size is being yarded and trucked away. In the old days the clearcut would have been strewn with casually discarded wood, and in fact so much slash would be left behind it would probably have to be burned after logging to expose the soil to seed and discourage lightning-set wildfire. The deliberate burn would in turn send a polluted haze across miles of sky. Afterward the toasted ground would be planted with new seedlings of a single tree species, such as Douglas fir. Foresters for Washington's Department of Natural Resources (which environmentalists like to ridicule as the Department of Nothing Remaining) coined a self-deprecatory saying for the common logging practice: "Cut it down, burn it black, bring it back."

But logs are too valuable to leave anymore: even the scrawniest pecker poles can be chipped for pulp. Tom Maloney, a wood materials scientist at Washington State University, has calculated the industry today gets 15 million tons of product annually out of material burned

as waste thirty years ago. As a result, this new clearcut looks picked clean. There is a fresh irony in that. Now some scientists think clearcuts have gotten too tidy. They want not only standing trees left behind, but logs too. Food for bugs. Shelter for the birds.

A glance over the edge explains Poppe's reluctance to take this job. The mountain falls away to the wooded canyon bottom as if in a dreadful hurry to get down to thicker air. Just moving on such a pitch is an act of conscious balance. The wind knocked most of the conifers into a matchstick jumble, the survivors that still stand grizzling the slope like missed whiskers. To get to their work the two cutters will have to descend half a mile along the edge of the blowdown, breaking their own trail through the weeds of the adjacent clearcut. At the bottom of the tangle they begin cutting, working upward. "Gravity is always your worst enemy in a place like this," Poppe explains. A faller starts low and works upward so if trees break away and plunge downhill, they won't squash the loggers or become snarled in the work still to come.

The cutters pull on their caulks. Where possible they will use the logs as elevated sidewalks above the brush, the hobnails of these boots lending traction. They pull on steel hats as well. Beyond that, there is not too much to carry today. Because Poppe and his partner have already started this job, the chainsaws and wedges and axes are already down in the tangle, left over the weekend. Poppe and Helvey hoist gasoline, saw oil, and jugs of water out of the back of the pickup and we start down.

Poppe and Helvey drop down the slope with an easy lope. I follow a bit clumsily in my hiking boots, trying to pick out footholds but periodically sliding down the loose dirt. Poppe points out the Douglas fir seedlings planted in the clearcut. They are a few inches high, lost in the grass and fireweed this first year. Their tips are covered with plastic netting to discourage browsing deer.

It is cool this early fall morning, but I'm sweating by the time we reach the bottom. Poppe is not. He simply looks preoccupied at deciding where next to saw in this tangle, and how to break in Joe, his new partner. He has little doubt of Helvey's skill, but partners accustomed to each other's habits can adopt a wordless kind of communication like that seen in a long marriage. Russ and Joe still have to feel each other out.

I ask Poppe if he's ever considered a safer, easier job. "Sure have," he replies. "I just don't know what it is."

He tries to explain the feeling that brings him down into a patch of woods that looks like it's been hit by an artillery barrage. "It sure feels good to work up a good sweat for six hours and then go home and be tired. It feels good to step in that shower and know you've done a good day's work. I don't know if another job would be as satisfying. Not one that would have the physical and the mental stimulation."

The men work their way across the slope's tangle to a mammoth hemlock, laid out across the hillside the previous week. I follow as best I can, sometimes balancing on logs, sometimes slipping off and dropping several feet into the tangle, a couple of times dropping on my butt and sliding a moment before being arrested by the underbrush. The problem I am illustrating, the cutters explain when I struggle up to them, is gravity.

"People think loggers are stupid," says Poppe matter-of-factly. "They don't know that out here, every move you make you've got to be thinking. In a blowdown, it's a domino effect. This tree is going to hit that log, and that log is going to hit that log, and that log is going to hit that rock. There's just a lot of variables. You've got to know what a tree is going to do before it does it."

They thread the sharp chain onto the jutting four-foot-long arms of their saws and feed the beasts gas and oil. Pointing the blade down and away from himself while standing on a stump, Helvey pulls the motor rope with a jerk. Once, twice. He is rewarded with the cough and snarl of the motor. Experimentally, he dips the tip of the chain arm into the stump, sending up a little spout of sawdust. Satisfied, he lifts plastic muffs over his ears. A lot of old-time loggers are half-deaf by the time they come out of the woods.

The men start bucking the downed tree, working together. The saws bite through the wood astonishingly fast, spewing out sawdust like a fountain. The cutters' concern about physics is soon illustrated. With a crack, a section of log suspended above the brush breaks free and sits down on the slope with a force of several tons, the weight so powerful it yanks Helvey's saw down with it, the motor quivering in the air. Helvey pries it loose.

With this warm-up completed, they begin moving apart, Helvey bucking to the left, Poppe falling standing trees to the right. There is little talk. Each man has cut a small forest of trees, and once they get into the rhythm of the day's work the distance between them deliberately widens as they work across the slope. This means there is less

chance of them sending a tree or log into each other. At their advice, I stay well upslope.

They move with a deliberate grace, a paced economy of motion and effort as interesting to watch as an athlete snaring a ball or a dancer extending her body. Helvey strides along a log with the forty-inch arm of his chainsaw out front clipping off inch-thick branches, seemingly as casual as a child pushing a wheeled toy. Trailing behind him, unreeling from a coil on his belt like a strand of web from a spider, is a metal tape. "I think this'll be a twenty-four and a thirty," he says at the beginning to Poppe, suggesting the mill lengths to which a log can be bucked. At the right intervals, he marks the bark with the tip of his chainsaw. Then he comes back to buck it. Straddling his cut as he stands on the log's back, the chainsaw winning between his legs, sawdust flying, he looks like he could castrate himself with a false move. Each log falls away with a solid crack.

Then on to the next tree. Helvey shuts down the saw motor and balances it on his shoulder like a musket, his arm draped around the saw blade that is pointed forward. He strides down the trunk like a model, planting one foot in front of the other, scanning the tangle like a chess board to plot his next move and whip the threat of gravity.

Poppe is down in a small draw, falling standing timber. From a distance he is lost in the vegetation and all one hears is the periodic snort and howl of the chainsaw. Finally there will be a crack and the top of a tree will tremble. Then it will go over in a smooth arc, seeming to suck a hole in the air in its wake. The trees always crash with a boom, the noise like a cannon shot that reverberates across the canyon with a marvelous echo. The noise is followed by quiet, as if the forest gives a moment of silence to what was once there, and then, quite quickly, the chirping of birds starts up again.

At one point the men release a precariously balanced root ball from a log and it goes cartwheeling down hill, throwing off a spray of rocks and dirt. It bangs into trees, the loggers wincing, the sound rattling off the hillsides like maniacal applause. This time the moment of silence is followed by whoops of exclamation from the loggers in the big clearcut across the canyon. It reminds me of every bunch of kids who have ever rolled a rock down into a canyon to watch it bounce. Poppe shakes his head. Gravity.

The loggers look diminutive in this landscape, like insects scrambling through a field of wheat. They bring to mind the industrious chutzpah of ants that carry bundles three times their size through a

landscape of colossal scale. Poppe works his way around the butt of a massive cedar tree, eight feet in diameter and perhaps 150 to 200 feet high. The ground is so steep that the downslope side of the trunk is about four feet lower than the upslope. The geometry of this situation dominates Poppe's decision making. The momentum and force of a downhill fall is so tiamic it can break even a sound tree into splinters. Unfortunately, it is almost impossible, without using hydraulic jacks or a steel cable attached to the top of the tree, to make most trunks fall uphill. The tug of gravity and the gradual sloughing of ground gives most trees a slight downhill lean. A compromise is made between desire and physics: most of the trees are aimed to fall sideways across the slope. Ideally they will fall to be cradled between stumps and standing trees, braking any tendency to roll downhill.

Each trunk is cut twice: an undercut in the direction the faller wants the tree to topple, and then a backcut on the opposite side, slightly higher, to saw the tree through. Because the ground is so steep, Poppe can't reach high enough on the downslope side of this tree to make the two cuts match. To boost himself higher, he makes a springboard. A narrow slot is sawn in the side of the tree to be fallen, and the springboard—a short, rough, makeshift plank sawn off a nearby log—is wedged into it, twisted until it is firm. Old-time loggers armed only with axes and handaws used springboards all the time to elevate themselves above the swollen butt of a tree, giving them less distance to saw through and avoiding the thick pitch and gnarly fibers at the bottom. The rotting hulks of such turn-of-the-century stumps can still be found throughout these woods, the springboard holes clearly visible in their flanks. Timber baron Frederick Weyerhaeuser hated this waste: his last words reportedly were a whispered, "Cut 'em low, boys, cut 'em low."

Poppe clambers up onto this narrow board, hoisting his chainsaw with him, and stands, teetering a moment on his caulk boots. The demand for balance here is extraordinary. The springboard's flex explains its name. The buzzing chainsaw, weighing fifteen to twenty pounds and held at arm's length, can tip a logger over. A loss of footing here means a fall into a thicket of broken branches, vines, and nettles on a slope so precipitous that Poppe, if not impaled or cut by his own saw, would keep tumbling through the mess until he fetched up against a log or stump. From this perch he has to cut a bite out of the tree nearly four feet deep to its core, the center of the cut marking precisely which direction he wants the tree to fall.

Not only must this slice be centered correctly, but it must also be level. Poppe sighs along the perpendicular handles, motor housing, and arm of his saw to ensure this, as if he were sighting a gun. A tilt to the cut will tilt the tree, spilling it downhill. This is why a good cutter can entertain half a dozen different job offers in the early spring and a bad cutter can wipe out a contractor's profit margin. In the old days, when there were more trees and cheaper wood, salaried cutters for timber giants like Weyerhaeuser would sometimes deliberately break a big tree across a stump so they wouldn't have to bother bucking it, and to hell with the wasted splinters. Today, the pressure is always on to save the wood, save the wood.

Planted on his ludicrously narrow board, Poppe bends to his work. A plume of sawdust spits out, raining downhill. A horizontal cut is made into the tree, and then a lower incision comes up diagonally to meet it in what is known as a Humboldt cut. The carved mouth that results seldom opens of its own accord because the tree tends to settle on its wound a bit. So Helvey, on hand to help with this monster, hands up an ax to Poppe. A couple whacks with the butt end of the ax and the wedge pops out. The cut leaves a mouth in the cedar tree opened in an expression of mute surprise.

The tree is now cut halfway through, leaning a bit more in the direction of its intended fall. Poppe leaps down from his springboard and moves to the upslope side. Now he must make a single straight cut to meet the top of the mouth he has carved. Ideally, in a sound tree, a strip of wood across its center a few inches wide will be left between the two cuts as a hinge. The trunk will pivot on that as it goes over. That hinge and the fact the tree is falling into the open wedge will, the logger hopes, keep the tree from twisting as it falls, or, even worse, kicking back at the faller.

Poppe takes his time. This tree is several centuries old, and it will come down in less than half an hour. It is old enough and its top broken and scraggly enough to indicate it is probably rotten inside, and thus doubly dangerous. A young, healthy tree is likely to fall with some predictability. But an old-growth tree past its prime may have developed rot in its core. A cut through the outer shell of healthy bark and cambium can reveal a heart of wood powder. The resulting weakness can send the tree over before the cutter has time or wit to scramble out of the way.

His saw bites in. Poppe pauses occasionally to ensure his cuts are lining up. The cedar has a sweet, pungent odor, but the smells of

sawdust and dirt are unromantic to loggers, many of whom suffer respiratory problems if they survive their first couple decades in the woods.

As Poppe's saw bites toward the core of the old cedar, there is an ominous crack. His head jerks up and the saw is yanked out. He scrambles in a quick retreat uphill, eying the top of the trunk for signs of its intentions. There is another crack and another, a succession of internal snaps of woody tendons like a chain of firecrackers. The effect is eerie. The tree is not moving and yet from its interior are coming all these pops and bangs, as if there was a strange machine inside its bark. This tree is so rotten it has started to disintegrate before the cut is adequately completed.

Finally the cedar begins to lean. Momentum multiplies on momentum. At the base of the tree, cracks race ten and twenty feet high up the bark as the weak wood loses cohesion. The tree swings a bit, as if considering whether to fall as intended or launch itself straight downhill. To Poppe's dismay, it twists further as if to choose the latter. The fall accelerates. Finally the tree hits the steep slope with a boom that shakes the earth, and it smashes into giant slabs. A cloud of dust and detritus thrown up by its fall dissipates like fog before sunlight.

Poppe is dissatisfied. He had given it a good lay. The impatience of the tree to fall made it jump downhill.

He turns to a younger, six-foot-diameter hemlock, its boughs draped with moss from a lifetime in fog and rain. The pattern is repeated, though the smaller size of this tree and a slightly less severe slope makes a springboard unnecessary. Again one is impressed with the brute grace of this work, the bend of back and the strain of arms. Poppe looks around for the best place to lay it down. There is a spot between a stump and a wildlife tree, perhaps fifteen feet wide, that would be perfect. This tree is sounder at its core, and Poppe's aim proves accurate. The tree waits patiently until the saw makes its last bite and Poppe pulls the chain arm out. Then the hemlock goes over with the power of solid weight, moss fluttering from some of the upper boughs like green scarves. It clips the branches of the wildlife tree and there is a spray of moss and bark and needles, like the midair explosion of an antiaircraft shell. Cones fly like shrapnel. Then the tree is down as if falling into bed.

"That one fell just where I wanted it," Poppe says with satisfaction.

There is a terrible beauty in this. The fall of a great tree is as instinctively satisfying as a Fourth of July fireworks explosion. Human



survival has hinged on manipulation of the environment, and few manipulations are as dramatic as falling big trees. It seems extraordinary that two men with motorized handsaws can change a centuries-old landscape so profoundly, so quickly.

But there is a new idea afoot, a new uneasiness, blowing through these woods. It is the notion that we have converted the earth too thoroughly, harnessed it too tightly, and that some of this forest needs to be left alone so that we can still learn from the wisdom of evolution. This is an idea that has come from Outside, from urban communities remote from Forks. It threatens not just the livelihood of men such as these cutters, but more importantly their sense of purpose. Nothing is more bewildering, nothing hurts more, than that this work of courage and skill is now perceived as villainy.

Poppe, breathing hard, takes a break to talk about what he does. His grandfather was a logger. His father was a manager for Crown Zellerbach timber in Cathlamet, a small pulp and paper town on the Columbia River about 150 miles to the south. Poppe's father had hoped his son might go to forestry school and get on the paperwork side of logging. But Poppe had a wife and child to support upon graduation from high school. The best money was in the woods. "It was more out of necessity than desire" that he became a logger, he said.

Now it is threatened. This kind of timber job, cutting trees centuries old, is an increasing rarity. Most old-growth trees have been put off limits while scientists try to figure out how much "ancient forest" need survive to ensure the survival of its ecosystem. The allowable cut on Olympic National Forest has plunged 90 percent in a decade, much of the decline bunched into the last two years. Logging on adjacent state of Washington land has declined 50 to 60 percent. The private lands are also short of trees: the biggest local landowner, ITT-Rayonier, has seen its annual cut plunge from 200 million board feet in the 1970s to 80 million now and perhaps down to 40 million in a few years. The number of logging contracts around Forks is down by two-thirds.

Maybe things will balance out. Certainly some logging will go on. But Poppe has a small farm in the Bogachiel River Valley and has begun buying pack horses. He is thinking maybe he could be a back-country guide to tourists if logging fades out.

"I like to feel I'm as environmentally sensitive as the next guy," said Poppe. "On the other hand, I don't like to see my way of life elimi-

nated. Environmentalists have some idealistic notion of the way the world ought to be, and as long as it don't affect their pocketbook, it's okay. Well, it would be real romantic to think the world can be some kind of paradise, but paper and lumber is going to be needed. The way I feel, if it ain't natural, it ain't good. It ain't natural to make things out of synthetics. Wood is natural. This is the most natural alternative we have, plus it's renewable."

Poppe understands some of the alarm of urbanites who come to these woods. He said he hates to see the new clearcuts along Highway 101, sawn in panic before some new round of regulation forbids their harvest. He says the industry has overcut these forests the past five years. He approves of leaving strips of trees along streams to preserve water quality. He thinks there is a lot of work that could be done in these woods to correct old mistakes, to rehabilitate forest streams.

"That kind of work would be a good alternative for a logger," he muses. "None of us wants a handout."

What Poppe can't understand is the hysteric sweep of proposals to curb logging, the drastic cutbacks, the urban callousness toward thousands of timber families. A few years ago, the timber industry was helping lead the Northwest out of a severe recession. Now it is the bad guy, reviled on national television. Loggers have hailed out almost blindly at this shift, holding rallies with hundreds of logging trucks. They called for a boycott of Burger King because the fast-food chain used salad dressing sold by Paul Newman, the actor who had narrated a critical Audubon Society special on public television. Peninsula loggers petitioned the U. S. Fish and Wildlife Department to be declared an endangered species. Dead spotted owls have been nailed to signs on Olympic National Park. Where do people think their houses come from? Their newspapers? Their toilet paper? The fibers in their clothes? Why do they scorn the rugged, artful grace of fallers like Poppe and Helvey?

Poppe considers the environmentalists a bit too self-righteous, as if they had invented love for the outdoors with their weekend hikes. Well, these loggers live in the woods and work in the woods and play in the woods. They are out in the chill rain and the hot sun. They see deer while driving to the logging job in the morning and eagles on the way home. They fish, they hunt, they hike. These forests are to them a mosaic of memory a city dweller can't imagine, a hundred places cut and regrown. To them, a clearcut isn't an end. It is a beginning.

What Poppe resents is the image of callousness, as if loggers didn't care about the forest they harvest. He recalls an incident in which he deliberately cut around a grove of trees sheltering baby elk, at least sparing them until the elk left. And another when he cut a tree and near its top found a nest of baby flying squirrels, miraculously alive after the tree's crashing fall. He watched as the mother took the tiny creatures and bounded up a nearby cedar tree.

Poppe spared that cedar for a month, cutting all around it to give the squirrels time to either move entirely out of the clearcut or grow big enough to survive. Finally the cedar had to come down too. It was thousands of dollars, just standing there. But he had tried to give the tiny creatures every chance.

The talk seems to make Poppe gloomy, and he quits for the day shortly after noon, clambering back up the slope with Joe. "I just don't want to leave Forks," he says, trying to explain how his allegiance to this hard, dangerous life is evidence not of his indifference to the forest, but his love for it. "Forks is good people."

Months later, a Weyerhaeuser employee named Bob Hoffman will put some of these sentiments in a plaintive song and sing them on the steps of the federal courthouse in Seattle where a federal judge is about to shut down most remaining national forest timber harvests:

*What about my family, what about our home?  
Wildlife and timber, it's the only life I've known.  
I'm just one man, living off the land.  
It's more than what I do;  
It's who I am.*

## 2

### THE BIOLOGIST



Summer's dusk is pleasant and soft in the Pacific Northwest. At that latitude the light lingers, a long, blue twilight seemingly reluctant to give up the landscape. The forest gently shadows, and while its details become less distinct to human eyes, it doesn't rest: a night shift of wild creatures begins to stir. Those seeking to fully understand the forest must listen to its nocturnal cycle, just as a city can't be explained without understanding the work that goes on at night.

In the summer of 1968, a twenty-year-old Oregon State University student named Eric Forsman relaxed each evening by taking in this cool transition. His box seat for dusk's theater was the porch of a lonely guard station near Box Canyon, in Oregon's Willamette National Forest. The solitude of the place fit him. "I've always liked wild places—just getting away from people," he would later remark. Forsman was a wildlife biology student who had landed a summer Forest Service job patrolling the woods for fire. The guard station where he lived was a cabin on the edge of a clearing, tucked into a fringe of old-growth trees. Forsman liked to listen to the forest talk.

One evening, something happened off Forsman's porch that, like so many events in the final forest debate, seemed so serendipitous as to be eerily predestined. An owl hooted from the trees.

"I heard a kind of barking sound," Forsman recounted. It was a queer noise: ow-ow-ow-ow-ow. "I thought it was a dog." But that made no sense. A dog out here? No, there was a different familiarity to this noise. He listened again. Ow-ow-ow-ow. "Finally it occurred to me, because I had read a lot about owls, that it was probably a spotted owl."

Intrigued, Forsman—who had been interested in owls since childhood—decided to imitate the call. He hooted back.