

**New Jersey SurvCon 2018**

**Carlson GIS**  
*for Surveyors*

*Presented by*

**That CAD Girl**





## Who Is That CAD Girl?

---

**Jennifer DiBona** is a long-time CAD consultant and trainer doing business as **That CAD Girl**. She is based in Raleigh, North Carolina.

Jennifer has a degree in Surveying and spent about 15 years working as an engineering & surveying technician before leaving to become a Civil 3d Implementation Certified Expert (ICE) for an Autodesk reseller.

Today, as That CAD Girl, Jennifer provides sales, support and training for Carlson, AutoCAD and IntelliCAD software and Carlson hardware and data collection. Jennifer specializes in Field to Finish, Surface Modeling, CAD standardization and Carlson Software implementation.

Jennifer is one of the charter members of Carlson College, has been a member of the Steering Committee for the National CAD Standard® and most recently served as Chair of the Survey/Civil Task Team.







You can reach her at [Jennifer@ThatCADGirl.com](mailto:Jennifer@ThatCADGirl.com) or (919) 417-8351.

**Jeremy Taylor** is a licensed Professional Land Surveyor based in Apex, North Carolina and is the owner of Taylor Land Consultants PLLC. Jeremy has been licensed in North Carolina since 1996 and holds associates degrees in both Survey Technology and Civil Technology.

In his spare time Jeremy steps into the role of **That CAD Guy** to provide sales, support and training on hardware and data collection for That CAD Girl.

You can reach Jeremy at [jeremy@taylorlc.com](mailto:jeremy@taylorlc.com) or (919) 337-7998.

Carlson Self-Study Manuals are available for purchase from my online store at [www.thatcadgirl.com](http://www.thatcadgirl.com)

		
<b>Carlson Software - Self-Study Manual</b> <i>Don't Just Learn It... Understand It</i>	<b>Carlson Software - Self-Study Manual</b> <i>Don't Just Learn It... Understand It</i>	<b>Carlson Software - Self-Study Manual</b> <i>Don't Just Learn It... Understand It</i>
<small>Carlson Software Carlson Configure &amp; CAD Settings Part 1: Recommended Carlson Configuration Settings Part 2: Recommended AutoCAD Options &amp; Settings Part 3: Recommended IntelliCAD Options &amp; Settings Appendix A: Using Project Folders for Project/Data File Setup Appendix B: Carlson Quick Keys Approximate time to complete: 0.8 Hours</small>	<small>Carlson Survey or Carlson Civil Getting Started with Points Part 1: Working with Points Appendix A: Search Published Control Appendix B: Understanding the Carlson Point Block Entry Approximate time to complete: 4.9 Hours</small>	<small>Carlson Survey Field to Finish Part 1: Overview of Field to Finish Part 2: Creating a Field Code Table (.fct) File from Scratch Part 3: Field to Finish Coding - Preparing You're in the Field Part 4: Using Point Attributes to Annotate Plans Part 5: Creating a Field Code File from Your Point Files Approximate time to complete: 6.8 Hours</small>
		

### 1 Set GIS Settings

Before creating GIS data in Carlson, you must specify a GIS Features (.gis) file and choose whether to store the GIS data in an external GIS database (.db or .mdb) file or within the Drawing (.dwg) file using Esri Map Specs for CAD (MSC).

For this example, the GIS Features (.gis) file will be a new, empty file and we will be importing shapefile data to a Carlson GIS Database file.

(1-1) Start a new or open an existing drawing.

(1-2) Go to *GIS Data > GIS Settings*

(1-3) Next to **GIS Features File**, click the **Select** button.

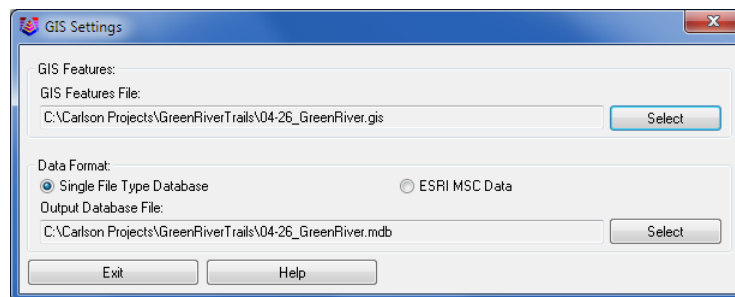
(1-4) Specify a filename and location of the GIS file.

(1-5) Select the **Single File Type Database** as the **Data Format**.

(1-6) Next to **Output Database File**, click the **Select** button.

(1-7) Click **New Access '97 Format**.

(1-8) Specify a filename and location for the new MDB file.



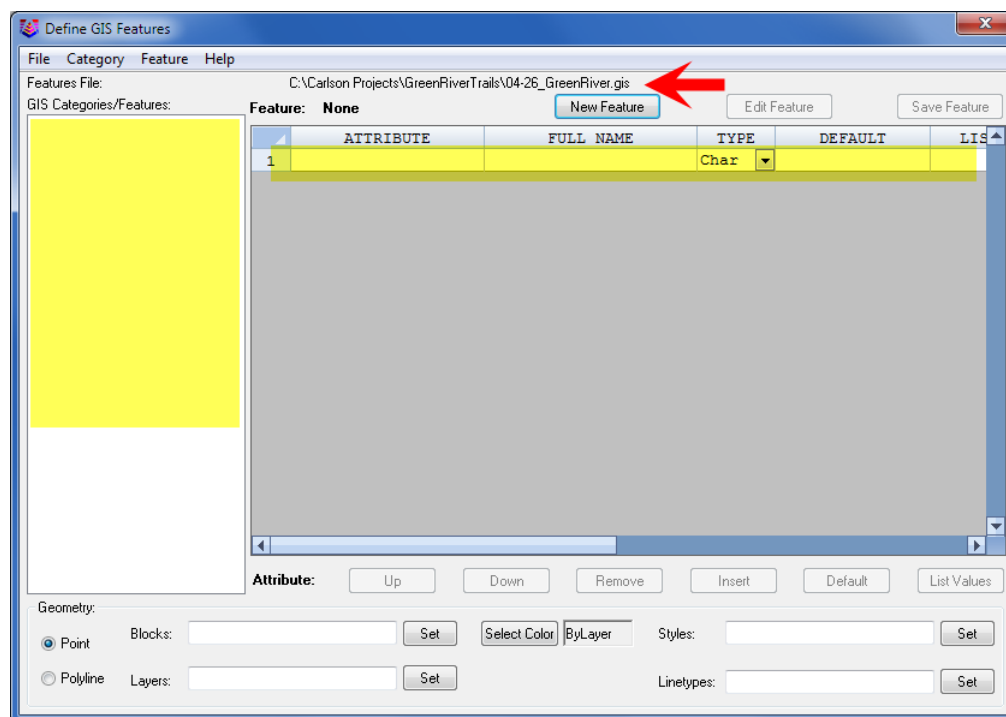
(1-9) Click **Exit** to close the box.

### 2 Review the GIS Features (.gis) File

A GIS Features (.gis) file can be manually populated with features and associated attributes or can be automatically populated when importing shapefiles.

(2-1) Go to *GIS Data > Define GIS Features*

As mentioned above, this example starts with a new, blank GIS file (shown below) and it will be populated from a shapefile we will import.



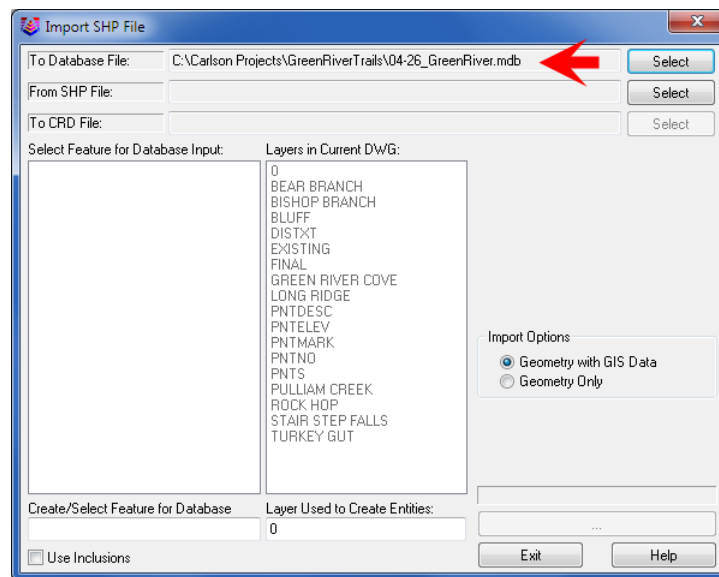
(2-2) Close the dialog box without making any changes.

### 3 Import Shapefile

Importing an Esri shapefile requires a minimum of 3 files: an SHP file (stores linework), a DBF file (stores associated data) and an SHX file (helps connect linework to data). The 3 files must have the same filename and be stored in the same folder.

(3-1) Go to *GIS Data > Import ESRI SHP File*.

The MDB file specified in the previous step should be displayed in the **To Database File** field.

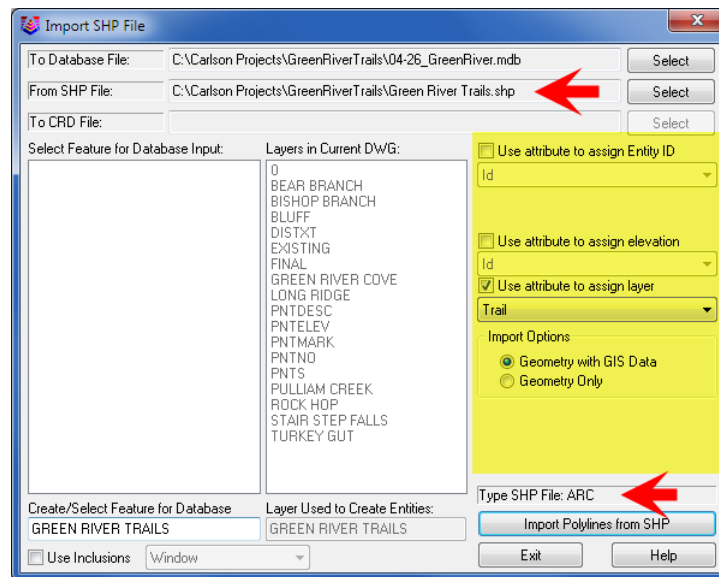


(3-2) Click the **Select** button next to **From SHP File**.

(3-3) Browse to and select the shapefile to be imported.

The Green River Trails.shp file contains ARC data. The image below shows the options available to assign attribute data to entity properties for this type data.

For this dataset, we are using the attribute “Trail” (which is the name of the trail) to assign the layer for each polyline.



Other types of shapefile data (point or polygon) will make other options available during the import process.

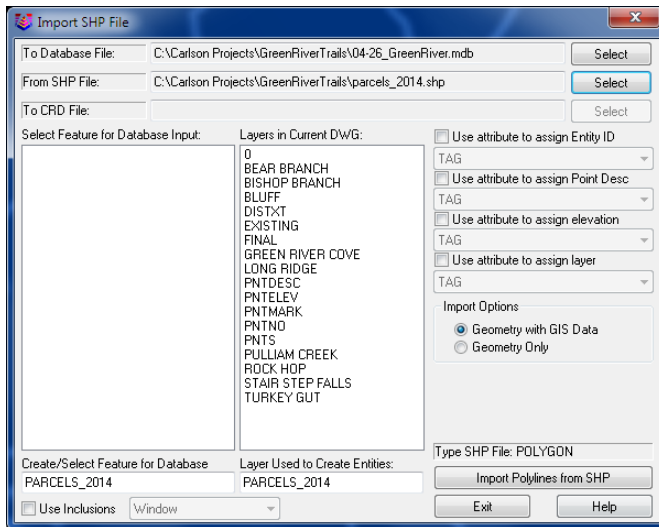
As an example, if a shapefile you’re importing contains point data, the **Select** button next to **To CRD File** will be active and you can specify a filename and location of the Carlson Coordinate (.crd) file into which the point data is to be saved.

Also, different types of shapefile data will give you different options of changing entity properties based on attribute values. For instance, you can:

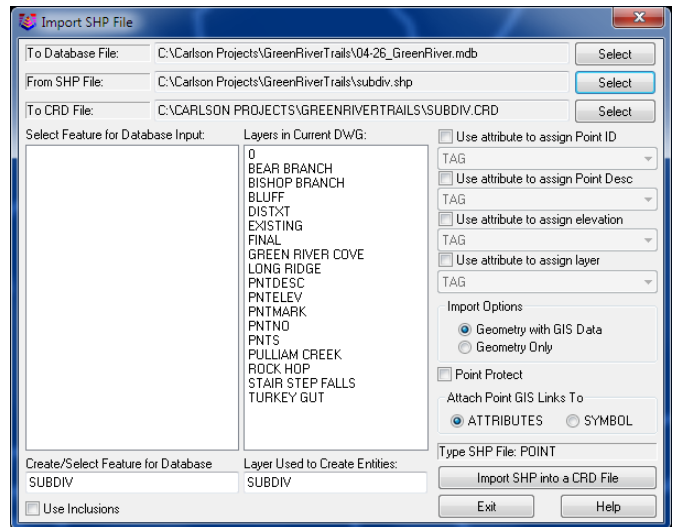
- Use attribute to assign Entity ID
- Use attribute to assign elevation
- Use attribute to assign layer
- Use attribute to assign Point Description

The images below show the options available when importing point- and polygon-type shapefile data into Carlson 2015 software.

Options when importing POLYGON-type SHP file:



Options when importing POINT-type SHP file:



(3-4) If all entities are to be imported into the drawing on a single layer, select a layer in the list of **Layers in Current DWG** or specify a new layer in the **Layer Used to Create Entities** field.

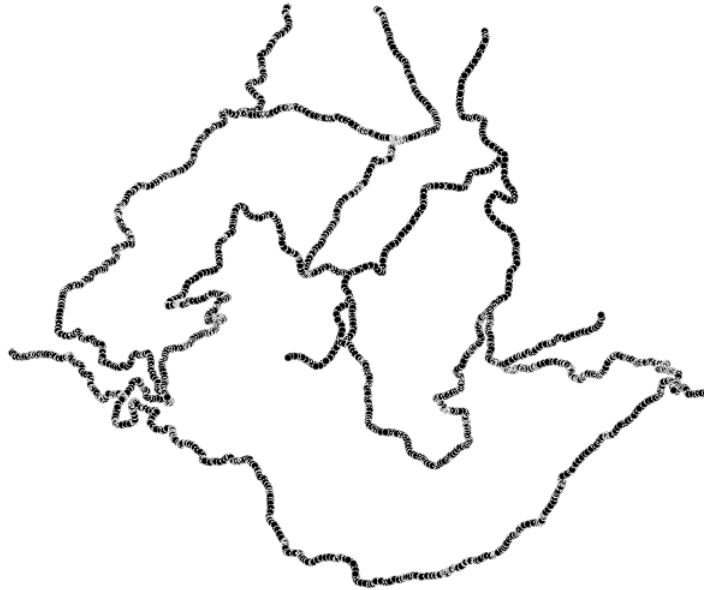
(3-5) Set the **Import Option** as either **Geometry with GIS Data** or **Geometry Only**.

(3-6) If needed, select the option to **Use Inclusions** either by **Crossing** or **Window** method. Otherwise, all data contained in the shapefile will be imported.

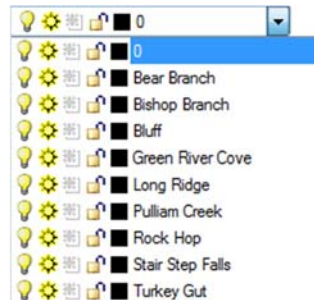
(3-7) Click **Import Polylines from SHP**.



The polylines imported from the shapefile look like this:



And the layers in the drawing correspond to the different trail polylines created:

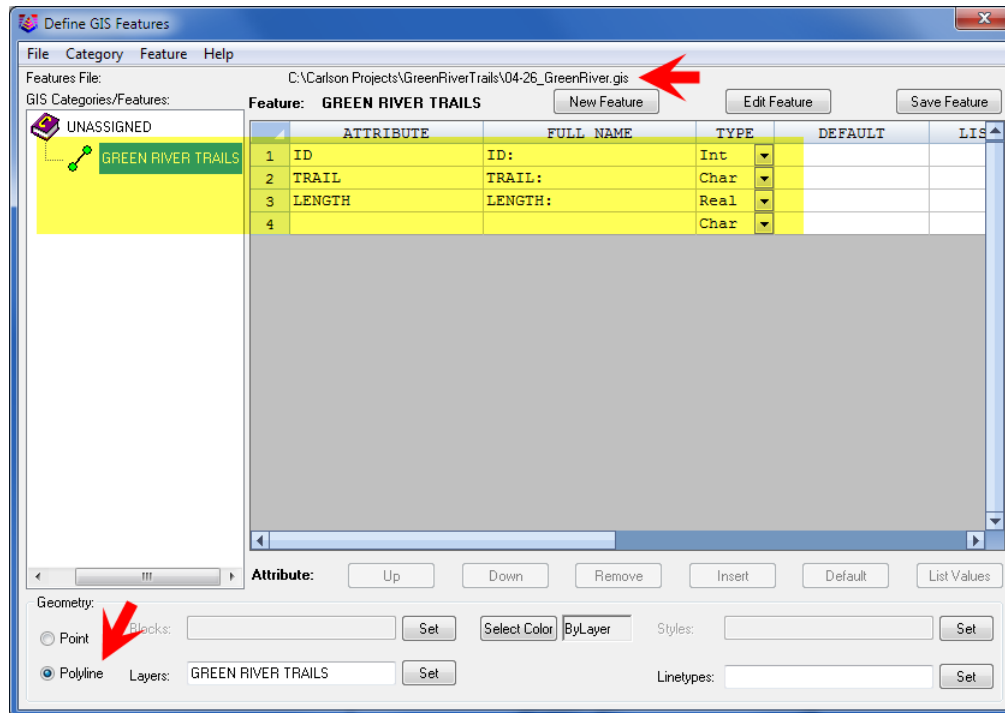


### 4 Review the GIS Features (.gis) File Again

(4-1) Go to *GIS Data > Define GIS Features*

(4-2) Double-click on the **Feature** name (Green River Trails in this example) to view the attributes associated with the feature.

After importing a shapefile, the GIS Features (.gis) file looks like this:

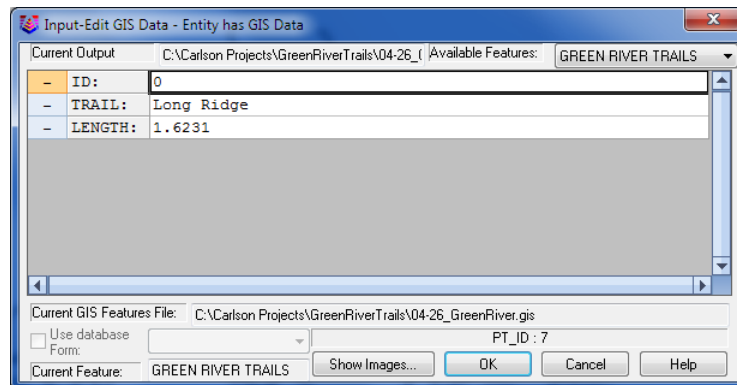


(4-3) Close the dialog box without making any changes.

### 5 Input-Edit GIS Data

(5-1) Go to *GIS Data > Input-Edit GIS Data*

(5-2) When prompted to **Select**, click on any GIS entity in the drawing.



A dialog box is displayed allowing you to view and edit the GIS attributes of the selected entity.

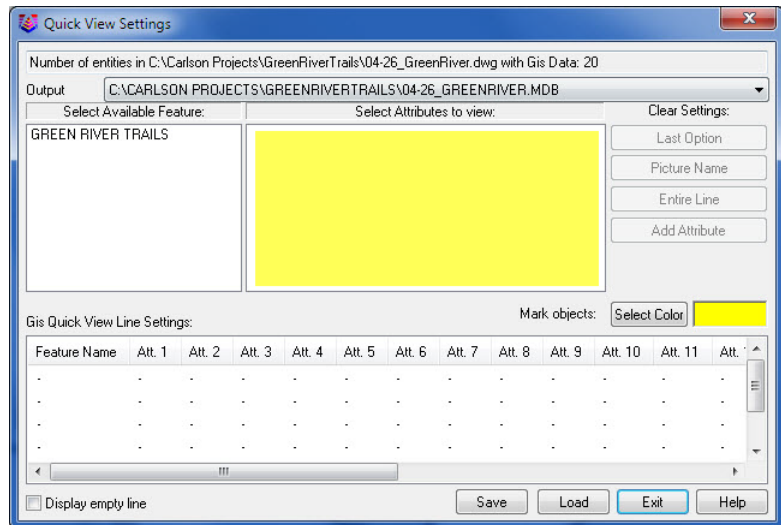
### 6 GIS Inspector

This command will create a “tooltip” that displays when you hover your mouse over similar features. The first step is to set up which attributes are displayed and in what order.

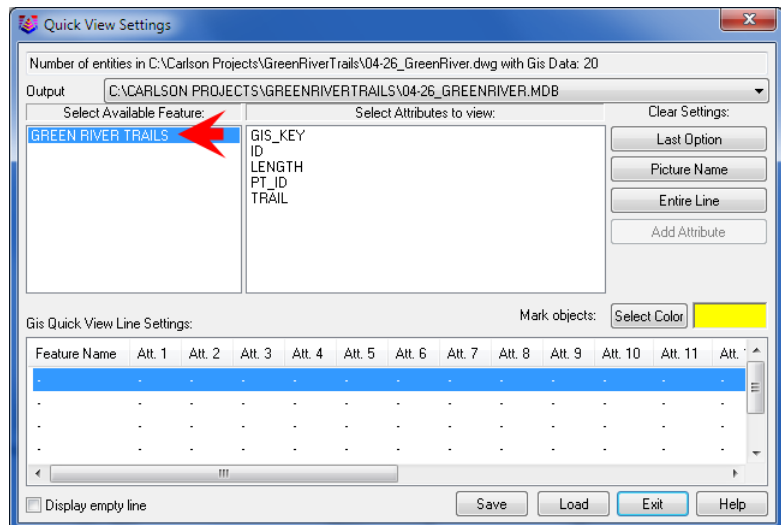
(6-1) Go to *GIS Data > GIS Inspector*

(6-2) When prompted to **Select Entities**, select all entities you may want to “inspect”.

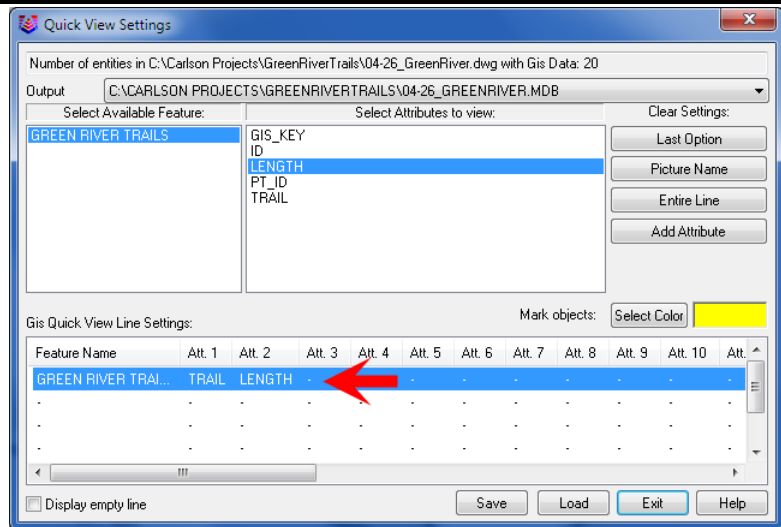
The GIS Inspector Quick View Settings box is displayed but, initially, no attributes are displayed.



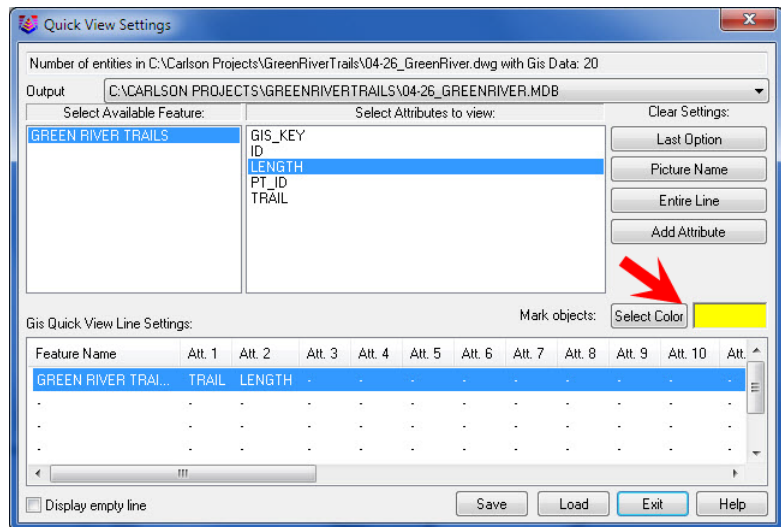
(6-3) Double-click on the **Feature** name to display the associated attributes.



(6-4) Next, double-click on each attribute in the order you want them to be displayed, top-to-bottom, in the tooltip.



(6-5) Click the **Select Color** button to set the color to highlight the Feature being inspected.

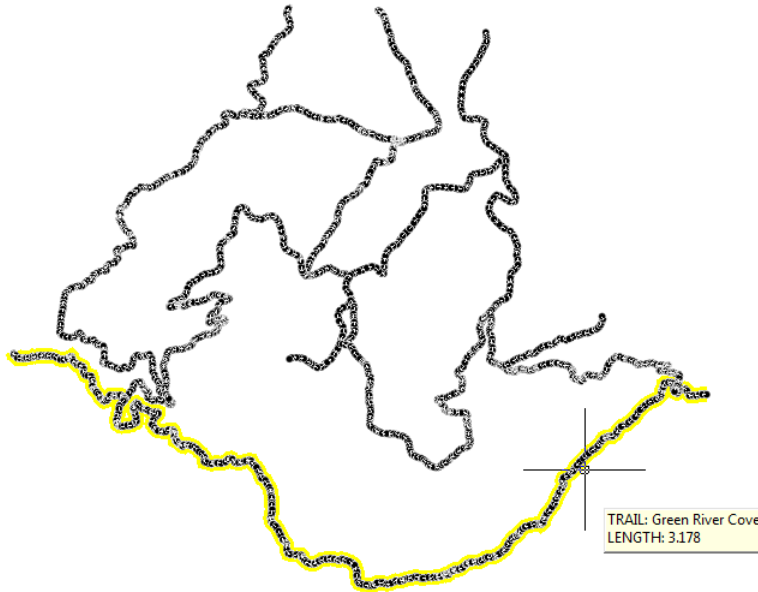


(6-6) Click **Exit**.

(6-7) When prompted to **Save Changes?**, click **Yes**.

The Command: line prompts you to: **Move pointer over entity with GIS Data**

(6-8) Hover over one of the GIS polylines to have it highlighted (yellow) in the drawing and a tooltip displayed.



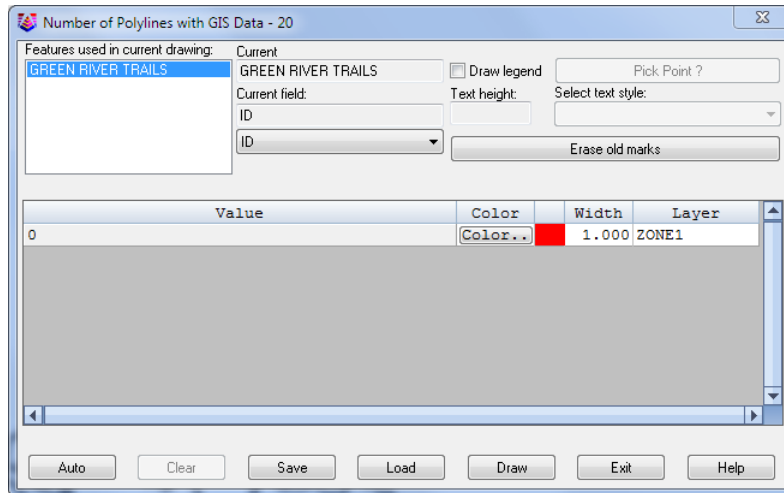
(6-9) Press **Enter** to end the command.

(6-10) If you need to make changes to the **Quick View** settings, go to *GIS Data > GIS Inspector Settings*

### 7 Mark GIS Polylines

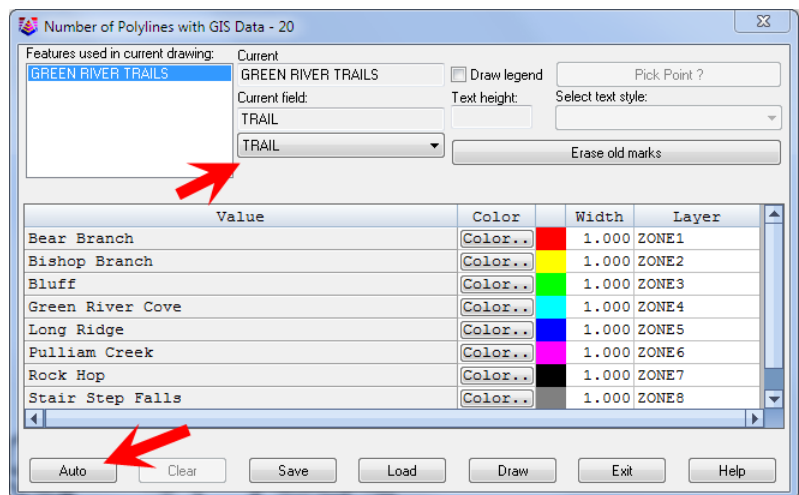
(7-1) Go to *GIS Data > Mark GIS Polylines*

(7-2) When prompted to **Select Entities**, select all GIS polylines to be “marked”.



(7-3) Change the **Current field** to “TRAIL” to see a list of the different values sorted into Zones.

(7-4) Click the **Auto** button.

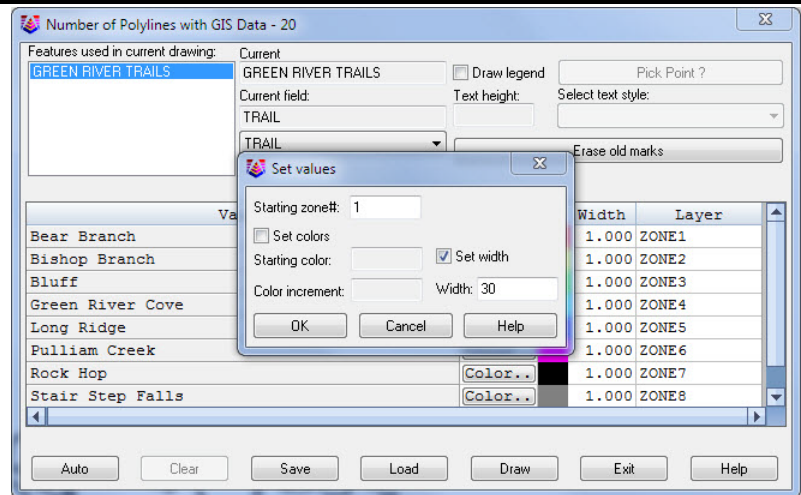


(7-5) Unselect the option to **Set colors**.

(7-6) Select the option to **Set width**.

(7-7) Change the **Width** to **30**.

(7-8) Click **OK** to close the box.

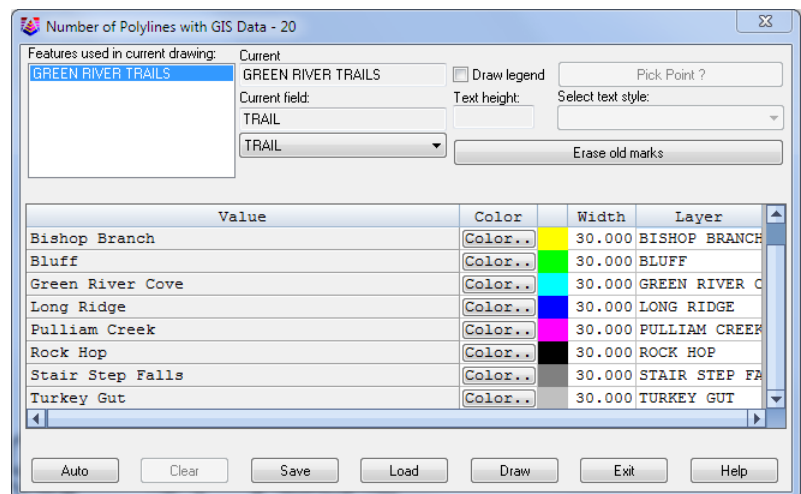


(7-9) Left-click with your mouse to select all the **Values** in the left-hand column.

(7-10) On your keyboard, press CTRL+C to copy to the clipboard.

(7-11) Left-click with your mouse to select all the corresponding **Layers** in the right-hand column.

(7-12) On your keyboard, press CTRL+V to paste.



The list of **Layers** should now match the list of **Values**.

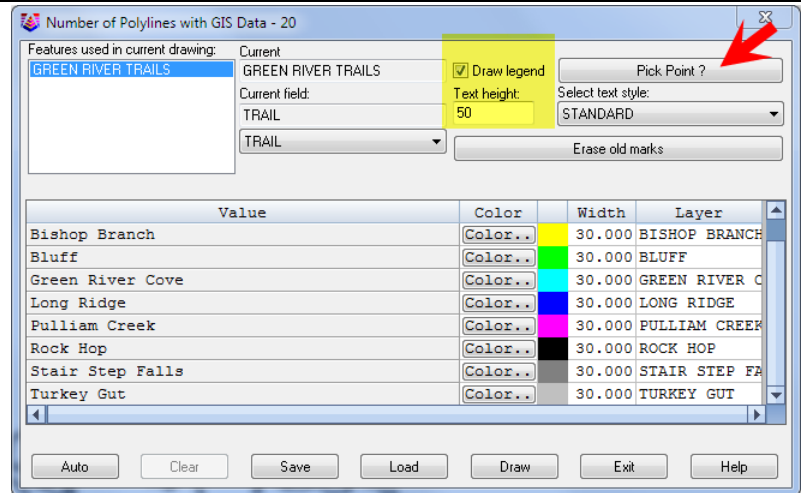


(7-13) Select the option to **Draw Legend**.

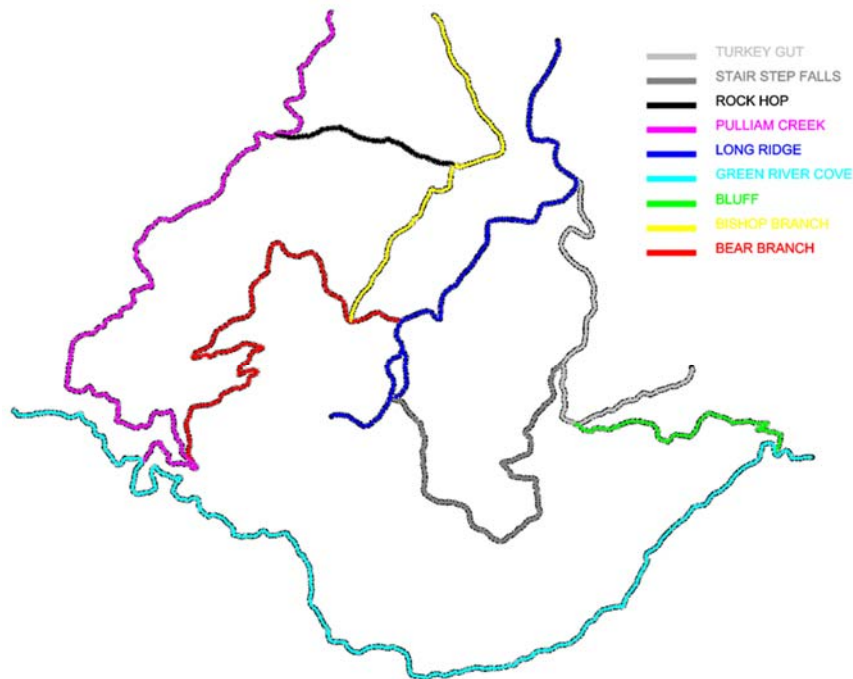
(7-14) Set the **Text height** to 50.

(7-15) When prompted, click the **Pick Point? Button** and then left-click a point in the drawing for the legend to be drawn.

(7-16) Click the **Draw** button.



The “marked” drawing and legend look like this:



(7-17) To remove all the markings, go back to *GIS Data > Mark GIS Polyines*.

(7-18) When prompted, select all GIS polylines.

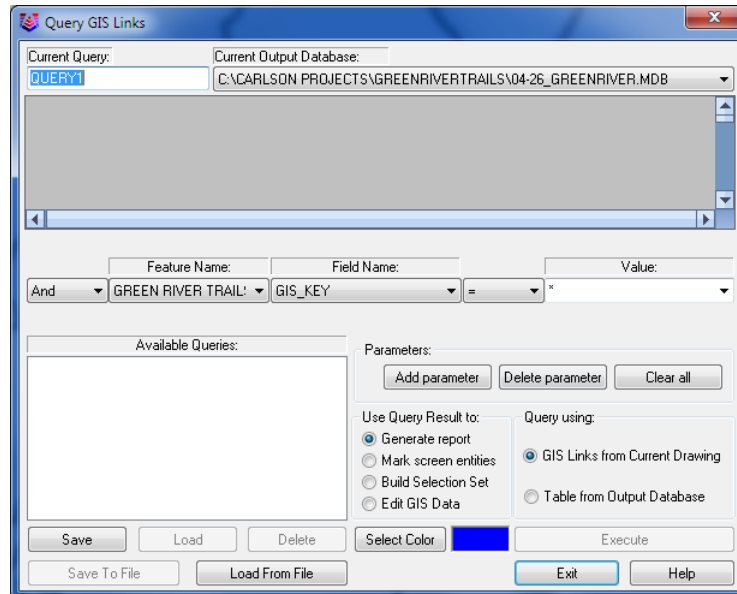
(7-19) Click the **Erase Old Marks** button.

(7-20) Click **Exit** to close.

### 8 GIS Query/Report

We will use this command to identify and mark only trails that are longer than 2 miles in length.

(8-1) Go to *GIS Data > GIS Query/Report*



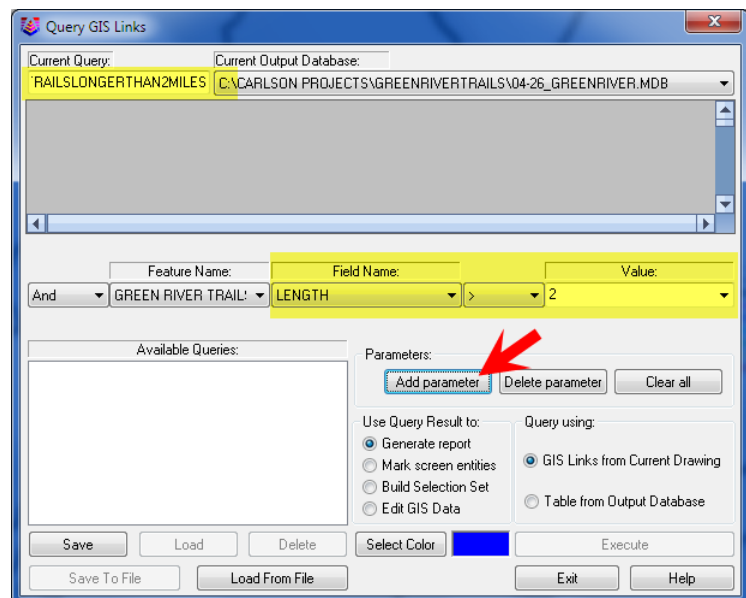
(8-2) Name the **Current Query**:  
**TRAILSLONGERTHAN2MILES**. (no spaces allowed)

(8-3) Set the **Field Name** to **Length**.

(8-4) Set the operator to **>** (greater than).

(8-5) Set the **Value** to **2**.

(8-6) Click the **Add parameter** button.



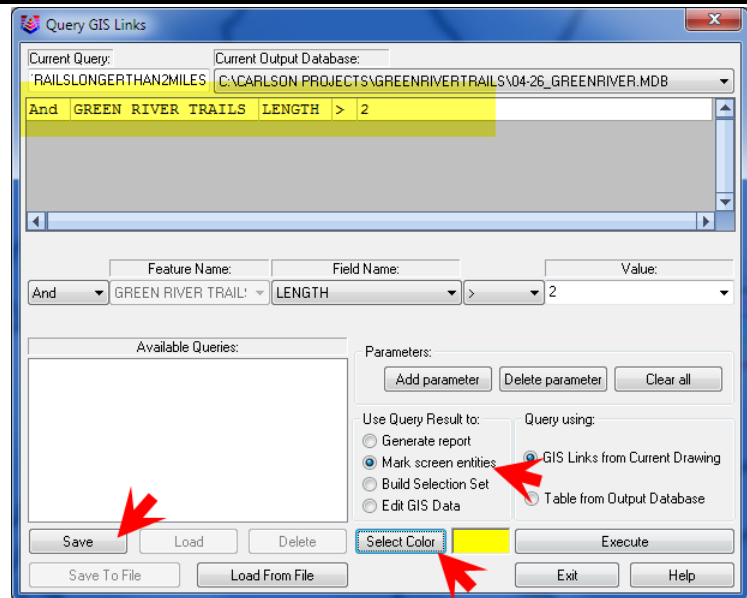
The details of the query should be displayed at the top of the table.

(8-7) Select the option to **Mark screen entities**.

(8-8) Click the **Select Color** button to set the color to be used to identify/mark GIS entities that meet the criteria.

(8-9) Click the **Save** button to save the query in the database for future use.

(8-10) Click the **Execute** button.

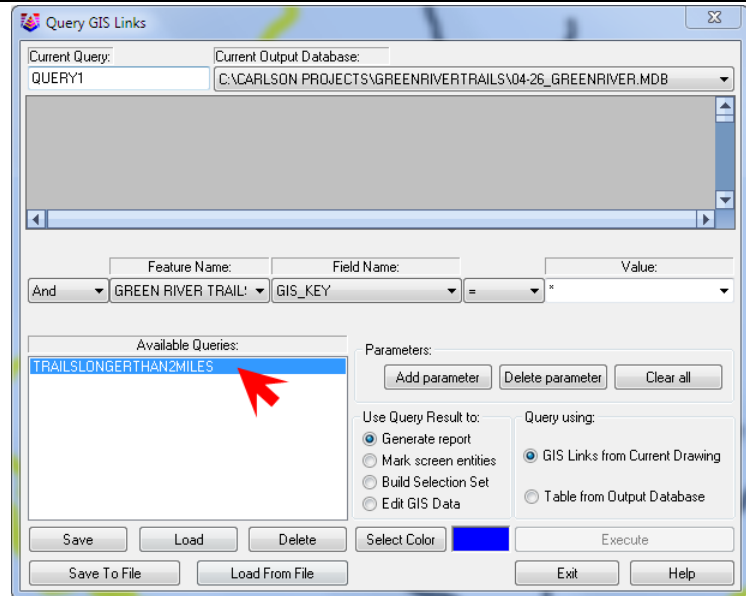


The results of the query are displayed in the drawing as shown below:



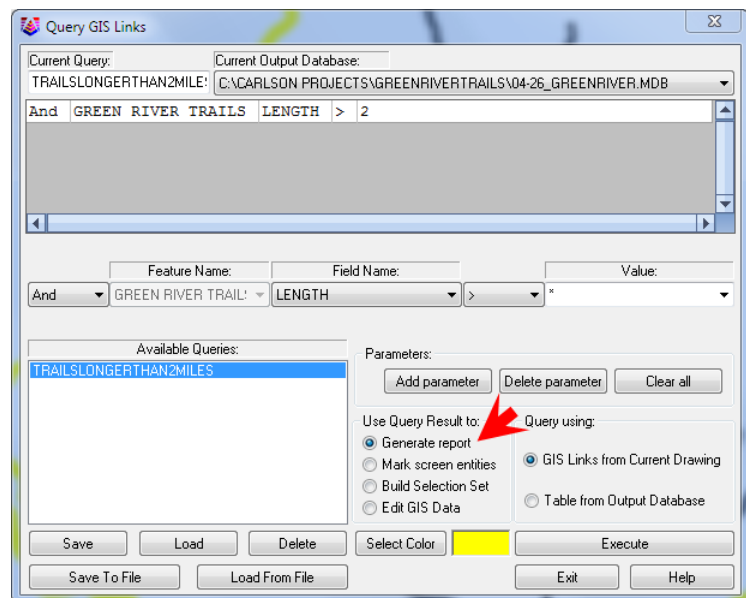
(8-11) To generate a report of the GIS polylines meeting the query criteria, go back to *GIS Data > GIS Query/Report*.

(8-12) In the list of **Available Queries**, double-click on the saved **TRAILSLONGERTHAN2MILES** query.



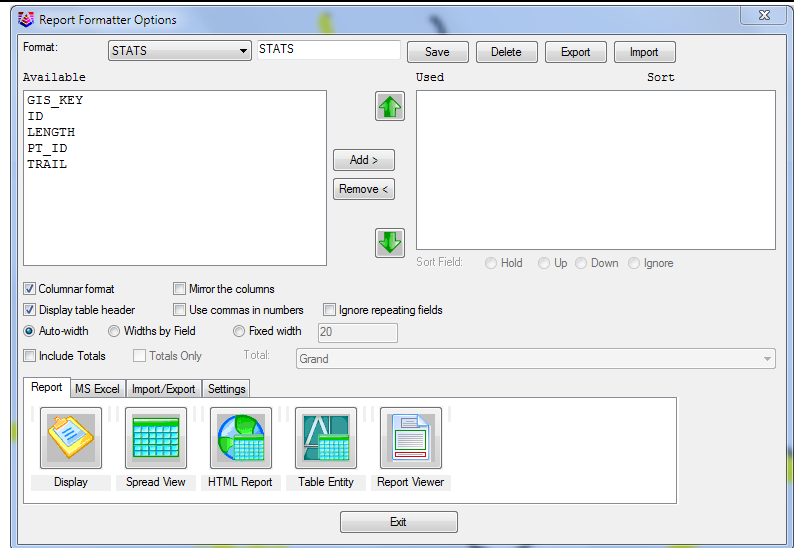
(8-13) If not already set, click the **Generate report** option to display **Query Result**.

(8-14) Click **Execute**.

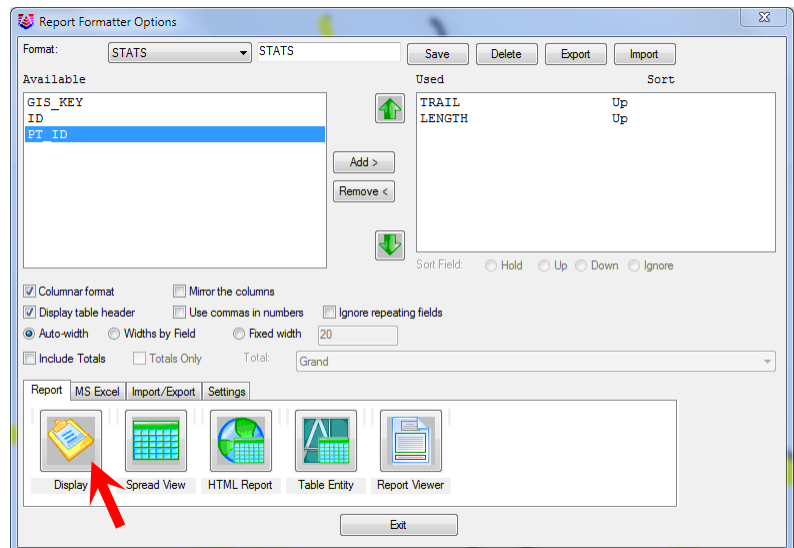


(8-15) In the list of **Available** fields on the upper left, double-click **TRAIL** to add it to the list of **Used** fields.

(8-16) Click once on **Length** in the list of **Available** fields then click the **Add** button to also add it to the list of **Used** fields.

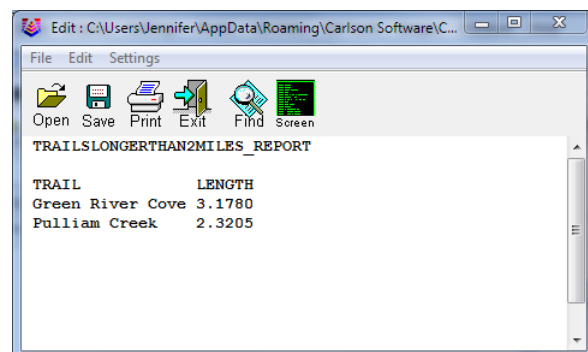


(8-17) Click the **Display** button.



(8-18) The sample report is shown to the right.

(8-19) Click the **Exit** button to close.

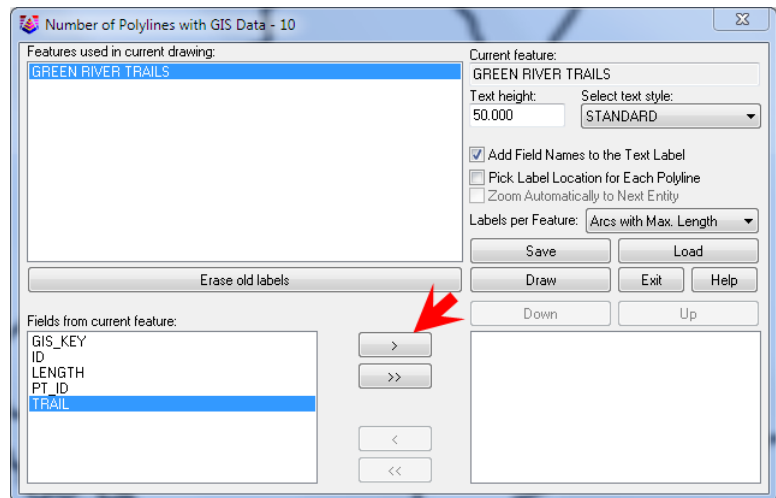


### 9 Label GIS Data

(9-1) Go to *GIS Data > Label GIS Data > Open Polyline Data*

(9-2) When prompted, select all entities to be labeled.

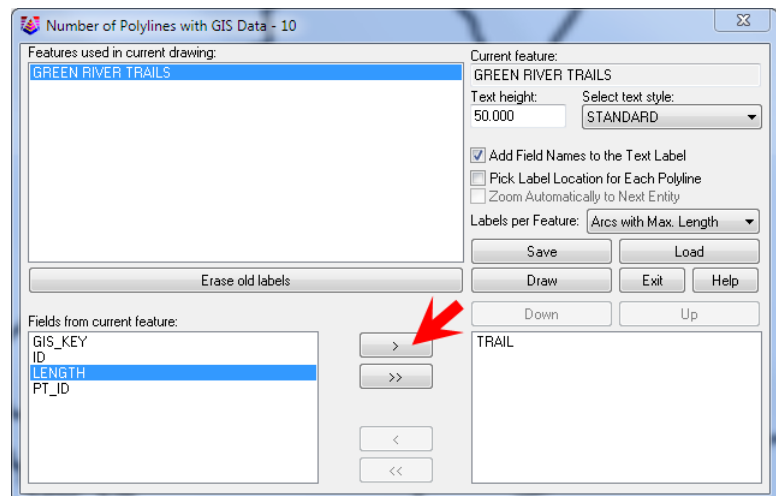
(9-3) From the list of **Fields from current feature**, click on **TRAIL** and then click the right-arrow > to add it to the list of used fields on the right.



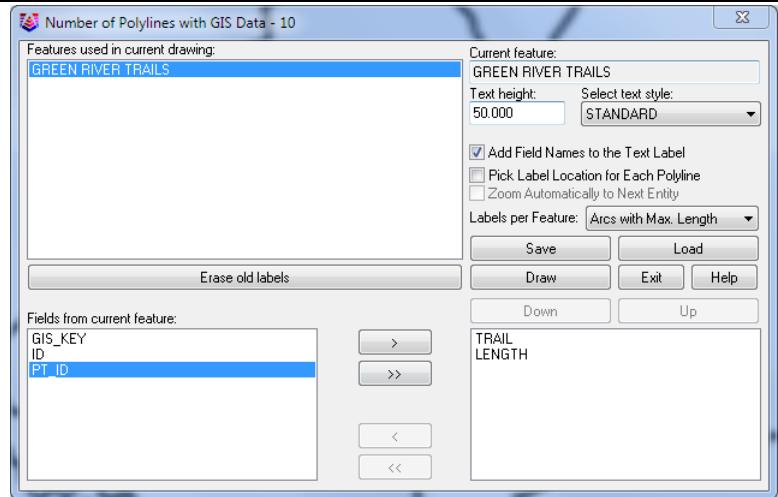
(9-4) Click on **LENGTH** and then click the right-arrow > to add it to the list of used fields on the right.

(9-5) Set the **Text Height** to 50.

(9-6) Select the option to **Add Field Names to the Text Label**.



(9-7) Click **Draw**.



The labels are shown to the right. They will most likely have to be moved, rotated and repositioned to be legible.

