



# Exercise 3: Labeling and Annotation



## Introduction

**Exercise Goal:** You will label the Callahan Creek Density Management Study Area (DMSA) map while employing the various settings and preferences needed for label placement. You will also learn to assign labels using the Maplex Label Engine.

## Overview of major steps:

- Customizing the Full Extent Button
- Quickly Label a Layer
- Using the Labeling Toolbar and Label manager
- Working with Multiple Label Classes
- Labeling Toolbar: View Unplaced Labels
- Label Priority Ranking
- Working with Annotation
- Maplex Label Engine

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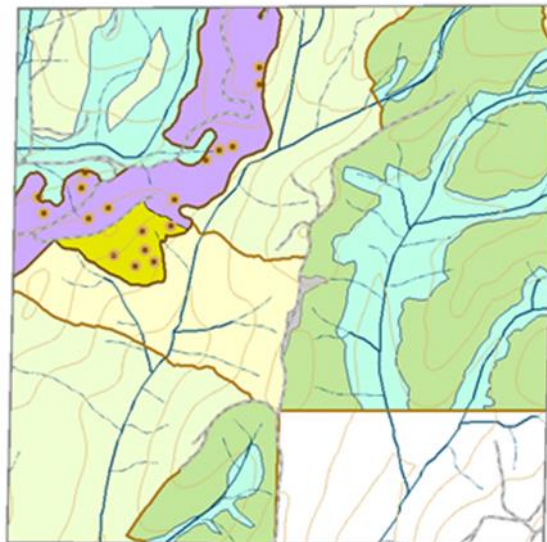


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## Part 1: Customizing the Full Extent Button

1. Open ArcMap
2. Open an existing map document.
3. Navigate to ...\\Data.
4. Open Sand\_CK\_Rethin\_Callahan\_Ck\_DMSA.mxd.

Drawn in the Data View is the Density Management Study Area (DMSA) for Sand Creek and Callahan Creek. At this map scale, it may be difficult to see the map's details. Let's click the Full Extent button to redisplay the map to the study area's spatial extent.

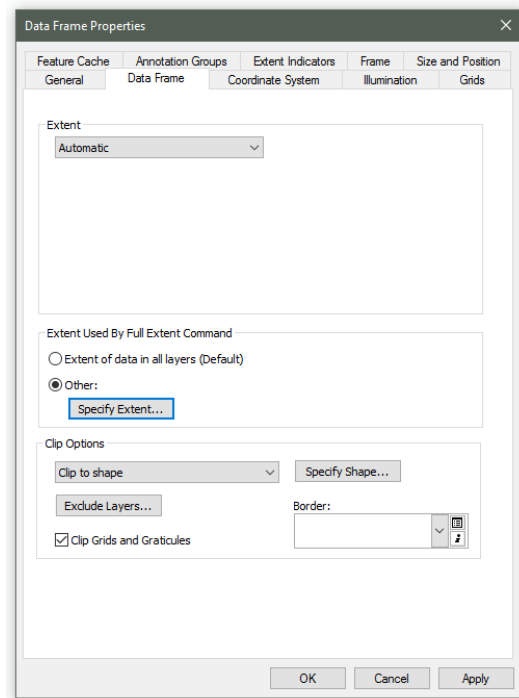


5. Click the 'Full Extent' button

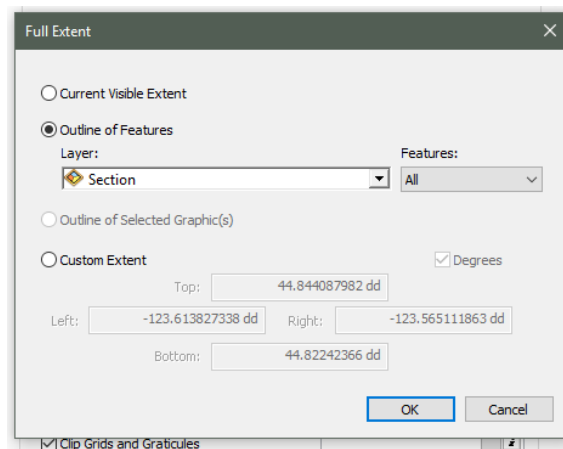
Instead of zooming in on the study area, the map zoomed out. The Full Extent button zooms out to the layer with the largest spatial extent and one or more layers in the Table of Contents (TOC) have a spatial extent greater than the study area. We can change the behavior of the Full Extent button by limiting the button's maximum spatial extent to match the spatial extent of the study area (the layer called 'Section'). This is done through the Data Frame's Properties.

6. Open the 'Properties' for the Sand Ck Re-thin Callahan Ck DMSA Data Frame.

- i. Hint: Double-click or right-click on data frame symbol 📄
7. Within the Data Frame Properties, activate the 'Data Frame' tab.
8. Under 'Extent Used By Full Extent Command', enable 'Other' and click 'Specify Extent...'



9. Enable 'Outline of Features' with the layer set to Section.



10. Click OK, then close the Data Frame Properties menu with OK again. The Full Extent button's spatial extent is now set to the limits of the Section layer.
11. Click the 'Full Extent' button The Data View zooms to the extent of the Section layer.

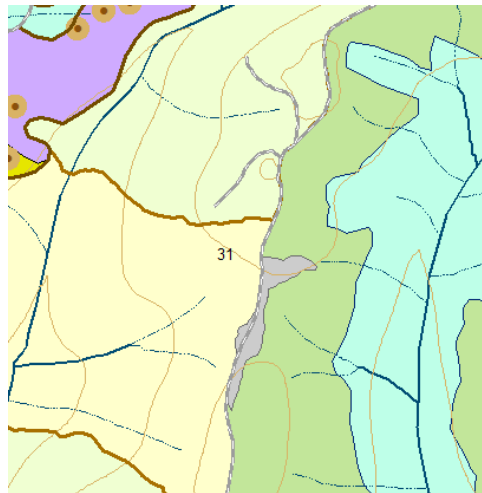
**For your reference...** Under the Data Frame tab, you can also disable the user's ability to zoom in or out on the map. If you set the **Extent** option to "Fixed Scale," the Data View's Map Scale is set to the Fixed Scale value you enter. Note: The user can still use the Pan tool.

## Part 2: Quickly Label a Layer

Labels are descriptive text used to identify features displayed in the map. A layer's labels are derived from the layer's attribute values. From the Table of Contents, you can right-click on a layer to quickly label features based on the default label settings. Let's try it!

1. In the TOC, right-click on the Section layer.
2. Click 'Label Features' to enable this option.

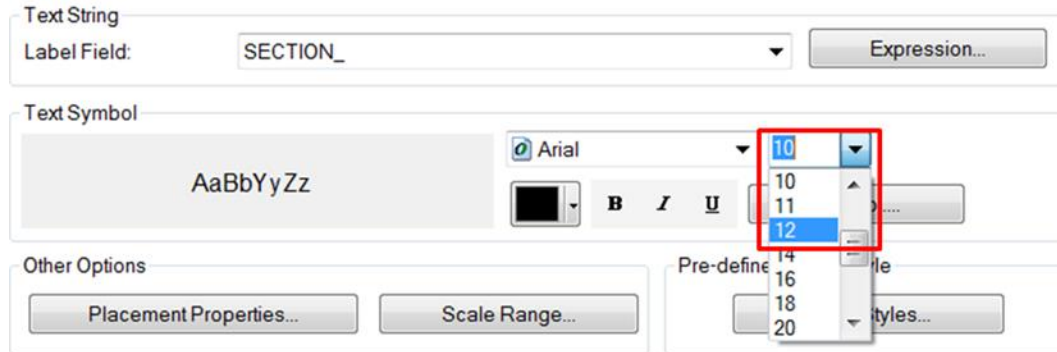
You have just labeled the Section layer with a "31." Look for the label at the map's center. Through the layer Properties window, you can modify a label's settings.



3. Open the 'Properties' for the Section layer.
  - i. Hint: In the TOC, double-click or right-click the layer name.
4. Activate the 'Labels' tab.
5. For the Label Field, values stored in the "**SECTION\_**" attribute are used to label the Section layer.

**Tip:** If you plan to print the map, avoid font sizes less than 10 pt. We won't be printing the map in this exercise.

6. Under the Text Symbol, change the font size to 12 pt.
7. Click OK. The Section layer properties window should close.



8. Open the properties for the Monitoring Plot Centers layer. The Labels tab should still be active. If not, activate it now.

9. From the 'Label Field' drop-down list, choose PLOT\_NUM.

How do I know which attribute to use for the Label Field? If metadata is available, a description of the layer's attributes are given. Otherwise, consult with your office's GIS Coordinator.

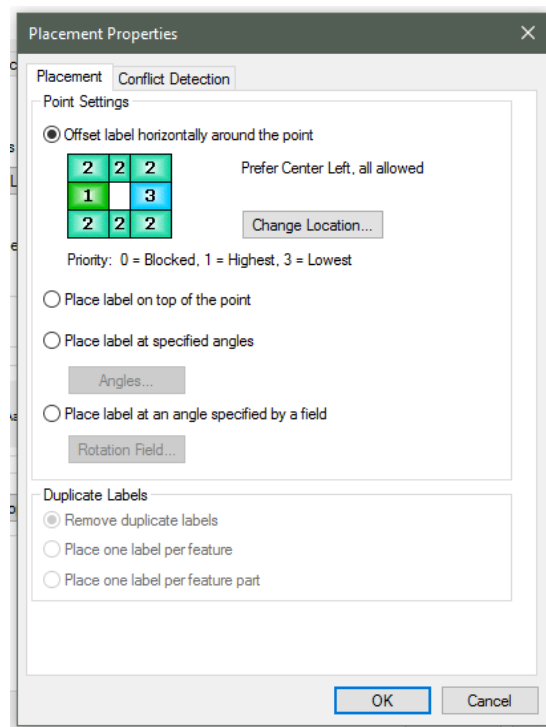
10. Check the box in front of 'Label features in this layer'.

11. As needed, change the following font properties:

- Type = **Arial**
- Size = **7 pt**
- Color = **Black**

In the Layer Properties dialog window, you can also adjust the placement of the labels. User-defined, label placement settings can minimize conflicts with other labels.

12. Click the 'Placement Properties' button.



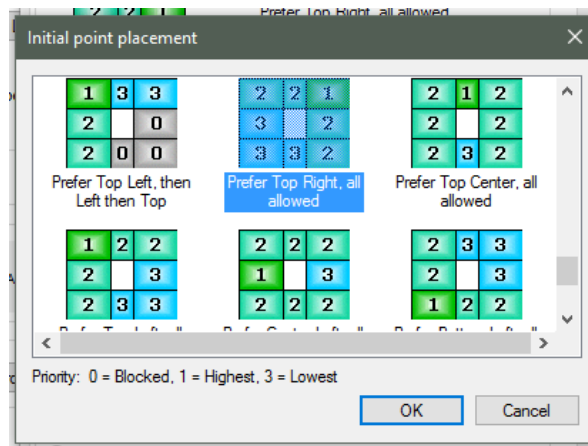
The Placement Properties dialog window opens with the Placement tab activated (see above). If you look at the cell diagram, the label's placement relative to the point's position is set to "Prefer Center Left, all allowed."

In other words, a label is placed at the first position (center left) unless a conflict occurs with another label (or feature) at that position. If there is a conflict, the label displays at the second or third positions, accordingly. If the label has conflicts for all of the point's placement positions, the label will not display.

13. Click the 'Change Location' button. The Initial point placement dialog window opens.

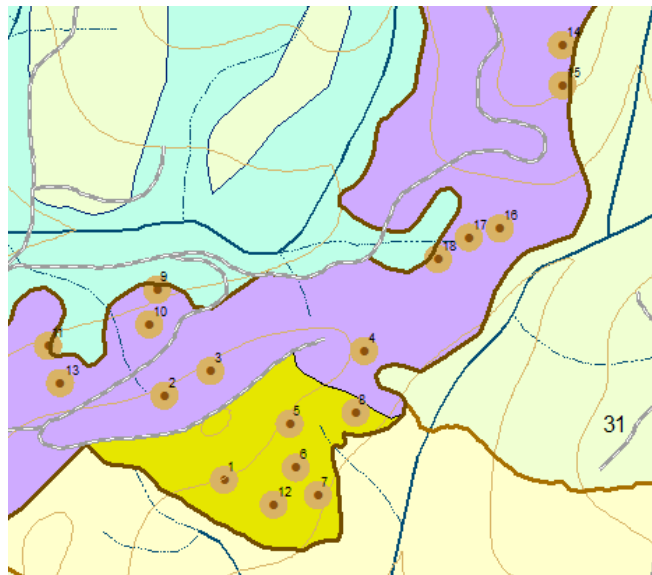
For the Monitoring Plot Center layer, we will change the label placement priorities to the points' upper right.

14. Change the placement to 'Prefer Top Right, all allowed'.



15. Click OK 3 times until the Layer properties are closed.

In the Data View, the features of the “Monitoring Plot Centers” layer are now labeled with “plot numbers” to the upper right of the point.



In future steps, be sure to watch what happens to the Monitoring Plot labels as we start turning on more labels.

## Part 3: Using the Labeling Toolbar and Label Manager

You can also manage a layer’s labels using the Labeling toolbar. The Labeling toolbar consolidates many of ArcMap’s label functions. For example, to control label settings for multiple layers, use the toolbar’s Label Manager.

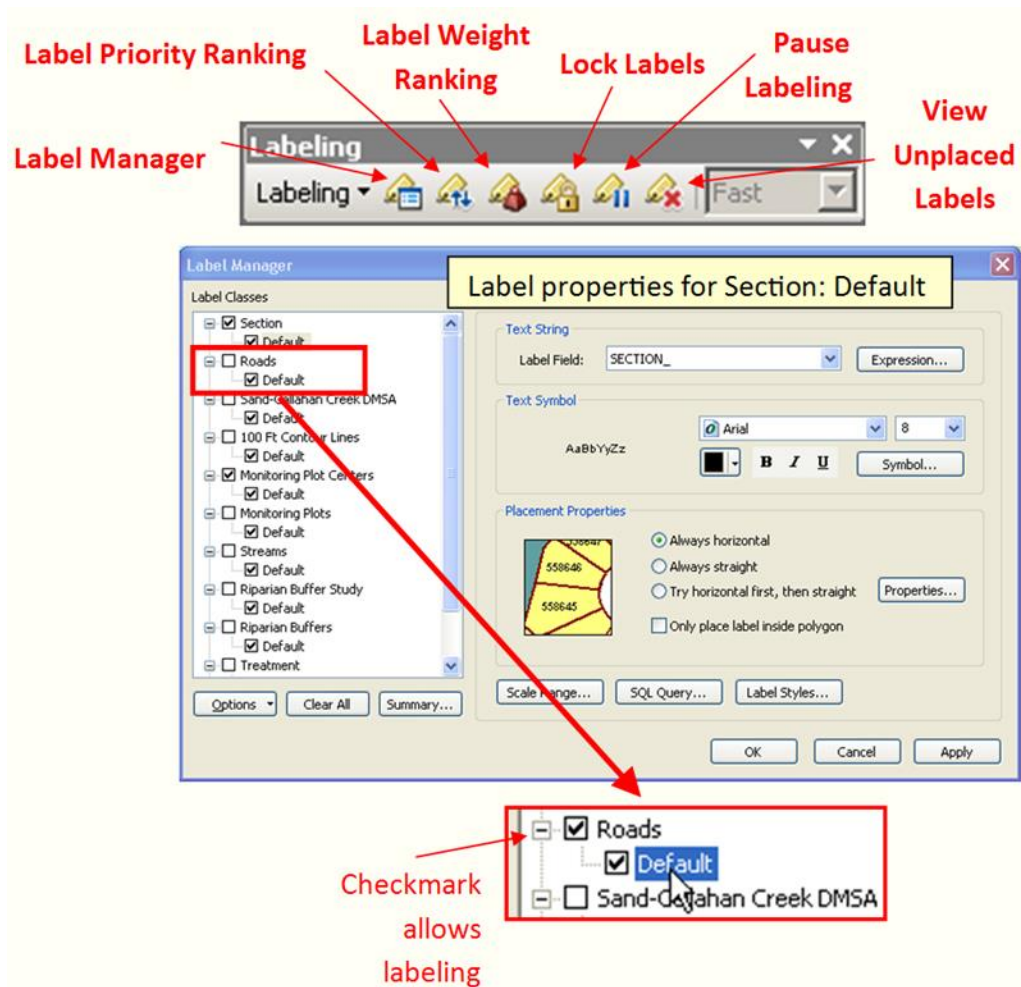
1. From the Customize > Toolbars > Labeling
  - i. If toolbar is already checked, leave as is. Dock if desired.



2. Click the 'Label Manager' button.
3. Under 'Label Classes', check the box next to Roads.

The **Label Manager** opens, showing the label properties for the Section layer. For all layers and respective **Label Classes**, the **Label Manager** gives you access to the label properties. All layers listed will have at least one Label Class called Default. Label Classes allow you to specify different labeling properties within the same layer (more on this in Step 4).

Also, you can rename the Default Label Class, but you cannot delete it. To set label properties, the Default Label Class must be highlighted.



The checkmark allows the layer's labels to display in the Data View. In order to change the Roads label properties, we need to highlight the Default Label Class.

4. Highlight the 'Default' Label Class for the Roads layer.
5. Set the 'Label Field' to RT\_NM1.

**FYI:** RT\_NM1 is an attribute that represents a feature's primary route number.



6. As needed, change the following font properties:

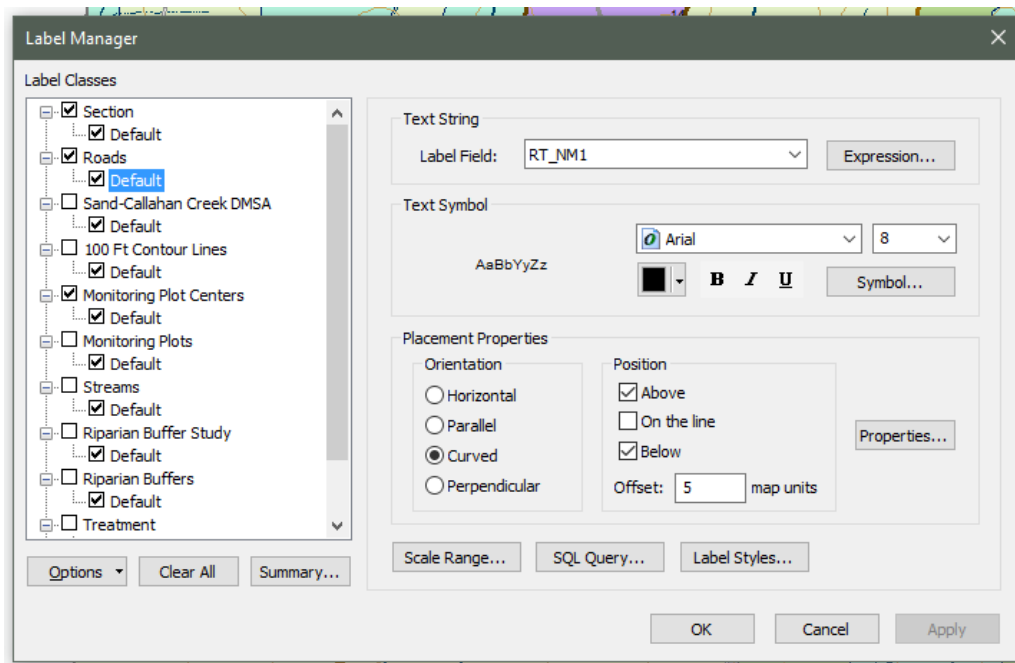
- Type = **Arial**
- Size = **8 pt**
- Color = **Black**

7. Under 'Placement Properties', set the Orientation to 'Curved'.

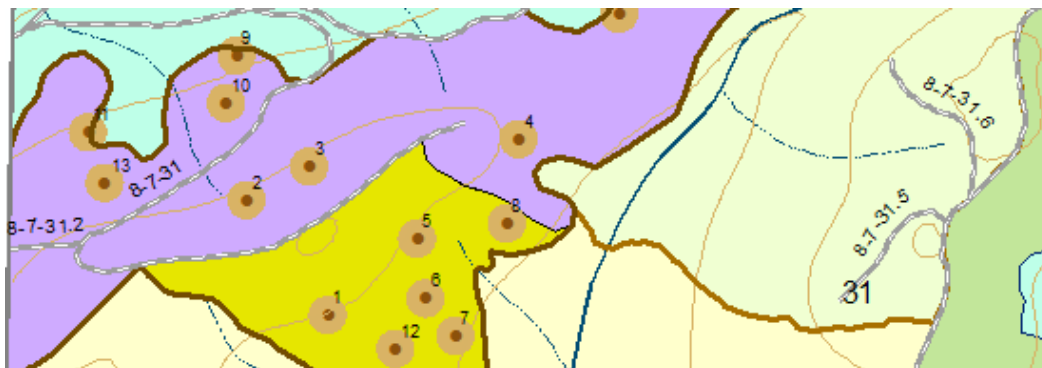
8. Change the label's position to 'Above' and 'Below', then uncheck 'On the line'.

9. Set the 'Offset' to 5 map units.

10. Click 'Apply', and leave the 'Label Manager' window open.



In the Data View, roads are now labeled by their route numbers.



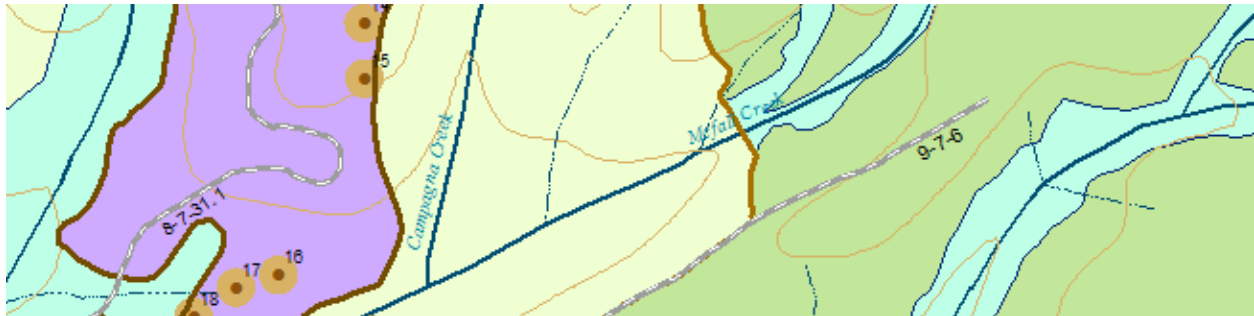
Let's continue labeling other features in your map using the Label Manager.

11. Under 'Label Classes', check the box next to Streams.
12. Highlight the Streams: Default Label Class.

In the Label Manager, the Streams: Default Label Class properties are displayed.

13. Verify the Label Field is set to STREAMNAME.
14. As needed, change the following font properties:
  - Type = Times New Roman
  - Size = **8 pt**
  - Color = Delft Blue
15. Set the font style to Italic.
16. Verify the 'Orientation' is set to 'Curved'.
17. Verify the labels 'Position' is only 'Above'.
18. Set the 'Offset' to 5 map units.
19. Click 'Apply'.

In the Data View, line features of the Streams layer are labeled.



Next, let's label the contour lines.

20. Under 'Label Classes', add a checkmark that allows labeling of the 100 Ft Contour Lines layer.
21. Highlight the 100 Ft Contour Lines: Default Label Class.

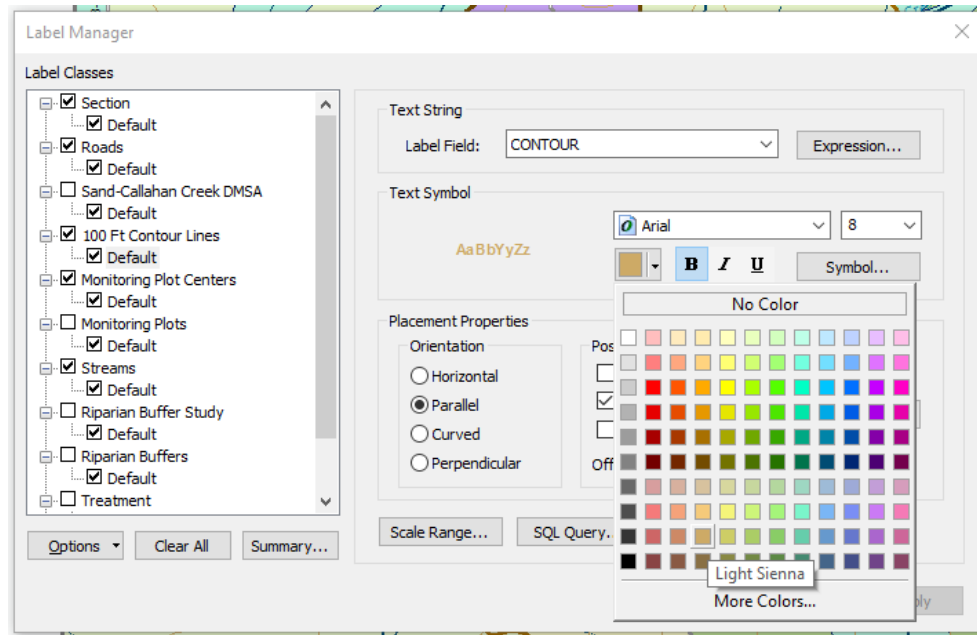


In the Label Manager, the 100 Ft Contour Lines: Default Label Class properties are displayed.

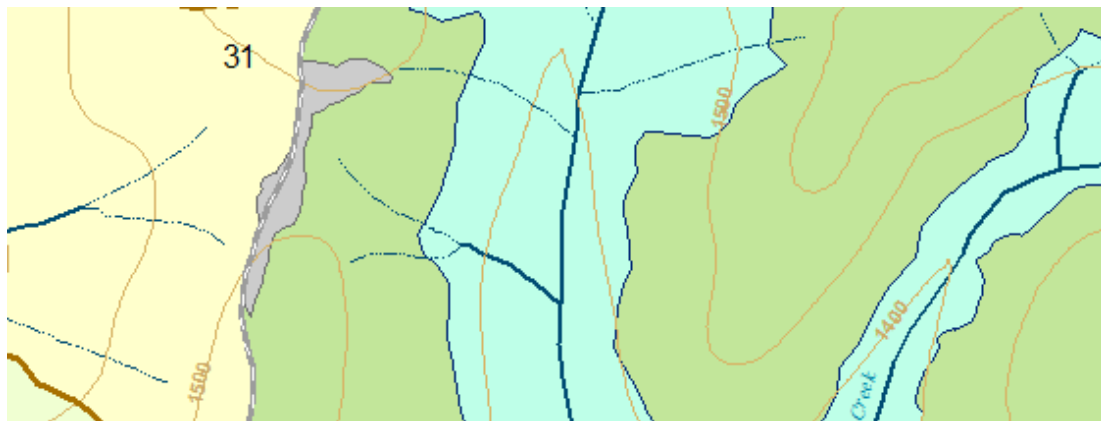
The values stored in the "CONTOUR" attribute represent an elevation value for each contour-line feature. The contour interval between elevation values is 100 feet.

22. Verify the 'Label Field' is set to CONTOUR.
23. As needed, change the following font properties:
  - Type = **Arial**
  - Size = **8 pt**
  - Color = **Light Sienna**
24. Set the font style to Bold.
25. Verify the 'Orientation' is set to 'Parallel'.

26. Set the labels 'Position' only to 'On the line'
27. Click 'Apply'.



In the Data View, contour-line elevations are labeled.



## Part 4: Working with Multiple Label Classes

To specify different label properties for features within the same layer, you can create multiple Label Classes—where each Label Class has unique label properties. For example, for a “Roads” layer, there could be separate Label Classes for Interstates, Highways, and Local Roads. Each Label Class would have different label properties. We will add a new Label Class for the Sand-Callahan Creek DMSA layer. The layer has two polygon features. The Callahan Creek DMSA polygon will be labeled differently from the Sand Creek Re-thin polygon.

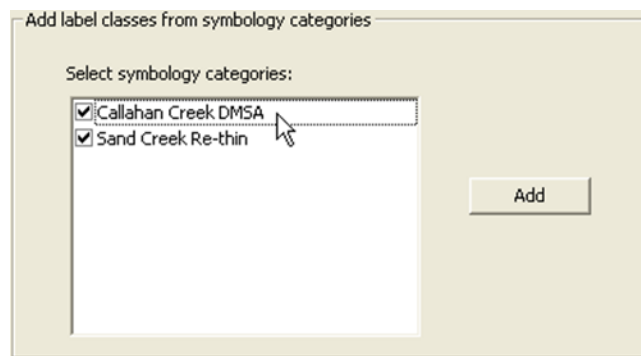
1. Reopen the 'Label Manager', if necessary.
2. Under 'Label Classes', check the box next to Sand-Callahan Creek DMSA.

### 3. Highlight Sand-Callahan Creek DMSA.

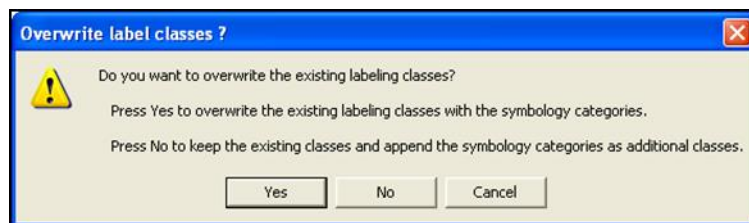
Currently, the Sand-Callahan Creek DMSA layer has one Label Class called Default.

We want to add a new Label Class so that the layer has two Label Classes. As a time saver, you can add a Label Class based on the layer's "Unique Values" symbology. As shown in the next screen capture, the Sand-Callahan Creek DMSA layer has two symbol categories: Callahan Creek DMSA and Sand Creek Re-thin.

### 4. Under 'Add label classes from symbology categories', make sure both symbology categories are checked, and click 'Add'.

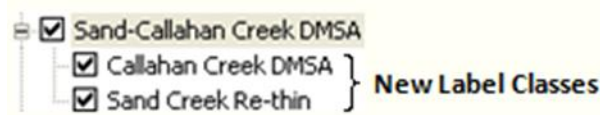


### 5. Click 'Yes'. This will overwrite the default category with the two new classes.



Does Sand-Callahan Creek DMSA have two new 'Label Classes'? YES NO

(If "NO", try repeating the instruction on the previous page. You should not have three classes.)



Next, we need to set the label properties for each new Label Class.

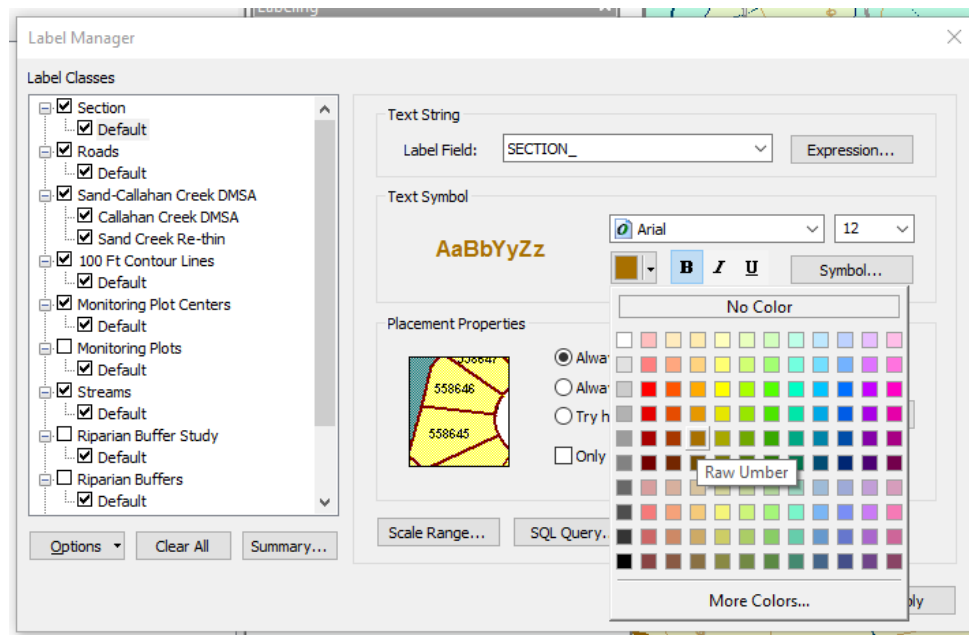
### 6. Highlight the Callahan Creek DMSA Label Class.

### 7. As needed, change the following font properties:

- Type = **Arial**
- Size = **12 pt**
- Color = **Raw Umber**

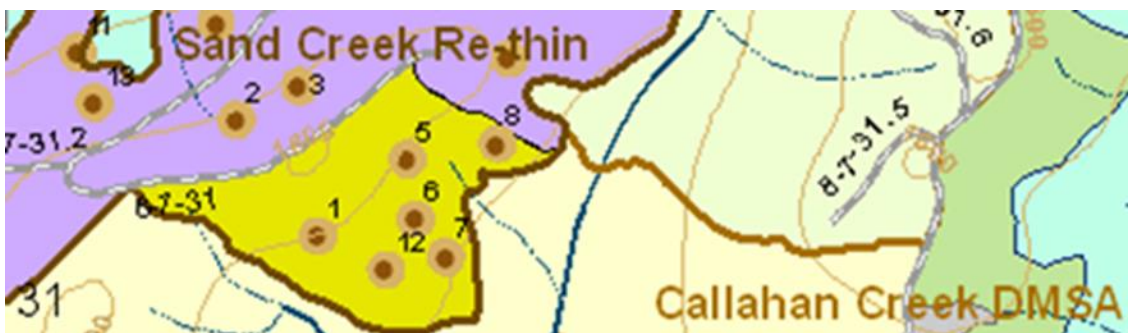
### 8. Change the font style to Bold.

9. Verify the labels' placement is 'Always horizontal', check the option to 'Only place label inside polygon', then click 'Apply'.



10. Highlight the Sand Creek Re-thin Label Class.
11. As needed, change the following font properties:
  - Type = **Arial**
  - Size = **12 pt**
  - Color = **Burnt Umber**
12. Change the font style to Bold.
13. Verify the labels' placement is 'Always horizontal', and check the option to 'Only place label inside polygon', and click 'OK'.

The Label Manager dialog window should now be closed. In the Data View, the Callahan Creek DMSA polygon and Sand Creek Re-thin polygon are labeled. Each label has different label properties (i.e., different font types and colors).



Can you find the Section 31 label?      YES      NO



(HINT: If you want, you can open the window magnifier to explore the map using Windows > Magnifier.)

Because labels are dynamic, they can move in order to avoid conflict with other labels. Try zooming in and out and watch the location of the Section “31” label move out of the way of the “Callahan Creek DMSA” label in order to avoid overlapping each other.

To further illustrate the dynamic nature of labels, find the label for Monitoring Plot Center #3. The label is initially at the point’s upper right, but can move or even disappear.

Can you find the label for Monitoring Plot Center #4?

YES

NO

**Note:** Label “4” has either disappeared from the map completely or has moved to a new location.

**Tip:** If you activate the Lock Labels button the labels are “locked” to the current map scale. As you pan and/or zoom in the map, label positions remain fixed. *Note: new labels do not appear if you pan or zoom outside the current map scale.*



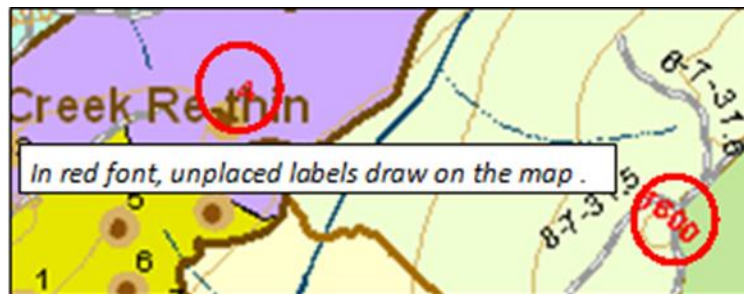
## Part 5: Labeling Toolbar — View Unplaced Labels

Another function on the Labeling toolbar to consider using is called View Unplaced Labels. This function allows you to see unplaced labels that failed due to the rules set in the Label Class's Conflict Detection/Placement Properties options.

1. On the Labeling toolbar, click on the 'View Unplaced labels' button.



From Step 4, we learned that Monitoring Plot Center #4 does not display because it is in conflict with the "Sand Creek Re-thin" label. If we could somehow move the Sand Creek Re-thin label to a new position, then Monitoring Plot Center #4 would be visible.



To allow unplaced labels to display normally, you have a couple options:

You can continue to manipulate each layer's label properties (e.g., font size, placement, label priority, etc.) until the unplaced labels display.

Or you can convert the labels to annotation and move the unplaced text independently.

2. Click the 'View Unplaced Labels' button again to disable it.



3. From the 'File' menu → 'Save As'.
4. Navigate to ...\\Data.
5. Save the file as: 4\_Sand\_Ck\_Re-thin-Callahan\_Ck\_DMSA\_results.mxd.

## Part 6: Labeling Toolbar — Label Priority Ranking

A tree Density Management Study (DMS) has been conducted in the Green Peak quadrangle of the Mary's Peak Resource Area (RA), Salem District BLM. The Salem GIS Coordinator has nearly completed a map of the Green Peak DMS, which will be used in reporting the final results of the project. *Let's take a look at the map.*

1. Open the existing map document called ...\\Data\\Green Peak1.mxd.
2. Click the 'View Unplaced Labels' button'.





**FYI:** The View Unplaced Labels button is a toggle, which you have just now turned on. Unplaced labels appear in red text.

3. Look around the map for unplaced labels.

Labels are dynamic. Within the limits of their placement properties and priority, labels will move out of the way of other labels in order to avoid a display conflict (a conflict occurs when two labels overlap). However, when conflict is unavoidable, some labels are simply not displayed. ArcMap keeps track of unplaced labels, which, as you saw in the last step, can be displayed by activating the “View Unplaced Labels” button.

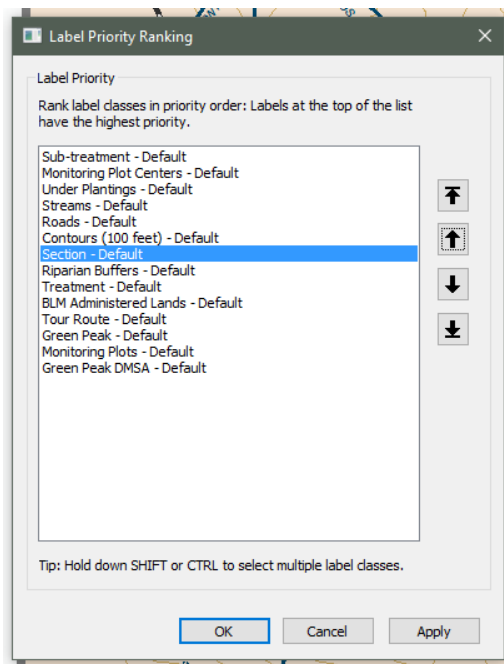
**Exercise note:** Depending upon your map scale and monitor size, you may have different unplaced labels than described in the next sentence. For the author, some contour labels (at the top of the Data View) and a Sub-treatment label (see screen capture on the right), are unplaced. Let’s see if we can add back some, if not all, of the unplaced labels.

4. Click the ‘Label Priority Ranking’ button.



Listed in the Label Priority Ranking window are all of the active data frame’s label classes. In the window (see screen capture on next page), you can assign the order that labels are placed on the map. In general, but not guaranteed, labels with a higher priority are placed first. Labels with a lower priority that conflict with higher priority labels are placed at alternate positions, or dropped from the map.

Working with labels is not an exact science. Because of the dynamic nature imposed by the conflict detection settings (e.g., label priority), obtaining what you believe to be the correct results can be a trial-and-error process. To change a label priority, highlight the label class, and use the arrow buttons to move the label class to its new rank.



5. For the listed label classes, set the following label priority ranking:
  - i. Sub-treatment
  - ii. Monitoring Plot Centers
  - iii. Under Plantings
  - iv. Streams
  - v. Roads
  - vi. Contours (100 ft) - Default
  - vii. Section
6. Click 'OK'
7. Open the 'Magnifier' window and look around the map for unplaced labels.
  - i. (Hint: Windows → Magnifier)
8. Click the 'View Unplaced Labels' button to turn off the unplaced labels.
  - i. (If you have the magnifier window open you will have to close it first.)
9. Click the 'Label Weight Ranking' button.



Besides overlapping with other labels, conflicts can also occur between labels and features on the map. With labeling weights, you can control how strongly features will act as barriers to label placement. To change the label weight of a layer, select the weight (low, medium, or high) from the Label Weight column (see screen capture on next page). Similarly, if a feature is more significant than the label, their weight can be changed from none to low, medium, or high.

10. Without any changes, close the 'Label Weight Ranking' window.
11. Click the 'Lock Labels' button.



The dynamic placement of labels can be stopped by activating the Lock Labels command. Label positions remain constant as you pan and zoom within the original map extent. New labels will not appear outside this area.

(Note: To resume dynamic-label placement, just re-click Lock Labels to disable it.)

12. Pan around your map to see if the label position changes...
13. From the File menu, choose 'Save As'.
14. Name the map document Standard\_Label\_Engine.mxd and place it in a location of your choice.

## Part 7: Working with Annotation

The goal for this step is to display all labels of the Monitoring Plot Centers, Streams and Roads layer. We will convert the labels to annotation so that you can move and edit them individually. Because a layer's labels behave as a group, you cannot manage labels individually. In order to manage individual labels, a layer's labels are converted to annotation, which are "text items" still connected to the original layer (e.g., if you turn off the layer, the annotation turns off). However, label-property settings no longer affect the annotation.

Before you convert labels to annotation... consider using the following tips:

Set the Data Frame's Reference Scale (i.e., the scale used to proportionally resize text and graphics). Note: If you do not specify a Reference Scale, the map's current scale is used.

For the labels to convert, set the layer's label properties (e.g., font type, style, color, preferred placement, etc.)

If the labels to convert are in conflict with other labels, turn off the conflicting labels (or layers) leaving only those labels you want to convert to annotation.

With the Data Frame's Reference Scale set to 1:10,000 and label classes established, all we need to do is to turn off those labels (or layers) in conflict with the layer labels that you want to convert. Let's start with converting the Roads Layer.

1. Turn off all layers except Roads.

**FYI:** You don't have to turn off all the layers. However, it is easier to turn off a layer rather than go through the extra steps needed to turn off the layer's labels.

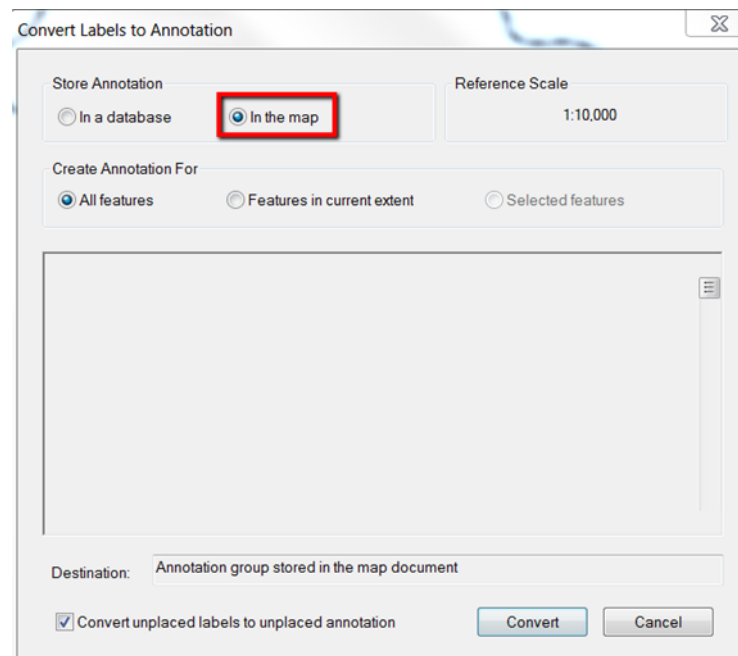
2. Right-click the Roads layer, then select 'Convert Labels to Annotation'.
  - i. The convert Labels to Annotation dialog window opens.
3. Take a moment to review the function's settings.

Before you click the Convert button, you need to decide where the annotation will be stored. Annotation can either be saved to a table in a database or exist solely in the map document. An advantage of database storage is that the annotation can remain linked to corresponding features (i.e., points, lines, or polygons). For example, if you move or delete a feature, the annotation will also move or delete. For most ArcMap users, storing the annotation in the map document is fine.

4. Enable the option to store the annotation 'In the map'.

This will allow you to edit the annotations outside of an **edit session** because the annotations themselves are not contained in a database environment but are simply referenced within the map.

We will use the default settings to create annotation for all features and to convert unplaced labels to unplaced annotation.



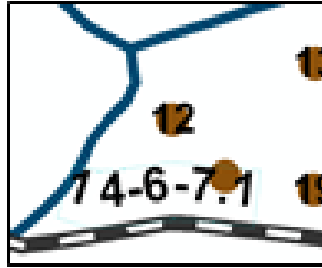
5. Click the 'Convert' button. In the map, labels are converted to annotation.
6. Turn on the Streams layer and turn off the Roads layer.
7. Right-click the Streams layer, then select 'Convert Labels to Annotation'.
8. This time, enable the option to store the annotation 'In a database'.
9. Click the 'Convert' button.

**Note:** In the TOC there is a new layer called StreamsAnno.

10. Turn on the Streams and Roads data and the Monitoring Plot Centers.
11. Activate the 'Select Elements' tool.



12. Click on the '14-6-7.1' annotation.



As indicated by the dashed outline surrounding the annotated item, the annotation can be moved or deleted. Annotated items have properties (e.g., font type, size, color, etc.) that are accessible by right-clicking or double-clicking on the selected annotated item. You can also use functions found the Draw toolbar to modify the selected annotation.

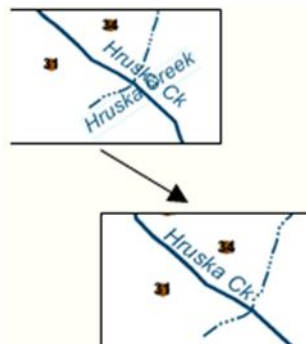
13. Grab and drag the '14-6-7.1' annotation under the road, so it no longer overlaps with Monitoring Plot Centers.
14. Click the 'Refresh' button .
  - i. Hint: Look along ArcMap's bottom margin.

Next we want to edit the overlapping and duplicate labels of the Hruska Creek in the bottom right corner of the map.

15. From the 'Editor' Toolbar dropdown menu, start an 'Edit Session'.
  - i. If you receive a warning, just click 'Continue'. You may need to add the 'Editor' Toolbar. (*Customize→Toolbars→Editor*)

The Streams annotation is saved in the Green Peak.gdb, so we can't delete any until we start editing.

16. Now, click on one of the "Hruska Creek" annotations and delete it.
17. Click on the remaining "Hruska Creek" annotation and move up along the stream so it does not overlap with the intermittent steams or monitoring plot centers.




The Stream at the top right of our map does not have a label/annotation. It turns out that the stream name was not included in the table. Instead of adding the name to the table and having

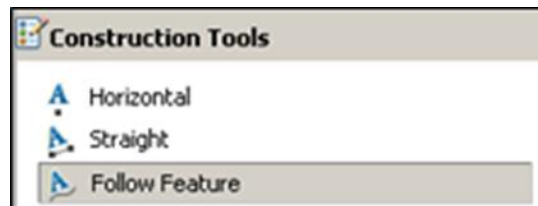
to convert the labels to annotation, we will simply add the annotation to the StreamsAnno layer.


18. If the 'Create Features' window is not already open, activate it from the 'Editor' Toolbar, by clicking its icon



The Create Features window initially opens vertically and docks on the right side of your ArcMap application. The top of the Create Features window lists the feature templates in your map that are currently turned on in the TOC. The feature template is a concept first introduced with ArcGIS 10.0. It is somewhat like setting the old target layer but is more powerful than that because it contains properties about how new features should be created: the target layer (feature class) where a feature will be stored, the attributes that a feature is created with, and the default tool that is used to create that feature. Feature templates also have a name, description, and tags that can help you find and organize them. You can review and set these on the Template Properties dialog box, which you can open by double-clicking a feature template on the Create Features window.

19. Click the  under the StreamsAnno title in the 'Create Features' list
20. Select 'Follow Feature' from the 'Construction Tools' below the 'Create Features' list.




Clicking  allows you to now add annotation text to the annotation feature class. Remember like other editing done in ArcMap 10, you need to specify a construction tool within the feature template options. These include **Horizontal**, **Straight**, **Follow Feature**, **Leader**, and **Curved**. All are options of how text will be aligned as it is added to the map.

**Note:** The **Follow Features tool** uses the feature in the topmost layer as the feature to with which to align. If you have a polygon boundary on top of other features, you will need to turn this layer off to 'snap' annotations to features below it.

21. Click the cursor on the stream for which the annotation will be added, then slide the cursor along the feature, clicking again to set the placement.



The new annotation that you created is added to the annotation feature class and is placed along the river.

22. Activate the 'Edit Annotation' tool , then double-click the new text, change the text in the 'Annotation' Tab *within the Attributes window that appears* to "Willow Creek", then click 'Apply'.



It's worth noting that there are other options for placing annotation within the **Create Features > Construction Tools** box that provide alternative methods for positioning and rotating the annotation. If you wish you may undo the edit and experiment with these options.

23. Close the 'Annotation Construction' box.

**How is creating annotation different than adding text to the map?** The Draw toolbar has text tools that you can use to add text to the active Data Frame. Unless you specify a target Annotation Group, text items you create with the text tools are stored in the <Default> Annotation Group. To add text to a different Annotation Group, from the Draw toolbar's Drawing dropdown, select Active Annotation Group, and select another annotation group. To learn more, do an Index search on "annotation groups" in ArcGIS Desktop Help.

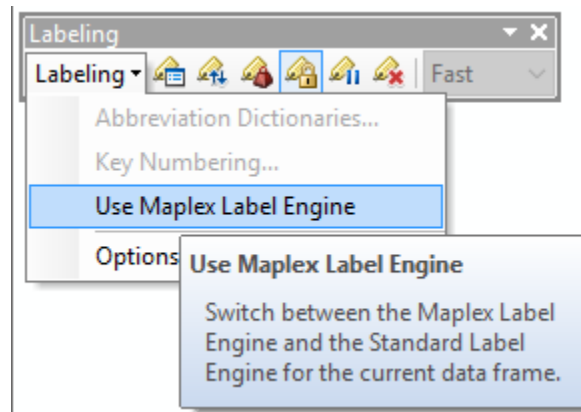
24. Click the 'Select Elements' tool from the Tools or Draw toolbar to reposition the annotation along the stream, if needed.
25. From the 'Editor' Toolbar, click 'Editor' > 'Save Edits' and then 'Stop Editing'.
26. Save your document as Annotation\_results.mxd in your Workspace folder.

## Part 8: Maplex Label Engine

Up until this point, our labels were placed in ArcMap using the **ESRI Standard Label Engine**. However, ArcGIS comes with a second label engine called the **ESRI Maplex Label Engine**, which allows more flexibility in adding and positioning labels. For example, you can create an "abbreviation dictionary," which will automatically shorten text in order to fit a label on the map.

1. Open the Green\_Peaks2.mxd from ...\\Data.
2. From the Labeling Toolbar's 'Labeling' drop-down choose 'Use Maplex Label Engine'

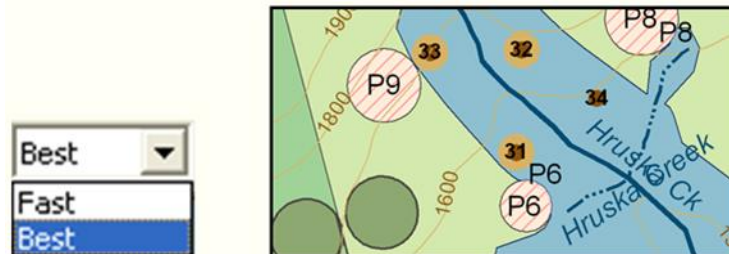




Instead of a separate toolbar, the Maplex Label Engine is enabled through the Labeling menu on the Labeling toolbar.

A couple of immediate changes you should notice are that a dropdown list on the far right of the Labeling toolbar is now available, and more labels appear on the map. The dropdown list on the Labeling toolbar controls the label-placement quality. Currently, it is set to “Fast.”

3. Find the Hruska Ck labels in the lower right corner of the map. The labels are unstacked and one of them goes off the Section boundary.
4. From the ‘Placement Quality’ dropdown list, choose ‘Best’.



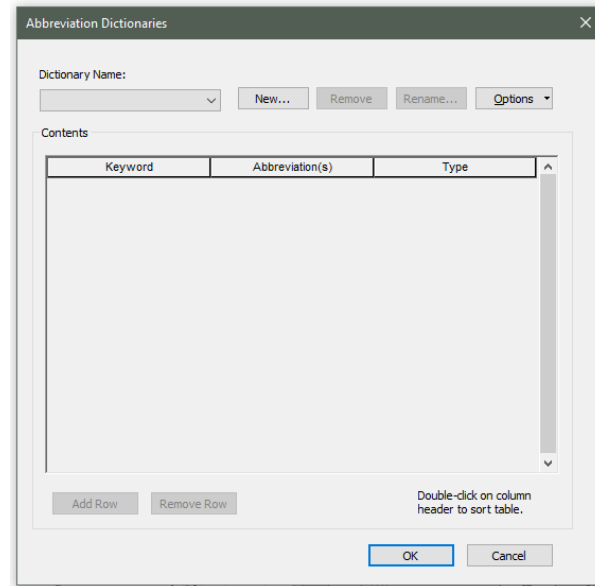
The Maplex Label Engine attempts to find the best label placement by stacking the labels and shifting them along the feature.

**Data Quality Issue?** Take another look at the Hruska Creek labels, and you will see that the word “Creek” is sometimes spelled out as “Creek,” and sometimes it is abbreviated as “Ck.” These are how the Stream names are saved in the layer’s attribute table. We can use **Maplex** to create consistent labeling. For example, let’s abbreviate all instances of the word “Creek” to just “Ck.” Abbreviations save space and allow for better label placement.

5. From the ‘Labeling’ menu, choose ‘Abbreviation Dictionaries’.

As this is the first time creating an abbreviation dictionary, the contents of the Abbreviation Dictionary window should be empty. See the screen below.

**Note:** Through the Options button, you can save dictionaries for other map docs.



6. Click the 'New' button.

7. For the new dictionary name, enter Creeks, and click 'OK'.

There are three columns that need to be populated:

Keyword is the word you want to abbreviate (e.g., Creek).

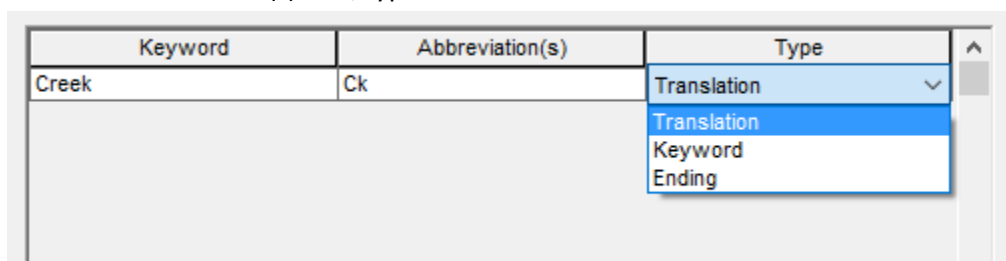
Abbreviation is the replacement to the keyword (e.g., Ck).

Type is the abbreviation method to be applied (see further).

8. Click the 'Add Row' button.

9. In the 'Keyword' cell, type in Creek. *Tip: You can use the <Tab> key to move between cells.*

10. In the 'Abbreviation(s)' cell, type in Ck.



11. Click on the 'Type' value drop-down list and choose 'Translation'.

12. On your own, add this second row :

- i. Keyword = **Crk**
- ii. Abbreviation (s) = **Ck**
- iii. Type = **Translation**

Keyword	Abbreviation(s)	Type
Creek	Ck	Translation
Crk	Ck	Translation

There are three types of abbreviation dictionaries you can apply:

Keywords—replace all keywords except the last word (e.g., Highway 20 to HWY 20)

Endings—replace only the last keyword (e.g., Hobbs Creek to Hobbs Ck)

Translations—replace all keywords in a string

13. Click 'OK'.

There is an extra step through the Label Manager, in which we must highlight the label class to be abbreviated, choose the abbreviation dictionary you just created, and enable the option to abbreviate the labels.

**Tip:** If ever your Labeling toolbar is closed, you can access the Label Manager (and the other Labeling commands) by right-clicking the Data Frame name and selecting from the Labeling options.

14. Open the 'Label Manager'



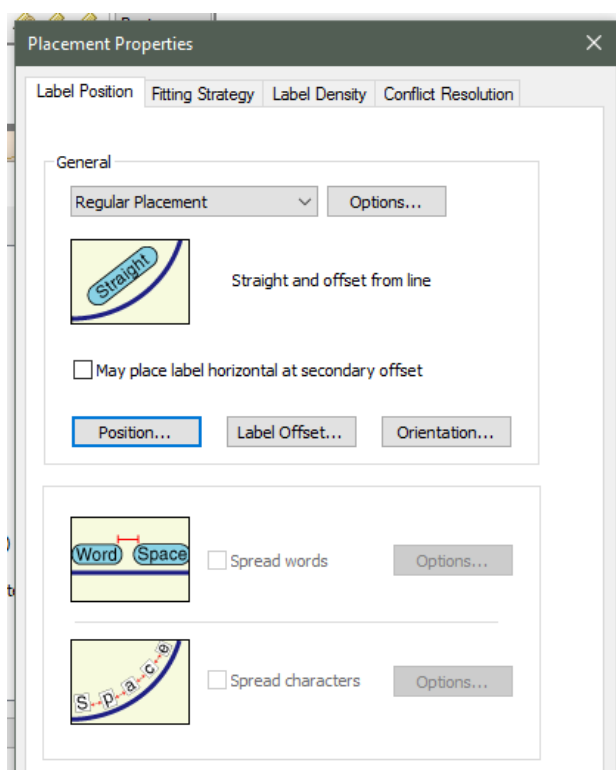
i. Hint: Alternatively, you can right-click on the name of the data frame Green Peak, then expand 'Labeling'.

15. Highlight the Streams: Default label class.

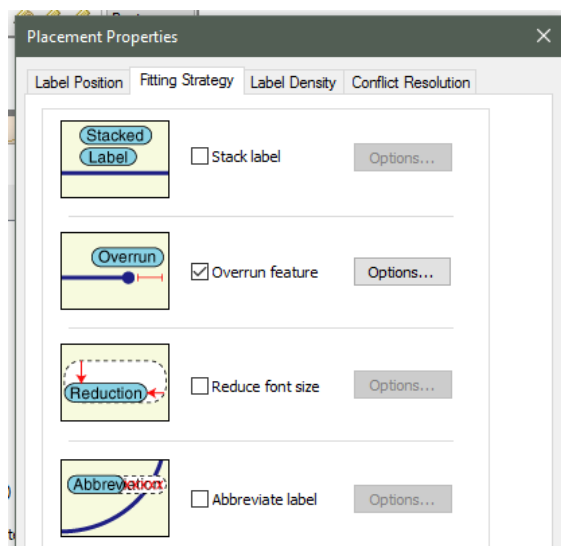
16. Remove the checkmark for 'Stack Label'.

17. Click the 'Properties' button.

The Placement Properties window opens. With the Standard Label Engine, this window had only two tabs: Placement and Conflict Detection. With the Maplex Label Engine, there are four tabs: Label Position, Fitting Strategy, Label Density and Conflict Resolution.



18. Activate the 'Fitting Strategy' tab. (Notice "Stack label" is unchecked.)



19. Place a checkmark for 'Abbreviate Label'.
20. Click the 'Options...' button.
21. Select 'Creeks' from the dropdown menu, click 'OK'.
22. Activate the 'Label Density' tab.
23. Add a checkmark for "Remove Duplicates".

**FYI:** You can fine tune how duplicate labels are removed by specifying a search distance. Any duplicate labels found in the search distance are reduced to one label.

24. Click the 'Options...' button.
25. For the 'Search Radius', enter 500 map units.
26. Click the 'OK' button until the 'Label Manager' closes.

*Did the Streams-label endings get abbreviated to "Ck"? YES / NO*

**FYI:** When you save the map, the abbreviation dictionary is also saved as a property of the map.

Our final demonstration of what the Maplex Label Engine can do for you is the use of the **"Stacking Character"** function, which adds line breaks to the label so that it can fit within a more narrow area.

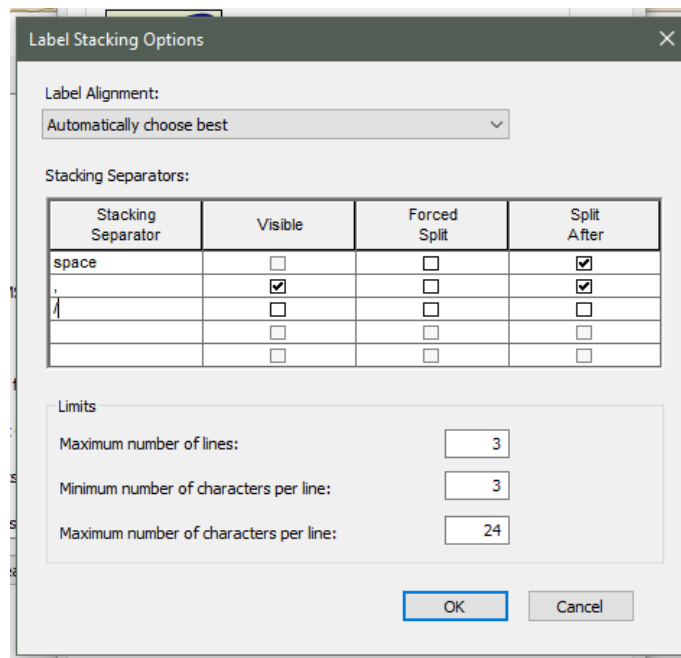
27. Right-click the Green Peak DMSA layer.
28. Check 'Label Features'.

Depending upon the application's Desktop extent, the "Green Peak DMSA" label may or may not be stacked. Regardless of whether or not the label is stacked, we want to change the label's stacking properties. The main purpose of stacking labels is to allow a label to fit into a limited space. With Maplex, you can use a special character to control where the label-split point should occur. Whatever special character you choose to split the label's text, the character must be included in the text as it is stored in the layer's attribute table.

29. Open the 'Label Manager'.
30. Highlight the Green Peak DMSA: Default label class, and apply the following label properties:
  - Label Field = **Name**
  - Font size = **12pt**
  - Font style = **Bold**
  - Font color = **Burnt Umber**
31. Click the 'Properties' button.
32. Activate the 'Fitting Strategy' tab.
33. For 'Stack Label' strategy (which should be checked), click the 'Options...' button.

The Label Stacking Options window opens. A cursory examination of the window reveals several options such as label justification, stacking separation, and the limits to the stacking. By default, two special characters used for label-splitting are already present in the list; space and comma.

34. In the 3rd row under 'Stacking Separator', enter a forward slash (/)
35. Check the option for 'Forced Split'.



36. Click the 'OK' button until the 'Label Manager' closes.
  - i. Did the Green Peak DMSA label stack into three rows? By default Maplex attempts to stack labels. However, there may be instances where you would prefer unstacked labels.
37. In the 'Data View', find some road names. For example, 14-6-17.1
  - i. At this map scale, all road labels employ some form of staking.

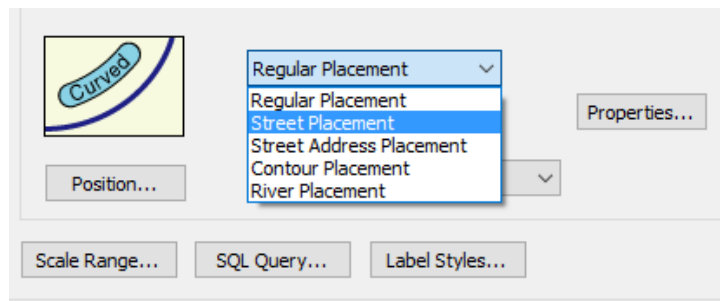
There are three ways you control the behavior of the split:

**Visible** - The split character appears on the map.

**Forced split** - A split will always happen at the character and stacking will always occur; otherwise stacking is determined by Maplex.

**Split after** - The split will happen after the stacking character; otherwise, it will occur before the character.

38. On your own, change the label properties for the Roads: Default label class to the following settings:
  - i. Remove the checkmark for 'Stack labels'.
  - ii. Select 'Street Placement' from the 'Placement Properties' dropdown menu.



When “Street placement” is checked, multiple line features (such as roads) are treated as connected and labeled accordingly as a single feature.

39. Click ‘OK’
40. Select ‘Save As’ from the ‘File’ menu.
41. Choose a location of your choice and name the map document Maplex\_Label\_Engine.mxd.
42. Exit ArcMap.

*-END OF EXERCISE*