

TREE DAMAGE AND MORTALITY FOLLOWING WILDFIRE AND PRESCRIBED FIRE IN LONG UNBURNED MIXED OAK-PINE FORESTS

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Intentionally excluding fire from fire-dependent mixed oak-pine forests in the Southeastern United States has dramatically changed forest composition and structure. In long-unburned stands, duff (Oe and Oa soil horizons) accumulation is greater than in frequently burned stands. When ignited, duff can smolder for long periods, contributing to tree mortality through cambial injury, fine root death, and susceptibility to other stresses. We present wildfire and prescribed fire data from two sites in northeast Alabama investigating fire effects along a mesophyte to pyrophyte gradient using measurements of duff accumulation, consumption patterns, and tree mortality. At each site, we established permanent transects at three slope positions, included trees >10 cm diameter at breast height (d.b.h.), and installed duff pins for repeated measurements. Prior to prescribed fire, duff accumulations were greatest at the base of *Pinus palustris*, and immediately adjacent to other pine species. Upland *Quercus* species, and all hardwood dominated stands showed little accumulation of duff. Postfire consumption in the prescribed fire sites is currently being sampled. Post wildfire, the remaining duff was patchy, with greatest consumption and measures of fire severity (extent of charring on the stem and crown damage) around *Pinus palustris* bases. Upland *Quercus* and other fire tolerant hardwoods exhibit limited postfire injury compared to pine species. However, when *Quercus* individuals are near *Pinus* individuals, they can potentially experience increased rates of injury. Reintroduction of fire continues to require special consideration to mitigate mortality for not only pines, but any species exposed to large accumulations of duff.

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