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geodatabase allows you to take advantage of geodatabase functionality like domains, subtypes and multiversioned editing.

Open the **Database Connections** folder.

Double-click **Add SDE Connection**.

The SDE Connection dialog opens.

For Server, type *server*

For Instance, type *instance*

If your server supports multiple databases, for Database, type *database*

For User Name, type *username*

For Password, type *password*

Click **Test Connection**.

If the connection is successful, the Test Connection button will disable.

Click **OK**.

Your new connection will be called *Connection to <server>*. Give your connection a more descriptive name.

NOTE: When a connection is created using ArcMap, the default name is Connection to <server>.sde.

Right-click your connection in the catalog tree and choose **Rename**.

For the connection name, type ***username@server***

NOTE: When an ArcSDE connection is created in ArcInfo, the connection parameters, like server name and instance, are stored in a file on the local disk. This file is read every time you open your connection. Your user name and password can be included in the file and encrypted for security. If you do not include this information, you will be prompted each time the connection is opened.

Open your connection folder

Choose your **WORLD_ADMIN** layer

EXERCISE: BUILDING A GEODATABASE WITH ARCCATALOG

This exercise will introduce you to the ArcCatalog™ and ArcMap™ software, and to the geodatabase. You will use ArcCatalog to view spatial and tabular information about existing ArcSDE™ layers, and to register a layer with the geodatabase. You will also load a shapefile into the geodatabase from ArcCatalog, create subtypes and apply range domains.

STEP 1: START ARCCATALOG AND EXPLORE A FOLDER CONNECTION

In this step you will launch ArcCatalog and explore the contents of a folder containing geographic data.

Start ArcCatalog.

From the Windows NT Start menu, click **Programs**.

Click **ArcInfo**.

Click **ArcCatalog**.

ArcCatalog opens.

The catalog tree, on the left side of the ArcCatalog window provides an overview of your data organization. The right side of the window lets you explore the contents of selected geographic data sources. Within ArcCatalog, folder connections let you access your computer's hard disk(s), the Database Connections folder lets you create and store connections to databases, and a Coordinate Systems folder lets you manage defined coordinate systems. You can also create additional folder connections which access shared folders on a network. Together, all the connections create a catalog of geographic data sources.

Navigate to the location of the admin98 shapefile that you worked with in the previous exercise, and look at it in the contents panel.

Navigate to the folder containing the admin98 shapefile.

Click **admin98**.

On the Contents panel, click the **Preview** tab.

The admin98 shapefile appears in the Contents panel.

In the Preview panel you can pan, zoom and identify features using tools from the Geography toolbar. You can see attribute information associated with individual features using the identify tool, or you can view tabular data for the entire layer.

On the Preview panel, choose **Table** from the Preview dropdown list.

A view of the tabular data appears in the Preview panel.

Click the **Contents** tab.

Select the rivers shapefile from the same folder. You will copy the shapefile to your working directory and create metadata.

In the catalog tree, right-click **rivers.**

Click **Copy.**

Navigate to your working directory.

Right-click and choose **Paste.**

A copy of the rivers shapefile will appear in your working directory.

Click **rivers.**

Rivers appears in the Contents panel.

On the Contents panel, click the **Metadata** tab.

Metadata is data about your data. Metadata is created in ArcCatalog and stored in Extensible Markup Language (XML) format. There are two main components of metadata in ArcCatalog: documentation (information added by the user) and properties (information automatically created by the ArcInfo™ software). When you click on the Metadata tab, properties are automatically generated. If the data is stored in a file, an XML file is generated and stored in the same folder.

If the data is stored in a database, the XML file is stored as a BLOB in an ArcSDE-managed table.

Click the **Spatial** tab.

Scroll down to **In projected or local coordinates.**

What is the coordinate of the lower left corner of the rivers shapefile? _____

Scroll down to **Spatial data description.**

Click **rivers.**

A description of the spatial data contained in the rivers shapefile appears.

How many features are in the rivers shapefile? _____

Scroll back to the top of the metadata listing.

Click the **Attributes** tab.

A list of the attributes contained in the rivers shapefile appears.

Click **ORDER.**

The alias, data type, and width of the ORDER attribute appear.

Notice that the information generated in the Metadata panel is similar to that generated by shpinfo.

Click the **Contents** tab.

Next, connect to ArcSDE and register your WORLD_ADMIN layer with the geodatabase.

STEP 2: CONNECT TO ARCSDE AND REGISTER A LAYER WITH THE GEODATABASE

In this step you will connect to ArcSDE and register an existing layer with the geodatabase. ArcSDE layers are read-only in ArcInfo unless they are registered with the geodatabase. Registering with the

geodatabase allows you to take advantage of geodatabase functionality like domains, subtypes and multiversioned editing.

Open the **Database Connections** folder.

Double-click **Add SDE Connection**.

The SDE Connection dialog opens.

For Server, type *server*

For Instance, type *instance*

If your server supports multiple databases, for Database, type *database*

For User Name, type *username*

For Password, type *password*

Click **Test Connection**.

If the connection is successful, the Test Connection button will disable.

Click **OK**.

Your new connection will be called *Connection to <server>*. Give your connection a more descriptive name.

NOTE: When a connection is created using ArcMap, the default name is Connection to <server>.sde.

Right-click your connection in the catalog tree and choose **Rename**.

For the connection name, type ***username@server***

NOTE: When an ArcSDE connection is created in ArcInfo, the connection parameters, like server name and instance, are stored in a file on the local disk. This file is read every time you open your connection. Your user name and password can be included in the file and encrypted for security. If you do not include this information, you will be prompted each time the connection is opened.

Open your connection folder

Choose your **WORLD_ADMIN** layer

Click the **Preview** tab.

Your layer displays in the Preview panel.

In the catalog tree, right-click your WORLD_ADMIN layer and choose **Register with Geodatabase**.

A message box will appear notifying you that an integer object ID field will be added to your layer.

ArcSDE adds an integer field (the spatial column) to each layer loaded. This number is maintained by ArcSDE and is used by the server to join the business table to the feature and spatial index tables. The geodatabase maintains another unique identifier that it uses to uniquely identify rows across different states of a multiversioned layer. You will edit a multiversioned feature class in Exercise 7.

Click **Yes** to continue.

Any ArcSDE layer on which you want to employ geodatabase functionality must first be registered with the geodatabase. Registering an ArcSDE layer as a geodatabase feature class adds the ObjectID field and populates the geodatabase system tables. Feature classes created using ArcCatalog are automatically registered with the geodatabase.

STEP 3: IMPORT A SHAPEFILE TO THE GEODATABASE

In this step you will import a shapefile to the geodatabase using ArcCatalog. In the previous exercise you learned how to determine loading parameters. These parameters still apply when loading through ArcCatalog. ArcCatalog will define default loading parameters for you, but it is essential to understand how the defaults will affect your data before you decide to accept or reject them.

Specify loading parameters and import a shapefile.

Right-click your database connection in the catalog tree and choose **Import**.

Click **Shapefile to Geodatabase**.

For Input shapefile type *path_to_data***rivers**

Click the feature class name field.

The feature class name will automatically update.

Notice the path for the output geodatabase. It is actually a the location of the connection file you created in the last step.

A feature dataset is a container for feature classes that share the same spatial reference and optionally, a topological relationship. In this exercise you will create a stand-alone feature class. If you were creating a feature class as part of a feature dataset, you would specify the name of the feature dataset. If you do not specify a feature dataset, the feature class is created as stand-alone.

Look at the output settings. All of these settings will have a default value. Notice that the coordinate system is listed as UNKNOWN and the grid size has been calculated for you. You may not want to accept the default values because ArcCatalog cannot know details about your data such as the scale at which the data was collected and the type of queries that will be executed against it. It is up to you to determine proper loading parameters or accept the system defaults. In the previous exercise you calculated loading parameters for a global dataset. You chose a scale that was adequate to represent your data, and you determined the offsets necessary for keeping the data in positive coordinate space. Here you will see how ArcCatalog calculates defaults, and choose new loading parameters based on your data needs.

Click **Change Settings.**

The Output Settings dialog opens.

The Output Settings dialog allows you to specify several loading parameters. You can set the spatial reference, which includes the XY domain, precision, and coordinate system. You can specify grid sizes and choose which attributes get loaded and how they appear in the database. You can also specify a configuration keyword to control storage of your data in the database.

The Spatial Ref tab describes the current spatial reference. It lists the coordinate system, XY domain, and precision. Record the XY domain and precision below. (The Minimum X and Minimum Y values are equivalent to the X and Y offsets. The precision is equivalent to the XY scale.)

Minimum X_____

Minimum Y_____

Precision _____

ArcCatalog allows you to import the spatial reference of an existing data source and apply it to your new layer. The rivers shapefile is a subset of the PADEP.MAJRIVRS.SHAPE ArcSDE layer. You can use its spatial reference for the rivers shapefile without having to recalculate the XY domain and precision.

Click **Change**.

The Spatial Reference Properties dialog opens.

Click **Import**.

If necessary, navigate to your database connection folder.

Click **PADEP.MAJRIVRS**.

Click **Add**.

The Coordinate System tab updates.

The name of the coordinate system is NAD_1927_Pennsylvania. All the parameters used to create the projection are listed in the Details listing. When you import the coordinate system of another layer, the XY, Z and M domains and precision are also imported.

Click the **XY Domain** tab.

Notice that the default values that you recorded from the Output Settings dialog have changed to the XY Domain settings of the `PADEP.MAJRIVRS.SHAPE` layer. Record the new settings below.

Minimum X_____

Minimum Y_____

Precision _____

Click **OK** to confirm the settings.

In the Output Settings dialog, click the **Grid Size** tab.

ArcCatalog calculates a grid size based on the feature envelopes of a ten percent sample of your data. This grid size will ensure that the data loads, but may not be efficient for all queries. The rivers shapefile only contains thirteen features; it is too small for the grid size to be of consequence.

Click the **Item Names** tab.

SQL has several reserved words which cannot be used as database object names. Database objects include tables, columns, and views. The rivers shapefile contains a column named ORDER, which is an SQL keyword. ArcCatalog will automatically create a new name (the old name followed by an underscore). This ensures that the file will import properly. You can rename the column here to give it a more appropriate name. The ORDER column represents the stream order of each tributary in the rivers shapefile.

Click the **ORDER_** field.

Type **STR_ORDER**

Click the **Keyword** tab.

You can specify a configuration keyword to control storage parameters of the layer you are about to create. This is the same as using the -k parameter used when loading from the command line with shp2sde or cov2sde. If you do not specify a keyword, default loading parameters will be used. For this small layer, accept the default loading parameters

Click **OK** to apply the new output settings.

Click **OK** in the Shapefile to Geodatabase dialog to import the layer.

Right-click your database connection in the catalog tree.

Click **Refresh**.

Your new feature class appears in the catalog tree.

Click the **rivers** feature class.

Click the **Preview** tab.

The rivers feature class displays in the preview panel.

Click the **Contents** tab after viewing the rivers feature class.

This new feature class is automatically registered with the geodatabase, allowing you to use its features such as subtypes and domains.

STEP 4: CREATE SUBTYPES AND APPLY DOMAINS TO A FEATURE CLASS

In this step you will create subtypes for the STR_ORDER field of the rivers feature class. Subtypes are a method of providing persistent classification of your feature class based on a long integer attribute. Using the STR_ORDER subtypes, you will apply range domains to the WIDTH field. Attribute domains define valid values for an attribute field with which the domain is associated. You will use subtypes and domains for quality control and assurance. There are certain acceptable values for STR_ORDER field and for each value there is a valid range of WIDTH values. Using domains will provide you with a way to ensure database integrity.

Right-click your database connection in the catalog tree.

Click **Properties.**

The Database Properties dialog opens.

Examine the **1st_str, 2nd_str and 3rd_str** domains.

What is the minimum and maximum value of each domain? _____

A domain is a property of the geodatabase. A domain can be associated with any field of any table in the geodatabase.

Close the Database Properties dialog.

Right-click the **rivers** feature class in the catalog tree.

Click **Properties.**

The Feature Class Properties dialog opens.

Click the **Subtypes** tab.

For **Subtype Field,** choose **STR_ORDER** from the dropdown list.

Replace the current value of Code with **1**

For Description, type **First Order Stream**

For **Default Values and Domains** find the WIDTH field.

For Domain, choose **1st_str** from the dropdown list.

Using the procedures above, create two more subtypes withthe following information:

Code	Description	WIDTH Domain
2	Second Order Stream	2nd_str
3	Third Order Stream	3rd_str

Click **OK**.

The display window updates, applying different line symbols for each subtype.

If you are ready to stop, quit ArcCatalog. If there is time remaining before the next exercise and you would like to try loading some non-spatial data into the RDMBS, go on to the Challenge step.

Exit ArcCatalog.

CHALLENGE: LOAD A TABLE INTO THE GEODATABASE

Load a database table of river attributes into the database and grant SELECT permission to the PADEP user.

Use ArcCatalog to load *path_to_data*/rivers_att.dbf into a new RDBMS table called *river_attributes*. Load all columns and do not specify any storage parameters for the table.

Hint: Right-click your database connection and choose *Import*.

Use ArcCatalog to grant SELECT permission to the PADEP user.

Hint: Right-click your new table and choose *Privileges*.

EXERCISE END

EXERCISE: EDITING A MULTIVERSIONED FEATURE CLASS IN ARCMAP

In this exercise you will edit multiple versions of the same feature class in ArcMap™ software. You will register a feature class for versioning in ArcCatalog™ software, and grant editing permissions to the SURVEYOR user. You will create multiple, persistent versions of the feature class in ArcMap, and as two different users, you will edit the feature class, and resolve editing conflicts between the different versions.

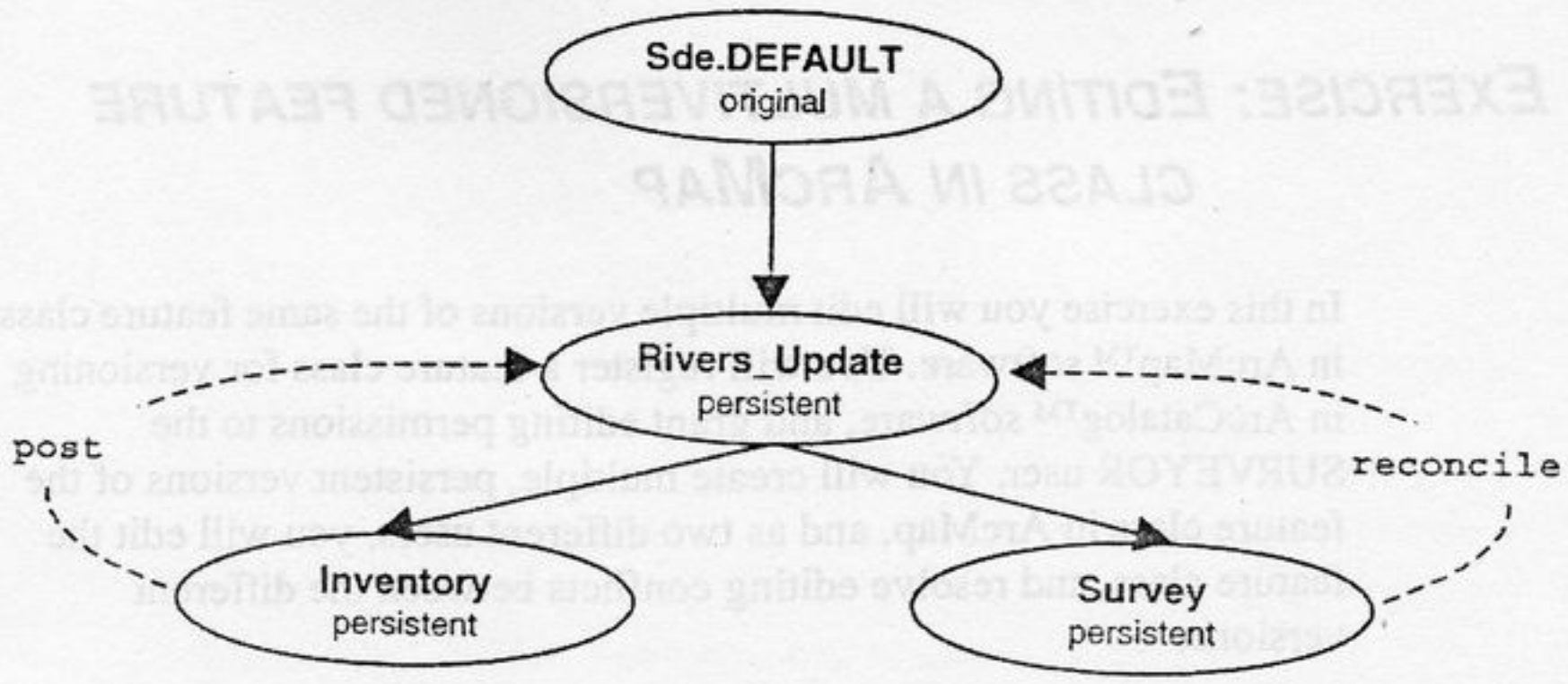
THE SCENARIO

An organization has a versioned geodatabase containing a rivers feature class. The organization conducts stream inventories, examining stream morphology and sampling to determine the presence of fish.

The organization uses the rivers feature class for navigation, and are updating its attributes with inventory findings. As they come across omissions or inaccuracies in the spatial data, they are approximating corrections into the database. The organization has also hired a team of surveyors to properly resurvey the rivers with new, high resolution equipment.

As the sole member of this organization's GIS department, you are responsible for maintaining and updating the rivers feature class. As this feature class is used in other ongoing projects, you do not want to make edits to the source. Nor, however, do you want the added administrative headache of having multiple copies of the same data to keep up to date.

To solve the problem of having multiple copies of the rivers dataset, and to prevent the source data from being updated until all the changes have been approved, you will use versioning. You will create a version for the project of updating the rivers feature class, and two more child versions: one for your inventory work, and one for the surveying team to update. When all the work is complete you will reconcile the changes you have made with those made by the surveying team and resolve any conflicts that arise between the two.



STEP 1: PREPARE THE RIVERS FEATURE CLASS FOR EDITING

In this step you will assign permissions to the surveyor user who will be editing your feature class. You will register the feature class for versioning. Registering a feature class for versioning creates two additional tables in the database which record edits.

Start ArcCatalog.

In the catalog tree, **Open** your connection to ArcSDE.

Right-click the **rivers** feature class.

Click **Privileges**.

For user, type **surveyor**

For Privileges check **SELECT, UPDATE, INSERT** and **DELETE**.

Click **OK**.

Right-click the **rivers** feature class in the catalog tree and click **Register as Versioned**.

Exit ArcCatalog.

STEP 2: CREATE THE NEW VERSIONS IN ARCMAP

In this step you will open the rivers feature class in ArcMap. You will create three versions to keep track of edits made during the rivers update project.

Open ArcMap.

From the Windwos NT Start menu, click **Programs**.

Click **ArcInfo**.

Click **ArcMap**.

ArcMap opens.

Verify that **Create a new map** is selected.

Click **Start using ArcMap**.

Click the **Add Data** button .

Navigate to your ArcSDE connection.

Click the **rivers** feature class.

The rivers feature class draws in the display window.

Notice that rivers is automatically drawn with different line symbols for each subtype. Subtypes provide persistent classification of data. It is similar to using a lookup table in ARCPLOT™ or classifying a theme in ArcView except that classification using a subtype is automatic. The classification permanently associated with your data is stored in the geodatabase.

Click the **Source** tab in the Table of Contents.

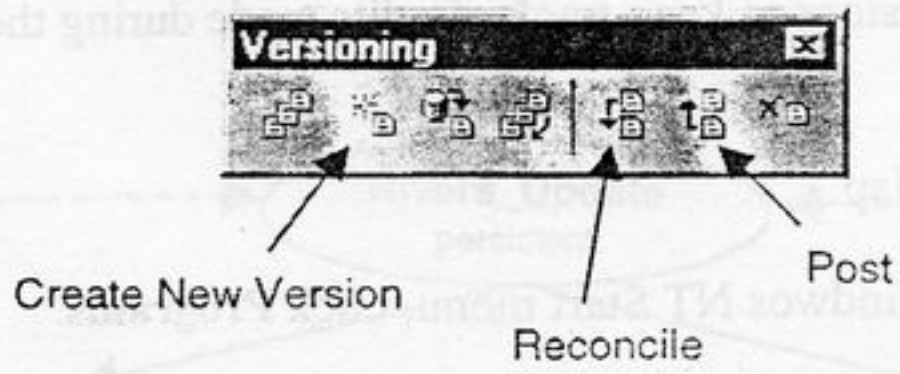
Notice the name of the rivers source: SDE.DEFAULT. This is the version of the feature class that clients will see by default.

Create a new version, RIVERS_UPDATE, based on the default version.

On the View menu, click **Toolbars**.

Check **Versioning.**

The Versioning toolbar appears.



Click the **Create New Version** button.

The New Version dialog opens.

For Name, type **RIVERS_UPDATE**

For Description, type **Update of the rivers feature class**

Click the **Protected** Radio button.

Check **Switch to this new version.**

Click **OK.**

Look at the name of the version now listed in the table of contents. The rivers feature class looks unchanged, but you are now looking at a different version of the data. This will be the parent version for the rivers update project. If you make changes to this version, they will not be reflected automatically in the default version.

Now create two new child versions. One will handle updates made by the survey team and the other by the inventory team.

On the New Version dialog, verify that Parent Version is **RIVERS_UPDATE.**

For Name, type **SURVEY**

For Description, type **Survey crew working copy**

Click the **Public** Radio button; do not switch to this new version.

Click **OK.**

On the Versioning toolbar, click the **Create New Version** button.

Verify that Parent Version is **RIVERS_UPDATE**.

For Name, type **INVENTORY**

For Description, type **Stream inventory working copy**

Make this version **protected.**

Switch to this new version.

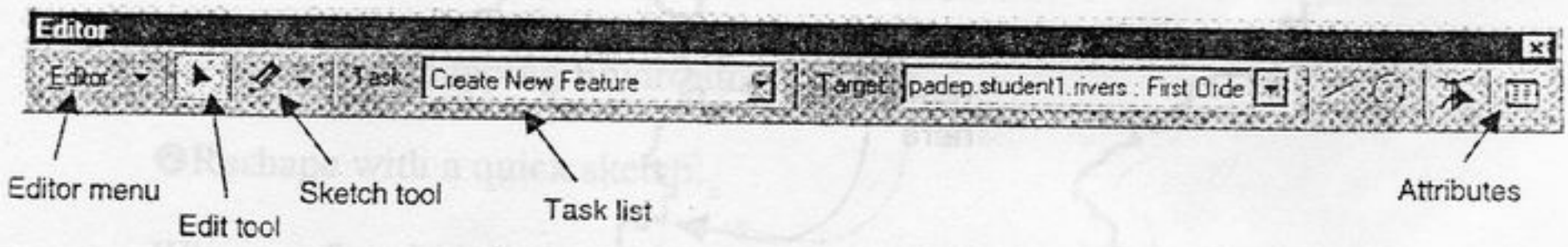
You are now ready to begin editing the INVENTORY version.

STEP 3: EDIT INVENTORY AND POST THE CHANGES TO RIVERS_UPDATE

In this step you will make edits to the spatial and attribute data of the INVENTORY version. When the edits are complete, you will post the changes to the RIVERS_UPDATE version.

Click the **Editor Toolbar** button .

The Editor toolbar appears.



All editing operations are controlled through the Editor toolbar. This toolbar contains several important controls, only some of which will be used to edit in this exercise.

The *Editor menu* contains commands for controlling the edit session, including saving, snapping, and editing options.

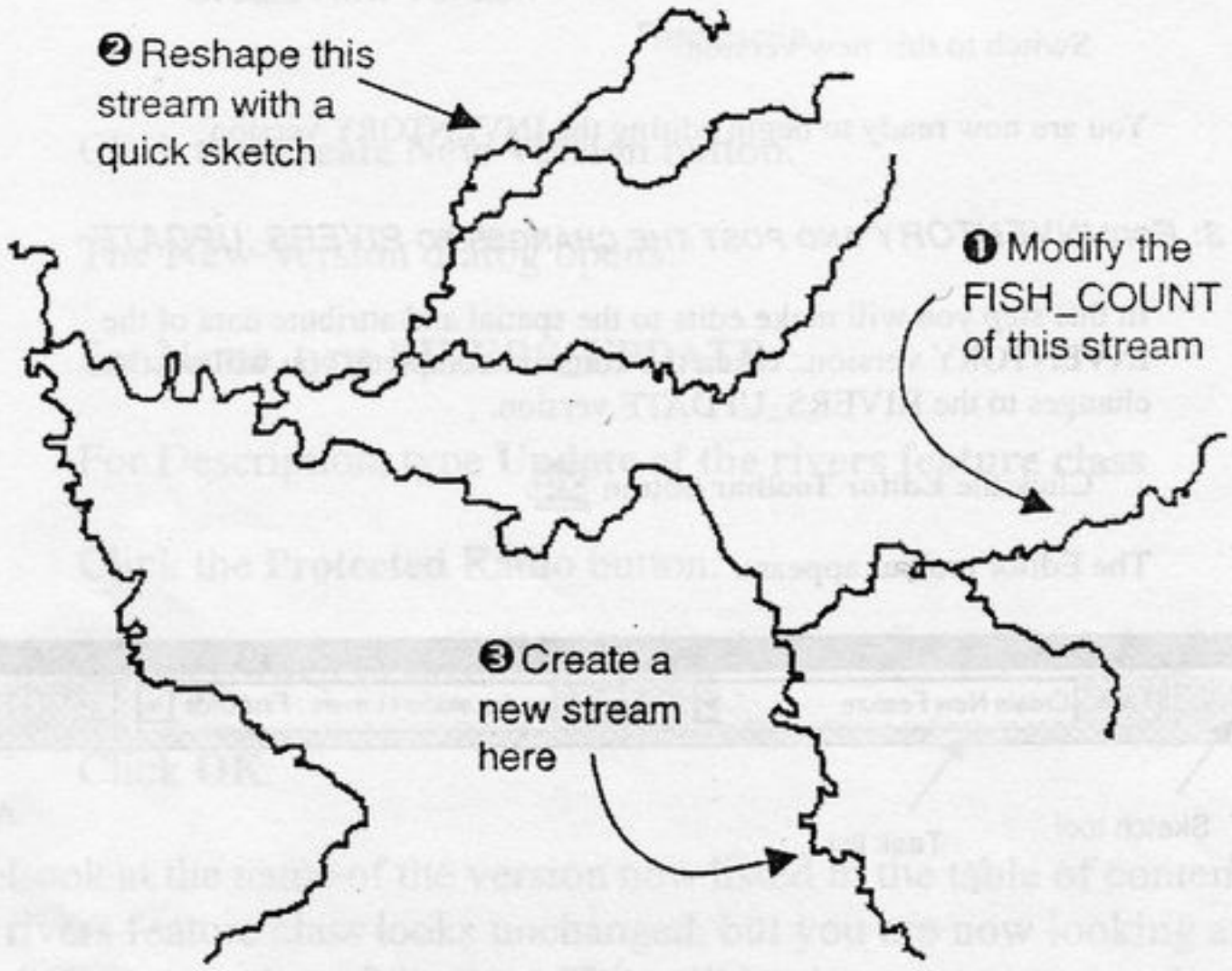
The *Edit tool* is used to select features for editing.

The *Sketch tool* is used to digitize new features, or modify existing ones.

The *Task list* lets you select an editing operation.

The *Attributes* dialog allows you to edit the attribute values of selected features.

You will perform the following three edits to the INVENTORY version:



Click the **Editor** menu.

Click **Start Editing.**

Click the **Edit** tool .

❶Modify the FISH_COUNT attribute.

In the Display window, **click** on the first stream to select it.

The selected stream is highlighted.

From the Editor toolbar, click the **Attributes** button .

The Attributes dialog opens.

The Attributes dialog lists tabular data for the selected features. To change attribute information, click the field you want to edit and enter new values.

For FISH_COUNT, enter **3**

Close the Attributes dialog.

When editing, vertex snapping automatically snaps your cursor to the closest vertex. This prevents you from having to click exactly on a feature in order to connect the features you are editing. Enable vertex snapping for this edit session.

From the Editor toolbar, click the **Editor** menu.

Click **Snapping**.

The Snapping Environment dialog opens.

For the rivers feature class, check **Vertex.**

Close the Snapping Environment dialog.

❷Reshape with a quick sketch.

When performing the inventory of this river, the team finds that the actual location of the river differs significantly from its recorded location in the database. To aid them during their inventory they sketch an approximate representation of the river in their version.

Use the Edit tool to select the second river segment.

From the Selection menu, click **Zoom to Selected Features.**

For Current Task, choose **Reshape Feature** from the dropdown list on the Editor toolbar.

Hint: If the Reshape Feature selection is grayed out, make sure you have only one river selected.

Click the **Sketch** tool .

Use the illustration below as a guide for completing the following steps.

In the Display window, **hold** the cursor near the vertex where you want the sketch to begin.

Notice that the cursor snaps to the nearest vertex.

Click the left mouse button to begin the sketch.

Place new vertices for the river by left-clicking.

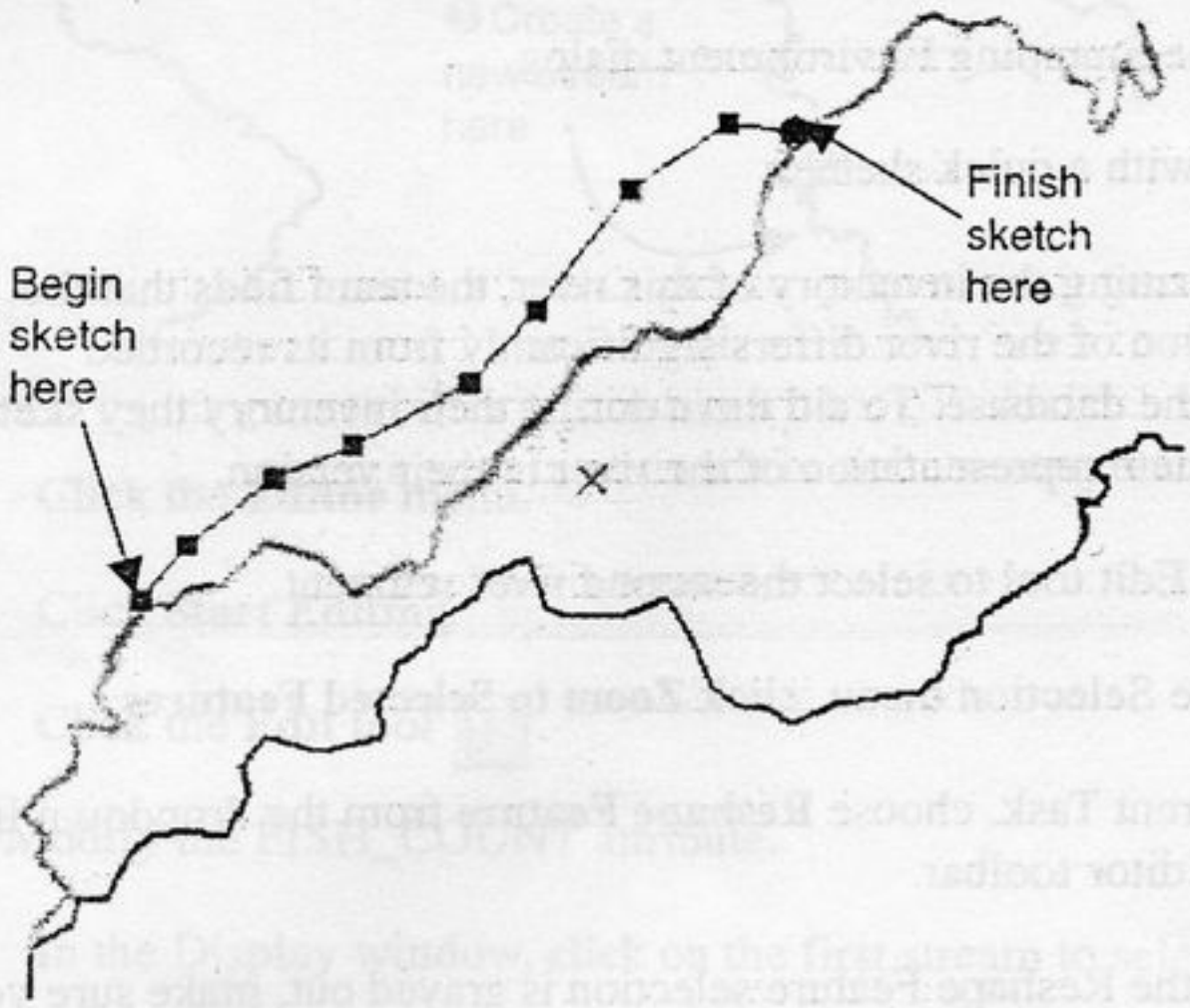
NOTE: To delete a vertex while you are sketching, right-click on the vertex and choose Delete Vertex from the Sketch context menu. To delete the entire sketch, right-click and choose Delete Sketch from either the Sketch Tool or Sketch context menus.

Your sketch should look similar to the example below.

Place the last vertex of your sketch on an existing vertex.

Right-click and choose **Finish Sketch**.

Notice that the river has been rehsaped.



Click the **Full Extent** button .

The rivers feature class redraws at full extent.

❸Create a new stream feature.

The base maps from which your rivers feature class was originally created are dated and are missing some features. When the inventory team discovers an omission they add a rough sketch of the river to their version. This river can be updated by the survey team with accurate coordinates at a later date.

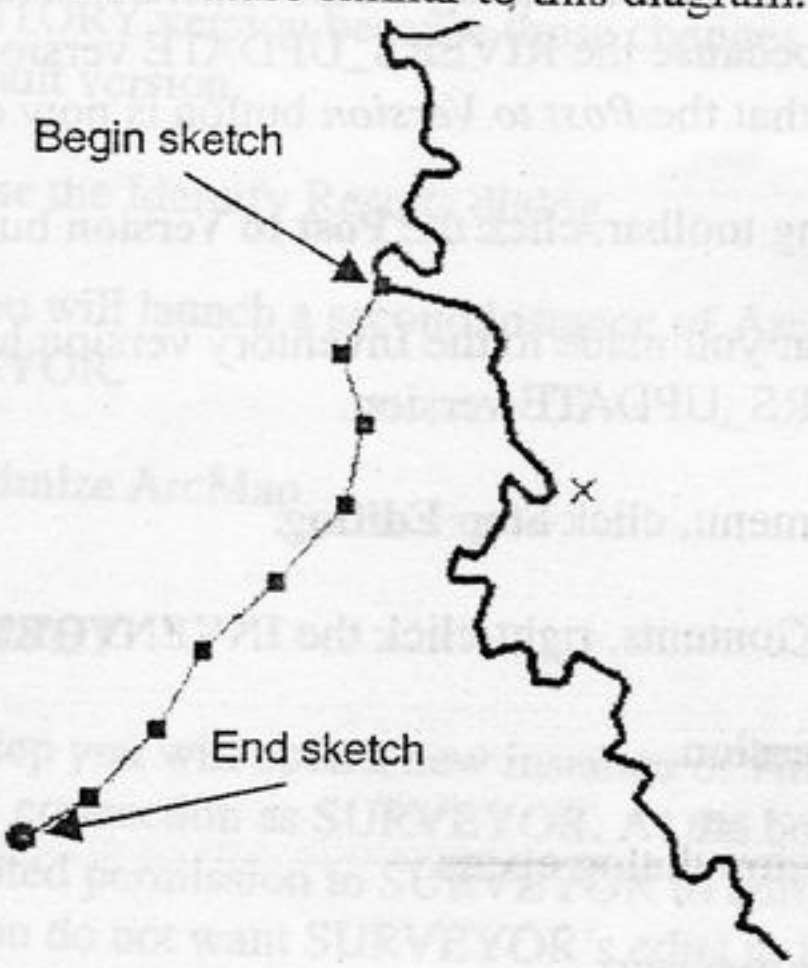
Use the Edit tool to select the third river segment where you will sketch a new stream.

From the Selection menu, click **Zoom to Selected Features**.

For Task, choose **Create New Feature** from the dropdown list on the Editor toolbar.

Click the **Sketch** tool.

Create a new line feature similar to this diagram.



In the Display window, **begin** the sketch at an existing vertex.

Place several vertices to create the new stream.

Right-click and choose **Finish Sketch** to complete the new line.

Zoom out to the full extent.

From the Editor menu, click **Save Edits**.

You are now ready to reconcile with, and post your changes to, the RIVERS_UPDATE version. You must be editing your version to reconcile. Reconcile will pull the parent version into your current version and check for any conflicts. When you have reconciled with the parent version and resolved any conflicts, you can post your changes back to the parent. Posting writes changes from a child version into a parent version.

On the Versioning toolbar, click the **Reconcile** button.

The Reconcile Against Version dialog opens.

Click the **RIVERS_UPDATE** version.

Click **OK**.

The Reconcile Against Version dialog closes. There will not be any conflicts to resolve because the RIVERS_UPDATE version has not been edited. Notice that the *Post to Version* button is now enabled.

On the Versioning toolbar, click the **Post to Version** button.

Now the changes that you made to the Inventory version have been written to the RIVERS_UPDATE version.

From the editor menu, click **Stop Editing**.

On the Table of Contents, right-click the **INVENTORY** version.

Click **Change Version**.

The Change Version dialog opens.

Click **RIVERS_UPDATE**.

Click **OK**.

The processes of reconciling and posting changes have made the INVENTORY and RIVERS_UPDATE versions identical. All the edits you made to INVENTORY have been written to RIVERS_UPDATE.

Change versions from RIVERS_UPDATE to SDE.DEFAULT.

If you look closely, the versions are slightly different. The new stream that you created in INVENTORY is not part of SDE.DEFAULT and the feature you reshaped appears in its original state. You also updated the FISH_COUNT value of one river. Identify the feature in the default version to verify that it has not been changed.

In the Display window, click the **Identify Features** button.

Identify the stream whose FISH_COUNT attribute you changed.

The Identify Results dialog opens.

Examine the value of FISH_COUNT.

Has FISH_COUNT been modified? (YES/NO)

The default version does not reflect changes that you made to the INVENTORY version because those changes have not been posted to the default version.

Close the Identify Results dialog.

Next you will launch a second instance of ArcMap to perform edits as SURVEYOR.

Minimize ArcMap.

STEP 4: EDIT SURVEY

In this step you will open a new instance of ArcMap and create a new ArcSDE connection as SURVEYOR. At the beginning of this exercise you granted permission to SURVEYOR to edit your rivers feature class. You do not want SURVEYOR's edits to interfere with your own, so you created a separate version, SURVEY, for SURVEYOR to edit. The SURVEY version is public, so any user who has permission to edit the feature class can also edit the version. You will open the rivers feature class as SURVEYOR and make edits to the SURVEY version.

Open a new instance of ArcMap.

You will now have two instances of ArcMap open; each editing a different version of the rivers feature class.

Click the **Add Data** button .

Navigate to the Database Connections folder.

Double-click **Add SDE Connection.**

The SDE Connection dialog opens.

For Server, type *server*

For Instance, type *instance*

If your server supports multiple databases, for Database, type **database.**

For User Name, type **surveyor**

For Password, type **surveyor**

Click **Test Connection.**

If the connection information you supplied is correct and the connection successful, the Test Connection button will disable.

Click **OK.**

Your new connection will be called *Connection to <server>.sde* Give your connection a more descriptive name.

In the Add Data dialog, **click** the name of your new connection to select it.

Click once again to change the connection name.

Enter **surveyor@*server***

Double-click your new connection to open it.

Choose your rivers feature class from the list of available layers.

Click **Add.**

The rivers feature class draws in the display window.

In the Table of Contents, click the **Source** tab.

Change versions to work with the **SURVEY** version.

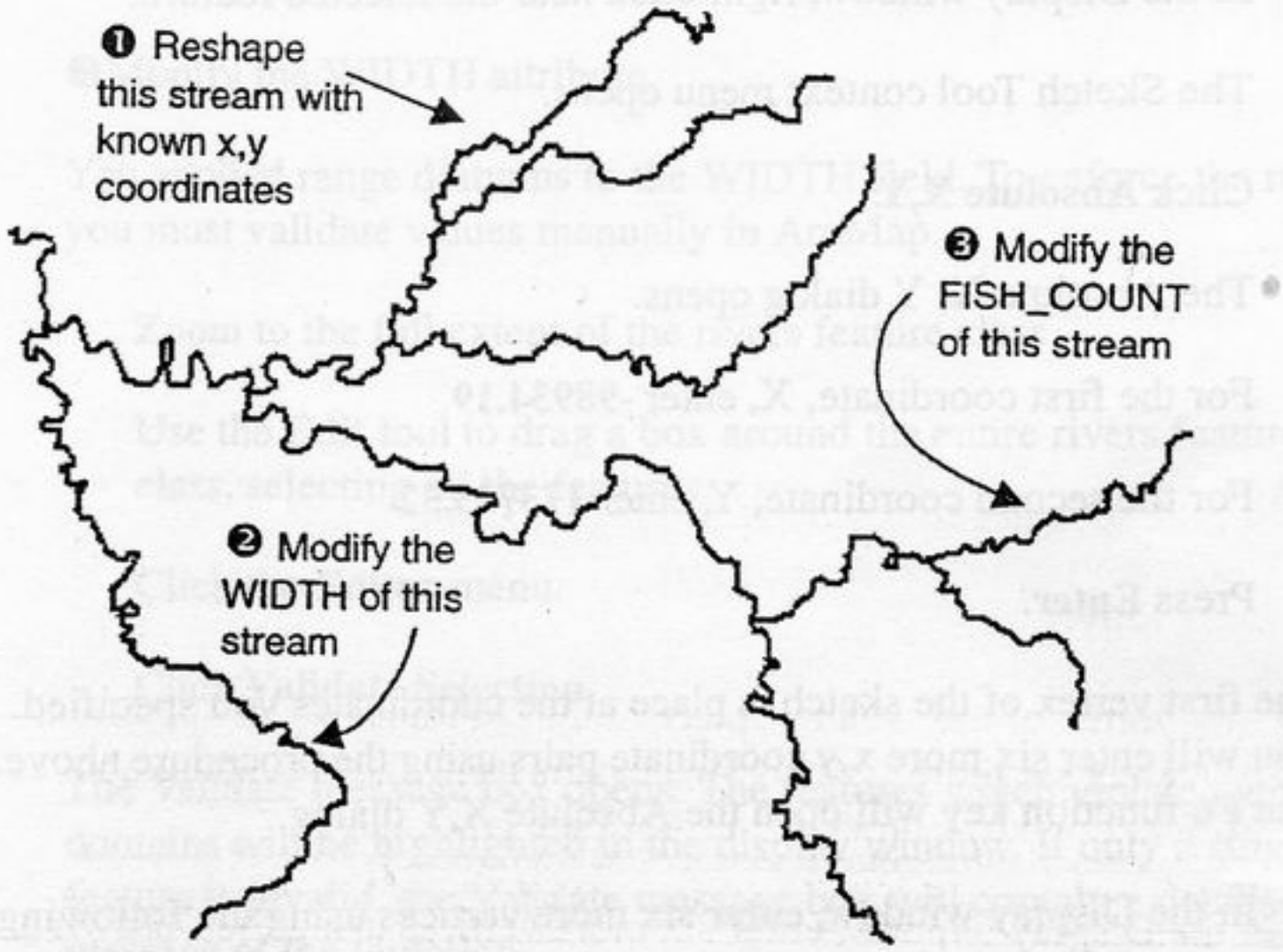
Click the **Editor Toolbar** button .

The Editor toolbar appears.

Click the **Editor** menu.

Click **Start Editing**.

You will perform the following three edits to the SURVEY version:



Set your snapping environment for this edit session.

On the Editor toolbar, click the **Editor** menu.

Click **Snapping**.

For the rivers feature class, check **Vertex**.

Close the Snapping Environment dialog.

Use the **Edit** tool to select the first river segment.

Click **Zoom to Selected Features**.

For Current Task, choose **Reshape Feature** from the dropdown list on the Editor toolbar.

Click the **Sketch** tool.

❶Reshape feature with known X,Y coordinates.

This time you will reshape the selected feature using GPS coordinates instead of a freehand sketch.

In the Display window, right-click near the selected feature.

The Sketch Tool context menu opens.

Click **Absolute X,Y.**

The Absolute X, Y dialog opens.

For the first coordinate, X, enter **-98934.19**

For the second coordinate, Y, enter **173793.52**

Press **Enter.**

The first vertex of the sketch is place at the coordinates you specified. You will enter six more x,y coordinate pairs using the procedure above. The **F6** function key will open the Absolute X,Y dialog.

In the Display window, **enter** six more vertices using the following x,y coordinate pairs:

X	Y
-97042.5452	175081.7179
-97007.0361	176441.8835
-97254.1741	177095.5218
-96573.4067	177846.5183
-95727.7425	178438.4833
-94406.4400	177722.9800

Press the **F2** function key to finish the sketch.

The line will move slightly to reflect the new vertex locations.

You have entered values with four decimal places.

What is the maximum number of decimal places that will be stored with each coordinate based on the precision used to load the data? Hint: What was the value of the rivers feature class coordinate precision? You recorded this value in Exercise 6.

_____

Save your edits, but do not stop editing.

❷Modify the WIDTH attribute.

You applied range domains to the WIDTH field. To enforce the range you must validate values manually in ArcMap.

Zoom to the full extent of the rivers feature class.

Use the **Edit** tool to drag a box around the entire rivers feature class, selecting all the features.

Click the **Editor** menu.

Click **Validate Selection.**

The Validate message box opens. The features which violate their domains will be highlighted in the display window. If only a single feature is invalid, the Validate message box will contain a detailed message of the violation.

A single river feature is invalid. The WIDTH value for the second feature you will edit has been transposed. Instead of a value of 2.4, the WIDTH field contains the value 4.2, while the valid range is from 0 to 3.

Click **OK** to close the message box.

The invalid feature remains selected.

Click the **Attributes** button from the Editor toolbar.

For WIDTH, enter **2.4**

Close the Attributes dialog.

❸Modify the FISH_COUNT attribute.

You have one final edit to make. After reviewing surveying field notes, you realize that a second WIDTH value needs to be updated.

In the Display window, **choose** the third feature.

This is the same feature whose FISH_COUNT value was modified in the INVENTORY version.

On the Editor toolbar, click the **Attributes** button.

You will accidentally modify the value for FISH_COUNT instead of WIDTH.

For FISH_COUNT, enter **2**

Close the Attributes dialog.

Save your edits and **stop** editing.

The user who you are currently connected as has permission to modify the SURVEY version, but not to post changes to the parent version. Changes can only be posted to a version to which you have write permission. When SURVEYOR's edits are complete, the SURVEY version is turned over to the GIS department administrator (your student user).

Exit ArcMap.

STEP 5: RECONCILE SURVEY AND RESOLVE CONFLICTS WITH RIVERS_UPDATE

In this step you will reconcile changes from RIVERS_UPDATE into the SURVEY version. When any conflicts have been resolved, you will post the changes back to RIVERS_UPDATE, and the editing project will be complete.

Maximize the first instance of ArcMap.

The DEFAULT version is currently displayed. To reconcile changes from RIVERS_UPDATE to SURVEY you must be editing the SURVEY version.

Change to the SURVEY version.

Start editing the version.

On the Versioning toolbar, click the **Reconcile** button.

The Reconcile Against Version dialog opens.

Click **RIVERS_UPDATE**.

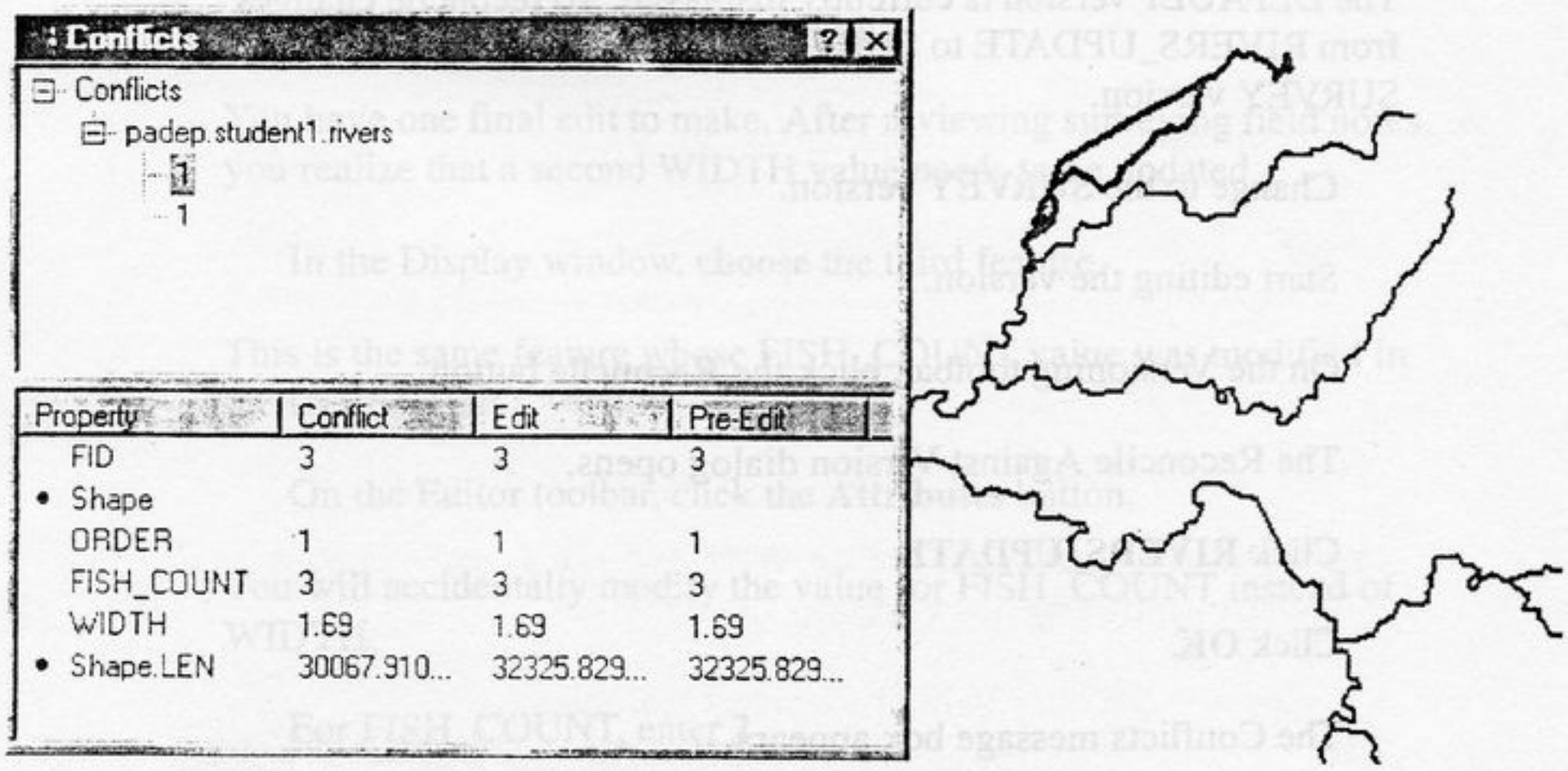
Click **OK**.

The Conflicts message box appears.

Conflicts have been detected between the RIVERS_UPDATE and SURVEY versions. Changes were made to the INVENTORY version, and the edits were posted back into RIVERS_UPDATE before the SURVEY version edits were reconciled with RIVERS_UPDATE. Although the SURVEY version was based on RIVERS_UPDATE, the two versions are no longer the same. When edits were posted from the INVENTORY version, the RIVERS_UPDATE version was updated. A conflict is created when the same features are edited in different versions. Remember that the same stream was reshaped in both the INVENTORY version and the SURVEY version. The FISH_COUNT attribute of another feature was also modified in both versions.

In the Conflicts message box, click **OK**.

The Conflicts dialog opens.



The Conflicts dialog contains a list of all the features in your current version that have conflicts with features in the version you are reconciling against.

Click on the first feature in the conflicts list.

Information about the conflict appears in the bottom half of the dialog.

The current feature and the conflicting feature are highlighted in the display window. The feature from your current version, or *Edit* feature is drawn in green. The *Conflict* feature, from the version you are reconciling with, draws in red.

NOTE: There is a third possible conflict, the Pre-Edit feature, which draws in yellow. Pre-edit conflicts will occur if you make edits, and reconcile without saving. The pre-edit feature is the version of your feature before you began editing. More often than not, you will save your edits before reconciling, in which case the edit and pre-edit versions of a feature will be the same. By default, the pre-edit version will not display. To change which features display, right-click on your feature class from the Conflicts Manager dialog and click Display to open the Conflict Display Settings dialog.

There are red dots next to the fields of the feature that are conflicting. In this case, the red dots are next to the Shape and Shape.LEN fields, indicating that the conflict is spatial.

You have more confidence in the spatial edits made to the SURVEY version because these edits are based on GPS coordinates, whereas the spatial edits made to the INVENTORY version were approximated. Accept the edit version for this conflict.

Right-click on the first feature in the conflicts list.

Choose **Replace with Edit Version.**

Click on the second feature in the conflicts list.

Information about the second feature appears in the bottom half of the dialog.

The red dot is next to the FISH_COUNT field, indicating an attribute conflict. SURVEYOR should not have made modifications to the FISH_COUNT field, as the survey crew's work did not involve fish sampling. You know it must be an accident and accept the conflict version. The conflict version was the edit made to INVENTORY.

Right-click on the second feature in the conflicts list.

Choose **Replace with Conflict Version.**

Close the Conflicts dialog.

Notice that a new stream has been added to the SURVEY version. New features are not conflicts and are automatically accepted during a reconcile.

Now that you have resolved the conflicts post the SURVEY version to RIVERS_UPDATE.

Click the **Post to Version** button on the Versioning toolbar.

Stop editing.

The changes to the SURVEY version have been posted to RIVERS_UPDATE. Now the RIVERS_UPDATE version contains edits that have been verified by the GIS administrator.

The RIVERS_UPDATE can be reconciled with and posted to SDE.DEFAULT so that all the projects that use the rivers feature class can see the updates. Posting to SDE.DEFAULT can only be done by the ArcSDE user because it is a protected version.

If you are ready to stop, quit ArcMap. If there is time remaining and you would like to try joining spatial and non-spatial data in ArcMap, go on to the Challenge step.

CHALLENGE: JOIN TO AN ATTRIBUTE TABLE

Join the river_attributes table you created in the last Challenge step, to the rivers feature class.

Change to the **SDE.DEFAULT** version of rivers.

Right-click on the layer name and choose *Join.*

Hints: 1) The join item in both tables is RIVERS_ID. 2) The join table is the river_attributes table. 3) Create a temporary join by unchecking *Create New Feature Class.*

Identify a feature in the new temporary layer to see the joined attributes.

Symbolize the features with a unique classification based on the NAME field.

Hint: Right-click the layer name, click *Properties* and the *Symbology* tab.

EXERCISE END