

Chapter 2

ResSim Concepts

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Chapter 2

ResSim Concepts

Before you begin working with the individual modules available in ResSim, you will need to understand the concepts that will allow you to develop, access and interact with watersheds in ResSim.

This chapter begins with the following basics: explaining how to start ResSim; describing screen components that are common across modules, including menu items and map/mouse tools; and showing you how to create a new watershed or open an existing watershed.

Next, you will learn about the following four kinds of schematic elements in ResSim: Time-Series Icons, the Stream Alignment, Watershed (Study) Components, and the Model Schematic. This chapter also explains how to interact with schematic elements using right-click shortcut menus, which allow you to plot and tabulate data, edit model data, and edit common components of the watershed.

Layers are another concept in ResSim. This chapter will help you to understand how layers work in ResSim and describe the six kinds of layers: Time Series, Study, Stream Alignment, Gridded Data, Model Schematic, and Maps.

To work with Layers, you will use the Layer Selector. This chapter describes the components of the Layer Selector, including its menu items and layout, and shows you how to control layer display using the Layer Selector. You will learn how to view layer legends, organize layers, configure toolbar icons to control layer display, and add and remove map layers.

Each layer has a unique set of properties that you can configure to make your watershed display look the way you prefer. This chapter shows you how to use Properties Editors and other tools to configure the properties of Time Series, Study, Stream Alignment, Gridded Data, Model Schematic, and Map layers.

2.1 Starting ResSim

To begin working with the Watershed Data Sets, you must first start ResSim. Either double-click the HEC-ResSim icon on your PC's desktop, or from the **Start** menu, select **Programs** → **HEC** → **ResSim**. Once you start ResSim, an information screen (as shown in Figure 2.1) will appear briefly; then, ResSim's Main Window will open (Figure 2.2).

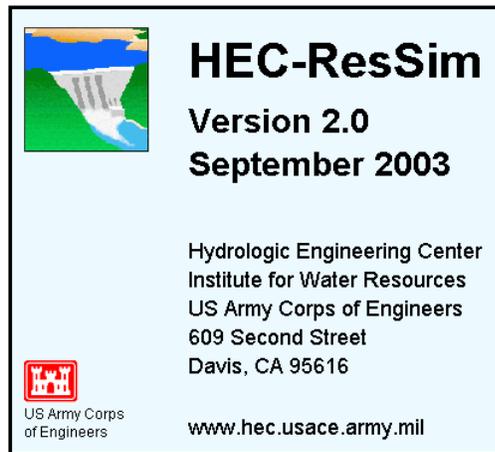


Figure 2.1 ResSim Information Screen

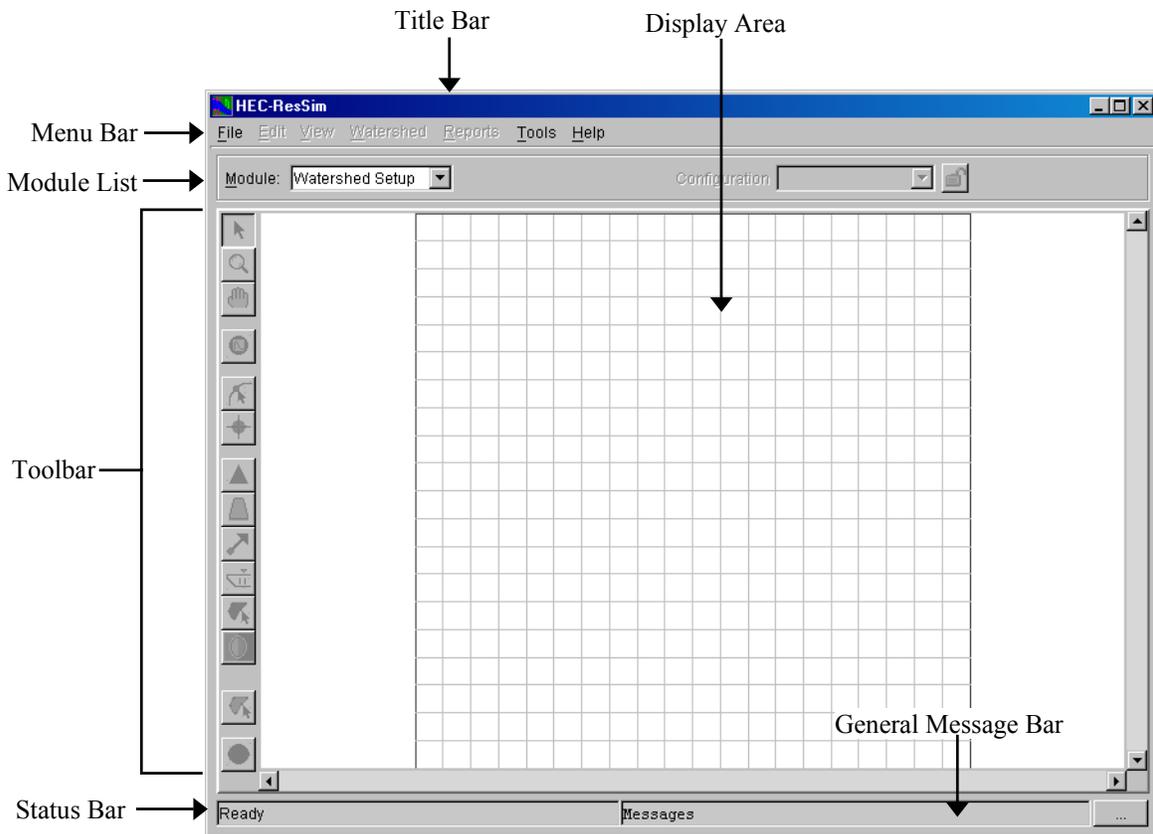


Figure 2.2 ResSim Main Window

2.2 Recognizing Common Screen Components

ResSim offers three modules, each with its own functions and module-specific tools, menus, and output. However, the modules share common screen components, as previously illustrated in Figure 2.2.

The **Title Bar** displays the ResSim title. After a watershed is opened, the name of the watershed will appear.

The **Menu Bar** contains menus for the modules. The items on the menus change as you switch between the modules, offering module-specific commands. You can select a menu item by clicking on the name of the menu (such as **File**), then pointing and clicking on the item you wish to select. Section 2.2.1 describes the **Menu Bar** in more detail.

The **Module List** contains all the available modules of ResSim. Use this list to move between the Watershed Setup module, the Reservoir Network module, and the Simulation module. Section 2.2.2 describes the **Module List** in more detail.

The **Display Area** is the geographic-referenced (geo-referenced) map space where all model schematic objects (reservoirs, junctions, diversions, etc.), watershed objects (stream alignments, reservoirs, stream reaches, etc.), and map layers are shown. You can manipulate elements and view results in the modules through the use of the tools in the **Toolbar**. Tools that affect the **Display Area** can have different functions depending on which module is selected.

The **Status Bar** displays map coordinates of the pointer in the display area when you are interacting with the watershed. When the pointer is outside of the display area, the **Status Bar** reflects the status of the program.

The **General Message Bar** displays a scrolling list of messages. System output log information appears in this window from the time you start ResSim until you exit the program. The scroll buttons on the right end of the Message Bar control the display and allow you to review all messages received during your ResSim session.

2.2.1 Menu Bar

In the Menu Bar, the **File**, **View**, **Tools**, and **Help** menus contain commands you can access from all three ResSim modules. Some of these menus also contain module-specific commands that appear only within individual modules. Commands and options that are *common to all three modules* are described as follows:

The **File** menu (Figure 2.3) allows you to create a **New Watershed**, **Open** an existing watershed, **Save** a watershed, **Save Map** (the Display Area) and **Exit** ResSim. Your most-recently-used watersheds are located at the bottom of the File menu. When a watershed is opened, the remaining menu items become active.



Figure 2.3 File Menu

In the **View** menu (Figure 2.4), select **Zoom to All** to restore your watershed view to full size after zooming in on one portion. **Layers** opens the Layers Selector dialog box which is used to select the spatially referenced layers (map/coverage). **Unit System** allows you to see the current screen view settings. *You can view data using whichever Unit System you prefer (English or SI); however, the Watershed (native) Unit System is established when a watershed is created and cannot be changed afterward (see **Tools** menu for Watershed information).* Lastly, if a dialog or editor window is open but inactive, **Restore Windows** brings the dialog or editor window to the front as the active window.



Figure 2.4 View Menu

The **Tools** menu (Figure 2.5) provides access to **Hec-DssVue**, which you will use to view (and possibly edit) dssfiles that are used for storing primarily time-series data. The **Scripts** command allows you to create, open and edit scripts (the scheduling of scripts is accomplished in the Simulation Module, from the Edit Menu).

Options lets you specify watershed locations for storing your watersheds; specify a directory for caching map files; set the colors for compute messages and the format of log files; set the level of debug messages; choose whether or not you want a confirmation message to appear when you exit ResSim; and choose whether you want the last watershed reloaded at startup of the program. **Information** provides details about client, user, and watershed settings as well as server and system properties.



Figure 2.5 Tools Menu

In the **Help** menu (Figure 2.6), the **About** command displays information about the version of ResSim.

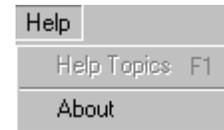


Figure 2.6 Help Menu

In addition to the four common menus described above, the following two menus appear in all three modules but contain module specific commands:

Edit – Typically, the edit options will be relevant to data element(s) for a specific module. The edit options available for each module are described in more detail in subsequent sections of this chapter.

Reports – Provides access to reports produced for a specific module. The reports available for each module are described in more detail in subsequent sections of this chapter.

2.2.2 Module List

From the ResSim main window (Figure 2.2) the graphical user interface (GUI) is organized to provide the necessary information to enter data, review data, edit data, run a simulation, and view results. The steps are divided into separate sets of functions called **modules**. A **module** has a specific set of commands that are accessed through menus and toolbars. Each module provides access to specific types of data or results. The modules of ResSim are as follows:

Watershed Setup – create a stream alignment, define projects (e.g., reservoirs, levees), define computation points, identify impact areas, create configurations for the watershed, and define time-series icons that represent specific locations or time-series identifiers. Section 2.3 provides more details of this module.

Reservoir Network – create networks, add routing reaches, edit elements, create and edit alternatives including assigning the DSS pathnames for time-series references. Section 2.4 provides more details of this module.

Simulation – define simulations for a watershed. A simulation consists of a time window and the ResSim alternatives you wish to execute for the simulation. Within this module, you can also edit element data. Once a simulation is defined, a compute is performed and the results are analyzed using graphical and tabular output. Section 2.5 provides more details of this module.

Each module has a menu bar and toolbar that are very similar for all of the modules. Example windows for each of the modules are presented in subsequent sections of this chapter.

2.3 Watershed Setup Module

The **Watershed Setup** module is used to create and setup your watershed. From the **Module** list, select **Watershed Setup**. The main window and the different components for the **Watershed Setup** module are illustrated in Figure 2.7.

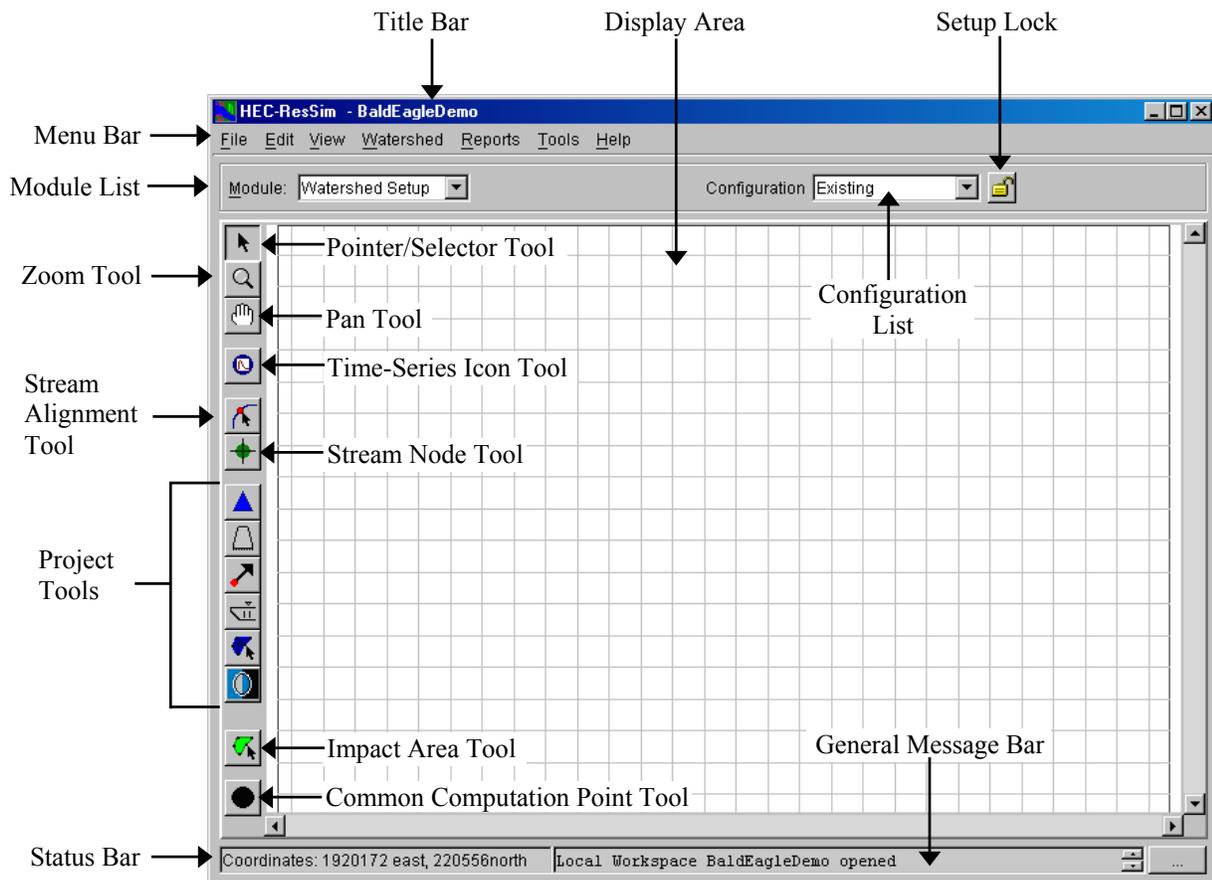


Figure 2.7 Watershed Setup Module

The **Menu Bar** (in Figure 2.7) contains the menus for the **Watershed Setup** module. In addition to the four common menus described in Section 2.2.1, the following list is a description of the available menus in the **Watershed Setup** module.

Edit – From this menu, you can edit study information and view watershed information, edit global information for impact areas and projects, and adjust the colors and fonts used by the individual projects. Also, you can set the lock for editing the stream

alignment and/or configurations. Available commands are: **Watershed Data, All Impact Areas, Projects, Drawing Properties, and Allow Editing.**

WaterShed – From this menu, you will establish the program sequence, create and edit configurations. You can also import and/or export the Stream Alignment. Available commands are: **Program Sequence, Configuration Editor, Update Computation Points, Import, Export, and Save Configuration.**

Reports – From this menu, you can review reports. These reports contain information about the streams, watershed elements, and configurations for the watershed. The available reports are: **List of Streams, List of Impact Areas, List of All Configurations, List of Computation Points, and Projects.**

The **Configuration List** (in Figure 2.7) shows the current configuration. Configurations are created, edited, and deleted in the **Watershed Setup** module. See Chapter 7 for discussion on Watershed Configurations.

The **Setup Lock**  (in Figure 2.7) allows you to edit the stream alignment and the current configuration. This lock prevents others from editing the stream alignment and configuration elements while you are editing.

The **Display Area** (in Figure 2.7) is where you create and view the stream alignment, projects, impact areas, and computation points through the use of the available tools in the **Watershed Setup** module. The following are descriptions of the available tools:



Pointer/Selector Tool –this tool can be used to edit, rename, and delete elements. To access, select the **Pointer/Selector Tool**, click the right mouse button (right-click) on an element, and the commands are available from a shortcut menu.



Zoom Tool - this tool allows zooming in and out of the display area. To zoom in, hold the left mouse button down and outline the area you want to zoom in on. To zoom out, right-click in the display area.



Pan Tool – this tool can be used to move the display area while you are zoomed in. To do this, hold down the left mouse button and drag the mouse in the direction you would like to pull the display area.



Time-Series Icon Tool - this tool is used to create, delete, and rename time-series icons used for plotting and tabulating time-series data. To create, select the **Time-Series Icon Tool**, hold down the **CTRL** key and click. To access the available commands, select the **Time-Series Icon Tool**, right-click on a time-series icon, and the commands are available from the shortcut menu.



Stream Alignment Tool - this tool is used to create, delete, and edit stream elements that make up the stream alignment.



Stream Node Tool - this tool is used to create, delete, and edit stream nodes on the stream alignment.



Impact Area Tool - this tool is used to create, delete, rename, and edit impact areas. To create, select the **Impact Area Tool**; hold down the **CTRL** key while clicking the mouse button. Each click creates a vertex point, which is the boundary of the polygon. When reaching the end point, release the **CTRL** key and double-click. An impact area element is now visible. To access the available commands, select the **Impact Area Tool**, right-click on the impact area, and the commands are available from the shortcut menu.



Computation Point Tool - this tool is used to create, edit, rename, and delete computation points. Computation points are locations where time-series information is to be exchanged between models. For ResSim, this might be a control location for reservoir operations, a location where flows will be input, a location where a hydrograph is needed for FIA, etc. To create a computation point, select the **Computation Point Tool**, hold down the **CTRL** key and click on the stream alignment at the appropriate location. To access the available commands, select the **Computation Point Tool**, right-click on the computation point, and the commands are available from the shortcut menu.

Project Tools:



Reservoir Tool - this tool is used to create, delete, rename, and edit reservoirs. To create a reservoir, select the **Reservoir Tool**. A reservoir has to be created on the stream alignment. Hold down the **CTRL** key and click on the *upstream* end of the reservoir pool, release the **CTRL** key, drag along the stream alignment to the *downstream* end of the reservoir pool and click, and then name the reservoir. To access available commands, select the **Reservoir Tool**, right-click on the reservoir, and the commands are available from the shortcut menu.



Levee Tool - this tool is used to create, delete, rename, and edit levees. To create a levee, select the **Levee Tool**. A levee has to be created on the stream alignment. Hold down the **CTRL** key and click on the *upstream* end of the levee, release the **CTRL** key, drag along the stream alignment to the *downstream* end of the levee and click. To access available commands, select the **Levee Tool**, right-click on the levee, and the commands are available from the shortcut menu.



Diversion Tool - this tool is used to create, delete, rename, and edit diversions. To create a diversion, select the **Diversion Tool**. A diversion has to begin on the stream alignment. Hold down the **CTRL** key and click on the stream alignment. Each click creates a vertex point, along the diversion. When reaching the end point of the diversion release the **CTRL** key, and click. To access available commands, select the **Diversion Tool**, right-click on the diversion, and the commands are available from the shortcut menu.



Channel Modification Tool - this tool is used to create, delete, rename, and edit channel modifications. To create a channel modification, select the **Channel Modification Tool**. A channel modification has to be created on the stream alignment. Hold down the **CTRL** key and click on the *upstream* end of the channel modification, release the **CTRL** key, drag along the stream alignment to the *downstream* end of the channel modification and click. To access available commands, select the **Channel Modification Tool**, right-click on the channel modification, and the commands are available from the shortcut menu.



Off-Channel Storage Area Tool - this tool is used to create, delete, rename, and edit off-channel storage areas. To create an off-channel storage area, select the **Off-Channel Storage Area Tool** and hold down the **CTRL** key while clicking the mouse button. Each click creates a vertex point, which is the boundary of the polygon. When reaching the end point, release the **CTRL** key and double-click. An off-channel storage area element is now visible. To access available commands, select the **Off-Channel Storage Area Tool**, right-click on the off-channel storage area, and the commands are available from the shortcut menu.



Other Project Tool - this tool is used to create, delete, rename, and edit other projects. This tool enables the placement of elements that represent "other" projects, such as pump stations and gages. To create an "other" project, select the **Other Project Tool** and hold down the **CTRL** key and click. To access available commands, select the **Other Project Tool**, right-click on the other project, and the commands are available from the shortcut menu.

2.4 Reservoir Network Module

The **Reservoir Network** module is used for editing element data and placing additional elements onto the stream alignment. From the **Module** list, select **Reservoir Network**. The main window and the different components for the **Reservoir Network** module are illustrated in Figure 2.8.

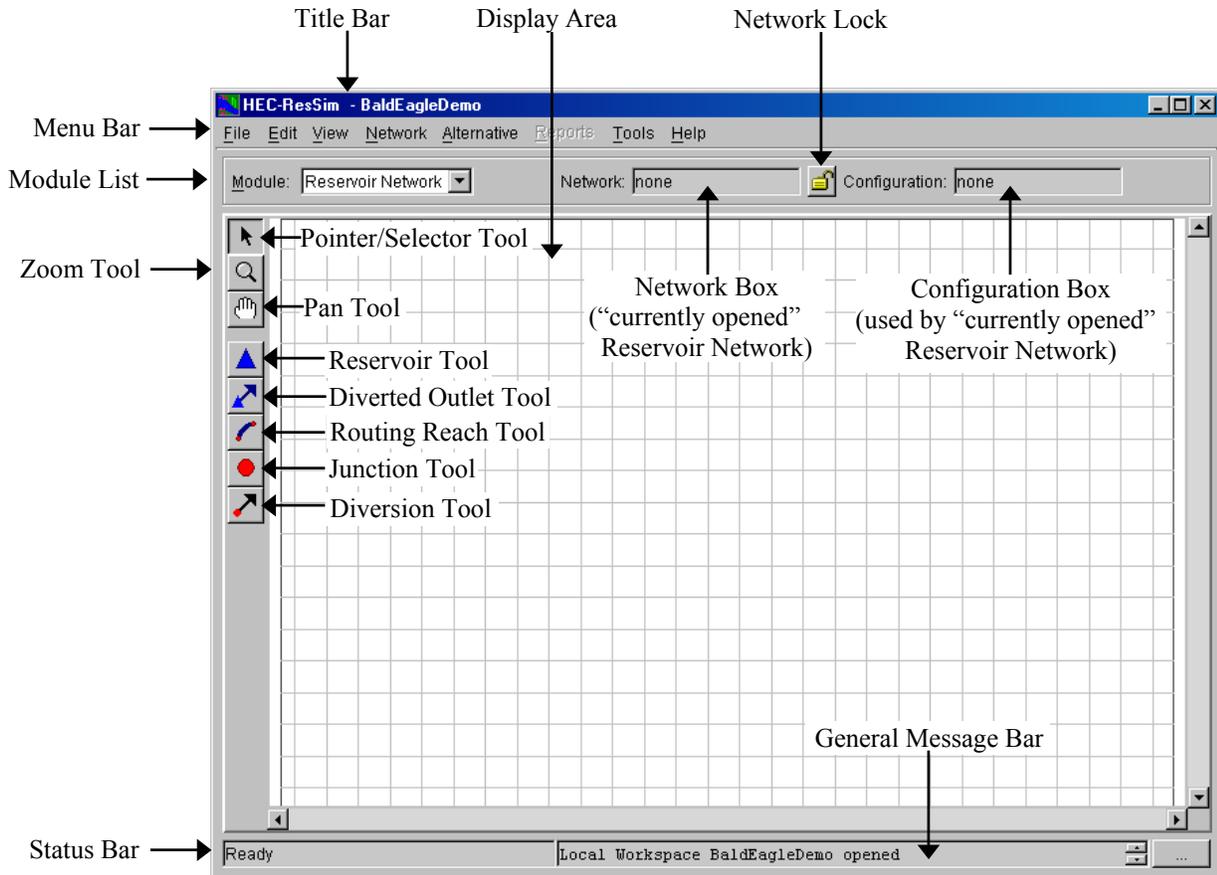


Figure 2.8 Reservoir Network Module



Your network elements will not be shown in the Display Area until you create or open a network from the Network Menu.

The **Menu Bar** (in Figure 2.8) contains the menus for the **Reservoir Network** module. After a reservoir network has been created or opened and is shown in the Display Area, the menus and their commands will become active. In addition to the four common menus described in Section 2.2.1, the following list is a description of the available menus in the **Reservoir Network** module.

Edit – From this menu, you can edit Reservoirs, Routing Reaches, Junctions, Diversions, and Reservoir Systems. Also, you can set the lock for editing the reservoir network. Available commands are: **Reservoirs, Reaches, Junctions, Diversions, Reservoir Systems, and Allow Network Editing.**

Network – From this menu, you will create, open, save, rename and delete reservoir networks. You can also update a network to recognize revisions made to its configuration within the Watershed Setup module. Available commands are: **New, Open, Save, Save As, Rename, Update Network from Configuration, and Delete Networks.**

Alternative – From this menu, you will open the Alternative Editor that will enable you to create, edit, save and delete alternatives. The only command available from this menu is **Edit.**

Reports – From this menu, you can review reports that list the elements for the currently opened network. These reports contain information about the reservoirs, routing reaches, junctions and diversions. Also, an advanced network summary listing is available. The available reports are: **Reservoir List, Reach List, Junction List, Diversion List, and Advanced.**

The **Network** box (in Figure 2.8) shows the “currently opened” Reservoir Network. *You will not see a watershed schematic in the Display Area until you create or open a network.*

The **Configuration** box (in Figure 2.8) shows the configuration the currently opened Reservoir Network is based upon. *If you make changes to the network's Configuration (within the Watershed Setup module), then you can update the network(s) that use that configuration to recognize those revisions by selecting the **Update Network from Configuration** command from the **Network** menu.*

The **Network Lock**  (in Figure 2.8) allows you to edit the elements within the Reservoir Network. This lock prevents others from editing the elements while you are editing.

The **Display Area** (in Figure 2.8) is where you create the routing reaches for your Reservoir Network. Also, you can edit the elements through the use of the available tools in the **Reservoir Network** module. The following are descriptions of the available tools:



Pointer/Selector Tool –this tool can be used to edit, rename, and delete elements. To access, select the **Pointer/Selector Tool**, right-click on an element, and the commands are available from a shortcut menu.



Zoom Tool - this tool allows zooming in and out of the display area. To zoom in, hold the left mouse button down and outline the

area you want to zoom in on. To zoom out, right-click in the display area.



Pan Tool –this tool can be used to move the display area while you are zoomed in. To do this, hold down the left mouse button and drag the mouse in the direction you would like to pull the display area.



Reservoir Tool - this tool is used to create, edit, and delete reservoirs. Typically, you will only be “editing” reservoirs within the Reservoir Network module. The other options would normally be done within the Watershed Setup module. To access available commands, select the **Reservoir Tool**, right-click on the reservoir, and the commands are available from the shortcut menu.



Diverted Outlet Tool - this tool is used to create, edit, rename, and delete diverted outlets from a reservoir. To create a diverted outlet, select the **Diverted Outlet Tool**. A diverted outlet must originate from a reservoir. Hold down the **CTRL** key and click on the appropriate reservoir, release the **CTRL** key, move the mouse pointer to a location in the watershed that will receive the diversion from the outlet and click. It is possible to create a diverted outlet that re-enters the network system. To do this, continue holding down the **CTRL** key and click to create vertex points and release the key when you are ready to place the final point back into the system. To access available commands, select the **Diverted Outlet Tool**, right-click on the diverted outlet, and the commands are available from the shortcut menu.



Routing Reach Tool - this tool is used to create, edit, rename, and delete routing reaches. A routing reach must be created between junctions and will follow the stream alignment. Attempting to create a reach where junctions don't exist will automatically generate junctions at the upstream and downstream ends of the reach. To create a routing reach, select the **Reach Tool**, hold down the **CTRL** key and click on the junction at the *upstream* end of the reach, release the **CTRL** key, drag along the stream alignment to the junction at the *downstream* end of the reach and click. To access available commands, select the **Reach Tool**, right-click on the routing reach, and the commands are available from the shortcut menu.



Junction Tool - this tool is used to create, edit and delete junctions. To add junctions (before creating routing reaches), select the **Junction Tool**, hold down the **CTRL** key and click on the stream alignment where you want to create the junction. To access available commands, select the **Junction Tool**, right-click on the junction, and the commands are available from the shortcut menu.



Diversions Tool - this tool is used to create, edit, rename, and delete diversions. To create a diversion, select the **Diversions Tool**. A diversion must begin from a junction. Hold down the **CTRL** key and click on the junction from which the diversion will occur. If you continue to hold down the **CTRL** key, each click creates a vertex point along the diversion. When reaching the end point of the diversion release the **CTRL** key, and click. Diversions can re-enter the network or leave the network system entirely. To access available commands, select the **Diversions Tool**, right-click on the diversion, and the commands are available from the shortcut menu.

2.5 Simulation Module

The **Simulation** module is used to perform a simulation (compute), edit element data and view results. From the **Module** list, select **Simulation**. The main window and the different components for the **Simulation** module are illustrated in Figure 2.9.

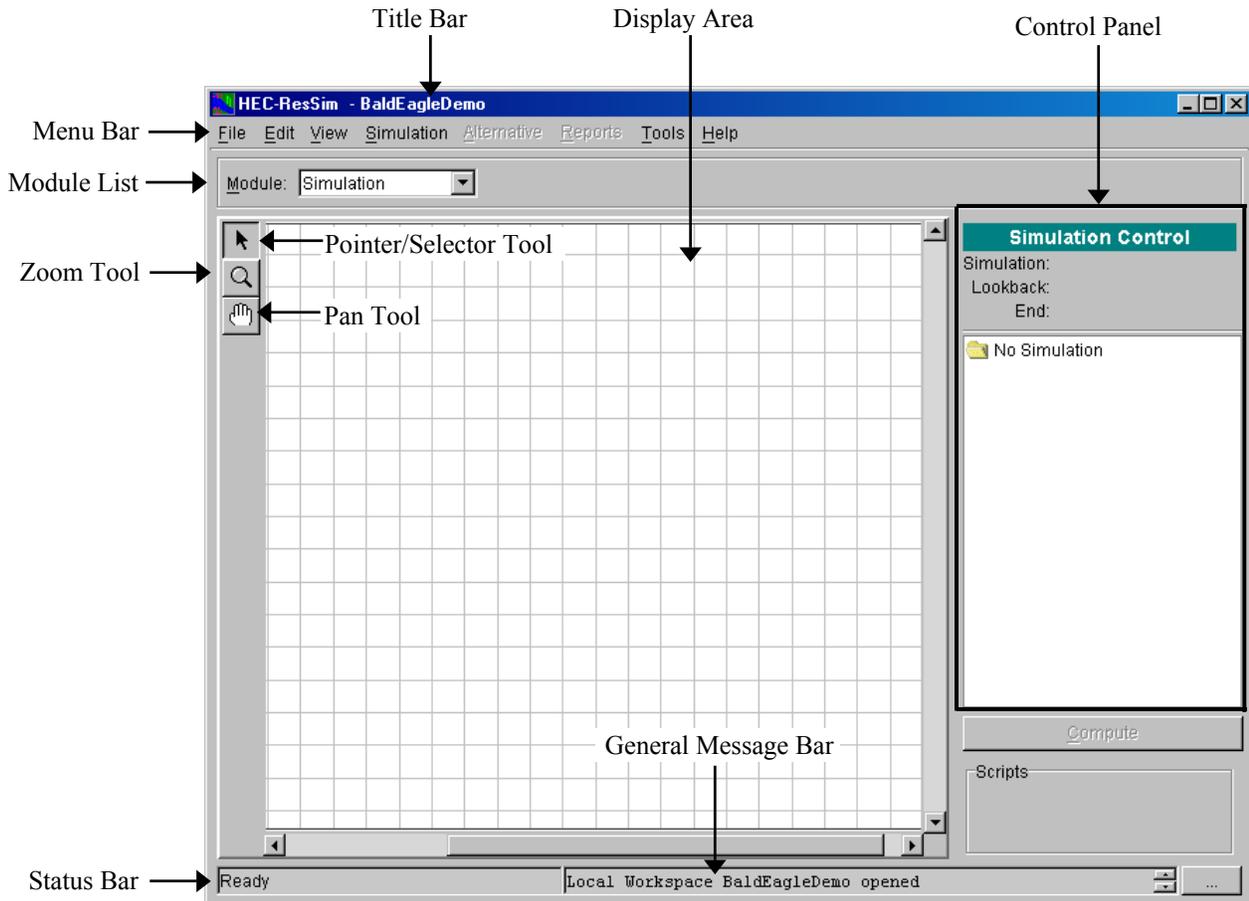


Figure 2.9 Simulation Module

The **Menu Bar** (in Figure 2.9) contains the menus for the **Simulation Module**. After a simulation has been created or opened and is shown in the Display Area, the menus and their commands will become active. In addition to the four common menus described in Section 2.2.1, the following list describes the available menus in the **Simulation Module**.

Edit – From this menu, you can edit the list of scheduled Scripts, make an Alternative Active, and edit Reservoirs, Routing Reaches, Junctions, Diversions, and Reservoir Systems. Available commands are: **Script List, Set Active Alternative, Reservoirs, Reaches, Junctions, Diversions, and Reservoir Systems**.

Simulation – From this menu, you can create, open, re-open, close, edit, save, and delete simulations. You can also get information about the currently opened simulation and define release and target elevation overrides. Available commands are: **New, Open, Re-Open, Close, Edit, Save, Delete, Info, and Release Overrides**.

Alternative – From this menu, you can edit alternatives. This menu only becomes active when a simulation is open. The only available command is **Edit**.

Reports – The available reports summarize results and provide network input summaries for the currently opened simulation. Available commands are: **Reservoir Summary, Flow Summary, Power Summary, Gates Summary, Stage Summary, Release Decision, Compute, and Network**.

The **Display Area** (Figure 2.9) is where your stream alignment and watershed elements are displayed. You can view simulation results and edit projects and computation points through the use of the available tools in the **Simulation Module**. The following are descriptions of the available tools:



Pointer/Selector Tool –this tool can be used to edit projects and computation points, plot hydrographs, and view results. To access this tool, select the **Pointer/Selector Tool**, right-click on a location and select commands from the shortcut menu.



Zoom Tool - this tool allows zooming in and out of the display area. To zoom in, hold the left mouse button down and outline the area to which you want to zoom. To zoom out, right-click in the display area.



Pan Tool – this tool can be used to move the display area while you are zoomed in. To do this, hold down the left mouse button and drag the mouse in the direction you would like to pull the display area.

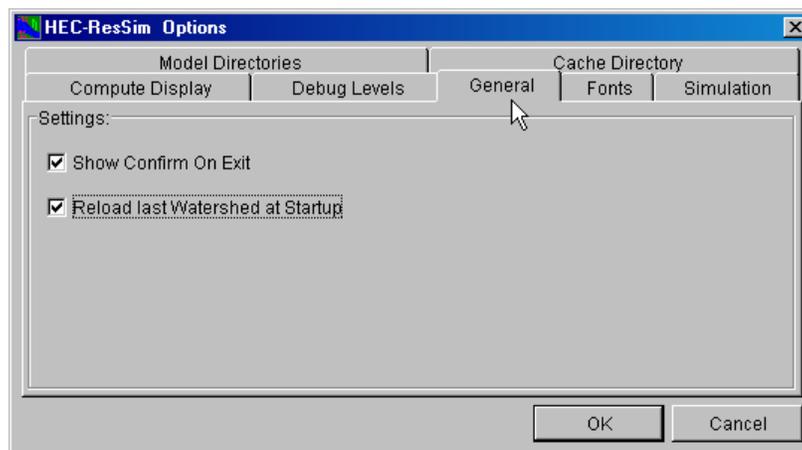
The **Control Panel** (Figure 2.9) shows the time window for the currently selected simulation in the **Simulation Module**. Also from the **Control Panel** you can manipulate simulations and alternatives.

2.6 Opening an Existing Watershed

With the ResSim main window open, you will need to open a watershed. In ResSim, a **watershed** is a data set associated with a geographic region for which you may configure multiple models and area coverages. A **watershed** may include all of the streams, projects (reservoir, levees), gage locations, impact areas, time-series locations, and hydrologic and hydraulic data for a specific area. All of these details together, once configured, form a watershed data set.

You may open an existing watershed from any of the modules (if you need to create a new watershed, refer to Chapter 3). Three methods of opening an existing watershed are available:

First, you can specify that your previously opened watershed be automatically opened by selecting **Reload last Watershed at Startup** from the **General** tab of the **Options** dialog box (Figure 2.10) from the **Tools** menu.



**Figure 2.10 Tools Menu, Options Dialog Box, General Tab:
Reload last Watershed at Startup**

Second, if you have opened the watershed before, you can select it from the list of most-recently-used watersheds, located at the bottom of the **File** menu.

Third, you may use the **Open Watershed** dialog to open the watershed, as follows:

1. On the **File** menu, click **Open Watershed**. The **Open Watershed** dialog box (Figure 2.11) will open.
2. Select a watershed from **Available Watersheds** (see Chapter 3, Section 3.3.1 for information on defining Watershed Locations). The **Current Watershed** box displays the watershed that is currently open, if any.
3. Click **OK**. The Open Watershed dialog box will close and the watershed you have selected will load and appear in the main window with the watershed name shown in the title bar.

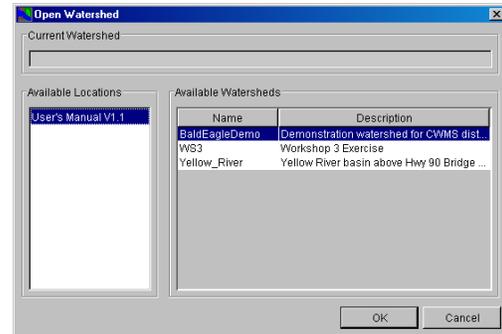


Figure 2.11 Open Watershed Dialog Box



You can have only one watershed open at a time. Therefore, if a watershed is open and you attempt to open another, the program prompts you to save the current watershed. If you do not save, any changes you have made to the current watershed will be lost.

2.7 Understanding Schematic Elements

Schematic elements in ResSim allow you to represent watershed, reservoir network, and simulation data visually in a geo-referenced context that interacts with associated data. You create schematic elements and edit their properties in the Watershed Setup Module (see Chapters 3 through 7) and the Reservoir Network Module (see Chapters 8 through 13). In the Simulation Module (see Chapter 14), you can plot and tabulate data by using the shortcut menus associated with the schematic elements.

2.7.1 Stream Alignment

The **Stream Alignment** (Figure 2.12) is a common component of the watershed. To create it, use the map (mouse) tools in the Watershed Setup Module to draw multi-segmented lines into the map display and to mark nodes and stream junctions.

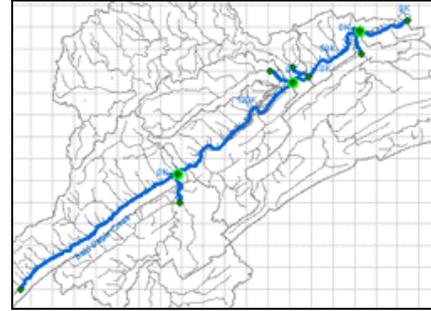


Figure 2.12 Stream Alignment

Stream elements (segments), stream nodes, and stream junctions are the components of a Stream Alignment. See Chapter 5 for more detailed information on creating and editing a Stream Alignment.

2.7.2 Other Watershed Elements

Other watershed elements include Projects, Computation Points, Impact Areas and Time-Series Icons. Create watershed elements in the Watershed Setup Module (see Chapter 6).

These watershed elements are common components of a watershed that multiple models can reference (e.g., ResSim and FIA). To represent the elements, you use the Watershed Setup Module's map (mouse) tools to insert icons and draw polygons and multi-segmented lines into the map display.

Projects include Reservoirs (Figure 2.13), Levees (Figure 2.14), Diversions (Figure 2.15), Channel Modifications (Figure 2.16), Off-Channel Storage (Figure 2.17), and Other Projects like pump stations and agricultural diversions (Figure 2.18).

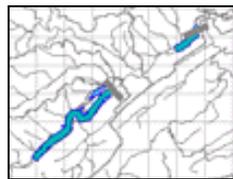


Figure 2.13 Reservoir

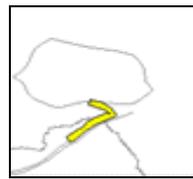


Figure 2.14 Levee

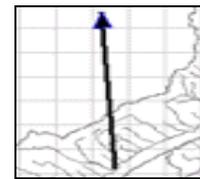


Figure 2.15 Diversion

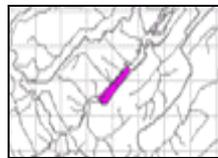


Figure 2.16 Channel Modification



Figure 2.17 Off-Channel Storage



Figure 2.18 Other Project

Computation Points (Figure 2.19) are common points where data is exchanged between models. To represent them, you use the map (mouse) tools to insert icons into the map display.

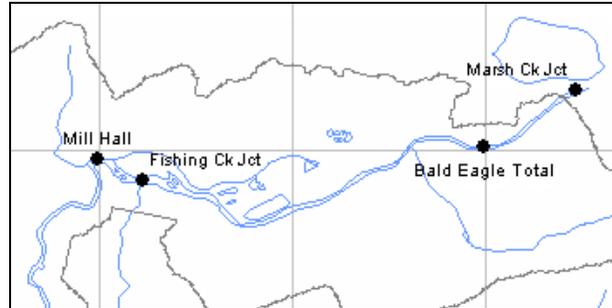


Figure 2.19 Computation Points

Impact Areas (Figure 2.20) are common elements representing distinct portions of a watershed affected by rising stage in a stream, river, lake, or reservoir where flood damages will be evaluated.

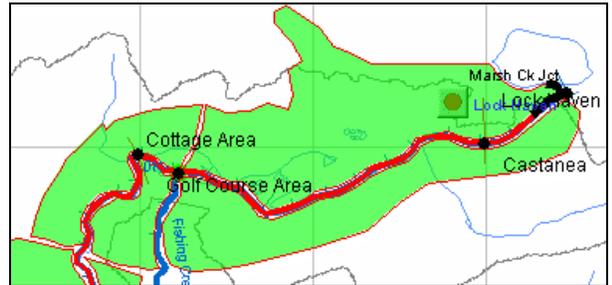


Figure 2.20 Impact Areas

For more information about Impact Areas, refer to the *HEC-FIA User's Manual* (HEC, 2003c).

Time-Series Icons (Figure 2.21) indicate sites where time-series data is available. You can use Time-Series Icons to represent the locations of gages or Time-Series locations.

For more information about Time-Series Icons, refer to the *CWMS User's Manual* (HEC, 2003a).

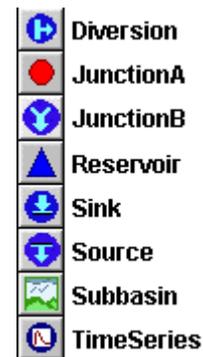


Figure 2.21
Time-Series Icons

2.7.3 Reservoir Network Schematic

The **Reservoir Network Schematic**, which you develop in the Reservoir Network Module (based on a Configuration created in the Watershed Setup module), is a template for simulation computations. The graphical elements allow you to access data editors and specify properties of reservoir network components.

The **Reservoir Network Schematic** (Figure 2.22) displays geo-referenced, graphical representations of Reaches, Diversions, Junctions, and Reservoirs. When you interact with these representations in the Simulation Module, you are able to view results from the ResSim model's observed and computed hydrographs.

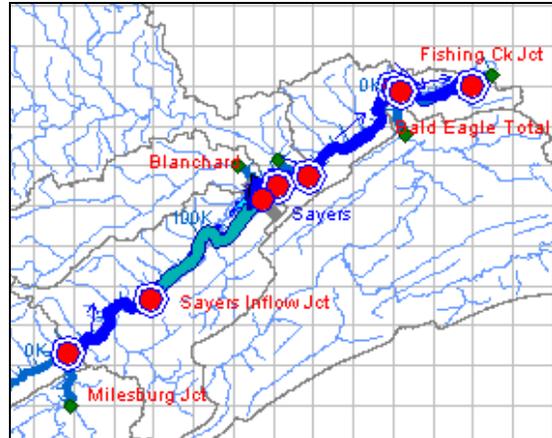


Figure 2.22 Reservoir Network Schematic

The Schematic is visible in the **Reservoir Network** module *only when a Network has been opened* and is visible in the **Simulation** module *only when a Simulation Alternative is “set as active”*.

2.7.4 Using Shortcut Menus

Shortcut menus display when you right-click on schematic elements in the map display and other ResSim components such as plots, tables, and “tree structures”. In ResSim, shortcut menus offer a variety of commands and options that allow you to access data editors, plot and tabulate data, view reports, compute Simulations, and more. Specific shortcut menu commands and options are described throughout this manual.

2.8 Printing and Exporting Reports

From each individual report there is a shortcut menu that allows you to print the report, preview the report before you print, and export the report to an ASCII delimited file. Right-clicking on the active report accesses the shortcut menu. Another way to print or export the reports is by clicking on **Export** or **Print** from the report's **Report** menu (in the Reservoir Network or Simulation module) or from the report's **File** menu (in the Watershed Setup module). Either method accesses the same dialog boxes.

2.8.1 Printing Reports

The output will be a print of the screen image of the active report. If items in the columns of the report are not printing, you can use the mouse to resize the column widths and the width of the entire report dialog box if you need to see more detail. To do so, roll the mouse

pointer over one of the lines that delimit the columns or over the dialog box border. You can click on that line with the left mouse button and drag the mouse from side to side to indicate how wide you want the columns or dialog box. If you end up highlighting some cells in the table, then you probably moved the mouse slightly just before you pressed the button.

To print a report from the Watershed Setup module:

1. You must have a report selected (opened). For example, from the **Reports** menu in the **Watershed Setup** module, select **List of Computation Points** (Figure 2.23).

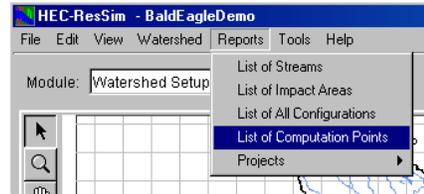


Figure 2.23 Selecting a Report

2. From the **File** menu of the opened report, select **Print** (Figure 2.24). Or, you can right-click anywhere within the tabulated data of the report and from the shortcut menu select **Print** (Figure 2.25).

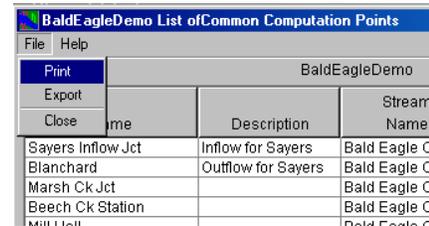


Figure 2.24 Select Print from Report’s File Menu

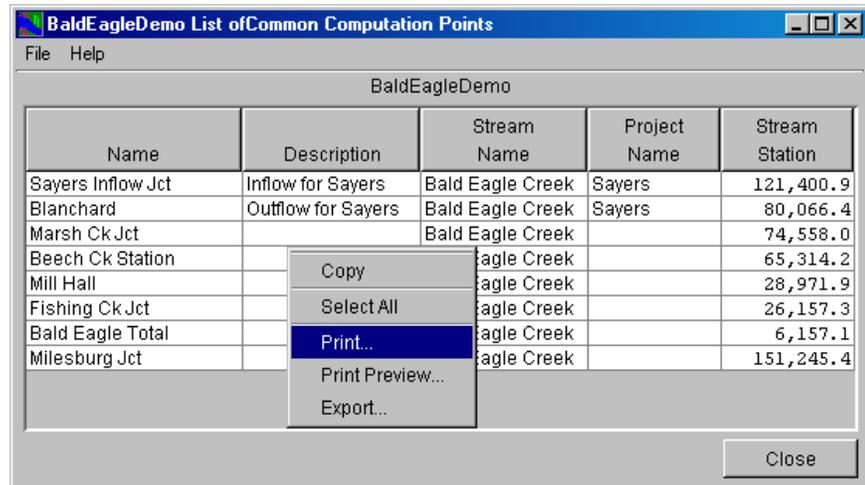


Figure 2.25 Select Print from Report’s Shortcut Menu

- The Print **Properties** dialog box will open (Figure 2.26).

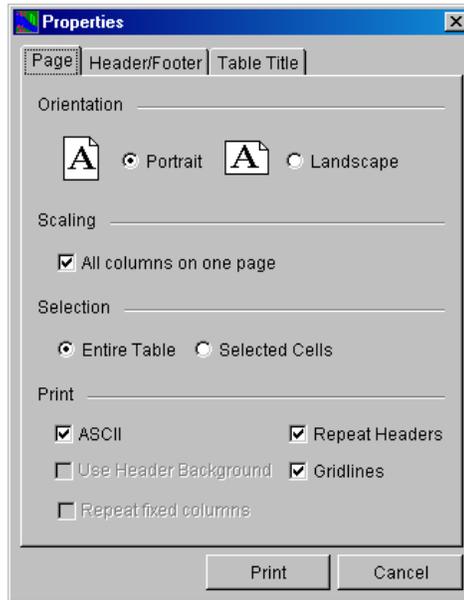


Figure 2.26 Printing Properties, Page Tab

- From the **Page** tab (Figure 2.26), you can set the orientation (default is Portrait), make the report columns fit on one page, print the entire table (default) or print selected cells, repeat headers on subsequent pages, and display gridlines. By default the report prints in an ASCII format, if you want a screen image of the report, unclick ASCII and the report will print with any shading that you see on the report.
- The **Header/Footer** tab (Figure 2.27) allows you enter a header and/or footer for the report.
- The **Table Title** tab (Figure 2.28) allows you to change the default title of the report, and to determine whether you want the report title repeated on subsequent pages.

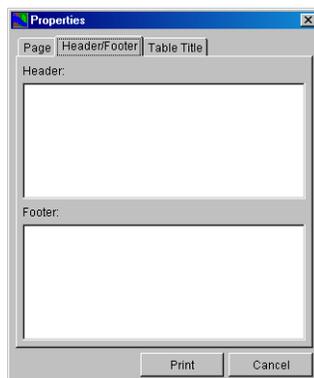


Figure 2.27 Printing Properties, Header/Footer Tab

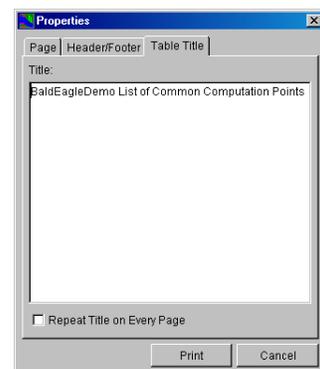


Figure 2.28 Printing Properties, Table Title Tab

- After you have everything set, click **Print** and the default system **Print** dialog box will open (Figure 2.29). Select the printer, and any other options you wish to set, click **OK**. The report will then be printed on the selected printer.

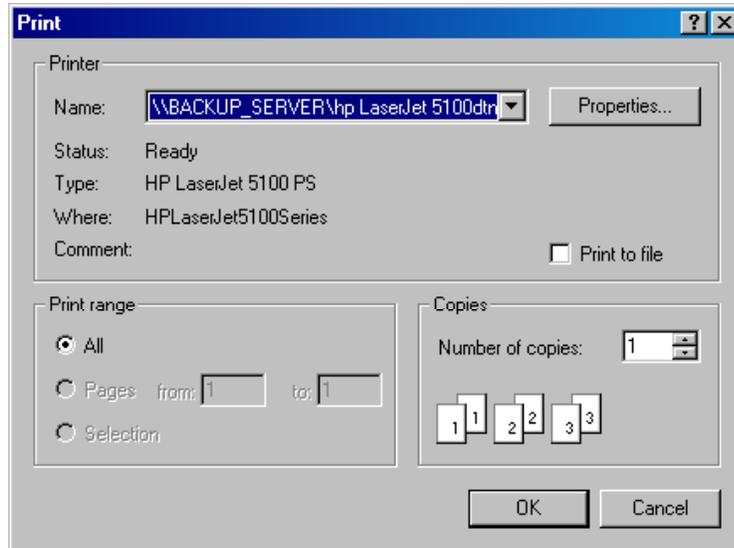


Figure 2.29 System Print Dialog Box

2.8.2 Print Preview

You can also preview the report before printing. To do so, do the following:

- You must have a report selected (opened).
- Right-click anywhere within the tabulated data of the report and from the shortcut menu, select **Print Preview** (Figure 2.30).

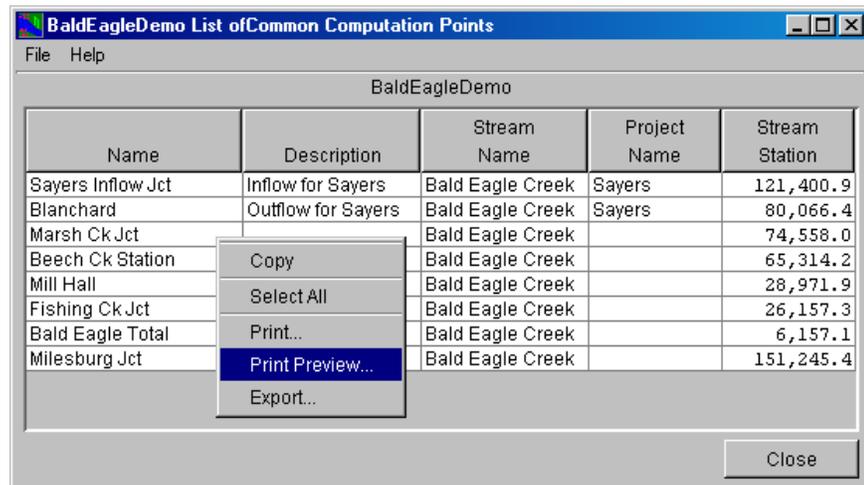
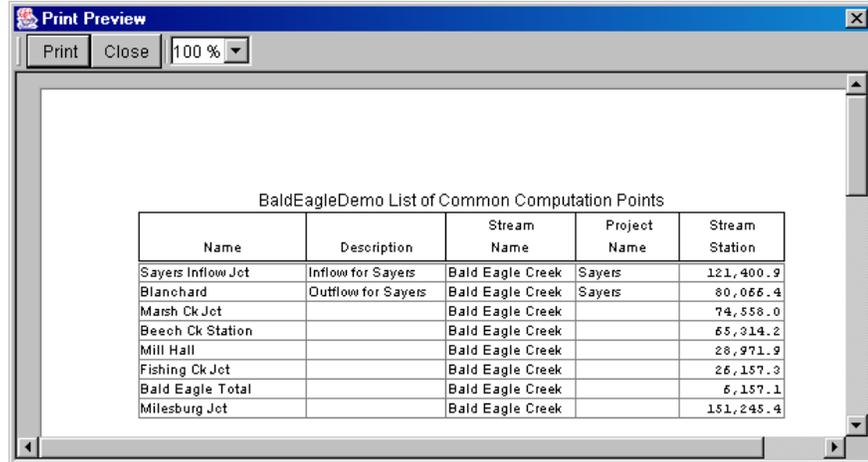


Figure 2.30 Select Print Preview from Report's Shortcut Menu

3. The **Properties** dialog box (see Figure 2.26) will appear.
4. Make the same adjustments for printing as described in Section 2.8.1. When you are satisfied, select **Print** from the **Properties** dialog box, and the **Print Preview** dialog box (Figure 2.31) will open.



The Print Preview dialog box displays a table titled "BaldEagleDemo List of Common Computation Points". The table has five columns: Name, Description, Stream Name, Project Name, and Stream Station. The data is as follows:

Name	Description	Stream Name	Project Name	Stream Station
Sayers Inflow Jct	Inflow for Sayers	Bald Eagle Creek	Sayers	121,400.9
Blanchard	Outflow for Sayers	Bald Eagle Creek	Sayers	80,066.4
Marsh Ck Jct		Bald Eagle Creek		74,558.0
Beech Ck Station		Bald Eagle Creek		65,314.2
Mill Hall		Bald Eagle Creek		28,971.9
Fishing Ck Jct		Bald Eagle Creek		26,157.3
Bald Eagle Total		Bald Eagle Creek		6,157.1
Milesburg Jct		Bald Eagle Creek		151,245.4

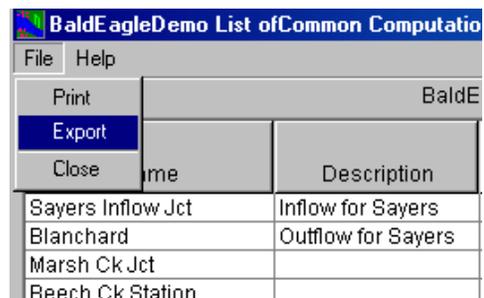
Figure 2.31 Print Preview Dialog Box

5. If you like what you see in the **Print Preview** dialog box, you can print by clicking **Print**, which opens the system **Print** dialog box (see Figure 2.29), or you can close the **Print Preview** dialog box by clicking **Close**.

2.8.3 Exporting Reports to a File

You can also export reports to an ASCII delimited file. To export a report from the Watershed Setup module, do the following:

1. You must have a report selected (opened).
2. From the **File** menu of the opened report, select **Export** (Figure 2.32). Or, you can right-click anywhere within the tabulated data of the report and from the shortcut menu select **Export** (Figure 2.33).



The screenshot shows the File menu of the "BaldEagleDemo List of Common Computation Points" report. The menu items are File, Help, Print, Export (highlighted), and Close. Below the menu, a portion of the report table is visible, showing columns for Name and Description.

Name	Description
Sayers Inflow Jct	Inflow for Sayers
Blanchard	Outflow for Sayers
Marsh Ck Jct	
Beech Ck Station	

Figure 2.32 Select Export from the Report's File Menu

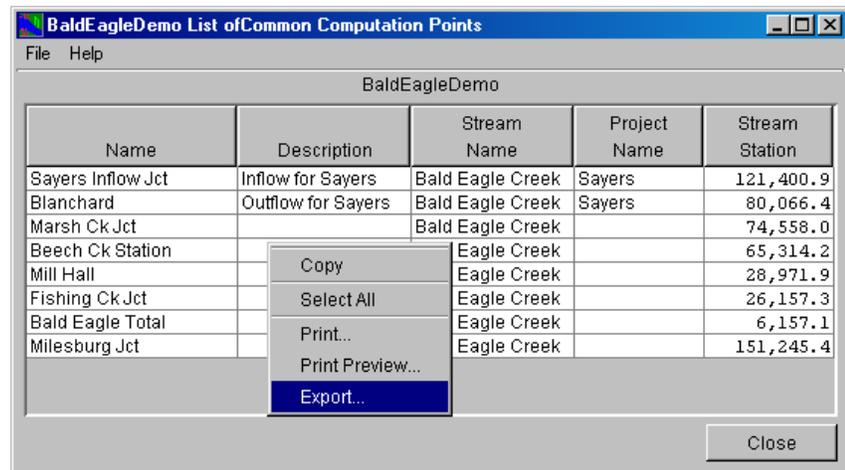


Figure 2.33 Select Export from Report's Shortcut Menu

3. The **Table Export Options** dialog box (Figure 2.34) will open.
4. You can select the **Field Delimiter** from the list to be **TAB**, **SPACE**, **COMMA**, or **COLON**.
5. By default, the export does not use fixed width columns; however, if you want to do this you can click in the **Fixed Width Columns** checkbox.
6. You can also include the **Column Headers** of the report (default), include **Gridlines**, and include the **Title** of the report.
7. Once you have chosen your desired options, click **OK** and the **System Save Browser** (Figure 2.35) will open.

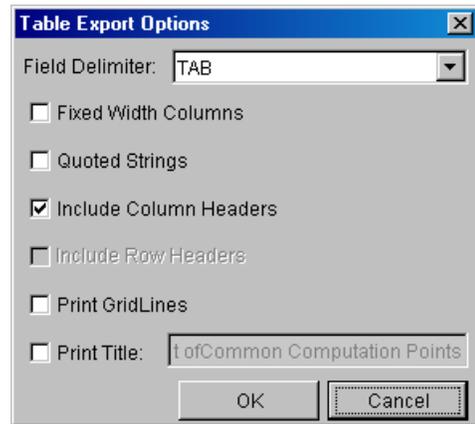


Figure 2.34 Table Export Options Dialog Box

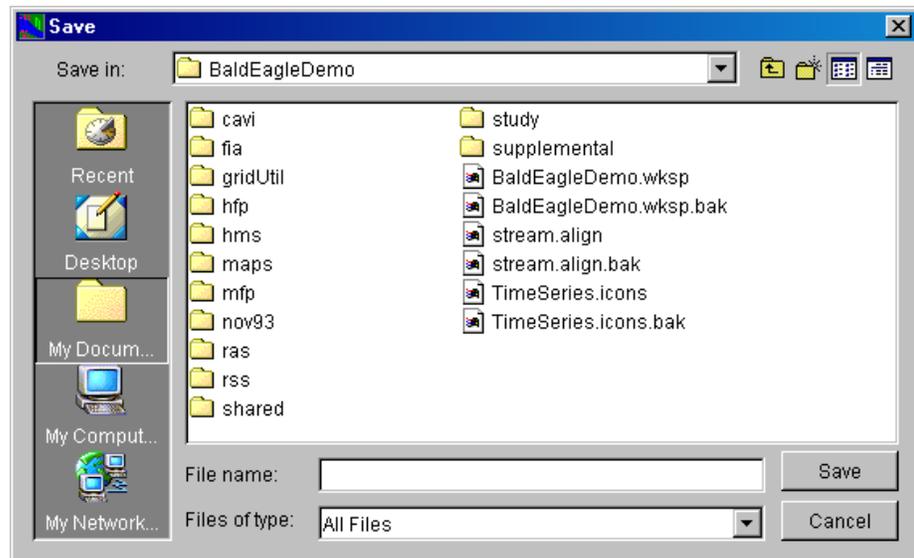


Figure 2.35 System Save Browser (for Saving a File)

8. You will need to select where you want the file to be saved and a filename. If you want the file to have an extension, you must enter your own; *there is no default file extension*.
9. Click **Save** and the **System Save Browser** will close. The filename that you entered will now be saved on your computer.

