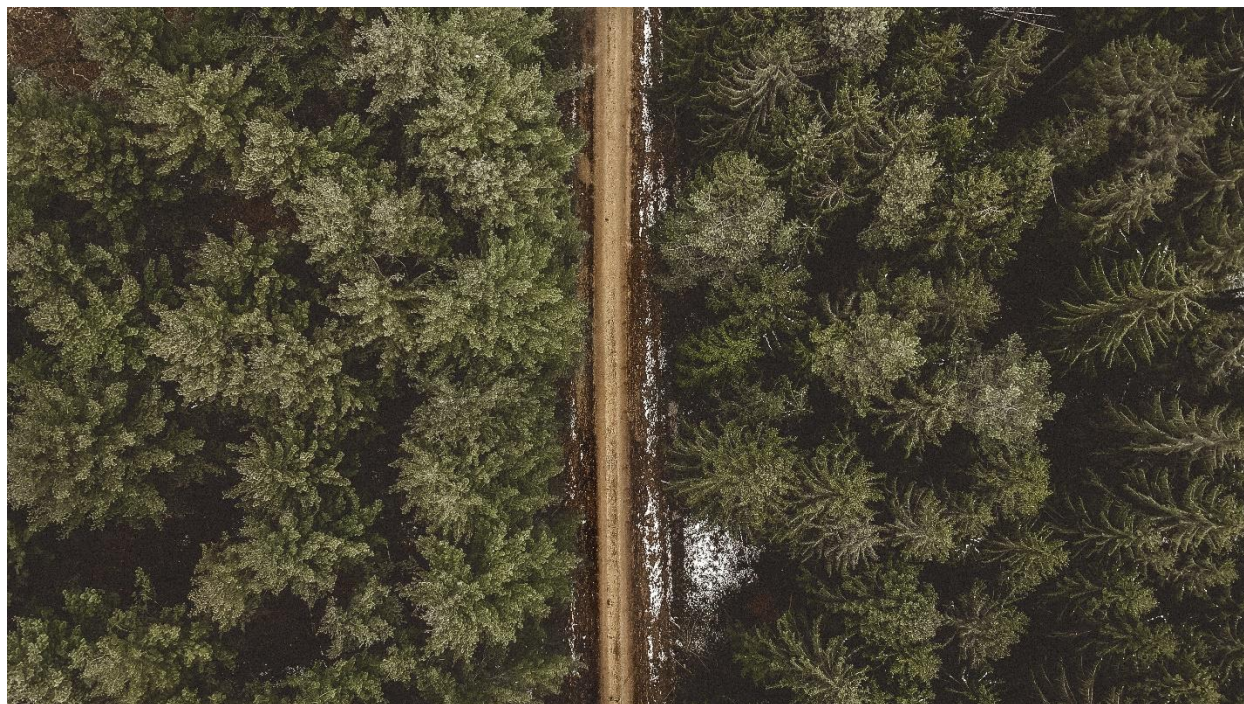


# Exercise 1: Layer Files



## Introduction

In this exercise you will learn how to load and modify existing layer files, create and modify group layer files, and create representations.

## Table of Contents

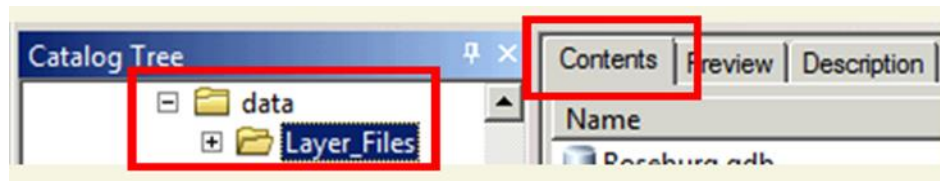
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## Part 1: What is a layer file?

This brief exercise presents greater detail involving layer file properties, and why you might consider using them. We'll begin by examining pre-made layer files, then assemble them into a "Road Maintenance Responsibility" map for a watershed in the BLM Roseburg District. Let's see how layer files appear in ArcCatalog.

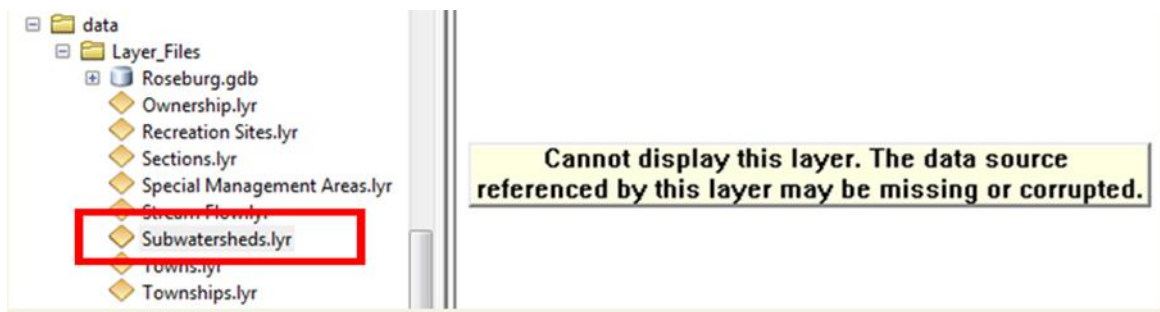
## A. Preview the Subwatershed's layer file in ArcCatalog.

1. Launch **ArcCatalog** and, if needed, activate the **Contents** tab.
2. Navigate to the ...\\Data\\Layer\_Files folder in the Catalog Tree.



The Layer\_Files folder contains a file geodatabase and multiple layer files. Note that a layer file does not store the actual geometry and attributes of a GIS dataset. Instead, a layer file simply stores information telling ArcMap how it should display a particular GIS dataset in a map document. Settings such as labeling, symbology, and definition queries are stored in a layer file. You can identify the source GIS dataset for a layer file from the layer Properties.

3. Expand the **Layer\_Files** folder in the Catalog Tree, then highlight the **Subwatersheds layer file**.
4. Activate the **Preview** tab, to see how the data will be displayed in ArcMap.



The preview indicates the layer cannot be displayed. This is because the source path stored in the Layer File references the creator's desktop. To view this Layer File, the source path has to be fixed. Let's set the source to the mc\_huc6 dataset in the Roseburg geodatabase.

5. Open the Properties of the Subwatersheds layer file, and activate the Source tab.
  - i. Hint: Right-click the layer from the Catalog Tree or Contents viewer then select Properties.

What is the data format for the source data? (Circle one)

ArcView Shapefile / File Geodatabase / ArcInfo Coverage

What is the name of the source data? \_\_\_\_\_



6. Click the Set Data Source button.
7. Navigate to ...\\Data\\Layer\_Files\\Roseburg.gdb
8. Double-click mc\_huc6 to set the dataset source for Subwatersheds.lyr, then click OK to close the Properties window.

## Part 2: Using the layer files in ArcMap

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### A. Add the layer files saved in the Layer\_Files folder into ArcMap.

1. Launch ArcMap
2. **Open** a new map document in ArcMap.
3. Drag and drop all the layer files (except Stream Flow.lyr) from ...\\Data\\Layer\_Files in ArcCatalog into ArcMap.
  - i. *Hint: You can use CTRL or SHIFT to select multiple layer files from the **Contents** viewer, but not the **Catalog Tree**.*

The Layer files added to ArcMap all have red exclamation marks. This is because the layer files have an incorrect source path to its data source. Instead of setting the data source through each layers' property window, you can also click on the red exclamation mark itself to set the data source.

4. Minimize ArcCatalog.

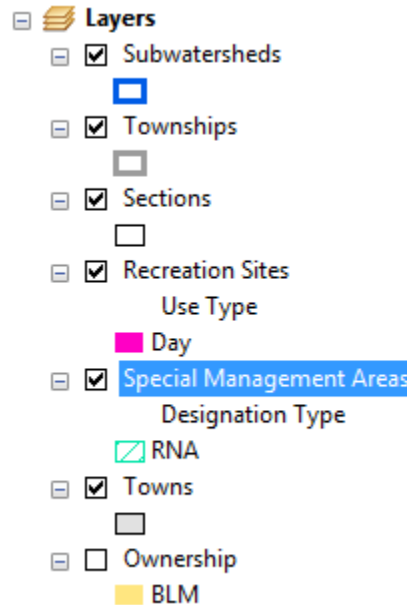
### B. Fix the broken Source links

1. Click on the **red exclamation** mark adjacent to the **Ownership** layer.
2. Navigate to ...\\Data\\Layer\_Files\\Roseburg.gdb, select mc\_ownership.
3. Click **Add**.

Because all the other Layers in ArcMap are located in the same location (the Roseburg geodatabase), it sourced all the other layers in that location as well.

4. Alter the TOC's drawing order to match the screen capture below.





Are layers or layer files listed in the TOC? The names listed in the Table of Contents (TOC) are “layers.” A “layer file” is just as its name implies. It is a file which stores properties for a layer.

5. Click **Save** to save the updated source paths in your map document. You may save the mxd to a location of your choice.

## Part 3: Alter a layer file's properties

Suppose you are not satisfied with the property settings for one of the layers. For example, maybe you don't like the symbol color or the label-font type. One option you have is to change the layer settings in the map document and then save your mxd. Done this way, the change will just be saved within the mxd and the source layer file will not be altered in any way. Another option, however, is to permanently change the layer properties in ArcCatalog, then swap this layer for what is in your map document.

In this step, you will use ArcCatalog to change the properties of the Subwatersheds layer file. The goal is to change the label properties to match the cartographic standards normally applied to hydrologic features: labels are blue and italicized.

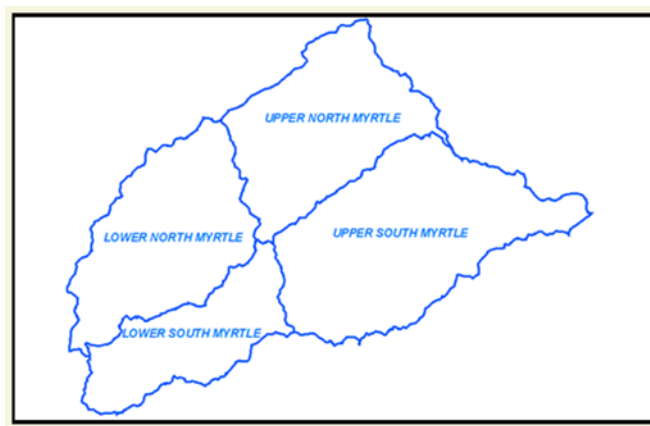
### A. Change Label properties in ArcCatalog

When a layer file already exists, there are 3 ways to modify the layer file:

- Create a new layer file.
  - Resave (overwrite) over the existing layer file. This assumes you have write access to the file.
  - Use ArcCatalog to change the layer file's properties. Again, write access is needed.
1. Maximize **ArcCatalog**.
  2. Open the **Properties** window for `...Data\Layer_Files\Subwatersheds.lyr`

- i. Hint: Right-click the layer name from the Catalog Tree.
3. From the Labels tab, apply the following settings:
  - Label Field: **SUBWAT\_NAM**
  - Color: **Cretean Blue**
  - Font: **Arial**
  - Style: **Bold, Italicized**
  - Size: **12 point**
4. Click **Apply** and **OK** to close the **Properties** window.
5. Activate the **Preview** tab, then highlight **Subwatersheds.lyr** from the Catalog Tree.
6. Maximize **ArcMap**, then remove the **Subwatersheds** layer.
  - i. Hint: Right-click the layer in the TOC, then click **Remove**.

The name of each watershed should be in blue, italicized text. To see the changes in ArcMap, you will have to add the layer file back into the TOC.



7. Add the modified **Subwatersheds** layer file from **ArcCatalog** into **ArcMap**.
8. **Zoom** to the extent of the **Subwatersheds** layer, *if needed*.

## Part 4: Create a layer file

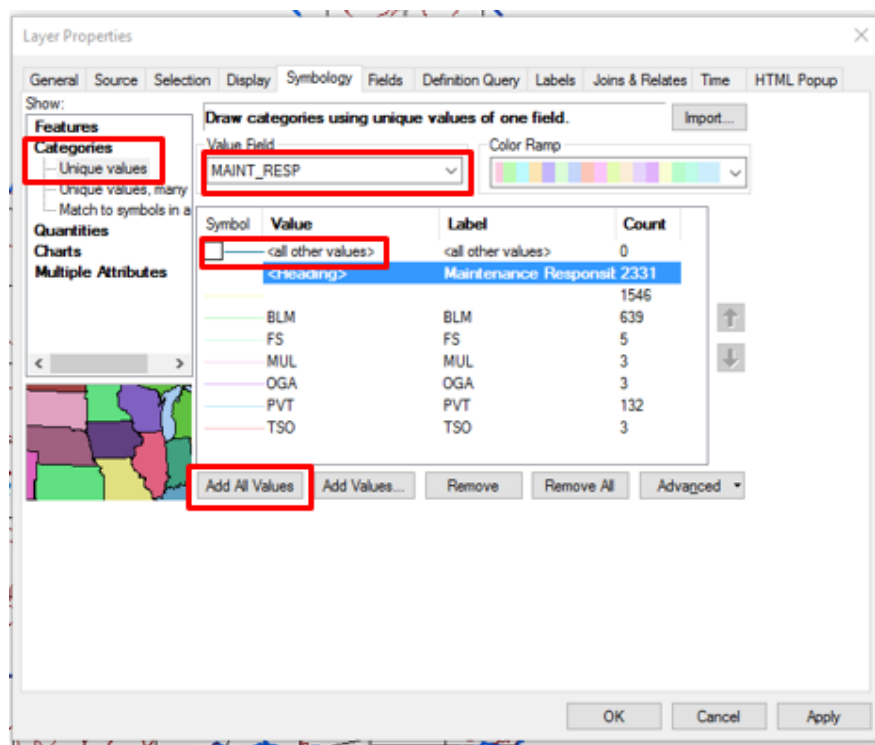
It was mentioned at the beginning of this exercise that your map is supposed to depict road maintenance responsibility. But, we seem to be missing a key layer—roads (a.k.a., Ground Transportation (GTRN)). Look carefully at the contents of the **...Data\Layer\_Files** folder we have been using so far, and you will see that there is no layer file representing the properties of a "roads" dataset. Since the random color ArcMap picks to display the roads is less than desirable and we want to classify **mc\_gtn** based on maintenance responsibility, let's create a layer file to save these custom display settings.

### A. Update the symbology

1. From the Catalog Tree in the ArcCatalog pane, navigate to **...Data\Layer\_Files\Roseburg.gdb**



2. Select the **mc\_gtrn** feature class
3. Drag the **mc\_gtrn** feature class into the Table of Contents in ArcMap.
4. In ArcMap open the **layer Properties** for **mc\_gtrn**.
  - i. Hint: Right-click the layer name in the TOC and select Properties
5. Under the General tab set the Layer Name to **Transportation**.
6. Under the Symbology tab change Categories to **Unique values**.
7. Set the Value Field to **MAINT\_RESP**.
8. Click **Add All Values** button, and uncheck **<all other values>**.
9. Change the heading **MAINT\_RESP** to Maintenance Responsibility.
10. Move BLM to the top of the list, then click Apply.

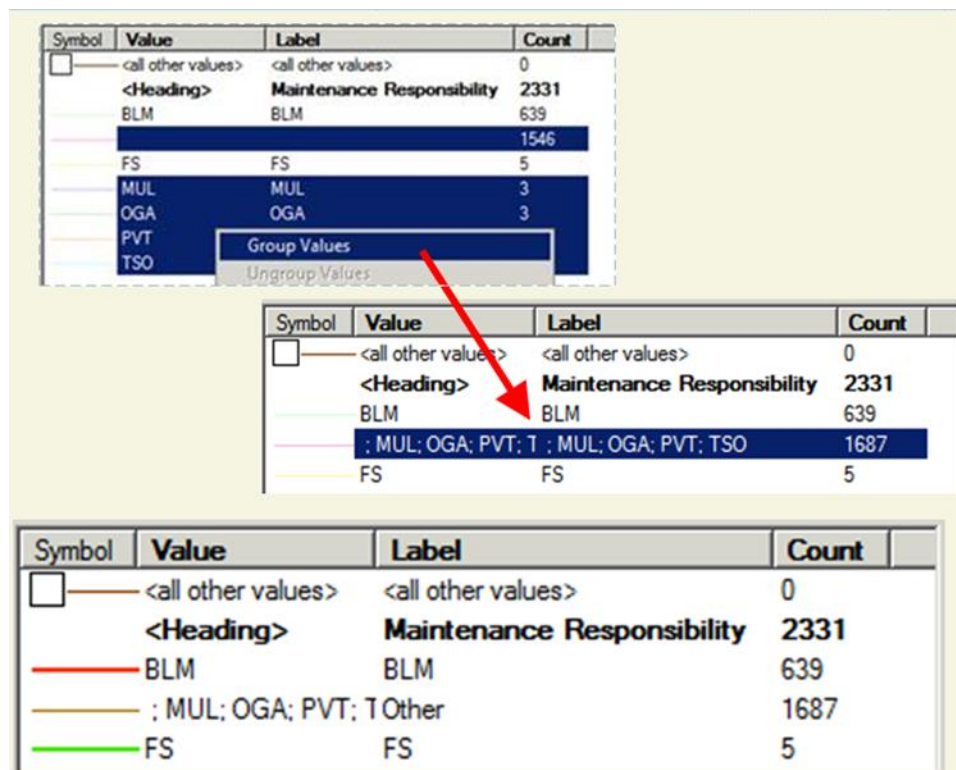


With so many unique values, it is difficult to interpret the maintenance responsibility for any given road segment. Let's simplify the symbology by highlighting those road segments under BLM and FS responsibility. As for the rest of the agencies, we can group them as a single legend item.

## B. Group legend items.

1. With the properties window still open select all values except FS and BLM, including the blank value. *Hint: Hold down the **CTRL** key.*
2. Right-click on the selection, and choose **Group Values**. *The result is a single value.*
3. Change the label for the grouped values to **Other**.
4. For the **BLM** symbol, apply the pre-defined symbol called **Highway Ramp**.

5. For the **FS** symbol, apply the pre-defined symbol called **Highway Ramp** and change the color to a shade of **green**.
6. For the **Other** symbol, apply a **Raw Umber** color which is a brownish orange shade.
7. Click **OK** to close the Layer Properties window.



Symbol	Value	Label	Count
	<all other values>	<all other values>	0
	<Heading>	<b>Maintenance Responsibility</b>	<b>2331</b>
	BLM	BLM	639
			1546
	FS	FS	5
	MUL	MUL	3
	OGA	OGA	3
	PVT		
	TSO		

Symbol	Value	Label	Count
	<all other values>	<all other values>	0
	<Heading>	<b>Maintenance Responsibility</b>	<b>2331</b>
	BLM	BLM	639
	; MUL; OGA; PVT; T	; MUL; OGA; PVT; TSO	1687
	FS	FS	5

Symbol	Value	Label	Count
	<all other values>	<all other values>	0
	<Heading>	<b>Maintenance Responsibility</b>	<b>2331</b>
	BLM	BLM	639
	; MUL; OGA; PVT; T Other		1687
	FS	FS	5

The Data View redraws to display the three categories of road-maintenance responsibility, BLM, FS, and Other. With the layer symbolized just the way you want it, you can save the layer's properties into a layer file.

### C. Save symbology to a layer file.

1. Right-click on the Transportation layer, and choose Save As Layer File...
2. Navigate to ...\\Data\\Layer\_Files, and save the layer file as Transportation.lyr.
3. Save the map document as Myrtle\_Creek.mxd at a location of your choice.

## Part 5: Combine Several Layers into a Group layer file

You can combine layers listed in the Table of Contents into a single group layer. This allows you to manage a group of individual layers as though they were a single layer. For example, if you turn off the group layer, all the layers within the group layer won't draw until you turn the group layer back on. You can also use the group layer in other map documents, thus simplifying the add data process to a single operation.

A group layer can combine data from several data sources, and from different data formats (e.g., coverage, shapefile, geodatabase, raster, etc.). To create a group layer, simply highlight the layer names you want to group, and then right click, and choose Group. In our example, we will group all the layers in the data frame into a single group layer.

## A. Create and edit a Group Layer.

1. In the Table of Contents, highlight all layers.

Multiple selections in a single operation works by highlighting the first layer in the TOC, holding down the **<Shift>** key, and then selecting the last layer in the TOC.

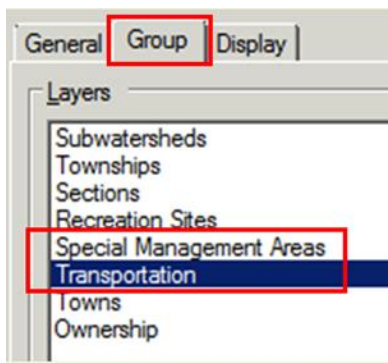
2. Right-click on any highlighted layer, and choose **Group**.

A new layer called "New Group Layer" is added to the Table of Contents.

3. Change the name of the resulting New Group Layer to **Myrtle Creek**.
4. **Remove** the checkmark for the **Myrtle Creek** group layer.

Notice the individual layers are still checked "on" but are not drawn in the data view. This is because the group layer is unchecked.

5. Turn the Myrtle Creek group layer back on.
6. For the Myrtle Creek group layer, open the Properties window.
7. Activate the Group tab.
8. Reorder the Transportation layer to follow below Special Management Areas (*see below*).



9. Click **OK**.

You can use the Group properties to add, remove, or change the drawing order of layers within the group, but be aware that if you remove a layer from a group layer, the layer is also removed from the map document.

Just as there are layer files for layers, there are group layer files for group layers. A group layer file saves the properties of a group layer.

## B. Save the Myrtle Creek group layer as a group layer file.

1. Right-click on the Myrtle Creek group layer, and choose Save As Layer File...
2. Navigate to ...\\Data\\Layer\_Files, and save the group layer file as Myrtle Creek.lyr.





The group layer file you just saved can be used to create an instant map.

Let's see how well you followed directions. We will open a new map and add the group layer file that we just created.

### C. Check the Group Layer File.

1. **Save** your map document.
2. Click on the **New Map File button**.
3. Click the **Add Data button**.
4. Navigate to ...\\Data\\Layer\_Files, and add the **Myrtle Creek.lyr** group layer file.

*END EXERCISE*

