The Cross Tabulation Table Tool

Cross-tabulation tables (sometimes called *Contingency* tables) are a useful way to investigate the joint distribution of two variables. They are essentially 2-dimensional histograms in which each cell in the table contains the amount or percentage of observations that occur within the joint range of two variables, similar to manner in which a histogram bin shows the number of observations in a single variable.

For example, if we record the slope and elevation at various points on the landscape, we could generate a cross-tab table as follows:

	Slope (in Degrees)				
Elevation (m)	**0 – 15**	**15 - 30**	**30 - 45**	**45 - 60**	**Sum**
1000 - 1250	0.448	0.114	0.003	0.000	0.565
1250 - 1500	0.150	0.180	0.041	0.001	0.371
1500 - 1750	0.008	0.032	0.022	0.000	0.062
1750 - 2000	0.000	0.001	0.001	0.000	0.002
Sum	0.607	0.326	0.066	0.001	1.000

The upper-left data cell (containing the value 0.448) is telling us that 44.8% of the observed locations had a slope between 0° and 15° and an elevation between 1000m and 1250m. The "Sum" row and column contain the values that would determine the bin size of a traditional 1-

dimensional histogram, and the lower-right cell contains the sum of all the data cells in the table. If the table values are percentages (as illustrated above), then the sum will always be 1 (i.e. 100%). If the table values are counts, then the sum will simply be the count of all the observations.

Cross-tab tables are commonly used to view joint distributions of data because they are informative and easy to understand. Spatial datasets provide a special challenge, however, because the "counts" reflected in each cell may, or may not, need to be adjusted to reflect the spatial size of that observation.

WEIGHTING OBSERVATIONS

For a simple example, suppose you learned the somewhat vague statistic that 50% of the United States was represented in the United States Senate by a senator from your favorite political party. Does this mean that 50% of the states have a senator from this party? 50% of the land mass? 50% of the people? Each of these would be legitimate statistics in certain situations, and each can be calculated by weighting the observations appropriately.

In each case, the statistic would be calculated by examining the political party of the senators from each of the 50 states. Each state would be treated as a single observation and would receive a value of "1" if it had a senator from your party or a value of "0" if it did not.

If you simply added up all the "1" values and divided by the number of states, then the resulting statistic would tell you the percentage of states that are represented by your party. If you weight each state by the geographic size of that state, then divide by the total land mass of the United States, then the resulting statistic would represent the proportion of the land area represented by your party. If you weight each state by the population in that state, then divide by the total US population, then the statistic would tell you the proportion of US citizens represented by your party.

Traditional cross-tab tables show the basic count of observations that lie within the joint range of two variables. For spatial data, the "count" value of a spatial object should often reflect the size of that object rather than simply assuming that all objects count equally.

But not always. If you need each observation to be weighted equally, or to be weighted by some other attribute value, then the cross-tab tool described here will allow you to do so (with some exceptions; see *calculating a cross-tab table from two datasets* on p. 5). If you wish to weight observations by size, then polyline features will be weighted by length, polygon features will be weighted by area, and multipoint features will be weighted by the number of points. Point features have no size so they cannot be weighted by size.

Automatic Conversion of Large Values

The basic size units of spatial objects are generally degrees, meters or feet. When analyzing large objects, these size values can become very large and consequently can be both difficult to display in the cross-tab table and difficult to read and understand (for example, it is difficult to know at a glance whether 2131121354 is larger or smaller than 923539578). Therefore, the code will convert the units of large values based on the following logic.

1. If the projection used in the analysis is geographic (i.e. using latitude and longitude coordinates) then:
    a. Lengths will be reported as "Pseudo-Degrees" and areas will be reported as "Square Pseudo-Degrees". Neither of these units are easily translatable into real-world coordinates, but they usually provide good relative sizes when the analysis area covers a small portion of the globe.

2. Otherwise if the projection used in the analysis uses linear units (i.e. meters or feet), then:
    a. If the features are polylines, and therefore the size is defined as the length of the line, then:
        i. If the combined size of all features is > 100,000 then:
            1. If the projection uses metric units, then the size is divided by 1,000 and reported as “Kilometers”
            2. Otherwise if the projection uses standard units, then the size is divided by 5,280 and reported as “Miles”
        ii. Otherwise if the combined size of all features is < 100,000, then:
            1. If the projection uses metric units, then the size is reported as “Meters”
            2. Otherwise if the projection uses standard units, then the size is reported as “Feet”
    b. Otherwise if the features are polygons, and therefore the size is defined as the geographic area of the polygon, then:
        i. If the combined size of all features is > 100,000,000 then:
            1. If the projection uses metric units, then the size is divided by 1,000,000 and reported as “Square Kilometers”
            2. Otherwise if the projection uses standard units, then the size is divided by 27,878,400 and reported as “Square Miles”
        ii. Otherwise if the combined size of all features is between 1,000,000 and 100,000,000, then:
            1. If the projection uses metric units, then the size is divided by 10,000 and reported as “Hectares”
            2. Otherwise if the projection uses standard units, then the size is divided by 43,560 and reported as “Acres”.
        iii. Otherwise if the combined size of all features is less than 1,000,000, then:
            1. If the projection uses metric units, then the size is reported as “Meters”
            2. Otherwise if the projection uses standard units, then the size is reported as “Feet”.
    c. Otherwise if the features are multipoints, then:
        i. The size is reported as “Point Count”
    d. Otherwise if the analysis is done on a table (not a feature class), then:
        i. The size is reported as “Row Count”

RESTRICTING ANALYSIS TO POLYGON

The tool also allows you to automatically restrict your analysis to some polygon boundary, such as a potential corridor polygon. The drop-down list box at the bottom of the dialog lists all polygon layers currently in the active frame of your map document. If the polygon layer you wish to use contains only a single polygon, then you may simply select that layer and be done. The tool works with a single polygon, and therefore will only use the first polygon in the polygon layer.

If you need to select a specific polygon from a polygon layer, or if you need to select or draw a polygon graphic, then choose the option "Select by clicking on map". This will enable the button "Select from Map", from which you can access an interactive tool to directly select or draw your polygon. For more information on using the interactive polygon selection tool, please refer to "Selecting or Drawing Polygons" (see p. 21).

Note: If you choose to restrict your analysis to a polygon, and if you also weight features by size, then be aware that the features will be clipped to the polygon prior to checking their size. Therefore, if a particular polygon in your cross-tab feature class is 100 hectares, but only 50 hectares lies within the analysis boundary polygon, then this feature class polygon will only be weighted as 50 hectares rather than the full 100 hectares.

USING THE TOOL:

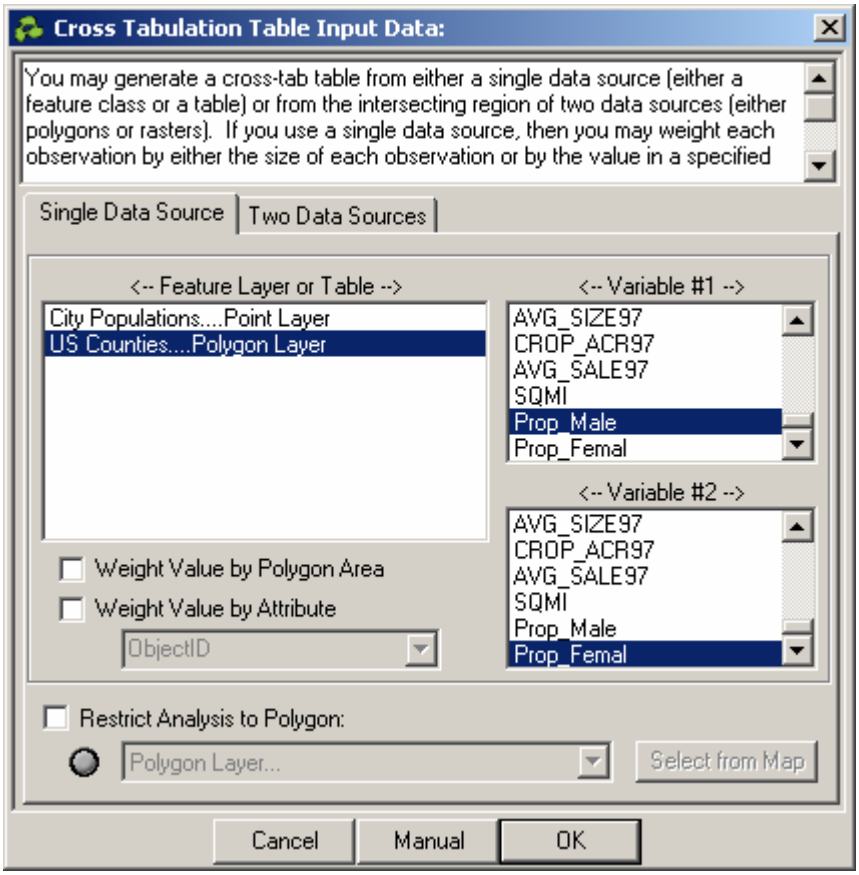
Click the Cross-Tab Statistics button  to set your input variables and analysis parameters. The cross-tab tool allows you to generate cross-tab tables on either a single table or feature class, or on the spatial intersection of two spatial datasets.

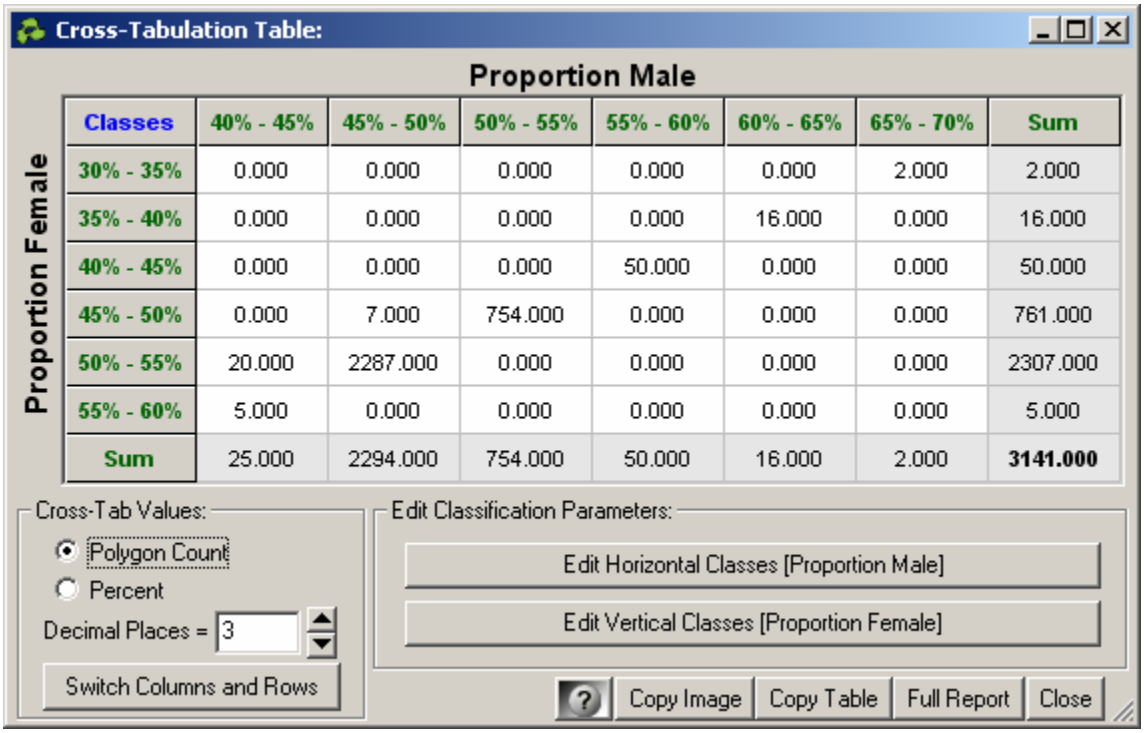
Calculating a cross-tab table from a single dataset

This option is intended for situations in which data from both variables are contained within a single table. Each record in the table is treated as a single observation, and that observation may optionally be weighted by a third attribute field or by the feature size.

In the dialog, click the "Single Data Source" tab and then select the feature class or table containing the data to analyze. Select the attribute fields that correspond with each variable you wish to analyze, and optionally a weighting method. If you are analyzing a feature class, then you have the option to restrict your analysis to some polygonal area of interest.

The next screen illustrates a selection that will produce a cross-tabulation of the numbers of males and females in each US county. Each cell in the cross-tab table will reflect the numbers of US counties containing the joint range of males and females in each population count class, and would be a useful way to see how many counties are predominately one gender and how many tend to be more evenly balanced.

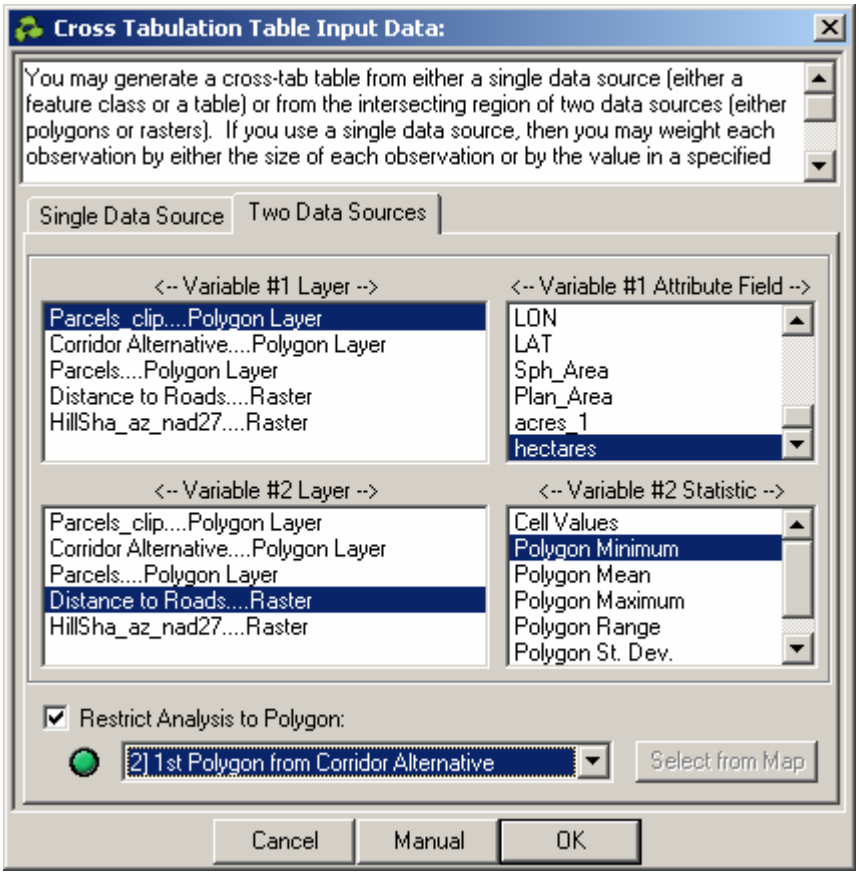




Calculating a cross-tab table from two datasets

This option allows you to calculate your table from either polygon or raster layers. The datasets do not need to be in the same projection but they do need to overlay each other.

NOTE: When using two datasets, the tool will always weight the observations by the size of the intersecting area. Therefore the "counts" reported in the cross-tab table will always represent the geographic size of the intersecting region (see *automatic conversion of large values* on p. 2 for a discussion of the size units).



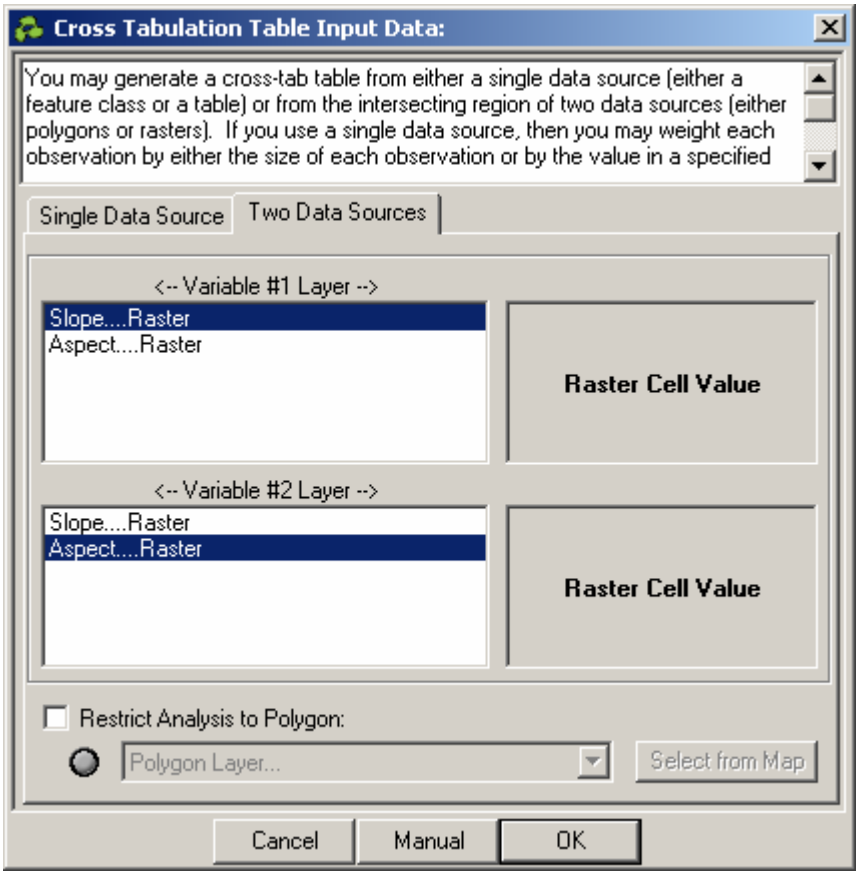
In general, the cross-tab data is derived from the spatial intersection of your two datasets. The analysis is done in different ways depending on whether your input datasets are polygons, rasters, or both.

Two Polygon Feature Classes: If both datasets are polygon feature classes, then the tool will intersect all polygons from the first feature class with all polygons from the second feature class. Each new intersected polygon will be treated as a single observation, weighted according to the size of that polygon, and with attribute values from both datasets.

In this case, select the appropriate polygon feature classes in the "Variable #1 Layer" and "Variable #2 Layer" listboxes, and then select the appropriate attribute fields to analyze. You may optionally restrict the analysis to some polygon area of interest.

Two Rasters: If both datasets are rasters, then the tool will extract the cell values for both rasters at a set of sample points. These sample points will correspond with all the cell centers of one of the rasters. If either of the rasters are projected, then the tool will use the first projected raster as the source for sample coordinates. If both rasters are unprojected, then the tool will use the second raster as the sample coordinate source.

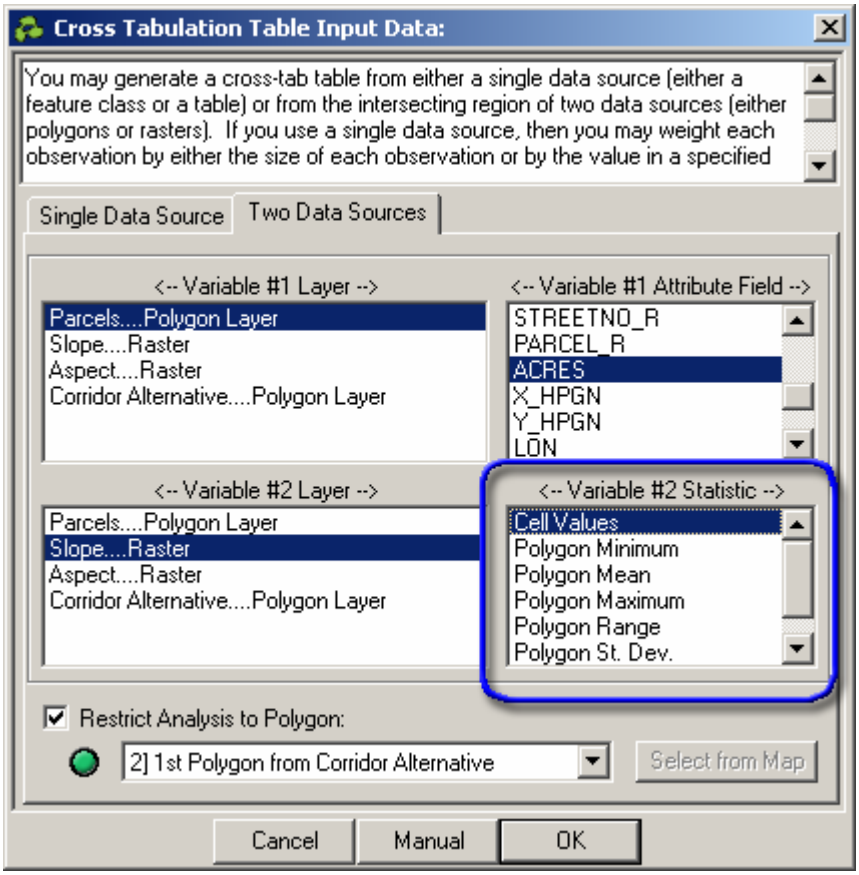
In this case, select the appropriate raster layers in the "Variable #1 Layer" and "Variable #2 Layer" listboxes. The "Attribute Field" listboxes will be disabled because you only have the option to use the raster cell values in the analysis.



One Polygon Feature Class, One Raster: You have two options in this case. You may either sample at each polygon or at each raster cell.

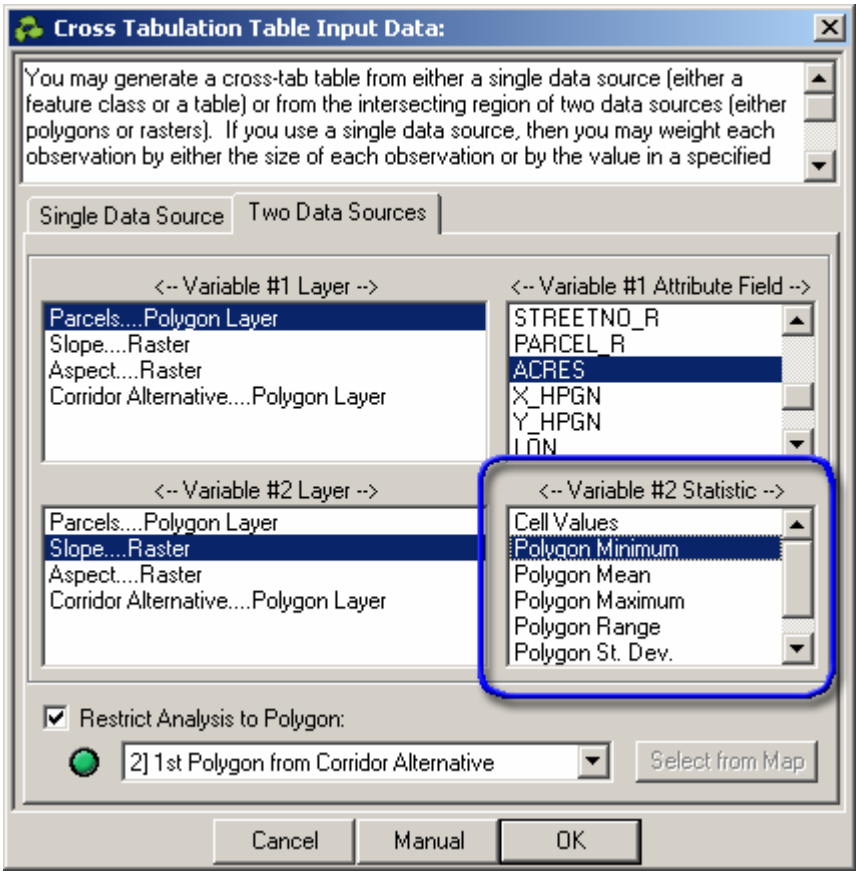
- *Sampling at each raster cell:* The cross-tab tool will treat each raster cell as a separate observation, weighted by the size of that raster cell. Each observation will use the raster cell value for one of the variables, and the attribute value from the intersecting polygon for the other variable.

  To force the cross-tab tool to sample at each raster cell, choose "Cell Values" as the raster variable statistic.



- *Sampling at each polygon:* The cross-tab tool will treat each polygon as a separate observation, weighted by the size of that polygon. Each observation will take the value from the polygon attribute table for one of the variables, and some statistic of all intersecting raster cells for the other variable (i.e. the mean, maximum, minimum, range, standard deviation or sum of all raster cells in that polygon).

  To force the cross-tab tool to sample at each polygon, choose one of the "Polygon Statistics" options as the raster variable statistic.

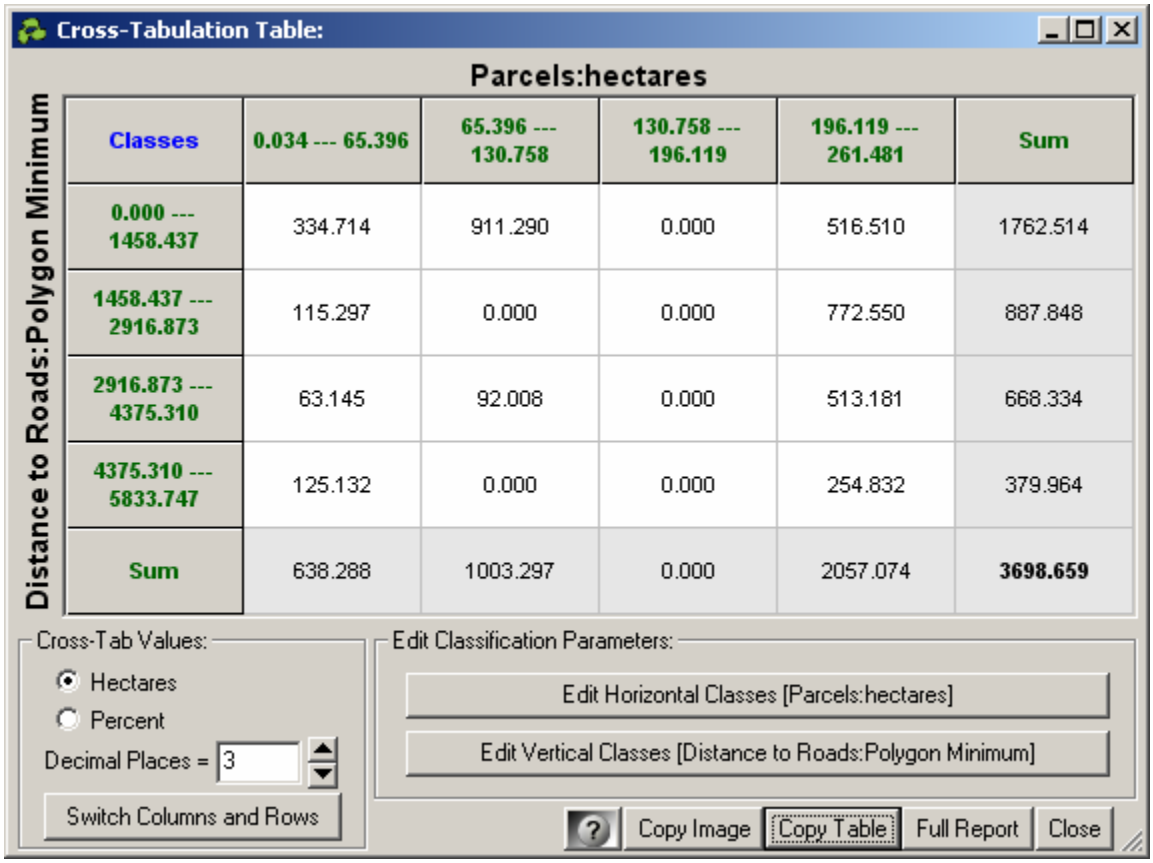


SUMMARY OF SCENARIOS:

Input data source		Variables	Options
Single Data Source			
Single Table		Two numeric attribute fields	▪ Weight each record by attribute value.
Single Feature Class		Two numeric attribute fields	▪ Weight each feature by feature size ▪ Weight each record by attribute value ▪ Restrict analysis to polygon
Two Data Sources			
One Polygon Feature Class One Raster Dataset	Method #1	▪ Polygon attribute value ▪ Raster summary statistic, summarizing all raster cells in that polygon	▪ May use the minimum, mean, maximum, range, standard deviation or sum of all raster cell values in each polygon ▪ Restrict analysis to polygon ▪ Analysis will always be done in projection of first projected dataset, or in geographic units if neither dataset is projected.
	Method #2	▪ Raster cell values ▪ Polygon attribute values extracted at each cell centerpoint.	▪ Restrict analysis to polygon ▪ Analysis will always be done in projection of first projected dataset, or in geographic units if neither dataset is projected.
Two Polygon Feature Classes		Polygon attribute values at all regions of intersection	▪ Restrict analysis to polygon ▪ Analysis will always be done in projection of first projected dataset, or in geographic units if neither dataset is projected.
Two rasters		Cell values	▪ Restrict analysis to polygon ▪ Analysis will always be done in projection of first projected dataset, or in geographic units if neither dataset is projected. ▪ Analysis will use cell size and positions of first projected raster, or of second raster if neither are projected.

THE CROSS-TABULATION TABLE WINDOW:

As soon as you select your analysis and data parameters and click the "OK" button, the tool will generate a basic cross-tab table with four vertical classes and four horizontal classes. The classes will be divided into equal-interval categories over the full range of the observed data. If any objects from one dataset did not have a corresponding value in the other dataset, then the tool will also add an "Other" class to indicate this. (**NOTE:** There will never be an "Other" class in the special case where you analyze a polygon dataset and a raster dataset, and you choose to sample by polygon. In this case, any raster cells that are outside the polygons, and any polygons that have no intersecting raster cells, will simply be ignored. If a polygon is only partially filled by raster cells, then the statistic for that polygon will be calculated from only those intersecting raster cells.)

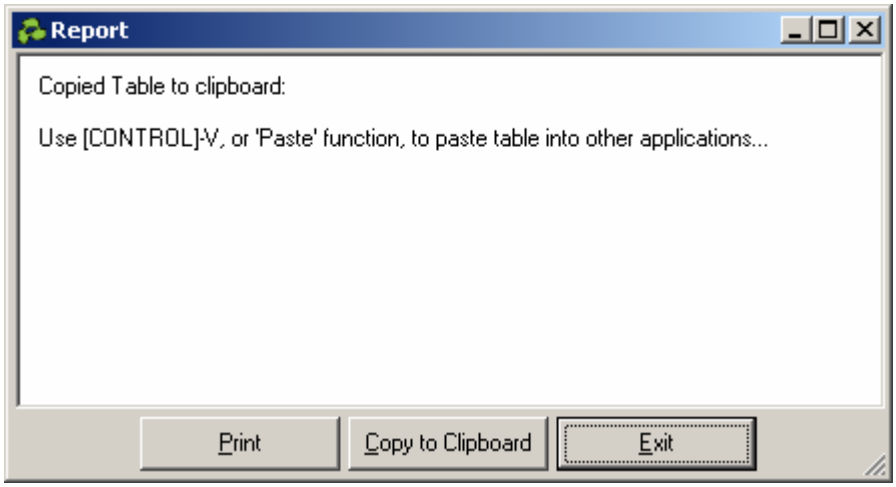


If any text is obscured because it is too large to fit in the space available to it, then the dialog may be resized by dragging on a corner.

You may modify the variable names, class names, class ranges, number of classes, number of decimal places shown, and whether the numbers represent percentages or counts (recall that "counts" can also mean "sizes" when analyzing geographic objects). You may also flip the columns and rows. The example below illustrates how to modify the variable names, class names and class ranges.

Copying the Table Data

You have several options to save the cross-tab data. If you wish to copy only the tabular data into a spreadsheet or word processing document, then click the "Copy Table" button. The tool will copy the table to the computer clipboard memory and then show you the following message:



Simply follow the instructions to paste the table into your document. It will appear as shown below:

Classes	0.034 --- 65.396	65.396 --- 130.758	130.758 --- 196.119	196.119 --- 261.481	Sum
0.000 --- 1458.437	334.714	911.290	0.000	516.510	1762.514
1458.437 --- 2916.873	115.297	0.000	0.000	772.550	887.848
2916.873 --- 4375.310	63.145	92.008	0.000	513.181	668.334
4375.310 --- 5833.747	125.132	0.000	0.000	254.832	379.964
Sum	638.288	1003.297	0.000	2057.074	3698.659

The “Full Report” button copies both the “Count” (i.e. “Area in Hectares” in this case) and “Percent” version of the table, plus lists all the data sources and analysis parameters you originally set. An illustration of the “Full Report” function is presented in the example below.

Copying an Image of the Table

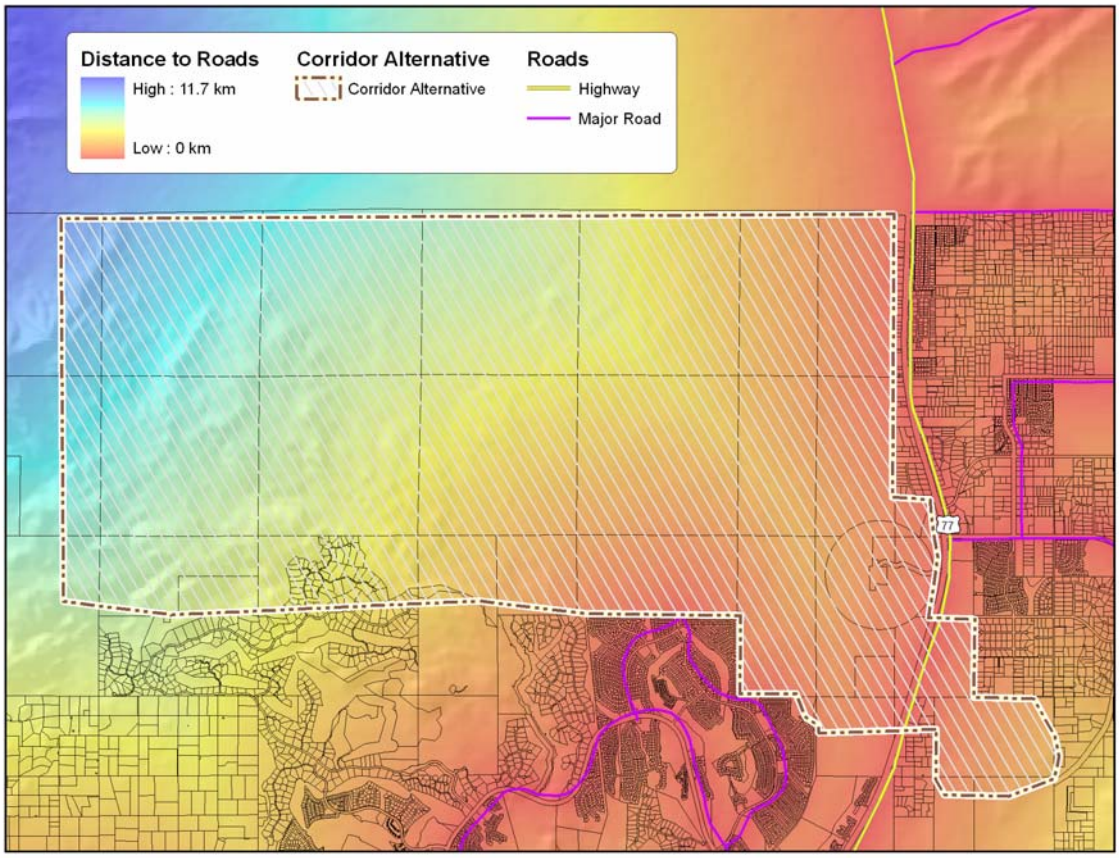
If you wish to use an image of the table in a report or presentation, the “Copy Image” button will copy the table image to the computer clipboard. You could then paste that image to your new document using the “Paste” function or by clicking [CONTROL]-V.

Classes	0.034 --- 65.396	65.396 --- 130.758	130.758 --- 196.119	196.119 --- 261.481	Sum
0.000 --- 1458.437	334.714	911.290	0.000	516.510	1762.514
1458.437 --- 2916.873	115.297	0.000	0.000	772.550	887.848
2916.873 --- 4375.310	63.145	92.008	0.000	513.181	668.334
4375.310 --- 5833.747	125.132	0.000	0.000	254.832	379.964
Sum	638.288	1003.297	0.000	2057.074	**3698.659**

Unfortunately the "Copy Image" function does not include the variable names, so you will need to add those yourself. **NOTE:** If necessary, you can also copy an image of the entire dialog to the computer clipboard by clicking [CONTROL]-[Print Screen].

EXAMPLE #1: TWO DATA SOURCES, POLYGON AND RASTER, SAMPLING AT EACH POLYGON

Suppose you are considering a potential corridor alternative and you are concerned about the cost of buying private parcels within that corridor. This cost will be directly proportional to the potential for commercial development of those parcels. A corridor composed of large parcels that are far from roads would have low development potential and correspondingly lower cost. The worst-case scenario would be a large number of small parcels close to roads.

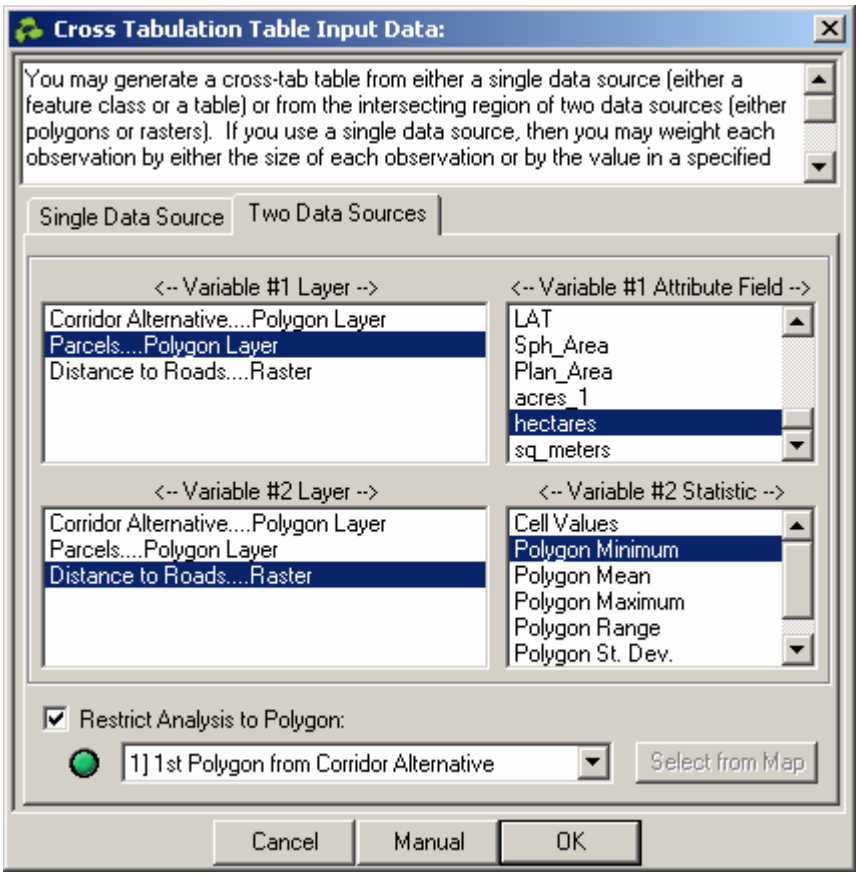


A cross-tab table would be a useful way to inspect the development potential of this corridor. In this case we would like to treat each parcel polygon in the corridor as a separate observation. For each parcel, we want the size (in hectares) and the distance from that parcel to the nearest road. The cross-tab table will then tell us the total area that lies within each joint size-class / distance-to-road range, and we hope that the majority of the corridor tends toward large parcels that are far from roads.

Assume we have already generated a "Distance to Road" raster, in which the cell values reflect the Euclidian distance from that cell to the nearest road. Assume also that we have an attribute field for the parcels that contains the size of each parcel in hectares.

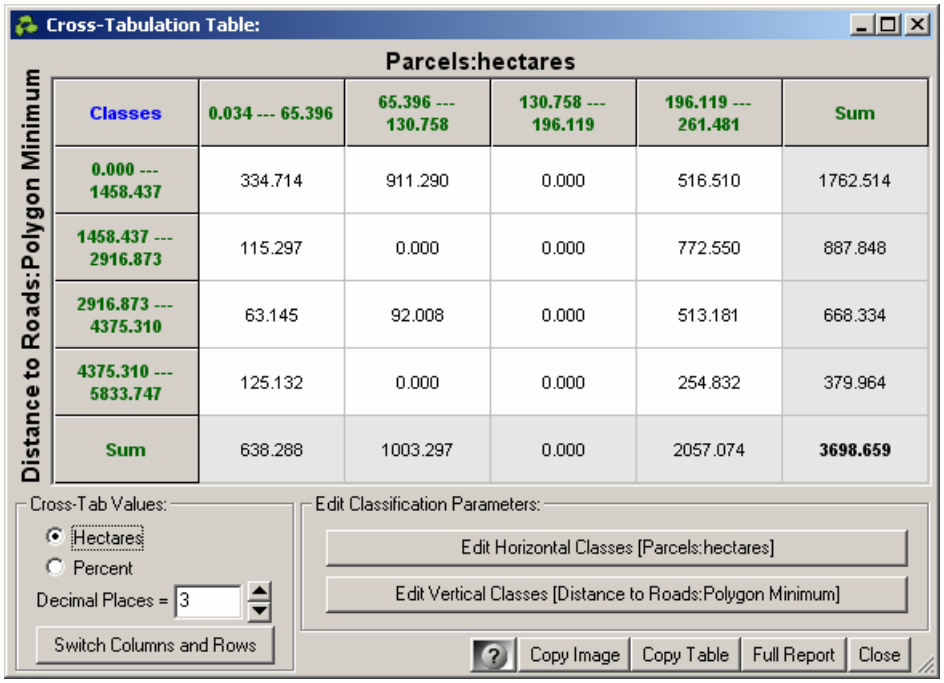
Click the Cross-Tab Statistics button to set the input data options, and click the "Two Data Sources" tab. For Variable #1, we select the "Parcels" polygon layer and the "Hectares" attribute

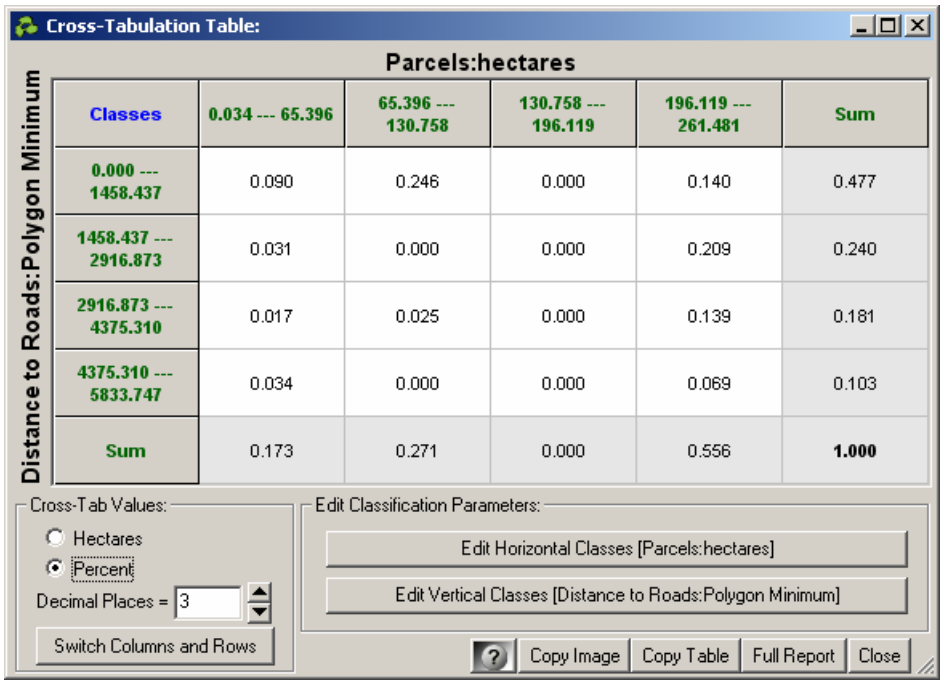
field. For Variable #2, we select the "Distance to Roads" raster and the raster statistic "Polygon Minimum". Finally, we opt to restrict our analysis to our corridor alternative polygon.



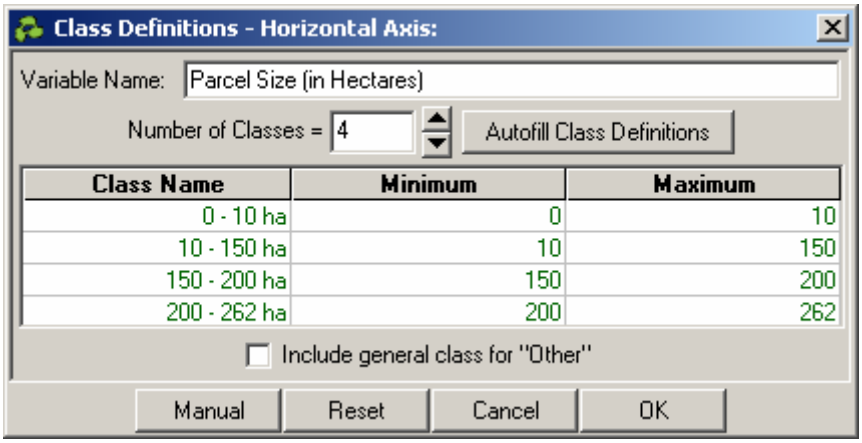
Click "OK" to generate the cross-tab table. Note that we can view the data within each cell as either percentages or as actual area values. Note also that the tool has automatically converted the total area values in each cell to Hectares (see *automatic conversion of large values* on p. 2).

NOTE: Because we opted to restrict the analysis to the corridor polygon, the total area reflected in each cell only reflects the portions of the parcels that actually lie within the corridor boundary. The sum of all the cells is approximately equal (with some rounding error) to the area of the corridor polygon. This clipping effect does not affect the analysis in this particular example, however. Recall that we are examining how much of the corridor is covered by parcels of various sizes. The "Parcel Size" variable is drawn from the "hectares" attribute field, and that "hectares" attribute value will not change regardless of how much of the parcel is inside the corridor polygon. If the parcel is large enough to fit into a particular class range, but only a few hectares of that parcel actually lies within the corridor, then that parcel will still be classified into that original size range. It will just contribute a few hectares to the total area, rather than the full size of the parcel.



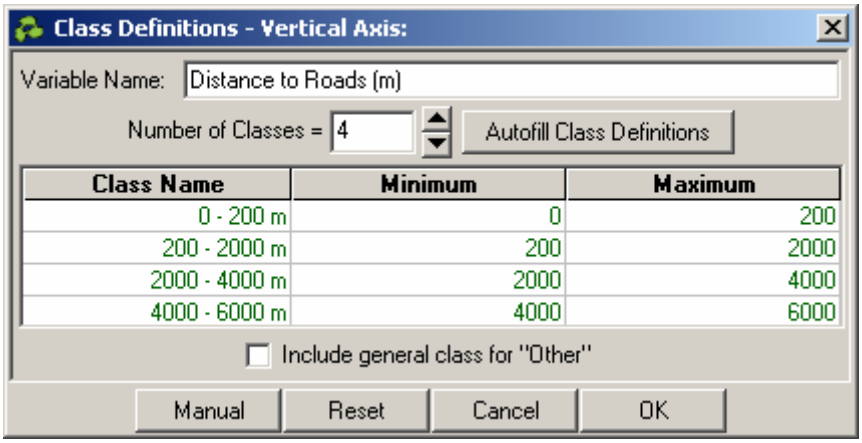


The auto-generated class ranges may not be useful for us. In this case, we are really most interested in the area comprised by parcels of 10 ha or less, so we can modify the horizontal axis to include this range. We click the "Edit Horizontal Classes" button to make the changes:

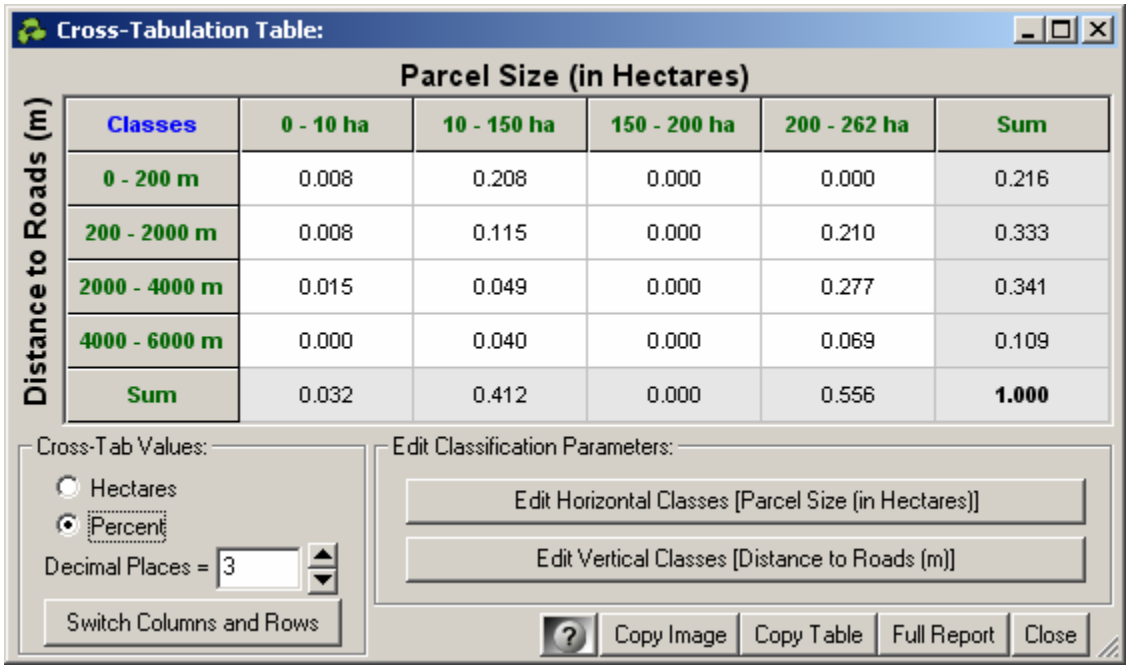


NOTE: The "Autofill Class Definitions" button will make X equal-interval classes over the full range of the data, where "X" is the number of classes you have selected. It will also change all the class names to explicitly state the class minima and maxima.

We can also edit the vertical axis categories to make them a little more intuitive:



Now the cross-tab table looks as follows:



Based on this, we see that 21.6% of our corridor is composed of parcels that are <= 200m from a road, and 3.2% is composed of parcels that are <= 10 ha (to see the actual area of the corridor in each cell, rather than the percent, click the "Hectares" option). Most of the corridor is composed of the largest parcels, which will typically have a relatively low acquisition cost per hectare, and none of these are <= 200m from a road, which further reduces the likely cost of acquisition or easements. Except for that cluster of small parcels just west of the center of the bottom edge (see map), this alternative probably has relatively low development potential.

For reporting purposes, we can click the "Full Report" button to generate the data below:

Crosstabs Report:

Input Data Sources:
*** First Data Source: Polygon Feature Class
*** Name: Parcels
*** Attribute Field: hectares
*** Second Data Source: Raster
*** Name: Distance to Roads
*** Data Values: Polygon Minimum
*** Option to restrict analysis to polygon boundary
*** Cross-tabulation cell units: Hectares
*** 150 total observations analyzed...

Crosstabs Table as Counts or Areas:

Classes	0 - 10 ha	10 - 150 ha	150 - 200 ha	200 - 262 ha	Sum
0 - 200 m	30.478	767.957	0.000	0.000	798.435
200 - 2000 m	30.288	426.042	0.000	776.337	1232.667
2000 - 4000 m	56.975	180.078	0.000	1025.904	1262.957
4000 - 6000 m	0.000	149.767	0.000	254.832	404.600
Sum	117.741	1523.844	0.000	2057.074	3698.659

Crosstabs Table as Percents:

Classes	0 - 10 ha	10 - 150 ha	150 - 200 ha	200 - 262 ha	Sum
0 - 200 m	0.008	0.208	0.000	0.000	0.216
200 - 2000 m	0.008	0.115	0.000	0.210	0.333
2000 - 4000 m	0.015	0.049	0.000	0.277	0.341
4000 - 6000 m	0.000	0.040	0.000	0.069	0.109
Sum	0.032	0.412	0.000	0.556	1.000

Variable Class Definitions:

Horizontal Axis; Classes distributed over columns:
Variable Name = Parcel Size (in Hectares)
Classes:
1) **0 - 10 ha:** Range = 0.....10
2) **10 - 150 ha:** Range = 10.....150
3) **150 - 200 ha:** Range = 150.....200
4) **200 - 262 ha:** Range = 200.....262

Vertical Axis; Classes distributed over rows:
Variable Name = Distance to Roads (m)
Classes:
1) **0 - 200 m:** Range = 0.....200
2) **200 - 2000 m:** Range = 200.....2000
3) **2000 - 4000 m:** Range = 2000.....4000
4) **4000 - 6000 m:** Range = 4000.....6000

In the example above, we can see that there are 30.48 ha in small (< 10ha) parcels within 200m of a road, but this total could represent 4 parcels of about 8 ha each, or it could represent 300 parcels of 0.1 ha each. We might want to know the number of parcels in each cell. To do this, we need to add a “distance to road” field to the “Parcels” data layer and then use the “single data source” option (see example below).

EXAMPLE #2: ONE DATA SOURCE (FEATURE CLASS), UNWEIGHTED

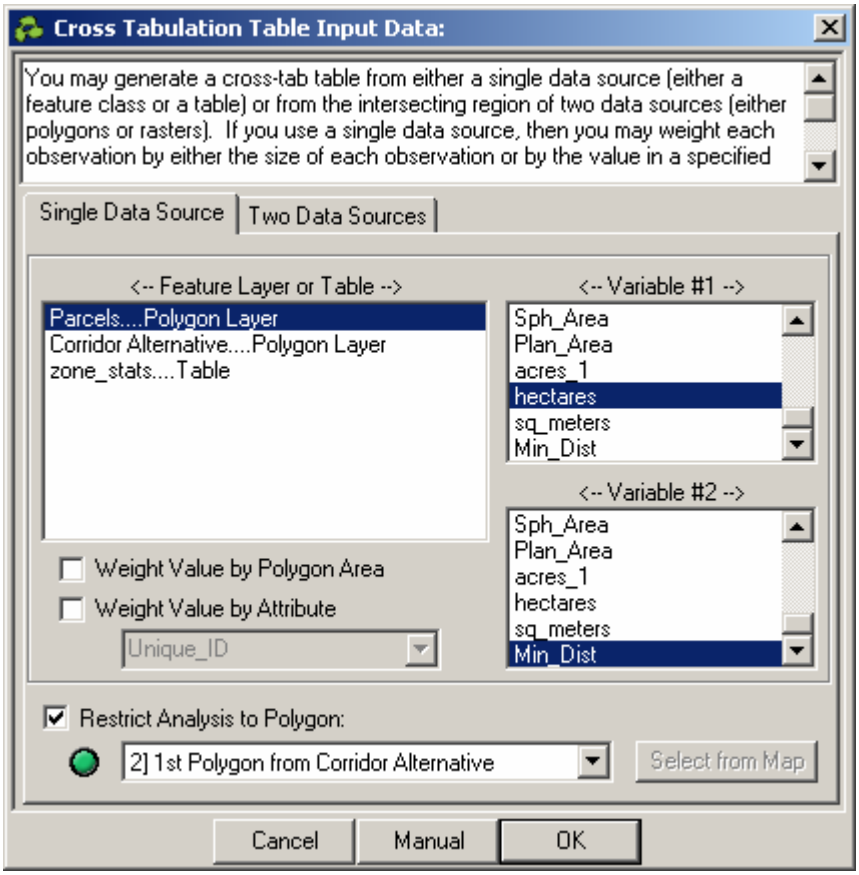
This example assumes that you have already generated the "Distance to Roads" data and added it to a new attribute field in the Parcels feature class.

NOTE: If you are unfamiliar with how to do this, then a fairly simple method would be as follows:

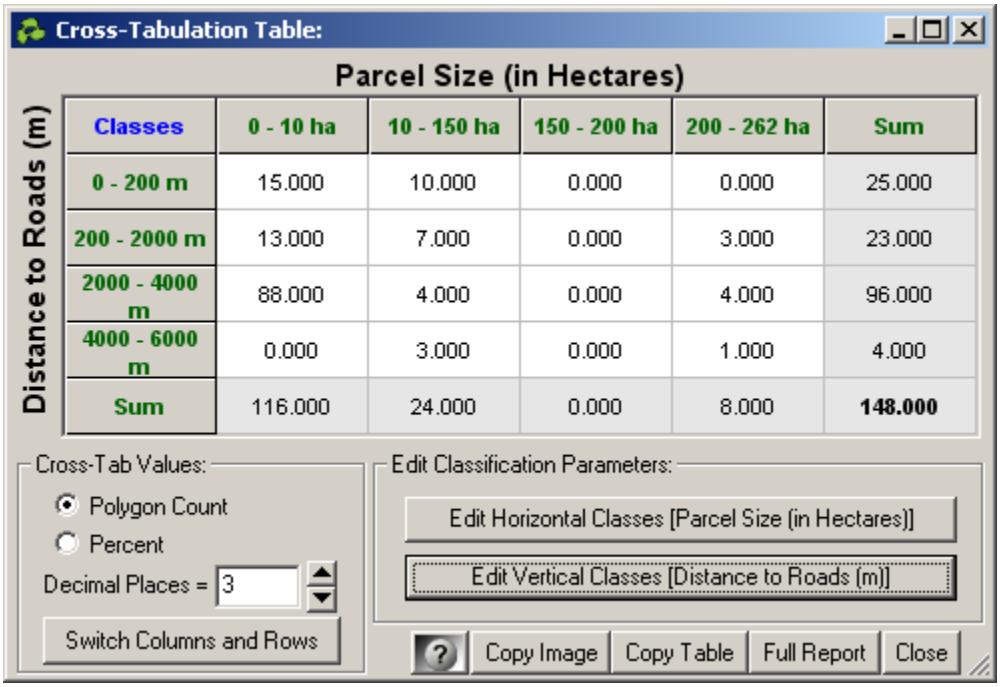
1. Create a table of Minimum "Distance to Roads" values for each parcel. Use the Spatial Analyst "Zonal Statistics as Table" tool (located in ArcToolbox, then "Spatial Analyst Tools", then "Zonal"). Make sure your "Zone Field" is something that uniquely identifies each polygon.
2. Join this table to your Parcels feature class, using the unique ID field to match the records. Note that the Zonal Stats table contains a variety of statistics, including the minimum "Distance to Road" value found in each polygon.
3. Add a new numeric field to your Parcels feature class, defined so that it can correctly hold the distance values (i.e. make sure it is either an integer or floating point, depending on your needs).
4. Use the Field Calculator function to transfer the minimum distance values from your joined Zonal Stats "Minimum Distance" field to this new attribute field.
5. Remove the joined Zonal Stats table from your Parcels feature class.

- **NOTE:** Steps 3 – 5 above are necessary because the cross-tab input data dialog will not display joined attribute fields. It will only show you attribute fields that are actually part of your feature class or table.

Click the Cross-Tab Statistics button  to set the input data options, and click the "Single Data Source" tab. For "Feature Layer or Table", we select the "Parcels" polygon layer. We select the "Hectares" attribute field for Variable #1, and the "Min_Dist" attribute field for Variable #2. Finally, we opt to restrict our analysis to our corridor alternative polygon.



After clicking "OK" to generate the table, and after adjusting the class names ranges to match the example above, the cross-tab table looks like this:



Clicking the "Full Report" button, we get the following:

Crosstabs Report:

Input Data Source:

*** Polygon Feature Class: Parcels
*** First Selected Attribute Field: hectares
*** Second Selected Attribute Field: Min_Dist
*** Cross-tabulation cell units: Polygon Count
*** Option to restrict analysis to polygon boundary
*** 148 features used in analysis

Crosstabs Table as Counts or Areas:

Classes	0 - 10 ha	10 - 150 ha	150 - 200 ha	200 - 262 ha	Sum
0 - 200 m	15.000	10.000	0.000	0.000	25.000
200 - 2000 m	13.000	7.000	0.000	3.000	23.000
2000 - 4000 m	88.000	4.000	0.000	4.000	96.000
4000 - 6000 m	0.000	3.000	0.000	1.000	4.000
Sum	116.000	24.000	0.000	8.000	148.000

Crosstabs Table as Percents:

Classes	0 - 10 ha	10 - 150 ha	150 - 200 ha	200 - 262 ha	Sum
0 - 200 m	0.101	0.068	0.000	0.000	0.169
200 - 2000 m	0.088	0.047	0.000	0.020	0.155
2000 - 4000 m	0.595	0.027	0.000	0.027	0.649
4000 - 6000 m	0.000	0.020	0.000	0.007	0.027
Sum	0.784	0.162	0.000	0.054	1.000

Variable Class Definitions:

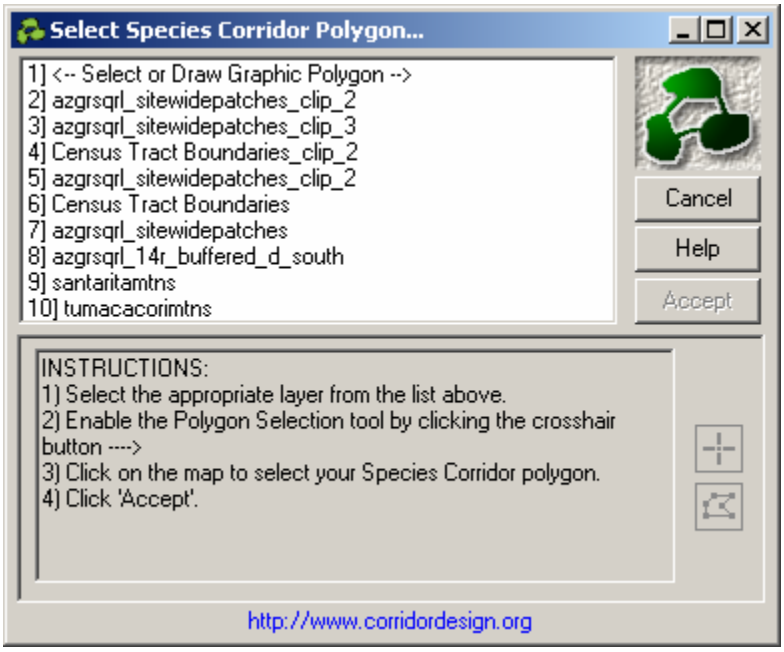
Horizontal Axis; Classes distributed over columns:
Variable Name = Parcel Size (in Hectares)
Classes:
1) **0 - 10 ha:** Range = 0.....10
2) **10 - 150 ha:** Range = 10.....150
3) **150 - 200 ha:** Range = 150.....200
4) **200 - 262 ha:** Range = 200.....262

Vertical Axis; Classes distributed over rows:
Variable Name = Distance to Roads (m)
Classes:
1) **0 - 200 m:** Range = 0.....200
2) **200 - 2000 m:** Range = 200.....2000
3) **2000 - 4000 m:** Range = 2000.....4000
4) **4000 - 6000 m:** Range = 4000.....6000

Comparing this with the example above, we can see that there are 15 small parcels (< 10ha) parcels within 200m of a road. From the previous example, we know that they cover 30.48 ha of the corridor polygon.

Selecting or Drawing Polygons:

Four functions allow the user to do something based on a selected polygon graphic or polygon feature, and therefore all three tools needed a way to select or draw that polygon. The Patch Analysis, Bottleneck Analysis, Cross-Tabulation Table and Clip tools all provide access to the following dialog:

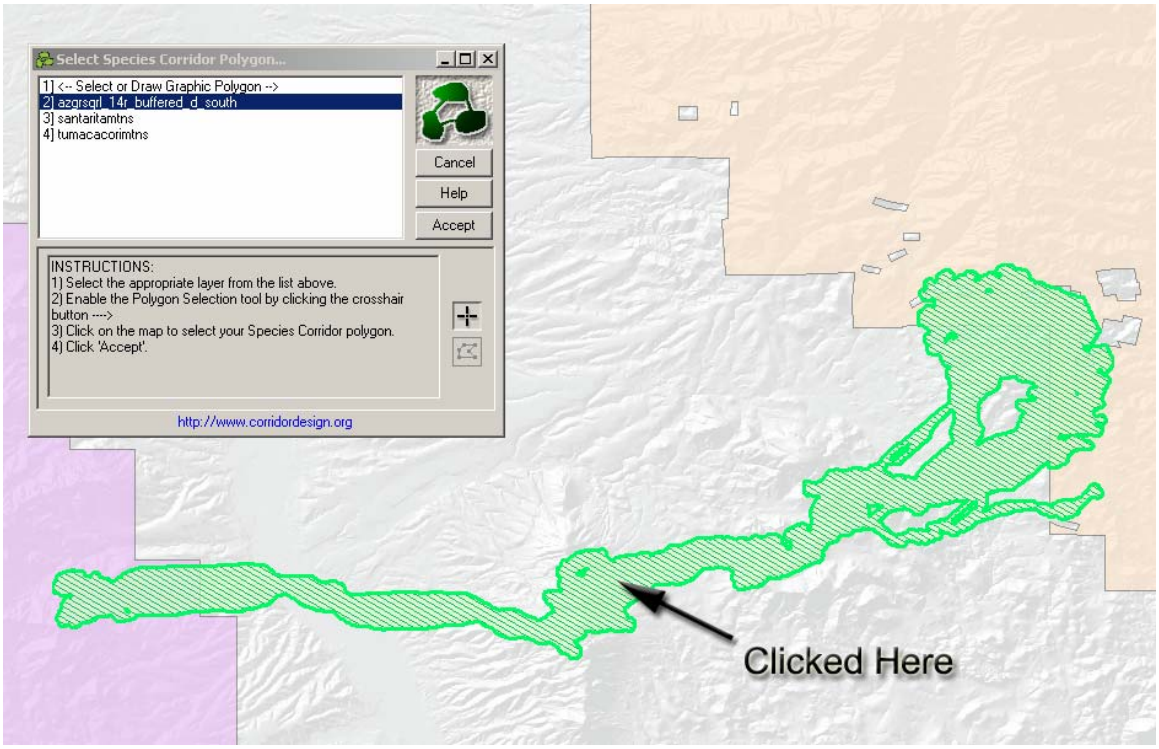


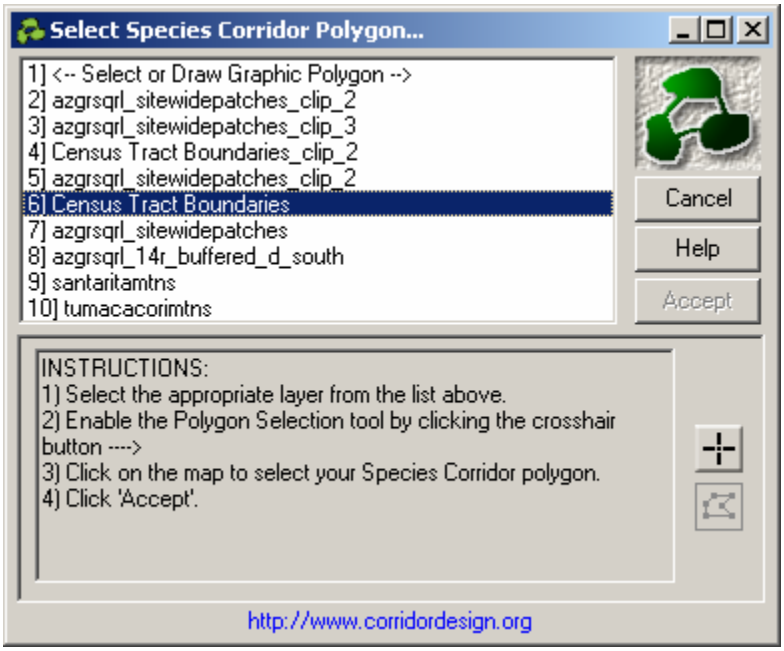
NOTE: The title of this dialog will change depending on whether the user is searching for a corridor polygon or a wildland block.

This dialog allows you to:

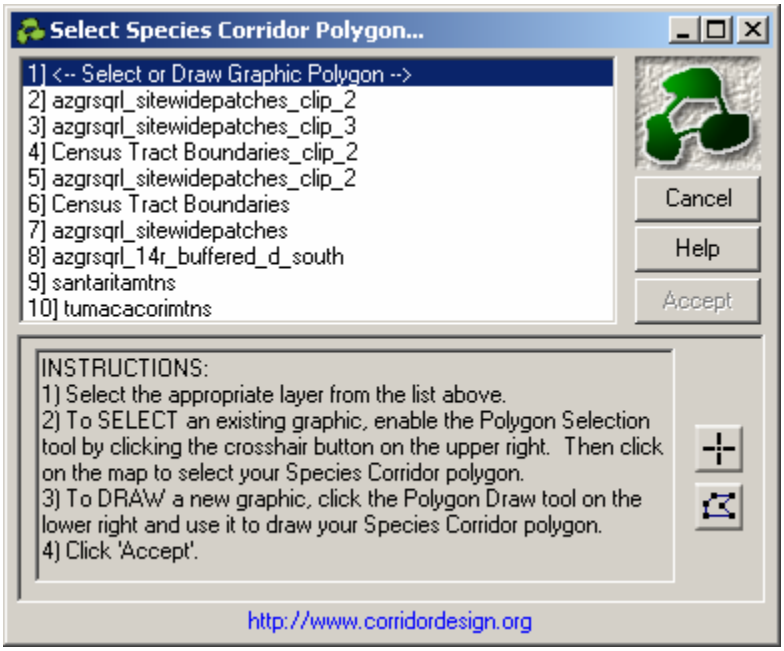
1. Select a single polygon from a polygon feature layer, or
2. Select a single graphic polygon, or
3. Manually draw a graphic polygon on the screen.

If you select a polygon theme from the list at the top of the dialog, then the "Select Polygon" button  will become enabled and the corresponding tool will become enabled on the Corridor Designer toolbar. Click this button and then select a polygon from the theme. After you click on a polygon, it will turn a green color with a crosshatch fill:



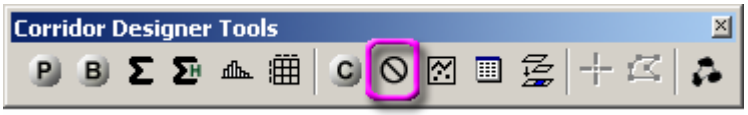


You may also select or draw graphic polygons, rather than selecting polygons from a polygon layer. If you select the first item in the list, "Draw or select graphic polygon", then both the "Select Polygon"  and "Draw Polygon"  buttons will become enabled. Use the appropriate button to either select or draw a graphic polygon. Note that the instructions change if you select this option:

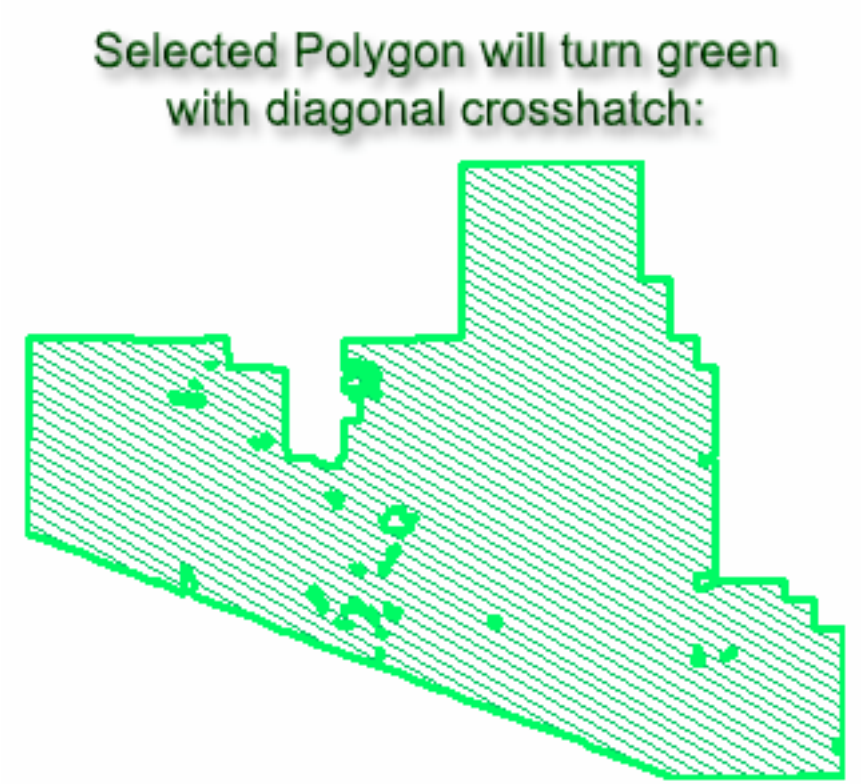


In all cases, selected polygons will be shaded green with a crosshatch pattern. If any of these graphics remain in your view after you no longer need them, you can quickly clear them out using the "Delete Corridor Designer Graphics" tool (p. 24). You may also convert any graphics to a shapefile using the "Create Shapefile" tool (p. 25).

Delete Corridor Designer Graphics:



Several of the Corridor Designer Evaluation functions create graphics on the screen. For example, the Clip tool and the Polygon Selection tool both produce polygons with a particular fill pattern:



The bottleneck and patch distance tools will also produce distinctive graphics.

This button simply clears out any CorridorDesigner-produced graphics, leaving any other user-created graphics untouched.

Create New Shapefile:

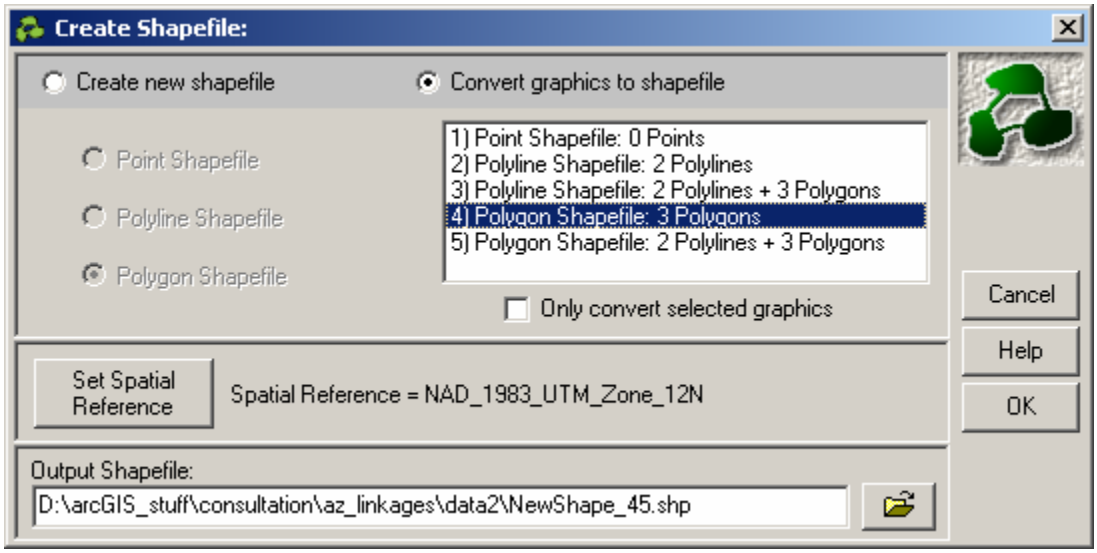
This function allows you to either create a new empty shapefile or convert graphic shapes to a shapefile. You may create either point, polyline or polygon shapefiles with this tool.

- Polygon shapefiles will include attribute fields for [Unique_ID] and [Area].
- Polyline shapefiles will include attribute fields for [Unique_ID] and [Length]
- Point shapefiles will include attribute fields for [Unique_ID], [X_Coord] and [Y_Coord].

NOTE: If you are converting graphics to a shapefile, and if those graphics have names (right-click the graphic and check the properties to see if it has a name), then these names will also be added to the attribute table in a [Name] field.

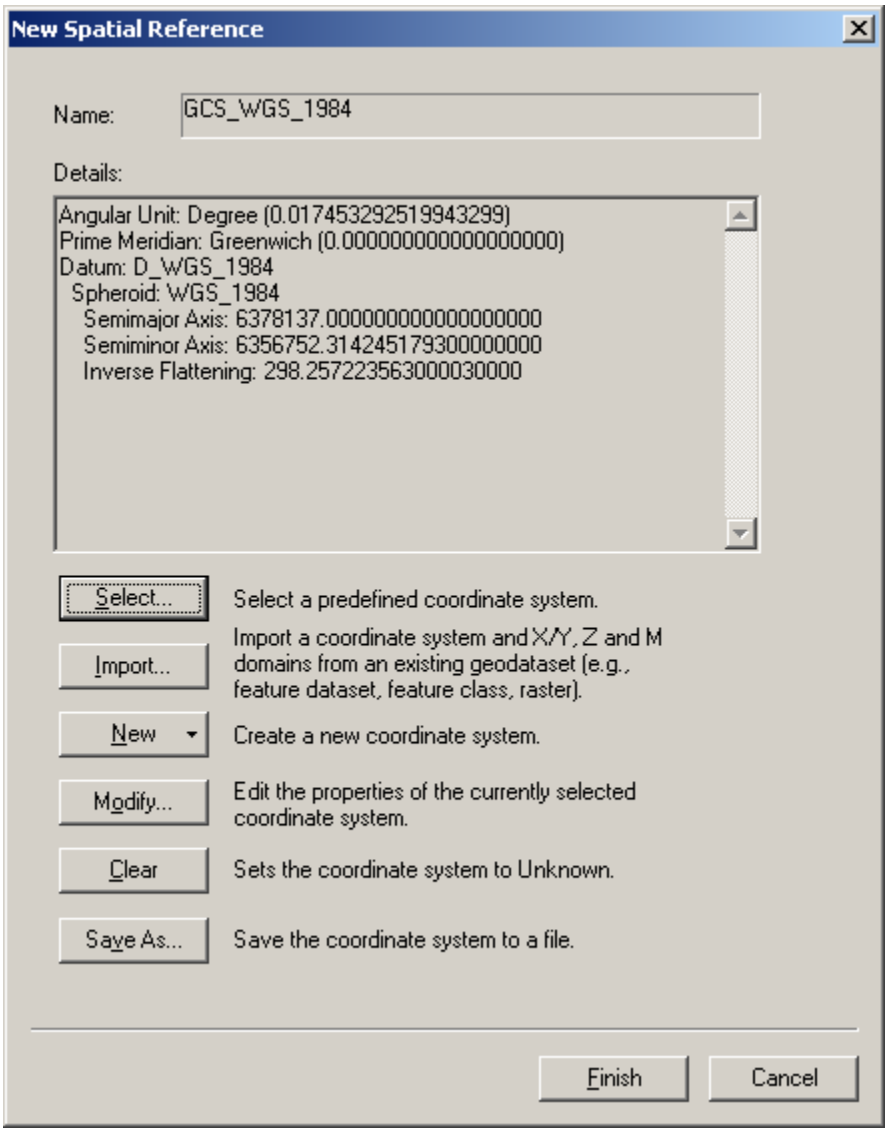
This function also allows you to convert polyline graphics to polygons, or polygon graphics to polylines, if you wish. When opened, the tool will examine your map to see how many point, polyline or polygon graphics are available, and whether any of them are selected. The tool will show you how many of each type are available to convert. If you attempt to create a shapefile from existing graphics when there are no graphics to convert, you will be notified of this and asked if you would like to try a different shape type.

NOTE: Certain linear or areal graphic shapes are not technically polylines or polygons. Polygons that are defined by a circle or elliptic arc are not really "polygons" in the sense that they are not composed of a series of straight-line segments. This is also true for linear features that are constructed of Bezier curves. It is not possible to add true curves such as circles, ellipses or Bezier curves to a polyline or polygon shapefile, so this function will convert these shapes to standard polygons or polylines before adding them to the shapefile. It does this by generating 200 evenly-spaced points along the length or perimeter of the curve, and connecting these points with straight segments. Therefore, if the original graphic feature is composed of true curves, then the actual shape in the shapefile will be slightly different than the original feature.



You must set a spatial reference for the new shapefile. If your map has a spatial reference set, then the map spatial reference will be the default value. You may easily change the spatial

reference by clicking the “Set Spatial Reference” button and identifying the spatial reference you want:



NOTE: This function adds the new shapefile to map, but does not delete existing graphics so you may not see the new shapefile when the shapes lie behind the graphics.