CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
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Project Number
J1409

Project Title
A Comparison of Small Population Transect and Radial Sampling Methods with Larger Whole Populations Sampling

Abstract

Objectives/Goals
My project was to determine if radial and transect sampling methods will represent a whole population statistically and at what sample size. It is obviously not practical for Forestry personnel to count all trees in large areas, so representative samples are taken with transect and radial sampling methods when aerial methods are not practical. The location of the sampling and the methods may be greatly influenced by the density over which the survey takes place.

Methods/Materials
To test this I made a representative scale math model where 520 hectares were laid out in a grid. Trees were simulated in a random distribution which produced areas of sparse and great density that might be found in nature. I then randomly produced numerous transect and radial survey samples of one hectare each. My hypothesis was that the whole population would be represented statistically at a 15% area sample size. I did a statistical analysis and performed a t-test at a 95% confidence level at differing sampling sizes with the two methods.

Results
I found out that my hypothesis was wrong. My calculations indicated that both sampling methods at a 15% sample or less did not adequately represent the whole population, nor did they work well at much larger sampling percentages.

Conclusions/Discussion
My conclusion is that neither radial or transects sampling in the model methods I employed worked well enough to be employed in the field. Either the sampling size needs to be increased greatly, or the methodology changed.

Summary Statement
My project is to determine if radial and transect sampling methods will represent a whole population statistically and at what size.

Help Received