PROPOSED METHODOLOGY FOR TRACKING COMMUNITY CHANGES

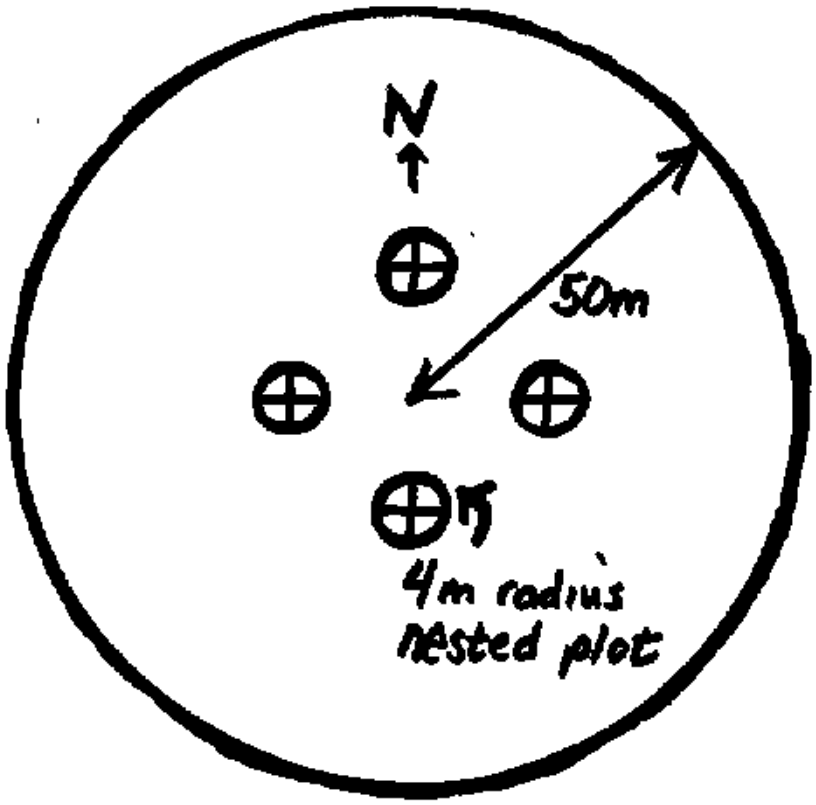

Figure 1: Plot schematic for inventorying and monitoring.

The methodology we present below was chosen to monitor spatial and temporal differences in vegetation. It was decided upon based on field work and consultation with biometricians and experts in the ecological field.

Main Plot

The main plot is a 50 meter radius circle (approximately 1 hectare) used to represent a spatial scale typical of a community-level study. This plot has the flexibility to be used as a point count station for bird studies as well. Several options exist for location of these main plots: random (not recommended), random stratified by habitat or community type (somewhat recommended), or stratified by management units or compartments (highly recommended). We highly recommend the latter because the change we are looking at will most likely be occurring within these units and community types will be changing over time. In general, do as many main plots as you have time for. Later if the power of your analysis is not adequate, you can add either more main plots or more nested plots depending on your spatial questions.

Nested Plots

50 square meter circular plots (4 meter radius) were found to be the most efficient and useful in determining both the number of species (twice as many species as smaller plots, same number of species as larger plots; slightly more time taken than for smaller plots, but less time than larger plots) and the structure (both

smaller and larger plots were difficult to measure due to visual problems). Circular plots were found to be more efficient.
The methodology recommended for inventorying and monitoring the plant community is as follows:

Presence/absence by quad

The 50 square meter circle is divided into four quads. For each quad, all plant species are tallied for presence/absence, yielding a number between one (found in one quad) and four (found in all quads). This data is used for frequency counts of the species and can be determined at various scales.

Percent cover by strata

The following cover types will be measured to determine structure. The divisions, although subjective, capture the different elements of the structure as listed below:

->5 meters (tree canopy)
-2-5 meters (tree subcanopy)
-1-2 meters (tall shrub)
-0-1 meters (short shrub)
-herbaceous
-graminaceous
-nonvascular

Basal area /DBH

Another aspect of structure is tree density, snag density, and tree diameter distributions. Using a Cruz-all to measure tree basal area has been shown to be the most efficient method. A Basal Area Factor (BAF) of 5 is most suitable for the Vineyard, based on its small-sized trees. This means for each tree tallied, it counts for 5 square feet of basal area. For each tree tallied, its diameter at breast height (DBH) should be recorded if a diameter distribution is desired. It is also useful in determining tree mortality or growth by diameter class. Should you need to determine accurate mortality, also record the bearing and distance for each tree that is tallied.

Nested Plot Arrangement

We recommend a fixed diamond arrangement based on the cardinal directions (figure 1). This will capture any gradient within the main plot. We found that these four plots captured more species than three plots and approximately the same as if a center plot is included. The plot arrangement is such that linear or triangular photomonitoring can be used. The number of plots and their arrangement can vary based on time available and sampling intensity needed. However, the arrangement for the nested plots should be the same for all main plots (we recommend along the cardinal directions). In other words, if you need to add additional plots, they may be placed in an outer diamond surrounding the inner diamond (8 plots). Other configurations may be the Star of David or hexagons. The fixed plots facilitate refinding the plots since it is inevitable some stakes will be lost.

Conclusions

This methodology is meant to be as flexible as possible for each organization yet also allow for cross-pollination, cross-comparison, and more successful data analysis. For this to happen, the above recommendations should be followed—measurements within the nested plots must be taken in exactly the same manner. The arrangement, number, and placement of the plots, however, can vary by property and organization. When we compare data, direct comparisons can be made, and when we combine and share data at the ecoregional level (landscape scale), the power of our statistical analyses will be greatly increased.