

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 <http://arcscripts.esri.com/>). 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 exported spreadsheet of formatted, critical fields
StartPts.shp shapefile created from the Samples.dbf Event
LinePts.shp 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 with the fields: **SampleDist** and **SampleAngle**
EndPts.shp shapefile created from mapping points using Distance/Azimuth tool on the Samples event theme with the fields: **LineLength** and **PlotAzimuth**

Steps in MS Excel

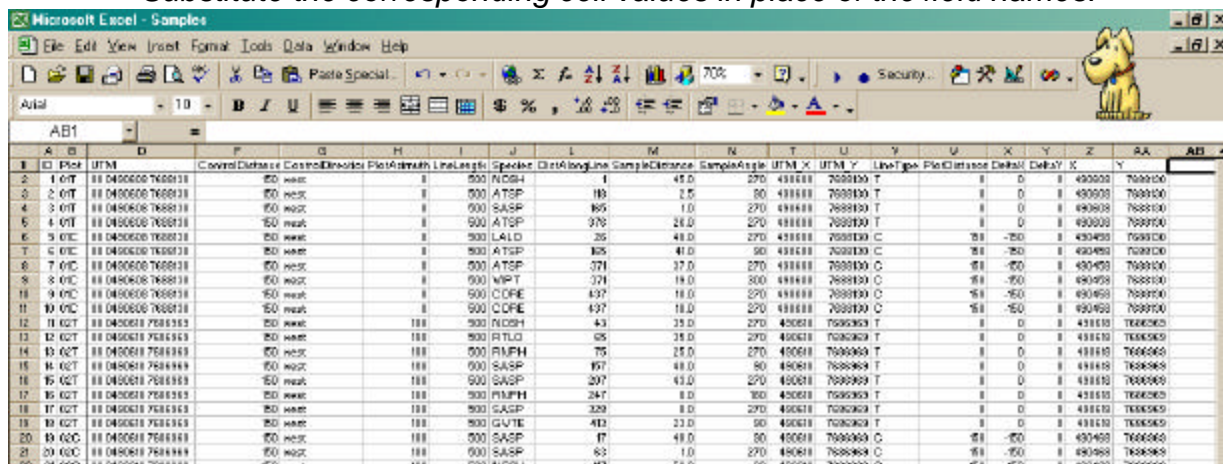
1. Open **Samples.xls** in MS Excel
2. Carefully check records for data quality, omissions, etc.
3. Make sure column headings do NOT contain spaces
4. Correct as necessary
5. Optionally, add a unique field – e.g. **ID** – and fill with sequential unique numbers

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))
X	=UTM_X+DeltaX
Y	=UTM_Y+DeltaY

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



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

Format and export to dBase:

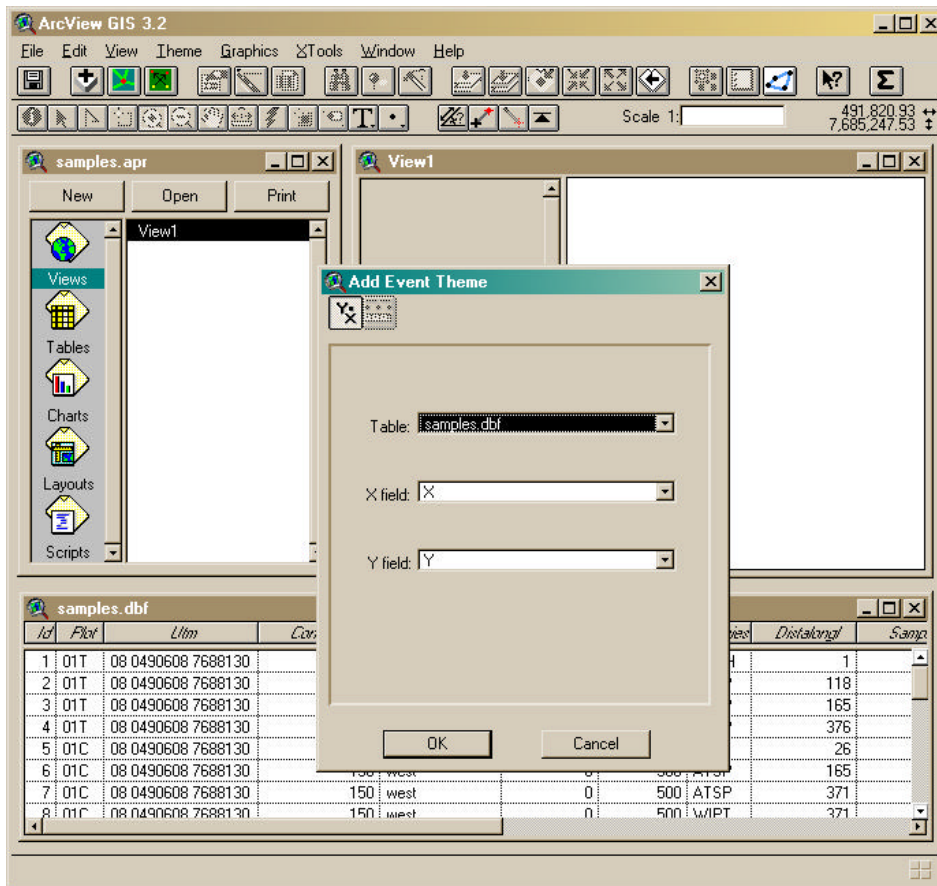
8. Format the columns with appropriate number types, etc.
9. SAVE the spreadsheet
10. SAVE AS a dBase file; e.g. **Samples.dbf**
11. Close MS Excel

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 → PROPERTIES and set the Map and Distance Units = **meters**
4. Add the **Distance and Azimuth Tools** extension (choose FILE → EXTENSIONS and click on the tool)

Add the points as an event theme:

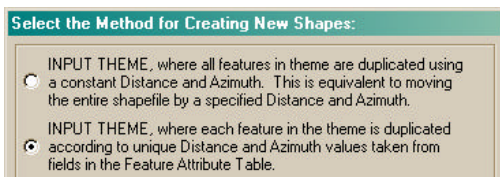
5. In the Table GUI, add the **Samples.dbf** as a Table
6. In the View GUI, choose VIEW → ADD EVENT THEME
7. Select the appropriate **X** and **Y** fields for **Samples.dbf** and click OK



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

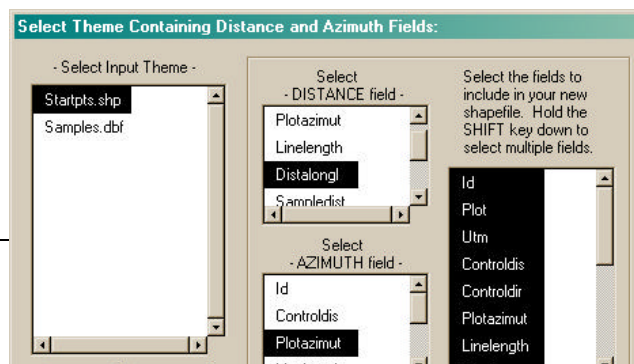
Create new point shapefiles for sampling locations (2-step process):

14. Click on the DISTANCE/AZIMUTH TOOLS button 



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

17. Select **StartPts.shp** as the input
18. Select **Distalong1** as the DISTANCE field
19. Select **Plotazimut** as the AZIMUTH field
20. Hold the shift key to select all fields for output

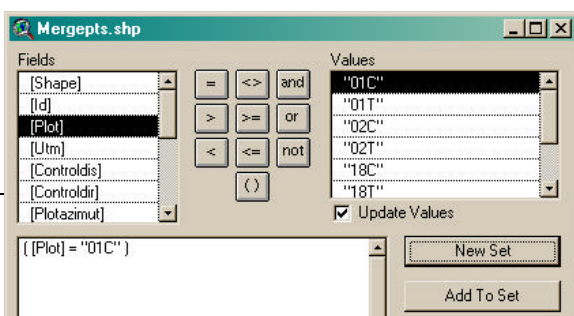
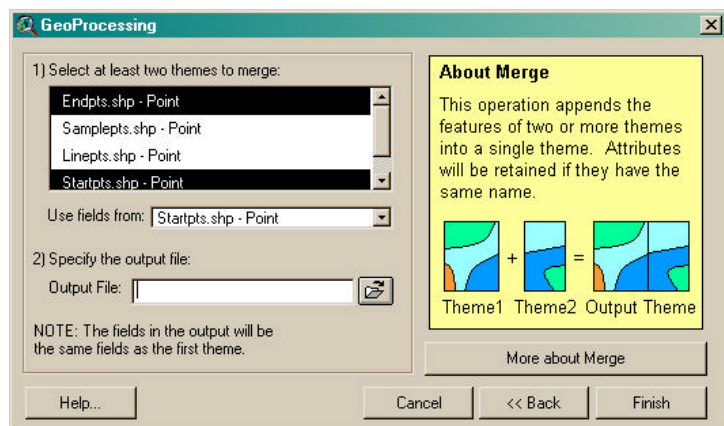


21. Click OK
22. Type a name for the output shapefile; e.g. **LinePts.shp**
23. Click OK
24. Click on the DISTANCE/AZIMUTH TOOLS button
25. Using the same method (second choice) create a new shapefile using the following parameters:
 - Input Theme: **LinePts.dbf**
 - DISTANCE Field: **Sampledist**
 - AZIMUTH Field: **Sampleangle**
 - Select all fields for output 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
5. Choose VIEW → GEOPROCESSING WIZARD
6. Select MERGE as the operation and click NEXT
7. 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**
9. Click FINISH



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.*

