IDWR Customized NHD Edit Tool Users Guide

Purpose:

The purpose of this tool is to collect more accurate geometry and attribute information of linear representations of Idaho waterways along with structures that impact water flow, referred to as points of diversion (POD), within and along the waterways. This tool will help the NHD steward to improve the Flowline accuracy and networking capabilities of the National Hydrography Database.   Edits made using this tool are stored in a geodatabase. After all information is collected, the geodatabase is to be returned to IDWR for incorporation into the National Hydrography Database.

Getting Started:

If using the tools for the first time, please review the README |INSTALLATION Document.

The IDWR customized NHD edit tool uses the Editor Toolbar and the custom NHD Edits – IDWR toolbar. The NHD Edits – IDWR toolbar is project specific to the nhd_edits.mxd. The provided canal_edits geodatabase which will hold the edits created using the tool.   ESRI ArcGIS 9.3x (ArcView license level) is required.

DO NOT CHANGE THE NAMES OF THE LAYERS FROM THE PROVIDED GEODATABASE VIA PROPERTIES| GENERAL TAB. Additional data frames and layers may be added to the project. Draw order is up to the user. If transferring data from a different source into the edit geodatabase, reproject as appropriate so that the source data and the edit geodatabase are in the same projection.

> Suggested data to add to the provided project
> 1) Current version of the National Hydrography Database
> 2) Other hydrologic information
> 3) Base layer information including roads, administrative boundaries, and Public Land Survey.
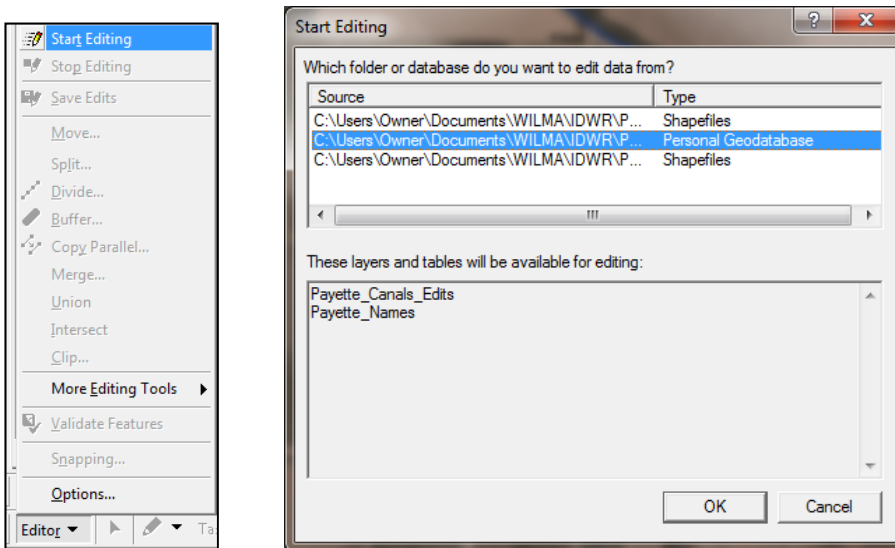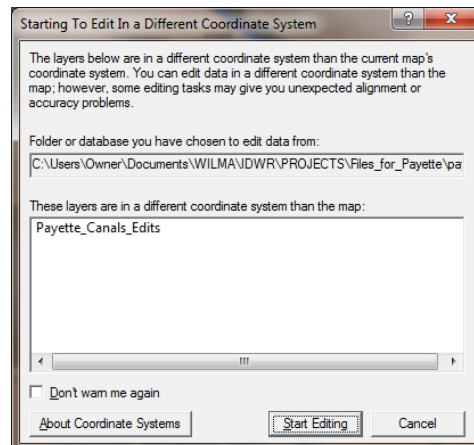> 4) Imagery

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Making Segment by Segment Canal Edits:

This portion of the tool allows the user to add linear features indicating a canal or other waterway.

- Start editing session (Editor > Start Editing). If you do not see the Editor Toolbar click the [icon] Editor Toolbar Button that is visible in ArcMap as part of your Standard Toolbar.

- Highlight the Personal Geodatabase you need to edit. For example, you should see the name of the Personal Database ("Payette_Canals_Edit") at the bottom portion of the "Start Editing" dialog box

- If you see the "Starting To Edit In a Different Coordinate System" Dialog Box, go ahead and click the "Start Editing" button.

- Editing in a different coordinate system OK when making segment by segment canal edits or when adding points of diversion. A different coordinate system can be a problem when transferring line geometry or point to POD.

- Make sure the Task = Create New Feature and the Target = the canal edits layer

- Click the Sketch Tool

Use the Sketch Tool to indicate where to Add, Modify or Delete existing Canals or StreamRivers.

Add a New Feature

It appears a lateral is missing. This lateral in drawn in the image on the right using the sketch tool. Remember to double click on the last vertex or press F2 to finish the sketch.

The following dialog box appears:

Complete the information in the dialog box:

FTYPE: Make certain that you change the FTYPE from the default 336 to a textual description of the type of waterway. For example: Canal or Ditch, Stream or River, or Pipeline.

EDIT_ACTION: Because this feature you just added does not exist in the underlying NHD data, the Edit_Action = Add New Feature.

NAME: Users have the option to leave the name field blank, pick a name from the drop-down list (population with GNIS names and GNIS IDs) or type in a new name. When a user types in a new name the following dialog will appear so the user can confirm the name.

When the user confirms the new name and saves the changes, this name is now added to the drop-down list and will be available from now on as a selection on this list.

COMMENT: Please add any short comment about the feature that you believe would be useful to know.

Canal_Lining: Please indicate the general below waterline surface of the canal. Is it a more natural/porous substrate, indicate Earthen. If it is cement or other non-porous substrate, indicate Non-Earthen.   Stream/Rivers are traditionally Earthen.   If **Other** is selected, please describe briefly in comments.

Please ignore the Shape_Length field, this field will be calculated with software tools.

When finished with the attribute entry, click the SAVE CHANGES button on the form.

Move onto the next feature or Click Editor| Save Edits to save your changes or Editor|Stop Editing, to save changes and end the edit session.

Note: Editor|Save Changes is what saves your work. Do not exit the project without Editor|Stop Editing, Save Changes – Yes.

Modify Feature

One lateral has a different geometry than indicated in the Canals_and_StreamRiver layer. Use the Sketch tool to draw in the correct geometry of the lateral.

Complete the dialog box. This time select "Modify Feature" as your Edit_Action.

If you want to add a name or adjust other attributes of an existing feature use the "Modify Feature" edit action and draw on top of the existing line. Simply indicate the attribute changes in the dialog box. Please add a comment "attribute only" to indicate the lack of geometry changes.

Move onto the next feature or Click Editor| Save Edits to save your changes or Editor|Stop Editing, save changes to end the edit session.

Note: Editor|Save Changes is what saves your work. Do not exit the project without Editor|Stop Editing, Save Changes – Yes.

Delete Feature

Use the Sketch Tool to draw on top of the lateral that should be deleted
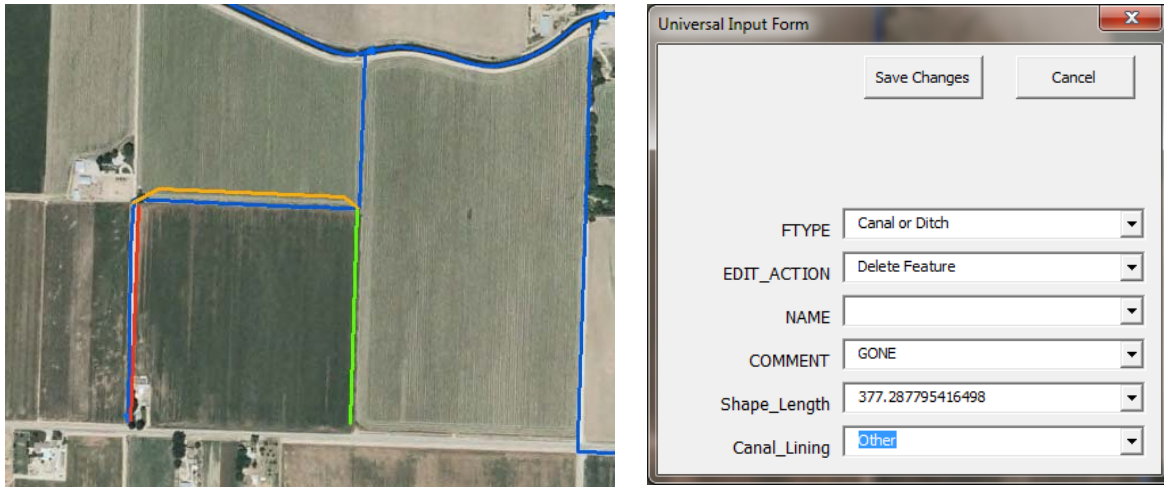
Select "Delete Feature" in the dialog box.

Move onto the next feature or Click Editor| Save Edits to save your changes or Editor|Stop Editing, save changes to end the edit session.

All the user generated edits are stored in the Payette_Canals_Edits attribute table:

OBJECTID *	Shape *	FTYPE	EDIT_ACTION	NAME	COMMENT	Shape_Length	Canal_Lining
1015	Polyline Z	Canal or Ditch	Add New Feature	Joes New Canal		375.236539	Earthen
1017	Polyline Z	Canal or Ditch	Modify Feature			405.794791	Earthen
1019	Polyline Z	Canal or Ditch	Delete Feature		GONE	377.287795	Other

Record: 14 ◄ ► ►I   Show: All Selected   Records (0 out of 6 Selected)   Options ▾ ✐

Fixing mistakes

The strength of this tool is its simplicity. A user does not move vertices or delete features if there is only a small mistake.

Let's assume an editor draws in a new canal using the "Add Feature" and then realizes this canal does not actually exist. In this case the editor would draw a new line on top of the "new canal" and identify it as a "Delete feature". When interpreting the edits, IDWR will be able to decipher the temporal order in which the edits were made by examining the OBJECTID in the attribute table and determine which edit was made last and should be used.

Adding Points of Diversion (PODs)

This portion of the tool allows the user to add point features indicating a POD along a waterway.

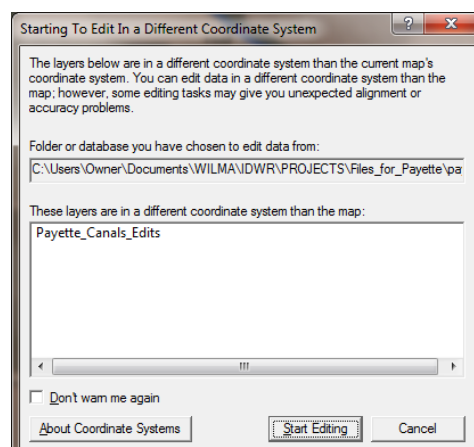- Start editing session (Editor > Start Editing). If you do not see the Editor Toolbar click the Editor Toolbar Button that is visible in ArcMap as part of your Standard Toolbar.
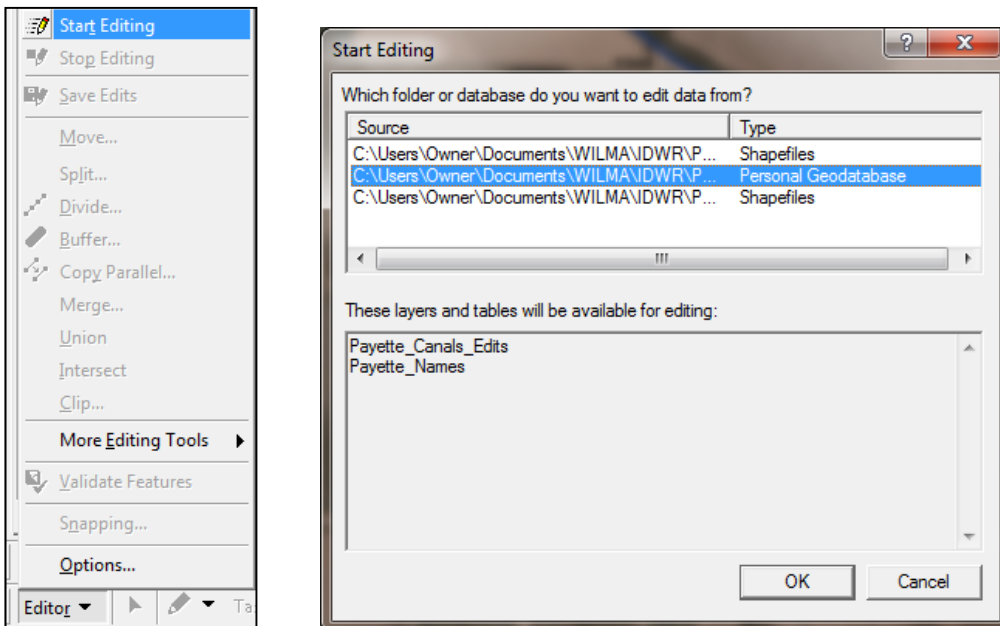
- Highlight the Personal Geodatabase you need to edit. For example, you should see the name of the Personal Database ("Payette_PODs") at the bottom portion of the "Start Editing" dialog box
- If you see the "Starting To Edit In a Different Coordinate System" Dialog Box, go ahead and click the "Start Editing" button.

- Editing in a different coordinate system OK when making segment by segment canal edits or when adding points of diversion. A different coordinate system can be a problem when transferring line geometry or point to POD.

- Make sure the Task = Create New Feature and the Target = the canal edits layer

- Click the Sketch Tool

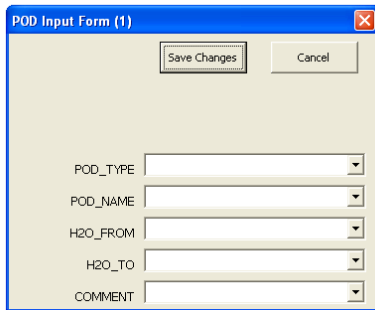Use the Sketch Tool to indicate where to place a POD on a canal or other waterway.

Note: it is important where the POD is placed. APOD placed on one segment versus another will change the way any network associated with that point will perform. Setting the snapping options can be helpful to insure the POD is directly on the segment intended.   Please See Snapping Option in the Appendix for directions on setting snapping tolerances.

When the point sketch is completed, the following dialog box appears:
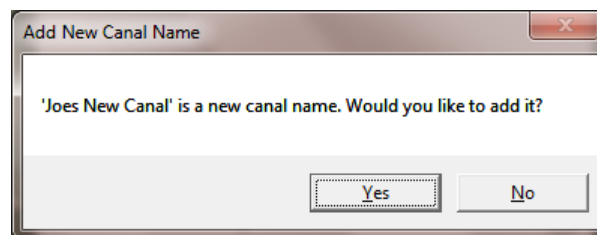

POD_TYPE: Select Check gate, Fish Screen, Headgate, Pump, Other. If Other is chosen, please explain in COMMENT.

POD_NAME: The name of the POD.

H2O_FROM: The source. Where the water is coming out of. Upstream.

H2O_TO: Where the water is going to. Downstream. If the canal or stream ends, H2O_TO = Sink

When filling in H2O_FROM or H2O_TO, users have the option to pick a canal or stream name from the drop-down list (population with GNIS names and GNIS IDs) or type in a new name. When a user types in a new name the following dialog will appear so the user can confirm the name.

When the user confirms the new name and saves the changes, this name is now added to the drop-down list and will be available from now on as a selection on this list.

COMMENT: Please add any short comment about the feature that you believe would be useful to know..

When finished with the attribute entry, click the SAVE CHANGES button on the form.

Move onto the next feature or Click Editor| Save Edits to save your changes or Editor|Stop Editing, save changes to end the edit session.

Modifying the Attributes of a POD

There are 2 ways to modify the attributes of an already created point of diversion.

1) Simply create another POD on top of the POD with the incorrect attributes. Indicate in the comment field that this point has corrected attributes and which attributes were corrected. (See Adding Points of Diversion.)
2) Edit the attributes in the Attribute Dialog Box.
   a. While you are in an Edit Session (Editor > Start Editing), select the POD you are looking for.
      Click on the tool [image] and draw a box around the POD you want to select.
      - If you select more than one POD, see the Note at bottom of page.
   b. Click on the Attributes button near the end of the Editor Toolbar.

   c. The Attributes dialog box will open. Click in the value column of the attribute you wish to fix. Type in new value. Enter.
      a. Note: If you add a new canal name through this method, it will not be available in the drop down list of the regular attribute entry form.
   d. Close Attributes dialog box.
   e. Continue to the next POD or Editor>Save Edits, Editor>Stop Editing to finish.

Note: If you select more than one POD, you will need to open the attribute table (Right Click on Edit_PODs and click on Open Attribute Table.) Click on the Selected button to only display the selected features. Click on the small gray square on the far left next to the OBJECTID field of the POD you want. It should turn yellow. Right click on the square, Reselect Highlighted. Close the attribute table.

Moving a POD

There are 2 ways to indicate a corrected location of an already created point of diversion.

1) Simply create another POD in the correct location with the same attributes as the incorrectly placed POD. Indicate in the comment field that this point has a corrected location. (See Adding Points of Diversion.)
2) Move the POD to the correct location
   a. While you are in an Edit Session (Editor > Start Editing), select the POD you need to move.

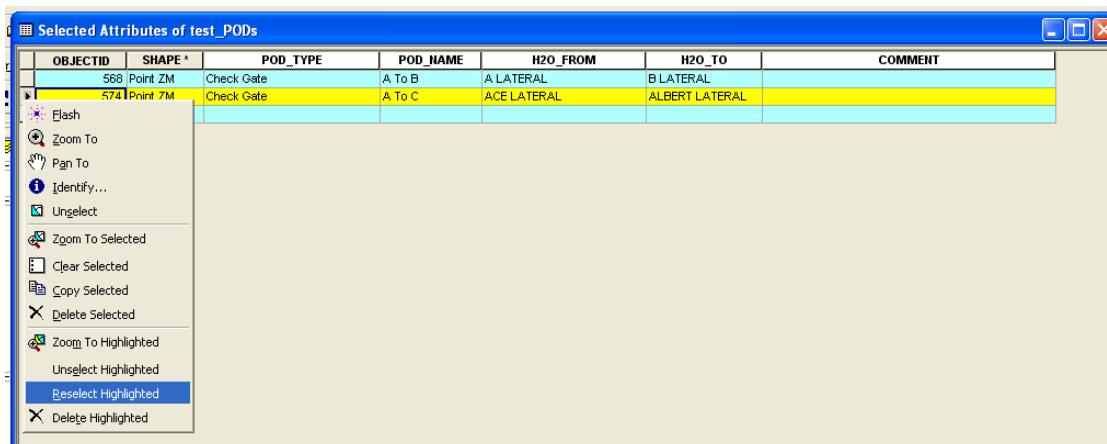   Click on the tool [icon] and draw a box around the POD you want to select.
      - If you select more than one POD, see the Note at bottom of page.
   b. On the Editor Toolbar, change the Task to Modify Feature and click on the black arrowhead.

   c. The selected POD should now have a green square in it.
   d. Hover over the green square until you see the box with 4 triangles. Left click and hold. Drag the square to the correct location. Release the mouse button when it is in the right place.
   e. If the location is good, press the F2 button on your keyboard. The POD input form will open. Adjust attributes if necessary.
   f. Click the Save Changes button on the form regardless if you adjust any attributes. Pressing Cancel will cause the point to be deleted.
   g. Continue to the next POD or Editor>Save Edits, Editor>Stop Editing to finish.

Note: If you select more than one POD, you will need to open the attribute table (Right Click on Edit_PODs and click on Open Attribute Table.) Click on the Selected button to only display the selected features. Click on the small gray square on the far left next to the OBJECTID field of the POD you want. It should turn yellow. Right click on the square, Reselect Highlighted. Close the attribute table.

The IDWR NHD Edits Toolbar

The NHD Edits – IDWR toolbar allows for several other edit operations to be conducted.


Append Segments from a Different Line Layer to Edit_Canals Database (Transfer Line Geometry)

Individual segments from different shapefiles or geodatabases can be appended to the Edit_Canals database using the "Transfer Line Geometry" button.
1) Select segments in a polyline layer.
2) Click the "Transfer Line Geometry" button, the geometry will be appended to the Edit_Canals database.
3) The POD Entry Form will be opened for attribution of each segments selected.
4) **Warning: Each segment must be attributed!**
5) **Warning: Projection of the polyline layer selected must match the projection of the Edit_Canals layer or they may not be placed correctly.**

Change Flowline Direction

Knowing how canals flow into and around each other is critical in making the NHD as accurate as possible. Flowline direction is initially determined by direction of digitization. If the direction of a canal edit is indicated incorrectly, it is a simple action to flip its direction.
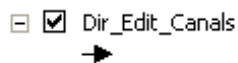
If the Dir_Edit_Canals layer is not in the table of contents, click the "Change FlowLine Direction" button to add it.

To flip the direction of a flowline:

1) Select one or more segments from the Dir_Edit_Canals layer
2) Click the Change NHD Line Direction button.

Connectivity

How water flows from one waterway to another is critical to building an accurate NHD. The Connectivity tool runs a series of tests on the edited canal layer. The result is a collection of point features indicating where canals or streams of different names are close enough to intersect. These are areas where either a true point of diversion or an end of a canal would be expected.

To run the tool, simply click on the Connectivity button. This tool is best if run after edits on the Canal_Edits layer are complete or if many updates have occurred.

Please transfer appropriate connectivity points to the Edits_PODs layer using "Transfer Pt. to POD".

Transfer Existing Point Geometry to POD

Individual points from different shapefiles or geodatabases can be appended to the Edit_Canals database using the "Transfer Pt. to POD" button.

1) Select points in a point layer
2) Click the "Transfer Pt. to POD" button, the geometry will be appended to the Edit_Canals database.
3) The POD Entry Form will be opened for attribution of each point selected.
4) **Warning: Each segment must be attributed!**
5) **Warning: Projection of the polyline layer selected must match the projection of the Edit_Canals layer or they may not be placed correctly.**

Adding Canal Names so that they are available in the NHD Entry Form:

If a new canal name is added via the NHD Edit Form, it is automatically added to the form Name Domain.

To bulk load multiple names to the NHD Edit Form Name Domain

1) Import the list of names into a new table in the ArcMap Project
   a. This table must be a stand-alone table in the project. This is to avoid possible corruption issues.
   b. Stand alone tables without OIDs (i.e. text files) will be exported to .dbf before append can occur.
2) Click the add "table of new names" button

Tips:
a) Names that are effectively the same but spelled differently (i.e. A Lateral vs. A Lat.) will be added, effectively creating duplicate entry.   The larger the domain, the longer the form will take to load. Please review the XX_Names table to avoid duplicate name entry.
b) The load process will be quicker if there are no duplicate names in the table to be loaded.

Appendix:

A) Snapping Options (For more information on setting snapping options, see ArcMap Help, Index, snapping, environment)

The Snapping Environment
   a. Editor Toolbar/ Editor/Start Editing/Snapping
   b. Check those theme(s) to snap to during editing in the snapping environment
         i. For PODs, check Vetex and Edge of the hydrography layer the POD is related to.
Snapping Options
   a. Editor Toolbar/Editor/Options/ General tab
   b. Set Snapping tolerance in mapping units. Mapping units are the unit of projection. For much Idaho data, it is in meters.   i.e. A snapping tolerance of 3 map units when the data frame is in IDTM83 means the data will snap if it is within 3 meters.

B) Changing Symbology (For more information on setting snapping options, see ArcMap Help, Index, Symbol Selector, Modifying symbols and map elements)
The default symbology for the Edits_Canals and Edits_PODs layers can be changed without affecting the functionality of Custom Edit Toolbar.

Click on layer symbol (point/line/polygon under name of layer) to adjust the layer symbology.
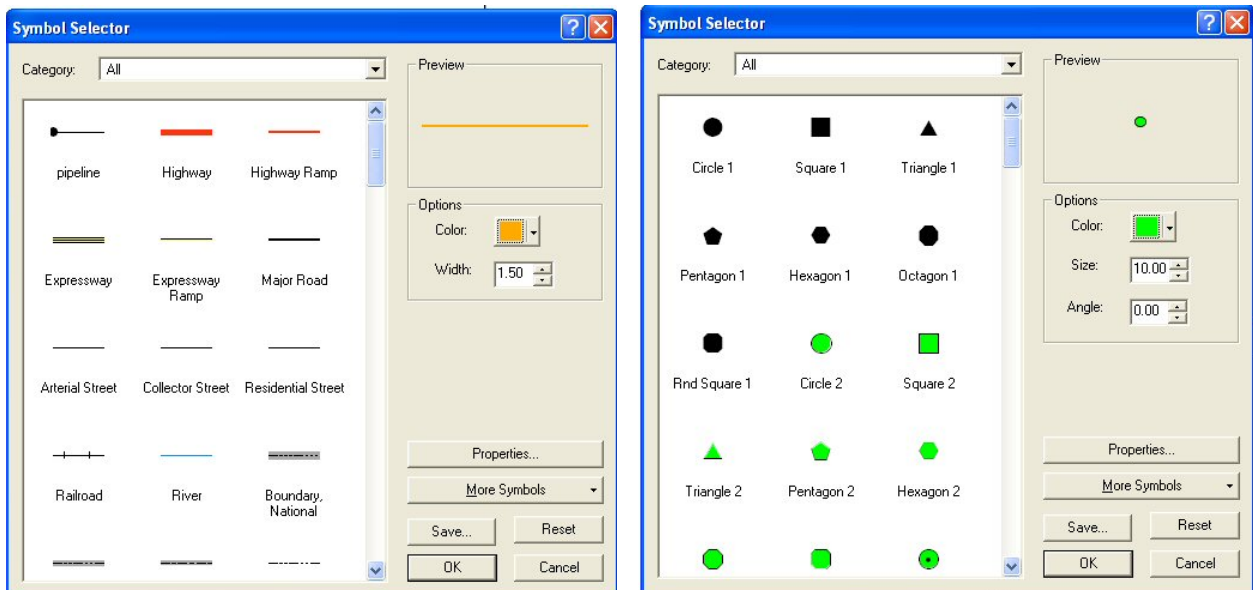
The Symbol Selector will open.
   a. Select the new symbol. (i.e. pipeline, river or Circle 2)
   b. Adjust the symbol Color in the Options area
   c. Adjust the symbol Width/Size in the Options area.

C) Appending Multiple Lines Directly to Edit_Canals Database:

If there is an area where a dataset exists that is geometrically correct at the proper scale and fully attributed, you can append the dataset to the Edit_Canals database using the ArcToolbox Append Tool with some simple adjustments.   APPEND CAN NOT BE UNDONE!!

Please make certain that all of the appropriate attributes are included in the input layer.
   a. FType
        i. Short data type – for each segment calculate the numeric value, i.e. 336
        ii. Domain: 336 (Canal or Ditch), 460 (Stream or River), 428 (Pipeline), 500 (Pressurized Underground), 600 (Other)
   b. Edit_Action
        i. Short data type– for each segment calculate the numeric value, i.e. 100
        ii. Domain: 100 (Add New Feature), 200 (Modify Feature), 300 (Delete Feature)
   c. Name
        i. String; length 50
   d. Comment
        i. String; length 50
   e. Canal_Type
        i. String; length 50
        ii. Domain: Earthen, Non-Earthen, Pipe, Other

Be certain that all attributes are appropriately mapped.

Any new canal names that are added using this method will not be available in the NHD Entry Form unless it is added to the Canal_Names table.

D) Appending Multiple Points Directly to Edit_Canals Database:

If there is an area where a dataset exists that is geometrically correct at the proper scale and fully attributed, you can append the dataset to the Edit_Canals database using the ArcToolbox Append Tool with some simple adjustments.   APPEND CAN NOT BE UNDONE!!

Please make certain that all of the appropriate attributes are included in the input layer.
   a. POD_Type
        i. String; length 50
        ii. Domain: Check gate, Fish Screen, Headgate, Pump, Other
   b. POD_NAME
        i. String; length 50
   c. H2O_FROM
        i. String; length 50
   d. H2O_TO
        i. String; length 50
   e. COMMENT
        i. String; length 100

Be certain that all attributes are appropriately mapped.

Any new canal names that are added from either the H2O_TO or H2O_FROM fields will not be available in the NHD Entry Form unless it is added to the Canal_Names table.