User's Guide to the Data Dictionary Tool Extension

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Current SHIM methodologies involve the use of high end Trimble Pathfinder GPS units to collect and store spatially accurate information on line, point and polygon features. Correct interpretation of the raw GPS data collected involves a series of post-processing steps that may be undertaken within a variety of computer software packages. To simplify this process and to allow SHIM mappers to more easily interpret their collected stream information, the Data Dictionary Tool was developed as a customized ArcView extension for post-processing raw GPS data. The Data Dictionary Tool also contains a series of features for easily creating, editing and merging ArcView shape files that will assist in minimizing project size and will facilitate general data management. In addition, there exists a wealth of historic SHIM data collected prior to the widespread use of the Trimble GPS units. The Data Dictionary Tool was consequently also developed to provide a means for linking this archived SHIM point data to newly derived stream linework collected in accordance with current GPS standards for spatial accuracy. In summary, the Data Dictionary Tool Extension provides a means to: 1) manually correct stream linework derived from GPS datapoints, 2) link previously derived GPS point data to new stream linework using unique ids, 3) create and merge common shapefile themes, 4) incorporate archived hard copy or electronic spreadsheet data into current SHIM data formats, and 5) create digitized polygons of riparian habitat. This guide will provide step-by-step instructions in the application of the Data Dictionary Tool and is designed for the basic ArcView user.

**(A) Loading the extension in ArcView:**

1. Copy the ddtool.avx file provided into the Ext32 subfolder on your computer hard drive (C:\Esri\Av_gis30\Arcview\Ext32)

2. Open ArcView with a new project and in the project file menu go to File > Extensions, select the Data Dictionary Tool 1.0 extension and click OK.

3. Loading the extension will add new script, view and dialog documents to the project. In the project window select the views document and open the Edit View by double-clicking on it.
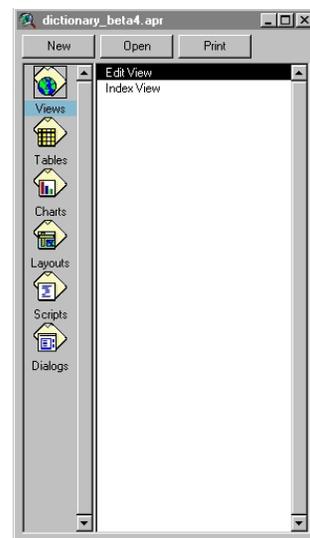

Edit View contains all the tools for manipulating GPS derived data and creating new point and line themes. There are also tools for linking and merging themes with the same feature type.

(B) Creating a new interpolated stream line:

1. In the Edit View window's button menu click on the Add Theme tool 🔽 and add a GPS derived line theme (e.g., streamdy.shp) to the view.

2. Click on the Interpolate GPS Line tool 🔼 and a dialog will appear. Provide a name for the new stream line theme and click OK.
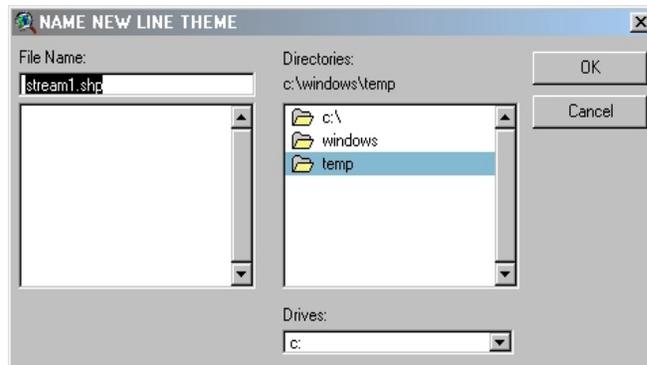

3. Another dialog box will appear prompting for the GPS derived line theme in the Edit View to copy attributes from. Select the appropriate theme (e.g., streamdy.shp) and click OK.
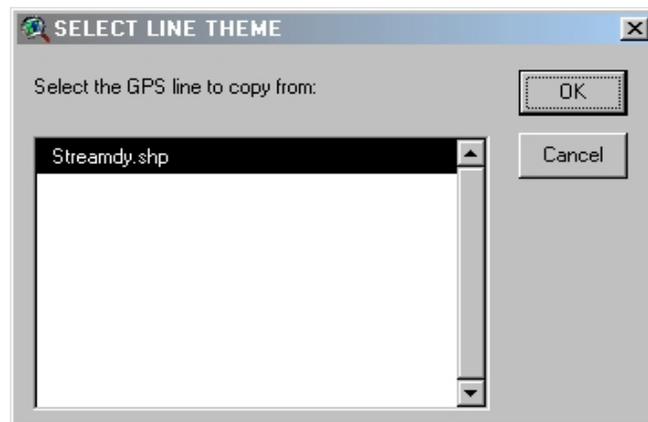

4. The Line Edit Tool will appear and the GPS derived line theme will now be colour coded based upon existing segment breaks.
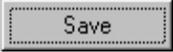
5. Click on the Draw Circle Buffer tool [icon] and click on locations in the view window to draw a series of 5m diameter red circles along the stream length. Use the Zoom In/Out tools [icons] within the Edit View window to zoom down to a view of the stream at which you can clearly delineate the boundaries of the buffer circles. These buffers will assist in the determination of the line of best fit during the line drawing process. A recommended suggestion would be that 300-500 meters of stream be visible within a single screen view (approximate scale of 1:2500) to ensure accurate interpolation of the stream line.
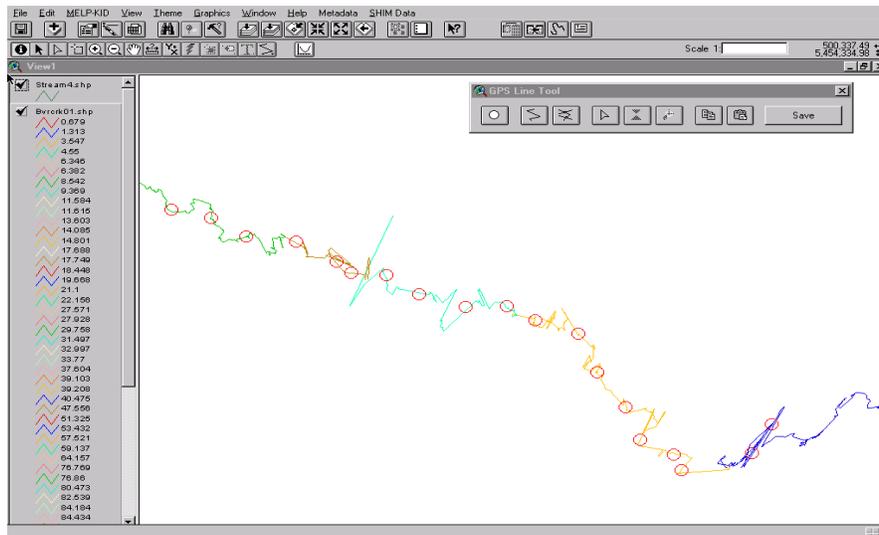

6. Click on the Draw Line tool [icon] and digitize a new best fit line theme based on the GPS derived line and circle buffers.

7. Click on the Split Line tool [icon] to insert the segment break points or vertices in the new line theme.
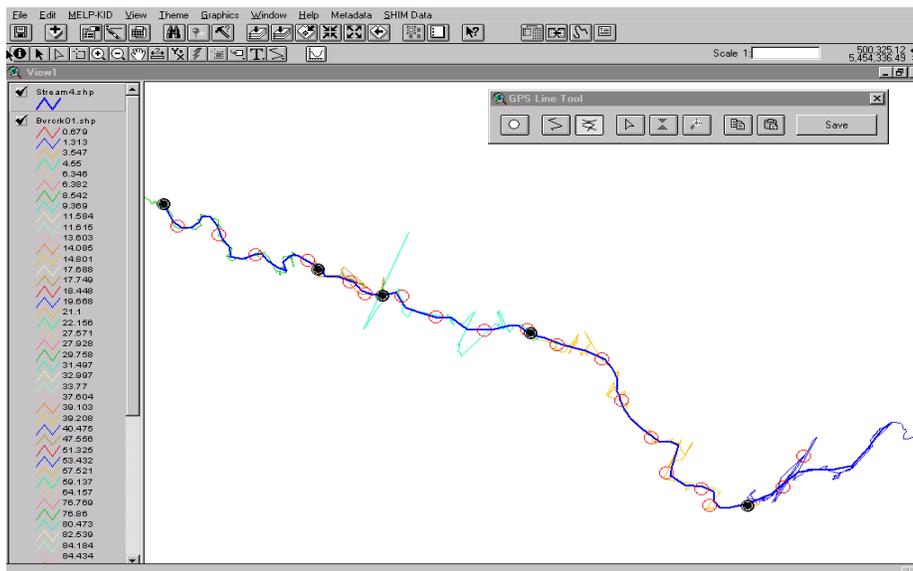
8. After all segment breaks are accounted for, click on the Copy Attributes tool ⧉ to copy the original attribute data from a GPS derived line segment. Then click on the Paste Attributes tool ⧉ to paste the copied attribute data to a new line theme segment.

9. Continue copying and pasting line segment by line segment. When all attributes have been copied fully to the new line theme, click on the Save button [Save] to save all edits.


(C) Linking point data to a stream line theme:

1. Ensure that a stream line theme and at least one point theme exists in the Edit View window.

2. In the Edit View window's button menu click on the Link Themes tool ⧉ to create a unique ID based on the stream name and TRIM mapsheet number.

3. In the Add Index Theme dialog that appears, browse to where the provided index theme (trimgridp.shp) is located and click OK. This dialog appears only when the Link Themes tool is used for the first time.
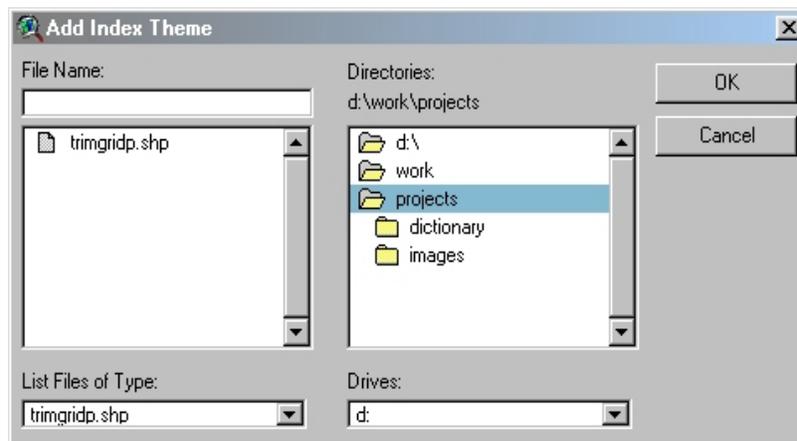

4. In the Select Line Theme dialog that appears, select the appropriate line theme for linking and click OK. A new field named "Key_ID" will be created in the line theme.


5. In the Select Point Theme(s) dialog that appears, select the appropriate point theme(s) for linking and click OK. A new field named "Key_ID" will be created in the point theme(s).
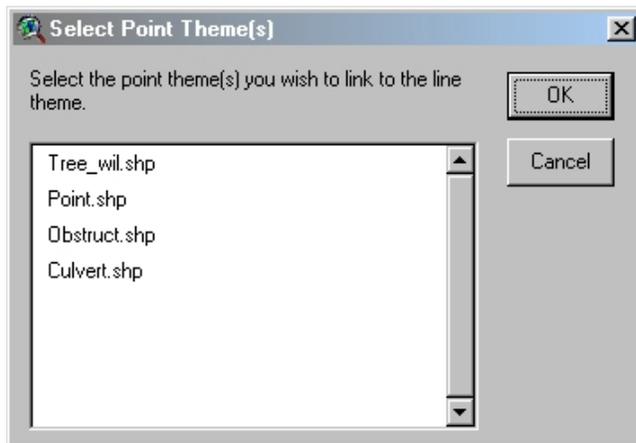
6. In the Stream Name dialog that appears, use the default name or enter a new name for the stream to be used in the unique ID and click OK. The stream name "test" is used as the default.
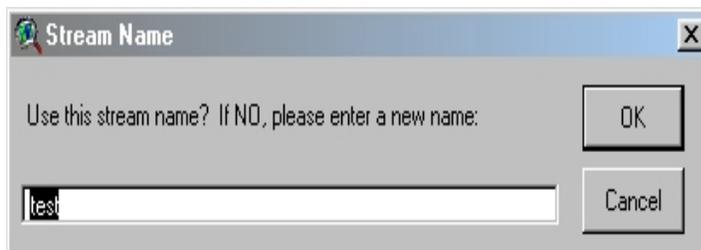
Another dialog will appear displaying the unique ID and prompting the user for validity. Click YES to continue. If the unique ID exists already (e.g., line theme already contains a different unique ID) a dialog will appear prompting for either the use of the existing ID or replacing it with the new one. The default is NO.
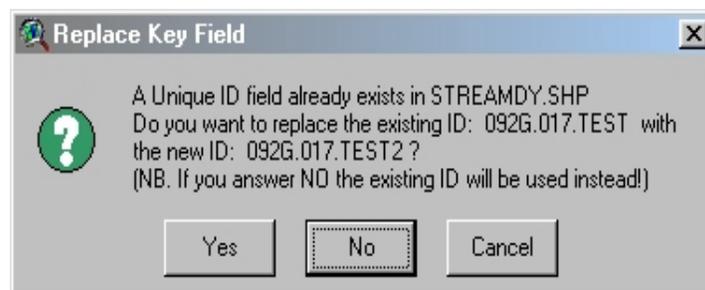

(D) Merging themes together:

1. In order to use the Merge Themes tool [icon] more than one theme of the same feature type must exist in the Edit View window.

2. Click on the Merge Themes tool in the Edit View's button menu. In the Input Theme dialog that appears, select one theme to be used as the template for the creation of fields. That means a field not contained in the template will <u>not</u> be merged into the resulting theme.

3. The Themes to Merge with… dialog box will appear showing themes in the view window that are of the same feature type. Select the appropriate themes and click OK. Another dialog box will appear prompting for the name and location of the newly merged theme. Enter the appropriate information and click OK. The merged theme will be automatically added to the Edit View window.
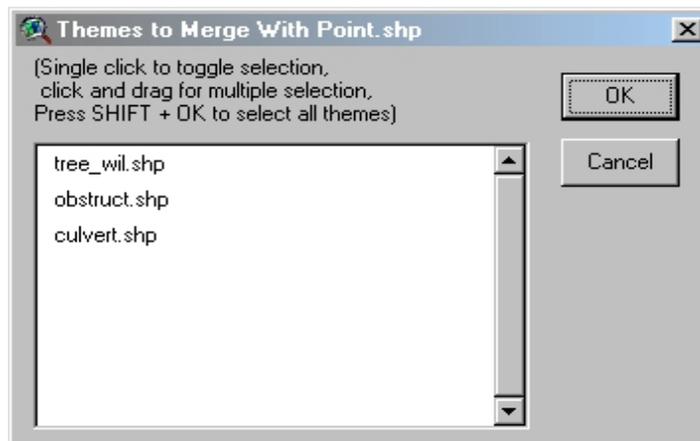

**(E) Creating or updating SHIM data points:**

The SHIM data entry options included with the Data Dictionary Tool extension can be used for recording and mapping of new point data. In general, however, this information is now more reliably collected and recorded directly in the field using high-end GPS receiver units and associated data loggers. The primary role of the SHIM tool is instead to allow incorporation of data from other sources (e.g., archived hard copy documents) into formats compatible with existing SHIM data structure and spatial mapping. A different tool dialog box can be brought up for each of the different point data types (e.g., culverts, cross-sections, obstructions, etc.) for which SHIM information is currently collected. Data entry options within each data type are identical to those currently existing within the SHIM Data Dictionary (Version 23) that has been

developed for use with the Trimble Pathfinder GPS. The only exception to this relates to the normal SHIM entries for riparian bands; due to size limitations a tool for riparian bands has been excluded from this extension.

1. In the Edit View window's file menu go to SHIM Data and select the desired SHIM data tool to create your new points.
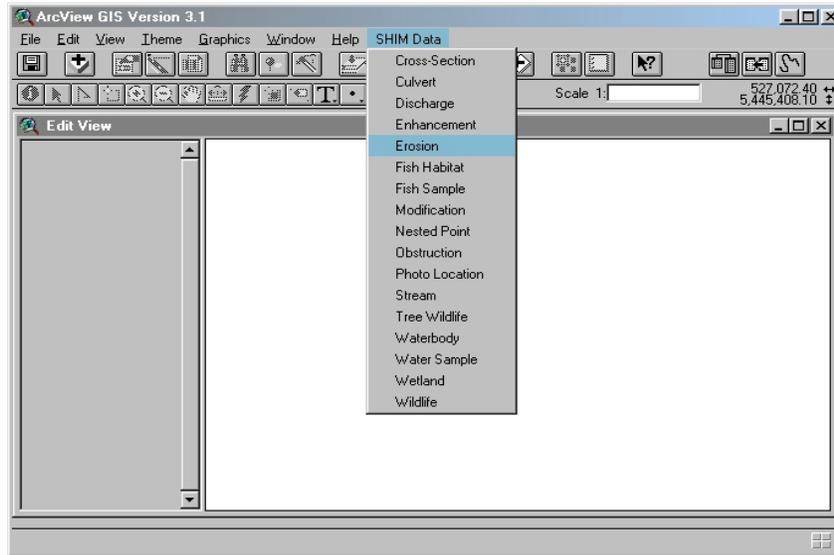
2. A Point Tool dialog box will appear indicating the required cells for data entry. Enter the appropriate information in each cell. Then click on the Add Point Tool [button] and place the accompanying cross-hairs on an selected area of your view (e.g., correct location on a mapped stream) to create a new point feature with its associated attribute data.
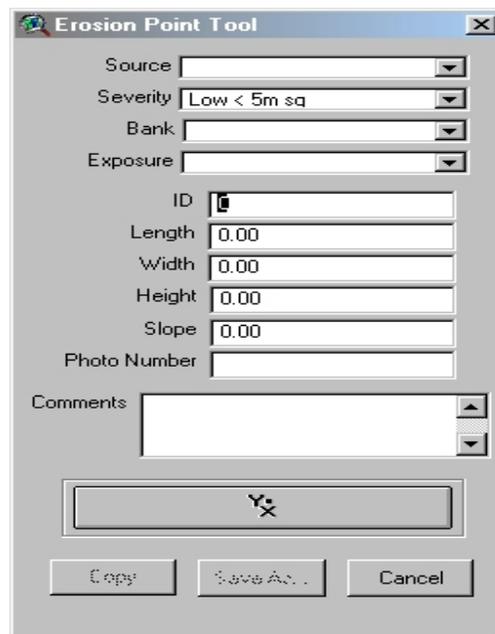
3. After entering the required information and creating a new point, click on the Save As button `Save As...` to save the point as a new shape file. This will automatically add the file to the Edit View window.

4. After creating single shape files for each point of the same data type (e.g., individual erosion points), all the saved points should be merged together into a single theme (e.g., pooled erosion points theme). To do this use the Merge Theme tool and associated methods outlined in section D.

5. To link the newly created SHIM data points to a mapped stream line use the Link Theme tool and associated methods outlined in section C.


(F) Creating riparian polygons:

The SHIM Data extension can also be used to delineate riparian habitat polygons adjacent to mapped streams. Data cells within the Riparian Polygon Tool can be populated by habitat information collected directly in the field or else interpreted from photogrammetric analysis of underlying orthophotos. The Confidence data cell allows for a qualitative assessment (low, medium or high) by the user of the relative accuracy of the riparian classifications for the polygon.

1. In the Edit View window's file menu go to SHIM Data and select the Riparian Polygon tool to create your new habitat polygons.

2. The Riparian Polygon Tool dialog box will appear indicating the required cells for data entry. Enter the appropriate information in each cell.
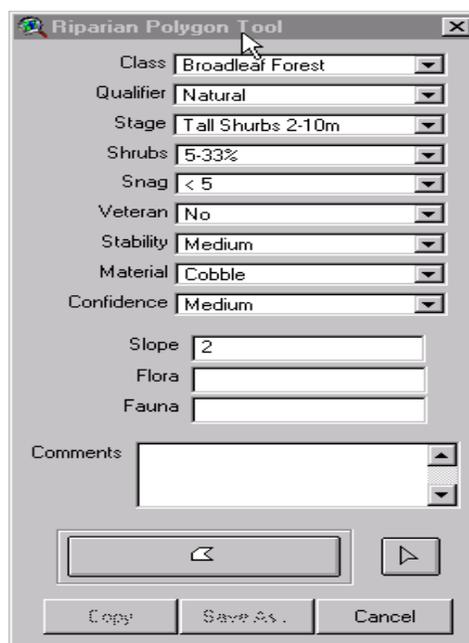
3. Then click on the Add Polygon Tool [ ] and use the accompanying cross-hairs to create the lines and vertices of the habitat zones you wish to define within the selected area of your view. The process will create a new polygon feature with all its associated attribute data. If available, it is recommended that an underlying orthophoto image of the area be imported into your ArcView project. This will greatly enhance the ability to accurately delineate the boundaries of riparian habitats. Acquisition of current orthophoto coverages is the responsibility of the user, and can be obtained through various regulatory agencies (e.g., DFO, GDBC, municipal governments)
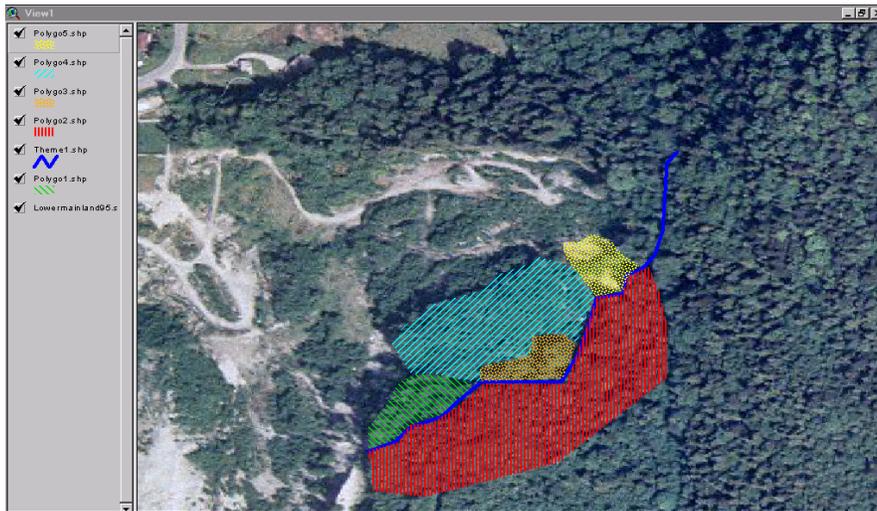
4. After entering the required information and creating a new polygon, click on the Save As button to save the polygon as a new shape file. This will automatically add the file to the Edit View window.
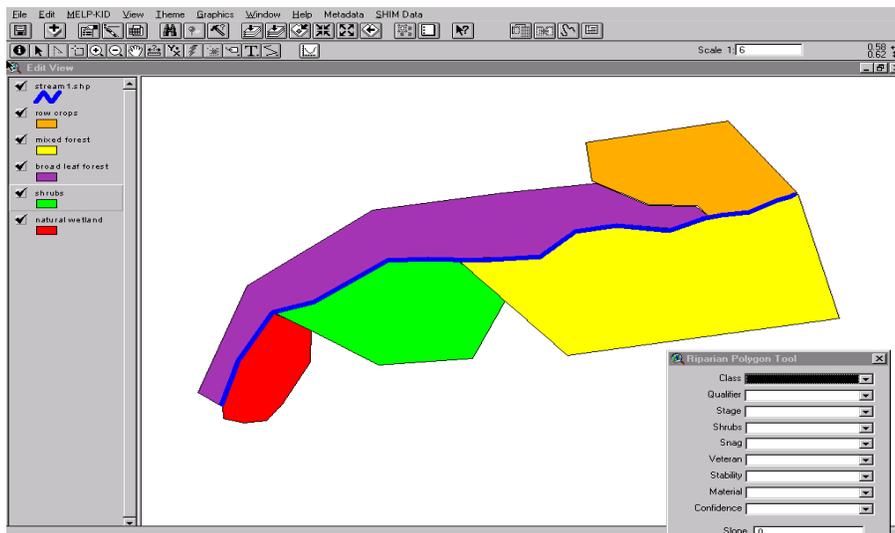
5. After creating single shape files for each riparian area the polygons can be merged together into a single theme (e.g., riparian habitats). To do this, use the Merge Theme tool and associated methods outlined in section D.