Calcium Cycling in Relation to Prescribed Fire on Oligotrophic Sites in North Florida. (S07-potter150433-Poster)

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Abstract:

Fire regimes may influence Ca availability in terrestrial ecosystems low in base cations. We hypothesized this mechanism as a control on endangered red-cockaded woodpecker (RCW) (Picoides borealis) populations in North Florida. We measured Ca dynamics for 4 y in forest management compartments under dormant, growing, or alternate dormant/growing season burns. Soil was sampled twice yearly in each compartment and Ca was analyzed in exchangeable, acid soluble, and organic fractions. A model was developed to simulate Ca movement through soil, litter and plants. Pre-burn soils had greater exchangeable and acid soluble Ca on sites where RCW populations were stable or increasing, compared to sites where populations are declining; most of this Ca was in 0-5 cm soil depths. Exchangeable and acid soluble Ca pool sizes increased after fire and slowly decreased until the next fire under all fire regimes. Model simulations suggest that increasing fire frequency increases soil Ca stocks and decreases Ca sequestered in understory and litter pools. We are examining pathways by which this Ca may become available to RCWs, including consumption of Ca-rich plant tissues and arboreal insects.

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