

In ten years, slim red alder and Douglas-fir saplings race to establish claims on the sky and the earth. Flocks of juncos and herds of black-tailed deer grow fat on abundant seeds and browse.

In fifty years, the winners are emerging, as the alders languish in the deepening shade of the Douglas-firs. Networks of fungal mycelia in the dead alder trunks send fruiting bodies through the bark to release powdery spores by the million.

In 120 years, the forest is dark and quiet. A dense Douglas-fir canopy intercepts so much light that only a handful of plants eke out an existence on the forest floor. Saplings suppressed by more vigorous competitors are unable to repel pathogenic fungi. Soon other fungi, the decomposers, will have their turn.

In 250 years, the largest Douglas-firs are producing substantial amounts of strong, fine-grained, rot-resistant heartwood. Many others, weakened by insects or diseases and toppled by storms, lie decaying on the forest floor. In shaded spots, the logs form nurseries for tiny, slow-growing hemlock seedlings. In sunny light gaps, however, the hemlock saplings on their nurse logs race quickly toward the sky.

In 500 years, huge, broken-topped Douglas-firs tower over giant western hemlocks, western redcedars, and smaller understory trees. The forest floor is thickly strewn with downed logs colonized by other plants. As the sun's last rays reach a den in a tall dead tree, a pair of flying squirrels awaken and descend, wary for spotted owls as they sniff the duff for truffles. Bands of Roosevelt elk wend their way among vine maples to drink from a cool stream.

In 1,200 years, the day after a storm toppled the last great Douglas-fir, hemlocks and redcedars now prevail. A snuffing black bear gorging on beetle grubs and salamanders rips through a rotting log, scattering panicking springtails and sowbugs. Ignoring other logs covering a fourth of the forest floor, the bear spares the next generation of hemlock seedlings growing slowly upon them.

The burn has undergone succession.

III

The Keys to Understanding

Succession: Forest Birth and Rebirth

Phoenix . . . Egyptian mythology: a bird that consumed itself by fire after 500 years and rose renewed from its ashes.

(The American Heritage Dictionary of the English Language [1976])

On a breezy August day during a dry year, a rare Cascades lightning storm ignites a fire that sweeps through the giant conifers, lightly charring some, thrusting tongues of flame into the crowns of others. Mice, wolves, and woodpeckers flee, but trees, land snails, and salamanders cannot. For many, the fire ends their lives. But it is also a beginning, the setting for a new phase of life.

In a year, most burned spots are strewn with plants. Some sprouted from underground parts deep enough to avoid baking. Others germinated from buried seeds. Still others came from seeds borne by the winds or deposited in the droppings of sparrows, bears, and foxes. And the pioneering plants are not alone. Caterpillars chew their favorite leaves, oblivious to predatory wolf spiders coursing through the burn until it is too late. Creeping voles scurry among scorched fallen logs. Out of sight, pallid fungal threads colonize the sudden wealth of dead roots, bark, and wood.