Stream Reach Editor User Manual

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Stream Reach Editor User Manual

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Introduction

The first major task in subbasin assessment using EDT Online is defining (or profiling) the environment for the area you are analyzing. This task is currently accomplished through the use of the offline Stream Reach Editor tool, downloaded from the EDT Online Web site.

Who will use the Stream Reach Editor

This User Manual provides step-by-step instructions for working with the Stream Reach Editor and is written for the following groups:

- General public
- Subbasin work groups
- Subbasin administrators

EDT Online allows users with varying levels of permission to edit/view stream reach data. All user groups may download the Stream Reach Editor, User Manual, and datasets—and thus may use the editor to create new datasets. However, only authorized subbasin work group members and subbasin administrators may upload new datasets to EDT Online.

What you should know

This manual assumes a familiarity with basic operating system functionality, such as copying, saving, and deleting files and installing applications; familiarity with various utilities, such as unzipping files; and familiarity with Web-based activities, such as navigation and filling in forms.

What software and hardware you will need

The offline Stream Reach Editor requires a PC with Windows 98, NT4, or later operating system and MS Access 2000 installed. It is also necessary to have file expansion software, such as Winzip or Aladdin Stuffit, and Acrobat Reader for viewing the documentation.

The Stream Reach Editor is a component of the EDT Online Web site, which may be accessed from a variety of operating systems, through various Browsers, and across a range of Internet connections (T-1, DSL line, cable modem, or dial-up modem). Your Internet connection will

affect the various file download times—the larger files may take several minutes with a dialup modem.

Before You Begin

Before you can begin to use the Stream Reach Editor to define strea reaches and rate habitat attributes, you must download the tool and data from the EDT Online Web site and get it set up offline. This section describes these procedures.

Downloading the Stream Reach Editor, Documentation, and Data

This section describes how to download the Stream Reach Editor User Manual, the Stream Reach Editor offline tool, and a stream reach dataset from the EDT Online Web site.

To download the User Guide and Stream Reach Editor:

1. Go to the EDT Online Web site (http://www.mobrand.com/edt).

2. Click on the desired Sponsor Logo (e.g., the Northwest Power and Conservation Council).

3. Select your area (province) and click on "Go."

4. Log in
   -or-
   register as a public user.

5. Select your subbasin from the drop-down list in the center of the page and click on "Go." The EDT Main Menu appears.

6. Click on "Stream Reach Editor" from the EDT Main Menu page. The Stream Reach Editor Main Menu appears.
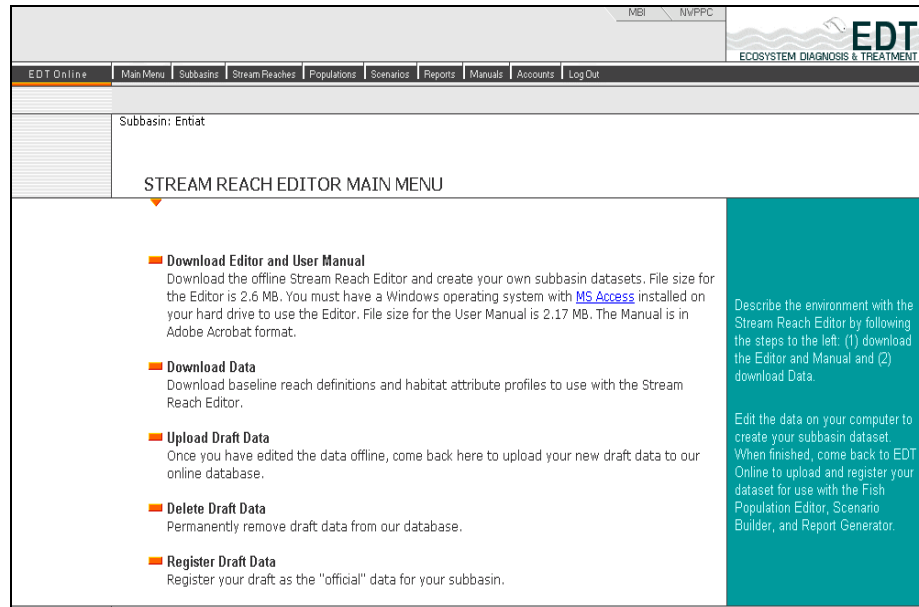
Figure 1: Stream Reach Editor Main Menu screen from EDT Online

Note: If you are a public user, you will not see all of the options listed on this main menu page—you will not be able to upload revised datasets. Subbasin work group members, with permissions from the subbasin administrator, will see more menu options and will be able to upload revised datasets, run reports on them, and delete their own draft datasets.

7.   Click on "Download Editor and User Manual." The Download the Stream Reach Editor and User Manual screen appears.
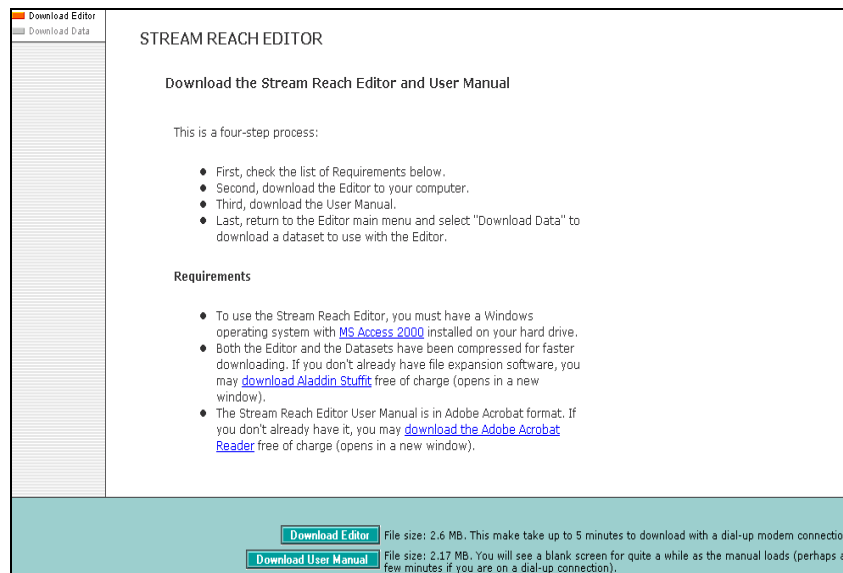

Figure 2: Download the Stream Reach Editor and User Manual screen from EDT Online

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8. Click on "Download User Manual" at the bottom of the page to either view the User Manual as a .pdf file or to save it to your computer for printing.

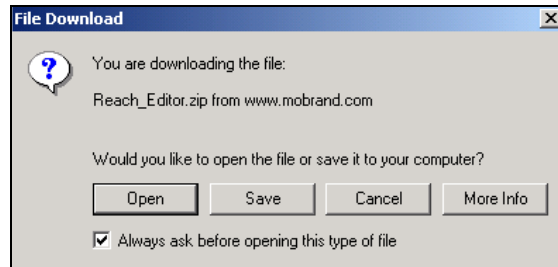9. Click on "Download Editor" at the bottom of the page. The Download File dialog box appears.

Figure 3: Download file dialog box

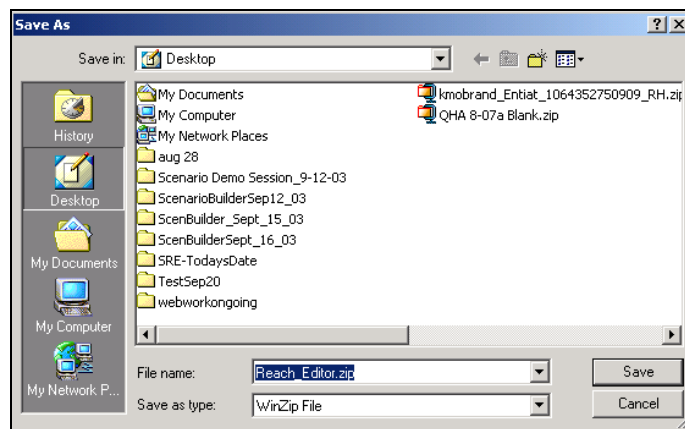10. Click on "Save." The Save As dialog box appears.

Figure 4: Save As dialog box

11. Create a directory for the Stream Reach Editor files, and click "Save."

12. Navigate with Windows Explorer to the newly created directory, and double-click on the downloaded file, Reach_Editor.zip.
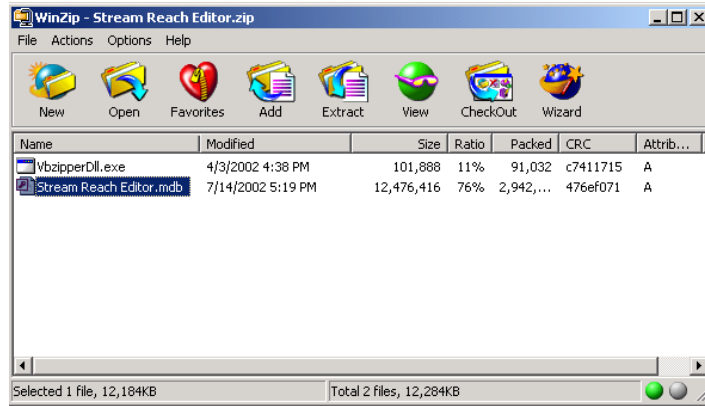
Figure 5: Contents of downloaded zip file

> NOTE: The .zip files contains two files: an executable DLL file utility (VbzipperDll.exe) and an MS Access database file (Stream Reach Editor.mdb), as shown below:

13. Extract these files into the same directory that you created for the downloaded .zip file.

> NOTE: These two files must be saved in the same directory or the application will not function properly.

Now that you have downloaded the Stream Reach Editor and documentation, you are ready to download a stream reach dataset.

To download the stream reach data:

1. Click on the "Download Data" button from the Stream Reach Editor Main Menu. The Download Stream Reach Dataset screen appears.
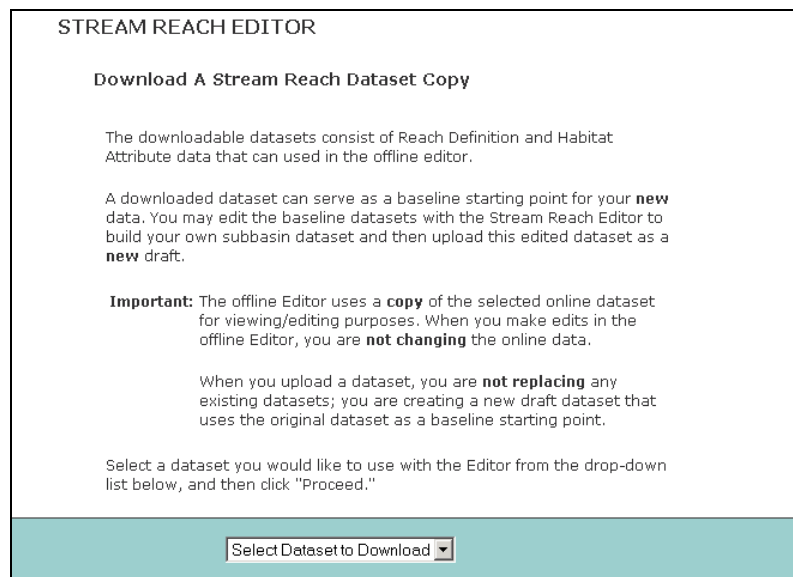

Figure 6: Download Stream Reach Dataset Copy screen from EDT Online

2. Select a dataset from the drop-down list at the bottom of the page.
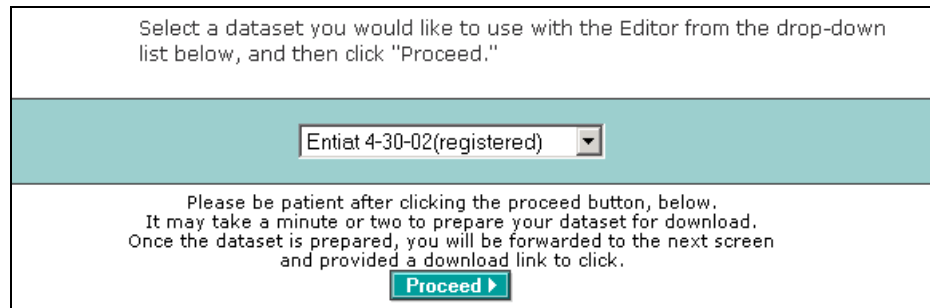

Figure 7: Dataset drop-down list

> NOTE: Public users will see on the registered dataset for the subbasin in the list; users with assigned permissions will see other datasets.

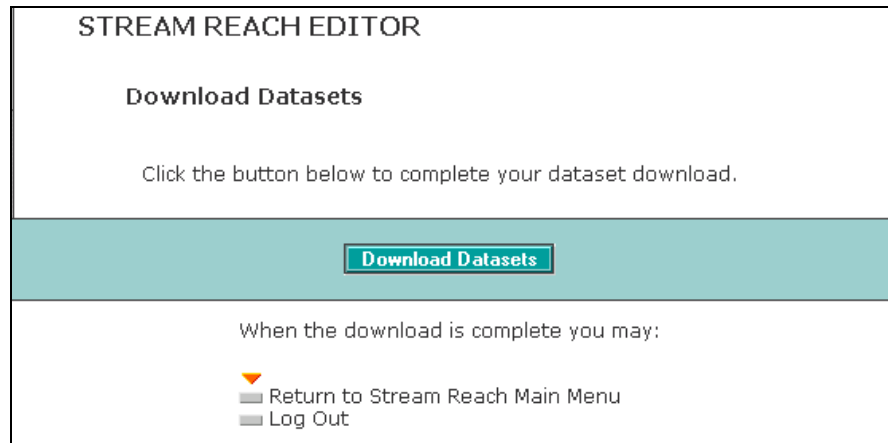3. Click on the "Proceed" button. This brings up the Download Datasets screen.

Figure 8: Download Datasets screen from EDT Online

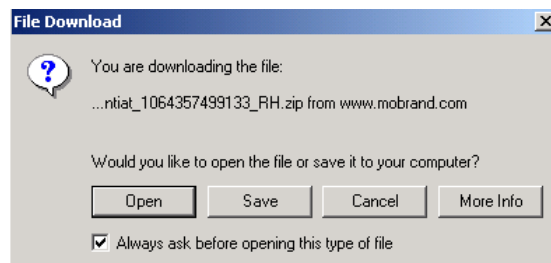4. Click "Download Datasets." The File Download dialog box appears.

Figure 9: File Download dialog box

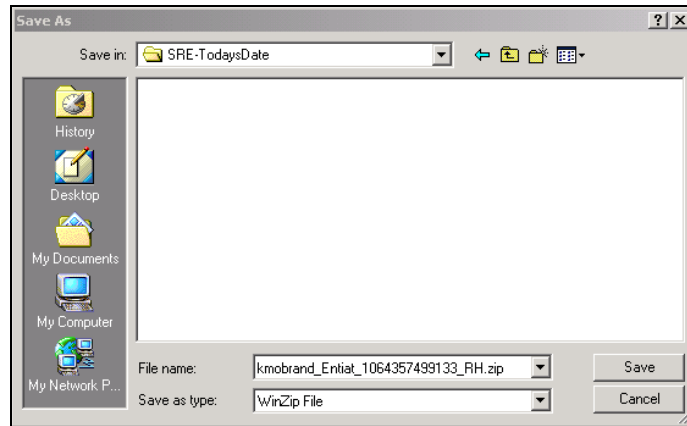5. Click on "Save." The Save As dialog box appears.

Figure 10: File Save As dialog box

6. Save the file to the same directory where you placed the Stream Reach Editor files.

Now that you have downloaded the Stream Reach Editor, User Guide, and dataset, you are ready to log off from the EDT Online Web site and get the Stream Reach Editor set up and ready for use.

Getting the Stream Reach Editor set up

This section describes getting the Stream Reach Editor tool ready for defining reaches and rating habitat attributes. There are three steps involved in this process (1) launching the Stream Reach Editor application, (2) unzipping the datafiles, and (3) importing the data files into the Stream Reach Editor

To launch the Stream Reach Editor

1. Navigate to the directory where you downloaded and extracted the Stream Reach Editor database application.

2. Double-click on the .mdb file (Stream Reach Editor.mdb). The MS Access application and database file will open, as shown in the following screen.
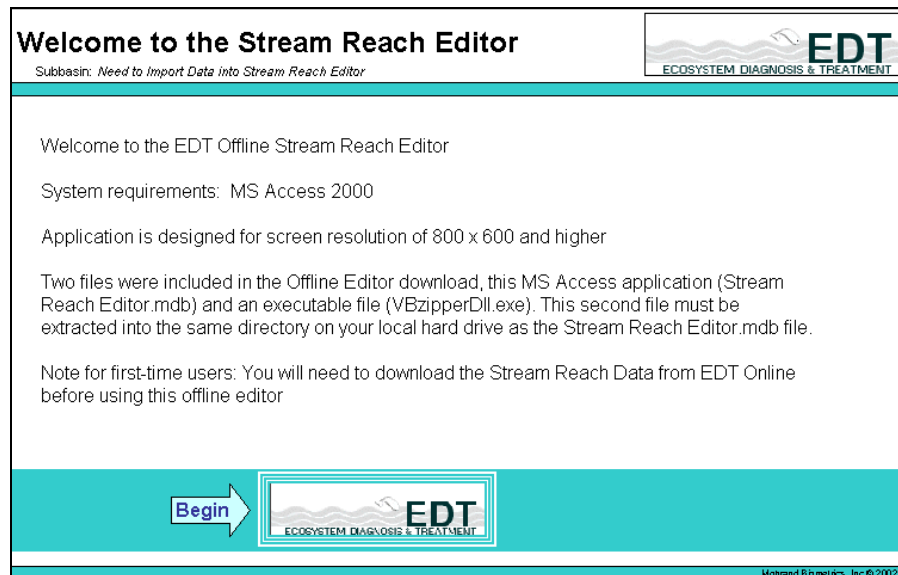
Figure 11: Stream Reach Editor Welcome screen

3. Click on "Begin" at the bottom of the screen. The Stream Reach Editor Main Menu screen appears.
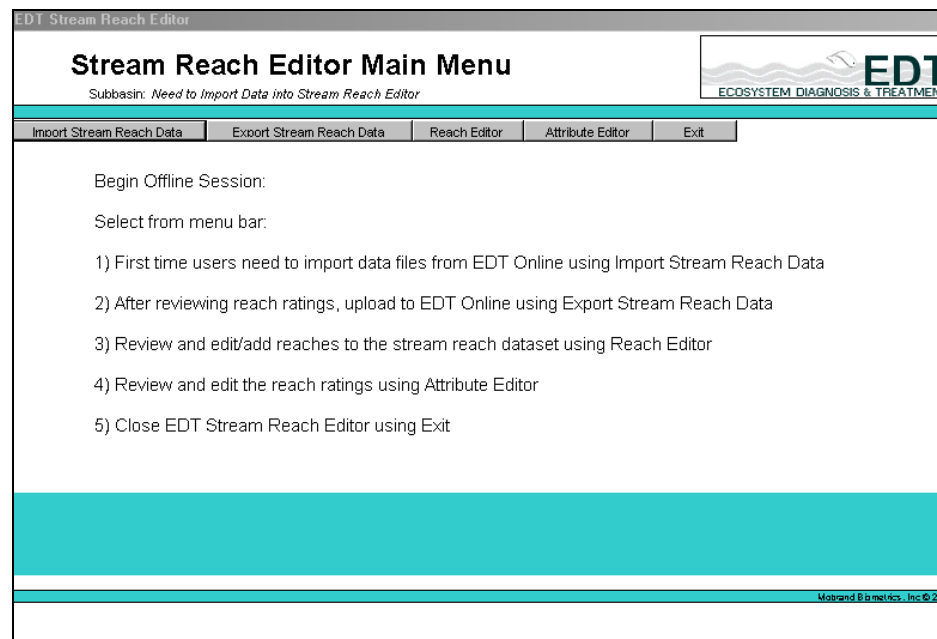

Figure 12: Stream Reach Editor Main Menu screen

NOTE: This screen describes the functionality of the menu buttons that are located across the top of the page. It does NOT represent the order in which the steps will be taken when using the offline Stream Reach Editor.

Now that you have launched the Stream Reach Editor, you are ready to to unzip the dataset that you downloaded from EDT Online.

Extracting the data files:

1. Click on the "Import Stream Reach Data" button on the left end of the navigation bar on the Stream Reach Editor Main Menu page. The Step 1 – Extract Data Files screen appears.
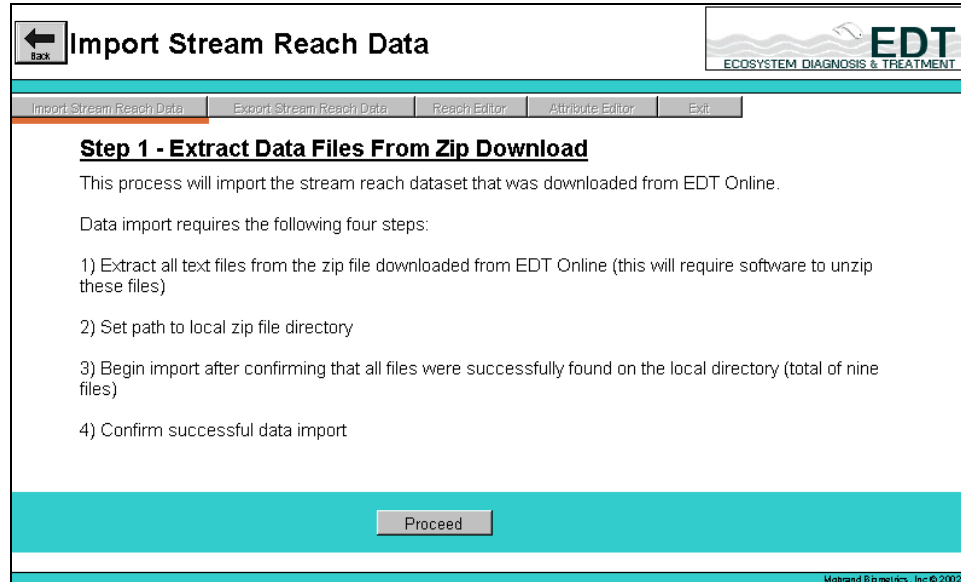
Figure 13: Extract Data Files screen

2. Navigate with Windows Explorer to the directory where you downloaded your stream reach dataset file and double-click on it. The contents of the .zip file are shown below.
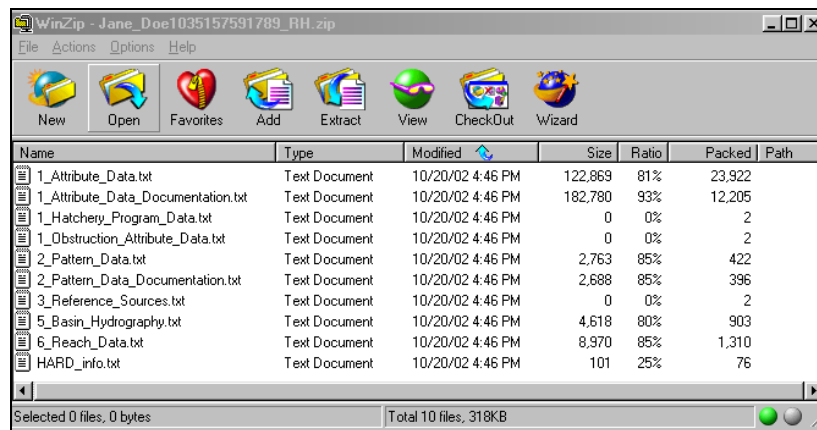
Figure 14: Data files within the downloaded dataset .zip file

NOTE: The file contains ten .txt files—nine data files and one HARD_info.text file.

3. Extract these ten files into the same directory where you placed the downloaded .zip file and the Stream Reach Editor files.

4. Return to the Extract Data Files screen and click "Proceed." The Step 2 – Locate Data Files screen appears.
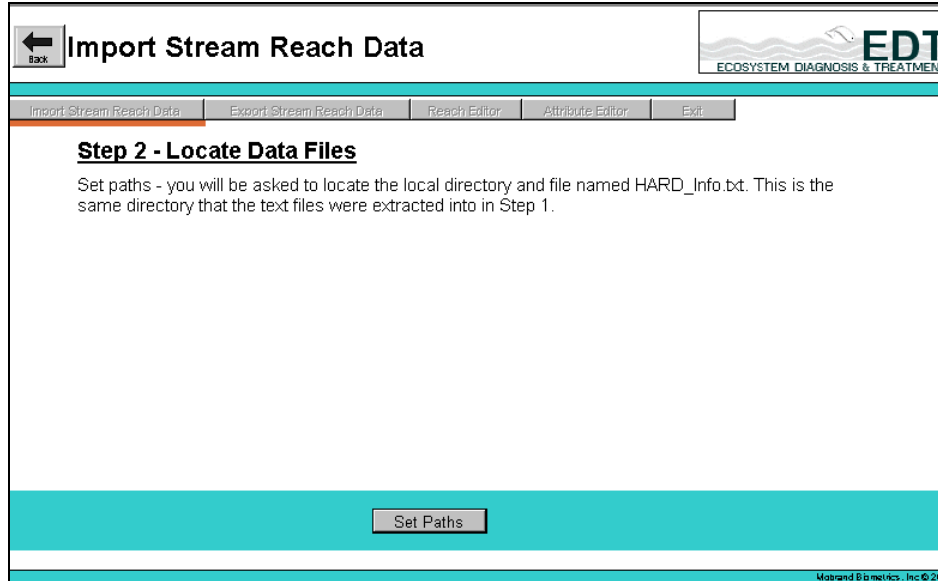
Figure 15: Locate Data Files screen

> NOTE: In this step, you will be asked to set the path to the directory where the dataset files were downloaded and unzipped. The Editor is looking for a file called HARD_info.txt.

5. Click on "Set Paths" at the bottom of the screen. The Select Import File dialog box appears.
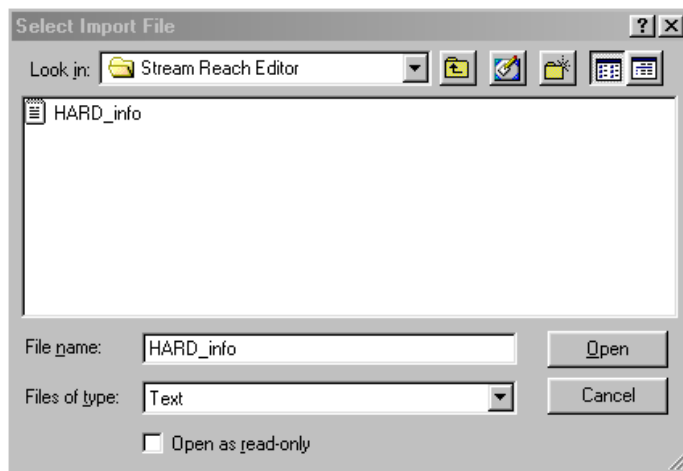

Figure 16: Select Import File dialog box

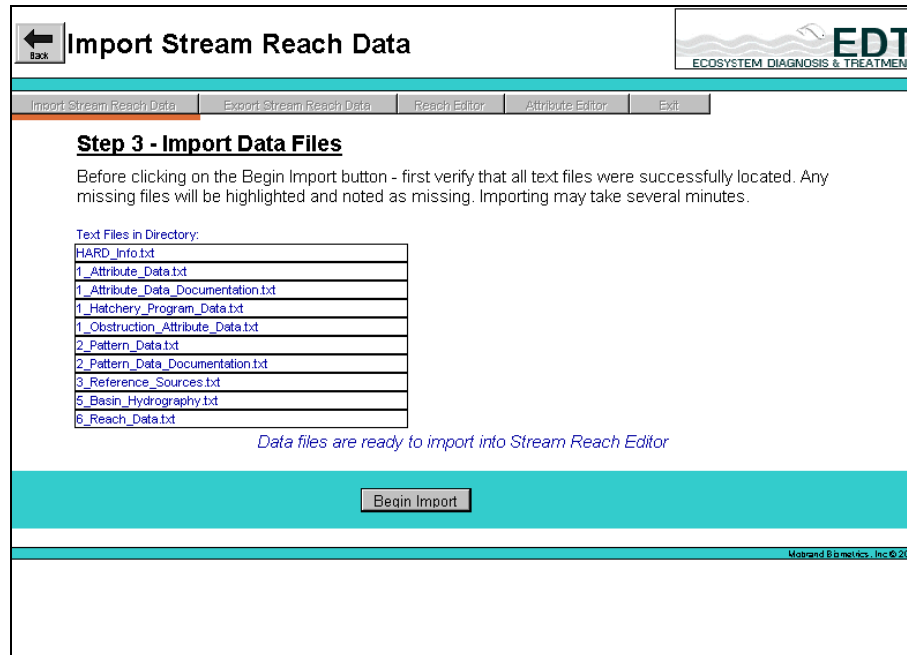6. Click on "Open." The Step 3 – Import Data Files screen appears.

Figure 17: Step 3 – Import Data Files screen

> NOTE: You should see the two files that were in the downloaded .zip file. If any files were not successfully located, they will be highlighted and noted as missing.

7. Click on "Begin Import" at the bottom of the screen. When complete, the Step 4 – Confirm Successful Import Screen appears.

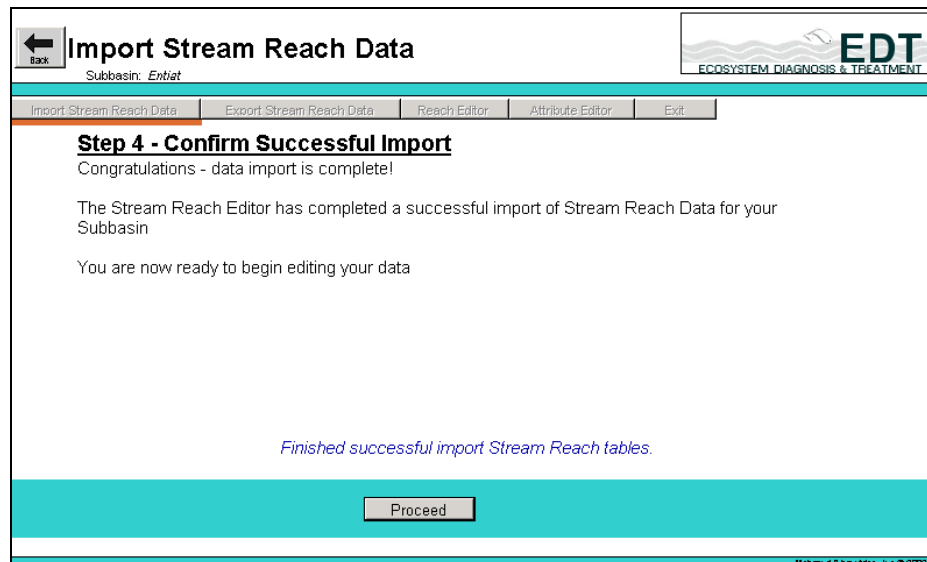> NOTE: Importing may take several minutes.

Figure 18: Step 4 – Confirm Successful Import screen

8. Click on "Proceed" at the bottom of the screen to return to the Stream Reach Editor Main Menu.

Now that you have the Stream Reach Editor launched and loaded with data, you are ready to proceed to the heart of the process: defining your reach structure.

Defining the Reach Structure

This section describes the process of defining, or profiling, your reach structure with the offline Stream Reach Editor. You will start with the stream reach dataset that you downloaded from the EDT Online Web site and imported into the Editor.

> NOTE: You may also use the process described in this section for editing reaches to simply review your dataset before making any revisions, additions, or deletions.

This section will address, separately, the procedures followed for editing existing reaches and for creating new reaches.

In working with the many forms described in this section, it is useful to use a "filter" function to find specific entries or to display a group of similar entries.

To use the filter function:

1. Select the cell containing the entry of interest.

2. Right click in that cell, bringing up the "filter" sub-menu.

3. Select "Filter by Selection," which refreshes the screen to show only those entries that share the same information as displayed in the selected cell
   -or-
   selection the "Filter on: " and type in the name of the specific record that has that name in the selected cell

4. Right-click in any cell to bring up the filter sub-menu and select "Remove Filter/Sort" to return to the regular view with all data showing.

Editing Existing Reaches

To begin editing reaches, click on the "Reach Editor" button on the navigation bar of the Stream Reach Editor Main Menu. The following screen appears.
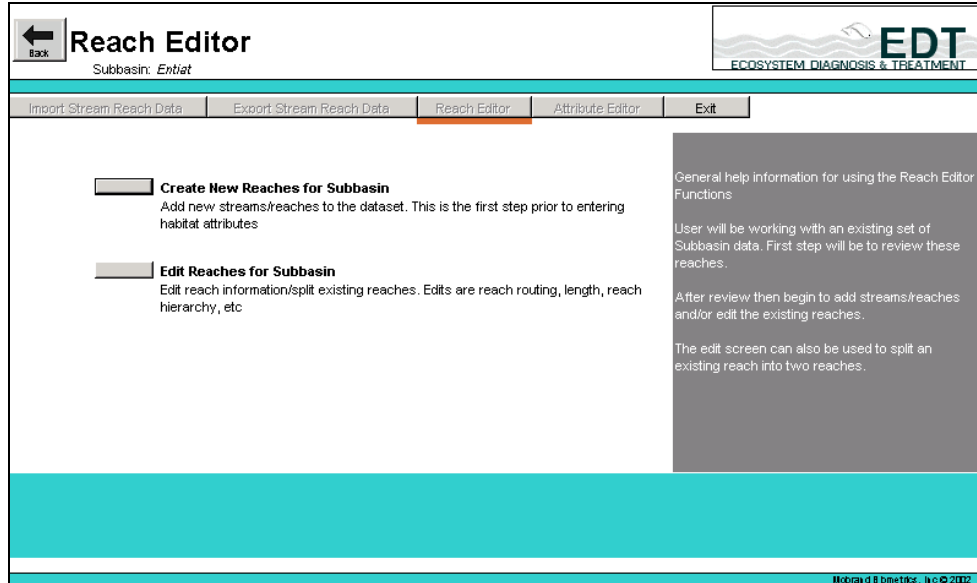
Figure 19: Create or Edit Reaches for Subbasin screen

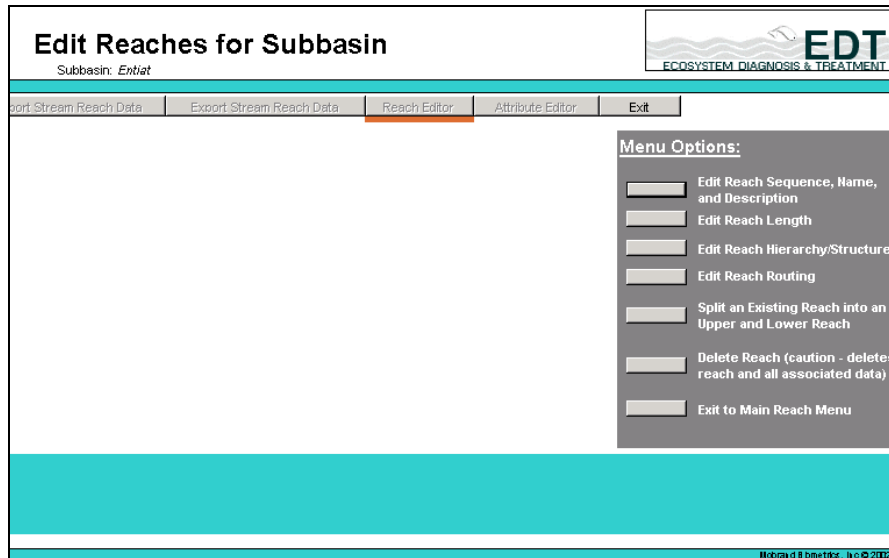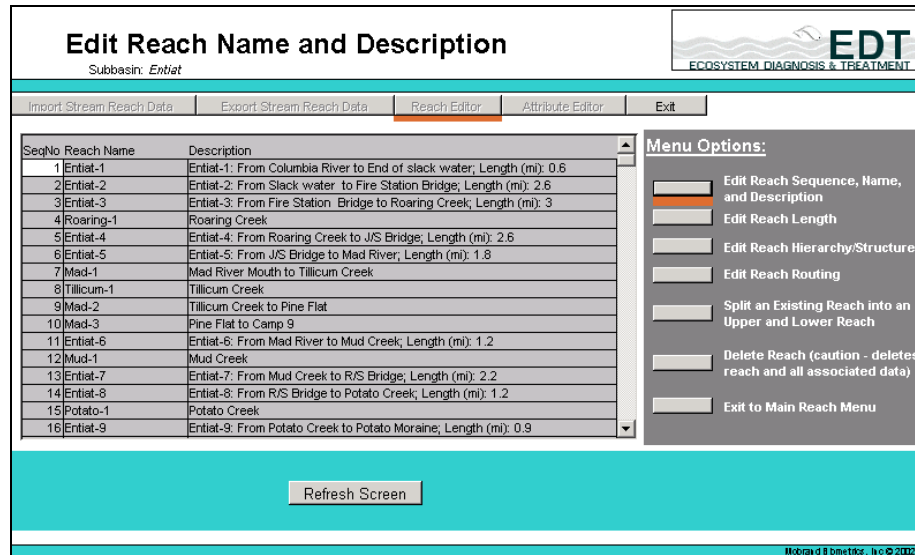Click on "Edit Reaches for Subbasin" to bring up the following screen:

Figure 20: Edit Reaches screen.

The procedures for each of the six menu options shown above will be described separately here.

To edit reach sequence, name and description:

1. Click on the first button on the Edit Reaches for Subbasin menu. The Edit Reach Name and Description screen appears.

Figure 21: Edit Reach Name and Description screen

> NOTE: When you make changes to data on this screen, your changes will be written immediately to the database—there is no "save" function associated with this screen. Therefore, make changes cautiously.

2. Click on a cell in the first column (the sequence number column) to enter a new number if desired.

> NOTE: The reach sequence number (SeqNo), for example, determines the order in which the reaches will be displayed. Typically, SeqNo increases from mouth to headwaters. SeqNo is not critical to the function of the model but can be helpful for navigation.

3. Click on a cell in the second column (reach name) to make any desired changes to the text.

> NOTE: Choose names carefully. The numerical "suffix" should increase from mouth to headwater. Obstruction reaches should be clearly identified—e.g., Rock Cr–1B (dam) or Rock Cr-1B (culvert).

4. Click on a cell in the third column (reach description) to make any desired changes to the text.

> NOTE: The reach description should clearly indicate upstream and downstream end points. A very concise summary of the salient characteristics of the reach—e.g., "from Columbia confluence to end of slack water"—will enhance the usefulness of the reach structure.

5. After making your edits, click the "Refresh Screen" button at the bottom of the page to view any changes in routing as a result of editing the sequence numbers.

To edit reach length:

1. Click on the "Edit Reach Length" button under Menu Options. The Edit Reach Length screen appears.

Figure 22: Edit Reach Length screen

> NOTE: You may make edits only in the two reach length columns (Template Length and Patient Length). The other three columns are locked against entries. Sequence number and reach name are handled through the Edit Reach Sequence, Name, and Description screen discussed previously.

2. Review reach lengths carefully.

> NOTE: One of the most common and significant sources of error in an EDT analysis is incorrect lengths and/or widths for reaches (lengths tend to err on the short side).

3. Click in any cell in either of the reach length columns (template or patient) to make desired changes.

4. When finished making edits, click on the "Save" button at the bottom of the screen to save your changes to the database.

> NOTE: Entries do NOT get written immediately to the database—you must use the Save button.

To edit reach hierarchy/structure:

1. Click on the third button under Option Menu, "Edit Reach Hierarchy/Structure." The screen shown below will appear.
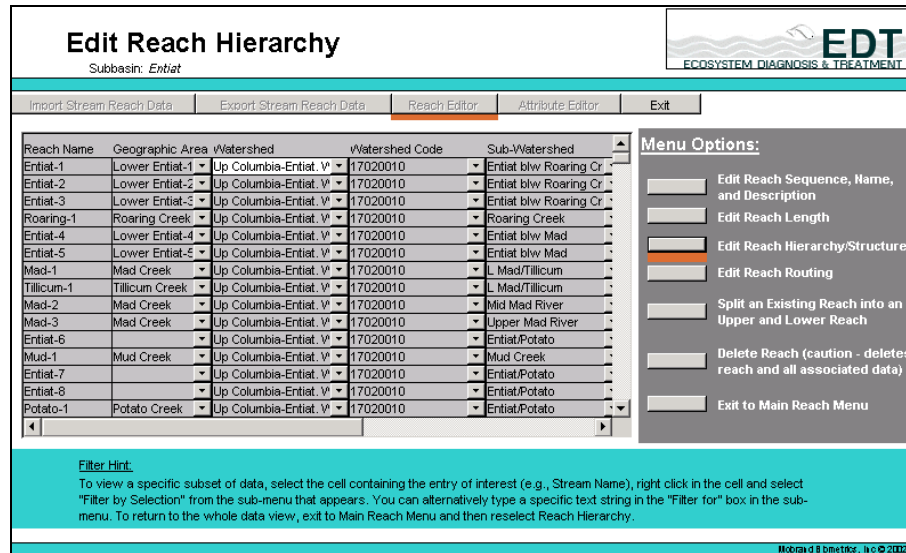
Figure 23: Edit Reach Hierarchy screen

> IMPORTANT: Changes are written immediately to the database—there is no "save" function associated with this screen. Therefore, make changes cautiously.

> NOTE: You must use both horizontal and vertical scroll bars to see all of the data. If there is no information in the Geographic Area drop-down list, you will need to enter new data. Your new entries will appear in the drop-down list for use with other reaches.

2. Make desired edits by selecting entries from the drop-down lists in all but the first column.

> NOTE: It is important to indicate the correct 6th field HUC ("sub-watershed") for each reach.

To edit reach routing:

1. Click on the fourth button under Menu Options, "Edit Reach Routing," which brings up the following screen:
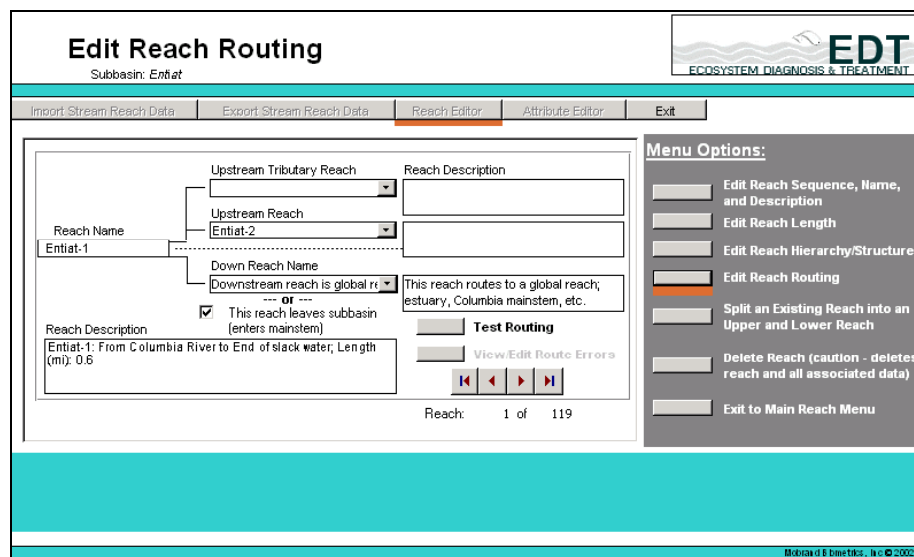

Figure 24: Edit Reach Routing Screen

NOTE: This function allows you to change routing data.

IMPORTANT: Edits made through this screen are written directly to the database—there is no "save" feature for this screen. Therefore, make edits with caution.

2. Select a reach to route by scrolling through the navigation buttons in the lower portion of the screen
   -or-
   right clicking in the "Reach Name" box to bring up the filter sub-menu and type an entry in the "Filter for: " field.

3. Select reaches from each of the three drop-down boxes: Upstream Tributary, Upstream, and Downstream.

4. Continue selecting and routing reaches until you are finished.

5. Click on the "Test Routing" button in the center of the screen to verify that the reaches are routed correctly.

NOTE: During export to the web, the Stream Reach Editor checks for valid reach routing. If routing is incorrect, the data can still be uploaded to others to access, however, the dataset cannot be used to run reports or create populations.

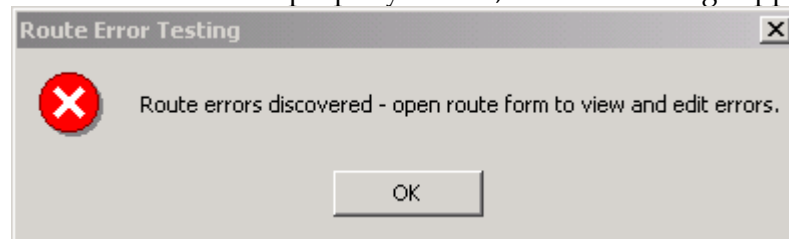6. If the reaches are not properly routed, an error message appears.

Figure 25: Route Error Testing Message

7. Click "OK." The Edit Reach Routing screen appears. The "View/Edit Route Error" option is now available (highlighted in yellow).
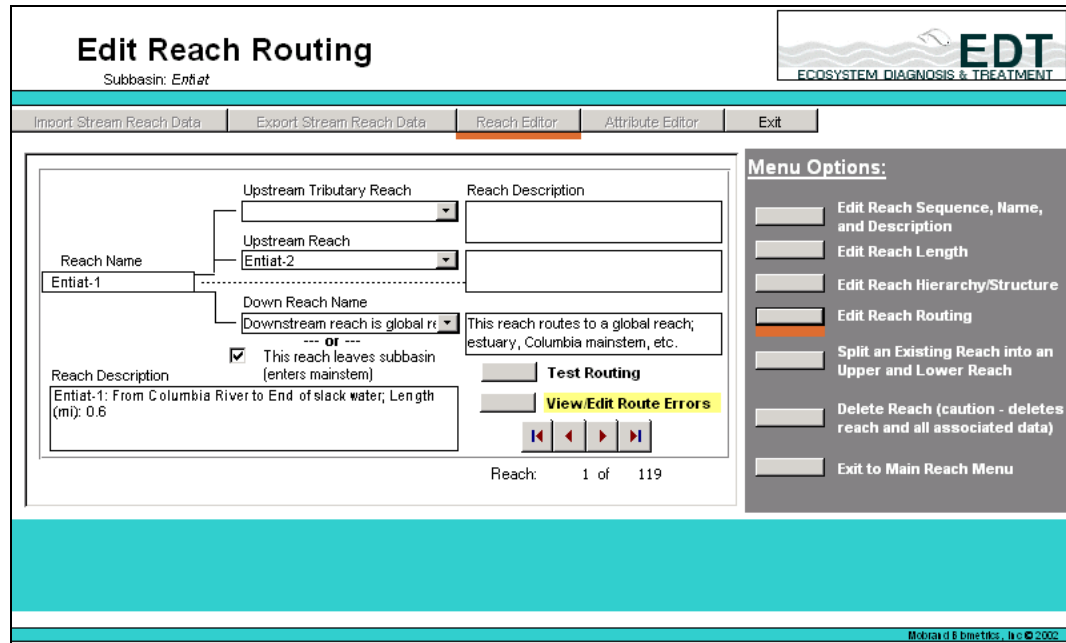
Figure 26: Edit Reach Routing Screen with View/Edit Route Errors Option Available

8. Click "View/Edit Route Errors" to review and correct routing errors. The Reach Routing Editor appears.
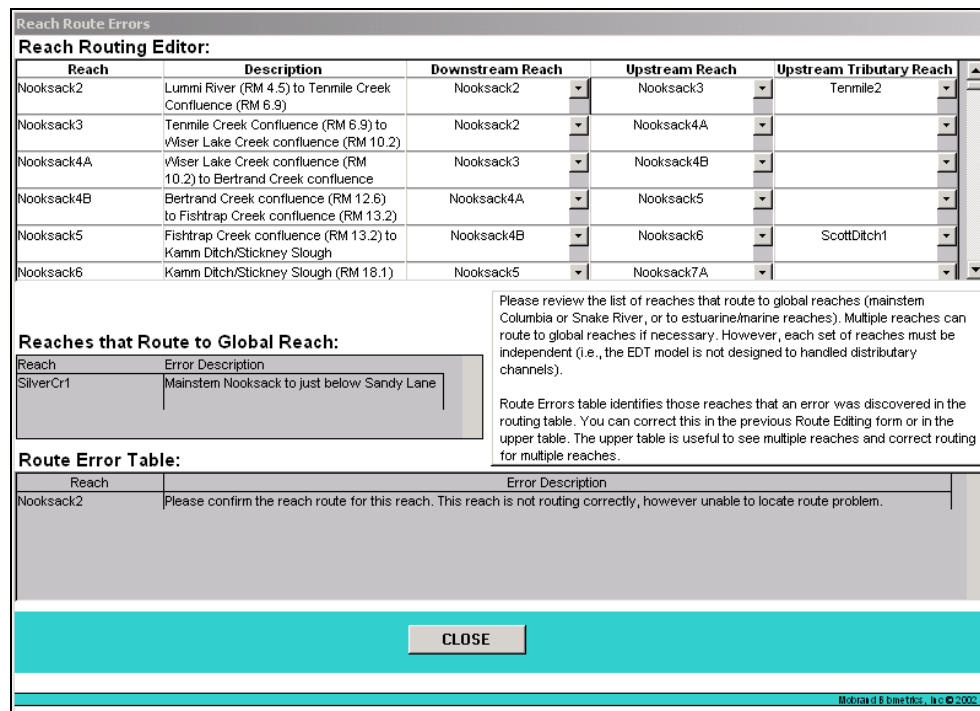

Figure 27: Reach Routing Editor

9. Review the reach and error description in the Route Error Table at the bottom of the screen.

10. Locate each reach named in the Error Table by scrolling through the Reach Routing Editing table at the top of the screen.

11. Locate the downstream and upstream reaches for that reach in the drop-down lists.

12. Carefully check the routing for that reach as well as those reaches above and below.

13. Repeat for each reach that appears in the Error Table.

14. When finished click "Close" to return to the Edit Reach Routing screen.

15. Click "Test Routing" again to verify that the reaches are routed correctly.

16. If a routing error appears, repeat steps 7 – 13 above. Otherwise, select another option from the side menu.

To split existing reaches:

1. Click on the fifth button under Menu Options, "Split an Existing Reach into an Upper and Lower Reach," to bring up the screen shown:
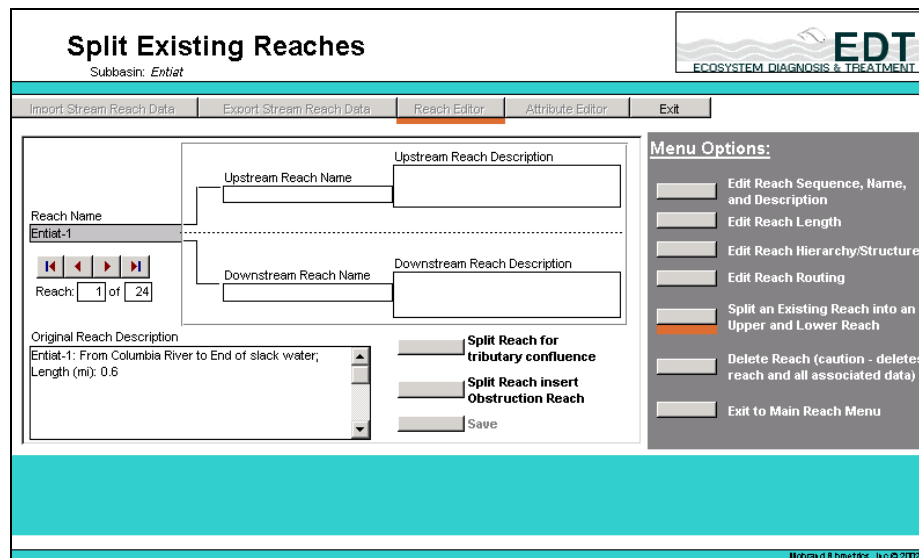

Figure 28: Split Existing Reaches screen

NOTE: This feature is typically utilized when there is a need to add additional small tributaries or obstructions, such as a culvert, into the database.

2. Select a reach using the navigation buttons at the left of the screen or right-clicking on the shaded Reach Name box and using the filter sub-menu.

NOTE: You cannot input data to this screen directly; you must select the tributary confluence or obstruction reach option in order to access the actual data input data screen.

To split reaches to add tributaries:

1. Click on the "Split Reach for tributary confluences" button to add a tributary that enters in the middle of a reach, for example. The following screen appears:
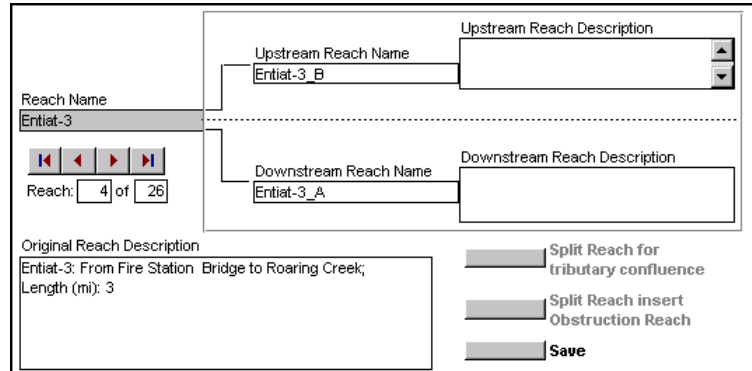

Figure 29: Split reach for tributary confluence form

IMPORTANT: When you are using the "Split Reach for Tributary Confluence" feature, your inputs are not being saved automatically to the database. Be sure to save your work by clicking on the "Save" button at the center bottom of the screen.

2. Enter a unique name for each reach in the "Upstream Reach Name" and "Downstream Reach Name" fields, unless you choose to accept the default reach names that appear in the Upstream and Downstream Reach Name boxes.

NOTE: Using these defaults will ensure a consistent naming protocol for each split.

3. Provide a description for each new reach.

4. Click on the "Save" button at the bottom of the form.

5. Continue splitting reaches and saving, as desired.

NOTE: It is useful to adopt the convention of including beginning and ending river miles in the Reach Description field. For example, for Entiat-1A, describe the reach as "Entiat River from mouth to unnamed RB tributary (RM 0.0 to 1.8)."

NOTE: The Editor does not ADD a tributary during this reach splitting procedure—it simply splits the original reach into two new segments: one below and one above the previously omitted tributary that you now wish to add. To actually add the tributary, you must use the "Create New Reaches" function.

To split reaches to add obstructions:

1. Click on the "Split Reach to Insert Obstructions Reach" button to bring up the following form:
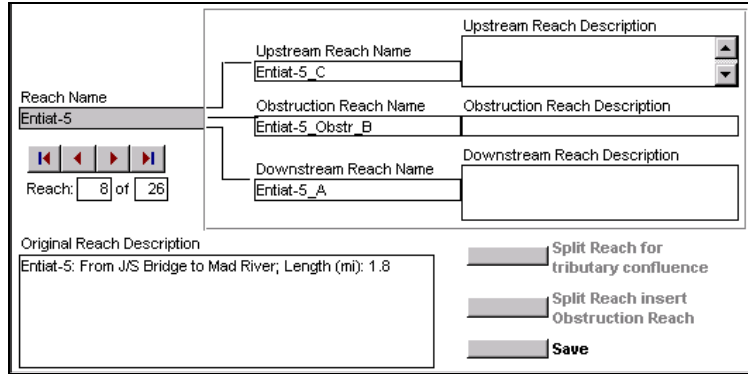
Figure 30: Split reach for obstruction form

> IMPORTANT: When you are using the "Split Reach for Obstructions" feature, your inputs are not being saved automatically to the database. Be sure to save your work by clicking on the "Save" button at the center bottom of the screen.

2. Enter a unique name for each reach in the "Upstream Reach Name," "Obstruction Reach," and "Downstream Reach Name" fields (unless you choose to accept the default reach names that appear in those fields).

> NOTE: Using these defaults will ensure a consistent naming protocol for each split.

3. Provide a description for each new reach.

> NOTE: It is useful to adopt the convention of including beginning and ending river miles in the Reach Description field. For example, for Entiat-1A, describe the reach as "Entiat River from mouth to unnamed RB tributary (RM 0.0 to 1.8)."

> NOTE: The split reach feature uses the length for the reach being split as the default length for the two new reaches. To change the reach lengths for the two new reaches, use the Edit Reach Length button described previously. Obstruction reaches always have a length of zero, and, therefore, you will not enter a length value.

4. Click on the "Save" button near the bottom of the screen.

5. Continue splitting reaches for obstructions, as desired.

To delete reaches:

1. To delete reaches from your dataset, click on the sixth button under Menu Options, "Delete Reaches" to bring up the following screen:
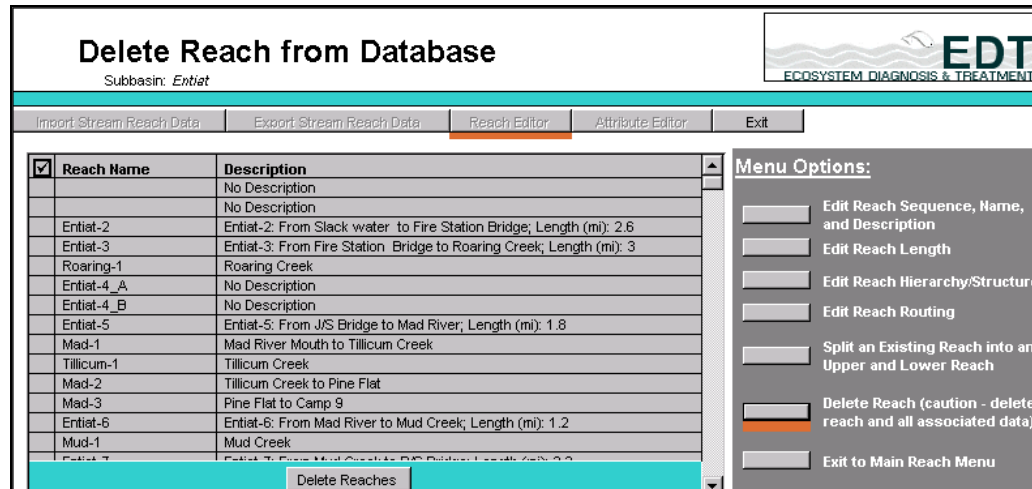
Figure 31: Delete Reach from Database screen

> 2. Click each reach that you wish to delete from the database.

> NOTE: You will need to scroll vertically to see all of the reaches.

> 3. Click the "Delete Reaches" button at the bottom of the screen.

Now that you have edited existing reaches, you are ready to begin adding new reaches your reach structure.

Creating New Reaches

This section describes the procedure for adding new reaches to your reach structure.

Click on the "Creating New Reaches for Subbasin" button on the Reach Editor main menu screen. The "Creating New Reaches for Subbasin" form that appears is divided into two sections: the Reach Definition input form and the Reach Routing input form. These two sections will be discussed separately.

To define new reaches:

> 1. Click on the "Create New Reaches for Subbasin" button on the Reach Editor Main Menu screen. The Create New Reaches for Subbasin screen appears, containing the Reach Definition form shown below:
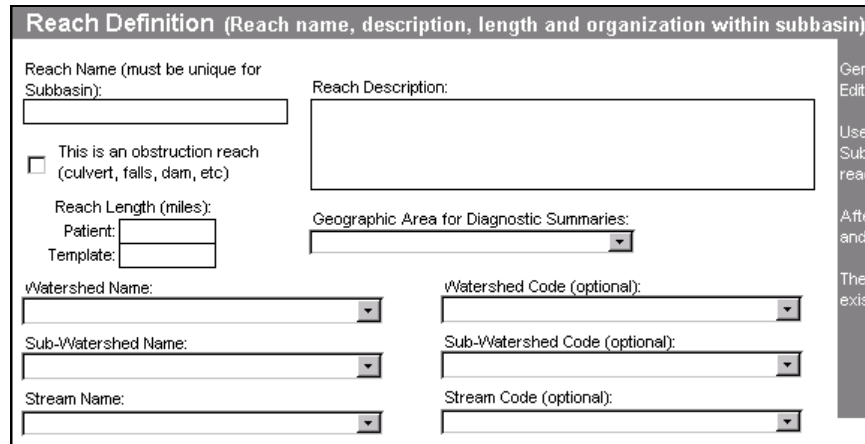
Figure 32: Reach definition form

2. Enter a unique name in the Reach Name field (you can use numbers, letters, dashes, etc.)

NOTE: We suggest that you name reaches starting at the mouth and working your way to the headwaters of the stream.

3. Provide a description of this reach in the Reach Description field that clearly denotes where the reach starts and ends.

4. Enter the length of this reach for both the Patient and Template conditions in the Reach Length fields (enter the length in miles).

5. Check the "This is an obstruction reach" box if the reach you are describing is an obstruction to either juvenile or adult migrants (e.g., dams, culverts, or waterfalls).

NOTE: If you check this box, the Reach Length box grays out. In EDT, obstruction reaches are given zero length so that survival past this point can be rated as an instantaneous value (e.g., 95% survival through a turbine).

6. Provide the name of your watershed in the Watershed Name field.

7. Provide a subwatershed name for your dataset in the Sub-Watershed Name field.

8. Provide the USGS 4th HUC code for this reach in the Watershed Code field (required).

9. Provide the USGS 6th Field HUC Code for this reach in the Sub-Watershed Code field (required).

10. Enter another type of stream classification code in the Stream Code (optional).

Now that you have defined a new reach, you are ready to move to the bottom of the screen to the reach routing portion to route the new reach.

To route new reaches:

1. Use the bottom of the screen to input reach routing data.
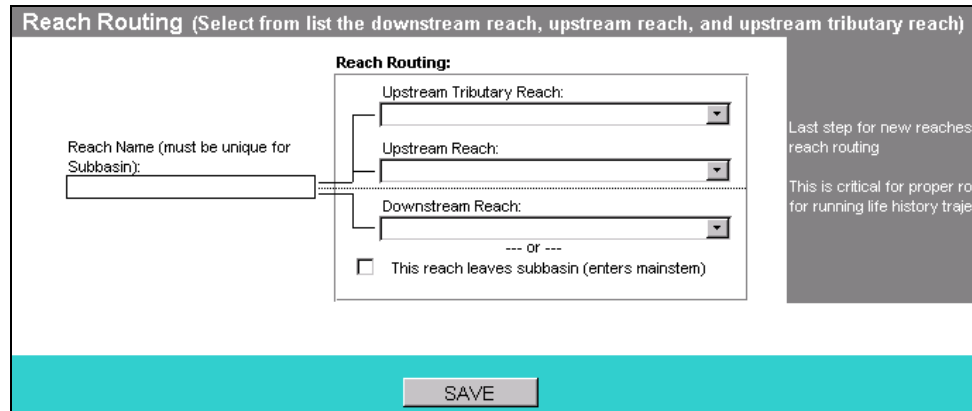
Figure 33: Reach routing form

> NOTE: Use the fields in this input form to hydraulically link stream reaches.

2. Enter a unique name in the Reach Name field.

3. Select the name of the stream reach directly upstream of this reach from the drop-down list in the Upstream Reach field.

4. Select the name of the stream reach directly downstream of this reach from the drop-down list in the Downstream Reach field.

5. Select the name of the tributary that enters the reach at the top of the reach from the drop-down list in the Upstream Tributary Reach field.

6. Click the box labeled "This Reach Leaves Subbasin (enters mainstem)" if this reach is the first in the basin.

Rating Habitat Attributes

Once you have defined your reach structure with the "Reach Editor" function of the offline Stream Reach Editor, you are ready to create your dataset of environmental attributes with the "Attribute Editor" function.

The subbasin data that you downloaded from the EDT Online Web site and imported into the Stream Reach Editor may have data for some of the environmental attributes already entered. Therefore, the way to proceed with the Habitat Editor is to view the existing data and then either edit the existing data or, where no data exist, enter new data.

Before beginning, it is important to know how the attributes are arranged within the offline Stream Reach Editor. Attributes are oganized into four major categories and 12 sub-categories.

1. Hydrologic Characteristics

1.1. Flow variation

1.2. Hydrologoc regime

2. <u>Stream Corridor Structure</u>

2.1. Channel morphometry

2.2. Confinement

2.3. Habitat type

2.4. Obstructions

2.5. Riparian & channel integrity

2.6. Sediment type

3. <u>Water Quality</u>

3.1. Chemistry

3.2. Temperature variation

4. <u>Biological Community</u>

4.1. Community effects

4.2. Macroinvertebrates

This section will describe the procedure that you will use in working with the habitat editor to rate the above attributes.

To rate habitat attributes:

1. Click on the Attribute Editor button of the navigation bar on the Stream Reach Editor Main Menu page. The Habitat Attribute Editor screen appears.
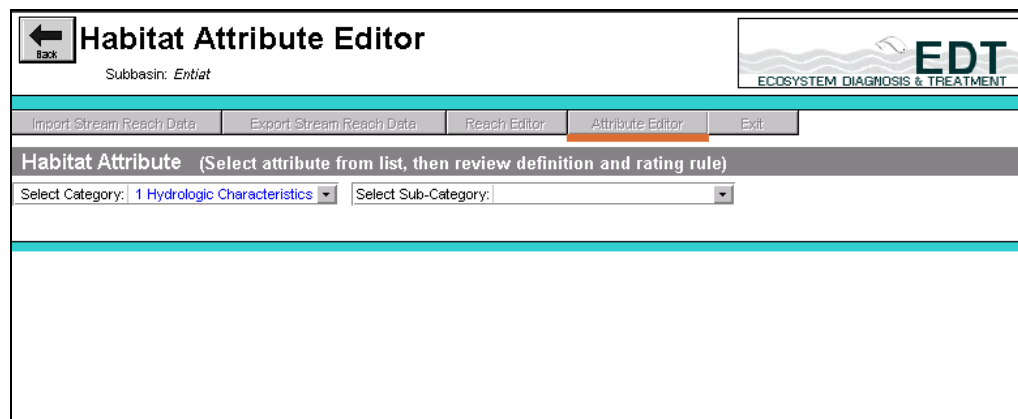
Figure 34: Habitat Attribute Editor main screen (top portion)

Note: To illustrate the process, we will use the category, Hydrologic Characteristics, and the sub-category, "Flow variation."

2. Select the category, Hydrologic Characteristics and the sub-category, "Flow Variation" from the two drop-down boxes at the top of the screen.
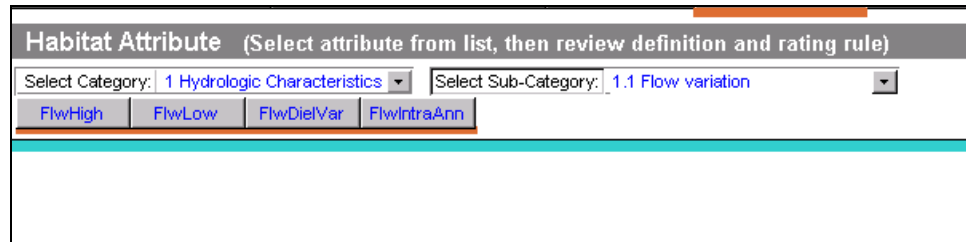
Figure 35: Habitat Attribute screen with category and sub-category selected

> NOTE: When the category and subcategory are selected, you will see the individual attributes that are assigned to this category displayed across the top of the page as buttons, as shown below:

3. Click on a specific attribute to begin rating (e.g., FlwHigh).

The next sections describe in detail how you use the Habitat Attribute Editor to work with the attributes. They will be discussed by major category.

Hydrologic Characteristics

Hydrologic Characteristics is the first major category of attributes. We will provide an overview the attributes in this category and a data input example. There is also a section describing the Hydrologic Regime attributes.

Overview of Attributes

As outlined above, the Hydrologic Characteristics category is divided into two sub-categories, Flow Variation and Hydrologic Regime.

Flow Variation is composed of the following attributes:
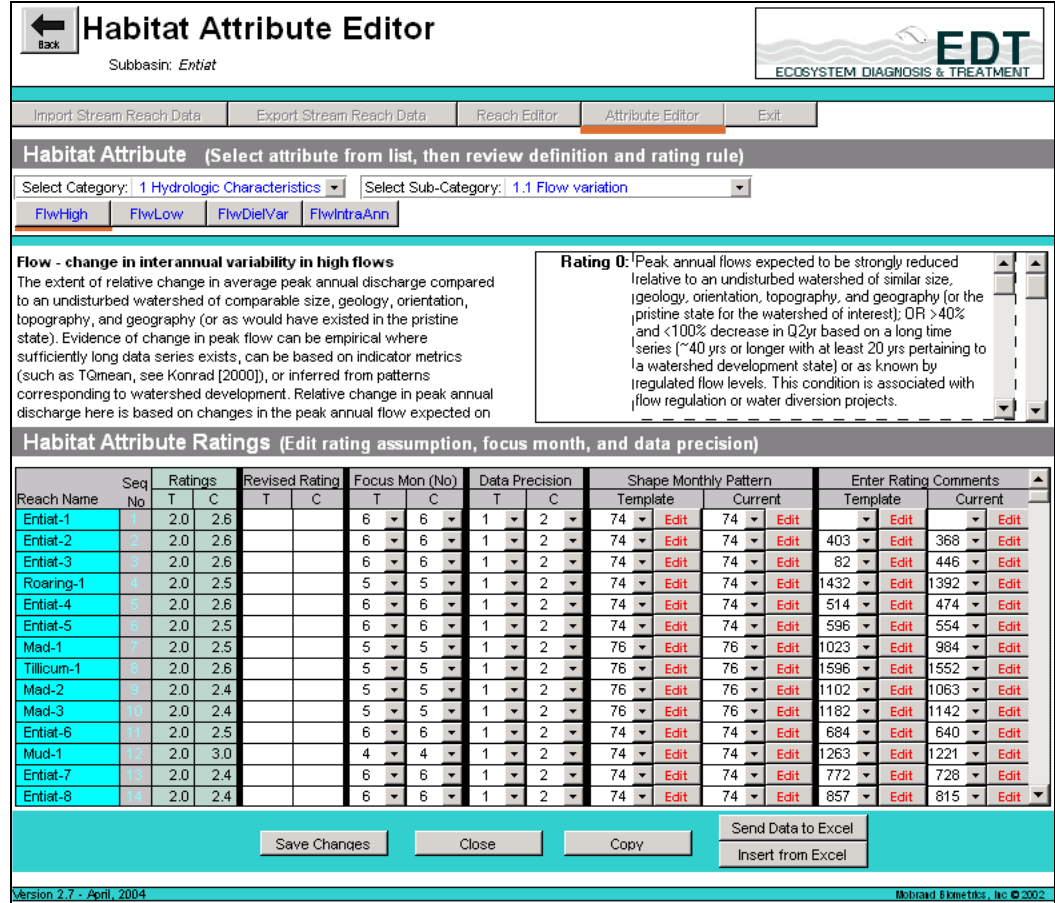
- Flow High (FlwHigh)
- Flow Low (FlwLow)
- Flow Diel Variation (FlwDielVar)
- Flow Intra-annual Variation (FlwIntraAnn).

Hydrologic Regime includes these attributes:

- Regime Natural (Regime Nat)
- Regime Regulated (Regime Reg)

Data Input Example

We will use FlwHigh as the example to describe how data for the Hydrologic Characteristic Attributes are entered.

Figure 36: Habitat Attribute screen with flow high

Select Hyrologic Characteristics from the "Select Category" drop-down list, select Flow Variation from the "Select Sub-Category" drop-down list, and click on the "FlwHigh" button. The FlwHigh data screen will appear, as shown below:

The upper left portion of the screen provides a description of the attribute, FlwHigh. Directly to the right of the attribute definition, a text box displays the definitions of the ratings from 0 through 4. Note that you must use the vertical scroll bar to view all five rating definitions in the box.

The Habitat Attribute Ratings portion of the screen is where you will enter or edit the data. Note that you will not be able to edit reach name,

sequence number, the first two ratings fields, or any fields that are grayed out (not required). Depending upon the attribute, you should be able to edit all, or a portion, of the fields described below.

Revised Ratings: Change the existing ratings for the Template (T) or Current (C) condition.

Focus Mon (No): Select the focus month from ths drop-down list (see discussion on Shape Monthly Pattern below for details on how to identify your focus month).

Data Precision: Enter 1 if the data entered is Categorical or 2 if Non-Categorical. Note that if this field is shaded (gray), then data precision is always non-categorical.

Categorical ratings may be either continuous or discrete and are coded simply as the integers 0 through 4. For attributes categorized in terms of a range of values, a categorical rating is modeled as the mean of the attribute values that define the range.

For example, Fine Sediment is categorized by five ranges of percent fines in the substrate. A rating of 3 is associated with the range 18% to 30% fines and is modeled as the mean of this range, or 24%. Approximate categorical ratings of this kind are entirely appropriate when knowledge of the atual conditions in a particular reach is incomplete.

Sometimes, however, our knowledge of local conditions for a particular attribute is much greater. In such cases, and especially when the attribute is expected to have a significant impact on production, the use of *non-*categorical ratings might be more appropriate.

Non-categorical ratings are expressed as decimals between 0 and 4. To indicate that an attribute should be modeled as the upper value of a rating range, the rating should be entered as a "0.5" value. Thus, if a fine sediment rating of 3 is modeled as the mean of 18% and 30%, a 3.5 would be modeled as 30%.
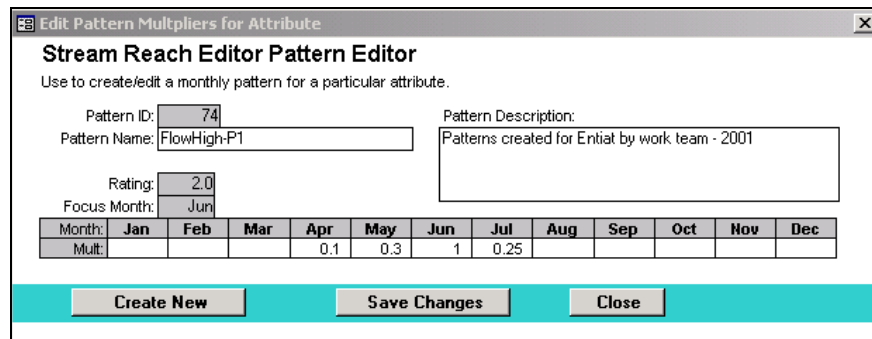
Similarly, a categorical fine sediment rating of 2 will be modeled as the mean of the range 11% to 18% (14.5%), whereas a rating of 2.5 will be modeled as 18%. When warranted by the precision of environmental information and the probable importance of the attribute, finer non-categorical interpolations may be made. In such cases, the planner should

assume a linear relationship between attribute values at the upper end of a category range and the ratings that define these end points.

Shape Monthly Pattern: Assign a monthly pattern to all four Flow Variation attributes for both patient and temp.   Note, however, that flow patterns are not needed for the two Hyrologic Regime attributes, Regime Reg and Regime Nat.

Several seasonally variable attributes require monthly shaping patterns, as shown below:

- Change in variability/magnitude of high flows

- Change in variability/magnitude of low flows

- Channel width

- Bed scour

- Icing

- Turbidity

- Dissolved oxygen

- Water temperature

- Predation risk

Figure 37: Stream Reach Editor Pattern Editor

To assign a monthly pattern to FlwHigh, click on the "Edit" button to produce the Stream Reach Pattern Editor Screen shown below:

Use this screen to create/edit flow patterns and assign attribute ratings by month. To begin, simply place a 1 in the month(s) where you want the full effect of the rating to be expressed. Note that you should define at least one of these months in the Focus Month field. Next, shape the pattern so that it expresses how the effect changes by month. Be sure to

click on the "Save Changes" button to have your changes be written to the database. If you click on the "Close" button before saving, you will be prompted to save.

The example shown in the screen capture above indicates high flows have the largest effect on this reach in June, followed by May (only 33% of the effect assigned to June), July (25%), and April (10%). Because values have not been entered for the remaining months, the model assumes that high flow is not an issue for these months.

Some key points to remember in shaping a monthly flow pattern:

- Use values from 0 to 1—otherwise the function does not work properly.
- Assign a value of 1 for both the Focus Month and any other months where you want the model to assign the full effect of the rating. If you want 50% of the effect to be modeled, use a 0.5, if 25%, assign a value of 0.25, etc.

After you have created a pattern, it is automatically assigned a pattern number and is added to the list of patterns, so that you can assign this same pattern to additional reaches if desired.

Enter Rating Comments: Enter comments to support your rationale, for the attribute rating or the flow pattern used or, more likely, both. The database keeps a running list of all comments entered so that you can assign the same comment or data source to multiple reaches or attributes.

Additional Comments about Hydrologic Regime Attributes

Selecting the category, Hydrologic Characteristics, and the sub-category, Hydrologic Regime, displays the attributes "Regime Nat" (natural hydrologic regime) and "Regime Reg" (regulated hydrologic regime).

The attribute Regime Nat is used to indicate which of five distinct patterns best characterizes the seasonal pattern of flow over a year. The particular natural hydrologic regime indicated here affects the opeartion of various rules—e.g., the impact of fine sediment on incubating eggs will be less in reaches with a groundwater-dominated hydrologic regime than in reaches with a rainfall-dominated pattern. Importantly, the natural hydrologic regime selected here will NOT generate a default pattern for other hyrologic attributes. That is to say, selecting a rainfall-dominated natural hydrologic regime for Regime Nat will not cause the patterns that shape

FlwHigh or FlwLow to chage to the default pattern for rainfall-dominated areas.

The attribute RegimeRegis largely an artifact of an earlier model. The planner should ignore the rating definiations for this attribute. Instead, Regime Reg should be used mainly a a mnemonic device for the planner. If a value is entered for Regime Reg for a particular reach, it should be used as a reminder to the planner that a natural hydrologic regime has been distorted in the reach. In turn, this reminder should lead to a revision of one or more patterns for other hydrologic characteristics.

An example of a situation where revising one or more patterns for a hydrologic characteristic may be needed would be a reach below a major irrigation diversion. The pattern for low flow would likely be altered in this reach, especially if the timing of maximum withdrawal did not conincide with the natural period of minimum flow.

Stream Corridor Structure

Stream Corridor Structure is the next major category of attributes. We will provide an overview the attributes in this category and a data input example.

Overview of Attributes

As outlined above, the Stream Corridor Structure category is divided into six sub-categories: Channel Morphometry, Confinement, Habitat Type, Obstructions, Riparian & Channel Integrity, and Sediment Type.

Channel Morphometry includes the following attributes:

- Channel Length (ChLngth)
- Width Maximum (WidthMx)
- Width Minimum (WidthMn)
- Gradient (Grad)

Confinement is composed of these attributes:

- Natural stream confinement (Confine)
- Confinement Hydro (ConfineHydro)

Habitat Type includes these attributes:

- Back-water Pools (HbBckPls)
- Beaver Ponds (HbBvrPnds)
- Glides (HbGlide)
- Large Cobble (HbLrgCbl)
- Small Cobble (HbSmlCbl)
- Pool Tail-outs (HbPlTails)
- Pools (HbPls)
- Off-channel habitat factor (HbOfChFctr)

Obstructions is composed of the following attributes:

- Obstructions (Obstr) such as waterfalls, culverts, and dams
- Water Withdrawals (Wdrwl)

Riparian and Channel Integrity includes these attributes:

- Channel Bed Scour (BdScour)
- Icing (Icing)
- Riparian Function (Rip Func)
- Large Woody Debris (WdDeb)

Sediment Type includes the following attributes:

- Stream channel substrate Embeddedness (Emb)
- Fine Sediment (FnSedi)
- Turbidity (Turb)

Data Input Example

We will use Width Maximum (WidthMx) as the example to describe how data for the Stream Corridor Structure attributes are entered.

Figure 38: Habitat Attribute screen with channel width

Select Stream Corridor Structure from the "Select Category" drop-down list, select Channel morphometry from the "Sub-Category" drop-down list, and click on the "WidthMx" button. The following screen will appear:

The upper left portion of the screen provides a description of the attribute, WidthMx. Directly to the right of the attribute definition, a text box displays the definitions of the ratings from 0 through 4. Note that you must use the vertical scroll bar to view all five rating definitions in the box. Also note that categorical values are no longer used for width—you enter widths in feet.
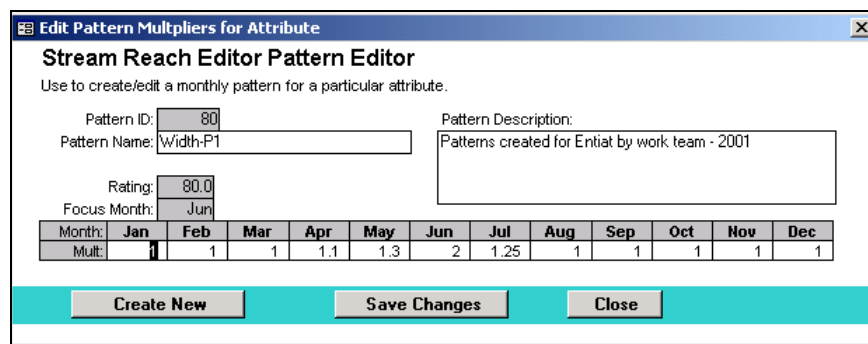
The Habitat Attribute Ratings portion of the screen is where you will enter or edit the data. Note that you will not be able to edit reach name, sequence number, the first two ratings fields, or any fields that are grayed out (not required). Depending upon the attribute, you should be able to edit all, or a portion, of the fields described below.

Revised Ratings: Change the existing ratings for the Template (T) or Current (C) condition.

Focus Mon (No): Select the focus month from the drop-down list (see discussion on Shape Monthly Pattern for details on how to identify your focus month).

Data Precision: Enter 1 if the data entered is Categorical or 2 if Non-Categorical. Note that if this field is shaded (gray), then data precision is always non-categorical (see discussion on page 34 regarding categorical and non-categorical ratings).

Shape Monthly Pattern: Assign a monthly pattern to all attributes requiring a pattern. Refer to page 35 for a list of seasonal variables that require monthly pattern.

Figure 39: Stream Reach Editor Pattern Editor

To assign a monthly pattern to WidthMx, click on the "Edit" button to bring up the screen shown below:

Use this screen to create/edit the width patterns and thus assign widths by month. Simply place the actual stream width for each month in its corresponding box. Use the same pattern for both the WidthMx and WidthMin attributes.

Alternatively, these widths could be scaled to the 0 to 1 range used in the other patterns, in which 1 represents the maximum width and amsller numbers represent the ratio of the expected width to the maximum width.

Remember to click on the "Save Changes" button to have your changes written to the database. If you click on the "Close" button before savign, you will be prompted to save.

After you have created a pattern, it is automatically assigned a pattern number and is added to the list of patterns. You can use the pull-down feature to assign the same pattern to additional reaches, if desired.

Enter Rating Comments: Enter comments to support your rationale, for the attribute rating or the pattern used or, more likely, both. The database keeps a running list of all comments entered so that you will be able to assign the same comment or data source to multiple reaches or attributes.

Exceptions in Data Input

The description of the fields and corresponding instructions given above apply, for the most part, to all attributes. Exceptions are presented below.

Habitat Type
To work with Habitat Type attributes, select Stream Corridor Structure from the "Select Category" drop-down list and Habitat Type from the "Select Sub-Category" drop-down list. For the eight habitat attributes that comprise this sub-category, you may enter either a value from 0 to 4 or an actual percent value for each reach. Percent values may be entered as 10% or 0.1.

Obstructions
To work with Obstructions (e.g., culverts, dams, waterfalls), select Stream Corridor Structure from the "Select Category" drop-down list and Obstructions from the "Select Sub-Category" drop-down list. Click on the "Obstructions" button to bring up the screen below:

Figure 40: Habitat Attribute editor with obstructions

Obstructions are their own reaches; the EDT model treats them as zero-length (0-ft) stream features.

They describe partial or complete barriers to fish migration and other sources of mortality associated with in-stream structures. These mortality sources could include such factors as predation in a tailrace of a dam, screen impingement, turbine mortality, or other physical or mechanical injuries.

Culverts or falls with significant length should be described as two reaches: 1) the feature as an obstruction to fish passage (described using this form), and 2) the feature as a reach with a length and associated environmental features (attributes).
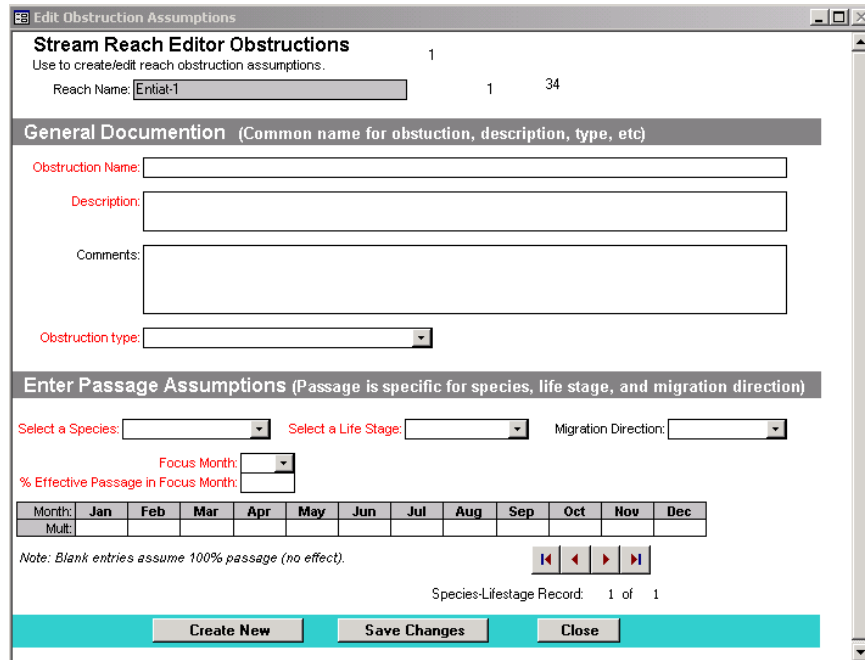
Figure 41: Stream Reach Editor Obstructions screen

To use this form, you must first identify the Obstruction by assigning a value of 1 to either or both of the Template and Current condition fields (Revised Rating). Next, click on the "Edit" button to the right of this field, which brings up the following screen:

Use the scroll bar to view all of the data fields or expand your window to see the entire screen.

The top portion of the screen is used to provide general documentation about the obstruction, as follows:

- Obstruction name

- Description

- Comments (optional)

- Select the obstruction type from the drop-down list

The lower portion of the screen is for entering passage assumptions, by making selection from the following drop-down lists:

- Species

- Life-stage

- Migration direction (denotes whether the survival data entered in the month boxes applies to upstream or downstream migrants)

- Focus month (denotes the month with the highest survival)

Also enter data for:

- Percent effective passage in focus month (percent survival for this month, for the target life-stage and species)

- Percent survival by month (percent survival (e.g. 0.95 or 95%) for all months for the target life-stage and species—note that if you leave this field blank, the model assumes that survival is 100%)

Once you have filled in all of the fields, you must save your work (Save Changes) before adding another record (e.g., species or life-stage).

To add another record, click on the "Create New" button at the bottom of the screen. A screen will appear alerting you to the fact that you will need to use the arrow keys in the lower right hand corner to move to the correct record. The correct record will not have any data in any of the boxes in the lower portion of the screen (species, life-stage, etc.). You must repeat this process for all life-stages and species affected by the obstruction.

<u>Withdrawals</u>

To work with Withdrawals, select Stream Corridor Structure from the "Select Category" drop-down list and Obstructions from the "Select Sub-Category" drop-down list. Click on the "Withdrawals" button to bring up the screen below:

Figure 42: Habitat Attribute Editor screen with water withdrawals

With this screen you can rate the Withdrawals attribute (number and relative size of water withdrawals in a reach). This attribute identifies the risk of fish being entrained or injured by screening or other structures associated with water withdrawals from streams. Generally, you would use this attribute to account for smaller diversions such as single-housing or small hobby farm type pumping or diversion systems. Large water withdrawals associated with cities are better captured with the Obstruction button.

This screen works the same as those that have been described for other habitat attributes. Ratings are entered in the Revised Rating cells, and the proposed pattern is entered using the "Edit" button under Shape Monthly Pattern. If you click this button, you will see the pattern screen below:

Figure 43: Stream Reach Editor Pattern Editor

Use this screen to create/edit withdrawal patterns and assign attribute ratings by month. To begin, simply place a 1 in the month(s) where you want the full effect of the rating to be expressed. Note that you should define at least one of these months in the Focus Month field. Next, shape the pattern so that it expresses how the effect changes by month. Be sure to click on the "Save Changes button to have your changes written to the database. If you click on the "Close" button before saving, you will be prompted to save.

The example shown in the screen capture above indicates withdrawals have the largest effect on this reach from May through October. Because values have not been entered for November and December, the model assumes that withdrawals have no effect (this also holds true for months where a zero appears).

Some key points to remember in shaping a monthly pattern:

- Use values from 0 to 1—otherwise the function does not work properly.

- Assign a value of 1 for both the Focus Month and any other months where you want the model to assign the full effect of the rating. If you want 50% of the effect to be modeled, use a 0.5, if 25%, assign a value of 0.25, etc.

After you have created a pattern, it is automatically assigned a pattern number and is added to the list of patterns, so that you can assign the same pattern to additional reaches if desired.

Enter Rating Comments: Enter comments to support your rationale, for the attribute rating or flow pattern used or, more likely, both. The database keeps a running list of all comments entered so that you will be

able to assign the same comment or data source to multiple reaches or attributes.

Water Quality

Water Quality is the next major category of attributes. We will provide an overview the attributes in this category and a data input example.

Overview of Attributes

The Water Quality category is divided into two sub-categories, hemistry and Temperature Variation.

<u>Chemistry</u> is composed of the following attributes:

- Alkalinity (Alk)

- Dissolved Oxygen (DisOxy)

- Metals In The Water Column (MetWatCal)

- Metals/Pollutants In Sediment/Soils

- Miscellaneous Toxic Pollutants In Water Column (MscToxWat)

- Nutrient Enrichment (NutEnrch).

<u>Temperature Variation</u> includes these attributes:

- Maximum Temperature (TempMx)

- Minimum Temperature (TempMn)

- Temperature Spatial Variation (TmpSptVar).
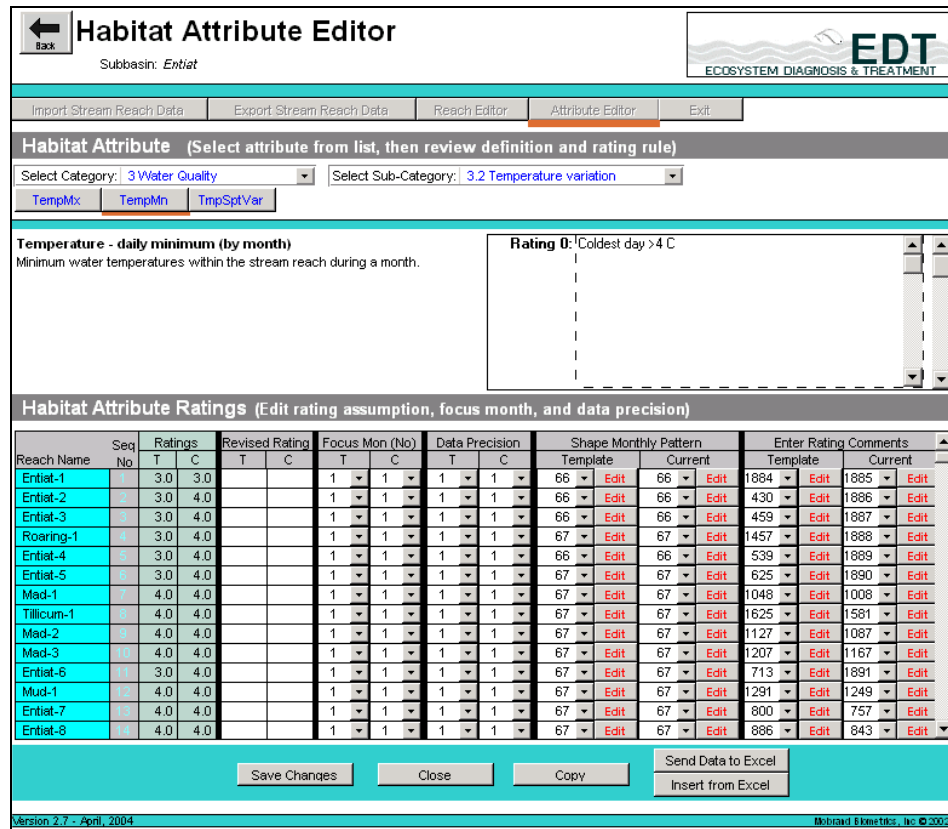
Data Input Example

We will use Minimum Temperature (TempMn) as the example to describe how data for the Water Quality attributes are entered.

Select Water Quality from the "Select Category" drop-down list, select Temperature Variation from the "Sub-Category" drop-down list, and click on the "TempMn" button. The following screen will appear:

The upper left portion of the screen provides a description of the attribute, TempMn. Directly to the right of the attribute definition, a text box displays the definitions of the ratings from 0 through 4. Note that you

must use the vertical scroll bar to view all five rating definitions in the box.

Figure 44: Habitat Attribute Editor with temperature – daily minimum

The Habitat Attribute Ratings portion of the screen is where you will enter or edit the data. Note that you will not be able to edit reach name, sequence number, Ratings data/fields, or any fields that are grayed out (not required). Depending upon the attribute being edited, you should be able to edit all, or a portion, of the fields described below.
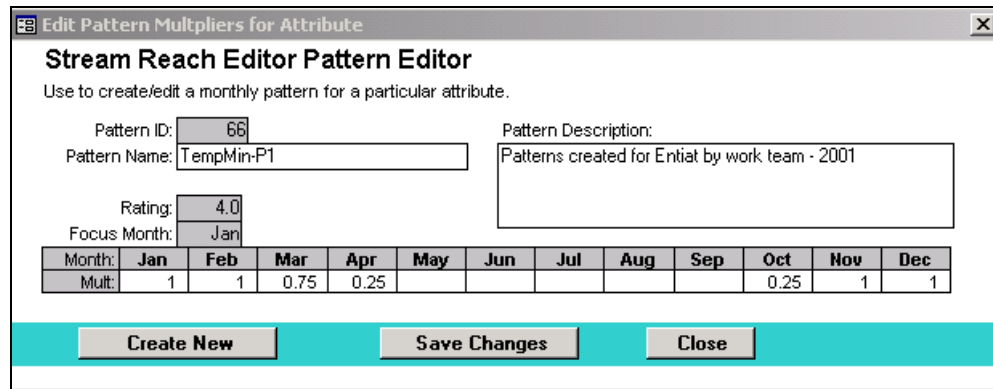
Revised Ratings: Change the existing ratings for the Template (T) or Current (C) condition.

Focus Mon (No): Select the focus month from ths drop-down list (see discussion on Shape Monthly Pattern below for details on how to identify your focus month).

Data Precision: Enter 1 if the data entered is Categorical or 2 if Non-Categorical. Note that if this field is shaded (gray), then data precision is always non-categorical. See discussion on page 35 for more information on categorical and non-categorical ratings.

<u>Shape Monthly Pattern</u>: Assign monthly pattern to all Flow Variation attributes. The pattern screen for the Temperature Minimum attribute is shown below:

Use this screen to create/edit patterns and assign attribute ratings by month. To begin, simply place a 1 in the month(s) where you want the full effect of the rating to be expressed. Note that you defined at least one of these months in the Focus Month field. Next, shape the pattern so that it expresses how the effect changes by month.

Figure 45: Stream Reach Editor Pattern Editor

The example shown in the screen capture above indicates that minimum temperature has the largest effect on this reach in November-February, as a value of 1 is provided for these months. The effect in May is only 75% that of February, and the effect in April and October is only 25%. Because values are not entered for the remaining months, the model assumes that minimum temperature is not an issue for these months.

Some key points to remember in shaping a monthly pattern:

- <u>Use values from 0 to 1—otherwise the function does not work properly</u>.

- Assign a value of 1 for both the Focus Month and any other months where you want the model to assign the full effect of the rating. If you want 50% of the effect to be modeled, use a 0.5, if 25%, assign a value of 0.25, etc.

After you have created a pattern, it is automatically assigned a pattern number and is added to the list of patterns, so that you can assign the same pattern to additional reaches if desired.

Enter Rating Comments: Enter comments to support your rationale, for the attribute rating or flow pattern used or, more likely, both. The database keeps a running list of all comments entered so that you will be able to assign the same comment or data source to multiple reaches or attributes.

Biological Community

Biological Community is the next major category of attributes. We will provide an overview the attributes in this category and a data input example.

Overview of Attributes

The Biological Community category is divided into two sub-categories, Community Effects and Macroinvertebrates.

Community Effects includes the following attributes:

- Fish Community Richness (FshComRch)
- Fish Pathogens (FshPath)
- Fish Species Introductions (FspIntro)
- Harassment (Harass)
- Hatchery Fish Outplants (HatFOutP)
- Predation Risk (PredRisk)
- Salmon Caracasses (SalmCarcass)

Macroinvertebrates includes only one attribute:

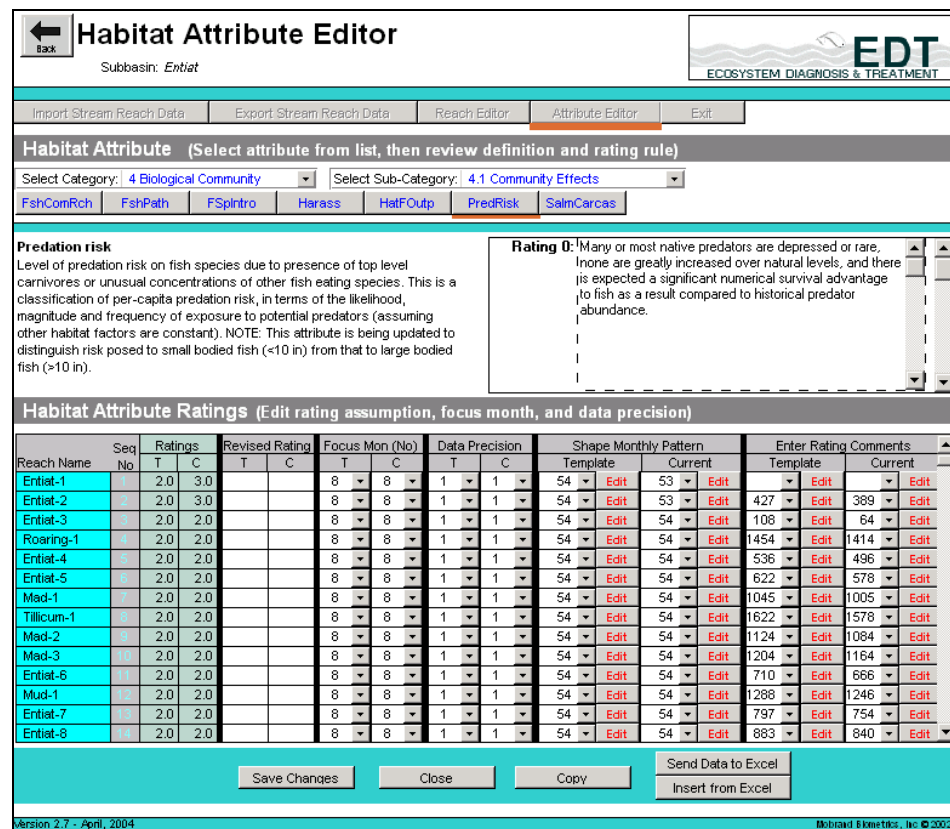- Benthic Community Richness (BnComRch)

Data Input Example

We will use Predation Risk (PredRisk) as the example to describe how data for the Biological Community attributes are entered.

Select Biological Community from the "Select Category" drop-down list, select Community Effects from the "Sub-Category" drop-down list, and click on the "PredRisk" button. The following screen will appear:

The upper left portion of the screen provides a description of the attribute, PredRisk. Directly to the right of the attribute definition, a text box displays the definitions of the ratings from 0 through 4. Note that you must use the vertical scroll bar to view all five rating definitions in the box.

The Habitat Attribute Ratings portion of the screen is where you will enter or edit the data. Note that you will not be able to edit reach name, sequence number, Ratings data/fields, or any fields that are grayed out (not required). Depending upon the attribute being edited, you should be able to edit all, or a portion, of the fields described below.
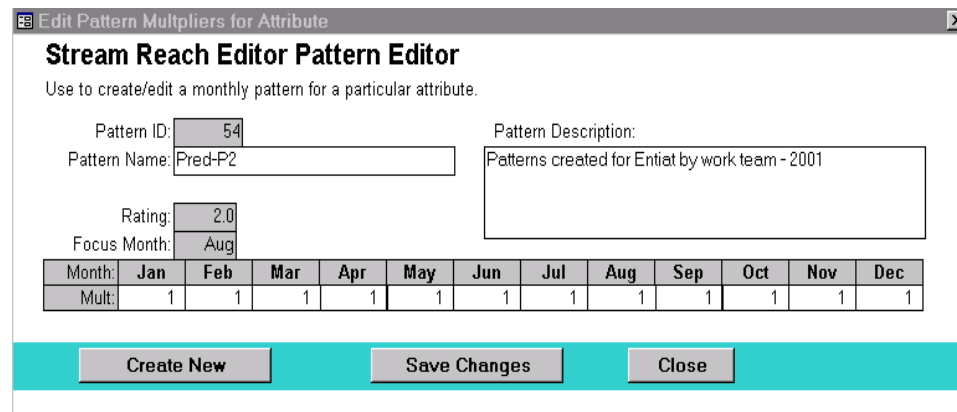

Figure 46: Habitat Attribute Editor with Predation

Revised Ratings: Change the existing ratings for the Template (T) or Current (C) condition.

Focus Mon (No): Select the focus month from ths drop-down list (see discussion on Shape Monthly Pattern below for details on how to identify your focus month).

Data Precision: Enter 1 if the data entered is Categorical or 2 if Non-Categorical. Note that if this field is shaded (gray), then data precision is always non-categorical. See discussion on page 35 for more information on categorical and non-categorical ratings.

Shape Monthly Pattern: This field allows you to assign a monthly pattern to all attributes requiring a pattern. For this set of attributes, only Predation Risk requires a monthly pattern. This pattern screen is shown below:

Figure 47: Stream Reach Editor Pattern Editor

You can use this screen to create/edit patterns and assign attribute ratings by month. To begin, simply place a 1 in the month(s) where you want the full effect of the rating to be expressed. Note that you defined at least one of these months in the Focus Month field. Next, shape the pattern so that it expresses how the effect changes by month. The example shown in the screen capture above indicates that Predation Risk is equal for all months.

Some key points to remember in shaping a monthly pattern:

- Use values from 0 to 1—otherwise the function does not work properly.

- Assign a value of 1 for both the Focus Month and any other months where you want the model to assign the full effect of the rating. If you want 50% of the effect to be modeled, use a 0.5, if 25%, assign a value of 0.25, etc.

After you have created a pattern, it is automatically assigned a pattern number and is added to the list of patterns, so that you can assign the same pattern to additional reaches if desired.

Enter Rating Comments: Enter comments to support your rationale, for the attribute rating or flow pattern used or, more likely, both. The database keeps a running list of all comments entered so that you will be able to assign the same comment or data source to multiple reaches or attributes.

Copying Habitat Data from One Reach to Another

Once you have input habitat attributes for a reach, you can copy those same attributes to other reaches.

To copy habitat data from one reach to another:

1. Select the Habitat Attribute that you wish to copy.

2. Insert your cursor at the reach that you wish to copy.

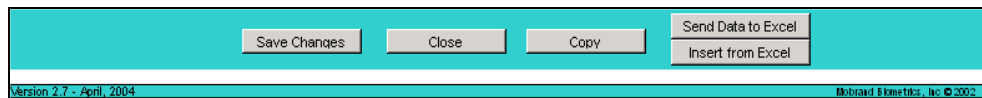3. Click "Copy" at the bottom of the screen.

Figure 48: Copy, Save, and Export options for the Habitat Data Screen

4. The Select Copy Options page appears. On the left side of the screen, select the attributes you wish to copy. On the right side of the screen, select the reaches to which these attributes should be copied.
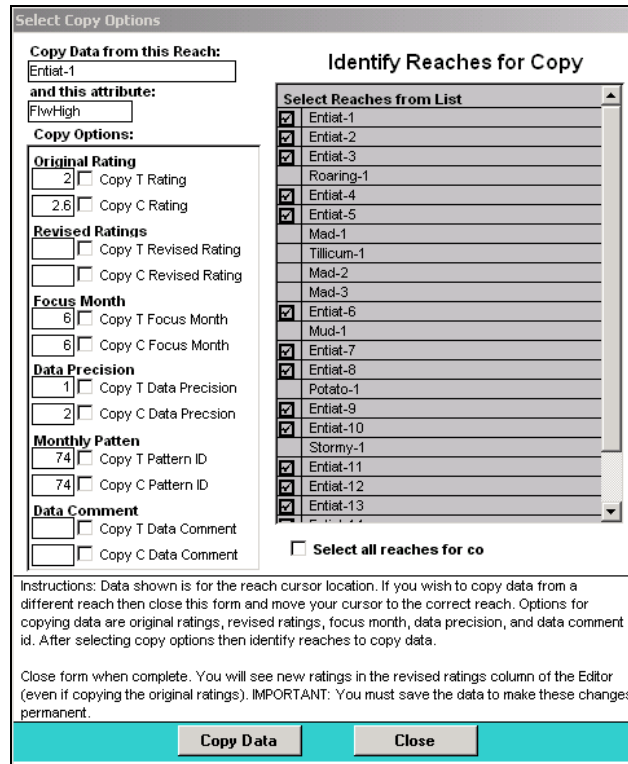
Figure 49: Select Copy Options Screen

> 5. Select "Copy Data." The data will be copied to the reaches selected. Click "Close" to return you to the Habitat Attributes screen. The new ratings will be visible.

Using Excel to View and Enter Habitat Data

The Stream Reach Editor allows you to export habitat attribute data into Microsoft Excel so you can edit the data and then import it back into the Stream Reach Editor to complete your analysis. This is particularly useful if you wish to plot your data using Excel features.

When exported, the Excel file will be protected against any formatting changes. If you change the format in any way, the data cannot be imported back into the Stream Reach Editor.

To export habitat data into Microsoft Excel:

> 1. Select the Habitat Attribute that you wish to export.
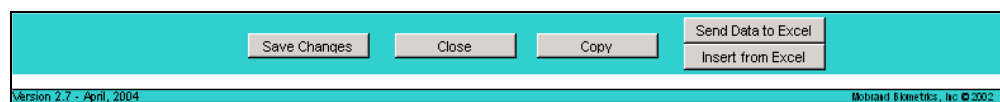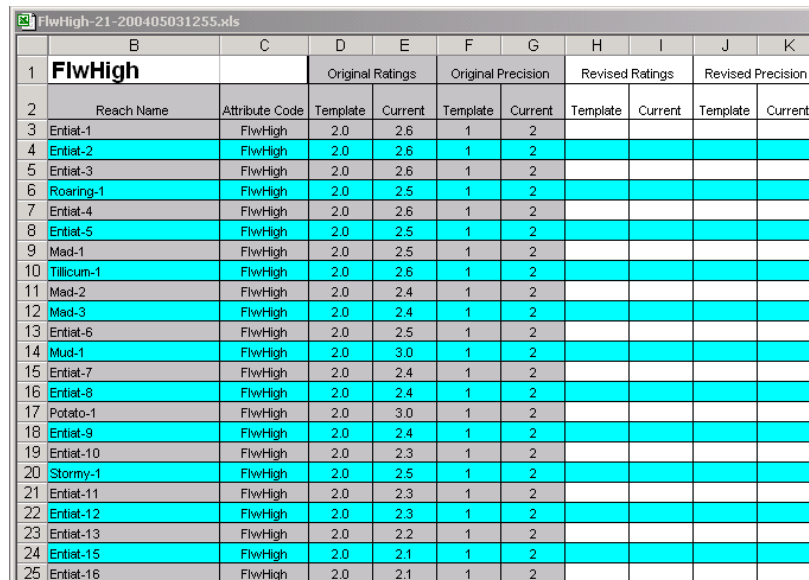> 2. Click "Send Data to Excel."

Figure 50: Copy, Save, and Export options for the Habitat Data Screen

3. Microsoft Excel will launch, displaying your data. Plot or edit your data as desired, being careful not to change the formatting.

Figure 51: Habitat Attribute Data exported into Excel

4. Plot or edit your data as desired, being careful not to change the formatting.

To import habitat data from Microsoft Excel:

1. Select the Habitat Attribute for which you have an Excel file to import.

2. Click "Insert Data from Excel."
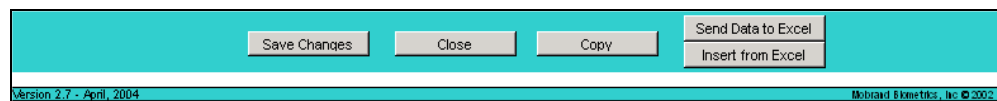
Figure 52: Copy, Save, and Export options for the Habitat Data Screen

3. Navigate to and select the Excel file that you previously exported. Click "Open." The data will be imported into the Stream Reach Editor.

4. Click "Save Changes" to save the newly imported data.

5. Save the Excel file.

6. Click "Close" to return to the Main Stream Reach Editor menu.

Exporting and Uploading your New Stream Reach Dataset

Once you have defined your stream reach structure and rated your habitat attributes, you are ready to export your dataset for upload to EDT Online.

This section describes how you export your stream reach dataset and upload it to EDT Online.

To export your dataset:

1. Click on the "Export Stream Reach Data" button on the navigation bar on the main menu page of the Stream Reach Editor. The Export Stream Reach Data (Step 1 – Begin Data Export) screen appears.
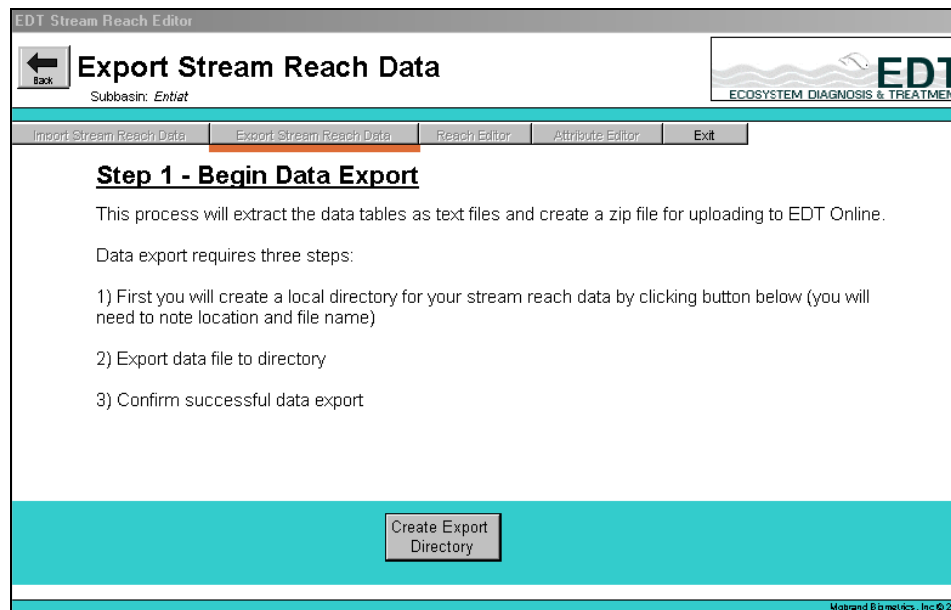

Figure 53: Export Stream Reach Data screen

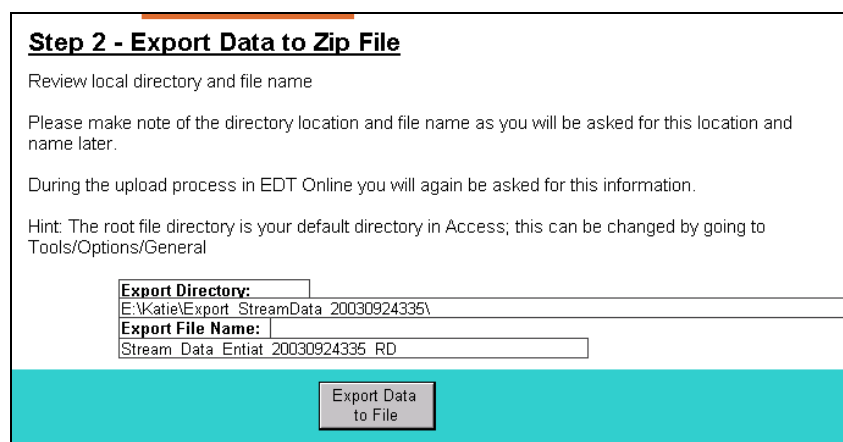2. Click on the "Create Export Directory" button at the bottom of the page.

Figure 54: Step 2 – Export Data to Zip File screen

3. Click on the "Export Data to File" button, found at the bottom of the screen. Processing may take a few moments. The Confirm Successful Data Export screen appears.
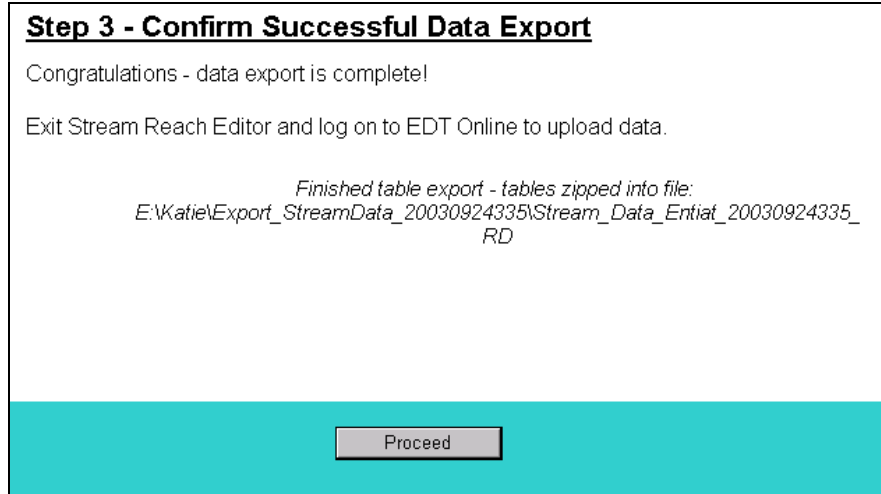
Step 3 - Confirm Successful Data Export

Congratulations - data export is complete!

Exit Stream Reach Editor and log on to EDT Online to upload data.

Finished table export - tables zipped into file:
*E:\Katie\Export_StreamData_20030924335\Stream_Data_Entiat_20030924335_*
RD

Proceed

Figure 55: Step 3 — Confirm Successful Data Export screen

NOTE: Make note of the export directory path and name. You will be asked for this information again when you are uploading to the EDT Online Web site. Note that this is the directory into which you extracted the downloaded files for importing into the Stream Reach Editor.

4. After completing the Export Data file step, click on the "Proceed" button at the bottom of the screen, which returns you to the Stream Reach Editor main menu.

5. Return to EDT Online and follow the steps outlined for Uploading Draft Data to the EDT Web application.

6. Select "Upload Draft Data" from the Stream Reach Main Menu page of EDT Online. The Upload Draft Data screen appears.
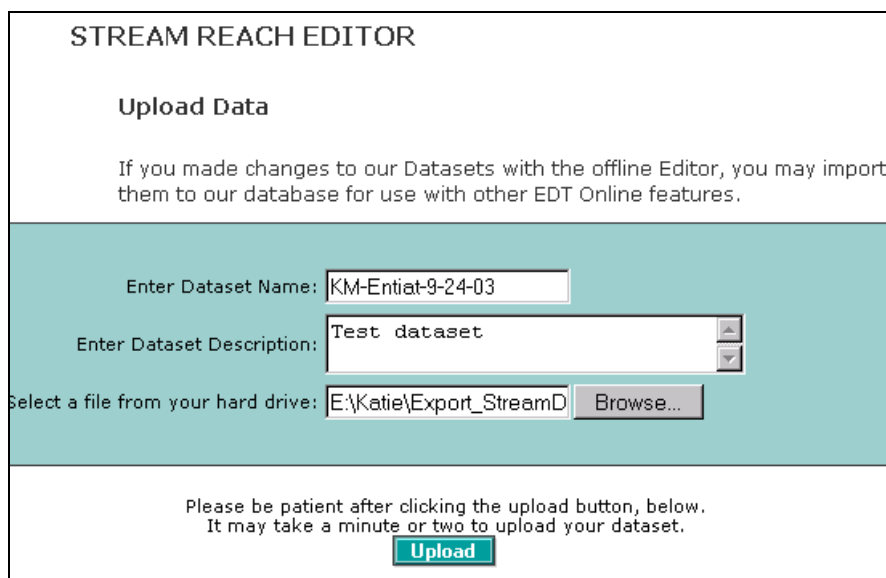

STREAM REACH EDITOR

Upload Data

If you made changes to our Datasets with the offline Editor, you may import them to our database for use with other EDT Online features.

Enter Dataset Name: KM-Entiat-9-24-03

Enter Dataset Description: Test dataset

Select a file from your hard drive: E:\Katie\Export_StreamD   Browse...

Please be patient after clicking the upload button, below.
It may take a minute or two to upload your dataset.
Upload

Figure 56: Upload Stream Reach Data screen from EDT Online

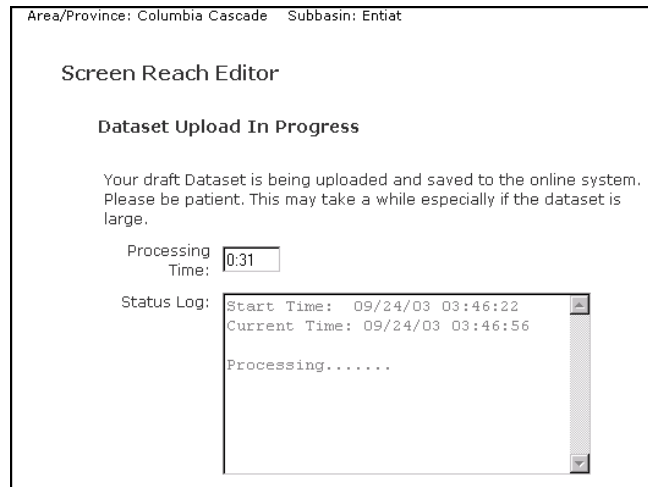7. Click "Upload" at the bottom of the screen. An Upload Progress screen will appear.

Figure 57: Dataset Upload in Progress screen

NOTE: Processing time may take a few minutes.

Figure 58: Successful Upload message

At this point, your dataset is uploaded to EDT Online, and you can use the Population Editor on EDT Online Web site to create a population, and then run reports on the dataset.