# Observations of the Effects of Forest Structure on Avian Assemblage Using Passive Acoustic Monitoring

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Prescribed burning and mechanical thinning are forest treatments commonly used to alter forest structures for wildfire mitigation. In 2001, the National Fire and Fire-Surrogate (FSS) Study examined the long-term ecological effects of burning and thinning. Lubrecht Experimental Forest developed and maintains one of 12 FFS sites. It contains three replicates of four treatments, i.e., control, burn-only, thin-only, and thin-and-burn, each producing distinct forest characteristics. To analyze effects of different forest structures on bird communities, 12 bioacoustic monitors were installed in each treatment area at Lubrecht for 82 days in the summer of 2025. It was hypothesized that bird species would be detected in their preferred habitats, and that there would be different assemblages in each FSS treatment due to forest structures favoring different foraging and nesting behaviors. BirdNET-Analyzer, a species detection software, was used to run batch analyses of the first week of recordings. Treatments involving burning demonstrated the highest levels of bird diversity, likely due to complex forest structures and presence of dead woody material. Sallying species preferred open structures (thin, thin-burn) and gleaners and ground nesters favored denser forests with dead wood (control, burn). The relationship found between species diversity and treatment indicates that to achieve diverse bird communities, land managers should implement various forest treatments. Furthermore, many of the species found in each treatment type indicate the individual habitat that each treatment creates. Long term continuation of the project incorporating varying monitor installation designs and programming will strengthen our understanding of how forest treatments transform ecosystems.

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