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Chanterelle productivity responses to young stand thinning.

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ABSTRACT: Full Abstract

The study consists of 5 data files derived from two sampling protocols. Systematically located strip plots were used to estimate chanterelle productivity and smaller circular plots were used to examine fine scale responses of chanterelle patches to nearby removal of ectomycorrhizal host trees. The first strip plot data file includes the number and weight of sampled chanterelles, information about when and where they were collected, and fresh and dry weights of subsamples from each collection. The second strip plot data file contains information about logging (thinning) impacts on the chanterelle fruiting microenvironments (soil and brush) of each strip plot. The first circular plot data file contains the distance and azimuth from the center of the plot to each chanterelle. The second circular plot data file contains the number of chanterelles, their total weight, and subsamples of fresh and dry weight from each circular plot. The third circular plot data file contains the distance and azimuth to each tree in or near the circular plot, the species of the tree, its dbh, and whether it was cut (stump) or not (tree) during thinning operations. (See methods for more details)

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KEYWORDS:
Mushrooms/sporocarps, Mycorrhizae, Productivity, Special forest products, Young stands

PURPOSE:
The purpose of this study is to investigate the impacts of thinning young stands of trees on chanterelle mushroom productivity and on the fruiting patterns of discrete chanterelle patches. The study is a part of a larger multidisciplinary study entitled the Young Stand Thinning and Diversity Study (YSTDS) being conducted under the auspices of the Cascade Center for Ecosystem Management, Blue River, OR.

METHODS:
Experimental Design - TP110:

Description:

The YSTDS study is replicated on four sites (blocks of treatments) (one on the Blue River Ranger District, one on the McKenzie R.D., and two on the Oakridge R. D.). At each site similar stands were assigned one of 4 thinning treatments (Control - 615 original trees per hectare, Light thin - 270 residual trees per hectare, Heavy thin - 125 residual trees per hectare, and a Clump thin which we did not sample for chanterelles) for a total of 3 thinning treatments for the chanterelle portion of the study. 4 blocks (sites) X 3 treatments (thinnings) = 12 stands sampled. Within each stand we used 2 different types of plots. Transects had been previously marked in the field for use by vegetation sampling crews. The transects were marked at intervals of 1 chain (66 feet, 20.117 m). We choose portions of these transects as the middle line for strip plots (elongated rectangles). Five strip plots were located in each stand. They were 5 meters wide (2.5 meters on either side of the transect middle line), and varied in length (multiples of the marked chains). Length and square area are noted in the data for each plot for productivity per unit area calculations. The vegetation transects were arranged systematically on North/South or East/ West parallel azimuths through the stands, and the portions of those transects over which we placed our strip plots were assigned prior to any knowledge of whether or where chanterelles fruited in each stand. The strip plots are used to estimate chanterelle numbers and weight per unit area for each stand.

We also delineated circular plots for use in spatially examining the reaction of chanterelle colony fruiting patterns to the removal of nearby ectomycorrhizal host trees. Within each stand we located 3 chanterelle patches where at least 20 mushrooms could be counted within a circle with an 8 meter radius. A plot center was selected that included the largest number of chanterelles beyond the 20 minimum. Chanterelles were mapped, counted and weighed on these plots.

Field Methods - TP110:

Description:

Sampling occurred each autumn from 1994-1997 and again in the autumn of 1999. Thinning occurred during the calendar years of 1995-1996. Some data are missing during these seasons as it was unsafe for crews to work around the logging equipment. 1994 data provide baseline productivity estimates and 1997 data provide the first complete set of post thinning productivity estimates. Each sampling season, the crew began in mid- September regardless of whether autumn rains had initiated fruiting because chanterelles rarely fruit before this date in this area and those that did were typically still present when sampling began. Snow usually ended sampling in mid-November after 2 full rounds of sampling all the strip and circular plots. In 1999, late rains and late snowfall enabled the crew to complete three rounds of sampling. In all years the intent was to measure all the chanterelles that fruited on our plots during the season. Typically the strip plots were measured first on each stand and then circular plots were measured next on a separate round of sampling. The rounds were then repeated. Crew travel logistics prevented the sequence of site sampling from being identical from year to year, but variations in scheduling appeared random and had no intentional systematic bias.

Strip plots were sampled by walking the mid-line transects and collecting all of the chanterelles encountered within 2.5 meters on either side. Entire chanterelles, including their bases were collected. In the evenings, the chanterelles were counted and weighed. Representative sub-samples of individual chanterelles from each plot were weighed fresh, dried over night and re-weighed dry to obtain moisture contents. File Name: StipPlotWeightData

On the circular plots, the location of each chanterelle was determined by recording the azimuth and distance (to the nearest decimeter) of each chanterelle from the center of the plot. File Name: CircPlotDistAzm. Frequently multiple chanterelles were clumped in one location and when this occurred, the number of chanterelles (stems above ground) in that location were noted. These chanterelles were also picked and weighed en mass for each plot. Tallies from the location records yielded the total number of chanterelles on each plot. File Name: CircPlotFreshWt.

Circular stumps - After thinning was completed the location, size (dbh) and species of live and cut (stumps) trees were recorded within and 2 meters beyond the perimeter of each chanterelle plot. File Name: CircPlotTrStmpAssoc

Disturbance plots - During the 1999 sampling season, the crew was asked to evaluate what percentage of each strip plot (to the nearest 10%) evidenced ground disturbance from logging equipment or slash pile burns, and what percentage of each strip plot a person would have difficulty finding chanterelles due to thick brush or logging slash. File Names: StripPlotDisturbData and CircPlotDisrb

SUPPLEMENTAL INFO:

Twelve stands located on the Blue River, McKenzie, and Oakridge Ranger Districts of the Willamette National Forest (WNF) in the Cascade Range west of Eugene, Oregon. numbers are:

1. Tap Thin (Boone Thin) timber sale, Blue River Ranger District

T17S, R 5E Sections 17,18,19,20,29 W.M.

Thinning Treatment WNF Stand Number Control 1001691 Heavy Thin 1004058-59 Light Thin 1004050-54

2. Mill Thin timber sale, McKenzie Ranger District

T16S R5E Sections 5,7,8,9,18,15

Thinning Treatment WNF Stand Number

Control 7001912 Heavy Thin 70025794 Light Thin 7002306

3. Flat Thin timber sale, Oakridge Ranger District (now Middle Fork R. D.)

T19S R4E Sections 19,20,29,30

Thinning Treatment WNF Stand Number

Control 8010101 & 8016133 Heavy Thin 8010022 Light Thin 8010024

4. Walk Thin timber sale, Oakridge Ranger District (now Middle Fork R. D.)

T19S R4e Sections 28,29,32,33

Thinning Treatment WNF Stand Number

Control 8000810 & 8010026 Heavy Thin 8010027 Light Thin 8010025

TAXA:

Cantharellus formosus, Cantharellus subalbidus, undescribed yellow Cantharellus species

TAXONOMIC_SYSTEM_NAME:
None

GEOGRAPHIC EXTENT:
Blue River, McKenzie, and Oakridge (now Middle Fork) Ranger Districts, Willamette National Forest

MEASUREMENT_FREQ:
annual

PROGRESS:
Completed

UPDATE FREQUENCY:
None planned

CURRENTNESS:
Ground condition