

Methods for Studying the Structure of a Forest, Burn or Clear Cut

The following methods are based on the procedures outlined by Dan Farr (forest Ecologist with the Hinton Environment School and the Alberta Perscribed Manual).

This method for analyzing forest structure centers on conducting a number of studies in 30 meter equalateral triangle plots located in a range of forest environments. Each plot is referenced to a recognized point (tie point "TP"). Plots outline by corner stakes and a measuring survey tape which is left in place during the study.

The analysis of forest sturcture includes six different components:

1. study of fine woody material on the ground (< 7 cm dia)
2. study of course woody material on the ground (> 7 cm dia)
3. study of dead standing trees
4. study of live trees
5. soil studies
6. ground cover studies

In addition, the studies may also include an analysis of seedlings, spruce beetle infestations, harvesting practice and any other feature having a direct or indirect impact upon the structure of the forest under study. Each of the study methods are outlined and data tables are presented on the following pages.

Laying out the triangular plot:

1. Establish an identifiable tie point
2. Set an azimuth and distance to the first plot site.
3. Select the first plot point as point A of the triangle and go 30 m along the same azimuth to point B. The measuring tape should follow these azimuth around the triangle.
4. At point B, turn of 120° and follow this azimuth for 30 m to point C
5. At C, turn of another 120° in the same direction and measure 30 m to close the triangle at A. Make necessary corrections to establish closure

Plot Information

Site	Plot location
Plot	
Date	
Participants	
Slope	Stand type
Aspect	
Elevation	
UTM ref	
Air Photo series	

Sketch of tie point and transect triangle	Side	Azimuth
	A	
	B	
	C	

General description, Comments

Team members and tasks done by each:

1. Records information on the DBH and species of all trees over 2 m tall in the plot and record ages and heights of representative samples.
2. Records numbers, size and health of all tree seedling within the plot.
3. Records DBH of dead standing trees over 2 m within the plot and categorizes the stage of decay of the standing dead trees,

DBH	Live trees > 2 m height count	species			
		Sp	Pi	dec	representative age and height
5-10					
10-15					
15-20					
20-25					
25-30					
30-35					
35-40					
40-45					
45-50					
50-55					
55-60					
60+					

Seedlings		1 strong, 2-moderate, 3-weak, 4-dead				planted in		
Height(cm)	count	Sp	Pi	other	Health	soil,	duff,	moss
0-15								
15-30								
30-45								
45-90								
90-140								
140-200								

DBH	count	decay state tally	
15-20		3	
20-25		4	
25-30		5	
30-35		6	
35-40		7	
40-45		8	
45-50		9	
50-55			
55-60			

Indicate the depth of each layer of soil
Show the composition and moisture using the table below for each layer

1. Sand
2. Clay
3. Silt
4. Loam
5. Gravel
6. Organic

A. Xeric (dry)
B. Mesic
C. Hygic

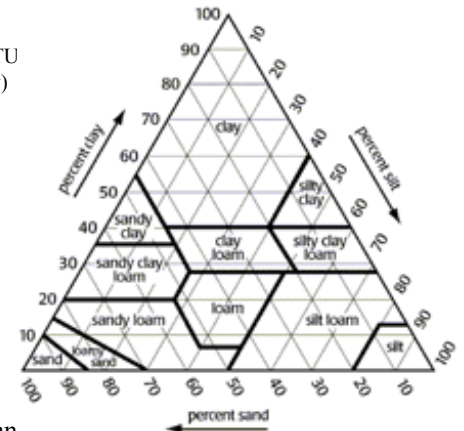


Figure 1 is a grid for recording data. The vertical axis is labeled "depth / cm" and ranges from 0 to 70 in increments of 5. The horizontal axis is labeled "location at the edge of the triangle / cm" and ranges from 5 to 85 in increments of 5. An arrow labeled "percent sand" points to the right above the grid.

Fine woody litter on the forest floor: Woody litter represents the stage in which nutrients taken in by trees are being recombined with nutrients in the soil. Decomposition occurs over a period of time and in a number of stages. This method counts and categorizes by size, smaller (<7cm) twigs and woody material that has not yet been covered by moss or has not been covered by other plants of the forest floor.

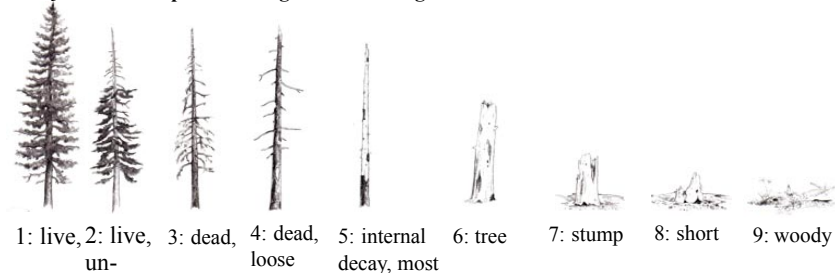
Method: Record small (< 7 cm in dia) woody material crossed by the triangle tape using a "go - no go" gauge to determine category.

fine woody material on the ground (not covered at the point of intersection)

dia	A-B count	B-C count	C-A count
0-.5			
.5-1			
1-3			
3-5			
5-7			

If there are extensive amounts of litter, use sampling methods, recording 1 meter long intervals at 6 points along each 30 meter side.

Decay and Decomposition Stages for standing dead



Decay Class 1 Decay Class 2 Decay Class 3 Decay Class 4 Decay Class 5



Course woody litter on the forest floor: Course woody litter takes longer to decompose. Assessment of course woody material counts the logs crossed by the triangular plot tape by the size, distance from the ground (height) and the state of decay. The state of decay is indicated by a scale of decomposition of the wood, the amount of bark left on the log and the % to which the log is covered by moss.

Method: Record the diameter of course woody material > 7cm not covered at the point of intersection, height from the ground, the percentage of bark on the log, percentage of moss on the log and the class of decay of the logs. Use the decay chart to identify category

(tally by diameter)		(tally height)		(tally by % bark, % moss)		
dia	counts	cm	height	%	% bark	% moss
7-10		0-10		0-10		
10-15		10-20		10-20		
15-20		20-30		20-30		
20-25		30-40		30-40		
25-30		40-50		40-50		
30-35		50-60		50-60		
35-40		60-70		60-70		
40-45		70-80		70-80		
45-50		80-90		80-90		
50-55		90-100		90-100		
55-60						
60+						

Texture Classes

- Class 1- Firm, sound wood
- Class 2 -Some softening, rotting
- Class 3 - rotting , chunks break off
- Class 4 - crumbles into chunks when hit
- Class 5 - crumbles to dust or powder when hit

Decay (by class)

class	count
3	
4	
5	
6	
7	
8	
9	

Texture (by class)

class	count
1	
2	
3	
4	
5	

Ground cover surveys identify the plants that occupy the forest floor. Four, 1 m² quadrat plots are taken at the mid point of each segment and at the center of to establish a representative plants and estimates of % cover are for each plant type are given for each species.

Name the species for each type of plant	% cover of meter quadrat
Flowering plants	
Woody Shrubs	
Grasses	
Mosses	
Lichen	
Duff/Organicnaterial	

Name the species for each type of plant	cover of meter quadrat
Flowering plants	
Woody Shrubs	
Grasses	
Mosses	
Lichen	
Duff/Organicnaterial	
bare soil	

Name the species for each type of plant	% cover of meter quadrat
Flowering plants	
Woody Shrubs	
Grasses	
Mosses	
Lichen	
Duff/Organicmaterial	

Name the species for each type of plant	% cover of meter quadrat
Flowering plants	
Woody Shrubs	
Grasses	
Mosses	
Lichen	
Duff/Organicmaterial	