

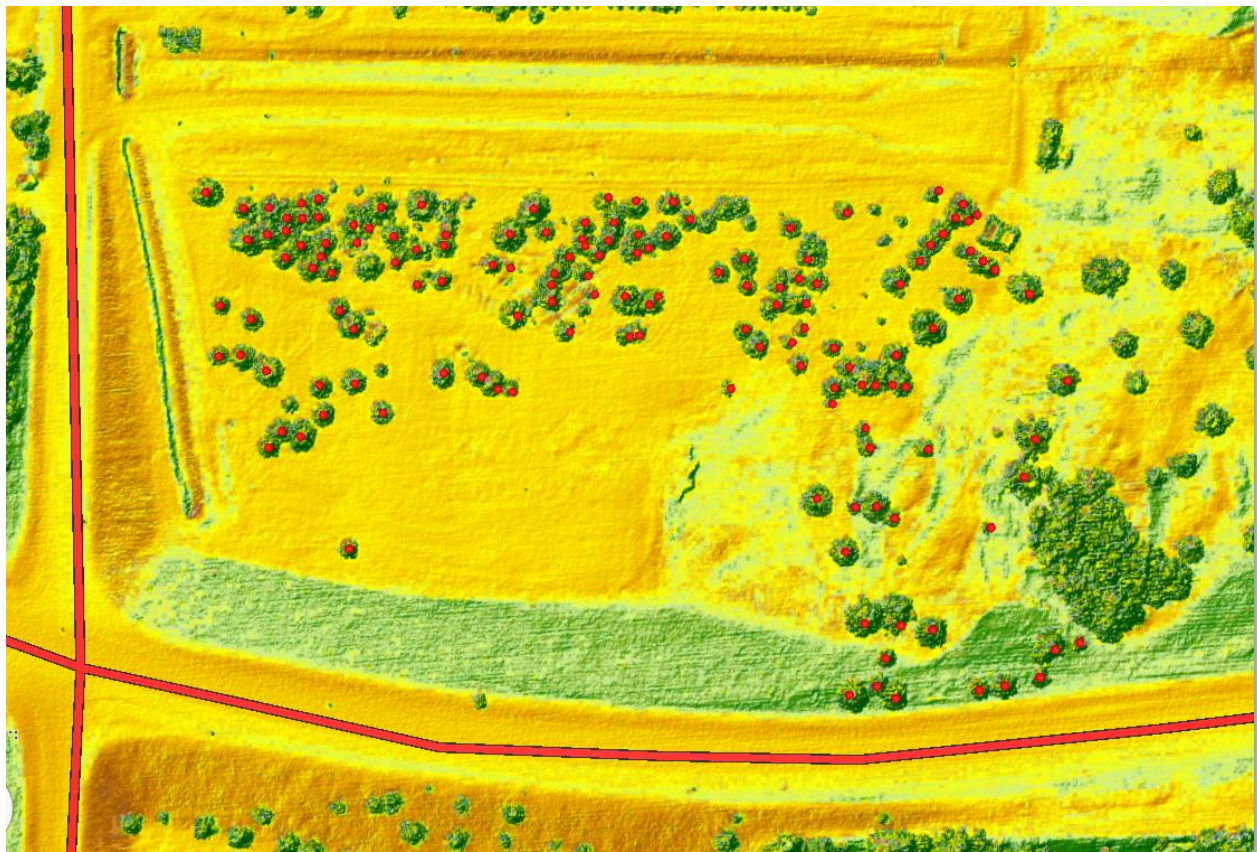
# ArcGIS Pro – Session Two

## Creating Data and Editing Features

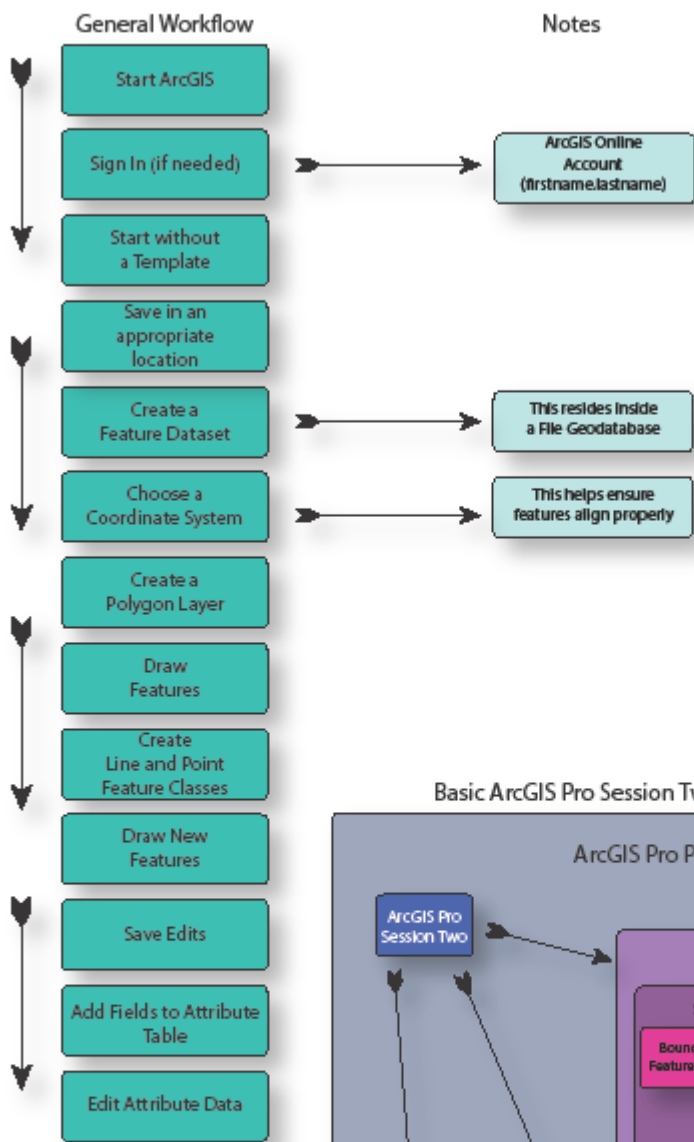
The following step-by-step guide will help you to create new Feature Classes. This will help you to build upon Session One documents and continue to explore the ArcGIS Pro software, and where certain items and tools are located. This guide will again touch on some best practices for managing data and explore a few options for creating new data and editing not only shapes, but tabular data as well.

Again you will be asked to build on previous documents "Create Your First Map", and utilize skills learned in that session. You will create a new File Geodatabase and Feature Dataset. This new Feature Dataset will contain new Feature Classes of Points, Lines, and Polygons and ultimately new features that you will draw.

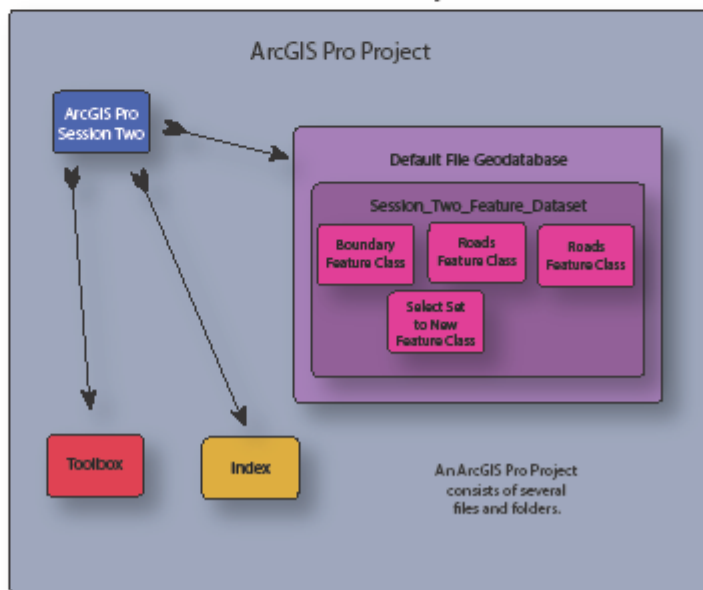
Please note that ArcGIS software updates regularly and images may not be completely accurate to your screen view. Every attempt has been made to make the images as accurate as possible.



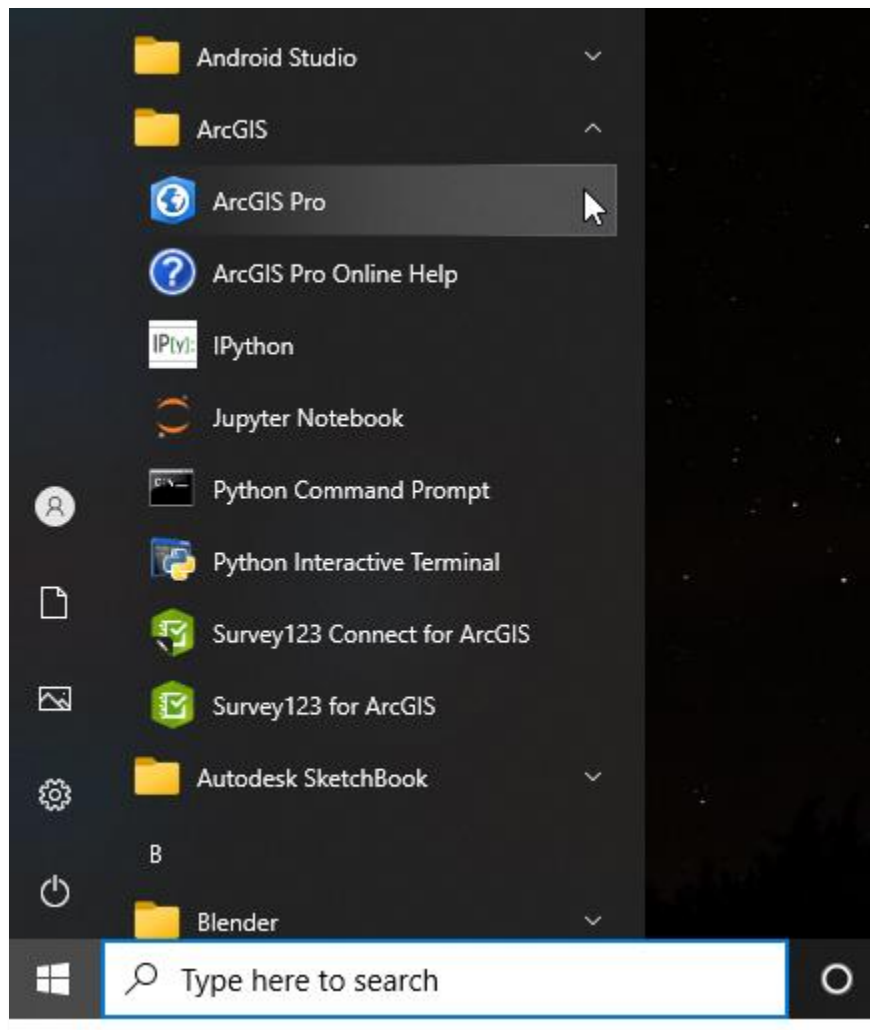
# ArcGIS Pro Session Two Diagram



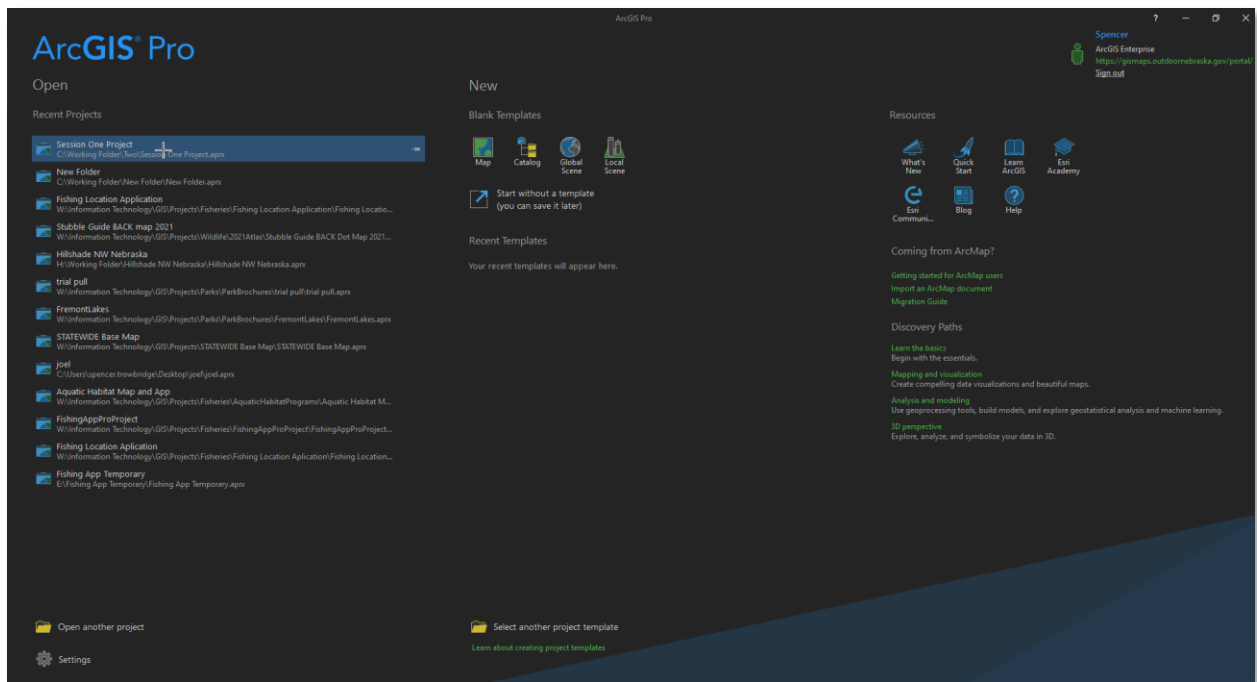
## Basic ArcGIS Pro Session Two Project Structure



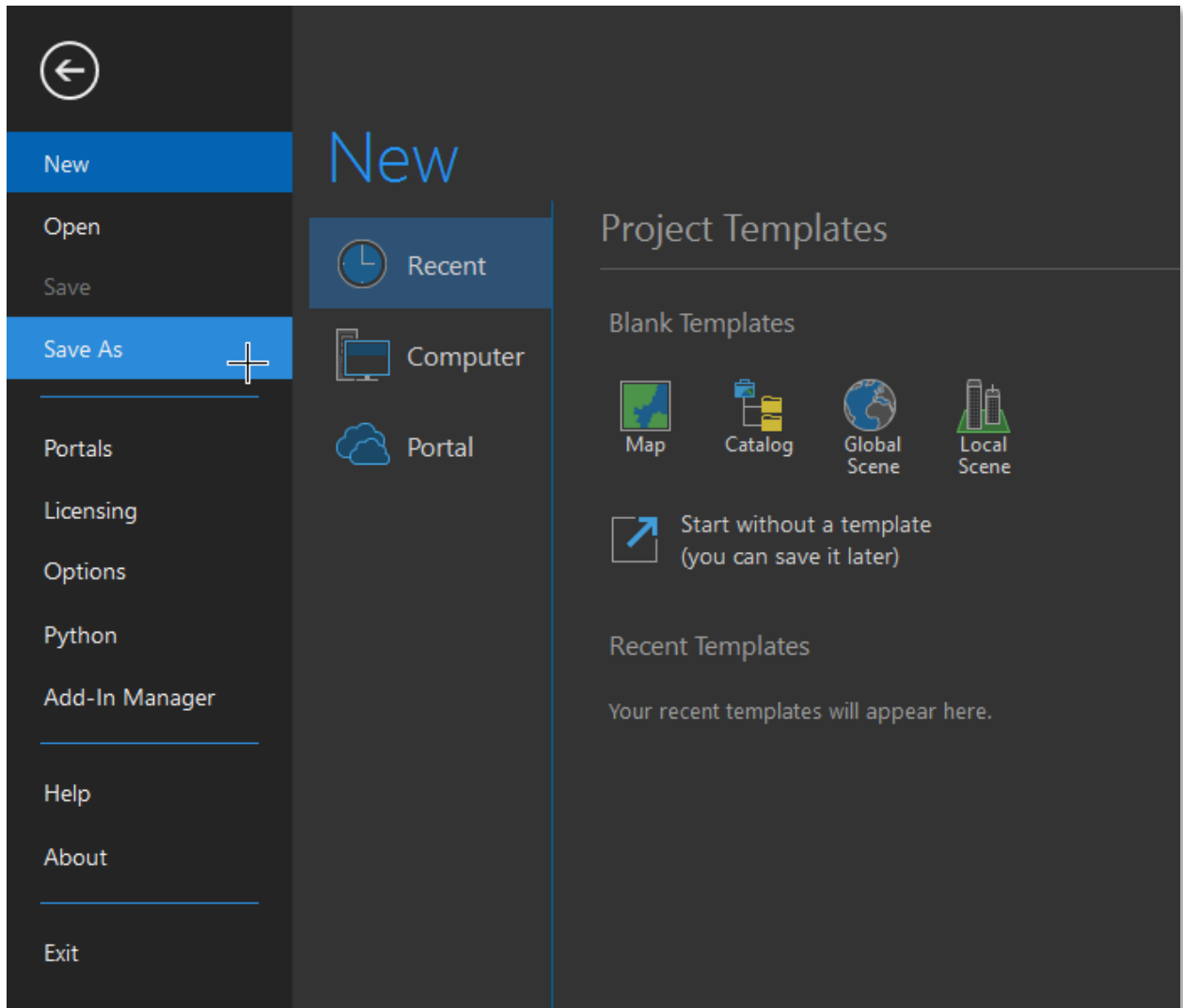
1. Click the ArcGIS Pro icon from the Start Menu to open the software.



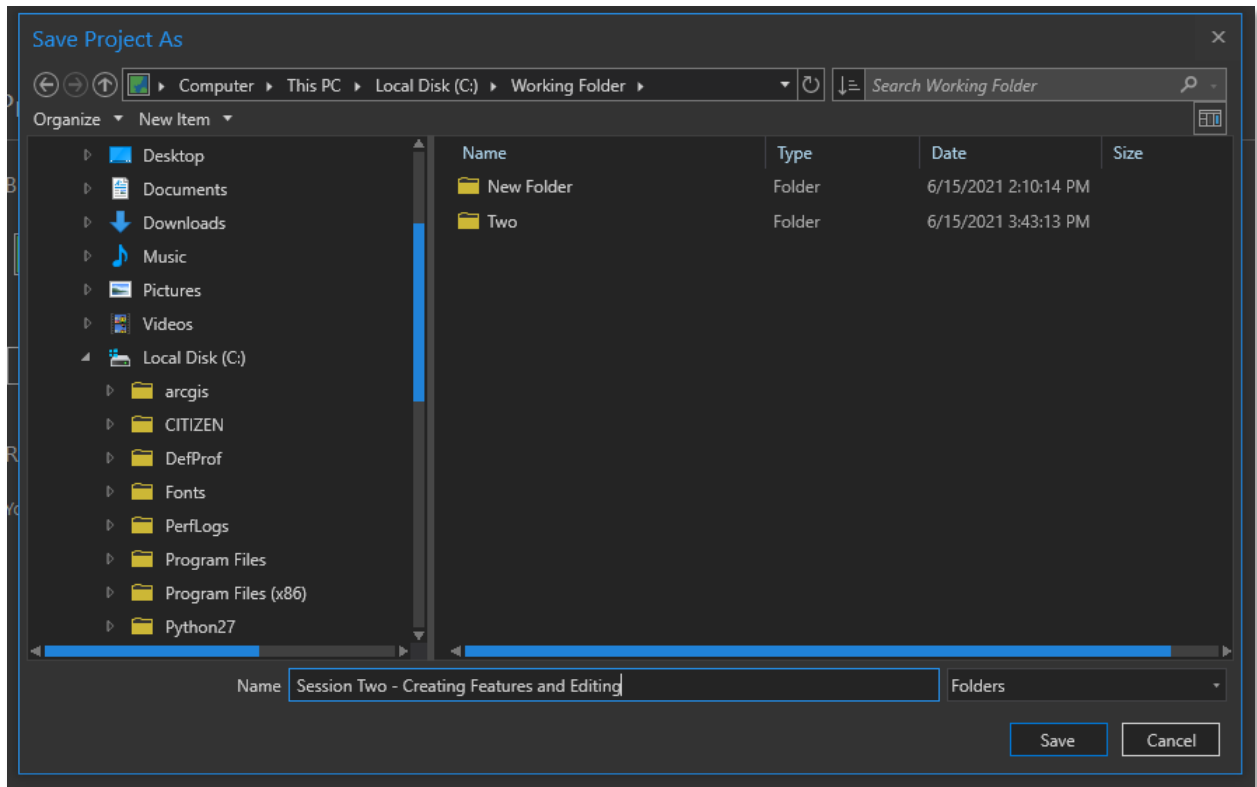
2. Select "Start without a Template (you can save it later)". Remember that there are training links at the right side – Those never used to be there, so make use of them and build your skill set.



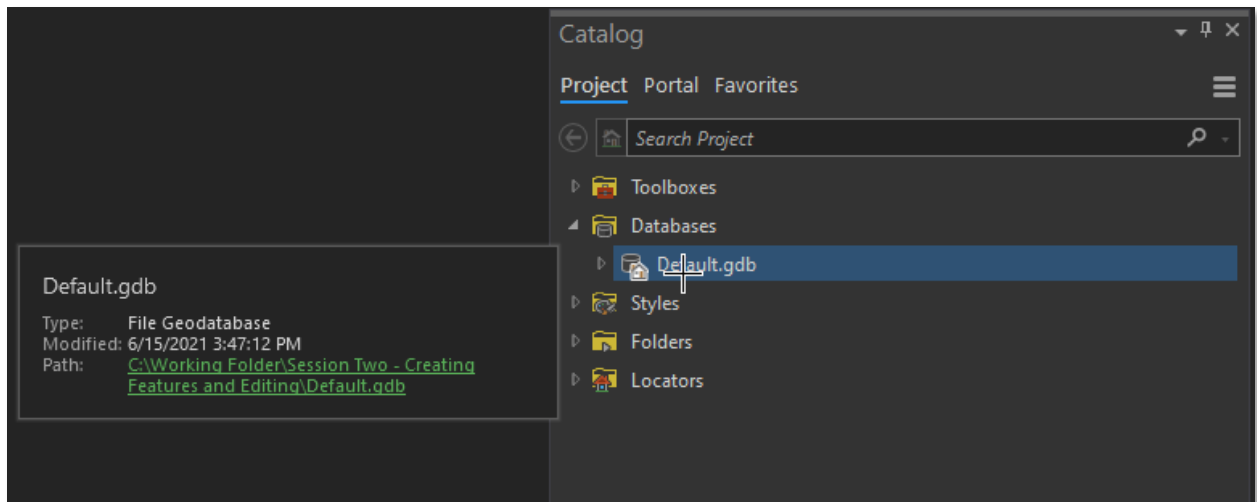
3. Click the Project Tab, then choose 'Save As'.



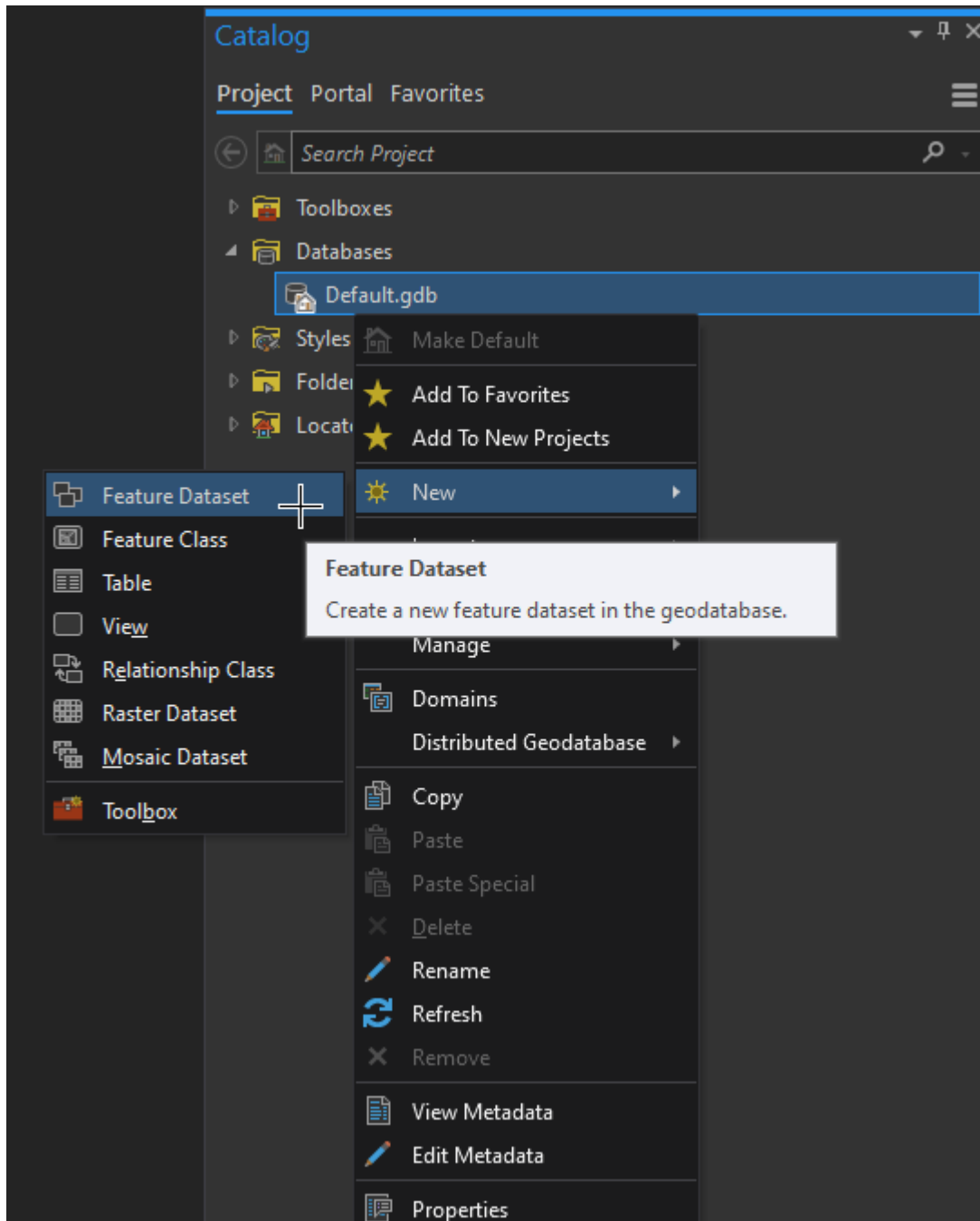
4. Navigate inside the Working Folder on the C Drive and Name the Project "Session Two – Creating Features and Editing". Press "Save" to create the project.



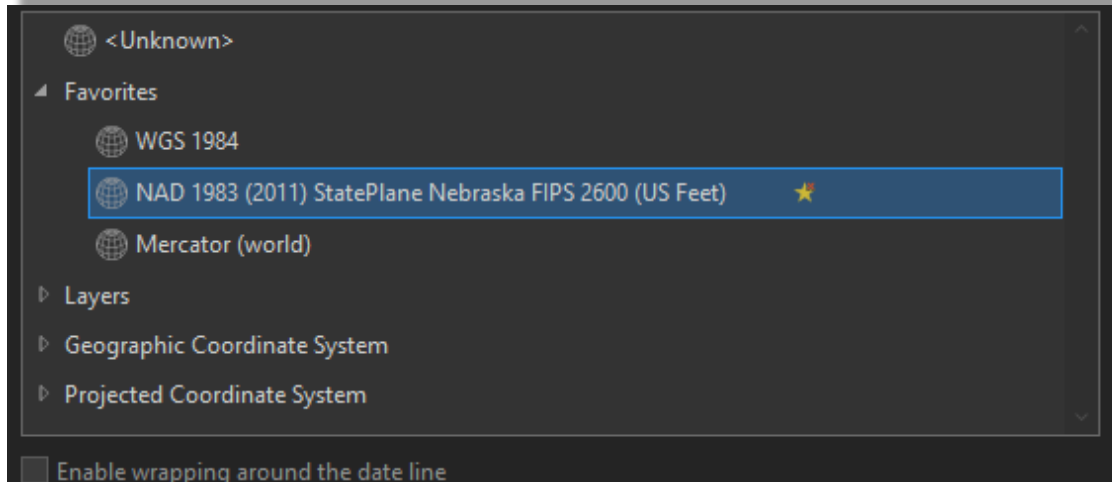
5. Again notice that on the Catalog Tab at the right side of the software under "Project", there is another "Default.gdb". Notice the location is different than the Default.gdb that was created in Session One. There isn't anything in this Default.gdb yet. In the next step we will create a Feature Dataset.



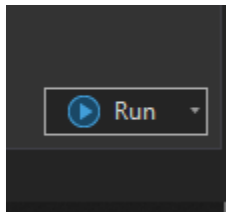
6. Right-click on the Default.gdb and then Hover on New. Choose "Feature Dataset".



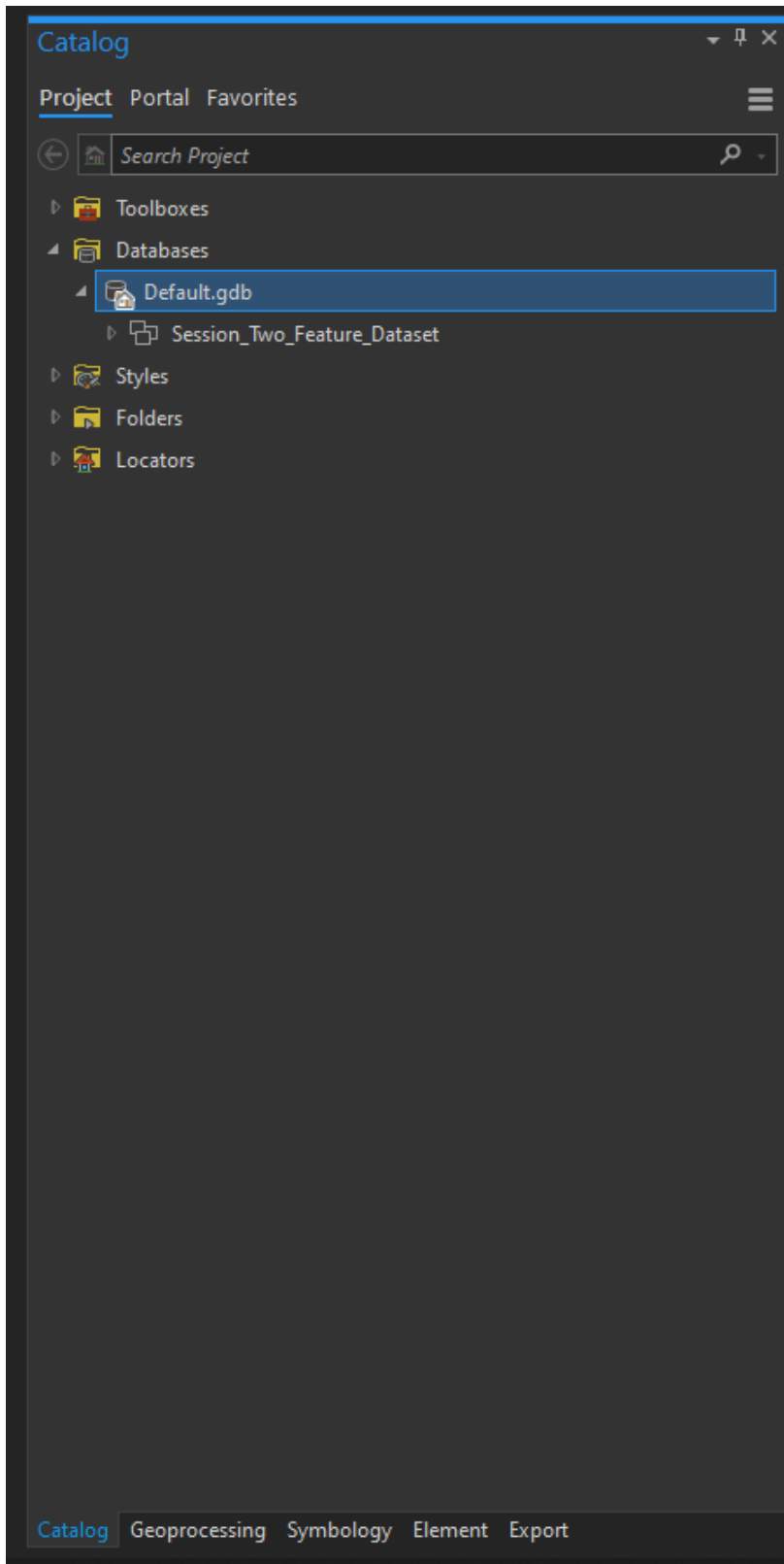
7. Name this new Feature Dataset "Session\_Two\_Feature\_Dataset". Remember there can be no spaces in the text, and special characters are limited. Choose NAD 1983 (2011) StatePlane Nebraska FIPS 2600 (US Feet) as the coordinate system.



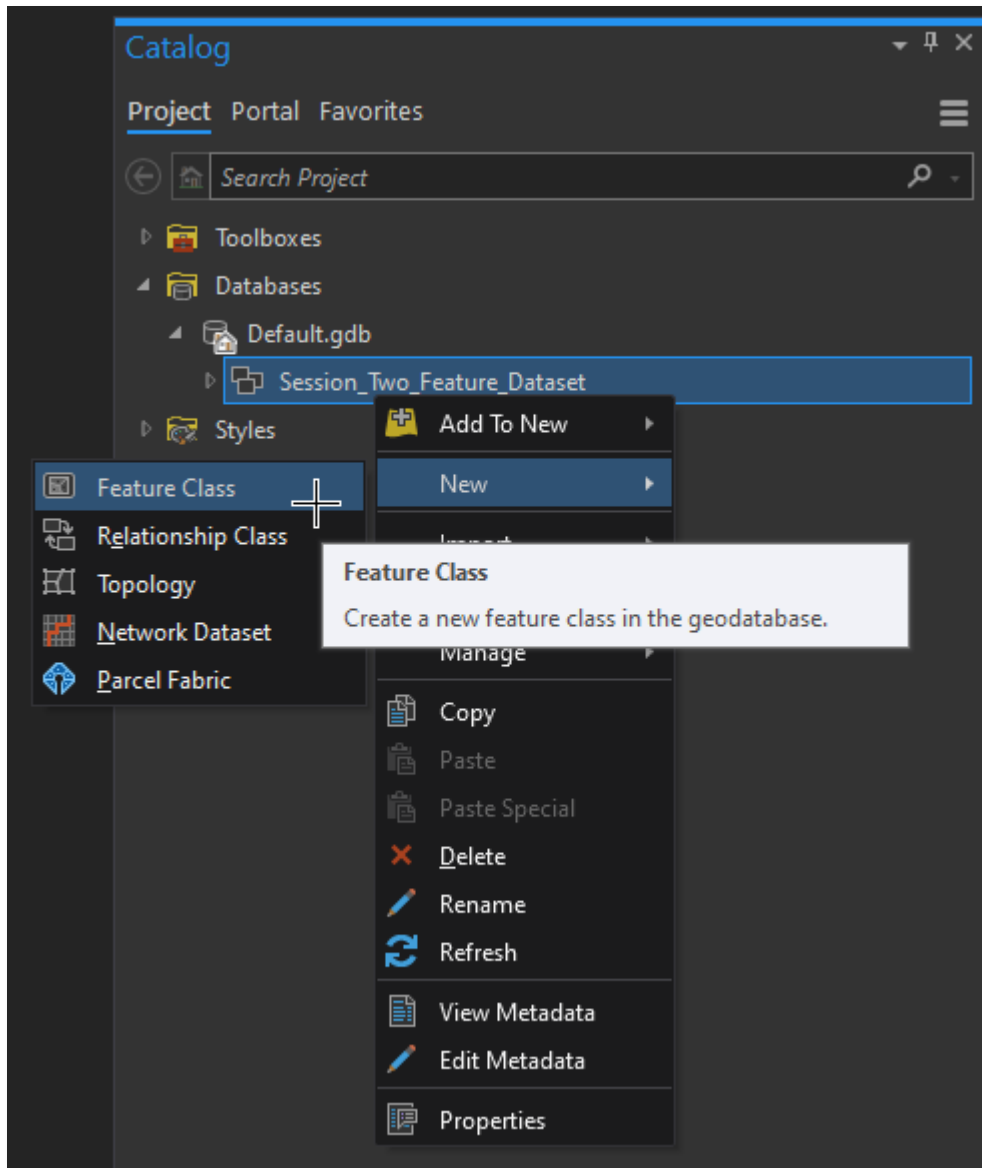
8. Click "Run" at the bottom right to execute the creation tool.



9. Back on the Catalog Pane, the Feature Dataset is now visible.



10. Right-Click on the Feature Dataset and again Hover on “New”. Choose “Feature Class”.



11. Name this new Feature Class "Session\_Two\_BOUNDARY". Make sure the Feature Class Type is Polygon. Go ahead and leave "Z Values- Coordinates include Z values used to store 3D data" --- checked.

Leave the "Add output data to current map" --- checked. We don't have a map yet, so nothing should appear when we run the tool anyway.

**Create Feature Class**

Define

Name: Session\_Two\_BOUNDARY

Alias: Boundary

Feature Class Type: Polygon

Geometric Properties

- M Values - Coordinates include M values used to store route data.
- Z Values - Coordinates include Z values used to store 3D data.

Add output dataset to current map

12. Click "Finish" at the bottom of the "Create Feature Class" Pane. Note: this is a new pane opened when you selected "Create New Feature Class".

Create Feature Class

Define

Name: Session\_Two\_BOUNDARY

Alias: Boundary

Feature Class Type

Type of features stored in the feature class.

Polygon

Geometric Properties

M Values - Coordinates include M values used to store route data.

Z Values - Coordinates include Z values used to store 3D data.

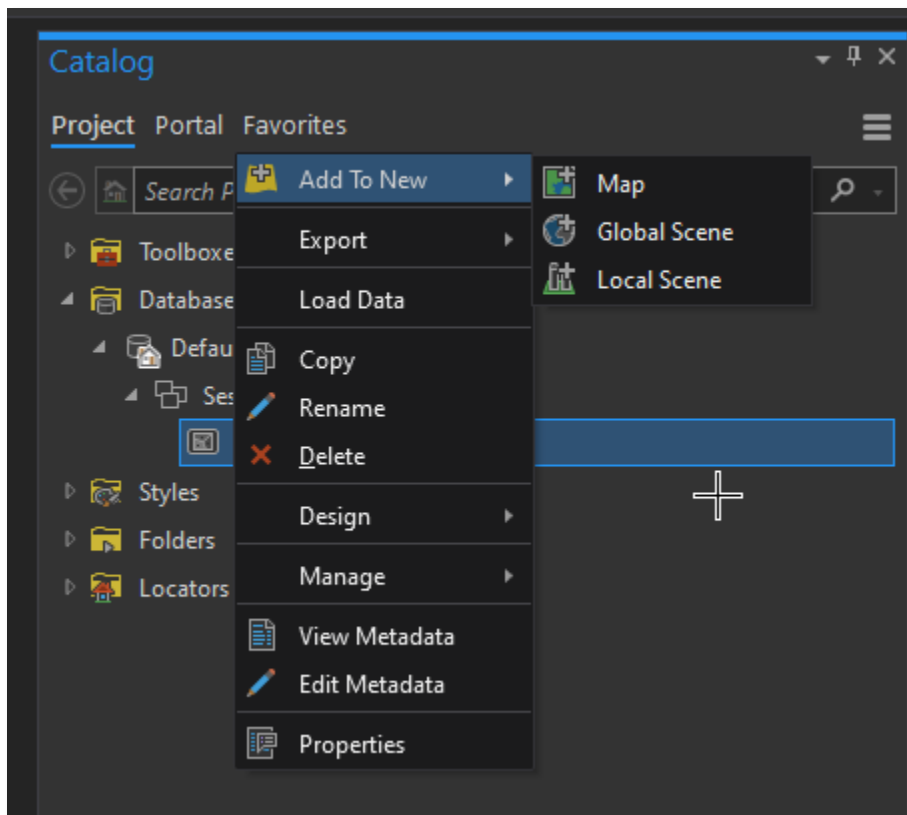
Add output dataset to current map

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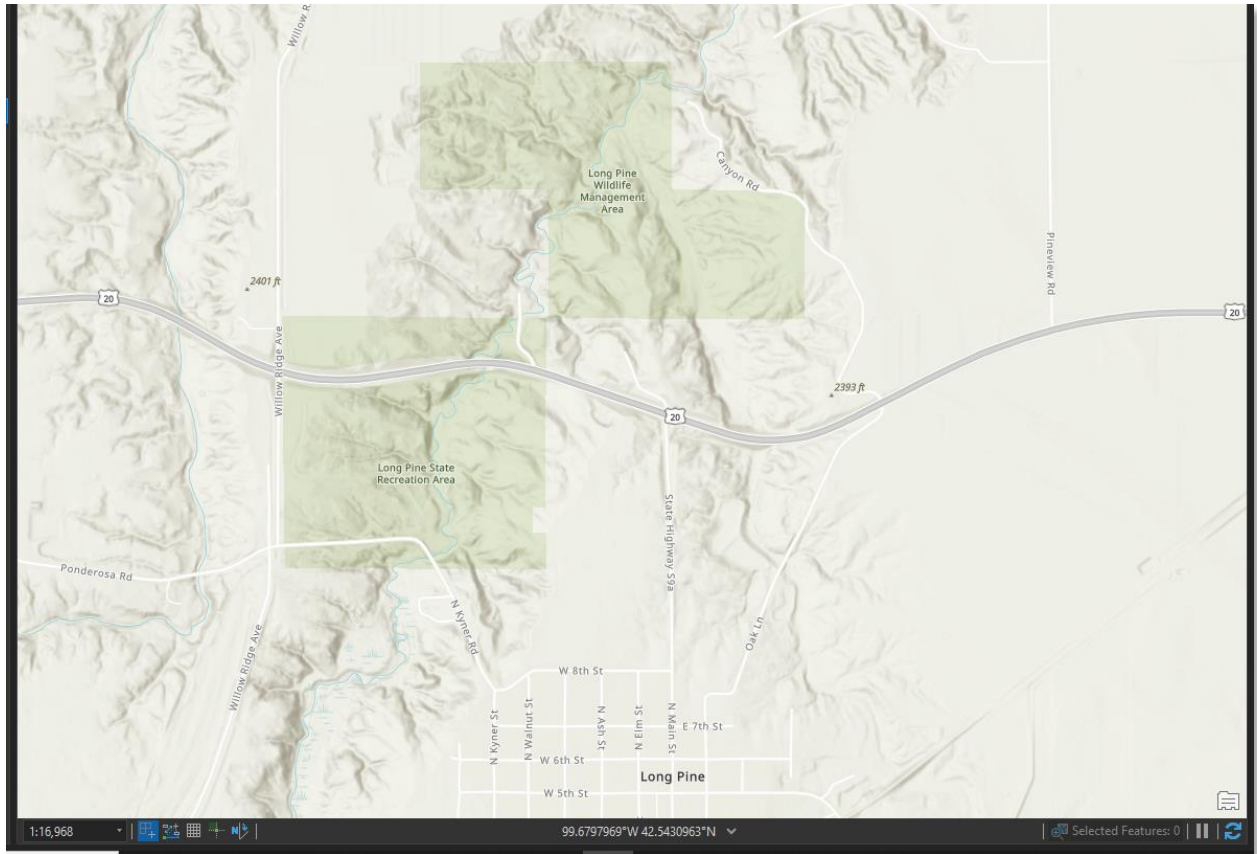
Previous Next Finish Cancel

Catalog Create Feature Class Geoprocessing Symbology Element Export

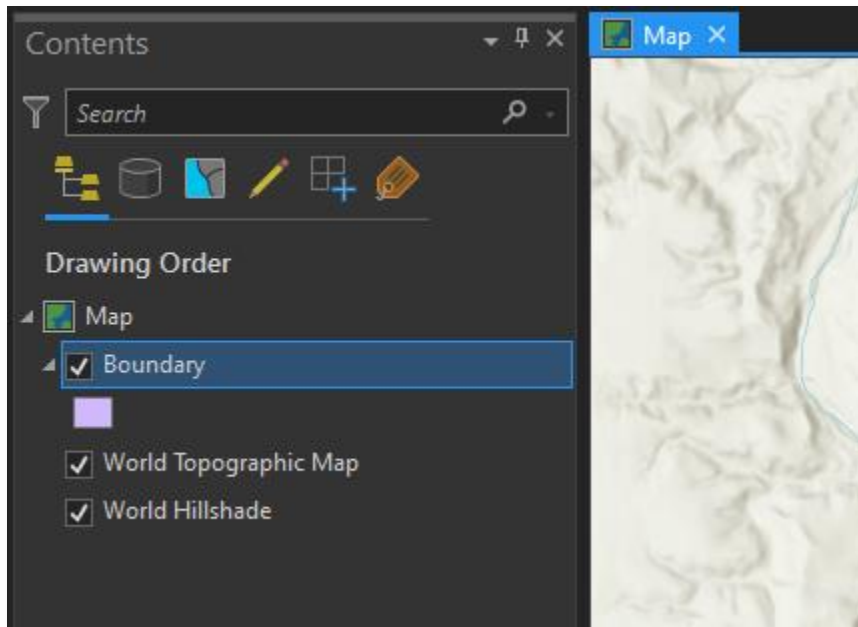
13. Right-Click the text for the new Feature Class and Hover on “Add to New”. Then choose, “Map”. It will be projected based on the Feature Class that inherited the coordinate system from the Feature Dataset.



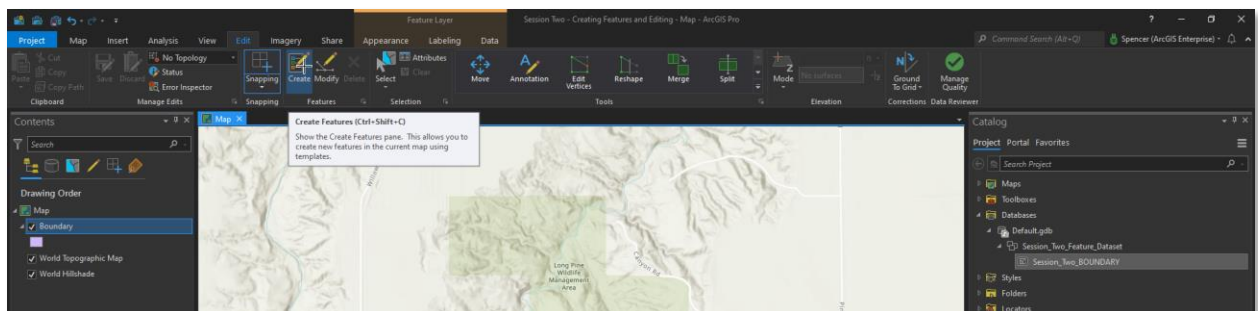
14. Pan and zoom to any Game and Parks property in the State. Here, the author chose Long Pine SRA and Long Pine WMA.



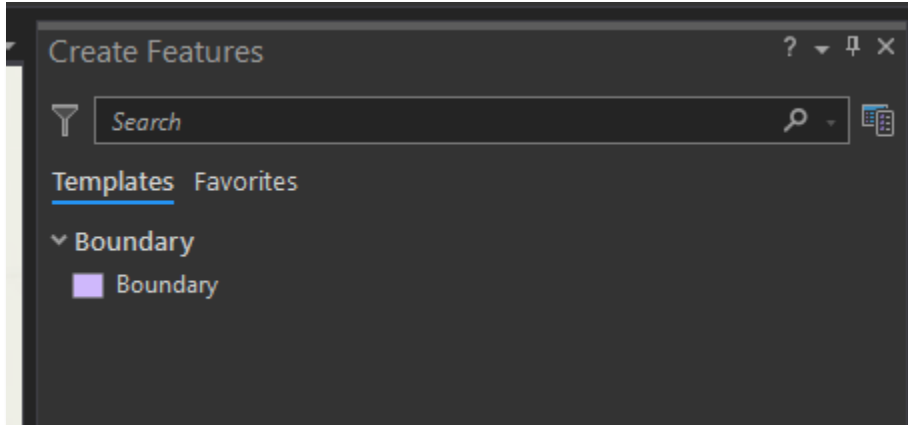
15. Notice in the Table of Contents that the Feature Class Alias name is displayed – “Boundary”, not the actual Feature Class name of “Session\_Two\_Boundary”.



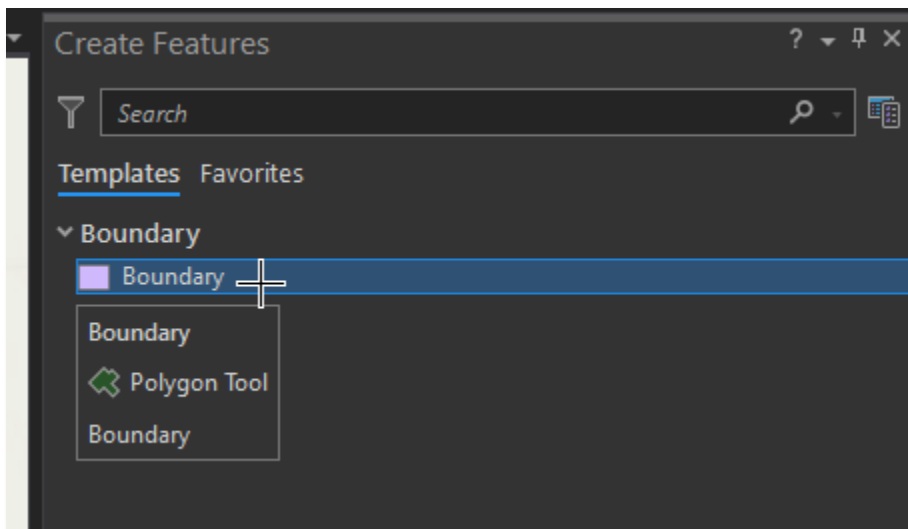
16. At the top of the screen, click the Edit Tab, then choose the Create icon. (It has a little pencil inside of it).



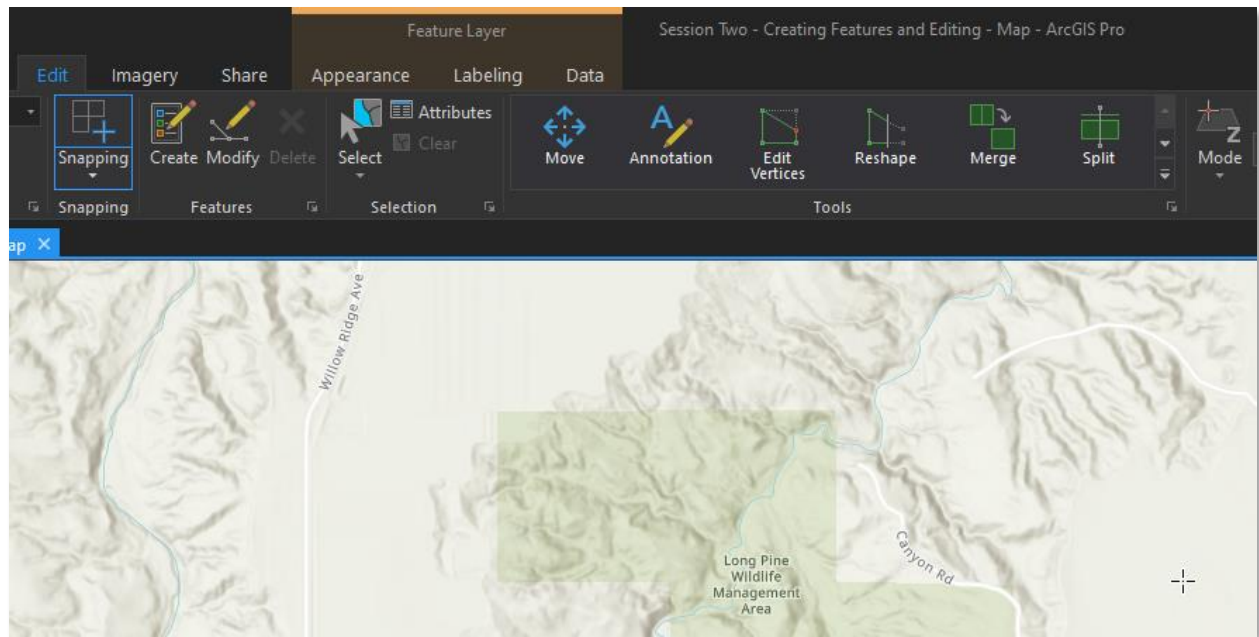
17. Please note that only the Boundary layer is available here to create features. This is because no other features are in the Table of Contents. Many times users attempt to begin creating features but they have not added the class containing the features (Feature Class) into the document yet.



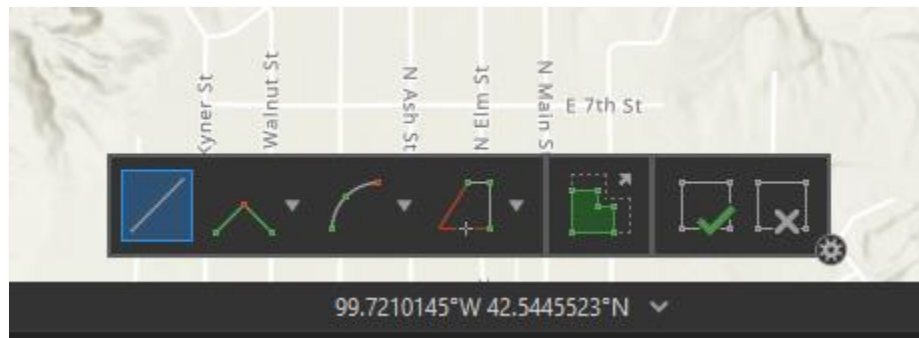
18. Click "Boundary" once to begin creating new features.



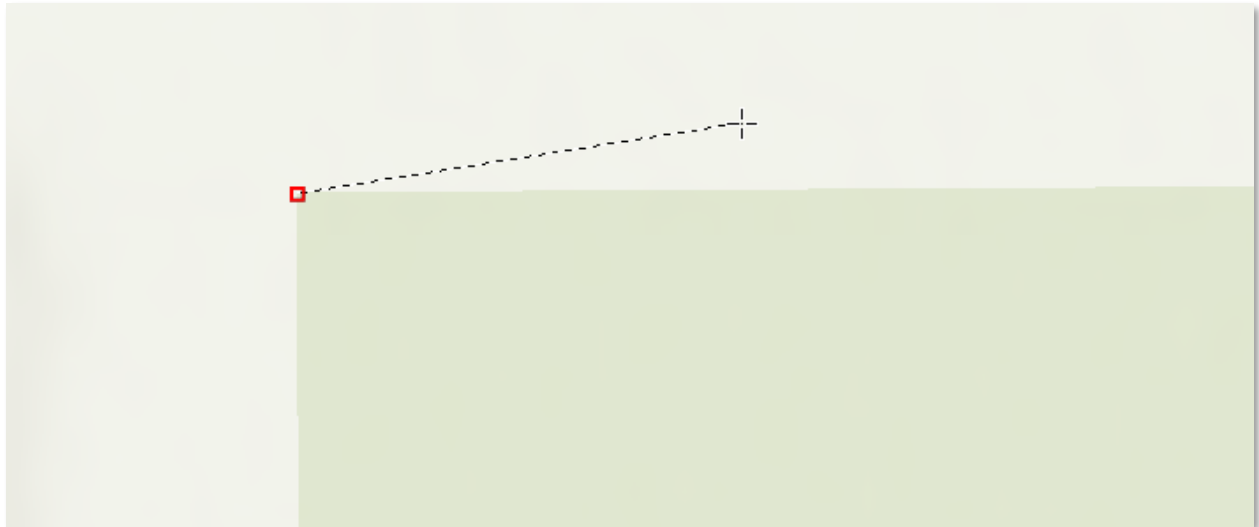
19. The options at the top on the Edit Tab are visible. The icon for the cursor has changed too.



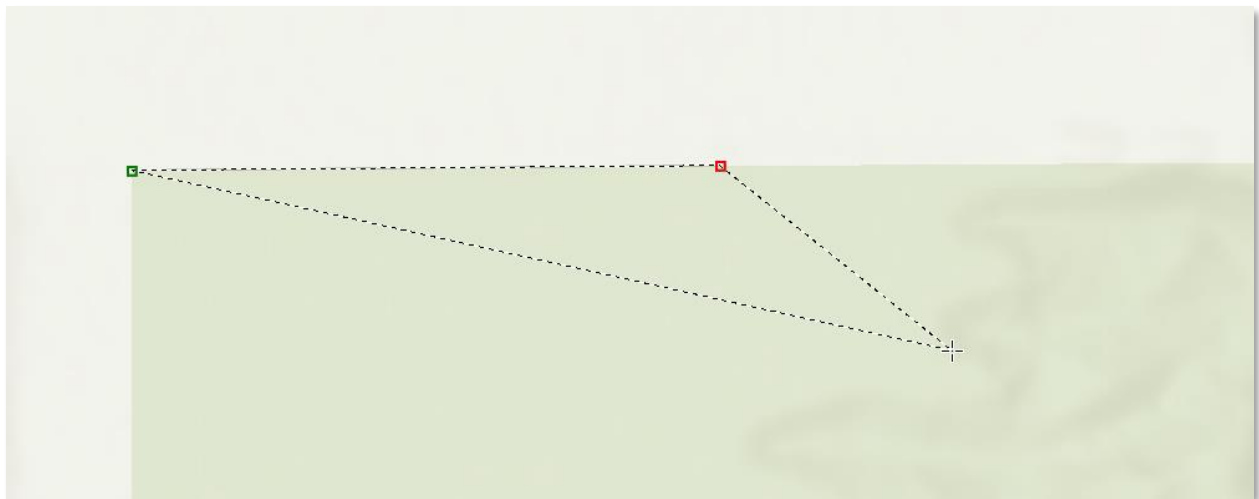
20. At the bottom of the screen there are options for "How" to begin drawing features. Choose the first one that looks like a simple line segment for now.



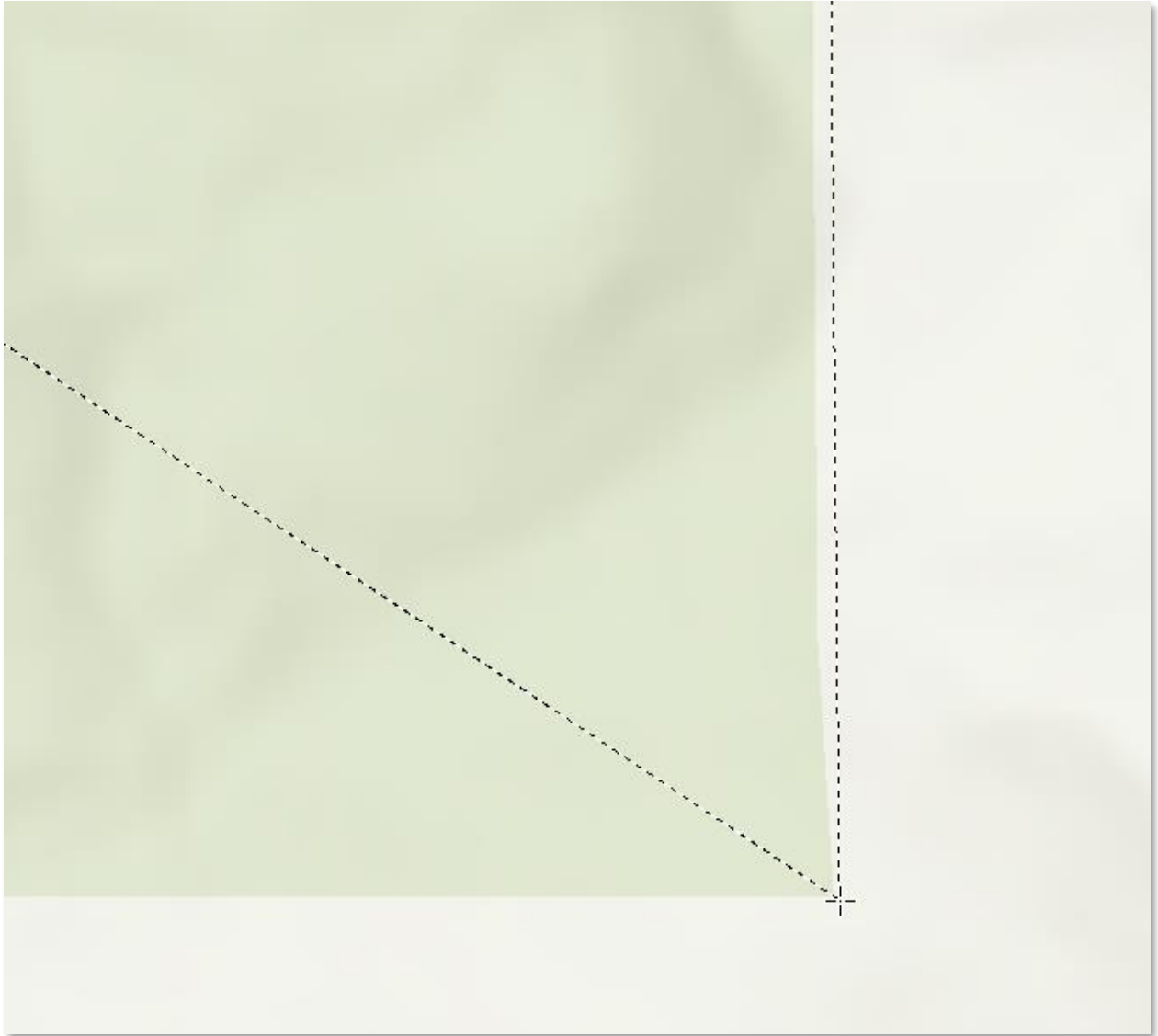
21. Pan and zoom closer to the boundary for a Game and Parks property. Use the scroll wheel on a mouse to zoom, or two fingers when using a laptop. Click once to create a vertex and begin drawing.



22. Click again to place another vertex. Notice how a polygon is starting to take shape.



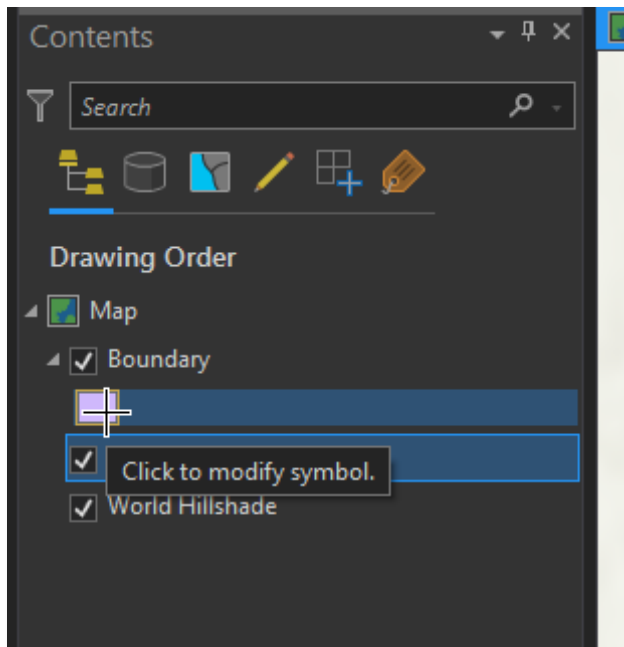
23. Notice here that the shape being traced along the east side has a slight jog in the line. Depending on one's use, it may be a good idea to place a few more vertexes, but at a larger scale. Sometimes time is more valuable than precision when ultimately the boundary line's thickness on a map or graphic would cover any such discrepancies anyway.



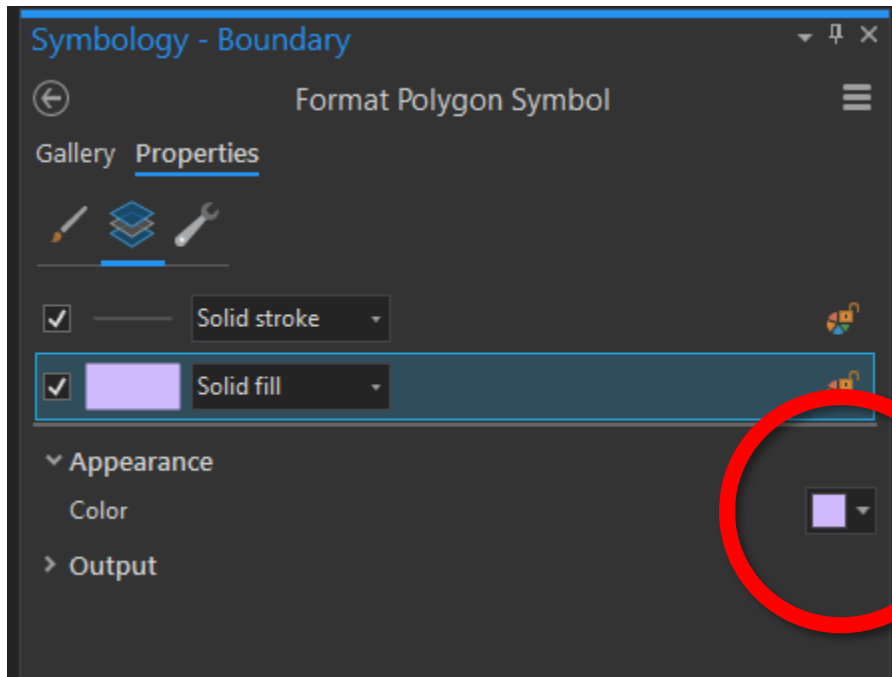
24. Notice here that the boundary for Long Pine WMA is covered by the purple while attempting to draw. We will have to adjust the transparency before we continue drawing.



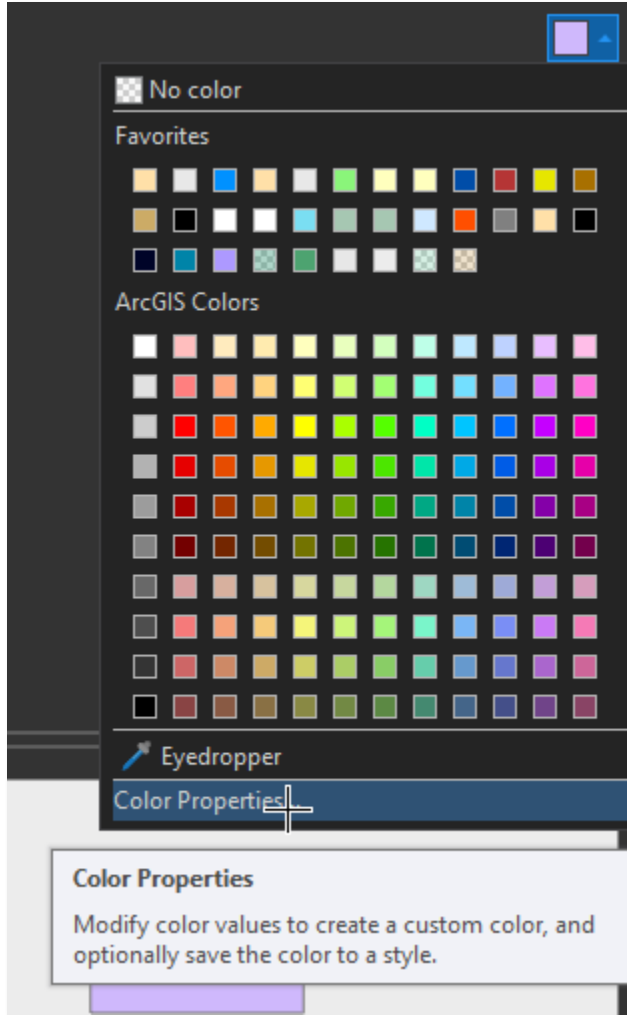
25. As we learned in the first session, we can change the color and transparency by clicking the small polygon for any layer in the Table of Contents. Note: you will still be in "Editing Mode", since you have not finished the feature or closed out of that tool. It is still the active tool.



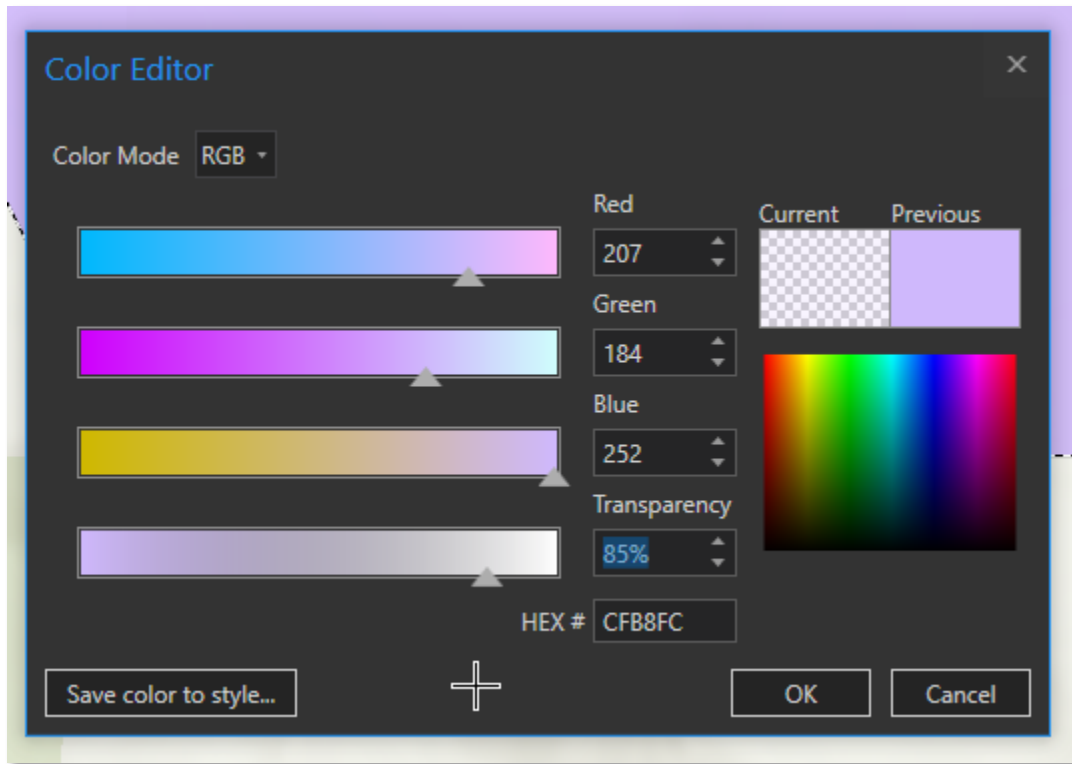
26. Click on Properties on the Symbology Tab to display how this polygon is 'styled'. Then click the small purple box to change its color properties.



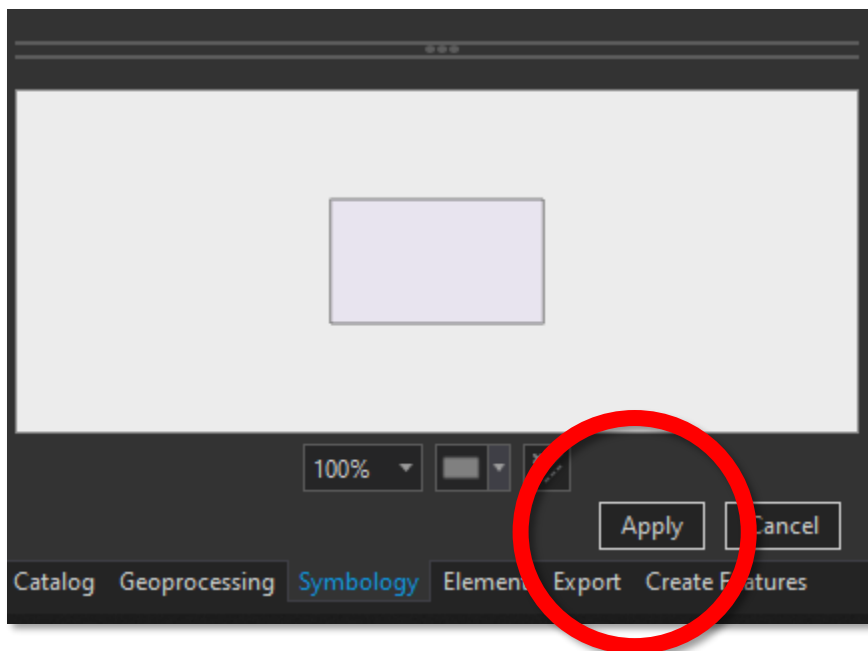
27. Choose 'color properties' at the bottom.



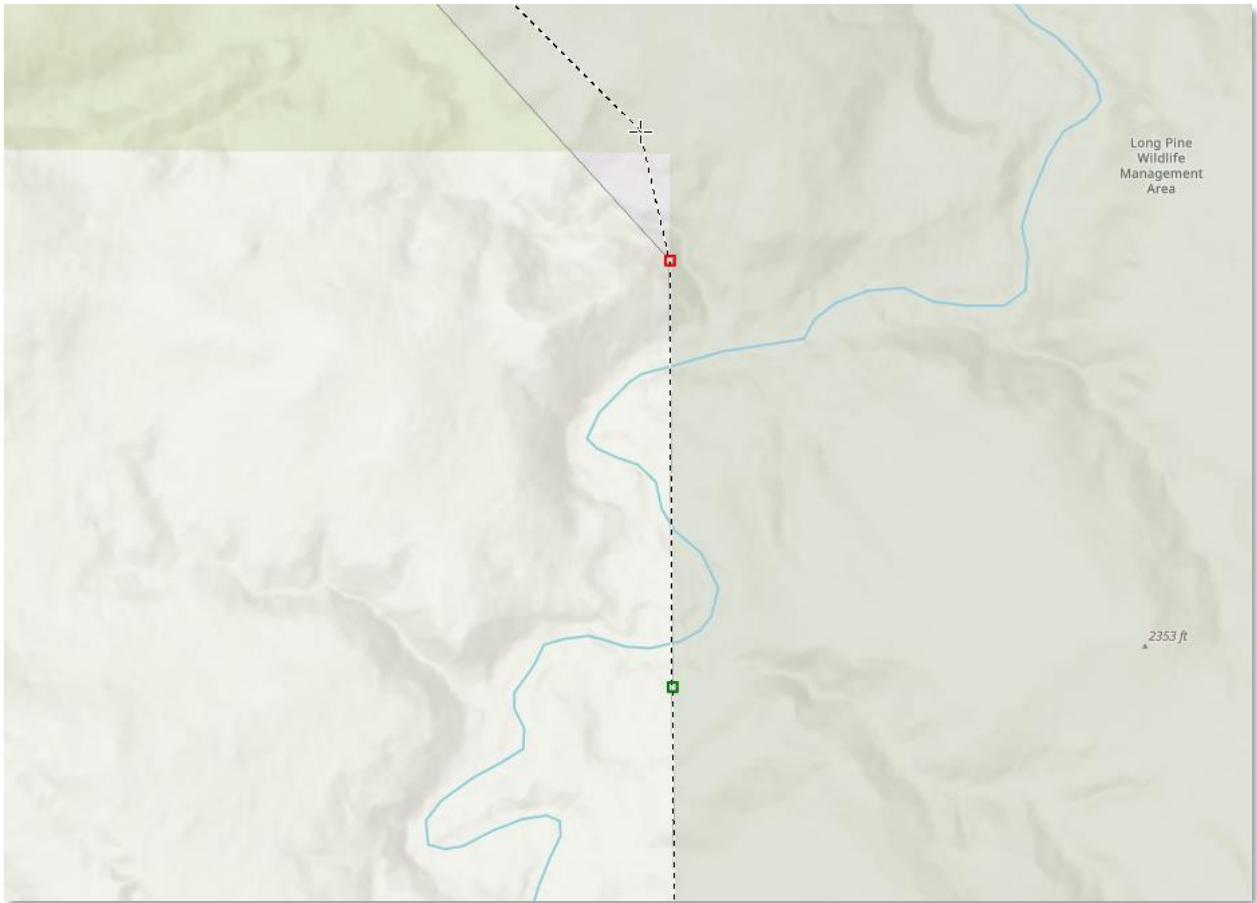
28. This opens the Color Editor dialogue window. Set the Transparency to about 85% to be able to see through the purple. Click OK.



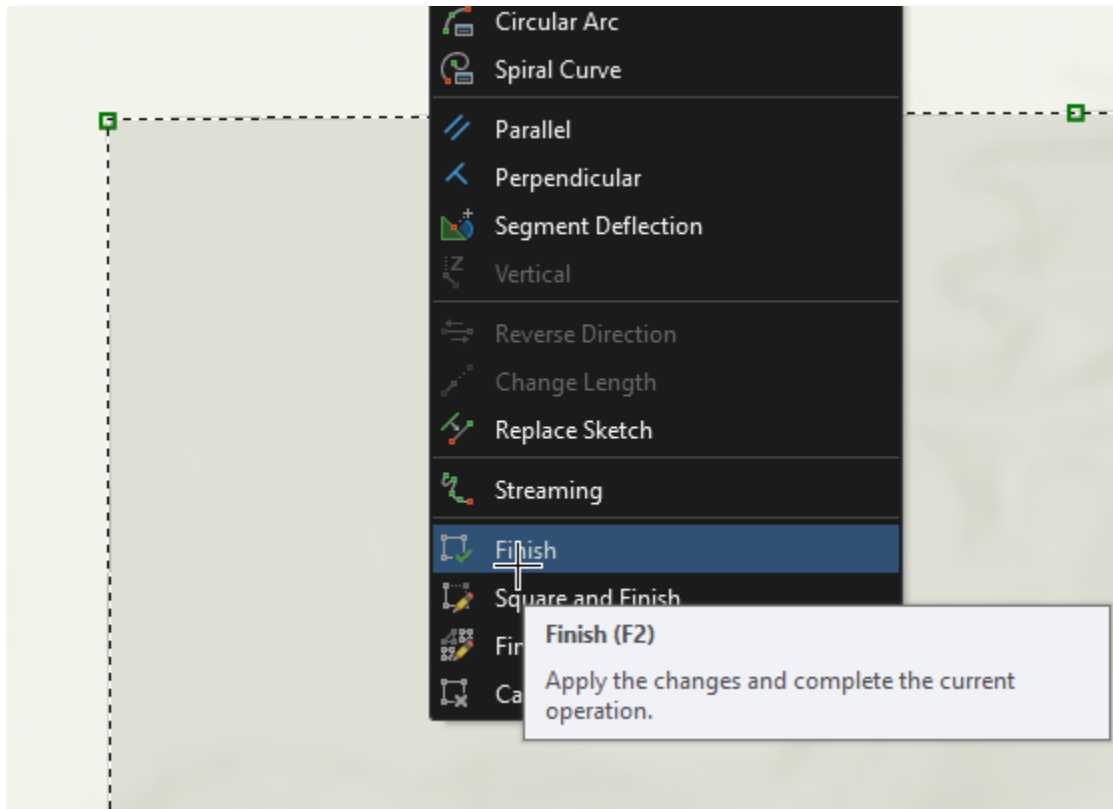
29. Click Apply on the Symbology pane to set that transparency to 85%. Then continue tracing.



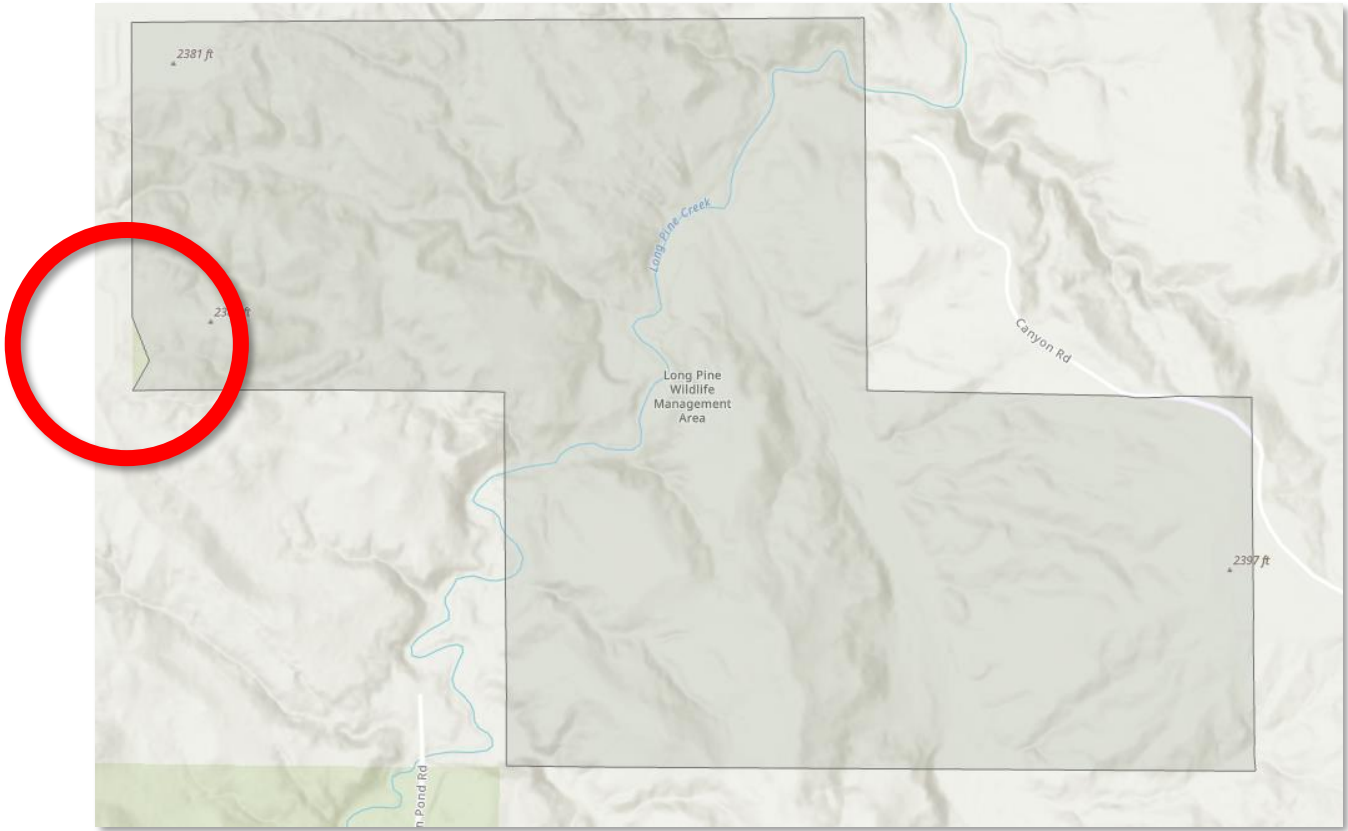
30. One is able to view both the new layer and anything underneath when the transparency is set just right. Please note: we could have just as easily turned OFF the Fill for this layer in the Symbology properties tab with one click.



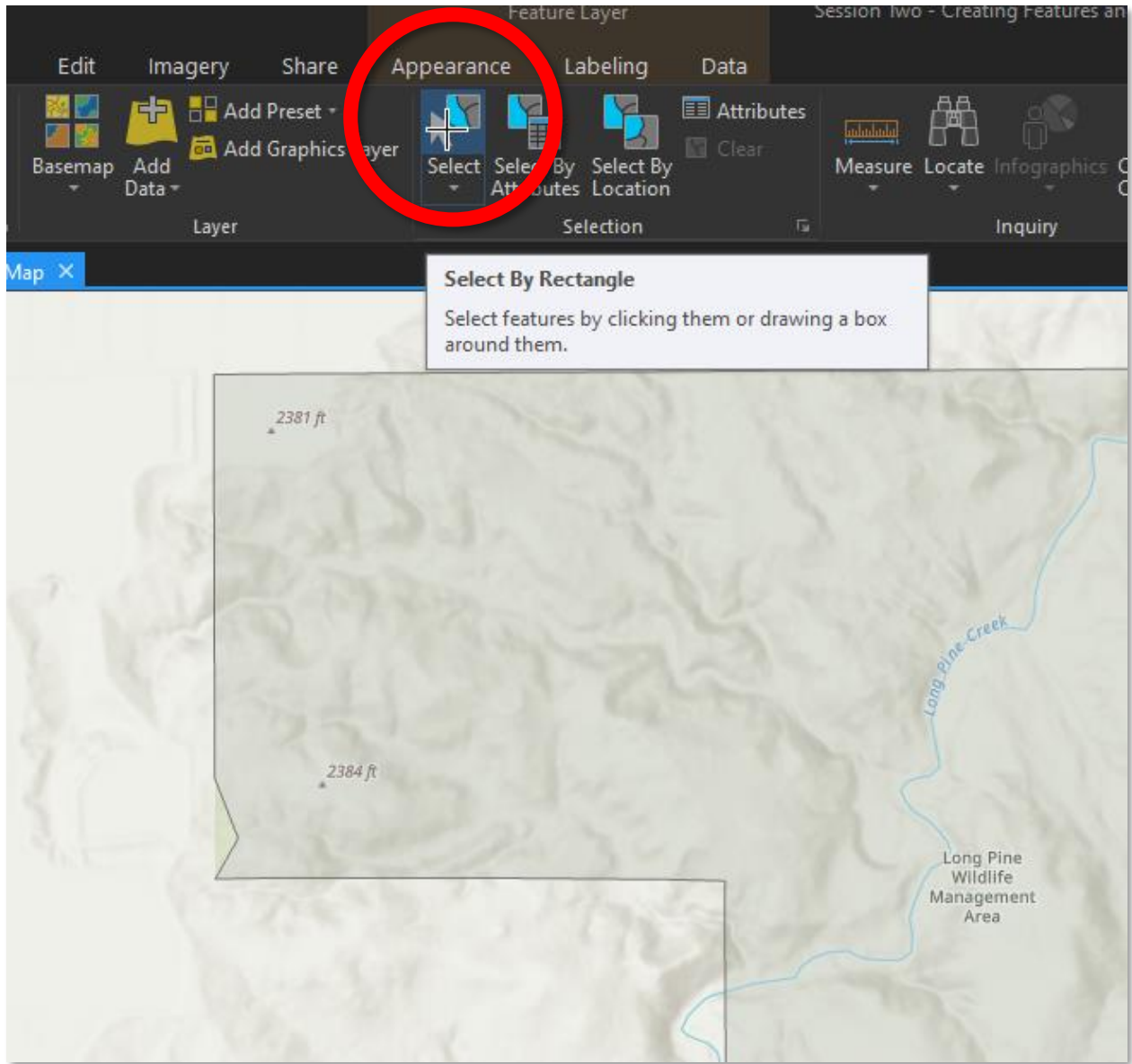
31. Press F2 to Finish the Sketch. Also, double-clicking can work, or right-click and choose 'Finish'.



32. The sketch is completed for Long Pine WMA, but there is a major discrepancy in the shape towards the west. We will edit this next.



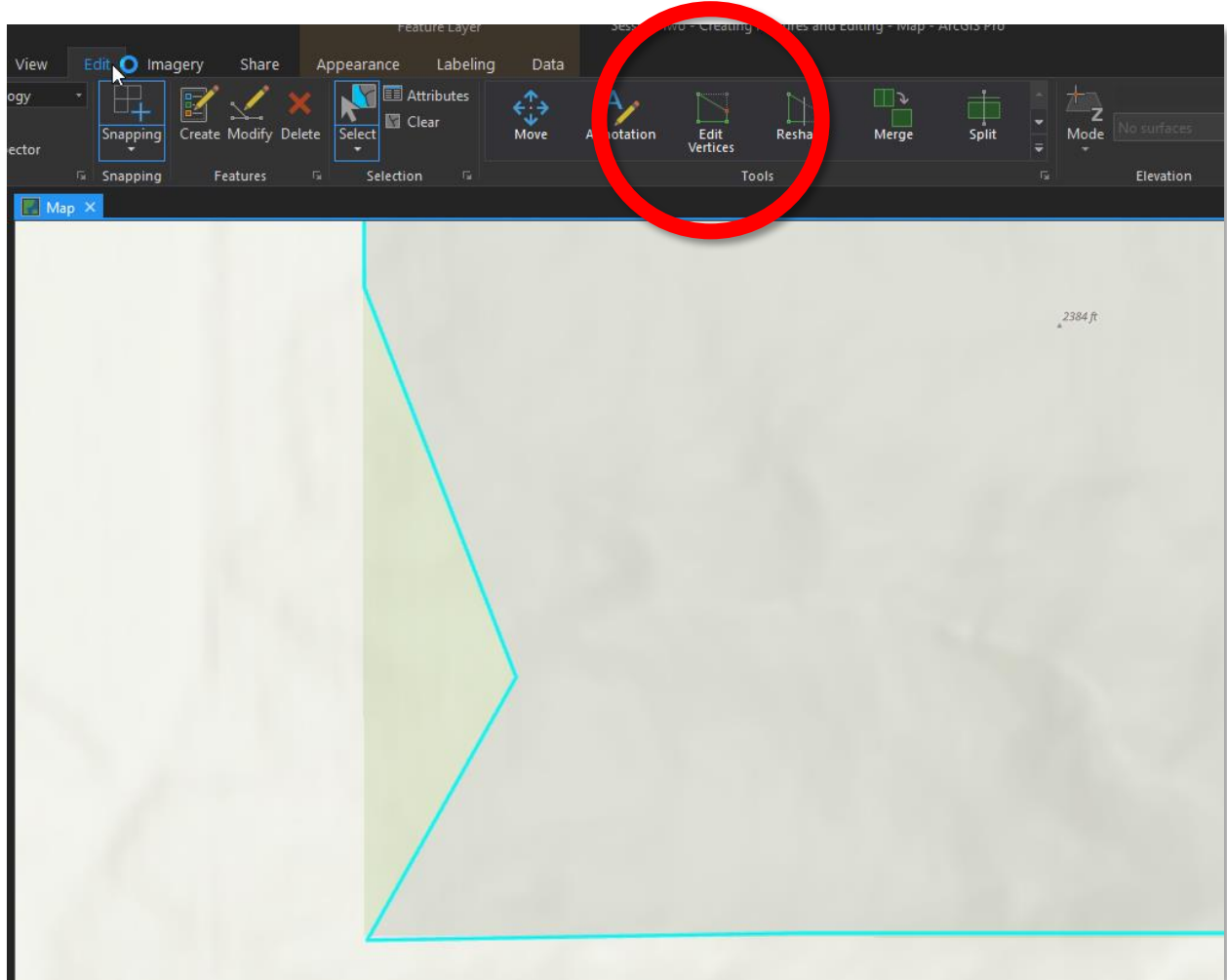
33. Begin by clicking the "Select" tool on the Edit tab. This will release you from Edit mode.



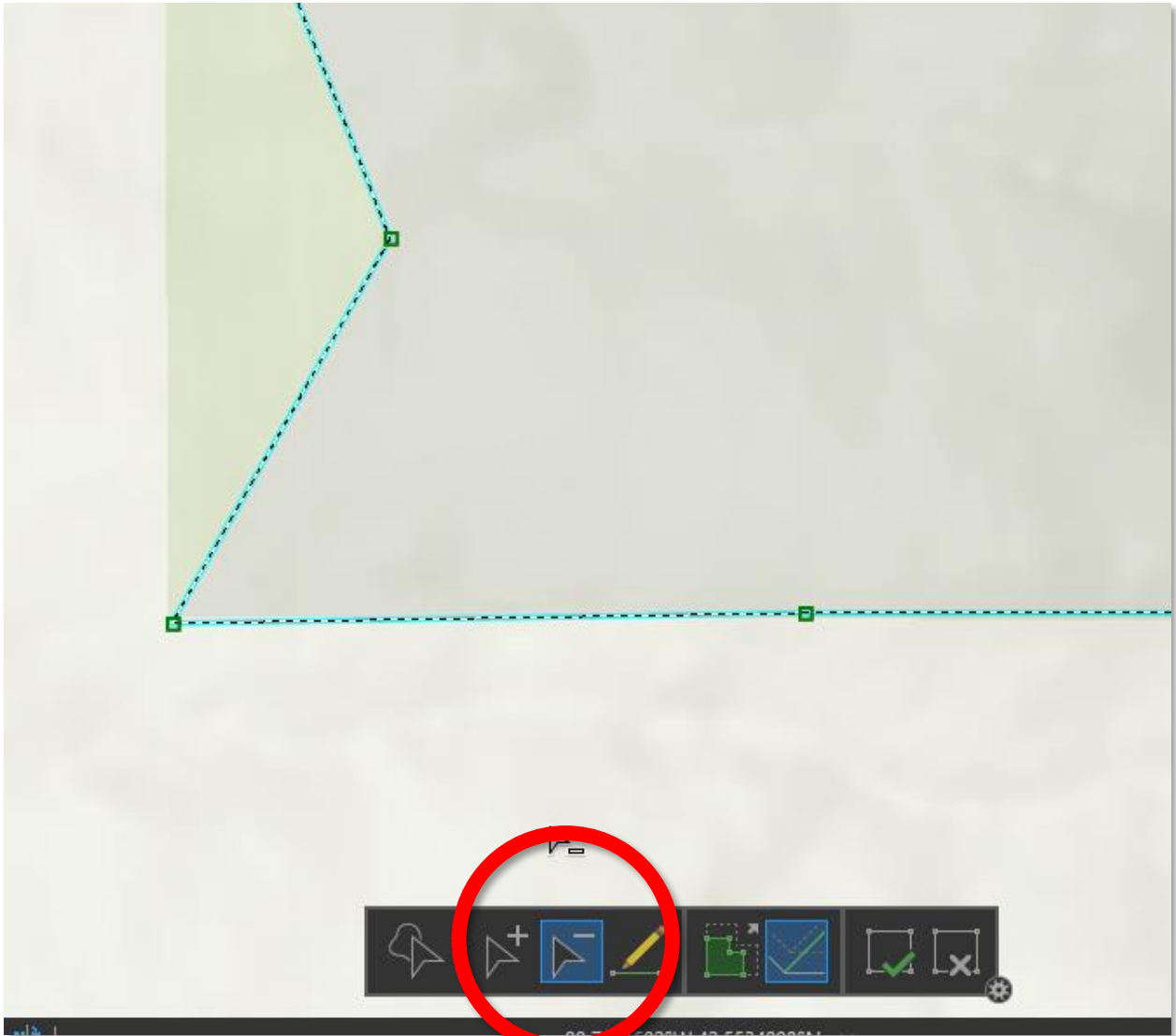
34. Click the feature once to select it – this is now the “Select Set”.



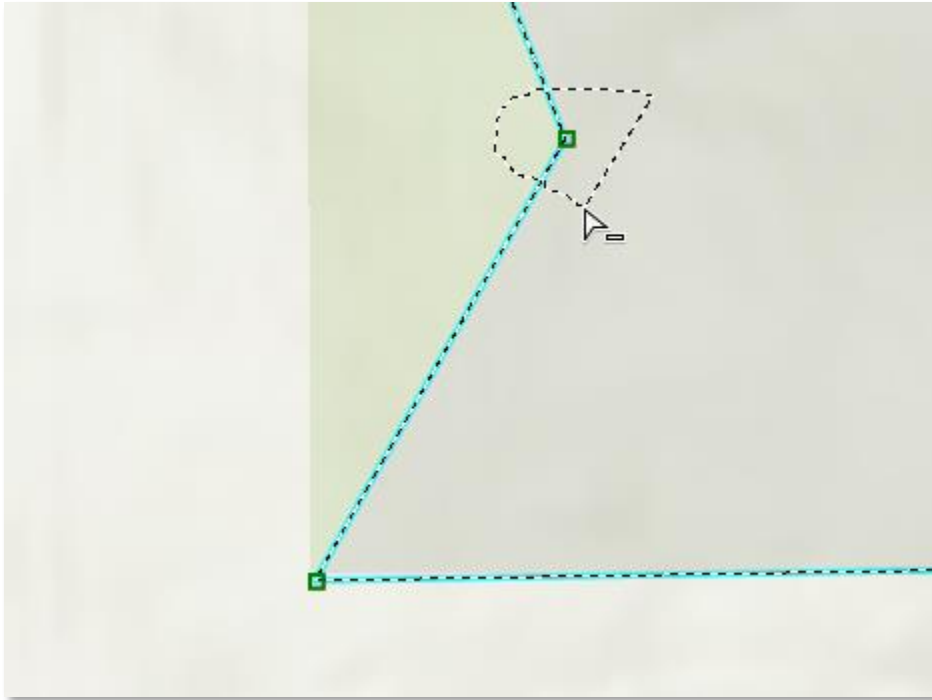
35. Zoom in to the area that needs repaired and again choose the Edit Tab. Choose the "Edit Vertices" icon near the middle. Not only will the vertices be visible now, but a new set of editing options are available at the bottom of the screen.



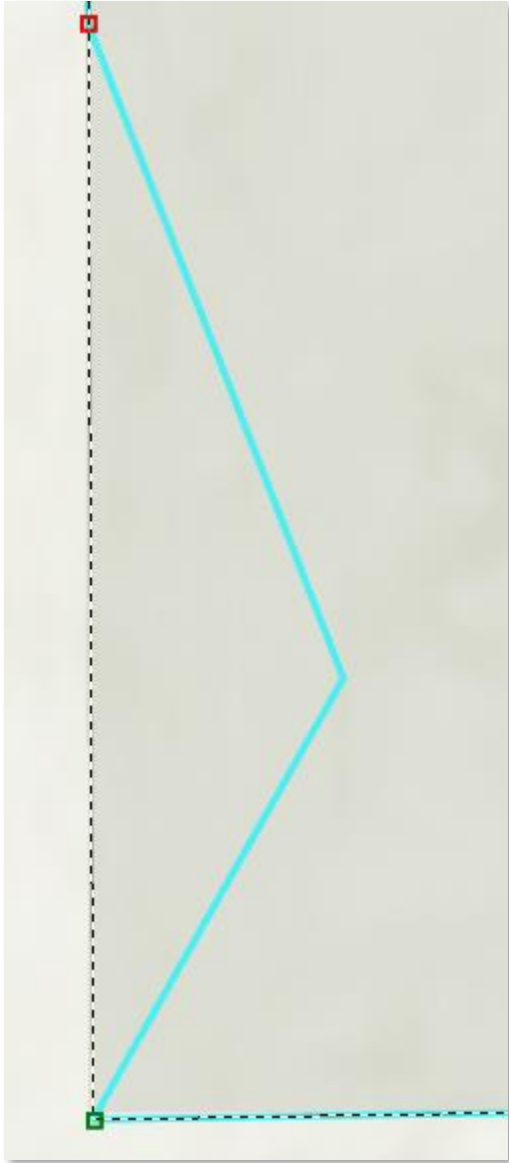
36. Choose the icon that has a little minus sign on it. Notice that the cursor has changed its appearance to reflect the tool that is active.



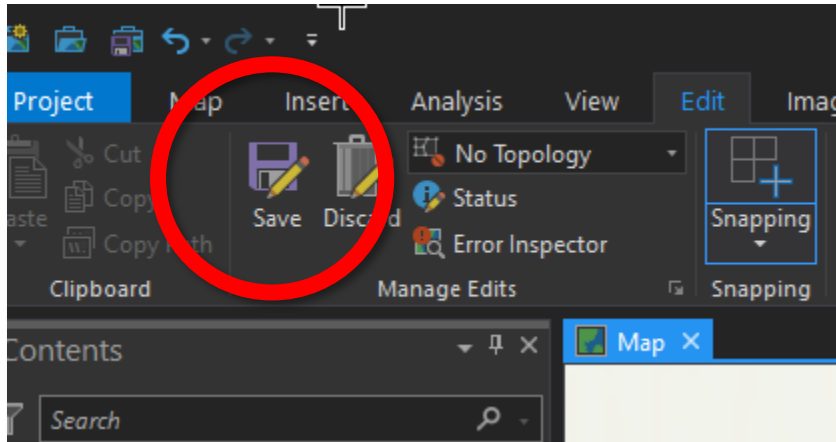
37. Drag a small box around the vertex that was placed incorrectly. It will be removed instantly.



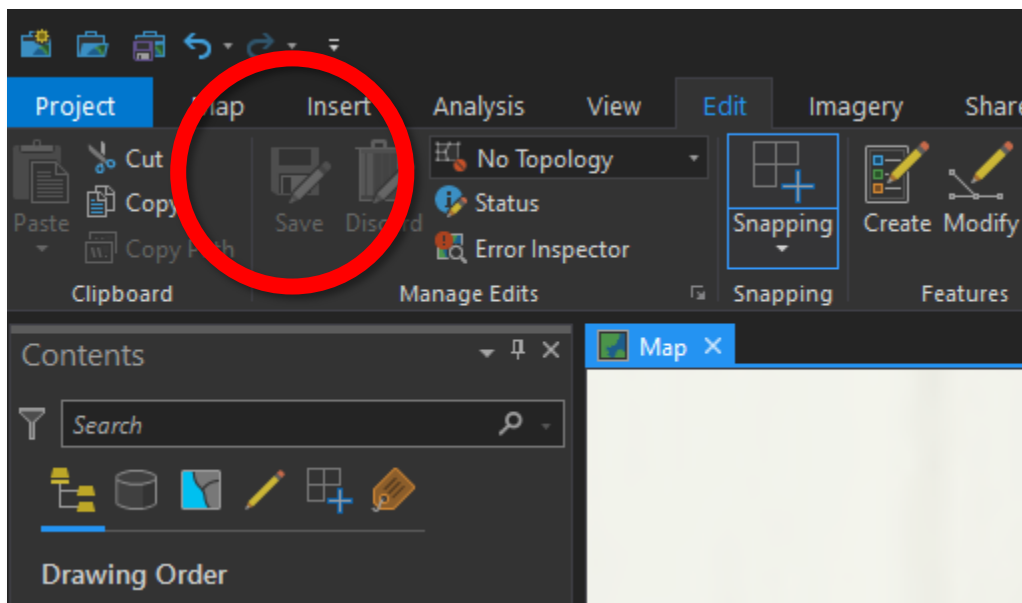
38. Note: a remnant of the original shape will exist until you save. This gives you one last chance to verify your edits.



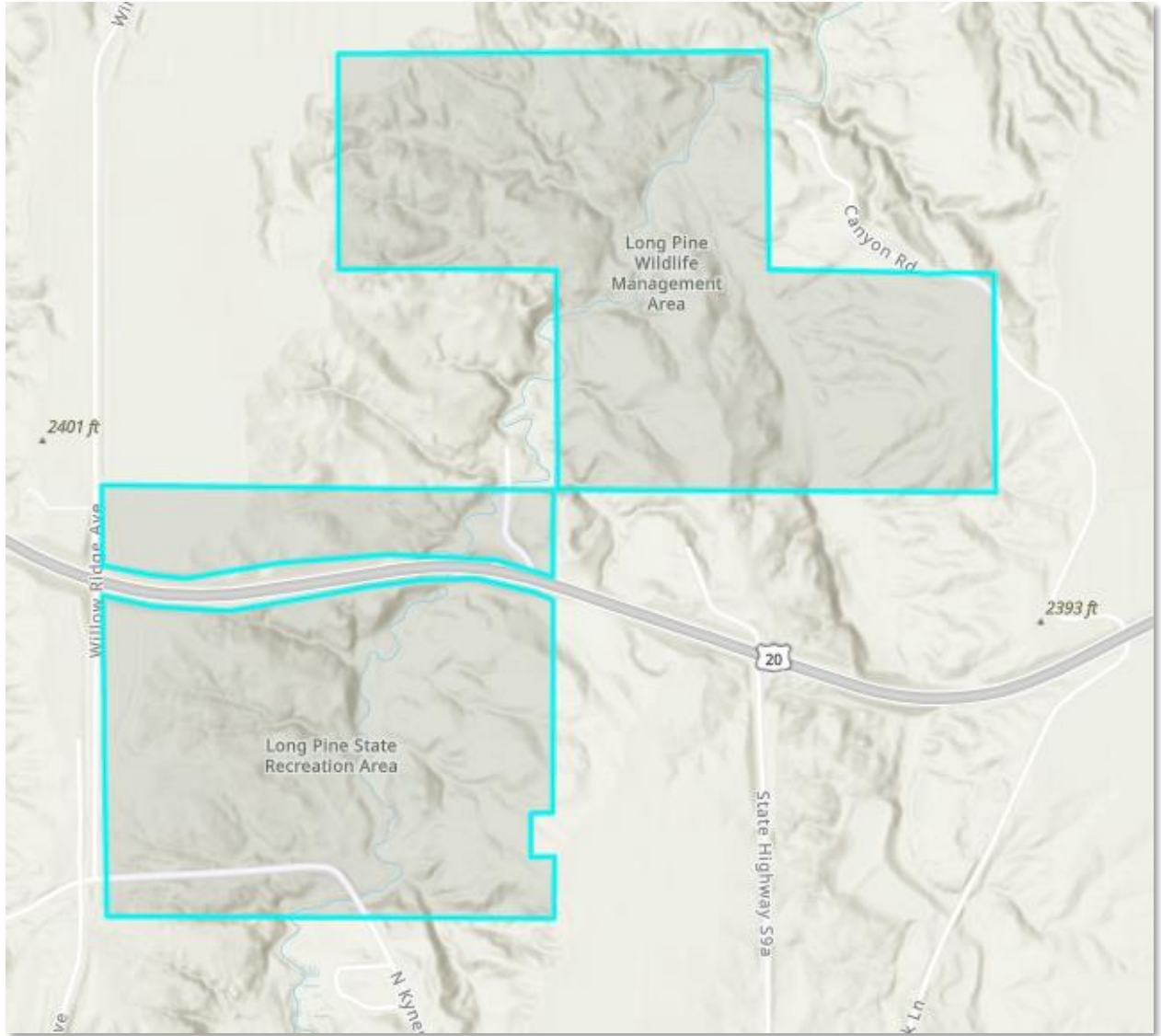
39. On the Edit Tab, press the purple Save icon to save these edits. Please Note: Adding Features is considered an Edit, along with any editing of vertices, or moving features and even editing of data, which we will get to eventually. For now, realize there are two different types of "Saves". One saves edits to a database (Geodatabase, or other kinds of databases just containing scalar or tabular data), and another kind of Save saves the entire Pro Project document.



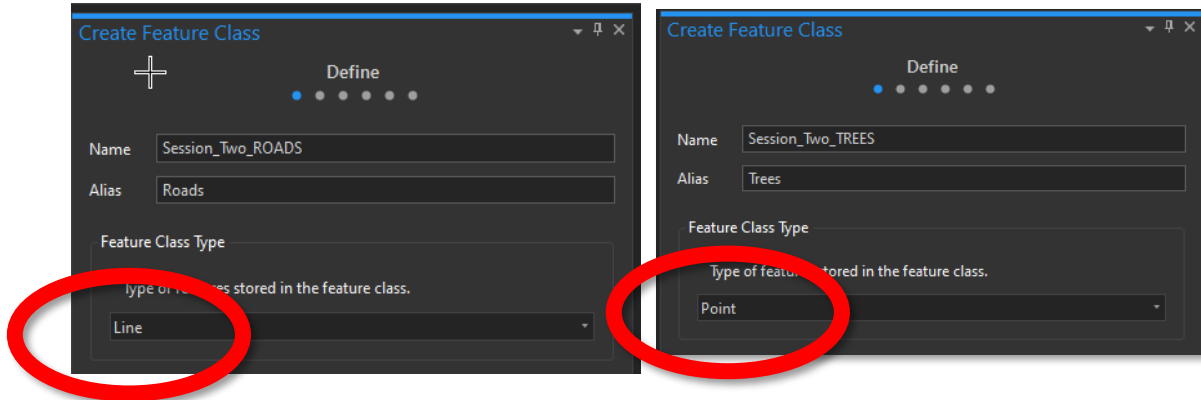
40. Click Save at the upper left, or press control-s. Notice that after you saved the Edits, the purple Save button turned grey. This indicates there were no more "Pending Edits". This is important to remember because sometimes, if there are pending edits, the software will not let you continue with other tasks. So, you sometimes have to save edits and get out of the Create Features activation in order to perform other Geoprocessing functions.



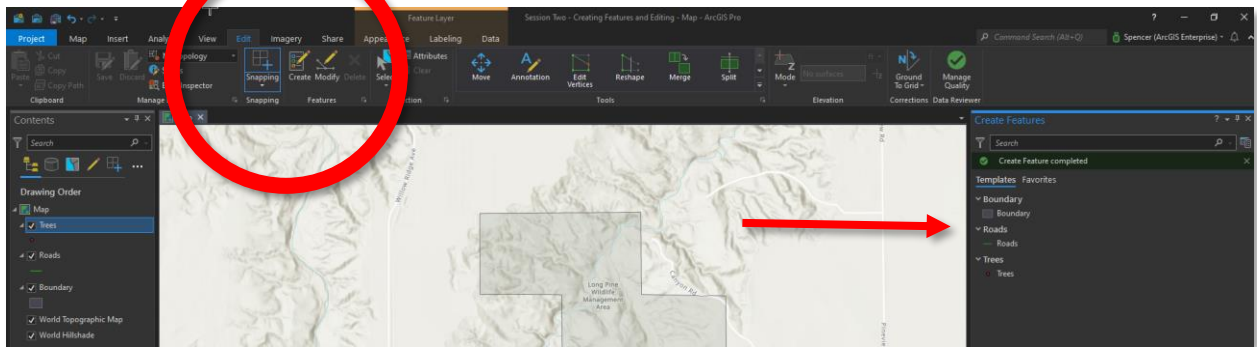
41. Trace the remaining portions of the Game and Parks boundary that you chose.



42. Create two more Feature Classes. One for Lines and one for Points. Name them Session\_Two\_ROADS and Session\_Two\_TREES, respectively. Then add them to the Map View. You can choose "Add to Current Map", or just drag and drop the layers from the Default.gdb into the Map View or even into the Table of Contents.



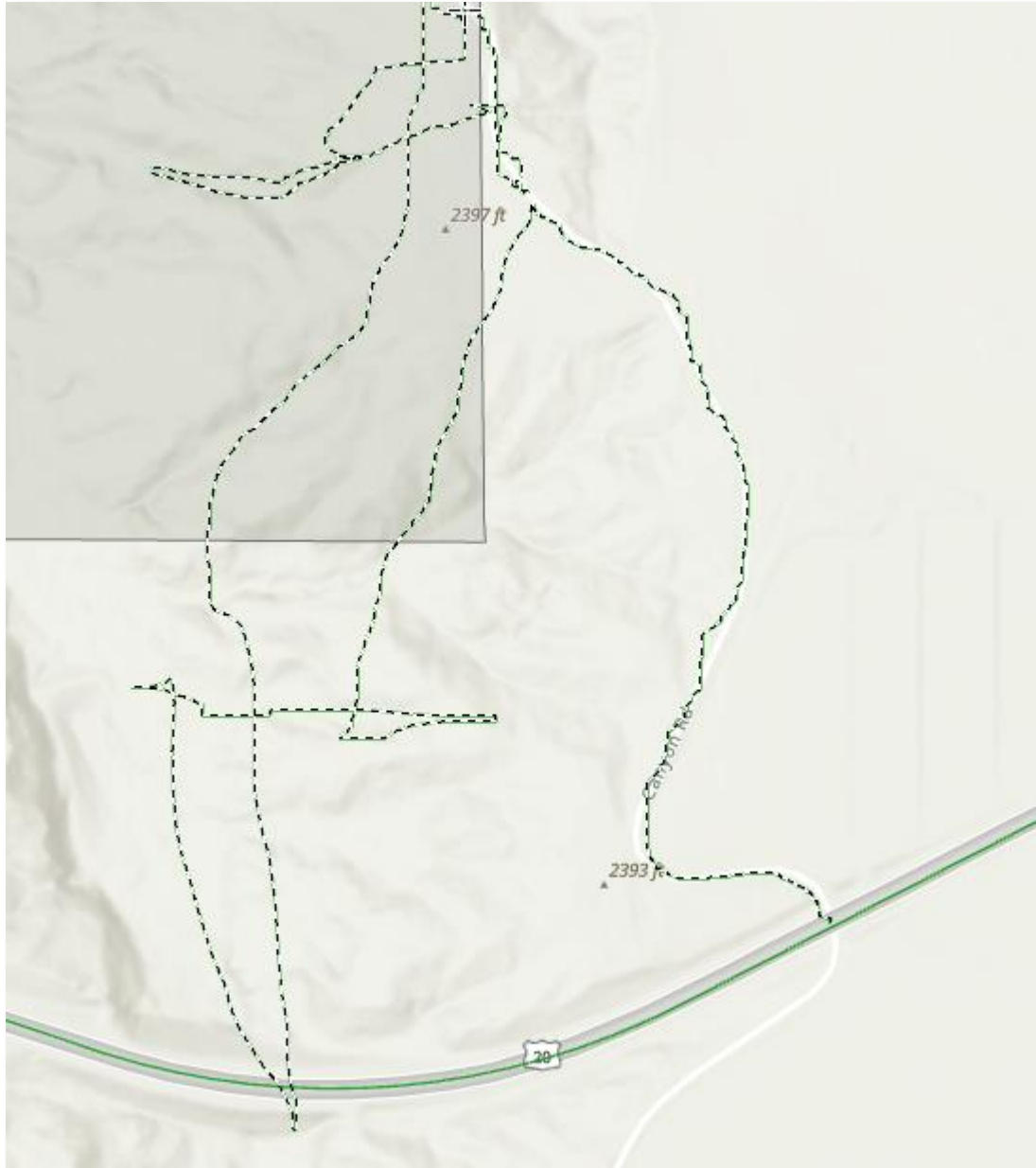
43. Again, pick Create on the Edit Tab and choose the Roads layer in the Create Features "Pane" on the right side. Then trace roads around the property you chose. Pan and zoom as needed.



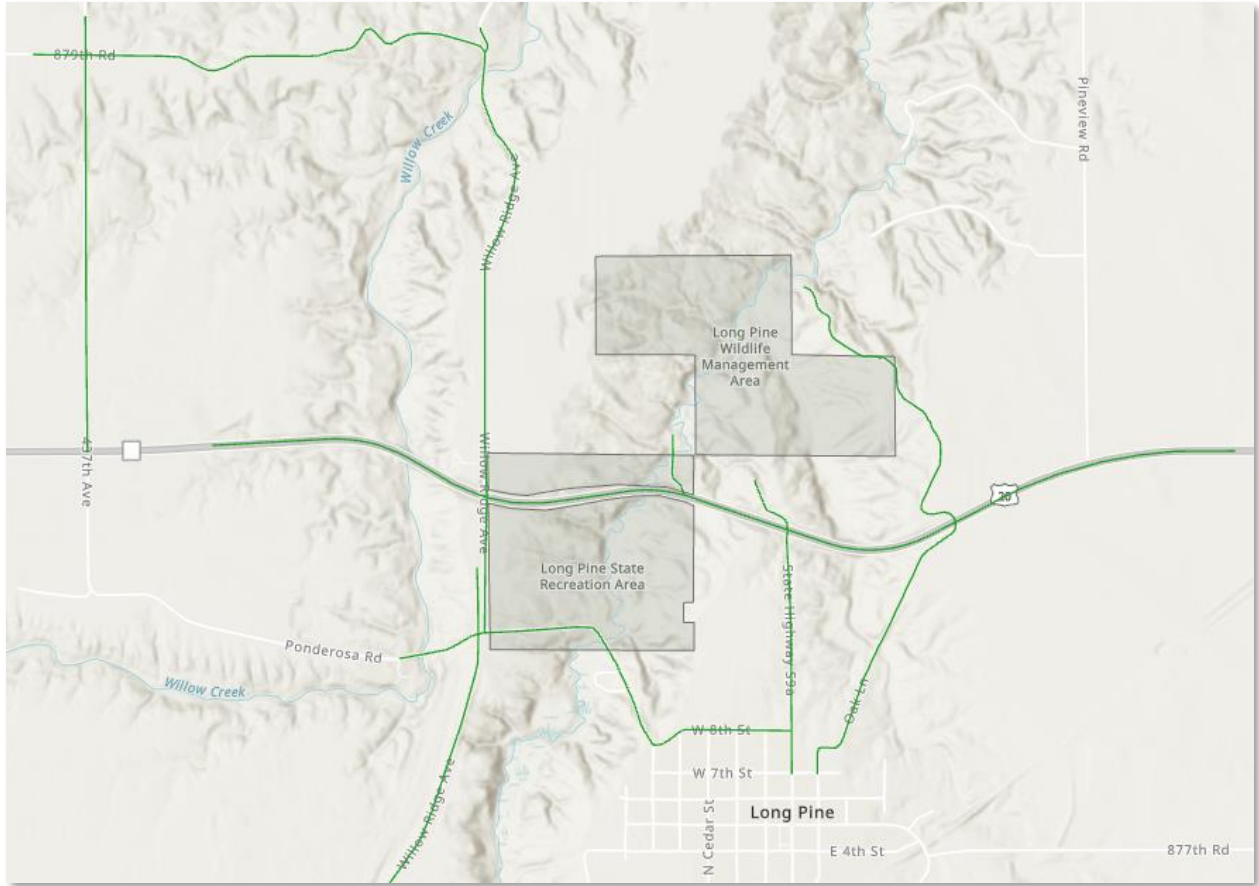
44. Explore the various drawing tools, including the Arc Segment for drawing curves. "Faceting" a curve with many individual straight line segments is also an option. Again, the stroke of the line, when drawn, will conceal many irregularities of a faceted line.



45. There is also a 'Free Hand' drawing tool, which is sometimes difficult to use...

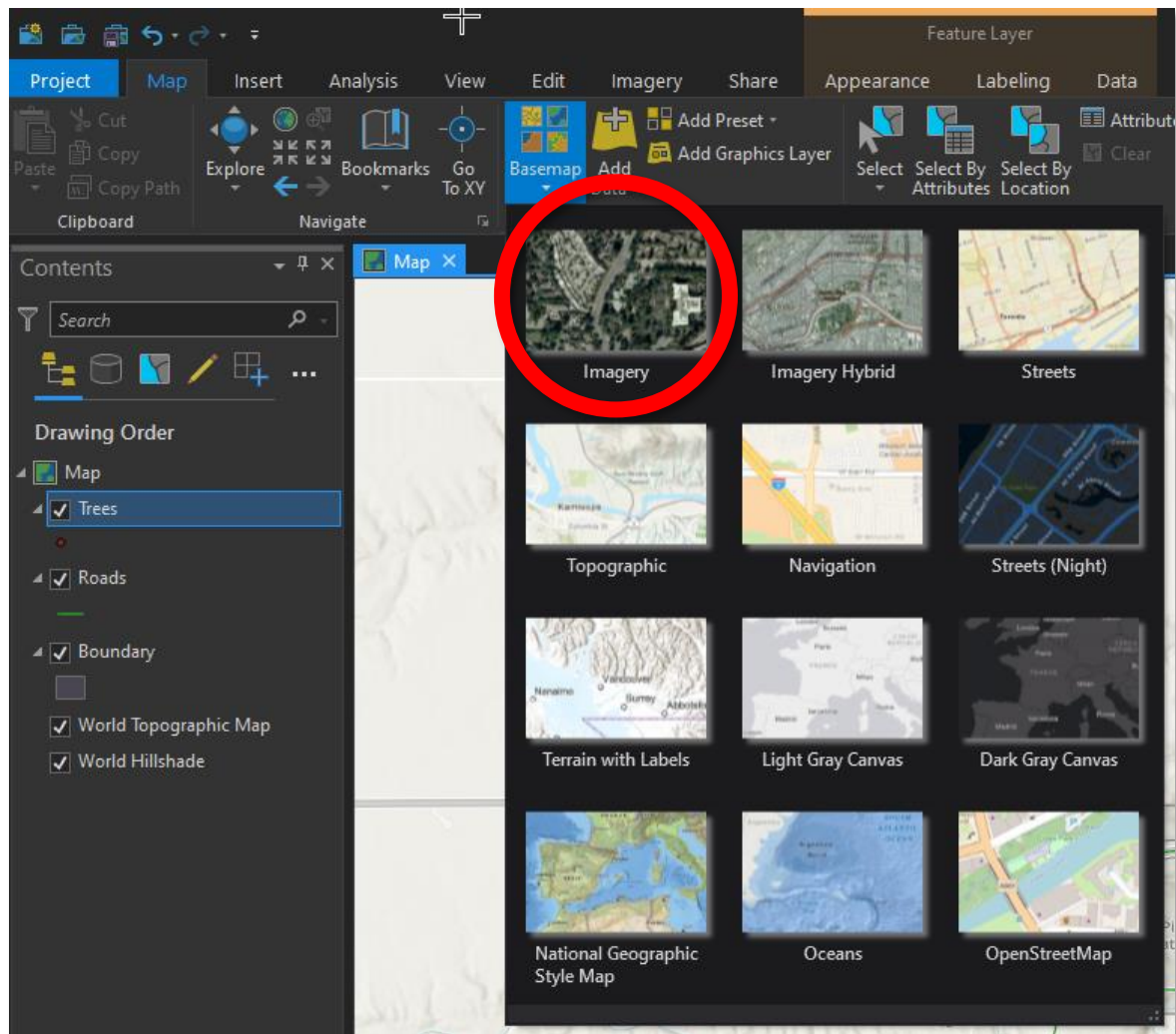


46. Here, only a few roads that were needed for this project have been traced.



47. On the Map Tab, click the drop-down arrow for Basemap and choose Imagery. Note: this is ESRI provided imagery and it comes from a variety of sources. There is ZERO standardization for how accurate it is – No one knows.

This problem is the same for any imagery provided by Google Maps/Google Earth and Bing Maps. Care MUST be taken and an understanding of this limitation must always be in mind. While sometimes imagery may have a higher resolution, there is no guarantee as to its accuracy. The only way is to go into the field with a surveyor and obtain 1/8<sup>th</sup> inch accuracy.



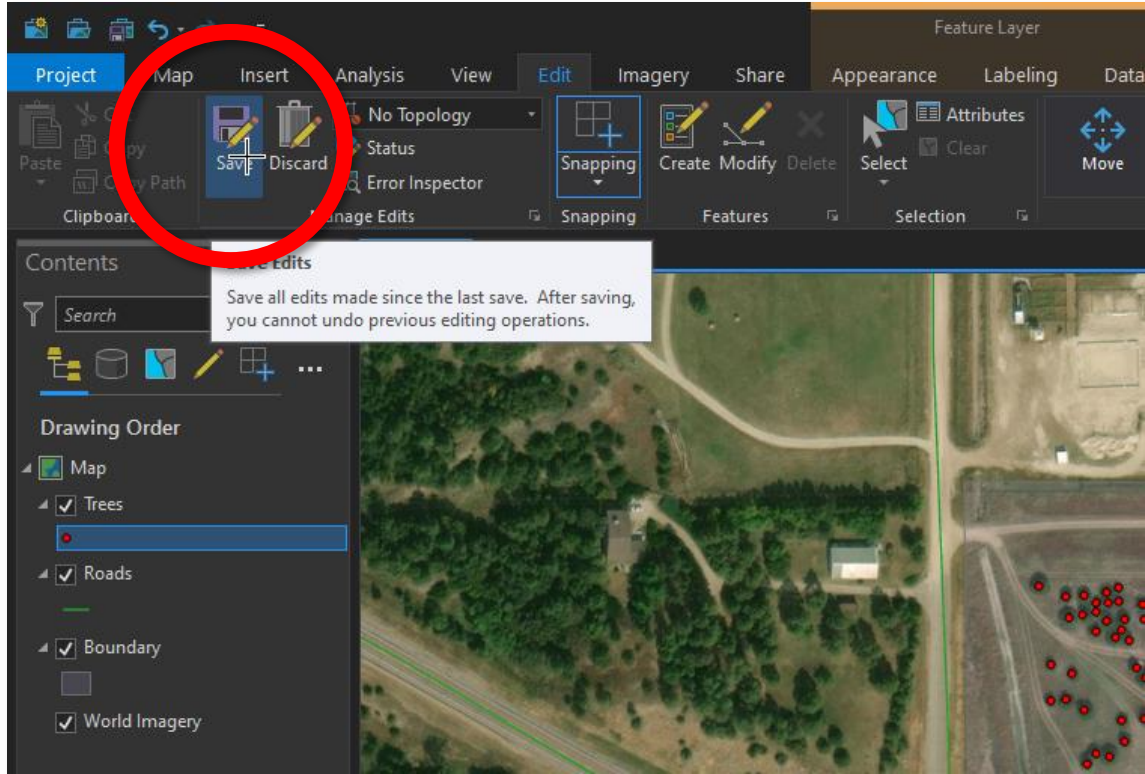
48. The "ESRI Imagery" is now the basemap.



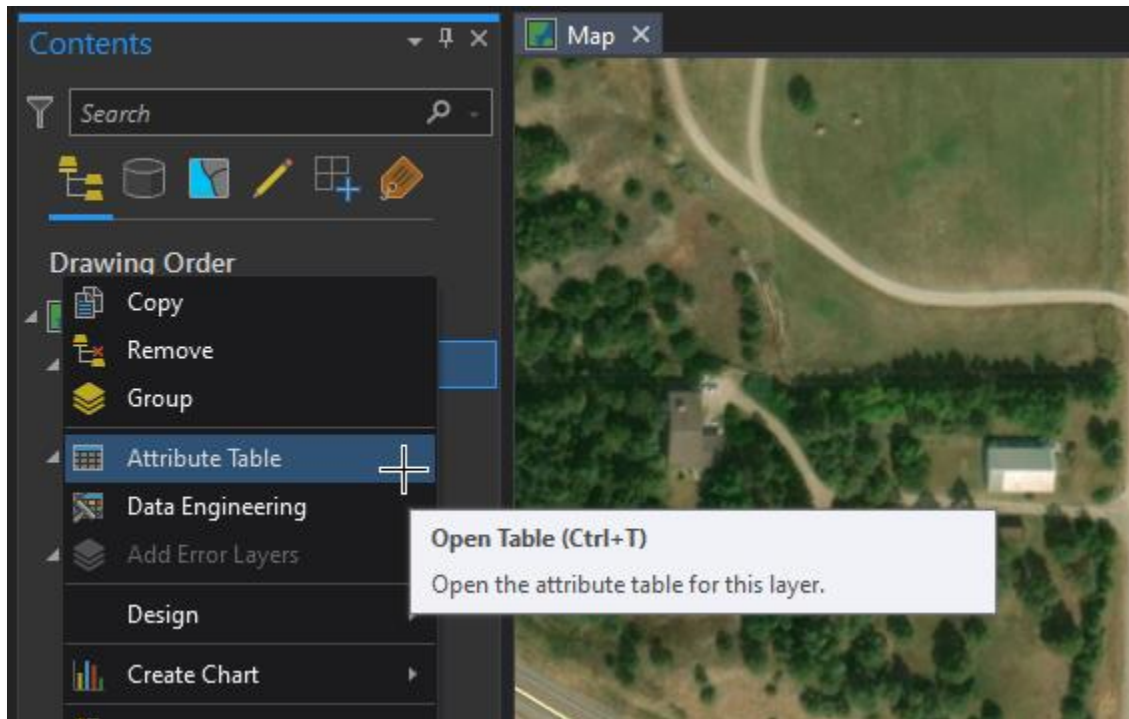
49. Here, the trees have been plotted just to the north of Highway 20 but only in this Area of Interest using the Create Features tool.



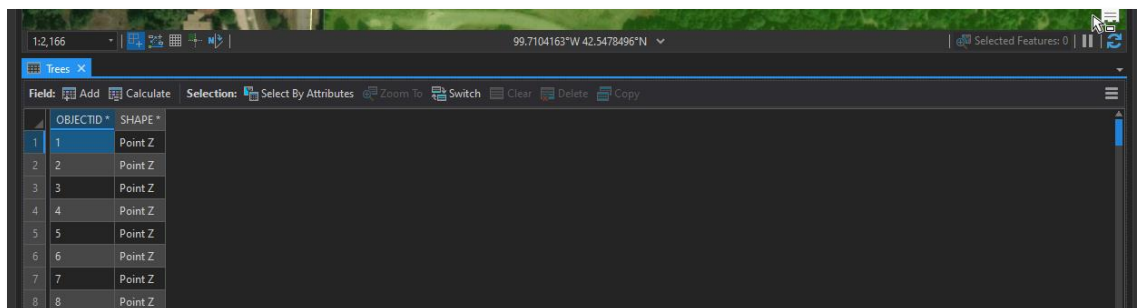
50. Remember to Save Edits, and also to save the Project often by pressing control-s.



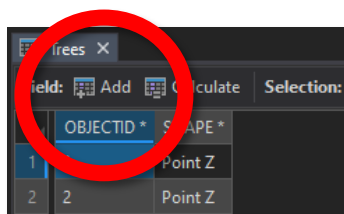
51. Right-click the Trees layer in the Table of Contents. Choose "Attribute Table". The shortcut is control-t.



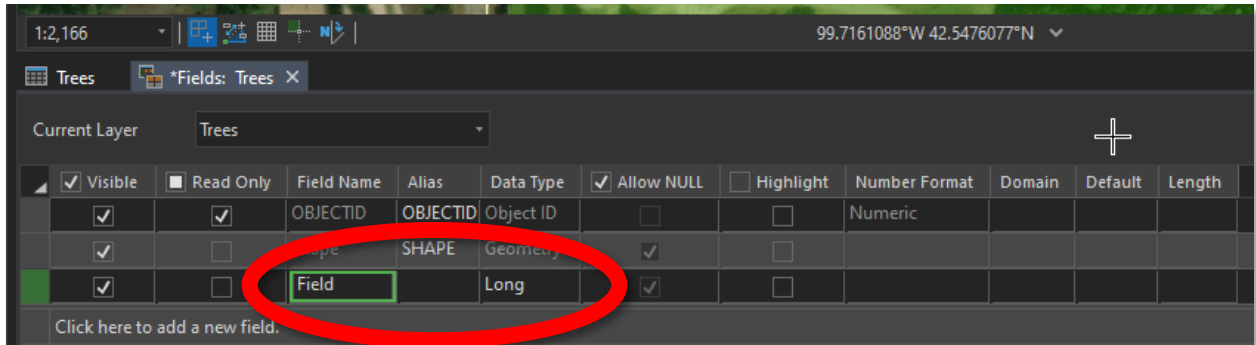
52. The Attribute Table for this layer will open and it will usually be docked at the bottom of the screen. It can be dragged to another location, or even a separate monitor, if more space is needed.



53. Click the text "Add" at the left side of the Attribute Table. Note: "Add" will not be available if there are Pending Edits. Save any edits using the purple save icon at the top, if needed.



54. The Attribute Table's Fields can be adjusted here in this new 'Table'. Notice how the Attribute "Field Name" is automatically populated with the generic name "Field" and the Data Type is "Long".

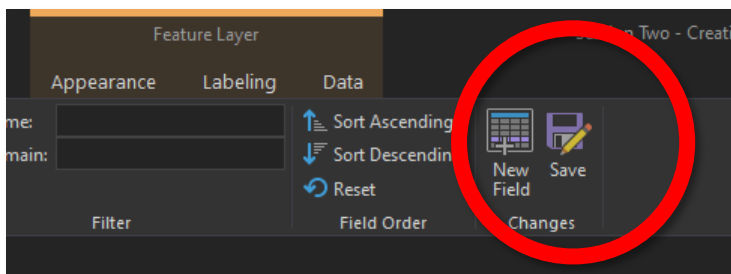


55. Change Field Names, Aliases, Data Types, Number Format, and text field Length as follows:

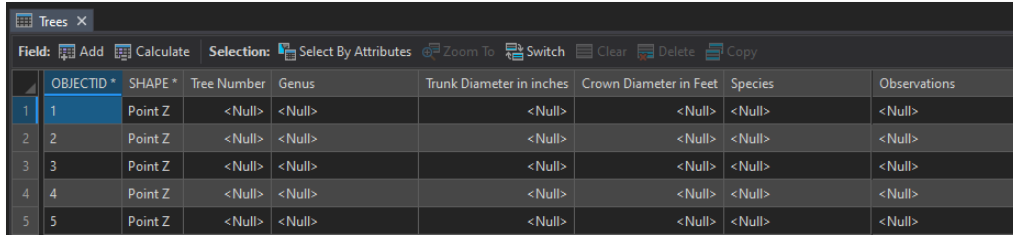
Field Name	Alias	Data Type	Number Format	Length
tree_number	Tree Number	Short	Numeric	
genus	Genus	Text		30
species	Species	Text		50
trunk_diameter	Trunk Diameter in inches	Float	Numeric	
crown_diamteter	Crown Diameter in Inches		Numeric	
observations	Observations	Text		255

Note: The limitations for ArcGIS Data Types are found here: [ArcGIS field data types—ArcMap | Documentation](#)

56. Press the purple Save icon at the top in the middle when finished, then close the Field editor. Please note this purple save icon is meant for the Attribute Table "Schema". It is a different type of Save than for Edits, and different than an overall Project Save.

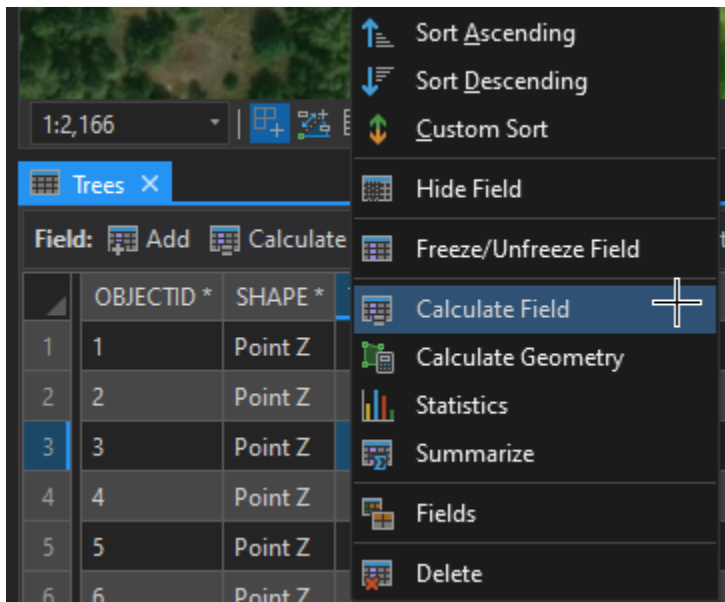


57. The Attribute Table now has Fields available for data entry.



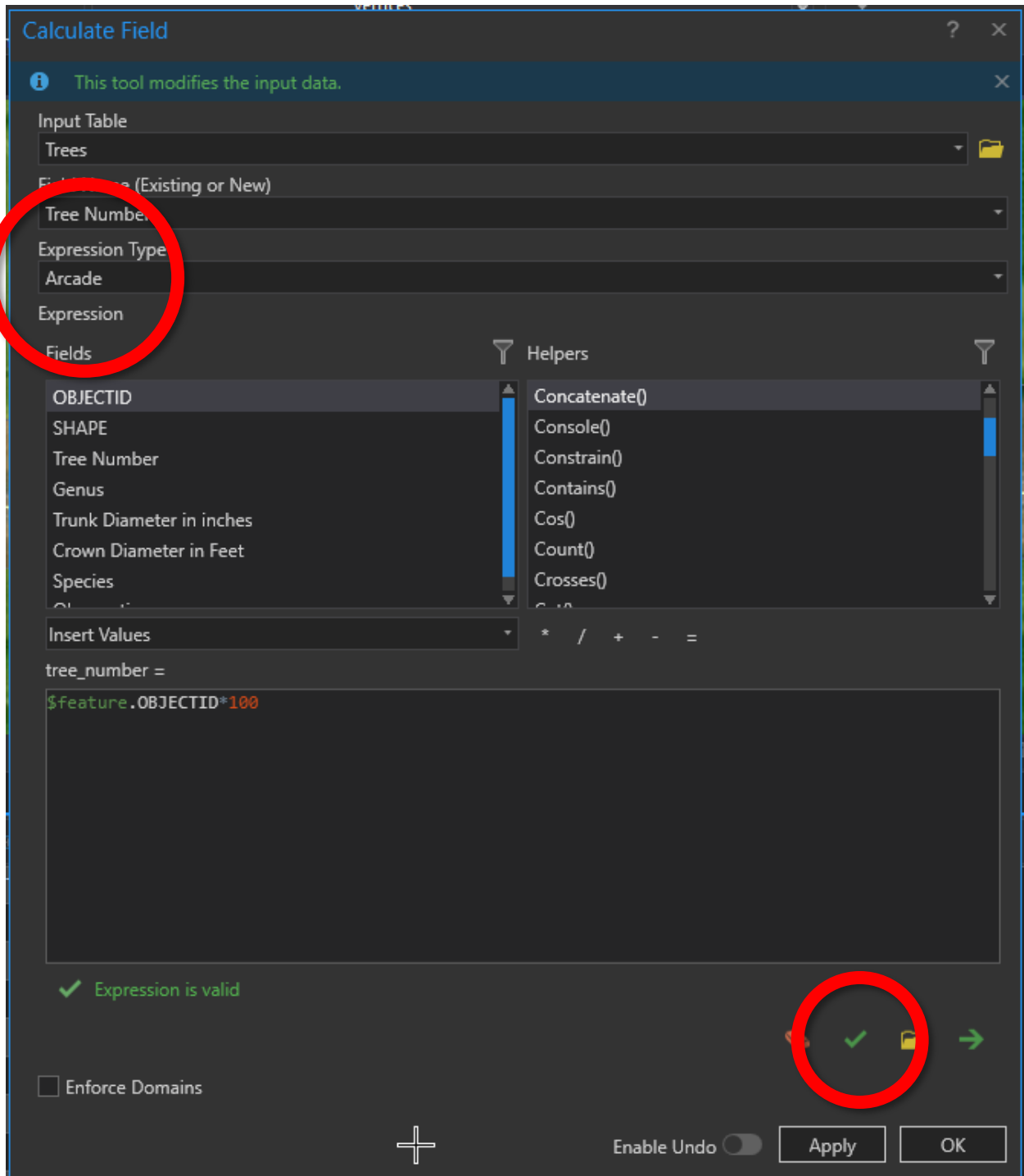
	OBJECTID *	SHAPE *	Tree Number	Genus	Trunk Diameter in inches	Crown Diameter in Feet	Species	Observations
1	1	Point Z	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
2	2	Point Z	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
3	3	Point Z	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
4	4	Point Z	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
5	5	Point Z	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>

58. In the Attribute Table, at the top of the field for "Tree Number" (note the Alias is now displayed there), right-click and choose, "Calculate Field".

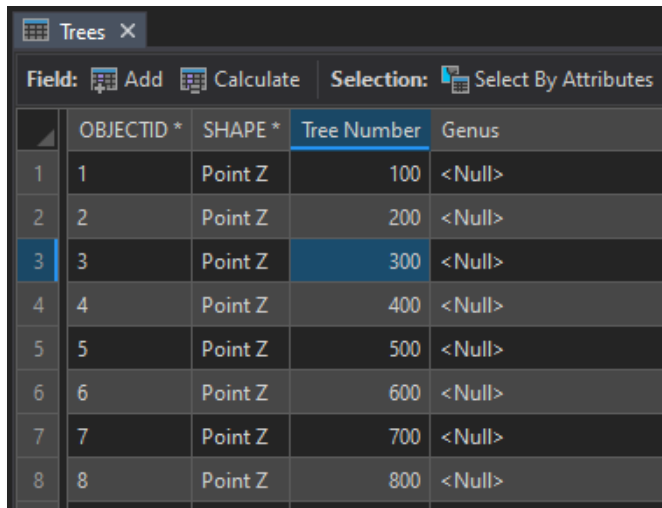


59. Create the following calculation by first switching the "Expression Type" to "Arcade" by using the drop-down arrow, then double-click the Field "OBJECTID" to add it to the expression. You can then type in a calculation using the computer's keyboard.

Note: The little green check mark lets the software check the calculation to see if it is valid prior to running it. Click Apply to perform the calculation for that Field and every record.



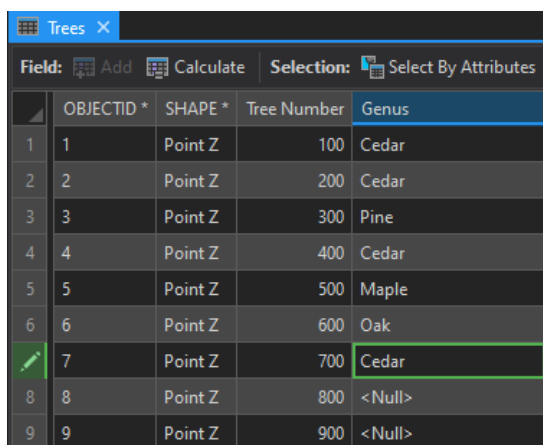
60. The Tree Numbers are filled in. These can be edited, if needed. Looking forward in the event that any new records for new trees are needed, there is space between the original numbers for those additions, such as 150, 160, 170, etc.



	OBJECTID *	SHAPE *	Tree Number	Genus
1	1	Point Z	100	<Null>
2	2	Point Z	200	<Null>
3	3	Point Z	300	<Null>
4	4	Point Z	400	<Null>
5	5	Point Z	500	<Null>
6	6	Point Z	600	<Null>
7	7	Point Z	700	<Null>
8	8	Point Z	800	<Null>

61. One can also edit directly in each cell, like Microsoft Excel. So, there are less and less reasons to continue working in Excel. And certainly not to share information with others using Microsoft Word. Instead, ArcGIS is a true database management system and information and tasks can be shared with others easily and managed much more efficiently by subsequent users. This is true only if the creator has some forethought in the building of the database and appreciates and understands its functionality and how to account for unforeseen circumstances or situations where the schema may need to be amended.

Using the Attributes, one can then begin to create maps or other graphics and charts using "Definition Queries" like was performed in Session 1, or 'styling options' on the Symbology Pane at the right side of the screen. These queries and 'styles' can also be saved and then used again or edited slightly for other data, as needed. Once you begin to build your workflow, you can become more efficient and avoid the duplication of your own work. Simply apply what you have done to new features and data.



	OBJECTID *	SHAPE *	Tree Number	Genus
1	1	Point Z	100	Cedar
2	2	Point Z	200	Cedar
3	3	Point Z	300	Pine
4	4	Point Z	400	Cedar
5	5	Point Z	500	Maple
6	6	Point Z	600	Oak
7	7	Point Z	700	Cedar
8	8	Point Z	800	<Null>
9	9	Point Z	900	<Null>

62. Now, the layers can be styled based on Attributes, or queried as needed.

In this session of ArcGIS Pro, you have seen how to create Feature Classes, and how to begin drawing and editing feature geometry. Later sessions will expand on various drawing tools and eventually, automatic feature extraction processes, but we have to understand how those types of processes and tools function to avoid creating problems for subsequent users.

You also explored the Attribute Table and began making edits. You were also shown there were several different types of Save including saving the "Schema" of an Attribute Table, saving the Attribute Table edits, and saving of a Project.

We will continue to build on editing tools including how to Split and Merge. We will also explore the use of the Trace tool. We will also edit more Attribute Data and display records accordingly using the Symbology options in future sessions.

Submit your Session 1 Map to a peer in order to get credit for that Session, and then try to style the Trees in this Session 2 according to any attribute you wish, or a 'Unique Value'. It could be using separate colors based on tree type, or it can be done using Graduated Circles or other shape, based on trunk size, or crown diameter.

If you do not know how to style the points based on an attribute, explore the training found here:

<https://www.esri.com/training/catalog/5ca28d18780a171ba3ec188a/symbolizing-map-layers/>

Then create and share a Layout of the trees with a peer.