



Creating a Map Series

Objective: Learn how to create a map series

14-1

Create a Map Series

Creating a Map Series


- MPS Atlas tab in Table of Contents
- Build Simple Map Series Wizard
- Uses MapExtents polygons
- Forces scale
- Table series created separately

Select Area of Interest dialog box


14-2

Once you have created your MapExtents feature class, you are ready to create the map series. In order to do this, you must first have the MPS Atlas tab available in the Table of Contents. You add this tab from Tools > Extensions. From this tab, you access the Build Simple Map Series Wizard, which walks you through the steps of creating a map series. In this wizard, you select the Feature Layer, as well as the specific map extent polygons. Also, since you created your map extents dependant on a specific scale, each map sheet will be zoomed to that extent, forcing the scale. Note that the table series, which is created for the Seasonal & Special Vehicle Designation Tables, is created separately.

Create a Map Series



MPS Atlas

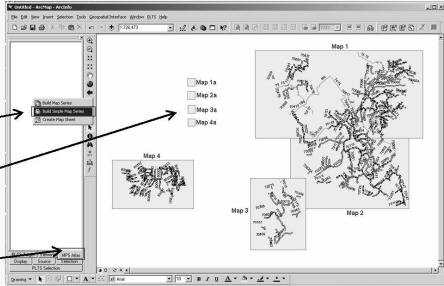


- Component of PLTS
- Uses map extents feature class to create each map sheet
- Build Simple Map Series Wizard
- More info:
CartoTools website

Build Simple Map Series

Empty map extents for
four Seasonal & Special
Designation Tables


MPS Atlas tab




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MPS Atlas is a component of PLTS and stands for Map Production System. It allows you to use a feature class of rectangular map extents to set the extent of each map sheet. Although there are different options to creating a series of maps, the only portion of MPS Atlas that you will be using is the Build Simple Map Series wizard, which is accessed by right-clicking in the white space of the Table of Contents. This wizard will limit you only to options useful for the MVUM. If you would like more information about MPS Atlas, consult the CartoTools website.

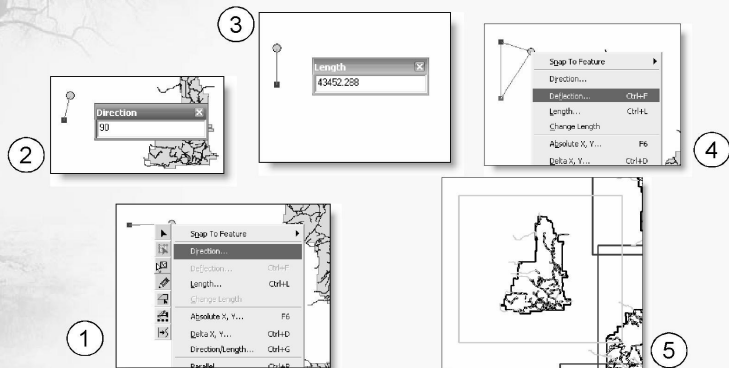
Create a Map Series



Creating Map Extents





- MapExtents feature class stored in RoadsAndTrails geodatabase
- Have same dimensions as listed in Production Guide



14-4

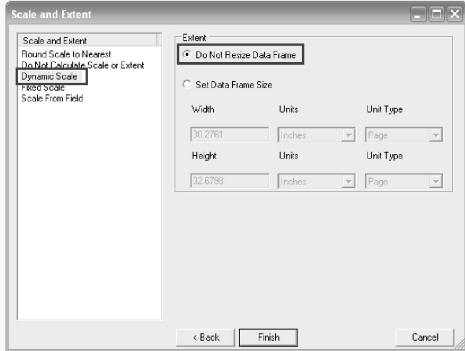
The MapExtents feature class is stored within the RoadsAndTrails geodatabase. In order to have the most accurate portrayal of how the map sheets will overlap one another, you will want the map extent polygon dimensions to be the same as what is listed in the Production Guide, which lists four different map extent dimensions for each of the five templates. The easiest way to create polygons that exactly match these dimensions is to use the Direction, Length, and Deflection tools. With these you can systematically insert each of the dimensions. Then you can copy/paste the polygon, if you want each map sheet to have the same dimensions.

Create a Map Series



Simple Map Series Wizard

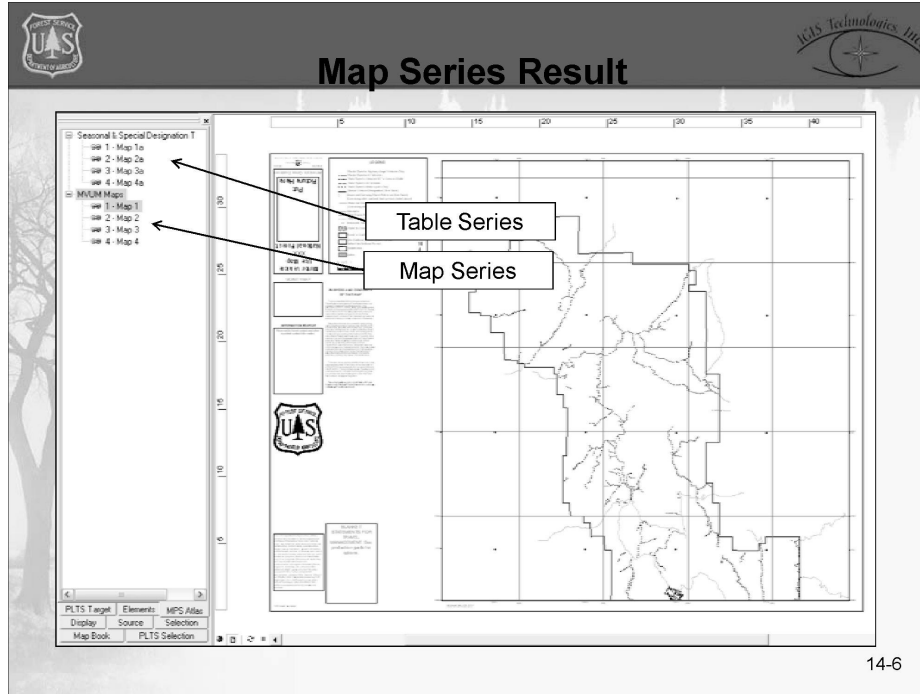
- Pick your Feature Layer (MapExtents)
- Select the map extents
- Store in .mxd
- Dynamic scale



14-5

The Simple Map Series Wizard is used to create a map series for the MVUM maps. It is also used to create a table series for the Seasonal and Special Designation Tables, if they need to go on the back of the maps. The process for creating the two series is essentially the same. However, you want to be sure to pick only your geographic map extents polygons for the map series, and vice versa for the table series. Note that all of the maps will be stored within the .mxd. There is one aspect to the wizard that is somewhat buggy, and that is the dynamic scale option. It often sets each map to the same extent, so you may have to go into the properties of the map series and re-apply this setting after the series is created.

Create a Map Series



After the Simple Map Series Wizard is completed for the MVUM maps and the Seasonal and Special Designation tables (if they are to go on the back of the maps), the table and map series can both be found in the Table of Contents.

Create a Map Series



Exporting the Maps

- Can export one or all of the map sheets
- Setup
 - Set path
 - Set DPI

Export Map Sheet(s)

Exporter

Name: PDF

Extension: PDF (*.pdf)

Resolution: 300

Path: C:\Documents and Settings\UMaster\My Documents\

Setup ...

Map Sheets

☐ All Map Sheets

☐ Current Map Sheet

☒ Map Sheets:
1

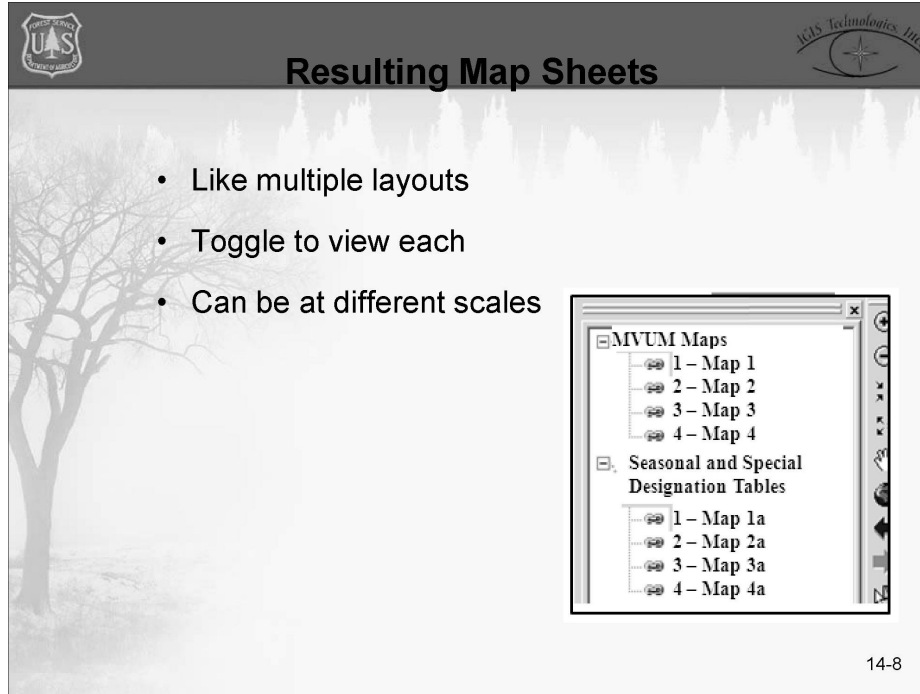
Enter page numbers and/or page ranges separated by commas. For example: 1,2,3&9

OK



Cancel

14-7

Maps should be exported to PDF, so that they can be easily printed, and placed on the internet. Note that you can export one or all of the map sheets, unlike the option for File → Export map. By clicking on the Setup button, you can set the desired path for the output, as well as the desired dots per inch (DPI). You can save them at 300 DPI, which will be sufficient for printing purposes.




The resulting map sheets that are produced from the Build Simple Map Series Wizard will be displayed in the Table of Contents. This is much like the old ArcView 3.x days when a project could support multiple map layouts. Each of these map sheets can be toggled to see the resulting layout within the standard template that was used. Depending on how you planned your forest, the extent rectangles could have been at different sizes which could result in different scales of each map sheet. Since the Build Simple Map Series Wizard was run twice, you can see the second grouping of map sheets that are related to the Designation Tables.



Exercise:



Creating a map series

- Goal: Students will use the planning strategy that they developed in the last chapter to create a map series.



1. Choose an MVUM template
2. Create the map extents
3. Create a map series
4. Create a table series

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Summary

- ❑ MPS Atlas is used to create a map series based on the MapExtents feature class.
- ❑ Maps are to be exported to PDF after completion.

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Exercise 14: Creating a map series



Exercise goal: Students will determine which MVUM template to use, create map extents, and create a map series.

In the previous exercise you developed a mapping strategy for the Manti La Sal forest. In this exercise, you will be using those decisions to determine which MVUM template to use for Manti La Sal. You will then use that strategy to create map extents, from which you will create a map series.

Upon completion of the exercise, you will be able to...

- ✓ Determine which MVUM template to use
- ✓ Create map extents that are stored in a geodatabase layer
- ✓ Create a map series using the Simple Map Series wizard

STEP	DESCRIPTION	PAGE
1	Choose an MVUM template	14 – 12
2	Create the map extents	14 – 17
3	Create a map series	14 – 21
4	Create a table series	14 – 25

Step 1: Choose an MVUM template

In this section, students will determine which MVUM template to use based on the scale required to clearly display route designations and the size of the area to be mapped. In Exercise 13a, you did some project planning for the Manti-la Sal forest. You will use that general information, as well as some specific data that you gather from this section, to pick an MVUM template for your data.

Our first concern is that individual road and trail segments are above the threshold set in the Production Guide, which is dependent on the scale used. We need to look at individual route segments to ensure that any change in symbology, which is a result of a change in designation, can be detected by the map reader.

First we need to download the most recent version of the MVUM Templates.

- a. In an internet browser, go to: <http://gis.gsc.wo.fs.fed.us/wo/mvum/step-3.php> and click on the most recent version of the **MVUM Templates.exe** file.
- b. When asked if you would like to save this file, click **Save File**.
- c. When the file has finished downloading, double-click on the file. When asked if you want to run this software, click **Run**.
- d. It will automatically unzip to C:/fsapps/fsprod/Carto_Tools. Click **Unzip**.

Note that if you have a previous version of the templates, it will ask if you want to over-write some files. Click **Yes** for all of them.

- e. After the file has unzipped, **close** the extractor program.

Now we will look at the smallest segments of roads and trails.

- f. Open a new ArcMap document, and add the **boundary** feature class from the **RoadsAndTrails** geodatabase for Manti-la Sal in **C:/student/Ex14**. Also add the **Roads and Trails** layer file from the same folder.

Create a Map Series

Note that the Roads and Trails .lyr file will be downloaded in the MVUM templates .exe file that you unzip. You may need to re-direct the layer file to the RoadsAndTrails geodatabase if you do not have your geodatabase in the C:/fsapps/fsprod/Carto_Tools/MVUM/data folder.

- g. Open the **Attribute table** for Roads. Scroll to the last field. Right-click on title of the **Shape_length** field and choose **Sort Ascending**.

Question:

3. What is the length for the shortest road segment? _____

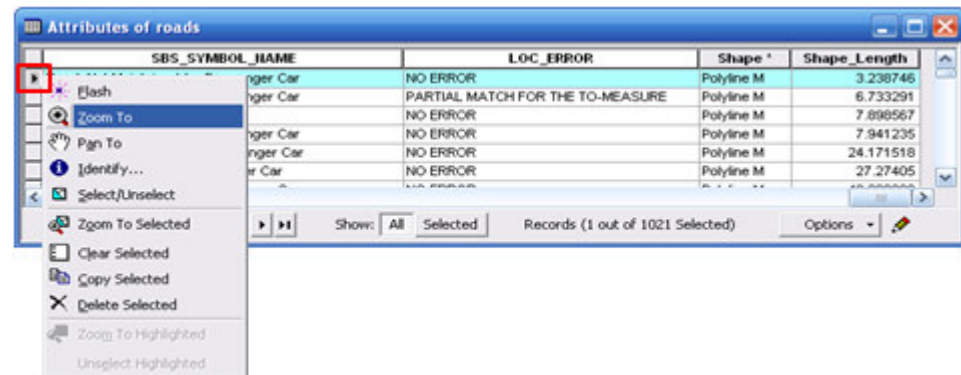
Now you need to find out what units the Shape_length field is measured in. Typically these are in the units of the coordinate system. This would be meters for most forests, but we want to be sure. Since the Production Guide lists its thresholds in feet, you may need to convert your Shape_length field into feet.

- h. In the roads Attributes window, select the **first road**. Right-click on the box to the left and select **Zoom To**.

- i. On the Tools toolbar, click on the **Measure** tool, and measure the length of the selected segment.



- j. On the Measure dialog toolbar, select the **Choose Units** tool pulldown and choose **Distance → Feet**.



This changes the display units that affect measurements.

Create a Map Series

Question:

4. How long is this segment? _____
5. Based on the discrepancy between your answers for Questions 3 and 4, what unit is the Shape_Length field in? _____

Notice that the length of this feature is too short to be seen at the maximum scale of 1:7,920. If there are only a few segments this small, then they can be handled with inset maps.

Now you will do a query for all of the segments below the threshold for the scale that you established in Question 2 (1:126,720), which is 2112 ft (643.737m), as per the Production Guide, taking into account the conversion from meters to feet. This allows you to skip the step of creating a whole new Shape_Length field in feet.

- k. From the main menu bar click **Selection → Select by Attributes**. In the Select By Attributes window, create the following query for the **Roads** layer: **[Shape_Length] < 643.737**. Click **OK**.

You should still have the roads Attributes window open.

Question:

6. How many road segments are selected? _____

Now you want to see how these roads are distributed. If they are clustered together, you might be able to address these with a few inset maps.

- l. In the Table of Contents, right-click on the **roads** layer, and choose **Selection → Zoom To Selected Features**.

Since the small segments are dispersed, you will need to choose a larger scale. You can still use the same template, but you will need to make a map series, rather than a single map. First, you need to figure out what scale you will need to use in order to make the fewest inset maps.

Create a Map Series

m. Perform queries for the other three scales, using the chart below:

Scale	Query
1:63,360	[Shape_Length] < 321.869
1:24,000	[Shape_Length] < 121.92
1:7,920	[Shape_Length] < 40.233

Now fill in the following table with your results:

Scale	# of Selected Roads	Few enough to allow for inset maps?
1:63,360		Yes No
1:24,000		Yes No
1:7,920		Yes No

Question:

7. Based on this information, what should your scale be? _____

Great job! But don't forget about the trails!

n. Repeat the query above, using **trails**.

Remember that you need to use the largest scale to adequately display both roads and trails. So there is no point in querying for the 1:126,720 scale.

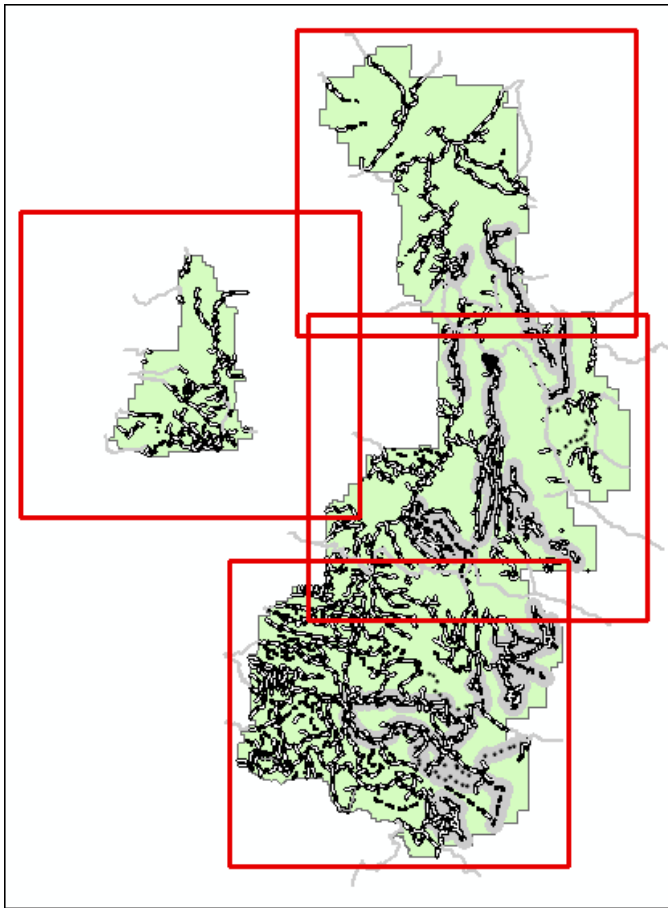
Question:

8. Can you use the same scale that you established in Question 7? _____

The 1:7,920 scale might be needed in this case due to the number widely distributed short roads. But for the sake of simplification in this exercise we are going to assume a target scale of 1:63,360 will be used. You are now faced with the decision of which template to use. You will need to take into consideration how much area each template covers at that scale. To summarize from the Production Guide, at 1:63,360:

Create a Map Series

Template Name	Map Extent Area	Map Extent Dimensions
“E” size: 44”x34”	518,380 acres	27.0 mi x 30.0 mi
“Newsprint” size: 35” x 22.75”	268,790 acres	20.0 mi x 21.0 mi
“D” size: 34”x22”	255,990 acres	20.0 mi x 20.0 mi
“C” size: 22”x17”	143,355 acres	14.0 mi x 16.0 mi
“Letter” size: 8.5”x11”	33,280 acres	6.5 mi x 8.0 mi



Since you want to use as few maps as possible, it makes sense to go with the “E” size template, which has map extent dimensions of 27.0 miles x 30.0 miles. However, if you find that another template will better suit your needs, you may want to choose a different template. A good example is the letter size template. Your forest may find it less expensive to create a map book, using the letter size template, rather than several larger format maps. Note that it is generally easier to use a few larger maps, rather than try to navigate across several letter-sized maps.

Now we will apply these measurements to our map from Chapter 5. These will be used in making the map extents feature class.

In the next step, you will create a map extent feature class with polygons that cover the areas depicted to the left.

Step 2: Create the map extents

In this step you will create a new map extents polygon feature class from which the map series will be derived. You will draw these polygons from the map strategy that you have created.

- a. Open **ArcCatalog**. Copy the **RoadsAndTrails** geodatabase from `c:/student/Ch14` to `c:/fsapps/fsprod/Carto_Tools/MVUM/data`.

This is the location that the Carto Tools templates will refer to when creating the map series.

- b. In the right side of ArcCatalog, in the RoadsAndTrails geodatabase, right-click and choose **New → Feature class**.
- c. For Name, enter **MapExtents**. Make sure that **Polygon Features** is selected as the Type, and click **Next**.

You will import the coordinate system from an existing feature class.

- d. Click **Import** and navigate to `c:/fsapps/fsprod/Carto_Tools/MVUM/data`. Double-click on the **RoadsAndTrails** geodatabase, and choose **roads**. Click **Add**. Click **Next**.
- e. Accept the default XY Tolerance, and click **Next**.
- f. In the next window, click the box under **SHAPE**, and enter **Name**. Click the box to the right of it and choose **Text** from the drop-down menu. Type in **Name** for the Alias. Accept the default length of 50. Click **Finish**.

The screenshot shows the 'New Feature Class' dialog box. It contains a table with the following data:

Field Name	Data Type
OBJECTID	Object ID
SHAPE	Geometry
Name	Text

Below the table, the 'Field Properties' section is visible for the 'Name' field:

Field Properties	
Alias	Name
Allow NULL values	Yes
Default Value	
Length	50

At the bottom right, there is an 'Import...' button. Below the dialog, there is a note: 'To add a new field, type the name into an empty row in the Field Name column, click in the Data Type column to choose the data type, then edit the Field Properties.'

Now you will create new polygons for the MapExtents feature class in ArcCatalog.


Create a Map Series

- g. In your ArcMap session, remove the existing layers, and add the following feature classes from the RoadsAndTrails geodatabase in **c:/fsapps/fsprod/Carto_Tools/MVUM/data: boundary, MapExtents**, and the **Roads and Trails.lyr** file. Change the symbology for MapExtents to a red box, with no fill.
- h. In the Table of Contents, right-click on **Roads**, and choose **Zoom to Layer**.
- i. From the main menu bar, click **View → Toolbars → Editor** and then **View → Toolbars → Advanced Editing**.

You will use these two editing toolbars. Now you can start editing the MapExtents feature class.

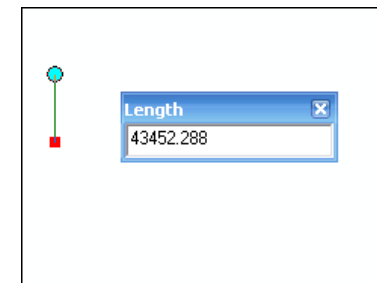
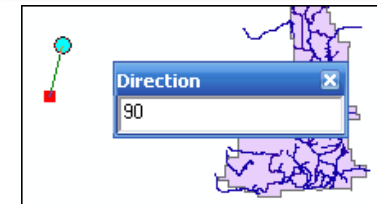
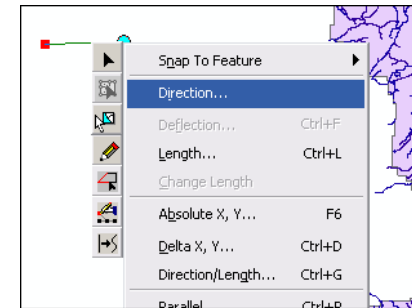
- j. On the Editor toolbar, click **Editor → Start Editing**. Set the Task to **Create New Feature** and the Target to **MapExtents**.

You will now create polygons that have the same boundaries as the map extent dimensions. The starting points for these will not matter as you will reposition these over your forest later.

- k. Click on the **Sketch tool**. Start your sketch anywhere within the Display. A short distance away from the starting node, right-click and choose **Direction**. 
- l. In the Direction box, type **90**. Then hit **Enter**.

Notice that your line can now only go up and down as 90 represents degrees in a 360 degree circle. If you had entered 0, then you would have constrained your direction directly to the east. Now you will enter a length.

- m. Dragging your cursor north, right-click and choose **Length**. Remember that these units are in meters. Type **43452.288**, which equals 27.0 miles. Hit **Enter**.



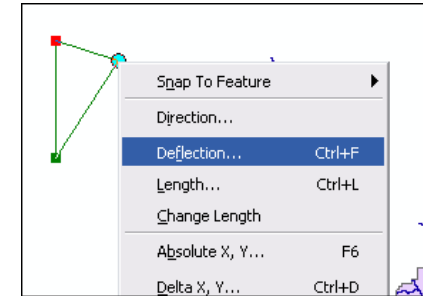
Create a Map Series

Now you will start a line that is perpendicular to the existing line.

- n. Right-click away from the sketch and choose **Deflection**. Type **90**, and hit **Enter**.

Now you will repeat these steps to create the remaining vertices.

- o. Right-click away from the sketch and choose **Length**. Type **48280.32**, which equals 30.0 miles. Hit **Enter**.
- p. Right-click away from the sketch and choose **Deflection**. Type **90**, and hit **Enter**.
- q. Right-click away from the sketch and choose **Length**. Type **43452.288**, and hit **Enter**.
- r. Right-click and choose **Finish Sketch**.



You have now created a rectangle that has the exact dimensions of the map extent dimensions of the “E” size template at 1:63,360 – 27.0 mi X 30.0 mi.

Note that you could simply use the Rectangle tool on the Advanced Editing toolbar to draw your MapExtent polygons. However, they would not be the same size. This is a good option though, when you want to use different templates to display different portions of your forest. For example, part of your forest might be large, but not have many transportation features. It might be able to adequately fit on a “C” size template. Another portion of your forest however, might need to be covered by three “E” size sheets. You would then draw one rectangle for your “C” sheet and three rectangles for the three “E” sheets. You could choose to use the steps listed above to draw precise rectangles, or you could use the Rectangle tool to approximate the boundaries. Be aware that this will alter the scales.

- s. While this may seem like a lot of work to get one polygon done, you can now simply **copy/paste** this polygon as many times as you need to. In this case you should do this to create 4 polygons.
- t. Now overlay the polygons in the overlapping pattern shown earlier in the exercise so that the entire area is covered.

Create a Map Series

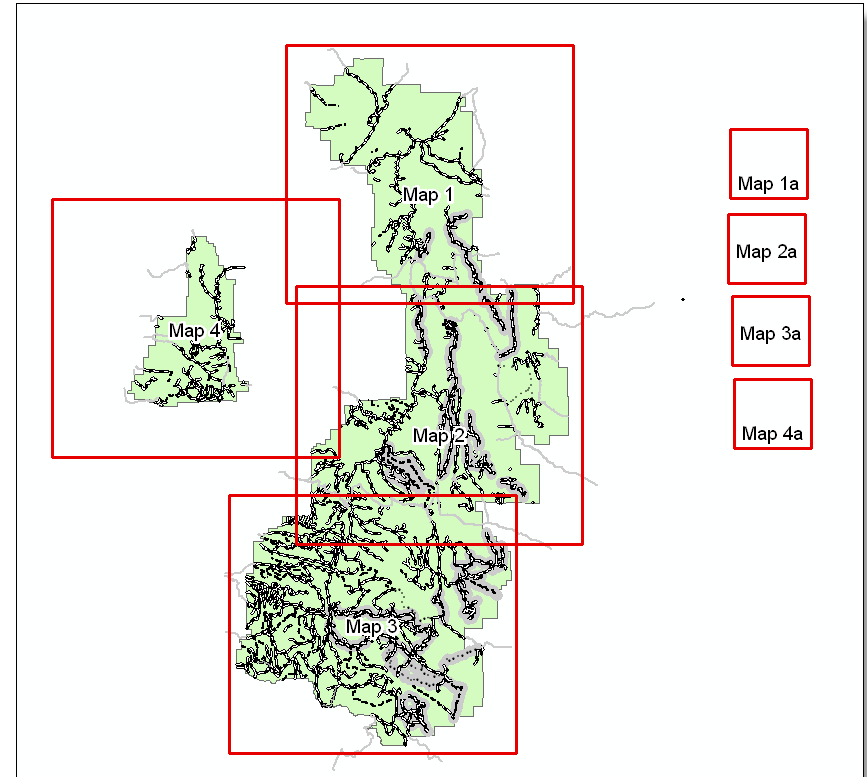
Make sure only the MapExtents feature class is selectable, so that you do not accidentally move another feature.

Next you will create polygons for the smaller extents that will be used to place the Seasonal or Special Designation table on the back of each map. Each table will need a separate data frame. There will be one blank data frame per map sheet. In this example, there will be 4 separate tables.

- u. Using the **Rectangle tool** on the Advanced Editing toolbar, draw 4 small rectangles to the east of your main data.

Now you will attribute the extents that you just created. You will want to connect the extents for the Seasonal or Special Designation tables with their appropriate map extents.

- v. On the Editor toolbar, click the **Edit** and **Attribute** tools to select an extent and then show its attributes. In the attribute window, enter the name of each map extent and its corresponding table extent according to the following pattern: Map 1 and Map 1a.




Hint: You may find it helpful to label the Name attribute field, so you can see the corresponding numbers as you go along.

You have now created all of the necessary map extents.

- w. On the Tools toolbar, click **Stop Editing**, saving your edits.

Create a Map Series

 NOTE: The process of creating map extents for a map book is essentially the same. However, you may want to use an alphanumeric system for naming the map extents.

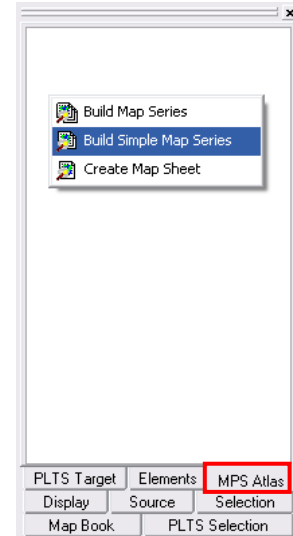
Step 3: Create a map series

In this step you will use the map extents you created in the last step to create a map series. This is the step in which you will utilize the MPS Atlas extension. First you may need to enable the extension.

- a. Click **Tools** → **Extensions**. In the Extensions window, check the box next to **PLTS MPS Atlas**.

You should now see an MPS Atlas tab in your Table of Contents.

- b. Click on the **MPS Atlas** tab and right-click within the blank MPS Atlas window. Choose **Build Simple Map Series**.
- c. Enter **MVUM Maps** as the name of your series. Click **Next**.

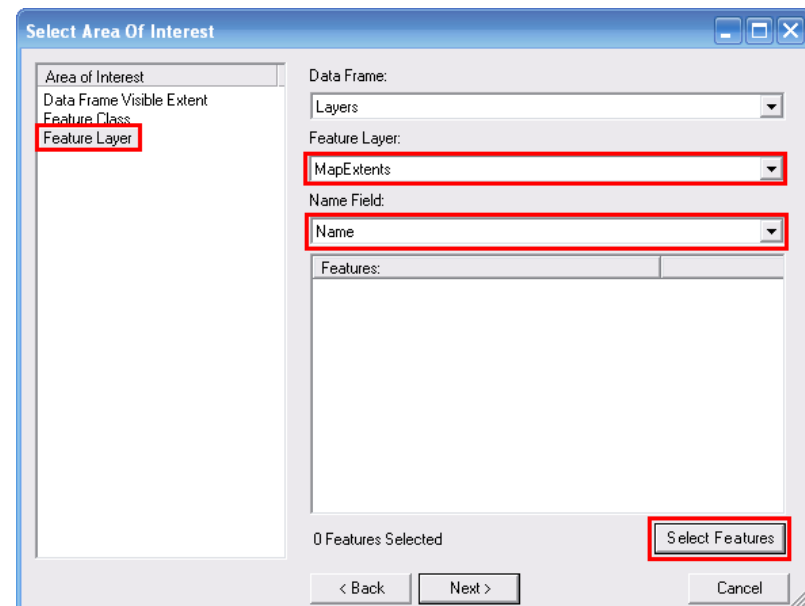


In this next window, you point to the feature class that you will be using to set the map extent for each map sheet.

- d. Under Area of Interest, click **Feature Layer**. Under Feature Layer, choose **MapExtents** from the drop-down menu. Make sure that **Name** is selected for the Name Field.

Now you need to select the features for which you want to create map sheets.

- e. Click **Select Features**.



Create a Map Series

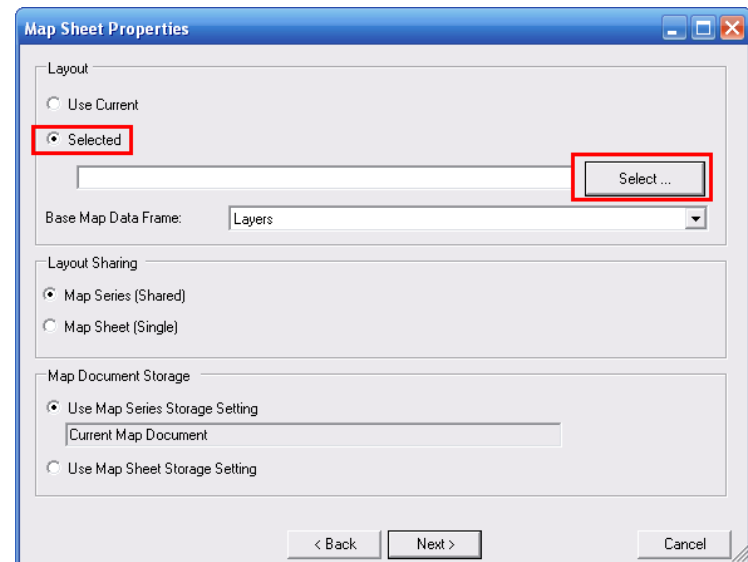
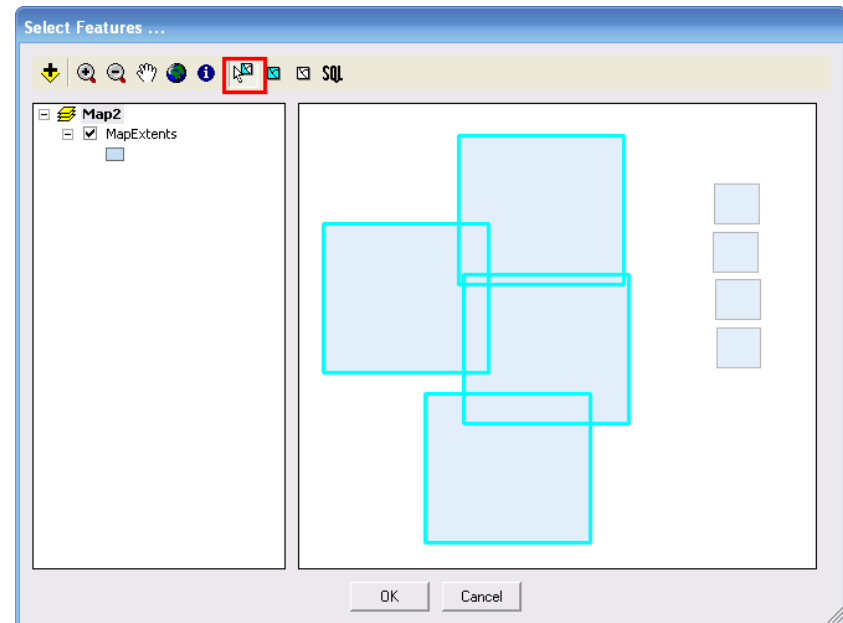
- f. In the Select Features window that comes up, click on the **Select Features** tool and select all of the polygons *for the map extents* (not the blank pages, which will be added as a separate map series later). Click **OK**.

You will now see that all 4 polygons are added as Features.

- g. Click **Next**.
- h. In the next dialog box, click **Current Map Document** under Select Storage. Click **Next**.

At this point, you will select which template you will want to use.


- i. Click on the **Selected** radio button, and click **Select**.



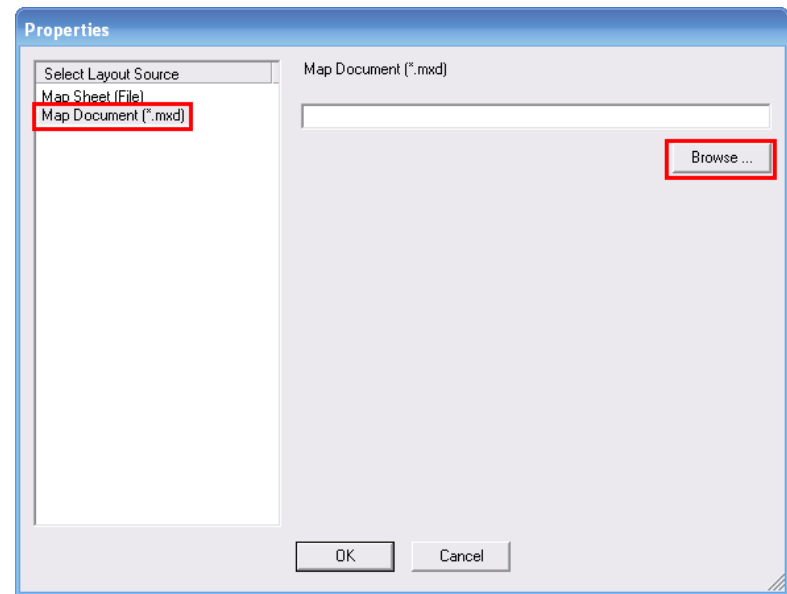
Create a Map Series

- j. In the Properties window, choose **Map Document** (*.mxd) for the Layout Source. Click **Browse** and browse to **c:/fsapps/fsprod/Carto_Tools/MVUM/templates** and select the **mvum_e_size_atlas** ArcMap document. Click **Open**.

Hint: Be sure not to pick the blank_e_size.mxd, which is used for the Seasonal and Special Vehicle Designation Table!

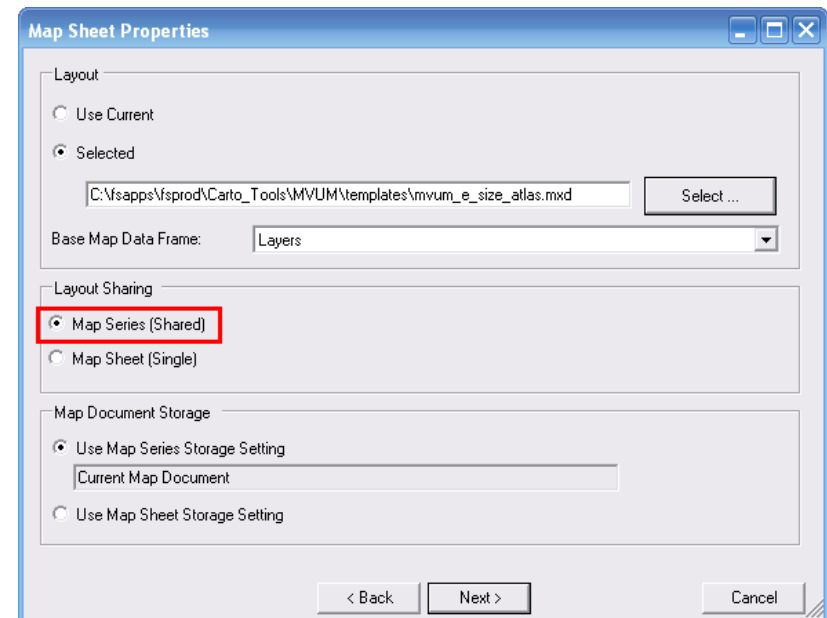
 **NOTE:** If you were creating a map book, you would choose mvum_letter_size_atlas.mxd.

- k. In the Properties window, click **OK**.



- l. In the Map Sheet Properties window, make sure that **Map Series (Shared)** is selected for Layout Sharing. Click **Next**.

Now you will choose whether or not to use dynamic scale. Dynamic scale allows the data frame to be resized to a specific size, thus changing the scale.



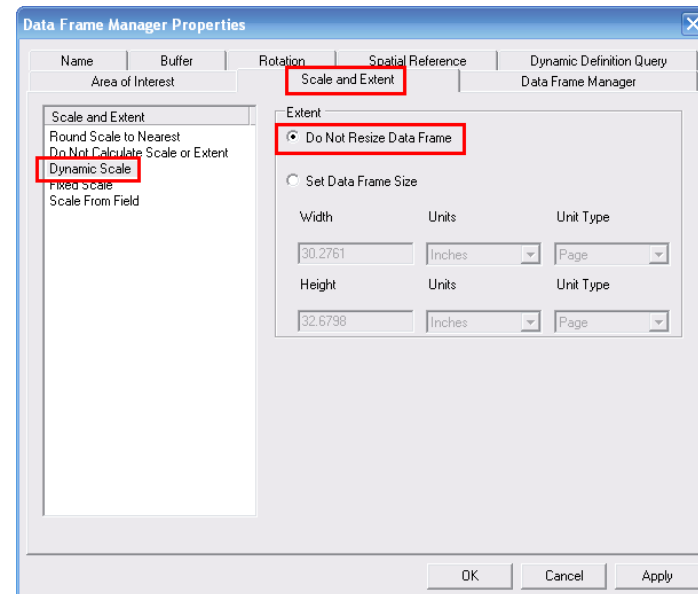
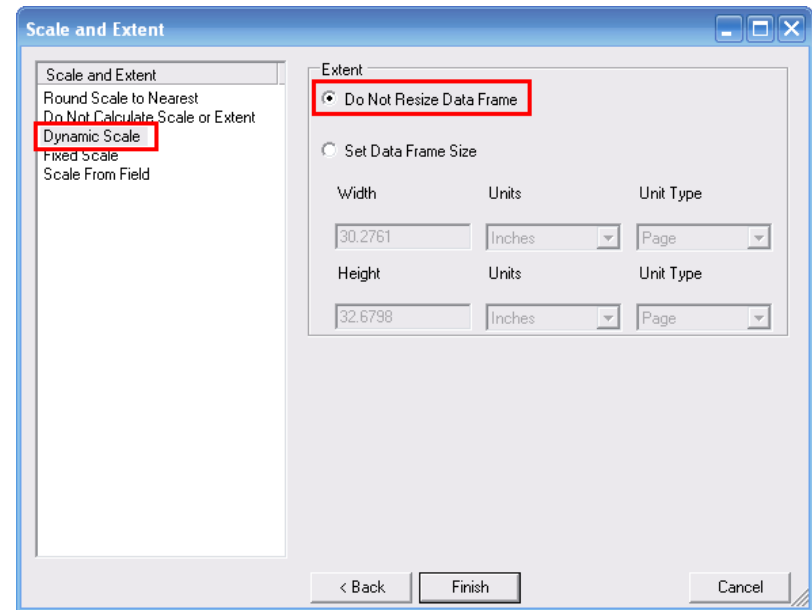
Create a Map Series

- m. In the Scale and Extent window, select **Dynamic Scale**. For extent, make sure **Do Not Resize Data Frame** is selected. Click **Finish**.
- n. Save your ArcMap document in **c:/fsapps/fsprod/Carto_Tools/MVUM/outputs** as **map_series.mxd**.
- o. In the table of contents, double click on each Map to see the resulting layout.

OPTIONAL: Steps O-Q if you have scale and display problems.

The dynamic scale function tends to be unpredictable, so you might need to reset it if you don't see your individual map extent polygons filling the data frame in the map layout. If you see the primary map extent appearing as a smaller area in the layout., you will need to reset the scale by doing the steps below.

- p. Click **View → Toolbars → PLTS MPS Atlas**. On the PLTS MPS Atlas toolbar, click the **Show Data Frame Manager Properties** icon.
- q. Click the **Properties** button. In the Data Frame Manager Properties window, click on the **Scale and Extent** tab. For Scale and Extent, click **Dynamic Scale**. Make sure that **Do Not Resize Data Frame** is selected for the Extent. Click **OK**. Click **OK** in the Properties window.



Create a Map Series

The other buggy thing is that MPS Atlas tends to redisplay your layers, so you may need to reposition your polygon layers at the bottom of the display.

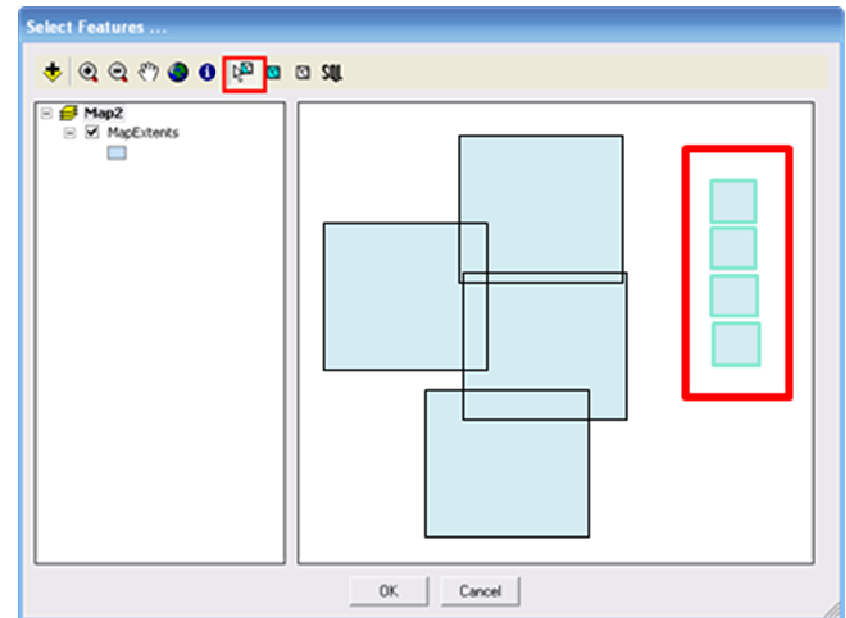
- r. In the Display tab of the Table of Contents, turn off the MapExtents layer, since you do not want that displayed on the MVUM. Change the symbology of the **boundary** layer to a thick black line to reflect the MVUM standard.

Step 4: Create a table series

In this step you will use the map extents you created earlier in the exercise for the Seasonal and Special Designation Vehicle Tables that will go on the back of the maps. You will use these extents to create a table series, which will be stored within your existing ArcMap document.

You will notice that many of the steps are the same for creating the table series as for creating a map series.

- a. In the MPS Atlas tab on the Table of Contents make sure that **MVUM Maps Series** is selected, right-click and choose **Build Simple Map Series**.
- b. For the Name, enter **Seasonal and Special Designation Tables**. Click **Next**.
- c. For Area of Interest, choose **Feature Layer**. For Data Frame, choose **Layers**. For the Feature Layer, choose **MapExtents**. Click **Select Features**.
- d. Using the **Select Features** icon, select the four small polygons that represent the data frames that will be added for the Seasonal and Special Designation Tables. Click **OK**.
- e. Click **Next**.



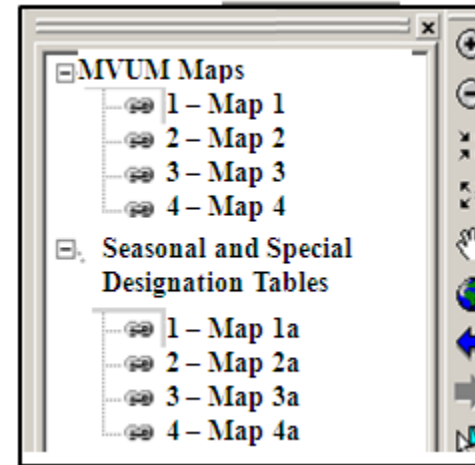
Create a Map Series

- f. In the Storage dialog window, choose **Current Map Document**. Click **Next**.
- g. In the Map Sheet Properties window, choose **Selected** for the Layout, and click **Select**.
- h. For the Layout Source, choose **Map Document (*.mxd)**. Click on the **Browse** button.

Now you will select the “blank” template that corresponds to the map layout size you chose earlier.

- s. Navigate to **c:/fsapps/fsprod/Carto_Tools/ MVUM/templates** and select the **blank_e_size** ArcMap document. Click **Open**. In the Properties window, click **OK**.
- i. Unlike with the map series, you will choose **Map Sheet (Single)** for the Layout Sharing option. Click **Next**.
- j. For the Scale and Extent, choose **Dynamic Scale**, and make sure that **Do Not Resize Data Frame** is selected. Click **Finish**.


You now have four map sheets created for the table series.



- k. Double-click on one of the map sheets.

Question:

9. What do you see? _____

 **NOTE:** If you saw the same map series template, rather than a blank page, this is a result of the PLTS service pack installed. If you see this, delete your table series, and recreate the series in a *new* ArcMap document.

- 1. **Save** your document and **close** ArcMap.

Create a Map Series

In this exercise you developed your map strategy further, taking into account the geographic extent of the data, as well as the scale needed to display that data so that all features are able to be read. You then created map extents which were based on your map strategy. You used those map extents to create a map series. You also created a table series. Later in the class, you will insert the Seasonal and Special Vehicle Designation Table into the map.

End Exercise.