

8.1. Characterizing unrestricted areas. The Region Manager associated with the Brown Tract, Becky Blaylock, is very interested in the management opportunities associated with this land, given its proximity to an area of suburban growth. Since she knows you know something about GIS, she has again come to you and asked you for some information. Specifically, she is interested in understanding the extent of the forest resources that are outside of areas where forest management is restricted for one or more reasons (either by regulation or by an organizational policy). She defines the zones where forest management is restricted to some extent:

- Area within 500 feet of authorized trails.
- Area within 500 feet of homes.
- Area within 1.5 miles of owl nest locations.
- Area within the riparian zones:
 - 100 feet around large fish-bearing streams
 - 70 feet around medium fish-bearing streams
 - 50 feet around small fish-bearing streams
 - 70 feet around large non-fish-bearing streams
 - 50 feet around medium non-fish-bearing streams
 - 20 feet around small non-fish-bearing streams
- Stands with the following land allocations:
 - Meadow
 - Oak Woodland
 - Research
 - Rock pit

a. How many acres of land are in the unrestricted areas?

In this exercise, we will use buffering processes, a query, and a merge process to create a "restricted area" GIS database. We will then erase the restricted areas from the stands GIS database of the Brown Tract to arrive at a description of the unrestricted areas. A flow chart of the process is required for question 8.2.

1. Open the trails, homes, owl nest locations, streams, and stands GIS databases for the Brown Tract in an ArcView View window.

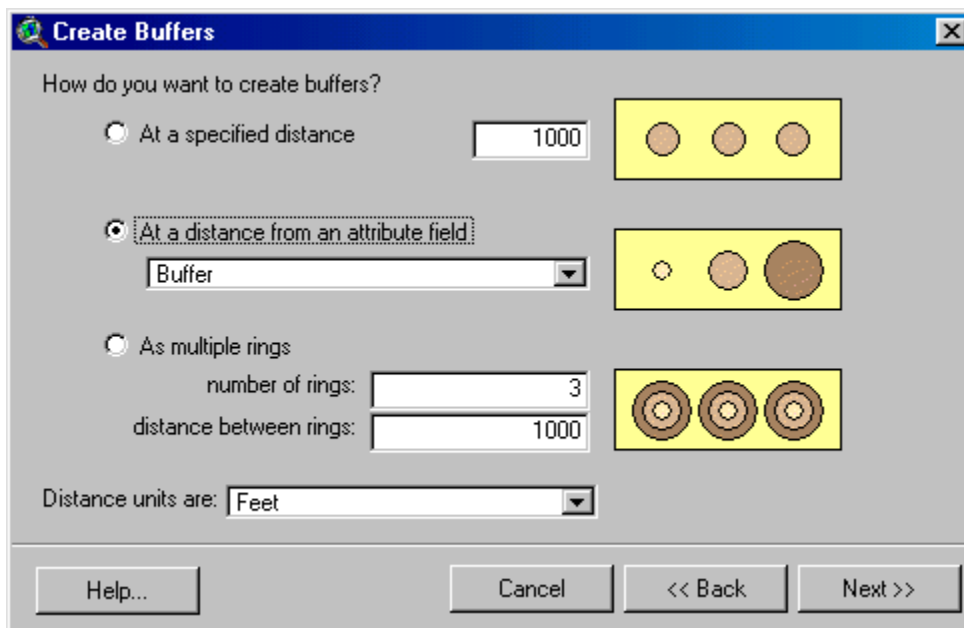
The following instructions suggest that users have gained experience with querying and buffering from previous chapters.

2. Buffer the trails GIS database. First, query the trails GIS database for authorized trails. Use the query "condition" = "authorized" to selected the authorized trails from the set of trails. Change the View Properties of the View Window: select View, the Properties from the ArcView Main Menu system. Change the Map and Distance Units to "feet." Select Them, then Create Buffers from the ArcView Main Menu system. Buffer the trails GIS database (actually the selected features in the trails GIS database) 500 feet, and save it as a new GIS database.

3. Buffer the homes sites in the homes GIS database 500 feet. Select Theme, then Create Buffers from the ArcView Main Menu system to accomplish this task.

4. Buffer the owl nest sites in the owl nest GIS database 7920 feet (1.5 miles). Select Theme, then Create Buffers from the ArcView Main Menu system to accomplish this task.

5. Open the attribute table associated with the streams GIS database. If the values in the "buffer" column are not appropriate given the direction provided, edit the table and change the values using queries and the Calculator button. Our goal is to make the buffering process efficient by creating variable width buffers that key off of the values in the "buffer" column. Once the values in the "buffer" column are correct, return to the View Window and buffer the streams. Select Theme, then Create Buffers from the ArcView Main Menu system. Use the "at a distance from an attribute field" option, and select the field "buffer" as the one that contains the appropriate buffer widths.



6. Select from the stands database those polygons with the following land allocations ("landalloc"): Meadow, Oak Woodland, Research, and Rock Pit. A complex query such as the following can be used:

([Landalloc] = "Meadow") or ([Landalloc] = "Oak Woodland") or ([Landalloc] = "Research") or ([Landalloc] = "Rock Pit")

Or simple queries such as:

([Landalloc] = "Meadow")

([Landalloc] = "Oak Woodland")

([Landalloc] = "Research")

([Landalloc] = "Rock Pit")

Where with each subsequent query one would "add to the set" of previously selected features.

Save the selected features to a new GIS database by selecting Theme, then Convert to Shapefile from the ArcView Main Menu system.

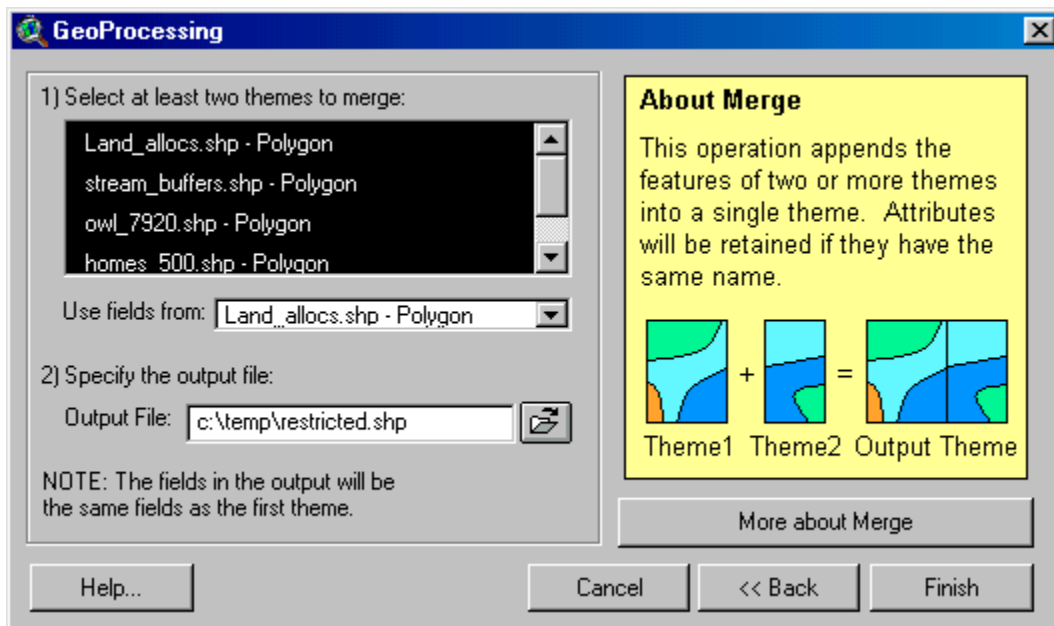
7. Merge the trail buffers GIS database, the home buffers GIS database, the owl buffers GIS database, the stream buffers GIS database, and the selected land allocations GIS database into a single GIS database using either the Geoprocessing Wizard or XTOOLS file extensions.

If using the Geoprocessing Wizard:

Select "Merge themes together"

Select all 5 GIS databases as those you wish to merge together.

Specify an output file name and location.



If using XTOOLS:

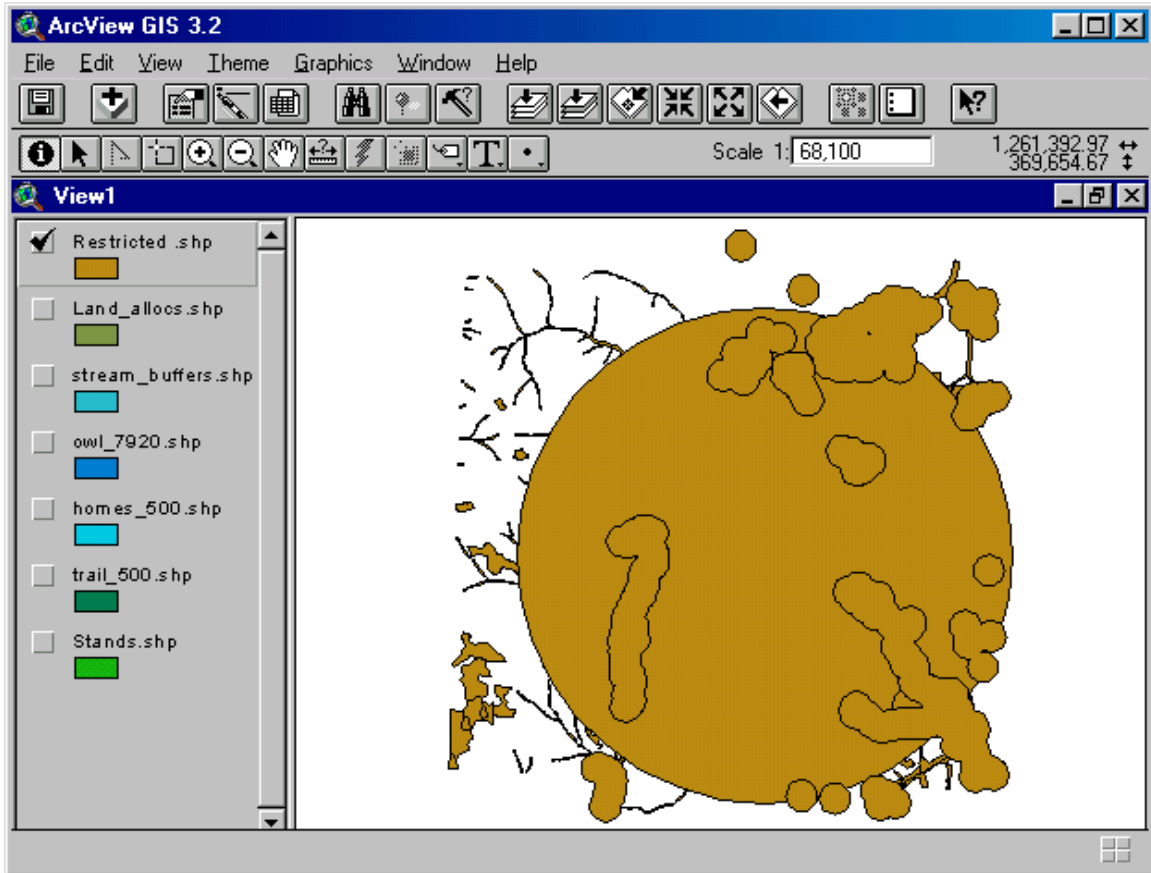
Select XTOOLS, then Merge Themes from the ArcView Main Menu system.

Select one of the 5 GIS database as the theme with fields you wish to preserve.

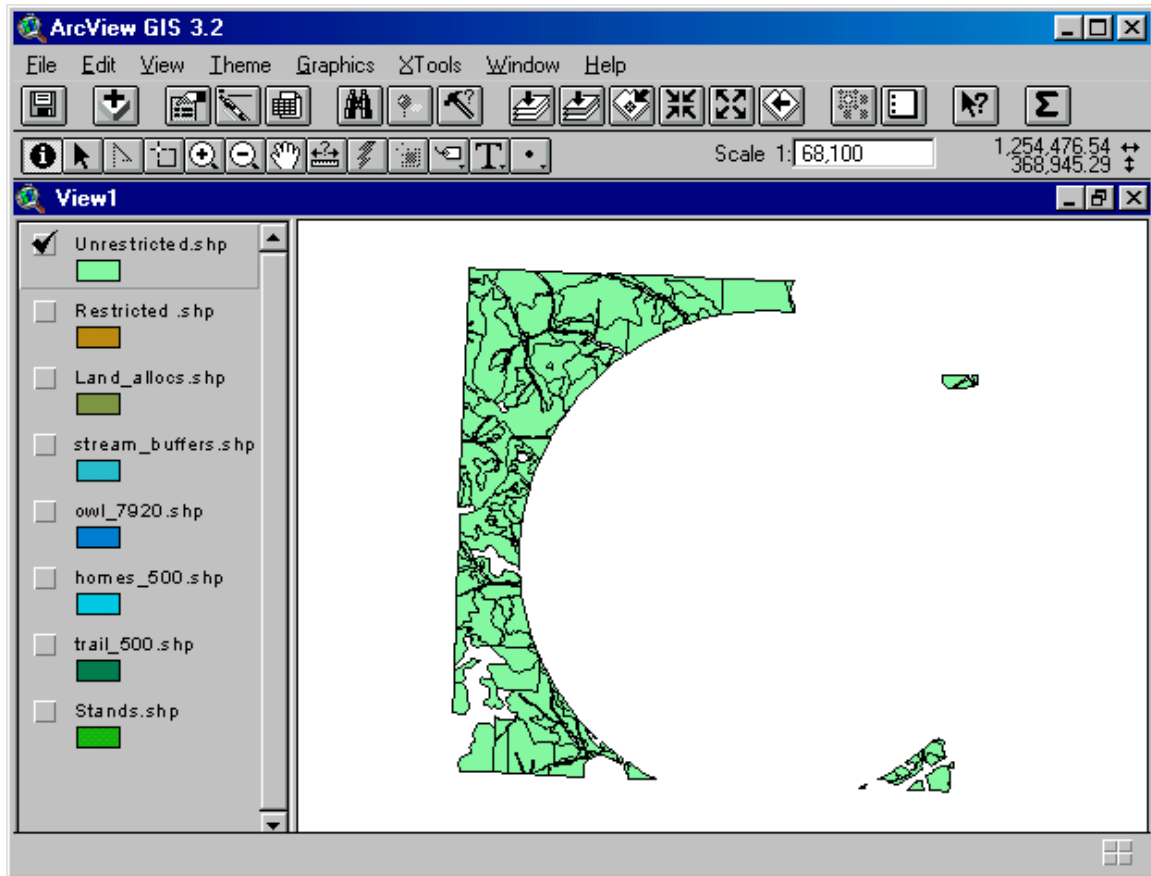
Select the other 4 GIS databases as those to be merged with the one selected previously.

Select a file name and location for the new GIS database.

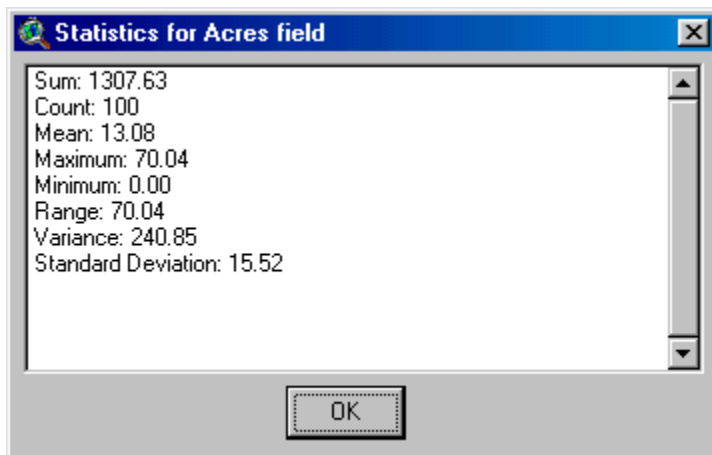
The new GIS database contains all areas where forest management activities are restricted for one or more reasons.



8. Erase the features contained in the merged GIS database from the stands GIS database. Using XTOOLS, select Erase Features. The theme that contains the features you wish to erase is the stands GIS database. The theme that will be used to do the erasing is the merged "restricted area" GIS database.



9. Open the attribute table associated with the unrestricted area GIS database. Press down the "Acres" column header button. Select Field, then Statistics from the ArcView Main Menu system.



The statistics indicate that forest management practices are not restricted on 1,307.6 acres of land on the Brown Tract.

b. How many acres of the following land allocations are in unrestricted areas?

By performing queries on the attribute table associated with the unrestricted areas GIS database, the using the Field, Statistics options available in ArcView, one can arrive at the following data:

Even-aged 939.1 acres
Shelterwood 0 acres
Uneven-aged 368.6 acres

c. Develop a map of the Brown Tract, illustrating the unrestricted areas. Include the road and streams systems on the map.

We'll let you decide how to create the map, but it might contain the features shown in the View Window below.

