

## Laying out a grid (in a natural area) with 1/10 acre circular study plots.

1. Download, unzip (using winrar or winzip), and install Hawth's Analysis Tools ([www.spatial ecology.com/htools/index/php](http://www.spatial ecology.com/htools/index/php)).
2. Restart computer and open ArcMap.  
Note: If Hawth's Tools do not appear in the drop down tool list after restarting your system you can manually add them:  
Under "Tools", select "Customize", "Add From", and navigate to the installed folder (not the unzipped folder) and select hawthstools.dll.
3. **Add layers.**  
Note: If layers have undefined projections (it says "missing spatial reference information"), click "OK", then right click the layer, select "Properties", click "Select Data Source", and select a shape file that has the appropriate projection/ coordinates (Georgia State Plane West), click "Apply", then click "OK"
4. **To "Clip" (create a subset of the existing map, just of the area with which you are working):**  
Select "Start Editing" under "Editor", then select "Create New Feature" under "Task". Outline the desired area, then right click on the layer in which you were working. Scroll down to "Data", then select "Export Data", choosing to stay on "this layer's source data" when prompted. Remove the source layers if necessary. Also, "Save Edits".  
Note: It would also be useful to create a Buffer around a line of individual plants and clip that area out as a separate shapefile to work with. There are probably many options here depending on what works best for the natural area and the distribution of plants within the area.
5. **Using Hawth's Tools**, under "Sampling Tools", select "Create Vector Grid". Select the layer you are working with. Change the spacing between lines to 32.8083' (=10m, used when mapping plant populations). Select "Line" as the output. Select a folder and create a name for the new shapefile that is being created. Click "OK".
6. **Before creating the study plots, a new shapefile must be created:**  
Enter ArcCatalog. Click to expand the destination folder on the left, right click, and select "New", "Shapefile". Name the shapefile and select "Point" as the feature type. Beneath where it says "unknown coordinate system", select "Edit", "Select", "Projected", "State Plane", "1983 Feet", "Georgia West", then click "Add". Click "Apply", then "OK". Click "OK".
7. Go back to ArcMap. **Add the new point layer.** Under "Sampling Tools" in Hawth's Tools, select "Generate Random Points". Select the layer you clipped, not the entire grid (the grid may exceed the clipped area). Enter the minimum distance between points and the number of points desired. Select a location and a name for the output shapefile and click "OK".
8. **To create Sample Plots at these random points**, select "Create Sample Plots" under "Sampling Tools" in Hawth's Tools. Select the layer containing the random points, select the desired shape and size for the Sample Plots (in this case circles, radius=20.97' for 1/10 acre study plot). Select a location and a name for the output shapefile. Click "OK".