29/Jan/04 Puerto Ayora, Santa Cruz Island, Galapagos, Pacific Ocean

USING EQUIDISTANT POINTS IN ANIMAL AND PLANT CONTROL AND ERADICATION PROGRAMS

Here we have two script files for ArcView® GIS that allow one to generate a grid of equidistant points (triangular array) and if necessary take a random sample of those points. (Scripts available online at: http://www.hear.org/articles/equidistantpoints/edp_av_scripts.zip)

This is what we use to follow routes (handheld GPS function) in GPS units to ensure a truly systematic search pattern for invasive animals or plants or to locate systematically spaced points in the field.

Combined with the tracking function you can see where field crews have actually gone in their search for invasive species. By also marking waypoints for each individual plant or animal found (and treated) you can have a good record of the work done. Individual points of a set distance also allow one to optimally place poison baits, or bait stations for the control or eradicate animals e.g. fire ants and cats.

Nick Seigal and Howard Snell and I are writing an article which we hope to publish soon that will include links to this page (and the scripts) so that anyone can have access to this technology which we found so useful.

HOW TO GENERATE EQUIDISTANT POINTS IN ARCVIEW

Nick Seigal the author of the scripts is a coauthor in the article. Here is what he has to say my modifications in [].

The problem with Lat-Long is that the area of each triangular "cell" between the equidistant points would be different depending on the distance of that cell from the equator. My triangular array script has a similar problem if you use it with decimal degree data (changing the view's projection won't help). But unlike the spreadsheet, my script will work anywhere in the world, if you treat it properly:

[Before doing this you need to load the script into ArcView- follow the help instructions if you don't know how to do this.]

1. Take your area of interest and create it as a shapefile in projected units. I recommend taking your reference data in decimal degrees and projecting the view it is in to the correct UTM zone (or other local projection). Then create a new (empty) poly shapefile and draw your rectangle or other poly (e.g., your circle idea) that is your area of interest. Save the shapefile.

2. Run my script on this area. This will create the correct grid (TARRAY) with a projection which "conserves" area and thus ensures a statistically valid spatial sampling space. [Doing this will lead you to a screen in which you have to specify the distance between points in decimal degrees- for your benefit I provide the following table]

Meters	Decimal degrees
1000	0.009013
500	0.0045065
400	0.0036052
300	0.0027039
200	0.0018026
100	0.0009013
50	0.0004506
20	0.0001802

3. Use the ESRI Projection Wizard to convert the TARRAY to decimal degrees.

4. Add the new DD_TARRAY to a new view. Define the units in the view properties as DD/DD.

5. Open the attribute table for DD_TARRAY and start editing. Add a "Lat" and a "Long" field (both Numeric, 12, 6). Calculate Lat = [Shape].GetY and Long = [Shape].GetX. Stop editing.

6. Export the table to a dbf or text file that you can load into your GPS.

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This document is available online via a link from: http://www.hear.org/articles/equidistantpoints/
