Book Review

Looking for Longleaf: The Rise and Fall of an American Forest

Lawrence S. Earley, The University of North Carolina Press, Chapel Hill, NC, 2004. X+322 pp., $27.50, hardcover (ISBN 0-8078-2886-6)

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The longleaf pine (*Pinus palustris*) has needles of eight to fifteen inches and grows throughout the US southeast, from Virginia to Florida to Texas. Lawrence Earley, a freelance writer and photographer and former editor of *Wildlife in North Carolina* elegantly describes the loss of and restoration efforts of the longleaf pine throughout its range, but places particular emphasis on the longleaf in North Carolina. The book, though detailed, is written for the general public. The book's four parts describe the ecology, exploitation, forest management, and ecosystem restoration for longleaf. There are notes, a bibliography, index, and 22 pages of graphics including a map, many historical photos and sketches.

Ecologically, the most important changes for longleaf have involved fire suppression, the loss of dense stands of contiguous forest, and the removal of most of the oldest trees, those in the 400-500 year range. There are many different longleaf communities. Whereas each community is fire-dependent and has a grassy, herb-rich understory, the communities differ considerably in their plant composition. There are at least eight distinct longleaf communities in North Carolina containing 600 plant species or nearly a quarter of the state's total. Longleafs survive mostly in xeric (dry), sandier portions of North Carolina, but can grow in moister, more fertile surroundings. In more fertile grounds, longleafs do not have a competitive edge once fires are suppressed. Pines are quite prone to lightning strikes relative to beech and other trees and lightning storms are common in the south. Fires burning literally millions of acres barely made the back pages of Raleigh newspapers as recently as 1898. In the 1970s, US forester Robert Mutch went as far as to suggest that certain trees, including the longleaf, depended on regular fires and might have adapted traits such as highly flammable resin which encouraged blazes. Common species associated with longleaf communities are the burrowing gopher tortoise (*Gopherus polyphemus*), red-cockaded woodpecker (*Picoides borealis*), and southeastern fox squirrel (*Sciurus niger*).

Humans have shaped longleaf communities for at least 5,000 years, but the greatest impacts have come in the last four centuries. Europeans brought cattle, hogs, and started longleaf-based industries. Cattle reduced perennial grasses which fuel fires that perpetuate the forest, hogs ate the nutritious longleaf seeds and seedlings. Workers cut 'boxes' into the bases of living longleaf trunks to extract gum for processing into turpentine spirits and rosin, others felled trees entirely for timber. Often much waste was involved because longleaf supplies seemed inexhaustible. North Carolina was the south's leading exporter of lumber during the colonial period and was home to nearly one-third of all sawmills in the longleaf range. Ship builders in Europe prized the US longleaf for its rot-resistant wood and pitch which could be used to caulk seams. North Carolina also was the key state for the production of turpentine. The state had 785 stills in 1850, more than ten times the stills in all other southern states combined. Turpentine was used to treat wounds, mixed with castor oil or alcohol and burned in lamps, used in the manufacture of varnishes, paints, and oil colors. Laborers and slaves cut boxes into trees, but poorly made cuts could lead to the tree's death. Even properly boxed longleafs were more vulnerable to insect activity and hurricanes. Longleaf populations had declined considerably by the time the US turpentine industry peaked in 1909. Less destructive methods of gum extraction gained popularity when they also increased profits and production.

Forest management arose with the understanding that resources could be exhausted. Whereas the skies over North America were once blackened with passenger pigeons, the unthinkable had occurred. The passenger pigeons were no more. Foresters, especially

those trained in Europe, arrived with cautionary tales. With the Forest Reserve Act of 1891 the US president could create national forest preserves. Scientific forest management took hold, and with it notions of the need to suppress fires. Fire suppression had the unintended side effect of encouraging the growth of the fast growing, frequently seeding trees such as the loblolly pine (*Pinus taeda*) and the slash pine (*Pinus elliotii*) throughout longleaf range. Foresters soon discovered that secondary growth trees like the loblolly and slash pine had marketable qualities that the longleaf lacked. Due to their rapid growth loblolly and slash were useful to the pulp and paper industry as a source of high quality newsprint. By the 1950s, pulp was the dominant forest product of the south. Over time it was noted by hunters that some of their favored species, such as the bobwhite quail, were less prevalent than in the past and scientists and the general public alike began to believe that the decline of the longleaf and the quail were interrelated. Indeed it was found that quail could starve in a food-rich environment if food was buried under a mat of grasses no longer removed by fire. By the 1940s some foresters realized that fires are necessary for some species to thrive, but others were busy creating Smoky the Bear, a 'public education' figure in cartoon form who promoted fire suppression. It was not until the mid-1980s that the Forest Service pronounced its commitment to restoring longleaf in its historic range. By this point there were only 3.8 million acres of longleaf remaining in a region that once boasted 92 million acres.

Litigation fueled the move from exploitation and neglect to ecosystem restoration. Species such as the red-cockaded woodpecker that required hollows in older longleaf trees to survive had declined to the point of being endangered. Based on the 1976 National Forest Management Act, in the 1980s, the Forest Service was sued successfully and repeatedly by environmental groups on behalf on endangered and threatened species associated with longleaf pine communities, prompting change in forest management. It took considerable effort for the Forest Service to recruit landowners to support longleaf restoration. Years of Smoky Bear campaigns and the long-term planning required due to the slow growth of longleaf hampered efforts. Economics slowly began to win over some land owners—the longleaf pine is more expensive to grow, but it provides high-grade saw timber and (telephone) poles that faster growing pines do not. Incentive programs, such as the Safe Harbor Program were created as well. Some landowners had cut down all of their longleaf fearing that the presence of endangered species would limit their options. Safe Harbor provided economic incentives to protect endangered species. The longleaf also provides superior needles for gardeners and landscapers. This relatively new pine straw industry created a virtual craze for the longleaf. Owners could have their properties raked once or twice a year, get immediate income, yet still be growing valuable trees. In North Carolina, by 2002, pine straw was a 50-55 million dollar a-year industry. Restoration of longleaf is not based on returning to 'pristine' or 'pre-European' conditions, but on bringing longleaf communities closer in general terms to what it might have been when there was more of it. Ironically, some of the oldest and most extensive stands of longleaf are areas not managed by the Forest Service—military bases where US Air Force bombing runs that bring about regular burns, Girl Scout camps, North Carolina's Fort Bragg Military Reservation, and elsewhere.

Earley concludes that he is cautiously optimistic about the future of the longleaf pine. Challenges to its future include the damage already done, the popularity of the south, and that the nation relies on the south for wood. The south produces 58 percent of US wood fiber and 16 percent of the worlds. For the past 20 years it has also been the fastest growing region in the country.

Looking for Longleaf makes for fine reading. It will serve as a useful introduction to forest management in the US for introductory-level university courses in environmental studies and for the person with general interest in natural history. The book's North Carolina focus also makes it appropriate reading for undergraduates studying the state's coastal zone, economic geography, or human-environment interactions.