'Edge effect' may be killing redwoods

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By David Anderson
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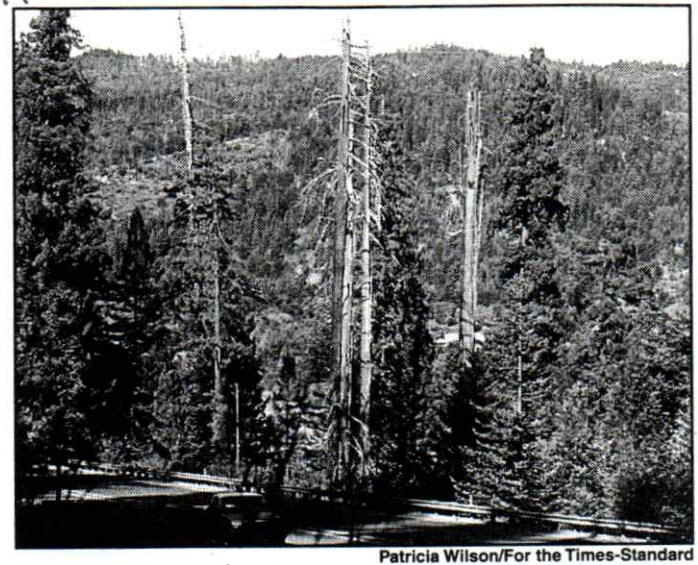
Old redwoods don't do well next to clearcuts, a plant scientist reports, and they thrive even worse next to highways.

Speaking to the North Coast Chapter of the Native Plant Society in Bayside last week, U.C. Berkeley botanist William Russell described studies he conducted last year on old-growth groves in Redwood National and State Parks. Russell researched the "edge effect" on the redwoods and the plant community associated with them.

The edge effect is caused by the intrusion of light and wind into a mature forest, a change that may also affect temperature and humidity. Plants that have evolved to live in deep shade often cannot survive, while light-loving plants may invade the forest.

"We found the edge effect extends for about 200 meters into an old-growth redwood forest," Russell said. "And within that zone we found a much lower species diversity."

Plants that don't live near the forest edge include such redwood specialties as trillium, redwood violets and oxalis, he said. In their place, species such as salmonberry, alders and pampas grass move in. Sword fern, a shade-adapted plant, is replaced by bracken fern.



Patricia Wilson/For the Times-Standard

Dead and dying old-growth redwoods can be seen along U.S. Highway 101.

The edge effect runs deeper into old-growth redwood forest than into most other kinds of woodland, Russell said, because the trees are taller and their canopy higher. His study did not include effects on fauna, although he said that many animal species depend on particular plant communities.

While the loss of shade-specialized understory plants is important, Russell said, the major concern of park managers is what happens to the big redwoods themselves. When they are exposed to sunlight and wind, they start to die from the crown down.

"Redwoods protect each other," he said. "They don't like wind, which is why they don't grow right down to the shoreline. You almost always find tracts of pine, spruce and other trees between them and the ocean."

Russell said botanists are still studying why redwood tops die first. He said it is probably because trees of that height has difficulty drawing water and nutrients up from their roots to their crown.

"Any added stress may make it impossible for them to do it," he said. "The crown gets starved before the lower portions of the tree."

Although Russell's research was conducted on redwood groves adjacent to harvested tracts, he said long-term damage may be worse where highways cut through mature forest. The effect is easily visible along U.S. Highway 101 where it was constructed through the Humboldt Redwoods State Park north of Weott.

"A harvested area will eventually come back in second-growth forest, which will form a protective buffer for the adjacent old-growth," he said. "But a highway doesn't go away. The cut always remains open and the trees next to it start to die."