Mapping Point Locations along Bird Transect Surveys

These instructions enable you to create point shapefiles of sampling locations along a transect line. You need to install the extension **Distance and Azimuth Tools** created by Jeff Jenness (available at <u>http://arcscripts.esri.com/</u>). Using MS Excel and ESRI ArcView 3.x software, you perform the following:

- in MS Excel input field data and calculate angles/distances
- export to dBase
- in ArcView add table as event theme
- use Distance and Azimuth extension to calculate adjusted locations and plot as point shapefiles

Extra instructions are included at the end to create linear shapefiles of the transects.

ORIGINAL DATA

Samples.xls	an MS Excel spreadsheet of field data with the following critical fields: Plot, UTM, CtrlDistance, CtrlDirection, PlotAzimuth, LineLength, DistAlongLine, SampleDistance, SampleAngle
CREATED DATA	
Samples.dbf StartPts.shp LinePts.shp	exported spreadsheet of formatted, critical fields shapefile created from the Samples.dbf Event shapefile created from mapping points using Distance/Azimuth tool on the Samples event theme with the fields: DistAlongLine and PlotAzimuth
SamplePts.shp	shapefile created from mapping points using Distance/Azimuth tool on the Linepts.shp theme
EndPts.shp	with the fields: SampleDist and SampleAngle shapefile created from mapping points using Distance/Azimuth tool on the Samples event theme with the fields: LineLength and PlotAzimuth

Steps in MS Excel

- 1. Open Samples.xls in MS Excel
- 2. Carefully check records for data quality, omissions, etc.
- 3. Make sure column headings do NOT contain spaces
- 4. Correct as necessary
- 5. Optionally, add a unique field e.g. ID and fill with sequential unique numbers

Calculate the new required fields:

6. Add the following new required fields to new columns and calculate as follows:

New Column Heading	Function
UTM_X	=VALUE(MID(UTM,4,7))
UTM_Y	=VALUE(RIGHT(UTM,7))
LineType	=RIGHT(Plot,1)
PlotDistance	=IF(LineType="C",CtrlDistance,0)
DeltaX	=IF(CtrlDirection="east",PlotDistance,IF(CtrlDirection
	="west",- PlotDistance,0))
DeltaY	=IF(CtrlDirection="north",PlotDistance,IF(CtrlDirection
	="south",- PlotDistance,0))
Х	=UTM_X+DeltaX
Υ	=UTM_Y+DeltaY

★ Substitute the corresponding cell values in place of the field names!

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7. COPY and PASTE each formula in the rest of the corresponding column cells

Format and export to dBase:

- 8. Format the columns with appropriate number types, etc.
- 9. SAVE the spreadsheet
- 10. SAVE AS a dBase file; e.g. Samples.dbf
- 11.Close MS Excel

Steps in ArcView 3.2:

- 1. Start a new project in ArcView 3.2
- 2. Open a new View but do not add any data yet
- 3. Choose VIEW \rightarrow PROPERTIES and set the Map and Distance Units = meters
- Add the *Distance and Azimuth Tools* extension (choose FILE → EXTENSIONS and click on the tool)

Add the points as an event theme:

- 5. In the Table GUI, add the **Samples.dbf** as a Table
- 6. In the View GUI, choose VIEW \rightarrow ADD EVENT THEME
- 7. Select the appropriate X and Y fields for Samples.dbf and click OK

27 February 2003

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- 8. Turn the event theme on
- 9. Make the event theme active
- 10. Choose THEME → CONVERT TO SHAPEFILE
- 11. Save as StartPts.shp
- 12. Add new shapefile to the view
- 13. Save the project

Create new point shapefiles for sampling locations (2-step process):

14. Click on the DISTANCE/AZIMUTH TOOLS button



- 17. Select StartPts.shp as the input
- 18. Select **Distalongl** as the DISTANCE field
- 19. Select **Plotazimut** as the AZIMUTH field
- 20. Hold the shift key to select all fields for output

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15. Select the second method for creating the new shapefile based on *unique Distance and Azimuth values taken from fields in the Feature Attribute Table*16. Click OK



- 21. Click OK
- 22. Type a name for the output shapefile; e.g. LinePts.shp
- 23. Click OK
- 24. Click on the DISTANCE/AZIMUTH TOOLS button
- 25. Using the same method (second choice) create a new shapefile using the following parameters:
 - Input Theme: LinePts.dbf
 - DISTANCE Field: Sampledist
 - AZIMUTH Field: Sampleangle
 - Select all fields for ouput to new shapefile
 - Output name: SamplePts.shp

26. Click OK

Extra Steps in ArcView

To create a linear shapefile for each transect, you need start and end points. Simply create a new point file from the original **Samples.dbf** event theme, then merge with the event theme, query, and finally join using XTools.

- 1. Add in the *GeoProcessing* and *XTools* extensions
- 2. Click on the DISTANCE/AZIMUTH TOOLS button
- 3. Using the same method as above, create a new shapefile using the following parameters:
 - Input Theme: Samples.dbf
 - DISTANCE Field: LineLength
 - AZIMUTH Field: PlotAzimut
 - Output all fields
 - Output name: EndPts.shp
- 4. Click OK
- Choose VIEW → GEOPROCESSING WIZARD
- 6. Select MERGE as the operation and click NEXT
- Select EndPts.shp and StartPts.shp as the themes to merge (use either fields)
- 8. Save to a new output name: e.g. MergePts.shp

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New Set Add To Set

9. Click FINISH

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he same fields as the first theme.	Maria ale a Maria	
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10. Add and make MergePts.shp the active theme
 11. Choose THEME → QUERY

- 12. Enter the expression for the transect you wish to map; e.g. ([Plot] = "01C") 13. Click NEW SET
- 14. Choose XTOOLS → MAKE ONE POLYLINE FROM POINTS
- 15. Select **MergePts.shp** as the input
- 16. Enter an output name; e.g. **01C.shp**
- 17. Click OK
- 18. REPEAT the selection query and polyline creation for each other unique Plot
 - ★ Note: Combining the Avenue scripts from XTools with a Get unique Value script (see Help Files) can automate this process.

