

Lab 1: The Effects of Prescribed Fire on Vegetation

Objective

To evaluate the effects of prescribed fire on forest vegetation and structure.

General Procedures

Students will compare and contrast forest vegetation and forest floor conditions in areas with and without prescribed burning by collecting field data in fixed plots. These conditions will be discussed relative to the objectives of prescribed burning programs and fire ecology.

Background

Prescribed burning is the deliberate use of fire under specific controlled conditions to meet management objectives. The most common objectives for prescribed burns include:

1. Hazardous fuel reduction
2. Wildlife habitat improvement
3. Site preparation for forest regeneration
4. Perpetuate fire-dependent species
5. Exotic/invasive and native plant/pest management
6. Improve access or enhance appearance

Prescribed burn managers set very specific objectives for prescribed burns relative to what resources or vegetation are to be altered, by how much, and when. They then prescribe detailed weather, timing, fire behavior, fuel moisture, ignition patterns, and many other variables and conditions under which the burn will be conducted. A wide range of fire intensity is possible. Very intense fires that are conducted under dry and warm conditions will maximize plant mortality and fuel consumption. Cool burns under wet conditions may have little impact on vegetation and surface fuels. An integral part of the prescription and burn operation management is to monitor the outcome(s) of the prescribed fire. This monitoring and assessment process is the basic exercise that students will be doing. Providing as much detail on the actual prescription, its objectives, and the predicted and desired conditions by comparison to those actually occurring during the burn will help students connect the objectives with the operation and, in turn, the outcomes of the prescribed burn.

Specific Procedures

1. Working in crews, establish a set of nested plots in burned and unburned areas.
2. 1/20 acre circular plots (~ 26 ft radius) for overstory trees, 1/100 acre plots (~12 ft radius) for understory trees and shrubs, and 1/1000 acre plots (~4 ft radius) will be established in areas delineated by the instructor.
3. In tree plots, record the species, DBH, scorch height, and severity (cambium exposed or not), and estimate the crown vigor (% of crown fully foliated). Use trees greater than 6" in diameter to differentiate the overstory from the understory.

4. In understory tree/shrub plots, count the number of live plants (rootstocks) or stems by species, and record an average height for each species. Also count the number of dead stems (by species if possible). Stems counted should be < 6" DBH but > 4.5' tall.
5. In the herb plots, record the number of different grass, forb, vine, and tree species found and visually estimate the percent ground cover in the plot of each growth form. Also estimate in herb plots the percent of the ground that has bare mineral soil (or completely ashed "O" horizon, surface is completely white or orange), intact duff (H and F layers of the "O" horizon, surface still covered with unburned organic matter), and intact leaf litter and duff (L, H, and F layers of the "O" horizon). Estimate/measure the mean depth of the duff and litter layers.
6. Working as an individual, compare and contrast the vegetation and soil surface conditions in burned and unburned areas by computing the averages (submit a table of these averages) of the response variables measured (average number of trees, average DBH, average scorch height....) for the two replicate plots and determine the dominant tree and shrub species based on frequency for the burned vs. unburned. Write a brief one-page summary of the results.

Materials and Tools

pin flags	data sheets
yard sticks or rulers	calculator
cloth tapes	prescribed burn plan
DBH tapes	burn day weather data

