MainProjDBH

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11 January 2018

Introduction

The purpose of this exploration is to examine the use of the various metrics calculated from the DBH class interval and frequency distribution measurements to generate which correlate with time since disturbance. The successional effect therefore expressed via the metric should correlate with species richness.

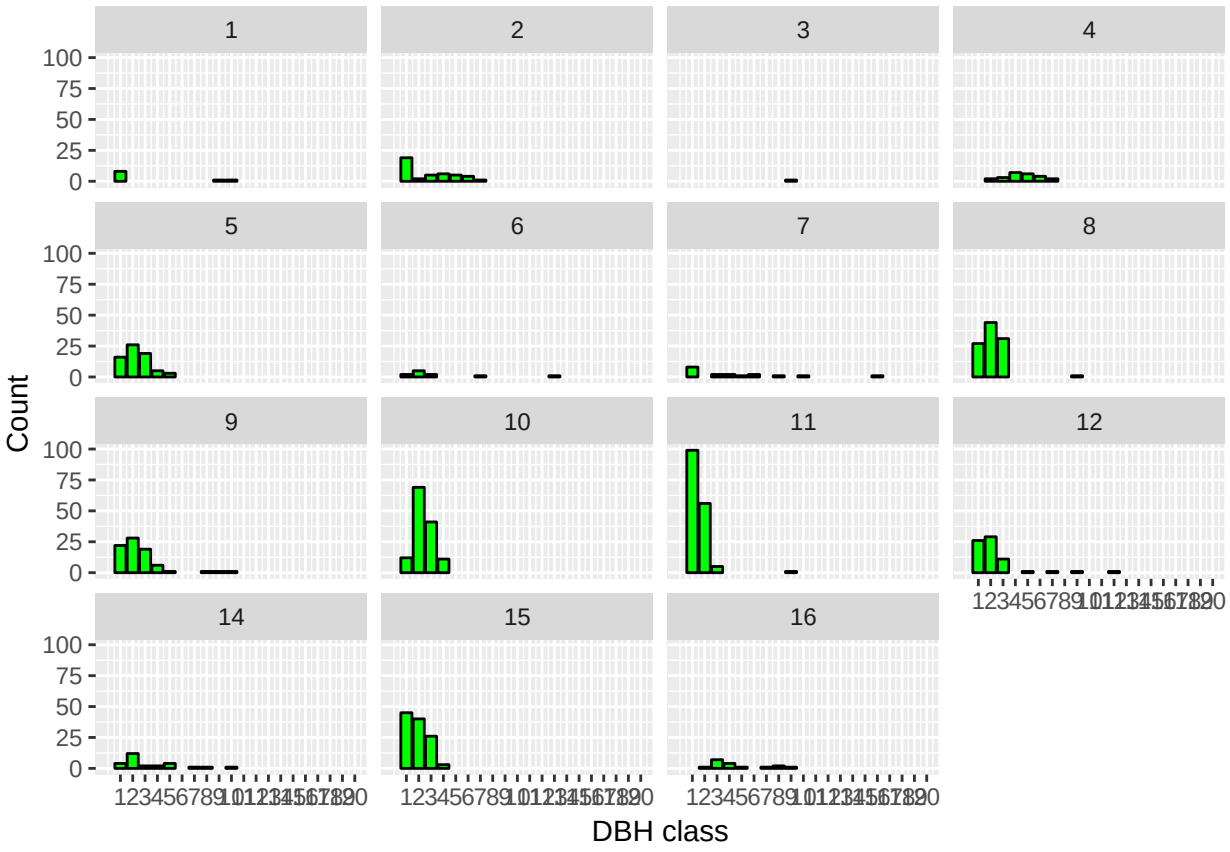
All the dbh data is imported from DBH_live_counts. This is filtered to just look at year 2. Since there are multiple species, each plot has multiple lines per DBH class per plot. These were therefore aggregated, so that this analysis is ignoring species.

The dbh classes in the raw data are recorded in 5cm intervals, class 1 is 5-10cm, class 2 is 5-10cm.

Running sum of differences

First, the sum of running differences in count between adjacent DBH classes is trialled. Using this calculation it can be seen that a high frequency of small dbh classes would be the first term in the sum. Subsequent subtractions of smaller values would result in a large positive value. A large positive would then represent an early succussion with lots of young saplings. The reverse would occur for a mature plot and a large negative number would be found.

Consider site 2 plots 10 and 11




```
##   DBH_class PLOT SITE Count
## 1         1   10    2    12
## 2         2   10    2    69
## 3         3   10    2    41
## 4         4   10    2    11
```

```
##   DBH_class PLOT SITE Count
## 1         1   11    2    99
## 2         2   11    2    56
## 3         3   11    2     5
## 4         9   11    2     1
```

```
##   PLOT SITE Count
## 1   10    2  -109
## 2   11    2    37
```

The first table show the frequency data, the second sow the indices calculated for these two plots (unhelpfullly also displayed as Count)

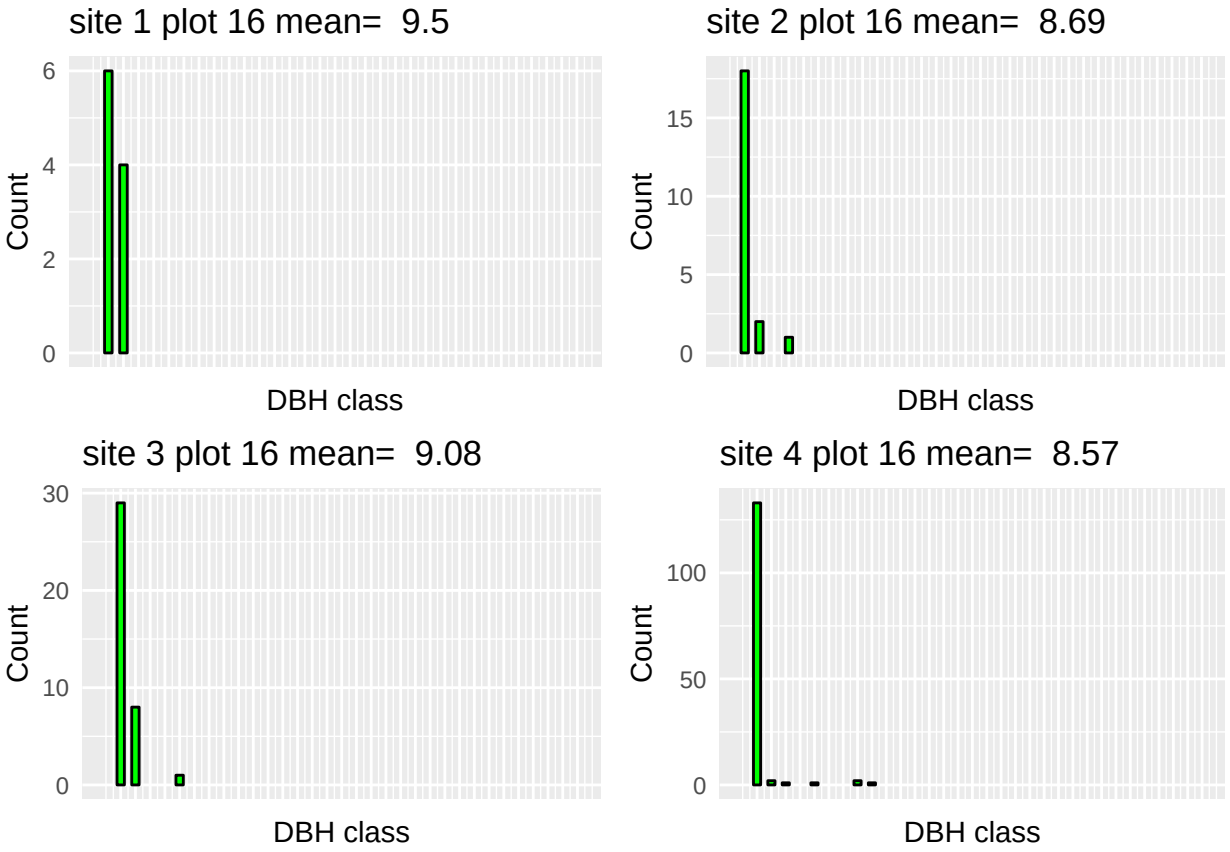
Plots 10 and 11 have lots of smaller trees, and therefore a similar time since an opening event. But they have indices of - 109 and 37 respectively. Plot 10 site 2 has the most negative index of all the plots, so we would want this number to imply a long time has occured since an opening event, which it does not.

Looking at the counts, plot 10 has 12 in the first category and 69 in the next, therefore the first subtraction gives a relatively large negative value, the remaining values, all being smaller, result in a large negative index.

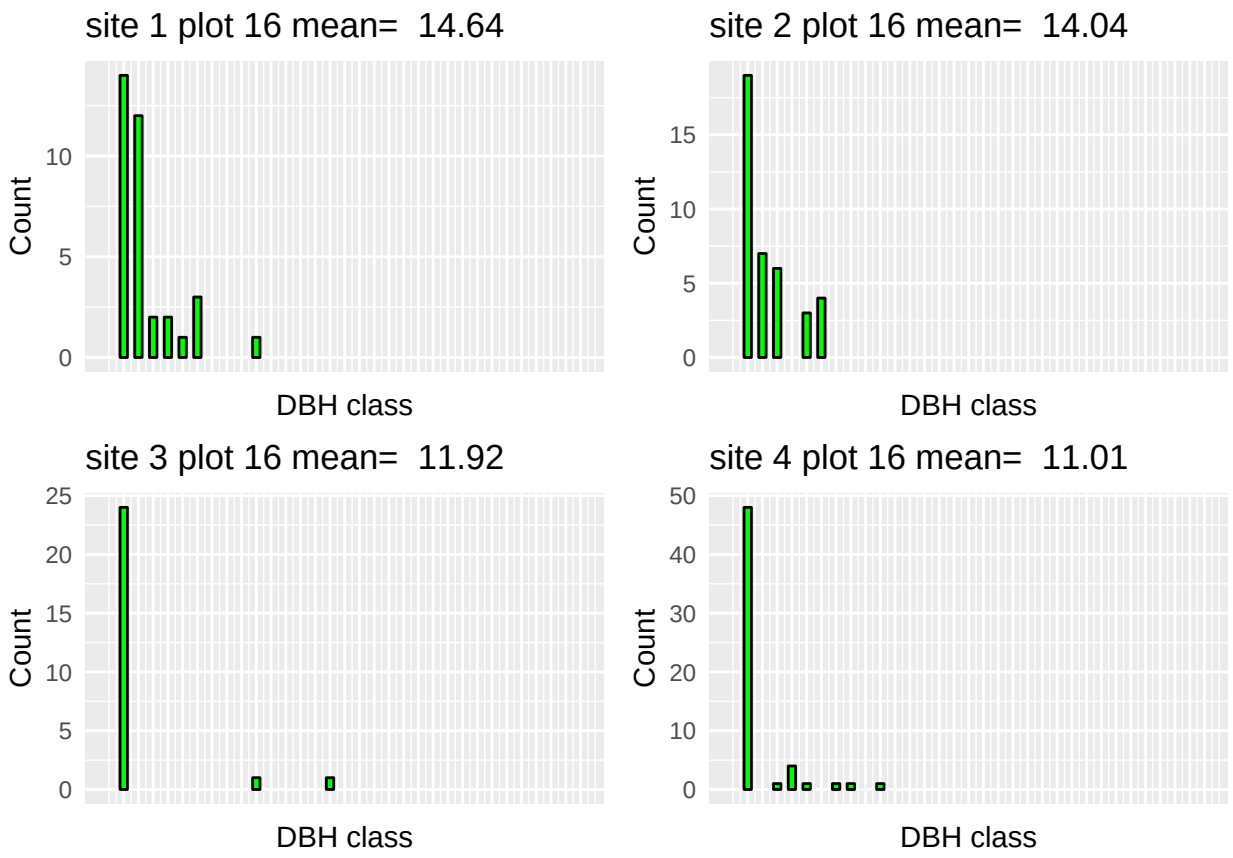
This shows that the subtraction is not suitable as a metric because it will only work if the are fewer counts in each successive class.

The mean as a metric

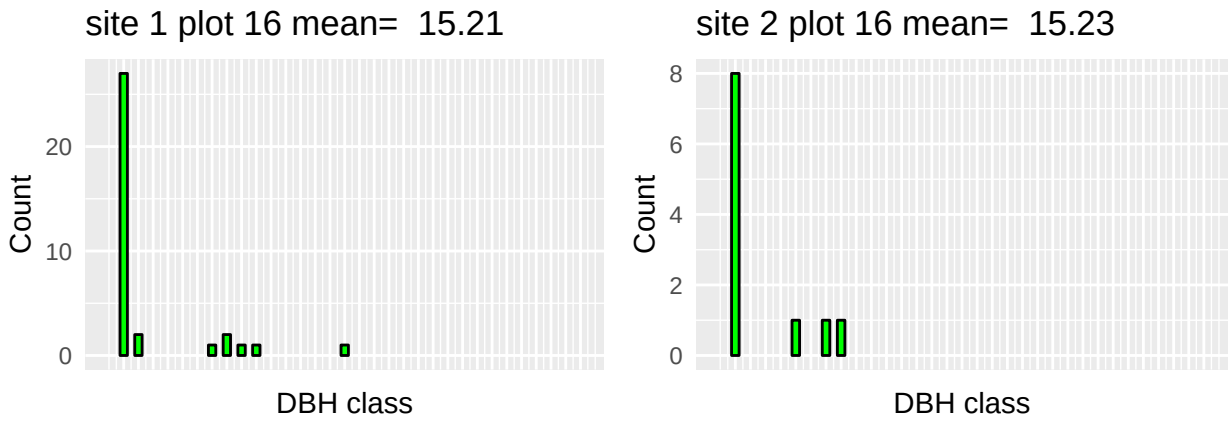
Plots of plots with mean less than 10



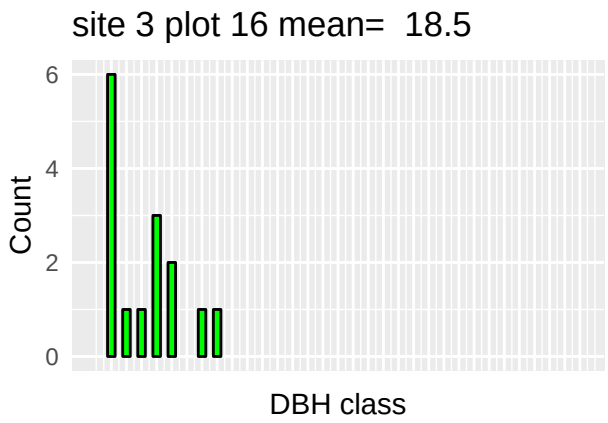
For a mean below 10 the graphs demonstrate a pattern consistent with lots of young saplings and arecent opening event.

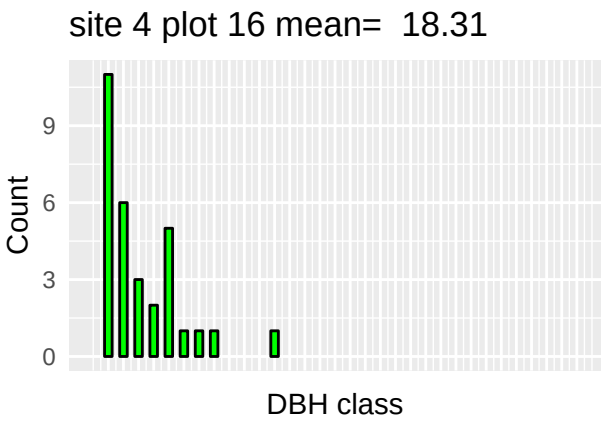


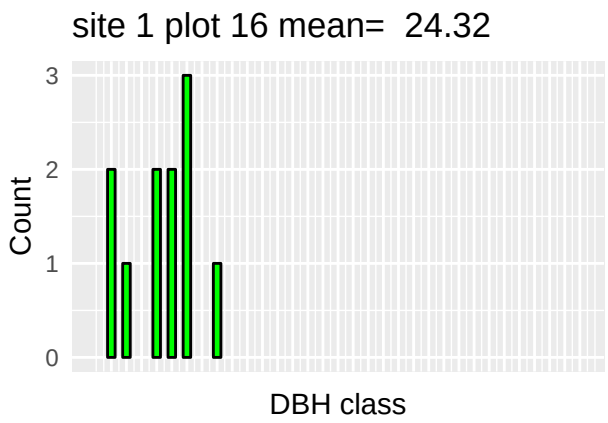
For means between 10 and 15 the frequency of trees in the next DBH classes increases

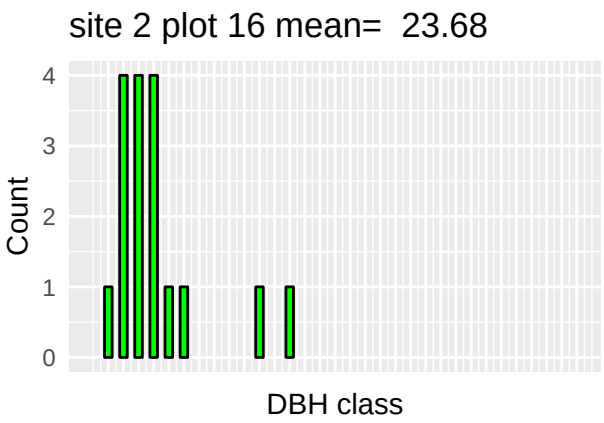

site 1 plot 16 mean= 15.21
Count
0
10
20
DBH class

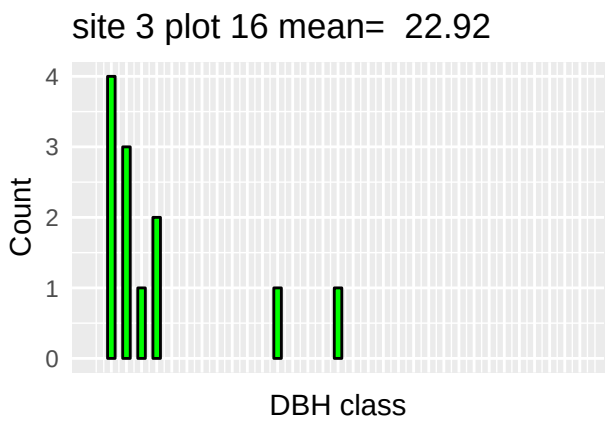
site 2 plot 16 mean= 15.23
Count
0
2
4
6
8
DBH class

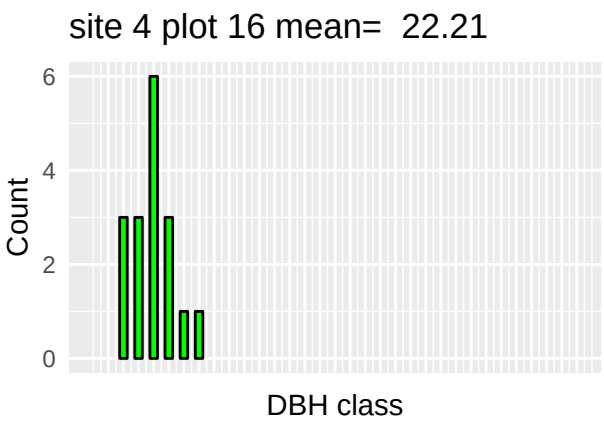

site 3 plot 16 mean= 18.5
Count
0
2
4
6
DBH class


site 4 plot 16 mean= 18.31
Count
0
3
6
9
DBH class


site 1 plot 16 mean= 24.32
Count
0
1
2
3
DBH class

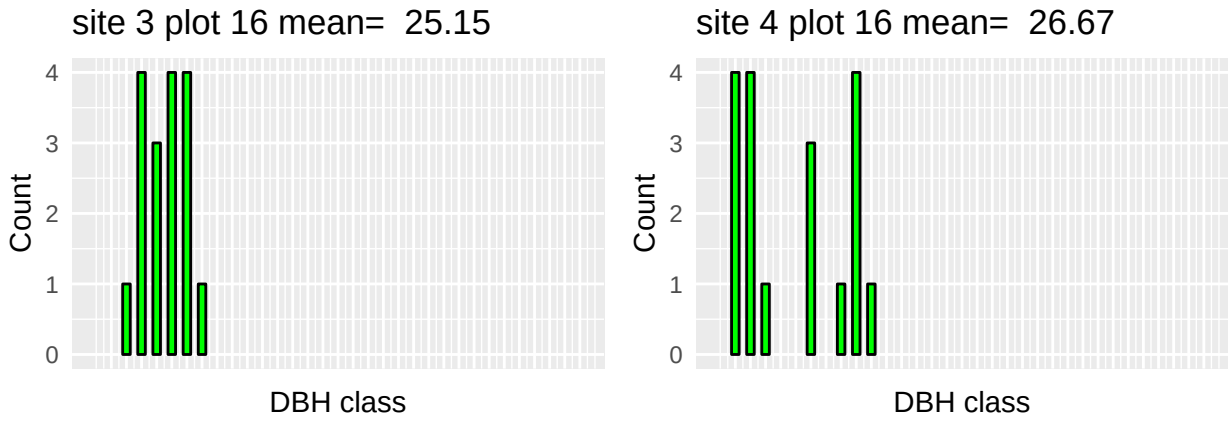

site 2 plot 16 mean= 23.68
Count
0
1
2
3
4
DBH class


site 3 plot 16 mean= 22.92
Count
0
1
2
3
4
DBH class

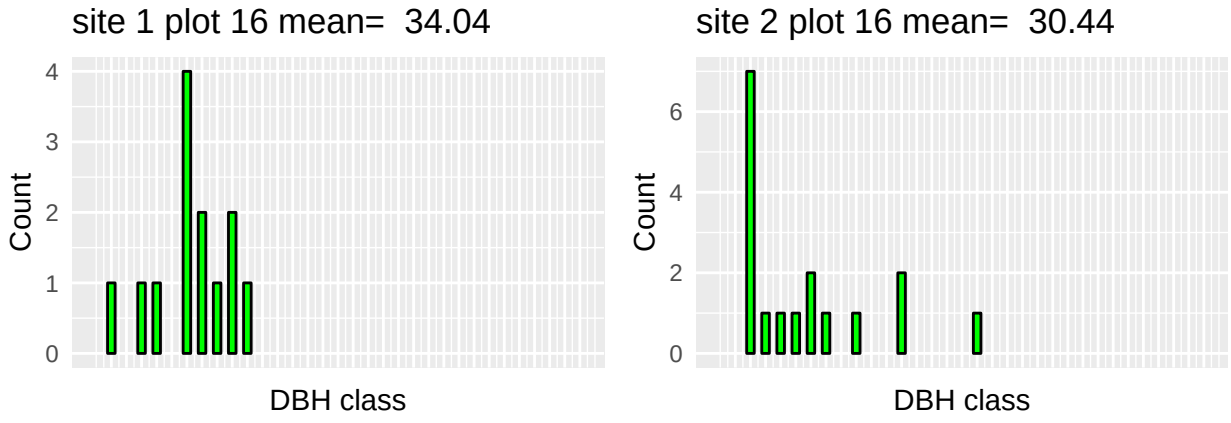

site 4 plot 16 mean= 22.21
Count
0
2
4
6
DBH class


site 1 plot 16 mean= 26.94
Count
DBH class

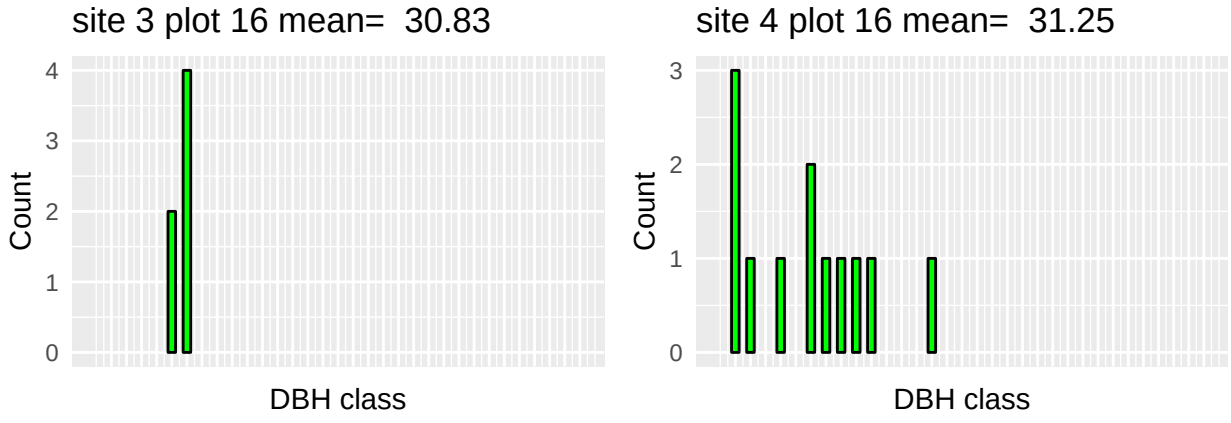
site 2 plot 16 mean= 27.5
Count
DBH class


site 3 plot 16 mean= 25.15
Count
DBH class

site 4 plot 16 mean= 26.67
Count
DBH class

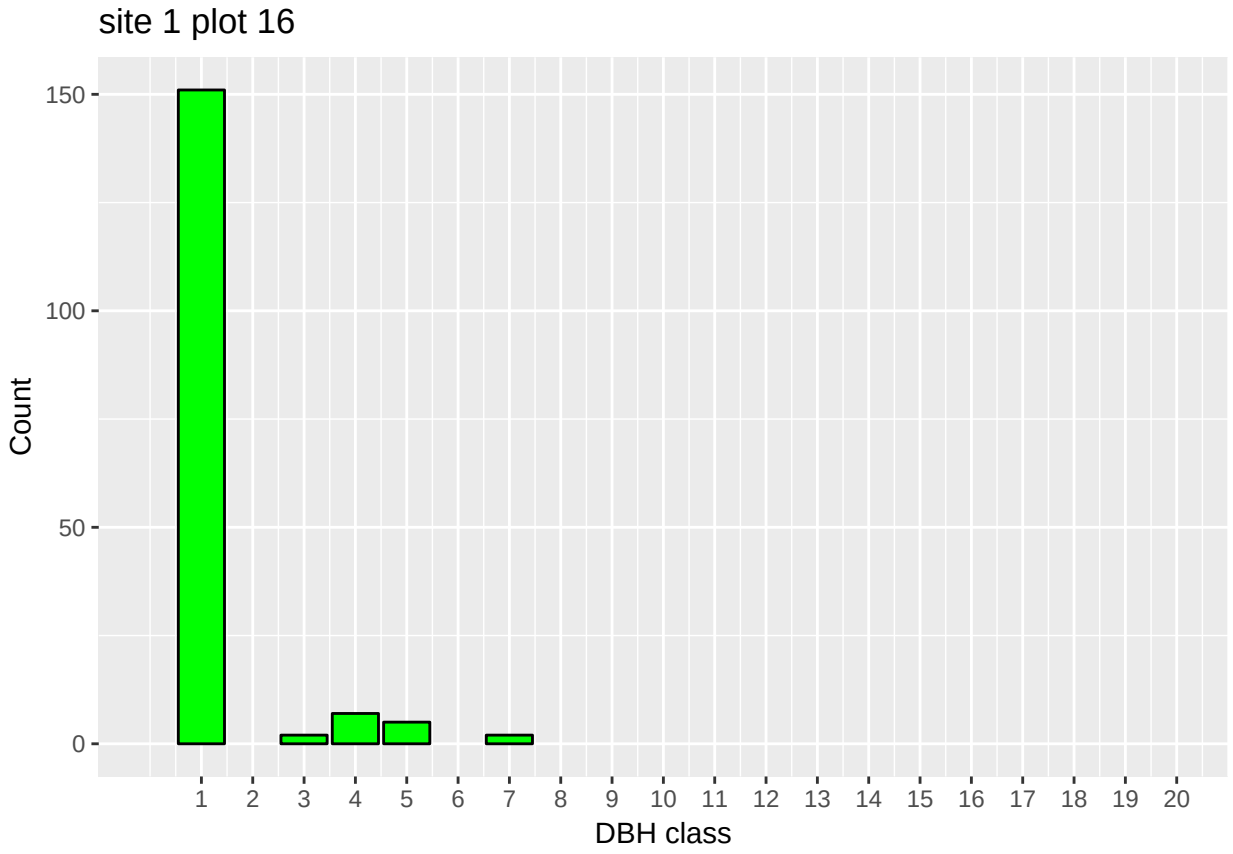

site 1 plot 16 mean= 34.04
Count
DBH class

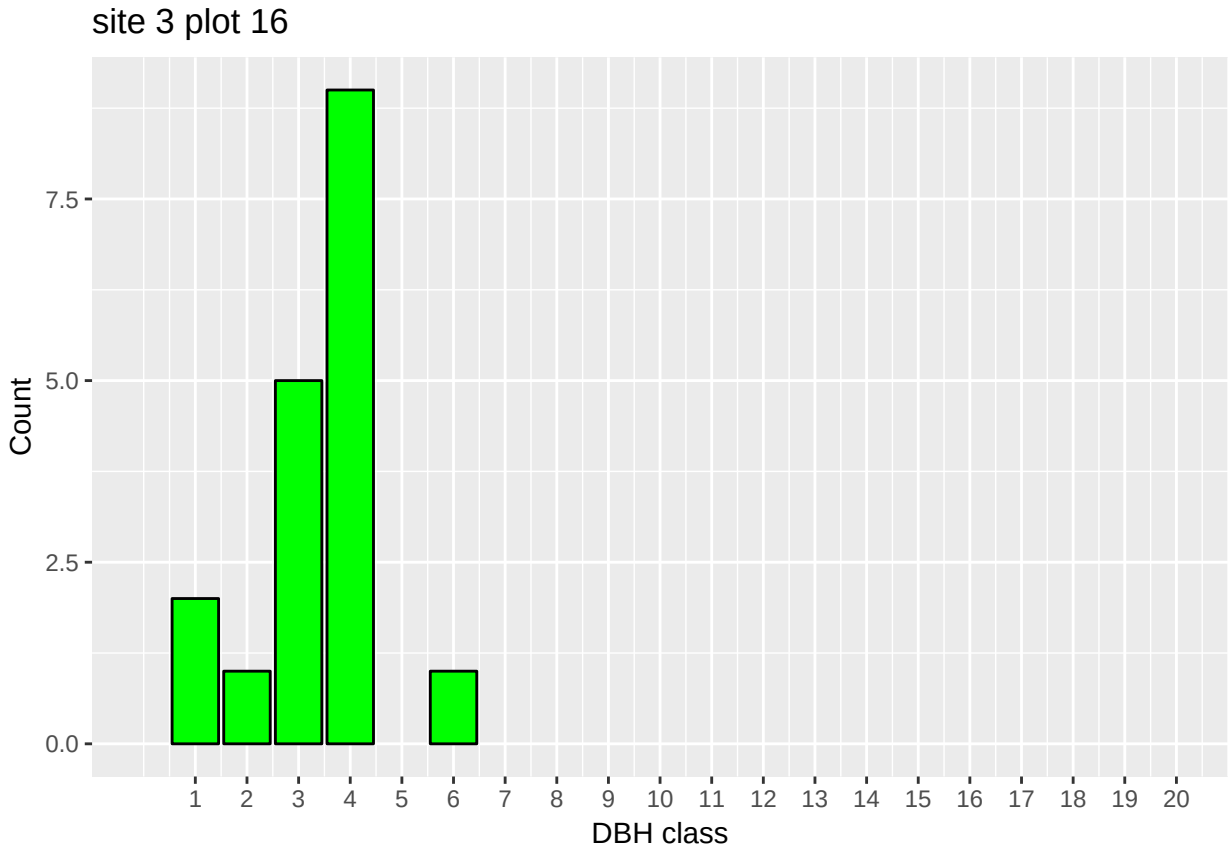
site 2 plot 16 mean= 30.44
Count
DBH class


site 3 plot 16 mean= 30.83
Count
DBH class

site 4 plot 16 mean= 31.25
Count
DBH class

With low means, because the mean is in or near the lowest dbh class, the distribution will be right skewed and fit the desired criteria of representing a plot with lots of young trees and few older ones. When we consider larger means there are more distributions that could give that mean, and whether or not they reflect the time since an opening event is less clear. Consider Site 1 plot 16 and Site 3 plot 16.





These have similar means, but would we be able to say they represented plots that had similar time since event. Site 1 plot 16 with its righ skew looks to be in an early successional stage, whereas Site 3 plot 16 looks more mature.

The mean may not be a metric that clearly correlates with time since event.