

# Analysis of the Old-Growth Forest at Lighthouse Park

**NOTE: This is natural area reserve. Please remain on the paths except to make the measurements within your PCQ plots – be careful as you walk off the trail. Take only notes and leave only footprints!**

## A. Old-Growth Forests

Lighthouse Park has never been logged – it is a remnant old growth forest. According to the class definitions of old-growth, human use of the forest (logged - never logged) is only one criteria, albeit an important one, for defining old-growth forests. Today you will work in groups of 4 or 5 students to assess the composition and structure of the Lighthouse Park forest. The objective is to determine whether it meets the structural criteria of old-growth presented by Wells, Lertzman and Saunders (1998).

## B. Composition

The floristic composition is a list of all species within a defined area. The genus and species of individual plants is determined using a botanical key. A key to common trees in Lighthouse Park is attached. Use it to determine the common and scientific names of the trees that you encounter today.

Scientific names of plants are written in Latin and are used to aid communication between researchers. Protocol for using scientific names of species is as follows:

- Genus = capitalized
- species = lower case
- always underline the genus and species names

For example, the scientific name for Douglas-fir is Pseudotsuga menziesii.

## C. Physiognomy or Structure

Simply stated, *physiognomy* is the appearance of vegetation. It combines architecture and life form to describe the structure and arrangement of plants in a community. *Architecture* identifies canopy layers or strata. Today we will use qualitative description or categories to describe forest architecture:

Category	Description
Emergents	scattered trees, above the main canopy layer
Canopy	crowns of the trees mostly exposed to sun
Sub-canopy	trees with crowns mostly shaded
Shrub layer	shrubs, large herbs or seedlings and saplings
Ground cover	moss, herbs, ferns, bare ground

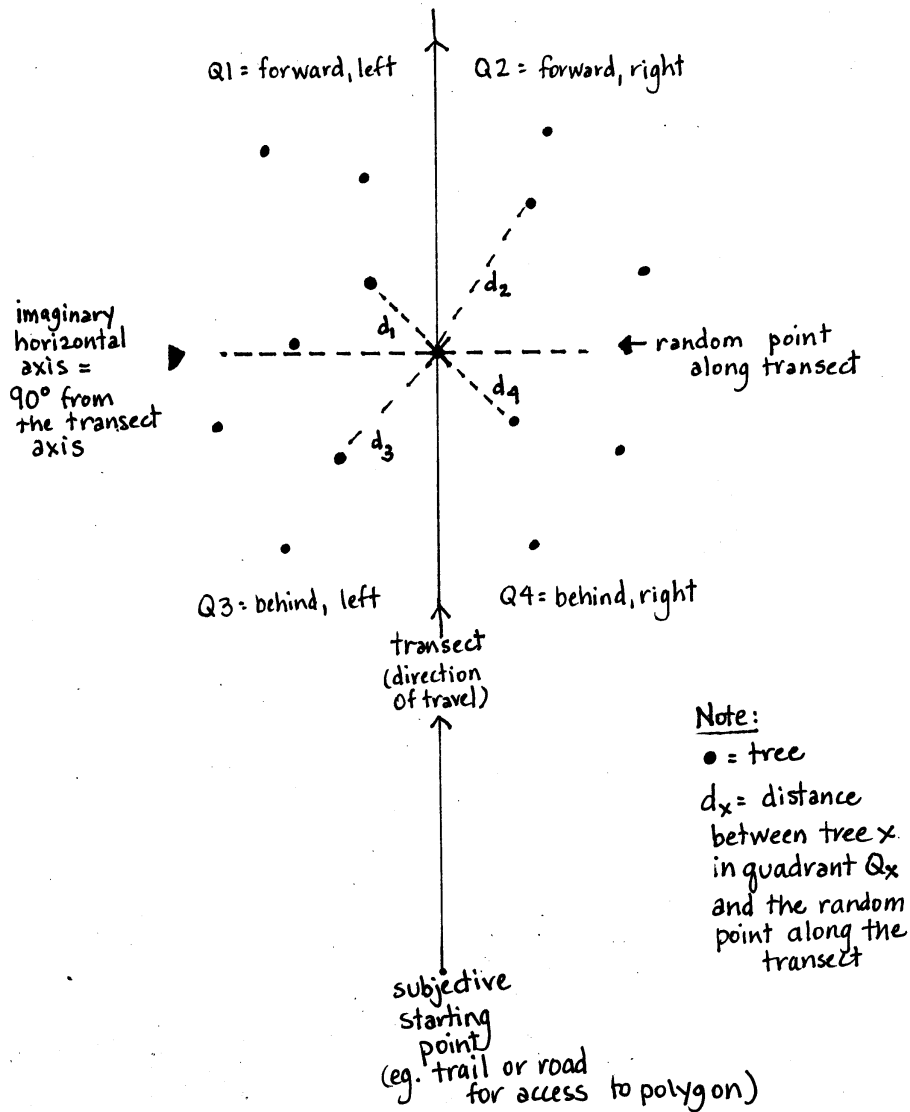
A second attribute of physiognomy is life form. To describe forests during fieldwork, we typically use a combination of growth form and size:

- a) Growth form – graminoid, herb, shrubs, trees, vines
- b) Size – seedling, sapling, tree

### D. Point-Centre Quarter Method of Forest Analysis

The objective of this research is to quantify the composition and structure of the old growth forest. With members of your group, locate an *old-growth tree*. This tree will form the centre of your sampling plot. Divide the area around the old-growth tree into four quadrants (N,S,E,W or uphill, downhill, right and left). Within each quadrant measure the distance to the nearest *living tree* that has a diameter at breast height (dbh) > 5cm ( or circumference of 15.7cm). For each tree record: distance to the tree in metres ( $d_1$ ,  $d_2$ ,  $d_3$  and  $d_4$ ), species, and dbh.

POINT - CENTERED QUARTER METHOD  
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## Data Collection and Calculations

### 1. Tree Species Check List

Make a list of tree species that you observe in the park. Use the dichotomous key to identify trees you do not know or to verify tree species that you know. For each tree note the type of habitat in which you observe it (e.g., midslope, concave site/wet depression, convex site/rock outcrop, exposure to wind or sea-spray, inland/protected, canopy layer)

Common name	<u>Scientific name</u>	Habitat notes

### 2. Forest Structure

At two subjectively selected locations, establish a PCQ plot to measure tree species composition, size and density. Record your data in the following table.

For each plot, calculate the mean tree density by averaging the distance measurements, square the average, then divide this value into 10 000m<sup>2</sup> (since 10 000m<sup>2</sup> = 1 ha)

$$\text{Density per ha of all trees} = 10\,000 / (d_{\text{mean}})^2$$

where  $d_{\text{mean}}$  = mean distance for 4 trees surrounding the old-growth tree

For the “plot” bounded by the old-growth tree and four neighbouring trees, describe the physiognomy of the forest. Be sure to note characteristics that are attributed to old-growth forests.

## 2. Forest Structure: PCQ Data

Tree	Species	Circumference (cm)	DBH (cm)	Distance (m)
OG1				
N1				
N2				
N3				
N4				
OG2				
N1				
N2				
N3				
N4				

**Note:** OG = old-growth tree and N = neighbouring tree that is alive and with dbh > 5cm

Mean tree distance in PCQ Plot 1: \_\_\_\_\_ m

Mean area (distance<sup>2</sup>) in PCQ Plot 1: \_\_\_\_\_ m<sup>2</sup>

Mean tree density in PCQ Plot 1: \_\_\_\_\_ per ha

Mean tree distance in PCQ Plot 2: \_\_\_\_\_ m

Mean area (distance<sup>2</sup>) in PCQ Plot 2: \_\_\_\_\_ m<sup>2</sup>

Mean tree density in PCQ Plot 2: \_\_\_\_\_ per ha