



THE LABORATORY OF TREE-RING RESEARCH

presents a talk by

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White fir as an invasive species in the Pinaleno Mountains

Wednesday, April 29, 2015 - 12:00pm to 1:00pm

Room: Bannister 110

Proliferation of shade-tolerant species during the period of fire exclusion has been put forth as a major driver of increased severity of fire and insect outbreak regimes in mixed-conifer forests of the interior West. Both fire regimes and insect defoliator outbreak regimes are responsive to closed and multi-storied canopies. Douglas-fir tussock moth (*Orgyia pseudotsugae*) and western spruce budworm (*Choristoneura occidentalis*), both major pests in interior West forests, are particularly responsive to the presence of white fir (*Abies concolor*). However, quantitative studies characterizing changes in forest structure and species composition are lacking. We used dendrochronology to reconstruct tree population demographics of mesic and dry mixed-conifer forests in the Pinaleno Mountains. Our findings indicate that lack of fire is a strong driver of cohort formation in fire-adapted landscapes, particularly in the dry mixed-conifer. During the period of fire exclusion, white fir transitioned from being a fairly uncommon species restricted to cool mesic drainages and other sites where fire was excluded by topographic, moisture, and temperature conditions to being the most abundant species on the landscape. Furthermore, the extent of area occupied by white fir more than doubled. The greatest invasion occurred in areas with the greatest departure from the historical fire regime, specifically the dry mixed-conifer. The increased abundance and extent of white fir contributes to fuels distribution favorable to high-severity fire, decreased forest health and resiliency, increased vulnerability to insect defoliators, and significantly affects habitat of threatened and endangered species.