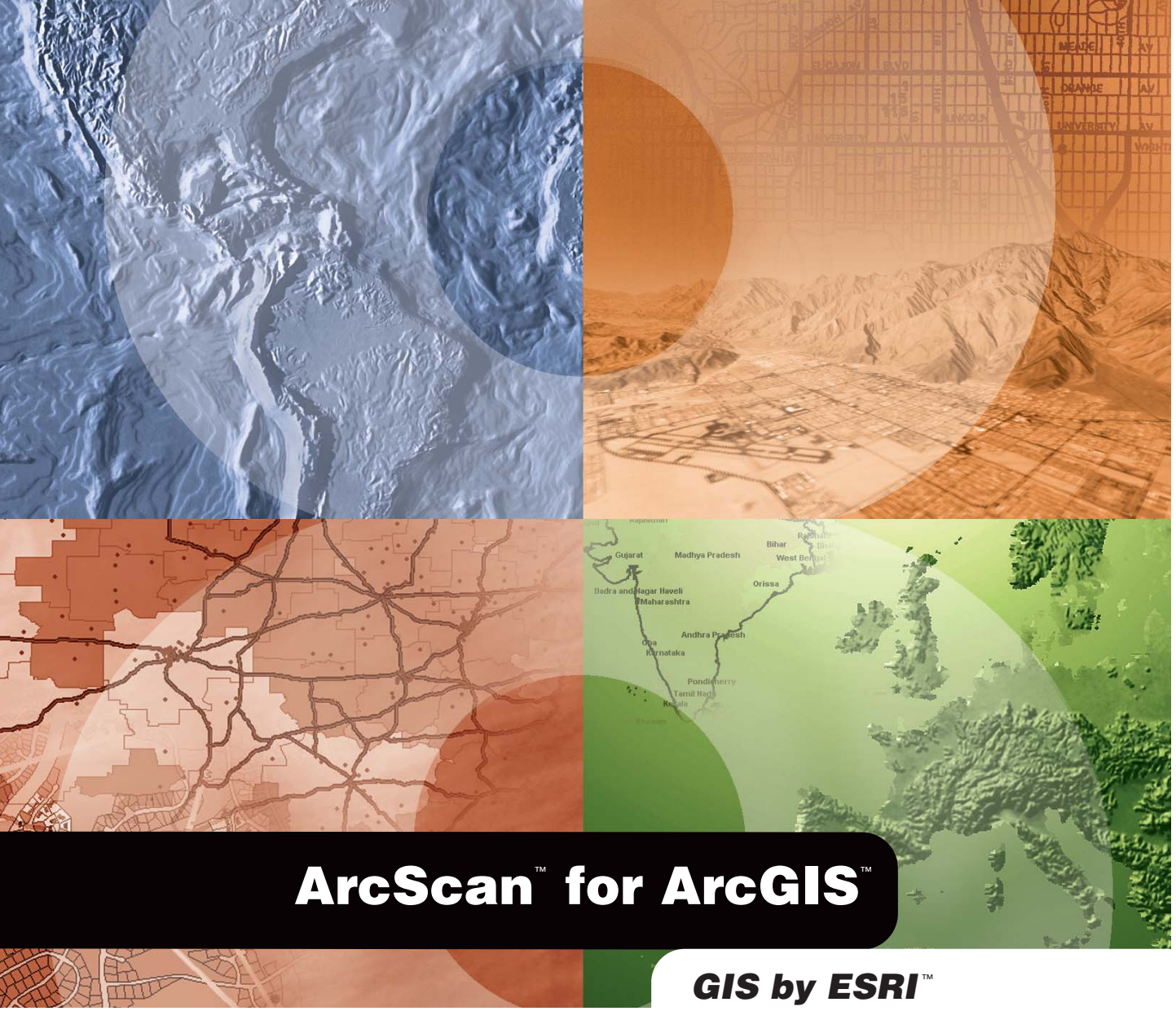

ArcScan™ for ArcGIS™

GIS by ESRI™

ESRI ArcGIS™

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WRITER

Phil Sanchez

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Quick-start tutorial

2

IN THIS CHAPTER

- Exercise 1: Raster tracing
- Exercise 2: Batch vectorization

ArcScan for ArcGIS software has the tools you need to convert your scanned raster images into vector-based GIS layers. This process can be performed interactively or in an automated fashion.

The easiest way to learn how to use ArcScan is to complete the exercises in this tutorial.

Exercise 1 shows you how to set up the raster snapping options and environment, snap to raster cells, and trace raster cells to create line and polygon features.

Exercise 2 teaches you how to edit a raster layer to remove unwanted cells, apply vectorization settings, preview the vectorization, and generate features using the batch vectorization mode.

Each of these exercises takes between 15 and 20 minutes to complete. You have the option of working through the entire tutorial or completing each exercise one at a time.

Exercise 1: Raster tracing

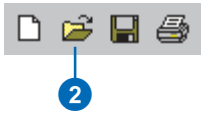
ArcScan makes it easy to create new features from scanned raster images. This process can significantly reduce the time it takes for you to incorporate raster data into your vector database.

In this exercise, you will generate features from a scanned parcel map by interactively tracing raster cells. You will begin by starting ArcMap and loading a map document that contains the raster dataset and two shapefiles.

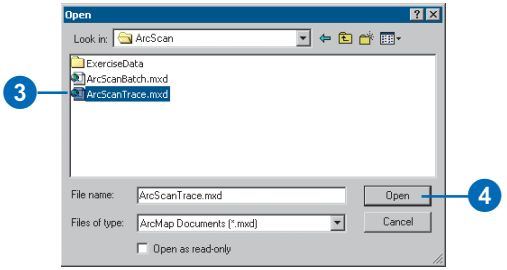
Starting ArcMap

Before you can complete the tasks in this tutorial, you must start ArcMap and load the tutorial data.

1. Double-click a shortcut installed on your desktop or use the Programs list in your Start menu to start ArcMap.
2. Click the Open button on the Standard toolbar.



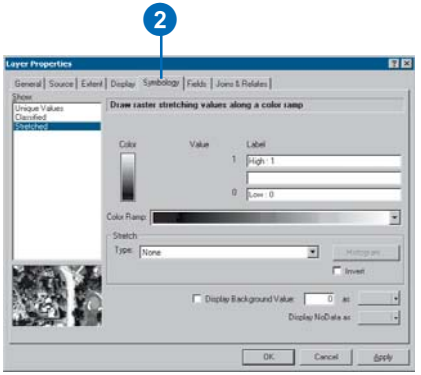
3. Navigate to the ArcScanTrace.mxd map document in the ArcScan directory where you installed the tutorial data and select it (C:\ArcGIS\ArcTutor is the default location).
4. Click Open.



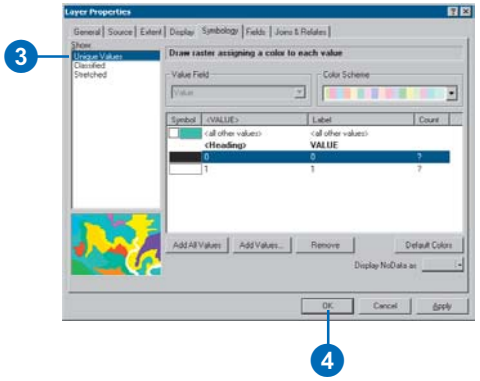
Changing the raster layer symbology

Raster layers must be symbolized as bi-level images to use the ArcScan tools and commands. You will change the raster symbology from stretched to unique values.

1. Right-click the ParcelScan.img raster layer in the ArcMap Table of Contents and click Properties from the context menu to display the Layer Properties dialog box.
2. Click the Symbology tab on the Layer Properties dialog box.



3. In the Show box, click the Unique Values display option.
4. Click OK.

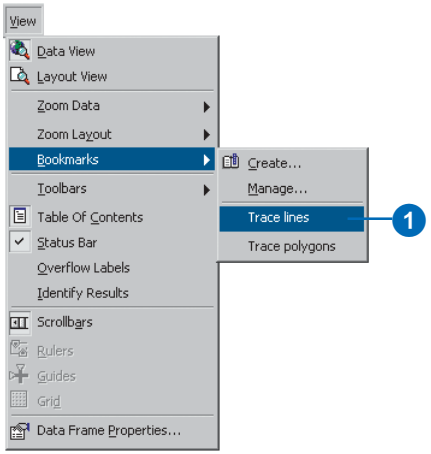


Locating the trace area

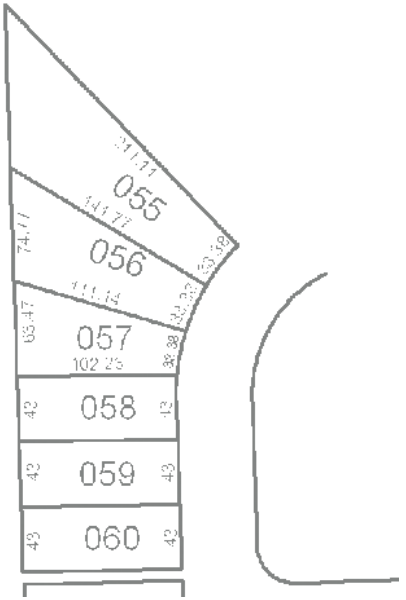
Spatial bookmarks are named extents that can be saved in map documents. Creating a bookmark for areas that you visit frequently will save you time. For information on how to create and manage spatial bookmarks, see *Using ArcMap*.

You will now zoom to a spatial bookmark created for this exercise.

1. Click the View menu, point to Bookmarks, and click Trace lines to set the current view to the edit area of the exercise.



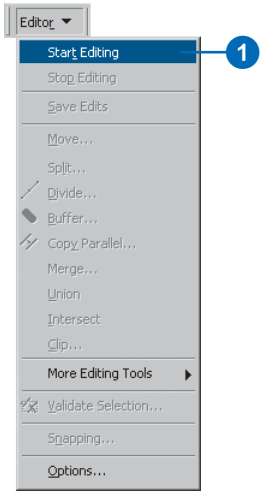
When the display refreshes, you should see the trace area.



Start editing

The ArcScan extension is only active in an edit session. The Start Editing command enables you to begin an edit session.

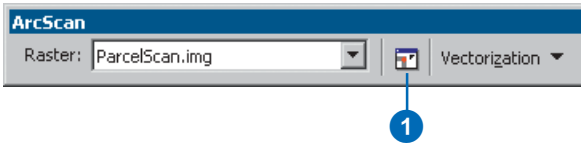
1. Click the Editor menu and click Start Editing to begin the edit session.



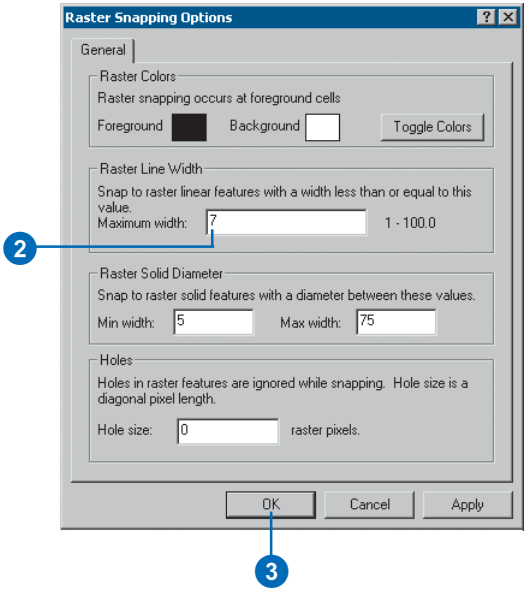
Setting the raster snapping options

Raster snapping requires settings that influence the behavior of the tracing. These options are set in the Raster Snapping Options dialog box.

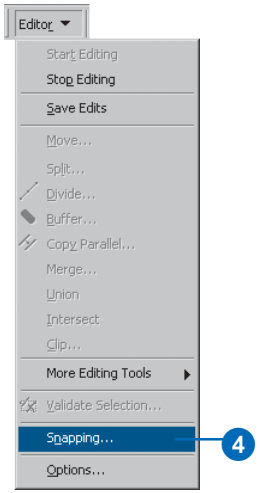
1. Click the Raster Snapping Options button on the ArcScan toolbar to open the Raster Snapping dialog box.



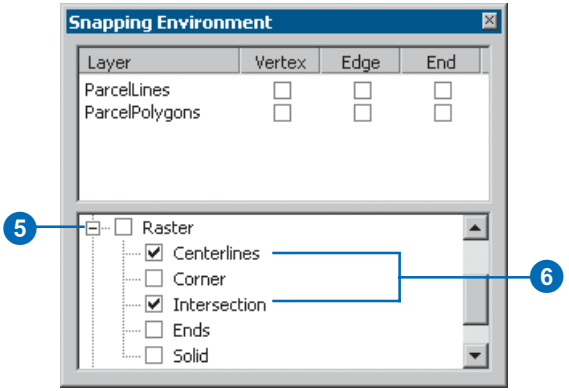
2. Set the maximum line width value to 7. This setting will ensure that you are able to snap to raster cells that represent the lot boundaries.
3. Click OK.



4. Click the Editor menu and click Snapping to open the Snapping Environment dialog box.



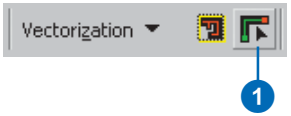
5. Click the plus sign next to Raster to expand it.
6. Check the Centerlines and Intersection options for raster snapping.



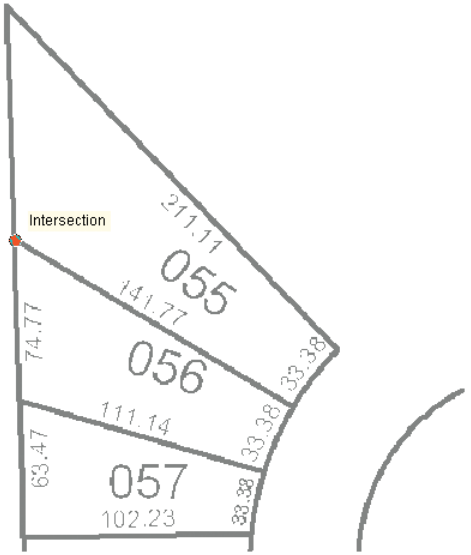
Creating line features by tracing raster cells

Now that you have set up your raster snapping environment, you are ready to begin tracing the raster cells. You will use the Vectorization Trace tool for this step.

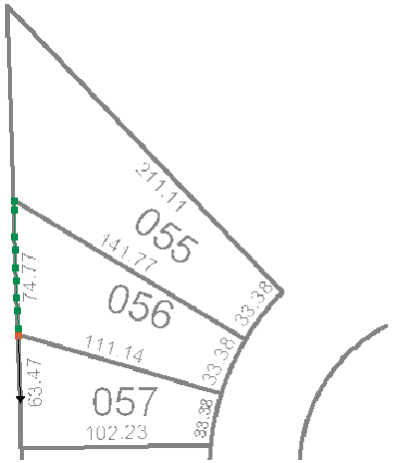
1. Click the Vectorization Trace button on the ArcScan toolbar.



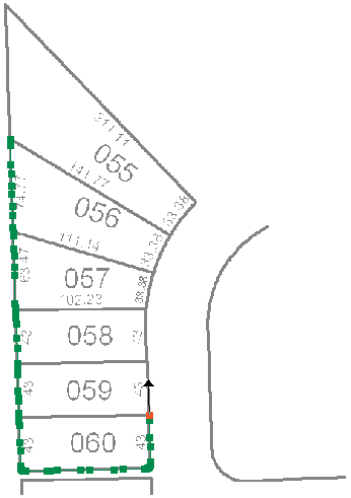
2. Move the pointer until it snaps to the intersection of the lot boundaries and click to start tracing.



3. Point the Vectorization Trace tool downward and click to start creating the line feature.

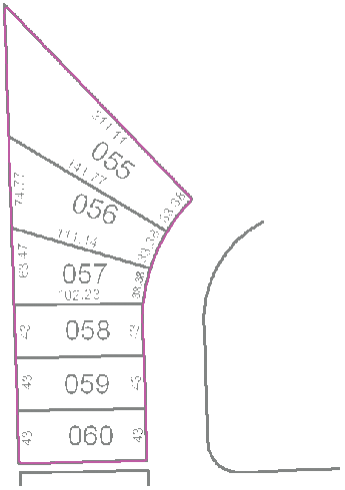


4. Continue to point and click with the Vectorization Trace tool to trace the exterior boundary of the lots.



5. Once you have finished tracing around the lot boundaries, press F2 to finish the sketch.

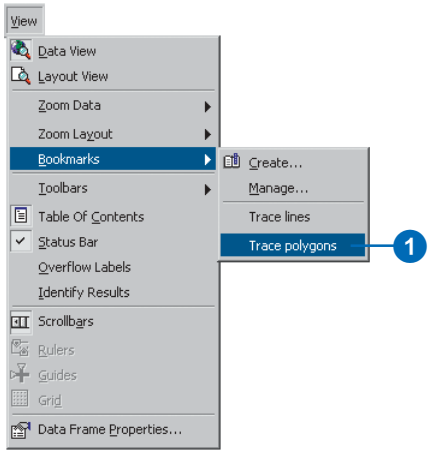
A line feature now represents the exterior boundaries of the scanned parcel lots.



Creating polygon features by tracing raster cells

Now that you have successfully traced raster cells to create line features, you will create polygon features using the Vectorization Trace tool.

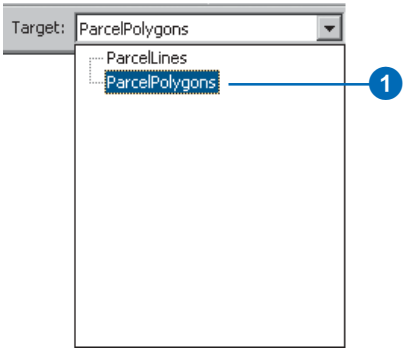
1. To get a better view of the area that will be traced, you need to zoom to the bookmarked extent called Trace polygons. Click the View menu, point to Bookmarks, and click Trace polygons.



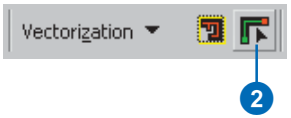
Changing the edit target layer

You must change the edit target layer from ParcelLines to ParcelPolygons to create polygon features when tracing.

1. Click the Target dropdown box on the Editor toolbar and choose ParcelPolygons.

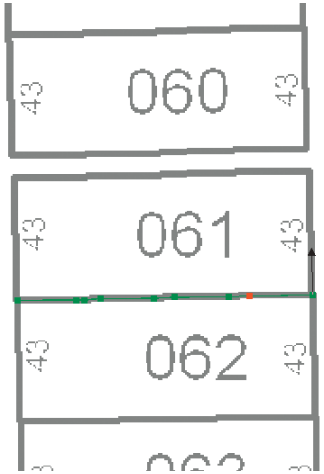


2. Click the Vectorization Trace button on the ArcScan toolbar.

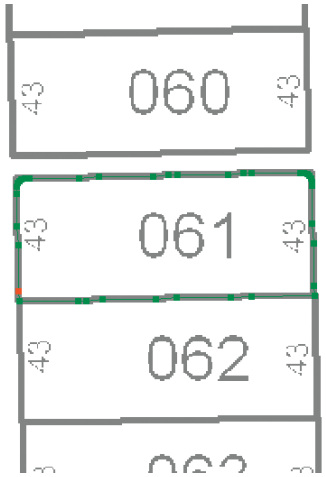


3. Move the pointer until it snaps to the lower-left corner of lot 061 and click to start tracing.

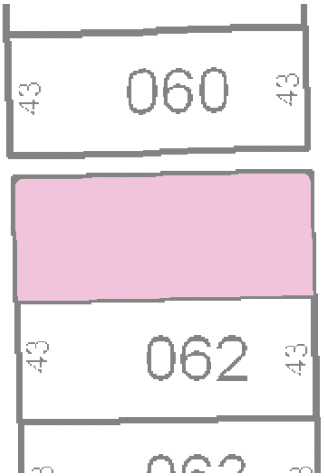
4. Point the arrow toward the lower-right corner of the lot and click to start creating the segments of the polygon feature.



5. Continue to trace the lot boundary in a counterclockwise direction.



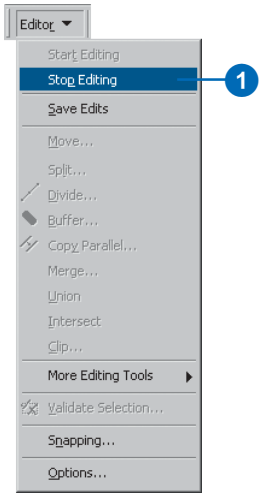
6. When the cursor has returned to the starting point of the trace, press F2 to complete the polygon.



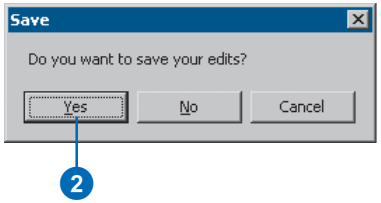
Finishing your edit session

Once you have finished tracing the raster cells and have disabled the Vectorization Trace tool, you can stop editing and complete the exercise by saving your edits.

1. Click the Editor menu and click Stop Editing.



2. Click Yes to save your edits.



In this exercise you learned how to set the raster snapping options and environment, snap to raster cells, and trace raster cells to create new line and polygon features. These steps covered the main components of the raster tracing process. The next exercise will show you how to edit a raster layer and automatically generate features for an entire raster layer using the batch vectorization tools.

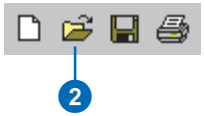
Exercise 2: Batch vectorization

In this exercise, you will edit a scanned parcel map to remove cells from the raster that are not in the scope of the vectorization. Once the raster has been cleaned up, you will generate features using the batch vectorization mode. You will begin by starting ArcMap and loading a map document that contains the raster dataset and two shapefiles.

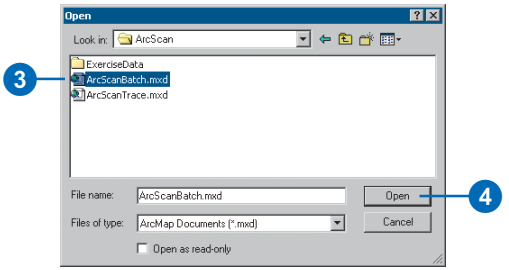
Starting ArcMap and beginning editing

Before you can complete the tasks in this tutorial, you must start ArcMap and load the tutorial data.

1. Double-click a shortcut installed on your desktop or use the Programs list in your Start menu to start ArcMap.
2. Click the Open button on the Standard toolbar.



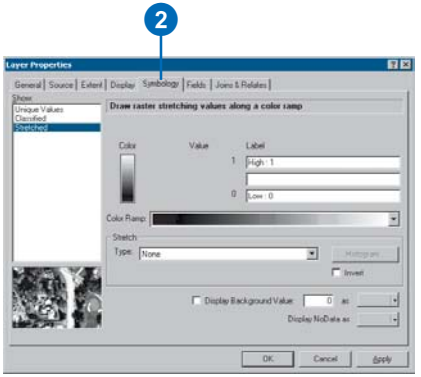
3. Navigate to the ArcScanBatch.mxd map document in the ArcScan directory where you installed the tutorial data and select it (C:\ArcGIS\ArcTutor is the default location).
4. Click Open.



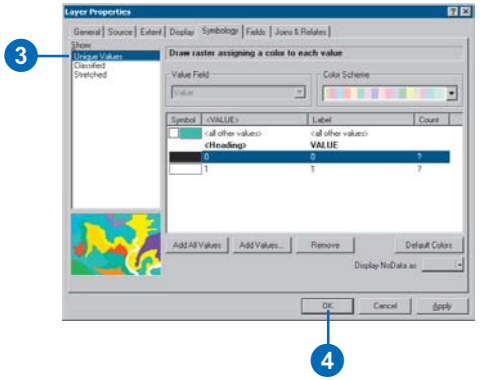
Changing the raster layer symbology

Raster layers must be symbolized as bi-level images to use the ArcScan tools and commands. You will change the raster symbology from stretched to unique values.

1. Right-click the ParcelScan.img raster layer in the ArcMap Table of Contents and click Properties from the context menu to display the Layer Properties dialog box.
2. Click the Symbology tab on the Layer Properties dialog box.



3. In the Show box, click the Unique Values display option.
4. Click OK.

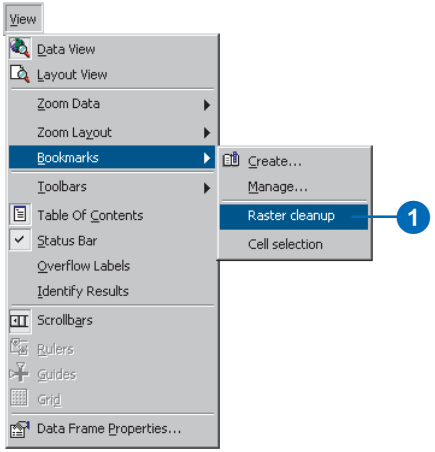


Locating the cleanup area

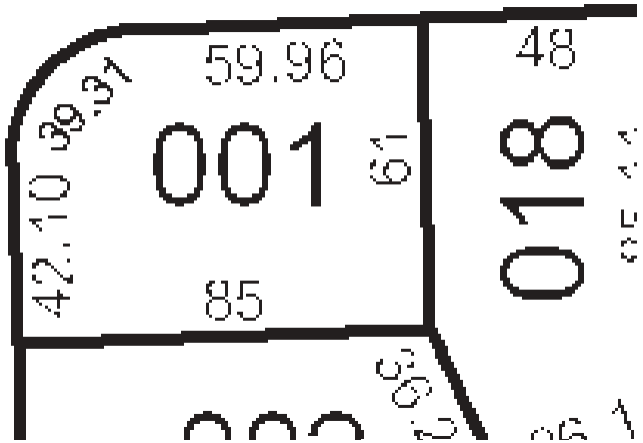
Spatial bookmarks are named extents that can be saved in map documents. Creating a bookmark for areas that you visit frequently will save you time. For information on how to create and manage spatial bookmarks, see *Using ArcMap*.

You will now zoom to a spatial bookmark created for this exercise.

1. Click the View menu, point to Bookmarks, and click Raster cleanup to set the current view to the edit area of the exercise.



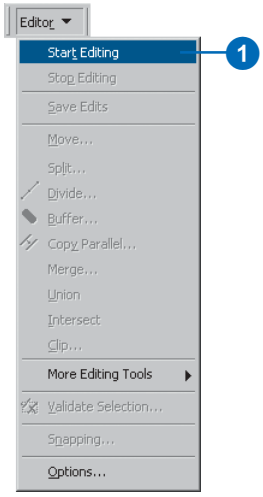
When the display refreshes, you should see the edit area.



Start editing

The ArcScan extension is only active in an edit session. The Start Editing command enables you to begin an edit session.

1. Click the Editor menu and click Start Editing to begin the edit session.

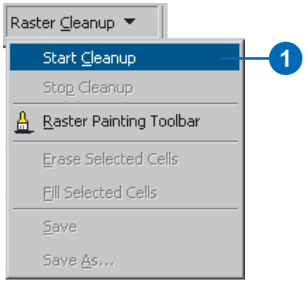


Cleaning up the raster for vectorization

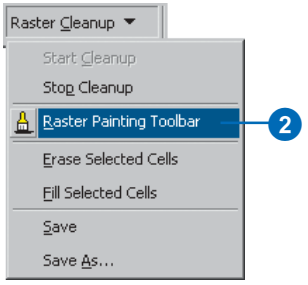
When performing batch vectorization, it is sometimes necessary to edit the raster image prior to generating features. This process is referred to as *raster cleanup* and involves the removal of unwanted cells from the raster image that are not in the scope of the vectorization. ArcScan provides the tools to perform raster cleanup.

You will now use the Raster Cleanup tools to remove unwanted text from the ParcelScan image.

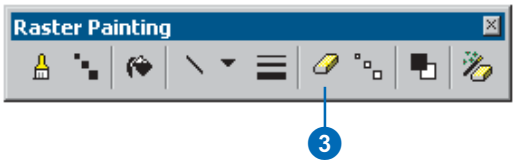
1. Click the Raster Cleanup menu and click Start Cleanup to start the raster cleanup session.



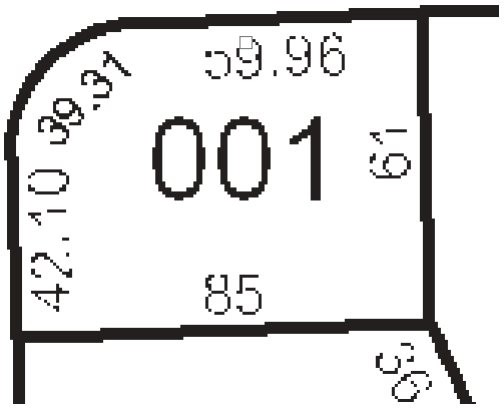
2. Click the Raster Cleanup menu and click Raster Painting Toolbar to display the Raster Painting Toolbar.



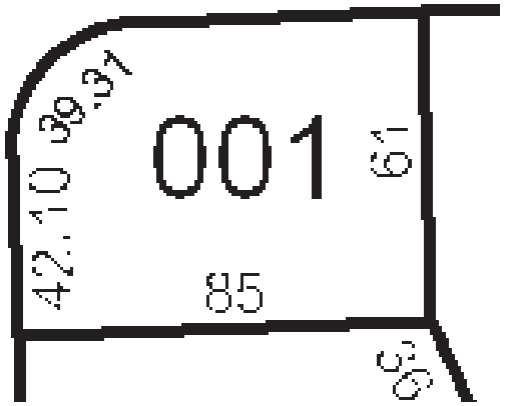
3. Click the Erase tool located on the Raster Painting toolbar.



4. Click and hold down the left mouse key and erase the text located at the top of the parcel lot.

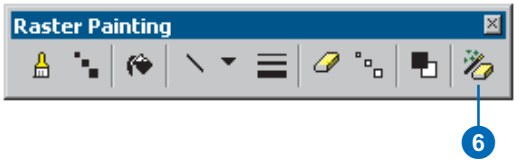


5. Continue to erase the text with the Erase tool until it has been completely removed from the image.

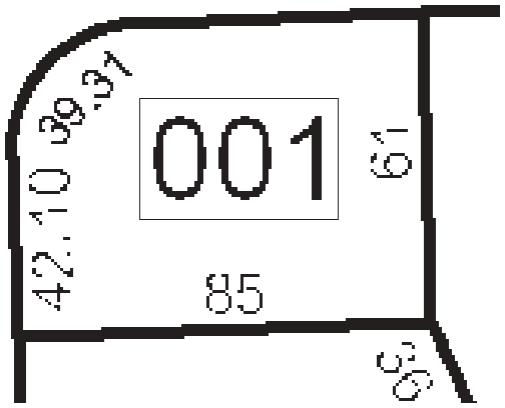


In addition to the Erase tool, the Raster Painting toolbar supports another tool designed to erase cells. This tool is called the Magic Erase tool, and it allows you to erase a series of connected cells by simply clicking or dragging a box around them.

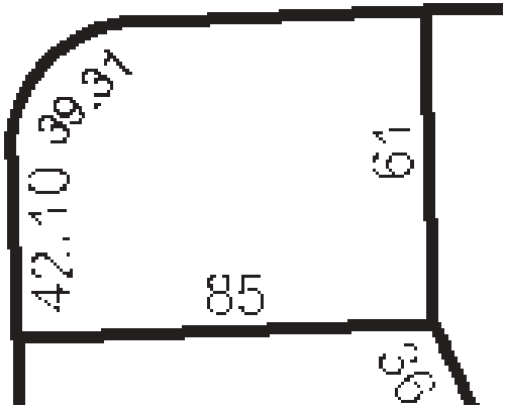
6. Click the Magic Erase tool located on the Raster Painting toolbar.



7. Drag a box around the text located in the center of the parcel lot to remove it.



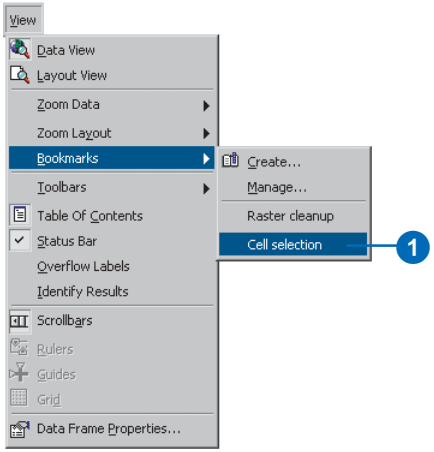
The text is now removed from the raster.



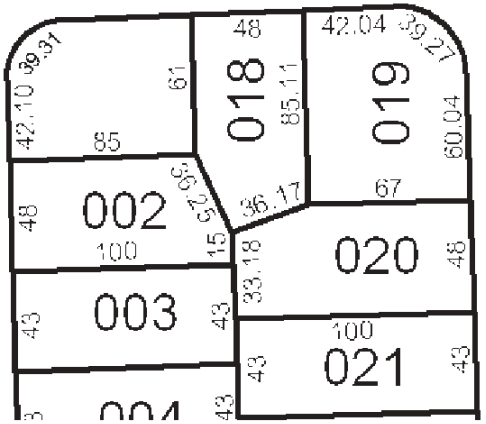
Using the cell selection tools to assist with raster cleanup

In the previous steps, you learned how to use the Erase and Magic Erase tools to remove unwanted cells from the raster image. However, if the image you are working with requires much cleanup, these techniques could be time consuming. To help streamline this process, you can use the cell selection tools in conjunction with the raster cleanup tools.

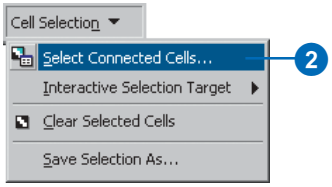
1. To get a better view of the edit area, you need to zoom to the bookmarked extent called Cell selection. Click the View menu, point to Bookmarks, and click Cell selection.



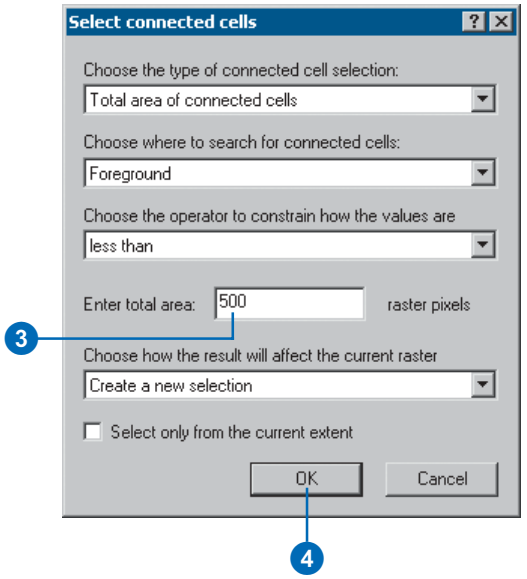
When the display refreshes, you should see the edit area.



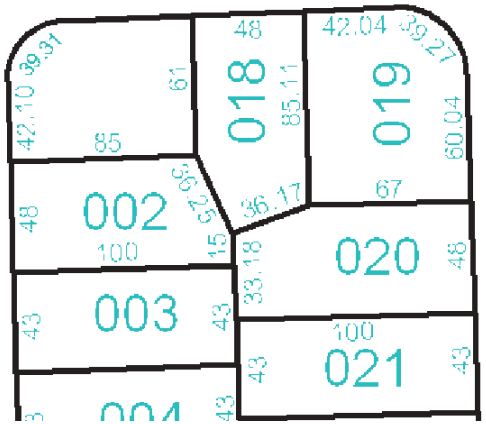
2. Click the Cell Selection menu and click Select Connected Cells.



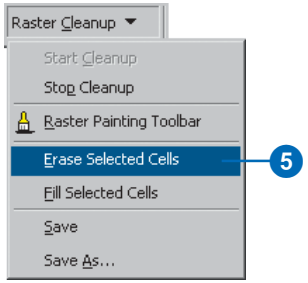
3. In the Select connected cells dialog box, enter a value of 500 for the total area of raster pixels. This expression will select all the cells that represent text in the raster.
4. Click OK.



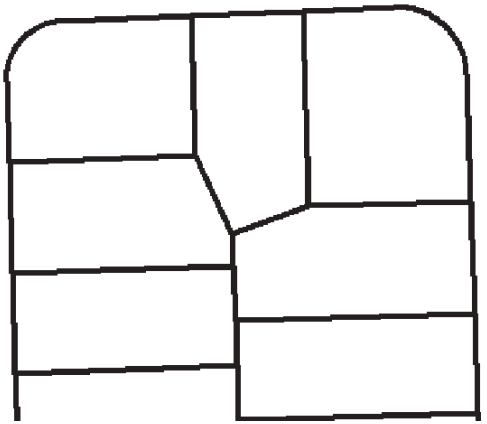
The cells that represent the text in the raster are now selected.



5. Click the Raster Cleanup menu and click Erase Selected Cells to delete the selected cells.



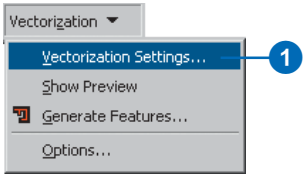
The selected cells are now erased.



Using the vectorization settings

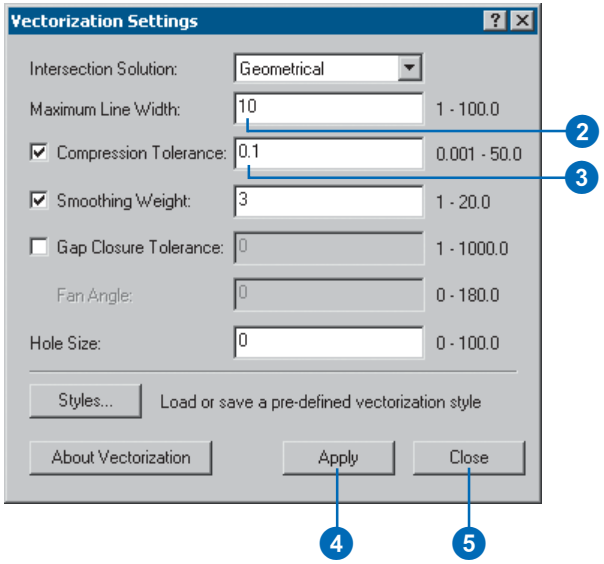
Batch vectorization relies on user-defined settings. These settings influence the geometry of the generated features. These settings may vary depending on the type of raster data you are working with. Once you have determined the appropriate settings for your raster, you can save them within the map document or to a separate file. You will use the Vectorization Settings dialog box to apply the settings.

1. Click the Vectorization menu and click Vectorization Settings to open the Vectorization Settings dialog box.



You will now modify the vectorization settings to ensure optimal results when generating features.

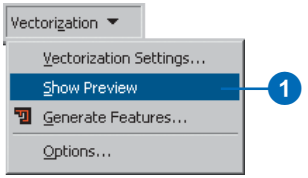
2. Change the Maximum Line Width value to 10.
3. Change the Compression Tolerance value to 0.1.
4. Click Apply to update the settings.
5. Click Close.



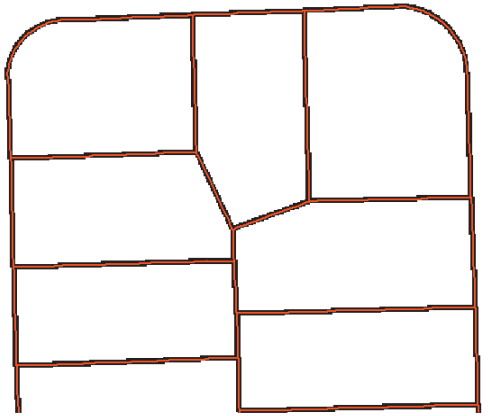
Previewing the vectorization

ArcScan provides a way to preview the batch vectorization prior to generating features. This can help you save time by allowing you to see how the settings will affect the vectorization. When the settings are changed, the preview can be updated by clicking the Apply button located on the Vectorization Settings dialog box. This design allows you to fine-tune the vectorization settings.

1. Click the Vectorization menu and click Show Preview.



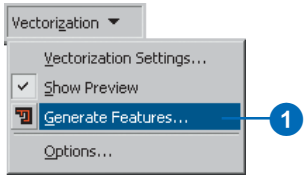
The vectorization preview is displayed in the map.



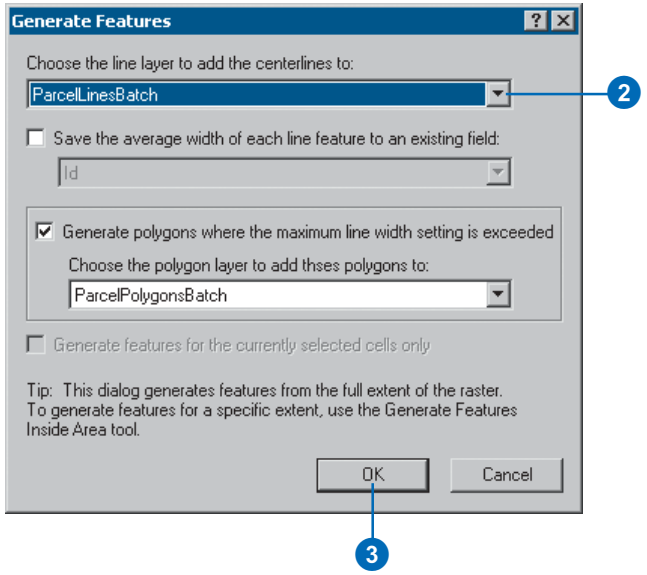
Generating features

The final step in the batch vectorization process is to generate features. The Generate Features dialog box allows you to select the vector layers that will store the new features and execute the vectorization.

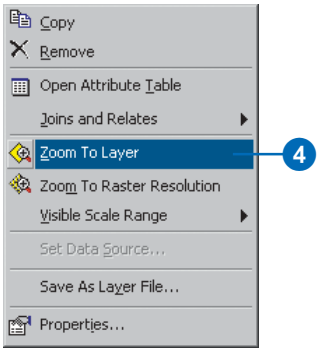
1. Click the Vectorization menu and click Generate Features.



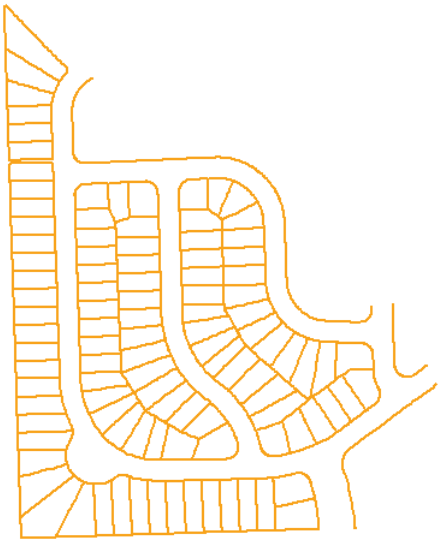
2. Choose the ParcelLinesBatch layer.
3. Click OK.



4. Right-click the ParcelScan.img raster layer in the ArcMap Table of Contents and click Zoom To Layer from the Context menu to view all of the new features that were generated.



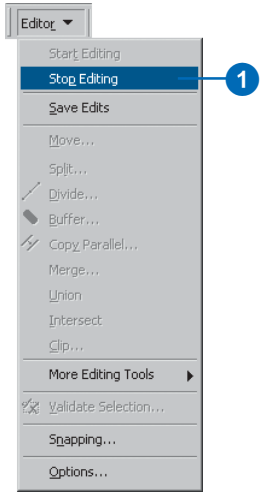
When the display refreshes, you should see the vector features that now represent the raster cells.



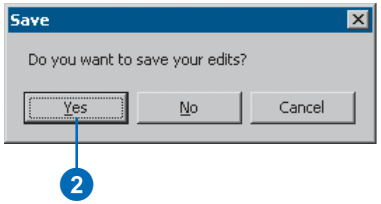
Finishing your edit session

Once you have finished generating features, you can stop editing and complete the exercise by saving your edits.

1. Click the Editor menu and click Stop Editing.



2. Click Yes to save your edits.



In this exercise you learned how to use the raster cleanup and cell selection tools to edit a raster layer, apply vectorization settings, preview the vectorization, and generate features. These steps covered the major components of the batch vectorization process.

This concludes the tutorial. You have been introduced to the most commonly used tools and commands for raster tracing and batch vectorization. The rest of this book will present additional information that will help you better understand the ArcScan extension.